Appendix 4.5.4—Electrical Manufacturer's Maintenance Manuals

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30.5 mm Push Buttons

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22.5 mm Push Buttons

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- Bulletin 800FC Configured Pendant Stations ..... **Page 10-127**
- Bulletin 800FD Monolithic ..... **Page 10-140**
- Bulletin 800M ..... **Web‡**

16 mm Push Buttons

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Specialty Push Buttons

Hazardous Location Push Buttons

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Touch/Palm Push Buttons

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Miscellaneous Push Buttons

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- Bulletin 800H Security Stations ..... **Web‡**
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‡ Information for this product line is available on the Industrial Controls Catalog website: www.ab.com/catalogs.

30.5 mm Push Buttons

Product Overview



Bulletin 800T/800H 30.5 mm Push Buttons

- 30.5 mm mounting hole
- Type 4/13 watertight/oiltight (Bul. 800T)
- Type 4/4X/13 corrosion-resistant/watertight/oiltight (Bul. 800H)
- Heavy industrial stations and operators

Description

The Allen-Bradley Bulletin 800T and 800H 30.5 mm push button product lines are in a class by themselves. They are designed and constructed to perform in the most demanding industrial environments. In terms of sealing and switching performance, you will not find a more dependable push button offering. Allen-Bradley delivers more styles and options of operator types and contact blocks, offering flexibility to meet the most demanding specifications in the world's toughest industrial environments.

Design innovation is key to the performance advantage provided in the Bulletin 800T and 800H offerings. New in this catalog are the **Trigger Action E-Stop** operators, the new standard bearer in a tamper-resistant design. Also new is the **Universal LED Illumination** option that accepts a wide 12…130V AC/DC voltage input. This is compatible with all illuminated operator types, allows retrofitting in existing installations, and incorporates super bright LED technology.

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See below.

Standards Compliance

UL 508

CCC

Certifications

UL Listed
(File No. E14840, E10314
Guide No. NKCR, NOIV)

CSA Certified
(File No. LR1234, LR11924)

CSA C22.2, No. 14

EN/IEC: 60947-5-1

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Specifications*

Electrical Ratings		
Contact ratings		Refer to the contact ratings tables on page 10-4.
Dielectric strength		2200V for one minute, 1300V for one minute (Logic Reed)
Electrical design life cycles		1 000 000 at max. rated load, 200 000 at max. rated load (Logic Reed)
Mechanical Ratings		
Vibration		10…2000 Hz, 1.52 mm displacement (peak-to-peak) max./ 10 G max. (except Logic Reed)
Shock		1/2 cycle sine wave for 11 ms ≥ 25 G (contact fragility) and no damage at 100 G
Degree of protection		Type 1/4/12/13 (800T); Type 1/4/4X/12/13 (800H); EN/IEC 60529 IP66/65
Mechanical design life cycles		
Push buttons	(Momentary, non-illuminated)	10 000 000 min.
	(Momentary, illuminated)	250 000 min.
	(Push-pull/twist-to-release)	250 000 min.
Selector switches	(Non-illuminated)	1 000 000 min.
	(Illuminated, key-operated)	200 000 min.
Potentiometers		25 000 min.
All other devices		200 000 min.
Contact operation		Shallow, mini, and low-voltage contact blocks: Slow, double make and break Logic Reed and sealed switch contact blocks: Single break magnetic
Wire gauge/Terminal screw torque		#18…14 AWG (#18…10 Max Duty) / 6…8 lb•in
Typical operating forces Operators without contact blocks		Flush, extended button, standard mushroom, jumbo plastic mushroom: 2 lbs max. Jumbo and extended aluminum mushroom head: 3.95 lbs max. Maintained selector switch: 3.6 in•lb max.
Spring return selector switches		3.6 in•lb to stop, 0.2 in•lb to return
Illuminated push buttons and push-to-test pilot lights		5 lb max.
2-position push-pull		8.0 lb max. push or pull
3-position push-pull		8 lb max. push to in position or pull to center position (15 lb max. pull to out position)
Twist-to-release or push-pull		9 lbs max. push or pull 30 in•oz max. twist, 6 in•oz minimum return
Potentiometer		Rotational torque 3…12 in•oz; stopping torque 12 in•lb (minimum)
Contact blocks	Standard	1 lb
	Logic Reed	1 lb max.
	Sealed switch	3 lb max. at 0.205 in. plunger travel
	Stackable sealed switch	1 lb max.
	MaxDuty	1.4 lb max.
	PenTUFF	1.4 lb max.
	Self Monitoring	1.6 lb
Environment		
Temperature range	Operating	-40…+131 °F (-40…+55 °C)
	Storage	-40…+185 °F (-40…+85 °C)
Note: Operating temperatures below freezing are based on the absence of moisture and liquids. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for use in lower temperature applications.		
Humidity		50…95% RH from 77…140 °F (25…60 °C) per Procedure IV of MIL-STD-810C, Method 507.1 cycling test

* Performance Data — See Important- 3.

Standard Contact Ratings

Minimum: 24V, 24 mA

Maximum thermal continuous current I^{th} 10 A AC/2.5 A DC. Bulletin 800T units with 800T-XA contacts have ratings as follows:

Max. Opertnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 600	AC-15	A600	120…600 72…120 24…72	7200VA 60 A 60 A	720VA 720VA 10 A
DC 600	DC-13	Q600	28…600 24…28∗	69VA 2.5 A	

∗ For applications below 24V/24 mA, Pen*TUFF* or Logic Reed contacts are recommended.

Sealed Switch Contact Ratings

Minimum: 5V, 1 mA

Maximum continuous current I_{th} 5 A. Bulletin 800T units have control circuit ratings with sealed switch contact blocks as follows:

Max. Opertnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 600	AC-15	B600	120…600 0…120	3600VA 30 A	360VA 3 A
DC 300	DC-13	P300	24…300 0…24	138VA 5.0 A	

Stackable Sealed Switch Contact Ratings

Minimum: 5V, 10 mA (digital); 24V, 1 mA (analog)

Maximum continuous current I_{th} 2.5 A. Bulletin 800T units have control circuit ratings with sealed switch contact blocks as follows:

Max. Opertnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 300	AC-15	C300	120…300 0…120	1800VA 15 A	180VA 1.5 A
DC 150	DC-13	Q150	24…150 0…24	69VA 2.5 A	

Logic Reed Contact Ratings

Minimum — DC: 5V, 1 mA
Maximum — DC: 30V, 0.06 A, AC: 150V, 0.15 A
Should only be used with resistive loads.

Materials Used in 800H Type 4X Operators

Thermoplastic Polyester (Fiberglass Reinforced)

- Bushings
- Mounting Rings
- Sockets

Thermoplastic Polyester

- Non-illuminated button caps

Transparent Amorphous Nylon

- Pilot light lens cap
- Illuminated button caps

Glass Filled Crystalline Nylon

- Thrust washer

Mineral Filled Nylon

- Trim washer

Nitrile (Synthetic Rubber)

- Gaskets and internal seals

Pen*TUFF*™ (Low Voltage) Contact Ratings

Minimum DC: 5V, 1 mA
Maximum thermal continuous current I_{th} 2.5 A AC/1.0 A DC. Bulletin 800T units with 800T-XAV contacts have ratings as follows:

Max. Opertnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 300	AC-15	C300	120…300 0…120	1800VA 15 A	180VA 1.5 A
DC 150	DC-13	R150	24…150 0…24	28VA 1.0 A	

Snap Action Contact Ratings

Max. Opertnl. Volts U_e	Contact Rating Designation	Rated Operational Currents		
		Volts U_e	Make	Break
AC 300	A300	120…300 24…72	7200VA 60 A	720VA 10 A
DC 250	—	230…250 115…125	0.2 A 0.4 A	

MaxDuty Contact Rating

Maximum thermal continuous current I_{th} 24 A.
Pilot Duty — 120V AC, 12 A; 24V DC, 10 A
Motor Ratings — 120V AC, 1.5 Hp; 240V AC, 3 Hp; 24V DC, 10 A FLA/60 A LRA

Time Delay Contacts

Max. Opertnl. Volts U_e	Contact Rating Designation	Rated Operational Currents		
		Volts U_e	Make	Break
AC 120	B150	120	3600VA	360VA

Note: This device is not rated for DC applications.

Adjustment range: 0.5…15 s ± 25% I_{th} = 5 A

Product Selection
Assembled Stations



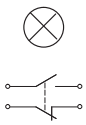
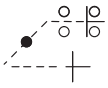
Die Cast Aluminum
Cat. No. 800T-2TAR



Booted Operator – Stainless Steel
Cat. No. 800H-1HA4T



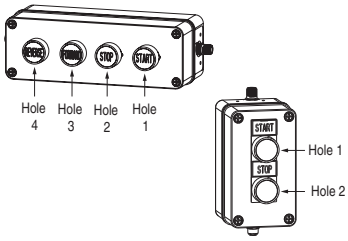
Booted Operator – Glass Polyester
Cat. No. 800H-1HA4R

Operator	Contact Symbol	Contact Action	Button Type	Button Color	Legend Marking	Type 4/13 Die Cast Aluminum Cat. No.	Type 4/4X/13 Booted Operator – Stainless Steel Cat. No.✶	Type 4/4X/13 Booted Operator – Glass Polyester Cat. No.✶
One Push Button	 1 N.O. - 1 N.C.	Momentary	Extended	Red	STOP	**800T-1TA**	800H-1HA4T	800H-1HA4R
		Momentary	Flush	Green	START	800T-1TB	800H-1HB4T	800H-1HB4R
		Momentary	Flush	Black	No Legend	**800T-1TX**	800H-1HX4T	800H-1HX4R
Two Push Buttons	 1 N.O. - 1 N.C. Each Button	Momentary	Flush Extended	Green Red	START STOP	**800T-2TA**	**800H-2HA4T**	**800H-2HA4R**
		Momentary	Flush Flush	Black Black	No Legend	**800T-2TX**	800H-2HX4T	800H-2HX4R
One Pilot Light, Two Push Buttons	 1 N.O. - 1 N.C. Each Button	Momentary	120V AC Flush Extended	Red Green Red	No Legend START STOP	**800T-2TAR**	800H-2HAR4T	**800H-2HAR4R**
		Momentary	120V AC Flush Flush	Red Black Black	No Legend	800T-2TXR	800H-2HXR4T	800H-2HXR4R
3-Position Selector Switch	 1 N.O. - 1 N.C.	Maintained	Knob Lever	Black with white insert	HAND-OFF-AUTO	**800T-R3TA**	—	—
		Maintained	Knob Lever	Black with white insert	No Legend	800T-R3TX	—	—
One Push Button	 1 N.C.L.B.	Maintained	Push-Pull/Twist	Red	EMERG STOP	**800T-1TYM**❄	—	—
Two Push Buttons	 1 N.O. - 1 N.C.	Maintained	Flush Extended	Green Red	START STOP	**800T-2TAM**	800H-2HAM4T	800H-2HAM4R
		Maintained	Flush Flush	Black Black	No Legend	800T-2TXM	800H-2HXM4T	800H-2HXM4R

✶ Boot material is chlorosulfonated polyethylene. Add suffix **L** to the cat. no. for station with bootless operators. Example: **Cat. No. 800H-1HB4T** becomes **Cat. No. 800H-1HB4TL**.

❄ Supplied with yellow legend plate to comply with IEC 60947-5-5 and NFPA79 E-Stop standards that require yellow background.

DeviceNet Stations



Two-Unit 800T – ____ ____ ____ ____ ____ ____ ____

a *b* *c* *d* *c* *d* *e*

c + d (Hole One) *c + d (Hole Two)*

Three-Unit 800T – ____ ____ ____ ____ ____ ____ ____ ____ ____

a *b* *c* *d* *c* *d* *c* *d* *e*

c + d (Hole One) *c + d (Hole Two)* *c + d (Hole Three)*

Four-Unit 800T – ____ ____ ____ ____ ____ ____ ____ ____ ____ ____ ____

a *b* *c* *d* *c* *d* *c* *d* *c* *d* *e*

c + d (Hole One) *c + d (Hole Two)* *c + d (Hole Three)* *c + d (Hole Four)*

a

Orientation	
Code	Description
V	Vertical
H	Horizontal

b

Enclosure Style		
Grey Code	Description	Yellow Code
A	2-hole	K
B	3-hole	L
C	4-hole	M
G	E-stop only§	N

c

Operator Types	
Code	Description
A	Non-illuminated flush (800T-A*)
B	Non-illuminated extended (800T-B*)
C	Non-illuminated mushroom (800T-D*)
D	Illuminated mushroom (800T-QM*)
E	Illuminated extended (800T-QB*)
F	Illuminated guarded (800T-QA*)
G	2-position SS maintained (800T-H2*)
H	3-position SS maintained (800T-J2*)
J	Enhanced pilot light (800T-QH*)
K	Non-illuminated 2-position push/pull (800T-FX*)‡
L	Non-illuminated push/pull twist-to-release (800T-FXT*)‡
M	Illuminated 2-position push/pull (800T-FXQH*)
N	2-position key SS (800T-H33*)❄
P	3-position key SS (800T-J44*)❄
Q	2-position SS spring return from right (800T-H5*)
R	3-position SS spring return from all (800T-J91*)
T	Illuminated 2-position SS maintained (800T-24H*H*)
U	Illuminated 3-position SS maintained (800T-24J*H*)
V	Non-illuminated 3-position push/pull (800T-FXM*)
W	Potentiometer⌘

d

Color/Text	
Code	Description
1	Green
2	Black (non-illuminated only)
3	Orange (non-illuminated only)
4	Grey (non-illuminated only)
5	White
6	Red
7	Blue
8	Clear (illuminated only)
9	Yellow (non-illuminated)/ amber (illuminated)
A	Green with Start legend
B	Red with Stop legend
C	Red with E-Stop legend
D	Black with Off/On legend
E	Black with Hand/Off/Auto legend
F	Red with Push to Stop/Pull to Start legend
G	Blue with Reset legend
H	Red with Power On legend
X	N/A (i.e. key ss)

e

External I/O Version➢	
Code	Description
Blank	No external I/O
A	1 input/1 output (sinking)
B	1 input/1 output (sourcing)
C	2 input
D	2 output (sinking)
E	2 output (sourcing)
F	1 E-stop block♣
G	2 E-stop blocks♣
H	2 input + 2 input
J	2 input + 2 output (sinking)
K	2 input + 2 output (sourcing)
L	1 input/1 output (sinking) + 1 E-stop block♣
M	1 input/1 output (sourcing) + 1 E-stop block♣
N	1 input/1 output (sinking) + 2 E-stop blocks♣
P	1 input/1 output (sourcing) + 2 E-stop blocks♣
Q	2 input + 1 E-stop block♣
R	2 input + 2 E-stop blocks♣
T	2 output (sinking) + 1 E-stop block♣
U	2 output (sourcing) + 1 E-stop block♣
V	2 output (sinking) + 2 E-stop blocks♣
W	2 output (sourcing) + 2 E-stop blocks♣
X	2 input + 1 input/1 output (sinking)
Y	2 input + 1 input/1 output (sourcing)

❄ Operator Types N and P from Table c must choose Color/Text option X from Table d.
‡ Operator Types K and L from Table c may be used as Emergency Stops. To be valid as an E-Stop, the operators must use Color/Text option C from Table d and it must be placed in the last hole position in the enclosure. An E-Stop connector also must be chosen from Table e.
§ Enclosure Style option G from Table b can only select one operator from Table c. Valid options are K and L with E-Stop.
♣ External I/O Versions F, L, M, Q, T and U receive only one contact block for the external E-Stop string. These connectors are rated to 3 A. If more than 3 A of current is needed or if there are two E-Stop strings, use External I/O Versions G, N, P, R, V, and W. These versions receive two contact blocks. This allows for 6 A of switching or for two E-Stop strings.
➢ This is an 8-in/4-out device. 2-in/1-out is assigned to each hole position in the enclosure. If a 2-hole enclosure is selected, 4-in and 2-out are assigned internally and up to 4 unassigned I/O points can be assigned to external connectors. This device contains up to two physical external I/O connectors. The "+" symbol in the Description field of Table e indicates that two external connectors exist. If an E-Stop connector is used, 2 unassigned I/O points can be assigned to the other connector.
⌘ Available for certain applications, please contact your local Allen-Bradley distributor.

2-Position Red Trigger Action Twist-to-Release, Non-Illuminated

- Tamper resistant – front-of-panel mounting and non-removable operator head
- Compliant with global E-stop standards, including EN ISO 13850 and EN 60947-5-5



Cat. No. 800T-TFXJET6



Cat. No. 800T-TFXLET6



Cat. No. 800T-TFXK6



Cat. No. 800H-TFRXT6

	Operator Position		Type 4/13			Type 4/4X/13
			45 mm Plastic	63 mm Metal	Key Release	45 mm Plastic
Contact Type	Out	In	Cat. No.∗❄‡	Cat. No.∗§	Cat. No.∗♣	Cat. No.∗❄‡
No contacts	—	—	**800T-TFXT6**	**800T-TFXLT6**	**800T-TFXK6**	**800H-TFRXT6**
1 N.C.	X	O	800T-TFXT6D2	800T-TFXLTD2	800T-TFXK6D2	800H-TFRXT6D2
1 N.O. - 1 N.C.	O X	X O	**800T-TFXT6A**	800T-TFXLT6A	**800T-TFXK6A**	**800H-TFRXT6A**
1 S.M.C.B.➢	X	O	800TC-TFXT6D4S	800TC-TFXLT6D4S	800TC-TFXK6D4S	800HC-TFRXT6D4S

∗ For finger-safe contact block terminals, add a **C** to the cat. no. Example: Cat. No. 800T**C**-TFXT6 or 800H**C**-TFRXT6.
❄ To order a device with a jumbo (60 mm) plastic head add the letter **J** after **X**. Example: Cat. No. 800T-TFX**J**T6A or 800H-TFRX**J**T6A.
‡ To order a jumbo head device with "E-STOP" printed on the cap add the letters **JE** after **X.** Example: Cat. No. 800T-TFX**JE**T6 or 800H-TFRX**JE**T6.
§ To order a device with "E-STOP" engraved on the cap add the letter **E** after **L.** Example: Cat. No. 800TC-TFXL**E**T6D4S.
♣ Provided with two DO18 keys.
➢ Self-monitoring contact block.

800 T ___ – T FX T 6 D2
a *b* *c* *d* *e*

a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Head Type‡		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
FX	Standard (45 mm) mushroom head	FRX
FXJ	Jumbo (60 mm) mushroom head	FRXJ
FXJE	Jumbo (60 mm) mushroom head with "E-STOP"	FRXJE
FXK	45 mm mushroom head key release	—
FXL	63 mm anodized aluminum head	—
FXLE	63 mm anodized aluminum head with "E-STOP"	—

d

Release Function	
Code	Color
Blank	Key release⌘
T	Twise release

Note: X = Closed/O = Open
⌘Configurable only with **FXK** head type.

e

Contact Block(s)			
Code	Operator Position  Out	 In	Description
Blank	—	—	No contacts on operator
Standard			
D1	O	X	1 N.O.
D2	X	O	1 N.C.
D4	X	O	1 N.C.L.B.
A	O X	X O	1 N.O. - 1 N.C.
A1	O X	X O	1 N.O. - 1 N.C.L.B.
A5	X X	O O	2 N.C.L.B.
Pen*TUFF* (Low Voltage)			
D1V	O	X	1 N.O.
D2V	X	O	1 N.C.
D4V	X	O	1 N.C.L.B.
AV	O X	X O	1 N.O. - 1 N.C.
Class 1, Div. 2/Zone 2			
Logic Reed			
D1R	O	X	1 N.O.
D2R	X	O	1 N.C.
AR	O X	X O	1 N.O. - 1 N.C.
Sealed Switch			
D1P	O	X	1 N.O.
D2P	X	O	1 N.C.
AP	O X	X O	1 N.O. 1 N.C.
Stackable Sealed Switch			
D1Y	O	X	1 N.O.
D2Y	X	O	1 N.C.
AY	O X	X O	1 N.O. - 1 N.C.

10

30.5 mm Push Buttons

Emergency Stop Operators

2-Position Red Trigger Action Twist-to-Release, Illuminated

- Tamper resistant – front-of-panel mounting and non-removable operator head
- Compliant with global E-stop standards, including EN ISO 13850 and EN 60947-5-5
- LED illumination provided as standard

Type	Volts	Contacts	Operator Position		Type 4/13		Type 4/4X/13	
			Out	In	45 mm∗	60 mm∗❄	45 mm∗	60 mm∗❄
					Cat. No.	Cat. No.	Cat. No.	Cat. No.
Operator only‡		No contacts			**800T-TFXTS00R**	**800T-TFXJTS00R**	**800H-TFRXTS00R**	**800H-TFRXJTS00R**
Universal	12…130V AC/DC	N.O. - N.C.	O X	X O	**800T-TFXTQH2RA**	**800T-TFXJTQH2RA**	**800H-TFRXTQH2RA**	**800H-TFRXJTQH2RA**
Transformer	120V AC 50/60 Hz				**800T-TFXTPH16RA**	800T-TFXJTPH16RA	**800H-TFRXTPH16RA**	800H-TFRXJTPH16RA

Note: X = Closed/O = Open

∗ For finger-safe contact block terminals, add a **C** to the cat. no. Example: Cat. No. 800T**C**-TFXTS00R or 800H**C**-TFRXTS00R.

❄ To order a device with "E-STOP" printed on the cap add the letter **E** after **J**. Example: Cat. No. 800T-TFXJ**E**TQH2RA or 800H-TFRXJ**E**TQH2RA.

‡ Operator-only supplied without power module, lamp, or contact blocks.

800 T ___ – T FXT QH 2 R A

a b c d e f

a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Head Type§		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
FXT	Standard (45 mm) mushroom head	FRXT
FXJT	Jumbo (60 mm) mushroom head	FRXJT
FXJET	Jumbo (60 mm) mushroom head with "E-STOP"	FRXJET

d

Illumination Option	
Code	Description
PH	Transformer with LED lamp
QH	Universal with LED lamp

e

Voltage	
Transformer	
Code	Description
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
46	480V AC 50/60 Hz
56	600V AC 50/60 Hz
Universal	
Code	Description
2	12…130V AC/DC

f

Target		
Contact		
N.O.	O	X
N.C./ N.C.L.B.	X	O
Contact Blocks		
Code	Description	
Blank	No contacts	
Standard		
D1	1 N.O.	
D2	1 N.C.	
D4	1 N.C.L.B.	
A	1 N.O. - 1 N.C.	
A1	1 N.O. - 1 N.C.L.B.	
A5	2 N.C.L.B.	
Pen*TUFF* (Low Voltage)		
D1V	1 N.O.	
D2V	1 N.C.	
D4V	1 N.C.L.B.	
AV	1 N.O. - 1 N.C.	
Class 1, Div. 2/Zone 2		
Logic Reed		
D1R	1 N.O.	
D2R	1 N.C.	
AR	1 N.O. - 1 N.C.	
Sealed Switch		
D1P	1 N.O.	
D2P	1 N.C.	
AP	1 N.O. - 1 N.C.	
Stackable Sealed Switch		
D1Y	1 N.O.	
D2Y	1 N.C.	
AY	1 N.O. - 1 N.C.	

Momentary Contact Push Button Devices, Non-Illuminated



Flush Head Unit
Cat. No. 800T-A1A



Extended Head Unit
Cat. No. 800T-B6A



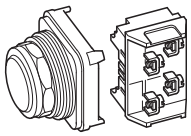
Booted Unit
Cat. No. 800H-R2A



Bootless Flush Head Unit
Cat. No. 800H-AR1A

Contact Type	Button Color	Type 4/13		Type 4/4X/13	
		Flush Head	Extended Head	Booted∗	Bootless Flush Head
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
No Contact	Green	**800T-A1**	**800T-B1**	**800H-R1**	**800H-AR1**
	Black	**800T-A2**	**800T-B2**	**800H-R2**	**800H-AR2**
	Red	**800T-A6**	**800T-B6**	**800H-R6**	**800H-AR6**
1 N.O.	Green	**800T-A1D1**	**800T-B1D1**	**800H-R1D1**	**800H-AR1D1**
	Black	**800T-A2D1**	**800T-B2D1**	**800H-R2D1**	**800H-AR2D1**
	Red	**800T-A6D1**	**800T-B6D1**	**800H-R6D1**	**800H-AR6D1**
1 N.C.	Green	**800T-A1D2**	**800T-B1D2**	800H-R1D2	800H-AR1D2
	Black	**800T-A2D2**	**800T-B2D2**	800H-R2D2	**800H-AR2D2**
	Red	**800T-A6D2**	**800T-B6D2**	**800H-R6D2**	**800H-AR6D2**
1 N.O. - 1 N.C.	Green	**800T-A1A**	**800T-B1A**	**800H-R1A**	**800H-AR1A**
	Black	**800T-A2A**	**800T-B2A**	**800H-R2A**	**800H-AR2A**
	Red	**800T-A6A**	**800T-B6A**	**800H-R6A**	**800H-AR6A**

800 T — – A 1 — A
a b c d e f



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Operator Type		
800T Type 4/13	Description	800H Type 4/4X/13
Code		Code
A	Flush head	AR
B	Extended head	BR
D	Mushroom head	DR
DX	Mushroom head less color cap	DRX
—	Bootless guarded head	GR
—	Booted head	R∗

d

Color Cap	
Code	Description
Blank	Used only when ordering Operator Type DX/DRX
1	Green
2	Black
3	Orange❄

d (cont'd)

Color Cap	
Code	Description
4	Grey❄
5	White❄
6	Red
7	Blue
9	Yellow

e

Special Mushroom Head	
Code	Description
J§	Jumbo mushroom head — plastic
L§	Jumbo mushroom head — metal

Note: Special mushroom head options only apply to mushroom head operator type code D/DR (Table c).

f

Contact Block(s)	
Code	Description
Blank	No contacts
Standard	
D1	1 N.O.
D2	1 N.C.
D3	1 N.O.E.M.
D4	1 N.C.L.B.
D5	1 N.O. (Mini)
D6	1 N.C. (Mini)
A1	1 N.C.L.B. - 1 N.O.
A2	2 N.O.‡
A4	2 N.C.
A7	1 N.C.L.B. - 1 N.C.
A	1 N.O. - 1 N.C.
B	2 N.O. - 2 N.C.

f (cont'd)

Contact Block(s)	
Code	Description
Pen*TUFF* (Low Voltage)	
D1V	1 N.O.
D2V	1 N.C.
D3V	1 N.O.E.M.
D4V	1 N.C.L.B.
AV	1 N.O. - 1 N.C.
BV	2 N.O. - 2 N.C.
Time Delay	
T	1 N.O. Depress close, delayed opening
S	1 N.C. Depress open, delayed closure
Snap Action	
M	1 N.O. - 1 N.C.
N	2 N.O. - 2 N.C.
Class 1, Div. 2/Zone 2	
Logic Reed	
D1R	1 N.O.
D2R	1 N.C.
A2R	2 N.O.‡
A4R	2 N.C.
AR	1 N.O. - 1 N.C.
BR	2 N.O. - 2 N.C.

f (cont'd)

Contact Block(s)	
Code	Description
Class 1, Div. 2/Zone 2	
Sealed Switch	
D1P	1 N.O.
D2P	1 N.C.
AP	1 N.O. - 1 N.C.
BP	2 N.O. - 2 N.C
Stackable Sealed Switch	
D1Y	1 N.O.
D2Y	1 N.C.
A2Y	2 N.O.
A4Y	2 N.C.
AY	1 N.O. - 1 N.C.
BY	2 N.O. - 2 N.C

Time Delay Contacts

Series C field installable kits can only be used with Series T or later operators. Adjustable range of 0.5 to 15 s + 25%. Maximum continuous current Ith 5 A.

Snap Action Contacts

Snap-action contacts feature a quick make, quick break snap-action mechanism that is only available on factory assembled units. Maximum continuous current I_{th} 10 A.

∗ Underlying operators are "flush head" type, except red which are "extended head". Boot material is chlorosulfonated polyethylene.
❄ Not available for booted operators.
‡ A2 and A2R contact blocks cannot be stacked upon, but can stack on other contact blocks.
§ Jumbo mushroom heads not available in white color.

30.5 mm Push Buttons

Push Button Operators

Momentary Contact Push Button Devices, Illuminated



Extended Head Without Guard
Cat. No. 800T-PB16R

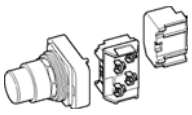


Extended Head without Guard
Cat. No. 800H-PRB16R

Type	Lamp Type	Volts	Color	Type 4/13 Extended Head Without Guard∗ Cat. No.	Type 4/13 Extended Head With Guard∗ Cat. No.	Type 4/4X/13 Extended Head without Guard∗ Cat. No.	Type 4/4X/13 Extended Head with Guard∗ Cat. No.
Operator Only❄				**800T-SB00XX**	800T-SA00XX	800H-SRB00XX	800H-SRA00XX
Full Voltage	Incandescent	24V AC/DC	Red	**800T-QB24R**	**800T-QA24R**	**800H-QRB24R**	800H-QRA24R
			Green	**800T-QB24G**	**800T-QA24G**	**800H-QRB24G**	**800H-QRA24G**
			Amber	**800T-QB24A**	**800T-QA24A**	**800H-QRB24A**	800H-QRA24A
	No Lamp	0…250V AC/DC	No Lens	800T-QBN25	800T-QAN25	800H-QRBN25	800H-QRAN25
Universal	LED	12…130V AC/DC	Red	**800T-QBH2R**	**800T-QAH2R**	**800H-QRBH2R**	**800H-QRAH2R**
			Green	**800T-QBH2G**	**800T-QAH2G**	**800H-QRBH2G**	**800H-QRAH2G**
			Amber	**800T-QBH2A**	**800T-QAH2A**	**800H-QRBH2A**	**800H-QRAH2A**
Transformer	Incandescent	120V AC, 50/60 Hz	Red	**800T-PB16R**	**800T-PA16R**	**800H-PRB16R**	**800H-PRA16R**
			Green	**800T-PB16G**	**800T-PA16G**	**800H-PRB16G**	**800H-PRA16G**
			Amber	**800T-PB16A**	**800T-PA16A**	**800H-PRB16A**	**800H-PRA16A**
	LED		Red	**800T-PBH16R**	**800T-PAH16R**	**800H-PRBH16R**	800H-PRAH16R
			Green	**800T-PBH16G**	**800T-PAH16G**	**800H-PRBH16G**	**800H-PRAH16G**
			Amber	**800T-PBH16A**	**800T-PAH16A**	800H-PRBH16A	800H-PRAH16A
	No Lamp		No Lens	800T-PBN16	800T-PAN16	800H-PRBN16	800H-PRAN16

∗ Includes as standard one Cat. No. 800T-XA (1 N.O. - 1 N.C.) contact block.
❄ Operator only supplied without power module, lamp, lens cap, or contact blocks.

800 T ___ – P B H 16 R ___
a b c d e f g h



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Power Module Type		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
P	Transformer (or dual input)	PR
Q	Full voltage/ Universal	QR

d

Head Type	
Code	Description
A	Extended head with guard
B	Extended head without guard
M	Mushroom
MJ	Jumbo mushroom

e

Illumination Options	
Code	Description
Blank	Incandescent
H	LED
Dual Input	
D	Diode type‡
T	Transformer — relay type
TH	Transformer — relay type LED

f

Voltage	
Transformer	
Code	Description
16	120V AC, 50/60 Hz
26	240V AC, 50/60 Hz
46	480V AC, 50/60 Hz
56	600V AC, 50/60 Hz
Full Voltage — Incandescent	
12	12V AC/DC
24	24V AC/DC
48	48V AC/DC
10	120V AC/DC
20	240V AC/DC
Universal — LED	
2	12…130V AC/DC
Dual Input	
16	120V AC
24	24V AC/DC➢

g

Lens Color	
Code	Description
Blank	No lens with standard contacts 1 N.O. - 1 N.C.
X	No lens if ordering any contacts other than standard 1 N.O. - 1 N.C.
A	Amber
B	Blue
C	Clear
G	Green
R	Red
W	White

h

Contact Block(s)	
Code	Description
X	No contacts
Standard	
Blank	1 N.O. - 1 N.C.
D1	1 N.O.
Pen*TUFF* (Low Voltage)	
AV	1 N.O. - 1 N.C.
Class 1, Div. 2/Zone 2	
Logic Reed	
AR	1 N.O. - 1 N.C.
Sealed Switch	
AP	1 N.O. - 1 N.C.
Stackable Sealed Switch	
AY	1 N.O. - 1 N.C.

‡ Diode type dual input provides circuit isolation via opposing diodes. Not recommended for use with solid-state outputs.
➢ Dual input diode only.

www.ab.com/catalogs Preferred availability cat. nos. are **bold**.
Publication A117-CA001A-EN-P

Allen-Bradley

Momentary Contact Push Button Devices, Non-Illuminated — With Two-Color Molded Legend Caps

Operator Only

- Less legend cap
- Less contact blocks

Button Type	Type 4/13 Cat. No.	Type 4/4X/13 Cat. No.
Flush	**800T-A00**	**800H-AR00**
Extended	**800T-B00**	**800H-BR00**



Cat. No. 800T-A00 with Cat. No. 800T-LC103W installed



Cat. No. 800H-BR00 with Cat. No. 800T-LC604 installed

Legend Caps

Text	Cap Color	Text Color	Cat. No.
I	Green	White	800T-LC101W
START			800T-LC103W
ON			800T-LC105W
START / I			800T-LC121W
O	Black	White	800T-LC202W
STOP			800T-LC204W
RESET			800T-LC207W
↑			800T-LC208W
FORWARD			800T-LC209W
REVERSE			800T-LC210W
JOG			800T-LC212W
UP			800T-LC213W
DOWN			800T-LC214W
RAISE			800T-LC215W
LOWER			800T-LC216W

Text	Cap Color	Text Color	Cat. No.
IN	Black	White	800T-LC217W
OUT			800T-LC218W
HIGH			800T-LC219W
LOW			800T-LC220W
STOP / O			800T-LC222W
I	White	Black	800T-LC501B
START			800T-LC503B
↑			800T-LC508B
START / I			800T-LC521B
O	Red	White	800T-LC602W
STOP			800T-LC604W
OFF			800T-LC606W
STOP / O			800T-LC622W
RESET	Blue	White	800T-LC707W
R			800T-LC711W

Note: Package Qty. = 1

800 T ___ – A 103W A

a b c d e

a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Operator Type		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
A	Flush head	AR
B	Extended head	BR

d

Cap Text/Color			
Code	Text	Color	
		Cap	Text
101W	I	Green	White
103W	START		
105W	ON		
121W	START / I		
202W	O	Black	White
204W	STOP		
207W	RESET		
208W	↑		
209W	FORWARD		
210W	REVERSE		
212W	JOG		
213W	UP		
214W	DOWN		
215W	RAISE		
216W	LOWER		
217W	IN		
218W	OUT		
219W	HIGH		
220W	LOW		
222W	STOP / O		
501B	I	White	Black
503B	START		
508B	↑		
521B	START / I		
602W	O	Red	White
604W	STOP		
606W	OFF		
622W	STOP / O		
707W	RESET	Blue	White
711W	R		

e

Contact Block(s)	
Code	Description
Blank	No contacts
Standard	
D1	1 N.O.
D2	1 N.C.
D3	1 N.O.E.M.
D4	1 N.C.L.B.
D5	1 N.O. (Mini)
D6	1 N.C. (Mini)
A1	1 N.C.L.B. - 1 N.O.
A2	2 N.O.‡
A4	2 N.C.
A7	1 N.C.L.B. - 1 N.C.
A	1 N.O. - 1 N.C.
B	2 N.O. - 2 N.C.
Class 1, Div. 2/Zone 2	
Sealed Switch	
D1P	1 N.O.
D2P	1 N.C.
AP	1 N.O. - 1 N.C.
BP	2 N.O. - 2 N.C
Stackable Sealed Switch	
D1Y	1 N.O.
D2Y	1 N.C.
A2Y	2 N.O.
A4Y	2 N.C.
AY	1 N.O. - 1 N.C.
BY	2 N.O. - 2 N.C

e (cont'd)

Contact Block(s)	
Code	Description
Pen*TUFF* (Low Voltage)	
D1V	1 N.O.
D2V	1 N.C.
D3V	1 N.O.E.M.
D4V	1 N.C.L.B.
AV	1 N.O. - 1 N.C.
BV	2 N.O. - 2 N.C.
Time Delay	
T	1 N.O. Depress close, delayed opening
S	1 N.C. Depress open, delayed closure
Snap Action	
M	1 N.O. - 1 N.C.
N	2 N.O. - 2 N.C.
Class 1, Div. 2/Zone 2	
Logic Reed	
D1R	1 N.O.
D2R	1 N.C.
A2R	2 N.O.‡
A4R	2 N.C.
AR	1 N.O. - 1 N.C.
BR	2 N.O. - 2 N.C.

‡ A2 and A2R contact blocks cannot be stacked upon, but can stack upon other contact blocks.

10

30.5 mm Push Buttons

Selector Switches

2-Position Selector Switch Devices, Non-Illuminated



Standard Knob Operator
Cat. No. 800T-H2A



Knob Lever Operator
Cat. No. 800T-H17A

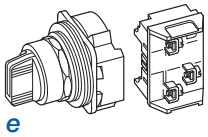


Standard Knob Operator
Cat. No. 800H-HR2A

Contact Type	Side	Contact	Operator Position		M = Maintained S = Spring Return	Type 4/13 Standard Knob Cat. No.	Type 4/13 Knob Lever Cat. No.	Type 4/4X/13 Standard Knob Cat. No.
No Contacts	—	—	—	—	M M	**800T-H2**	**800T-H17**	**800H-HR2**
					S→M	800T-H4	800T-H18	800H-HR4
					M←S	**800T-H5**	800T-H19	800H-HR5
1 N.O.	White	A	O	X	M M	**800T-H2D1**	**800T-H17D1**	**800H-HR2D1**
					S→M∗	**800T-H4D1**	800T-H18D1	800H-HR4D1
					M←S	**800T-H5D1**	800T-H19D1	800H-HR5D1
1 N.O. - 1 N.C.	White	A B	O X	X O	M M	**800T-H2A**	**800T-H17A**	**800H-HR2A**
					S→M∗	**800T-H4A**	**800T-H18A**	800H-HR4A
					M←S	**800T-H5A**	**800T-H19A**	**800H-HR5A**

Note: X = Closed/O = Open
∗ Target tables are reversed from those shown.

800 T – HA 2 A
a b c d e



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Knob Insert Colors		
800T Type 4/13	Description	800H Type 4/4X/13
Code		Code
H	White	HR
HX	Packet of colored inserts❄	HRX
Metal Wing Lever Colors§		
Code	Color	Code
HA	Red	—
HG	Grey	—

d

Operator Type and Function	
Standard Knob	
Code	Operator Function
2	Maintained
4	Spring return from left‡
5	Spring return from right
Knob Lever§	
Code	Operator Function
17	Maintained
18	Spring return from left‡
19	Spring return from right
Metal Wing Lever§	
Code	Operator Function
11	Maintained
15	Spring return from left‡
16	Spring return from right
Coin Slot§	
Code	Operator Function
6	Maintained
7	Spring return from left
8	Spring return from right

e

Contact Block(s)			
Code	Description Contact Configuration	2-Position	
Blank	No contacts	—	—
Standard			
D1	1 N.O.	O	X
D2	1 N.C.	X	O
A	1 N.O. - 1 N.C.	O	X
		X	O
B	2 N.O. - 2 N.C.	O	X
		X	O
		O	X
		X	O
Max Duty (Horsepower Rated)♣			
D1M	1 N.O.		
D2M	1 N.C.		
Pen*TUFF* (Low Voltage)♣			
D1V	1 N.O.		
D2V	1 N.C.		
AV	1 N.O. - 1 N.C.		
BV	2 N.O. - 2 N.C.		
Class1, Div. 2/Zone 2			
Logic Reed♣			
D1R	1 N.O.		
D2R	1 N.C.		
AR	1 N.O. - 1 N.C.		
BR	2 N.O. - 2 N.C.		
Sealed Switch♣			
D1P	1 N.O.		
D2P	1 N.C.		
AP	1 N.O. - 1 N.C.		
BP	2 N.O. - 2 N.C.		
Stackable Sealed Switch♣			
D1Y	1 N.O.		
D2Y	1 N.C.		
AY	1 N.O. - 1 N.C.		
BY	2 N.O. - 2 N.C.		

❄ One insert of each color (blue, green, orange, red, and yellow).
‡ Target tables are reversed from those shown.
§ Only available on Bul. 800T, Type 4/13 operators.
♣ Contact target tables same as those listed for standard contact blocks.

2-Position Selector Switch Devices, Non-Illuminated (Bul. 800T only)

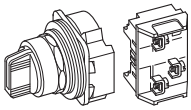


2-Position Cylinder Lock Operator
Cat. No. 800T-H33A

Contact Type	Side	Contact	Operator Position		M = Maintained S = Spring Return	Type 4/13 Cylinder Lock♣ Key Removal — Left❄ Cat. No.	Key Removal — Right❄ Cat. No.	Key Removal — Both❄ Cat. No.
No Contacts	—	—	—	—	M M	**800T-H31**	**800T-H32**	**800T-H33**
					M←S	**800T-H48**	—	—
1 N.O.	White	A	O	X	M M	**800T-H31D1**	**800T-H32D1**	**800T-H33D1**
					S→M∗	—	800T-H42D1	—
					M←S	**800T-H48D1**	—	—
1 N.O. - 1 N.C.	White	A B	O X	X O	M M	**800T-H31A**	**800T-H32A**	**800T-H33A**
					S→M∗	—	**800T-H42A**	—
					M←S	**800T-H48A**	—	—

Note: X = Closed/O = Open

800 T ___ – H31 ___ A (a b c d e)



a

Protection Rating	
Code	Description
T	Metal, Type 4/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Key Removal Position	
Maintained	
Code	Operator Function
H31	Key removal — left
H32	Key removal — right
H33	Key removal — both
Spring Return From Left	
Code	Operator Function
H42	Key removal — right∗
Spring Return From Right	
Code	Operator Function
H48	Key removal — left

d

Key Options for Cylinder Locks♣			
Code	T Series Key No.	Code	T Series Key No.
Blank	D018 (Std. Key)	15	T112
03	D020	16	T115
04	D025	17	T324
05	D335	18	T382
06	D429	19	T404
07	D461	20	T171
08	D111	21	T484
09	D587	22	T547
10	D682	23	T569
11	D713	24	T692
12	D900	25	T752
13	D992	26	T178
14	D118	—	—

e

Contact Block(s)			
Code	Description: Contact Configuration	2-Position	
Blank	No contacts	—	—
Standard			
D1	1 N.O.	O	X
D2	1 N.C.	X	O
A	1 N.O. - 1 N.C.	O	X
		X	O
B	2 N.O. - 2 N.C.	O	X
		X	O
		O	X
		X	O
Max Duty (Horsepower Rated)			
D1M	1 N.O.		
D2M	1 N.C.		
Pen*TUFF* (Low Voltage)			
D1V	1 N.O.		
D2V	1 N.C.		
AV	1 N.O. - 1 N.C.		
BV	2 N.O. - 2 N.C.		
Class1, Div. 2/Zone 2			
Logic Reed§			
D1R	1 N.O.		
D2R	1 N.C.		
AR	1 N.O. - 1 N.C.		
BR	2 N.O. - 2 N.C.		
Sealed Switch§			
D1P	1 N.O.		
D2P	1 N.C.		
AP	1 N.O. - 1 N.C.		
BP	2 N.O. - 2 N.C.		
Stackable Sealed Switch§			
D1Y	1 N.O.		
D2Y	1 N.C.		
AY	1 N.O. - 1 N.C.		
BY	2 N.O. - 2 N.C.		

∗ Target tables are reversed from those shown.
❄ Keys removable from maintained positions only.
§ Contact target tables same as those listed for standard and Pen*TUFF* contact blocks.
♣ Device supplied with 2 keys. Replacement key part no. for standard D018 key is X-181170. See page 10-46 for additional replacement key numbers.

3-Position Selector Switch Devices, Non-Illuminated



Standard Knob Operator
Cat. No. 800T-J2A



Knob Lever Operator
Cat. No. 800T-J17A

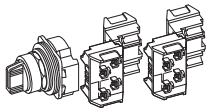


Standard Knob Operator
Cat. No. 800H-JR2A

Contact Type	Operator Position			M = Maintained S = Spring Return	Type 4/13 Standard Knob Cat. No.	Type 4/13 Knob Lever Cat. No.	Type 4/4X/13 Standard Knob Cat. No.
No Contacts	—	—	—	M M M	**800T-J2**	**800T-J17**	**800H-JR2**
				S→M M	**800T-J4**	800T-J18	**800H-JR4**
				M M←S	**800T-J5**	800T-J19	**800H-JR5**
				S→M←S	**800T-J91**	**800T-J20**	**800H-JR91**
1 N.O. - 1 N.C.	O X	O O	X O	M M M	**800T-J2A**	**800T-J17A**	**800H-JR2A**
				S→M M	**800T-J4A**	**800T-J18A**	**800H-JR4A**
				M M←S	**800T-J5A**	**800T-J19A**	**800H-JR5A**
				S→M←S	**800T-J91A**	**800T-J20A**	**800H-JR91A**

Note: X = Closed/O = Open

800 T ___ – J ___ 2 ___ C
a b c d e f



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Knob Insert Colors		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
J	White	JR
JX	Packet of colored inserts✶	JRX
Metal Wing Lever Colors❄		
Code	**Color**	**Code**
JA	Red	—
JG	Grey	—

d

Knob/Lever Type Operators	
Standard Knob	
Code	Operator Function
2	Maintained
4	Spring return from left
5	Spring return from right
91	Spring return from both
Knob Lever❄	
Code	Operator Function
17	Maintained
18	Spring return from left
19	Spring return from right
20	Spring return from both
Metal Wing Lever❄	
Code	Operator Function
11	Maintained
15	Spring return from left
16	Spring return from right
141	Spring return from both
Coin Slot❄	
Code	Operator Function
10	Spring return from both

e

Cam Option‡♣	
Code	Description
Blank	KB7 cam (std.)
KA1	KA1 cam
KA7	KA7 cam

e (cont'd)

Cam Option‡♣	
Code	Description
KC1	KC1 cam
KC7	KC7 cam
KD7	KD7 cam
KE7§	KE7 cam
KQ1	KQ1 cam
KQ7	KQ7 cam
KR1§	KR1 cam
KR7§	KR7 cam
KT1§	KT1 cam
KT7§	KT7 cam
KU7§	KU7 cam

f

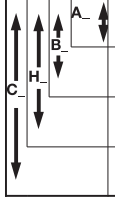
Contact Blocks	
Code	Description
Blank	No contacts on operator
Standard	
A	1 N.O. - 1 N.C. 1-**800T-XA** on white side
B	2 N.O. - 2 N.C. 2-**800T-XA**s — 1 on white side/1 on black side
PenTUFF (Low Voltage)	
AV	1 N.O. - 1 N.C. 1-**800T-XAV** on white side
BV	2 N.O. - 2 N.C. 2-**800T-XAV**s — 1 on white side/1 on black side

f (cont'd)

Contact Blocks♣	
Code	Description
Blank	No contacts
Class 1, Div. 2/Zone 2	
Logic Reed	
AR	1 N.O. - 1 N.C. 1-**800T-XAR** on white side
BR	2 N.O. - 2 N.C. 2-**800T-XAR**s — 1 on white side/1 on black side
Sealed Switch	
AP	1 N.O. - 1 N.C. 1-**800T-XAP** on white side
BP	2 N.O. - 2 N.C. 2-**800T-XAP**s — 1 on white side/1 on black side
Stackable Sealed Switch	
AY	1 N.O. - 1 N.C. 1-**800T-XAY** on white side
BY	2 N.O. - 2 N.C. 2-**800T-XAY**s — 1 on white side/1 on black side

✶ One insert of each color (blue, green, orange, red, and yellow).
❄ Only available on Bul. 800T, Type 4/13 operators.
‡ If an overlapping cam is required, consult your local distributor.
§ Not available with wing levers.
♣ See Table 1 for cam selections and associated targets.

Table 1. Cam and Contact Block Functionality Table

Contact Block Suffix Code	Contact Block Side	Circuits	Cam Codes: KB7 (Std.)	KA1	KA7	KC1	KC7	KD7	KE7	KQ1	KQ7	KR1	KR7	KT1	KT7	KU7
	White	A	X O O	X O O	O O X	X O O	O O X	X O O	O O X	X O O	O O X	X O O	O O X	X O O	O O X	X O O
		B	O O X	O X O	O O X	O X O	O O X	O O X	X O O	O X O	O O X	O X O	O O X	O X O	O O X	O X O
	Black	A	X O O	X O O	O O X	X O O	X X O	O O X	O O X	X O O	O O X	O O X	O O X	O X O	X X O	O O X
		B	O O X	O X O	O O X	O X O	O O X	O X O	X O O	O X O	O O X	O X X	O O X	X X O	O O X	X X O
	White	A	X O O	X O O	O O X	X O O	X X O	O O X	O O X	X O O	X O X	X O X	X O X	O O X	X O O	X O O
		B	O O X	O X O	O O X	O X O	O O X	O X O	X O O	O X O	O O X	O X O	O O X	O X O	O O X	O X O
	Black	A	X O O	X O O	O O X	X O O	X X O	O O X	O O X	X O O	X O X	X O X	X O X	O O X	X O O	X O O
		B	O O X	O X O	O O X	O X O	O O X	O X O	X O O	O X O	O O X	O X X	O O X	X X O	O O X	X X O

Note: X = Closed/O = Open

3-Position Selector Switch Devices, Non-Illuminated (Bul. 800T only)

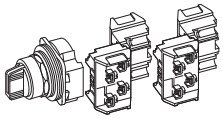


3-Position Cylinder Lock Operator
Cat. No. 800T-J41A

Contact Type	Operator Position			M = Maintained S = Spring Return	Type 4/13 Cylinder Lock§ Key Removal — Left ∗ Cat. No.	Key Removal — Center ∗ Cat. No.	Key Removal — All ∗ Cat. No.
No Contacts	—	—	—	M M M	800T-J41	**800T-J42**	**800T-J44**
				S→M M	—	800T-J50	—
				M M←S	800T-J69	800T-J38	—
				S→M←S	—	**800T-J631**	—
1 N.O. - 1 N.C.	O X	O O	X O	M M M	**800T-J41A**	**800T-J42A**	**800T-J44A**
				S→M M	—	800T-J50A	—
				M M←S	800T-J69A	800T-J38A	—
				S→M←S	—	**800T-J631A**	—

Note: X = Closed/O = Open

800 T — – J41 — KC1 A
a b c d e f



a

Protection Rating	
Code	Description
T	Metal, Type 4/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Key Removal Position	
Maintained	
Code	Operator Function
J41	Key removal — left
J42	Key removal — center
J43	Key removal — right
J44	Key removal — all
J45	Key removal — left and center
J46	Key removal — right and left
J47	Key removal — right and center
Spring Return from Left	
J50	Key removal — center
J52	Key removal — right
J51	Key removal — right and center

c (cont'd)

Key Removal Position	
Spring Return from Right	
Code	Operator Function
J69	Key removal — left
J38	Key removal — center
J73	Key removal — left and center
Spring Return from Both	
J631	Key removal — center

d

Key Options for Cylinder Locks§	
Code	Key No.
Blank	D018 (standard key)
03	D020
04	D025
05	D335
06	D429
Note: Refer to page 10-13 for additional key option codes.	

e

Cam Option❄	
Code	Description
Blank	KB7 cam (std.)
KA1	KA1 cam
KA7	KA7 cam
KC1	KC1 cam
Note: See Table 1 on page 10-14 for cam selections.	

e (cont'd)

Cam Option❄	
Code	Description
KC7	KC7 cam
KD7	KD7 cam
KE7	KE7 cam
KQ1	KQ1 cam
KQ7	KQ7 cam
KR1	KR1 cam
KR7	KR7 cam
KT1	KT1 cam
KT7	KT7 cam
KU7	KU7 cam

f

Contact Blocks	
Code	Description
Blank	No contacts
Standard	
A	1 N.O. - 1 N.C. 1-**800T-XA** on white side
B	2 N.O. - 2 N.C. 2-**800T-XA**s — 1 on white side/1 on black side
Pen*TUFF* (Low Voltage)	
AV	1 N.O. - 1 N.C. 1-**800T-XAV** on white side
BV	2 N.O. - 2 N.C. 2-**800T-XAV**s — 1 on white side/1 on black side

f (cont'd)

Contact Blocks	
Class 1, Div. 2/Zone 2	
Logic Reed	
Code	Description
AR	1 N.O. - 1 N.C. 1-**800T-XAR** on white side
BR	2 N.O. - 2 N.C. 2-**800T-XAR**s — 1 on white side/1 on black side
Sealed Switch	
AP	1 N.O. - 1 N.C. 1-**800T-XAP** on white side
BP	2 N.O. - 2 N.C. 2-**800T-XAP**s — 1 on white side/1 on black side
Stackable Sealed Switch	
AY	1 N.O. - 1 N.C. 1-**800T-XAY** on white side
BY	2 N.O. - 2 N.C. 2-**800T-XAY**s — 1 on white side/1 on black side

∗ Key removable in maintained positions only.
❄ If an overlapping cam is required, consult your local Rockwell Automation sales office or Allen-Bradley distributor.
§ Device supplied with 2 keys. Replacement key part no. for standard D018 key is X-181170. See page 10-46 for additional replacement key numbers.

30.5 mm Push Buttons

Selector Switches

4-Position Selector Switch Devices, Non-Illuminated



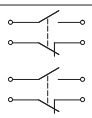
Standard Knob Operator
Cat. No. 800T-N2KN4B



Knob Lever Operator
Cat. No. 800T-N17KN4B

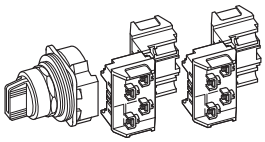


Standard Knob Operator
Cat. No. 800H-NR2KF4AAXX

Contact Type	Operator Position				M = Maintained S = Spring Return	Type 4/13 Standard Knob Cat. No.	Type 4/13 Knob Lever Cat. No.	Type 4/4X/13 Standard Knob Cat. No.
No Contacts	—	—	—	—	M M M M	**800T-N2KF4**	800T-N17KF4	800H-NR2KF4
					S→M M M	800T-N3KF4	800T-N29KF4	800H-NR3KF4
					M M M←S	800T-N9KF4	800T-N30KF4	800H-NR9KF4
 2 N.O. - 2 N.C.	X O O O	O X O O	O O X O	O O O X	M M M M	**800T-N2KF4B**	**800T-N17KF4B**	**800H-NR2KF4AAXX**
					S→M M M	800T-N3KF4B	800T-N29KF4B	800H-NR3KF4AAXX
					M M M←S	800T-N9KF4B	800T-N30KF4B	800H-NR9KF4AAXX

Note: X = Closed/O = Open

800 T ___ – N 2 KF4 B
a b c d e f



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Knob Insert Colors		
800T Type 4/13	Description	800H Type 4/4X/13
Code		Code
N	White	NR
NX	Packet of colored inserts✶	NRX
Metal Wing Lever Colors		
Code	Color	Code
NA	Red	—
NG	Grey	—

d

Operator Function and Knob Type	
Standard Knob	
Code	Operator Function
2	Maintained
3	Spring return from position 1 to position 2
9	Spring return from position 4 to position 3
Knob Lever§	
Code	Operator Function
17	Maintained
29	Spring return from position 1 to position 2
30	Spring return from position 4 to position 3
Metal Wing Lever§	
Code	Operator Function
11	Maintained
13	Spring return from position 1 to position 2
14	Spring return from position 4 to position 3

e

Cam Option♣	
Code	Description
KF4	F cam
KG4	G cam
KK4➢	K cam
KM4➢	M cam
KP4	P cam
KN4	Overlapping cam❄

f

Contact Blocks♣		
800T Type 4/13	Description	800H Type 4/4X/13
Code		Code
Blank	No contacts	Blank
Standard		
B	2 N.O. - 2 N.C. 2-**800T-XA**s — 1 on white side/ 1 on black side	AAXX
H	3 N.O. - 3 N.C. 3-**800T-XA**s — 2 on white side/ 1 on black side	AAAX
C	4 N.O. - 4 N.C. 4-**800T-XA**s — 2 on white side/ 2 on black side	AAAA

f (cont)

Contact Blocks		
800T Type 4/13	Description	800H Type 4/4X/13
Code		Code
PenTUFF (Low Voltage)		
BV	2 N.O. - 2 N.C.	FFXX
HV	3 N.O. - 3 N.C.	FFFX
CV	4 N.O. - 4 N.C.	FFFF
Class 1, Di. 2/Zone 2		
Logic Reed‡		
BR	2 N.O. - 2 N.C.	TTXX
HR	3 N.O. - 3 N.C.	TTTX
CR	4 N.O. - 4 N.C.	TTTT
Sealed Switch‡		
BP	2 N.O. - 2 N.C.	PPXX
Stackable Sealed Switch§		
BY♣	2 N.O. - 2 N.C.	TTXX
HY♣	3 N.O. - 3 N.C.	TTTX
CY♣	4 N.O. - 4 N.C.	TTTT

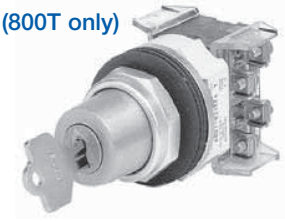
✶ One insert of each color (blue, green, orange, red, and yellow).
❄ Overlapping cam. See Publication 800T-2.8 for overlap specifications.
‡ Contact block mounting same as listed for standard and Pen*TUFF* contact blocks.
§ Only available on Bul. 800T, Type 4/13 operators.
♣ See Table 1 for proper cam/contact selection.
➢ Not available with wing levers.

Table 1. Cam and Contact Block Functionality Table

Contact Block Suffix Code	Contact Block Side	Circuits	Cam Codes																					
			KF4				KG4				KK4				KM4				KP4				KN4❄	
C_ H_ B_	White	A	X	O	O	O	X	X	O	O	O	O	X	X	X	O	O	O	O	O	O	X	O	X	O	O
		B	O	X	O	O	O	O	X	O	X	X	O	O	O	X	X	O	O	X	O	O	O	O	O	X
	Black	A	O	O	O	X	X	O	O	O	X	O	O	X	O	O	O	X	O	O	X	X	O	O	X	O
		B	O	O	X	O	O	O	O	X	O	X	X	O	O	X	O	O	X	O	O	O	X	O	O	O
	White	A	X	O	O	O	X	X	O	O	O	O	X	X	X	O	O	O	O	O	O	X	O	X	O	O
		B	O	X	O	O	O	O	X	O	X	X	O	O	O	X	X	O	O	X	O	O	O	O	O	X
	Black	A	O	O	O	X	X	O	O	O	X	O	O	X	O	O	O	X	O	O	X	X	O	O	X	O
		B	O	O	X	O	O	O	O	X	O	X	X	O	O	X	O	O	X	O	O	O	X	O	O	O

Note: X = Closed/O = Open

4-Position Selector Switch Devices, Non-Illuminated (800T only)

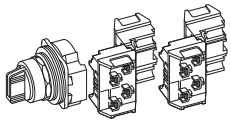


Cylinder Lock Operator
Cat. No. 800T-N32KF4B

Contact Type	Operator Position				M = Maintained S = Spring Return	Cylinder Lock – Type 4/13§		
						Key Removal — Position 2∗	Key Removal — Position 3∗	Key Removal — All∗
						Cat. No.	Cat. No.	Cat. No.
No Contacts	—	—	—	—	M M M M	800T-N32KF4	800T-N33KF4	**800T-N61KF4**
					S→M M M	800T-N132KF4	800T-N133KF4	—
					M M M←S	800T-N232KF4	800T-N233KF4	—
2 N.O. - 2 N.C.	X O O O	O X O O	O O X O	O O O X	M M M M	800T-N32KF4B	800T-N33KF4B	**800T-N61KF4B**
					S→M M M	800T-N132KF4B	800T-N133KF4B	—
					M M M←S	800T-N232KF4B	800T-N233KF4B	—

Note: X = Closed/O = Open

800 T – N31 KM4 C
a b c d e f



a

Protection Rating	
Code	Description
T	Metal, Type 4/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Key Removal Position and Operator Function	
Maintained	
Code	Operator Function
N31	Key removal position 1
N32	Key removal position 2
N33	Key removal position 3
N34	Key removal position 4
N61	Key removal all positions

c (cont'd)

Key Removal Position and Operator Function	
Spring Return From Position 1 to Position 2	
Code	Description
N132	Key removal position 2
N133	Key removal position 3
N134	Key removal position 4
N154	Key removal positions 2, 3, and 4
Spring Return From Position 4 to Position 3	
Code	Operator Function
N231	Key removal position 1
N232	Key removal position 2
N233	Key removal position 3
N251	Key removal positions 1, 2, and 3

d

Key Options for Cylinder Locks§	
D Series	
Code	Key No.
Blank	D018 (standard key)
03	D020
04	D025
05	D335
06	D429
Note: Refer to page 10-13 for additional key option codes.	

e

Cam Option	
Code	Description
KF4	F cam
KG4	G cam
KK4	K cam
KM4	M cam
KP4	P cam
KN4	Overlapping cam❄
Note: See Table 1 for proper cam selection.	

f

Contact Blocks	
Code	Description
Blank	No contacts
Standard	
B	2 N.O. - 2 N.C. 2-**800T-XA**s — 1 on white side/1 on black side
H	3 N.O. - 3 N.C. 3-**800T-XA**s — 2 on white side/1 on black side
C	4 N.O. - 4 N.C. 4-**800T-XA**s — 2 on white side/2 on black side
Pen*TUFF* (Low Voltage)	
BV	2 N.O. - 2 N.C. 2-**800T-XAV**s — 1 on white side/1 on black side
HV	3 N.O. - 3 N.C. 3-**800T-XAV**s — 2 on white side/1 on black side
CV	4 N.O. - 4 N.C. 4-**800T-XAV**s — 2 on white side/2 on black side
Class 1, Div. 2/Zone 2	
Logic Reed‡	
BR	2 N.O. - 2 N.C.
HR	3 N.O. - 3 N.C.
CR	4 N.O. - 4 N.C.
Sealed Switch‡	
BP	2 N.O. - 2 N.C.
Stackable Sealed Switch‡	
BY	2 N.O. - 2 N.C.
HY	3 N.O. - 3 N.C.
CY	4 N.O. - 4 N.C.
Note: Associated targets shown in Table 1.	

Table 1. Cam and Contact Block Functionality Table

Contact Block Suffix Code	Contact Block Side	Circuits	Cam Codes																									
			KF4				KG4				KK4				KM4				KP4				KN4❄					
C_ H_ B_	White	A	X	O	O	O	X	X	O	O	O	O	X	X	X	O	O	O	O	O	O	X	O	X	O	O		
		B	O	X	O	O	O	O	X	O	X	X	O	O	O	X	X	O	O	X	O	O	O	O	O	X		
	Black	A	O	O	O	X	X	O	O	O	X	O	O	X	O	O	O	X	O	O	X	X	O	O	X	O		
		B	O	O	X	O	O	O	O	X	O	X	X	O	O	X	O	O	X	O	O	O	X	O	O	O		
	White	A	X	O	O	O	X	X	O	O	O	O	X	X	X	O	O	O	O	O	O	X	O	X	O	O		
		B	O	X	O	O	O	O	X	O	X	X	O	O	O	X	X	O	O	X	O	O	O	O	O	X		
	Black	A	O	O	O	X	X	O	O	O	X	O	O	X	O	O	O	X	O	O	X	X	O	O	X	O		
		B	O	O	X	O	O	O	O	X	O	X	X	O	O	X	O	O	X	O	O	O	X	O	O	O		

Note: X = Closed/O = Open
∗ Key removable in maintained positions only.
❄ Overlapping cam. One layer of contact blocks allowed, no stacking. See Publication 800T-2.8 for overlap specifications.
‡ Contact block mounting same as listed for standard and Pen*TUFF* contact blocks.
§ Device supplied with 2 keys. Replacement key part no. for standard D018 key is X-181170. See page 10-46 for additional replacement key numbers.

30.5 mm Push Buttons

Selector Switches

2-Position Knob/Lever Type Selector Switch Devices, Illuminated



Standard Knob Operator
Cat. No. 800T-16HR2KB6AX



Knob Lever Operator
Cat. No. 800H-16HRR17KB6AX

Type	Lamp Type	Volts	Knob Color	Operator Position		M = Maintained S = Spring Return	Type 4/13 Standard Knob Cat. No.	Type 4/4X/13 Standard Knob Cat. No.
Operator Only∗				No Contacts		M M	800T-00HX2KB6	800H-00HRX2KB6
Full Voltage	Incandescent	24V AC/DC	Red	X O	O X	M M	**800T-24HR2KB6AX**	800H-24HRR2KB6AX
						S→M❄	800T-24HR4KL8AX	800H-24HRR4KL8AX
						M←S	800T-24HR5KL8AX	800H-24HRR5KL8AX
	No Lamp	0…250V AC/DC	No Knob			M M	800T-25HXN2KB6AX	800H-25HRXN2KB6AX
Universal	LED	12…130V AC/DC	Red			M M	**800T-2HRH2KB6AX**	800H-2HRRH2KB6AX
						S→M❄	800T-2HRH4KL8AX	800H-2HRRH4KL8AX
						M←S	800T-2HRH5KL8AX	800H-2HRRH5KL8AX
Transformer	Incandescent	120V AC 50/60 Hz	Red	X O	O X	M M	**800T-16HR2KB6AX**	**800H-16HRR2KB6AX**
						S→M❄	800T-16HR4KL8AX	800H-16HRR4KL8AX
						M←S	800T-16HR5KL8AX	800H-16HRR5KL8AX
	LED					M M	**800T-16HRH2KB6AX**	800H-16HRRH2KB6AX
						S→M❄	800T-16HRH4KL8AX	800H-16HRRH4KL8AX
						M←S	800T-16HRH5KL8AX	800H-16HRRH5KL8AX
	No Lamp	120V AC 50/60 Hz	No Knob			M M	800T-16HXN2KB6AX	800H-16HRXN2KB6AX

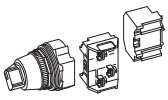
Note: X = Closed/O = Open

∗ Operator only supplied without power module, lamp, lens cap, or contact blocks.

❄ Target tables are reversed from those shown.

1st Level 2nd Level

800	T		–	16	H	R		2	KB6	A	X
	a	*b*		*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Power Module Type and Voltage	
Full Voltage — Incandescent	
Code	Description
12	12V AC/DC
24	24V AC/DC
48	48V AC/DC
Universal — LED	
2	12…130V AC/DC
Transformer	
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
For other voltages, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.	

d

No. of Positions		
Bul. 800T Type 4/13 Code	Description	Bul. 800H Type 4/4X/13 Code
H	2-position	HR

e

Knob Color	
Code	Color
A	Amber
B	Blue
C	Clear
G	Green
R	Red
W	White
X	No knob

f

Illumination Options	
Code	Description
Blank	Incandescent
H	LED

Table 1. Selector Switch Cam Targets

Cam Description (2-Position)		
Target		Contact Block Code⌘
O	X	D, H, V, R, 5
X	O	E, U, W, S, 6

X = Closed/O = Open

g

Operator Function and Knob Type	
Standard Knob or No Knob	
Code	Operator Function
2	Maintained
4	Spring return from left
5	Spring return from right
Knob Lever	
17	Maintained
18	Spring return from left
19	Spring return from right

h

Cam Options	
2-Position	
Code	Operator Function
KB6	Maintained Cam
KL8	Spring Return Cam

Table 2. Contact Block Code Reduction Rules

Contact Block Substitution	
Combination	Code
Standard	
D + E	A
D + D	M
E + E	N

i, j

Contact Blocks♣	
Code	Description
Blank (both pos.)	No contacts
Standard	
D	1 N.O.
E	1 N.C.
A	1 N.O. - 1 N.C.
X	No contacts in this position
PenTUFF (Low Voltage)	
H	1 N.O.
U	1 N.C.
F	1 N.O. - 1 N.C.
Class 1, Div. 2/Zone 2	
Logic Reed	
V	1 N.O.
W	1 N.C.
T	1 N.O. - 1 N.C.
Sealed Switch	
R	1 N.O.
S	1 N.C.
P	1 N.O. - 1 N.C.
Stackable Sealed Switch	
5	1 N.O.
6	1 N.C.
7	1 N.O. - 1 N.C.

♣ Contact blocks used on white side only.

⌘ Target tables are reversed for spring return from left operators.

3-Position Knob/Lever Type Selector Switch Devices, Illuminated



Standard Knob Operator
Cat. No. 800T-16JR2KB7AX



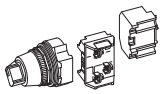
Standard Knob Operator
Cat. No. 800H-16JRR2KB7AX

Type	Lamp Type	Volts	Color	Operator Position			M = Maintained S = Spring Return	Type 4/13 Standard Knob Cat. No.	Type 4/4X/13 Standard Lever Cat. No.
Operator Only∗				No Contacts			M M M	800T-00JX2KB7	—
Full Voltage	Incandescent	24V AC/DC	Red	X O	O O	O X	M M M	800T-24JR2KB7AX	800H-24JRR2KB7AX
							S→M M	800T-24JR4KB7AX	800H-24JRR4KB7AX
							M M←S	800T-24JR5KB7AX	800H-24JRR5KB7AX
	No Lamp	0…250V AC/DC	No Knob				M M M	800T-25JXN2KB7AX	—
Universal	LED	12…130V AC/DC	Red				M M M	800T-2JRH2KB7AX	800H-2JRRH2KB7AX
							S→M M	800T-2JRH4KB7AX	800H-2JRRH4KB7AX
							M M←S	800T-2JRH5KB7AX	800H-2JRRH5KB7AX
Transformer	Incandescent	120V AC 50/60 Hz	Red	X O	O O	O X	M M M	**800T-16JR2KB7AX**	**800H-16JRR2KB7AX**
							S→M M	800T-16JR4KB7AX	800H-16JRR4KB7AX
							M M←S	800T-16JR5KB7AX	800H-16JRR5KB7AX
	LED						M M M	800T-16JRH2KB7AX	800H-16JRRH2KB7AX
							S→M M	800T-16JRH4KB7AX	800H-16JRRH4KB7AX
							M M←S	800T-16JRH5KB7AX	800H-16JRRH5KB7AX
	No Lamp		No Knob				M M M	800T-16JXN2KB7AX	—

Note: X = Closed/O = Open

∗ Operator only supplied without power module, lamp, lens cap, or contact blocks.

800	T		–	16	J	R		2	KB7	1st Level A	2nd Level X
	a	*b*		*c*	*d*	*e*	*f*	*g*	*h*	*i*	*j*



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Power Module Type and Voltage	
Full Voltage — Incandescent	
Code	Description
12	12V AC/DC
24	24V AC/DC
48	48V AC/DC
Universal — LED	
2	12…130V AC/DC
Transformer	
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
For other voltages, please contact your local Rockwell Automation sales office or Allen-Bradley distributor.	

d

No. of Positions		
800T Type 4/13	Description	800H Type 4/4X/13
Code		Code
J	3-position	JR

e

Knob Color	
Code	Color
A	Amber
B	Blue
C	Clear
G	Green
R	Red
W	White
X	No knob

f

Illumination Options	
Code	Description
Blank	Incandescent
H	LED‡

g

Operator Function and Knob Type	
Standard Knob or No Knob	
Code	Operator Function
2	Maintained
4	Spring return from left
5	Spring return from right
91	Spring return from both
Knob Lever	
Code	Operator Function
17	Maintained
18	Spring return from left
19	Spring return from right
20	Spring return from both

h

Cam Options	
3-Position	
Code	Operator Function
KB7	B7 cam
KC1	C1 cam
KC7	C7 cam
KE7	E7 cam
KQ1	Q1 cam
KT1	T1 cam

i, j

Contact Blocks§	
Code	Description
Blank (both pos.)	No contacts

i, j (cont'd)

Contact Blocks§	
Code	Description
Standard	
A	1 N.O. - 1 N.C.
X	No contacts in this position
Pen*TUFF* (Low Voltage)	
F	1 N.O. - 1 N.C.
Class 1, Div. 2/Zone 2	
Logic Reed	
T	1 N.O. - 1 N.C.
Sealed Switch	
P	1 N.O. - 1 N.C.
Stackable Sealed Switch	
7	1 N.O. - 1 N.C.

Table 1. Selector Switch Cam Targets

Target			Cam Description (3-Position)					
			KB7	KC1	KC7	KE7	KQ1	KT1
X	O	O	D, H, V, R, 5	—	D, H, V, R, 5	D, H, V	—	E, U, W, S, 6
O	X	O	—	E, U, W, S, 6	E, U, W, S, 6	—	E, U, W, S, 6	—
O	O	X	E, U, W, S, 6	D, H, V, R, 5	—	—	—	D, H, V, R, 5
X	X	O	G, I	J, Q	—	—	—	J, Q
O	X	X	J,Q	—	J,Q	E, U, W, S, 6	—	—
X	O	X	—	G,I	G,I	—	D, H, V, R, 5	—

❄ LED only.

‡ LEDs available in red, green, amber, blue, and white. White LEDs only available in 6V, 24V, 120V, and 130V full voltage and all transformer units. LED color matches lens color, except clear lens supplied with white LED and white lens supplied with amber LED. All LEDs except 120V have an internal shunt resistor for use with solid-state outputs.

§ Contact blocks used on white side only.

10

30.5 mm Push Buttons

Pilot Lights

Pilot Light Devices∗



Transformer Type Pilot Light
Cat. No. 800T-P16R



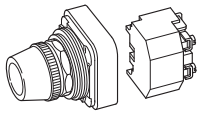
Push-to-Test Pilot Light
Cat. No. 800T-PT16R

Type	Lamp Type	Volts	Color	Type 4/13 Pilot Light Cat. No.	Type 4/13 Push-to-Test∗ Cat. No.	Type 4/4X/13 Pilot Light Cat. No.	Type 4/4X/13 Push-to-Test∗ Cat. No.
Operator Only❄				800T-S00	**800T-SB00XX**	800H-SR00	800H-SRB00XX
Full Voltage‡	Incandescent	24V AC/DC	Red	**800T-Q24R**	**800T-QT24R**	**800H-QR24R**	**800H-QRT24R**
			Green	**800T-Q24G**	**800T-QT24G**	**800H-QR24G**	800H-QRT24G
			Amber	**800T-Q24A**	**800T-QT24A**	**800H-QR24A**	800H-QRT24A
	No Lamp	0…250V AC/DC	No Lens	800T-QN25	800T-QTN25	—	—
Universal‡	LED	12…130 V AC/DC	Red	**800T-QH2R**	**800T-QTH2R**	**800H-QRH2R**	**800H-QRTH2R**
			Green	**800T-QH2G**	**800T-QTH2G**	**800H-QRH2G**	**800H-QRTH2G**
			Amber	**800T-QH2A**	**800T-QTH2A**	**800H-QRH2A**	**800H-QRTH2A**
Transformer‡	Incandescent	120V AC, 50/60 Hz	Red	**800T-P16R**	**800T-PT16R**	**800H-PR16R**	**800H-PRT16R**
			Green	**800T-P16G**	**800T-PT16G**	**800H-PR16G**	**800H-PRT16G**
			Amber	**800T-P16A**	**800T-PT16A**	**800H-PR16A**	**800H-PRT16A**
	LED		Red	**800T-PH16R**	**800T-PTH16R**	**800H-PRH16R**	**800H-PRTH16R**
			Green	**800T-PH16G**	**800T-PTH16G**	**800H-PRH16G**	**800H-PRTH16G**
			Amber	**800T-PH16A**	**800T-PTH16A**	**800H-PRH16A**	**800H-PRTH16A**
	No Lamp		No Lens	800T-PN16	800T-PTN16	—	—

∗ Includes one standard Cat. No. 800T-XA (1 N.O. - 1 N.C.) contact block. For typical pilot light wiring diagrams, see page 10-65.
❄ Operator only supplied without power module, lamp, lens cap, or contact blocks.
‡ All pilot lights except push-to-test without sealed contacts and dual input transformer relay, are rated for Class 1, Division 2 applications.

(Push-to-Test)

800	T		–	P	T		16	G	AR
	a	*b*		*c*	*d*	*e*	*f*	*g*	*h*



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Power Module Type		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
P	Transformer (or dual input)	PR
Q	Full voltage/ Universal	QR

d

Lamp Test Options	
Code	Description
Blank	No test option
T	Push-to-test
D	Dual input — diode♣
DT	Dual input — transformer relay
Note: Push-to-test supplied with factory jumpered contact block.	

e

Illumination Options	
Code	Description
Blank	Incandescent
H	LED∗

f

Voltage	
Transformer	
Code	Description
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
46	480V AC 50/60 Hz
56	600V AC 50/60 Hz
Full Voltage — Incandescent	
12	12V AC/DC
24	24V AC/DC
48	48V AC/DC
10	120V AC/DC
20	240V AC/DC
Universal — LED	
2	12…130V AC/DC
Dual Input	
16	120V AC
24	24V AC/DC (Dual input diode only)

g

Lens Color		
Code	Color	Glass Code ♠
Blank	No lens	Blank
A	Amber	D
B	Blue	E
C	Clear	F
G	Green	H
R	Red	J
W	White	K

h

Contact Blocks (Push-to-test units only)	
Code	Description
Standard	
Blank	1 N.O. - 1 N.C.
Pen*TUFF* (Low Voltage)	
AV	1 N.O. - 1 N.C.
Class 1, Div. 2/Zone 2	
Logic Reed	
AR	1 N.O. - 1 N.C.
Sealed Switch	
AP	1 N.O. - 1 N.C.
Stackable Sealed Switch	
AY	1 N.O. - 1 N.C.

∗ LED illumination option is not available with diode type dual input.
♣ Diode type dual input provides circuit isolation via opposing diodes. Not recommended for use with solid-state outputs.
♠ Glass lens available on 800T pilot lights only. Not available on push-to-test units.

2-Position Red Push-Pull and Push-Pull/Twist Release Devices, Non-Illuminated

Note: A jumbo or large legend plate is recommended, if space allows.



2-Position Push-Pull
Cat. No. 800T-FX6D4



2-Position Metal Push-Pull
Cat. No. 800T-FXLE6D4S



2-Position Push-Pull / Twist
Cat. No. 800T-FXT6D4



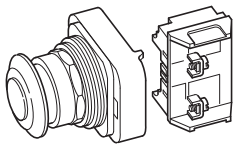
2-Position Push-Pull / Twist
Cat. No. 800H-FRXT6D4

Contact Type	Operator Position		Type 4/13			Type 4/4X/13
	Out	In	Push-Pull — 40 mm	Push-Pull — 63 mm Metal	Push-Pull/Twist Release	Push-Pull/Twist Release
			Cat. No.	Cat. No.	Cat. No.	Cat. No.
N.C.L.B.∗	X	O	**800T-FX6D4**	**800T-FXLE6D4**	**800T-FXT6D4**	**800H-FRXT6D4**
N.O. - N.C.L.B.∗	O X	X O	**800T-FX6A1**	800T-FXLE6A1	**800T-FXT6A1**	**800H-FRXT6A1**
N.C.L.B. - N.C.L.B.∗	X X	O O	**800T-FX6A5**	800T-FXLE6A5	**800T-FXT6A5**	**800H-FRXT6A5**
S.M.C.B.∗❄	X	O	**800TC-FX6D4S**	800TC-FXLE6D4S	800TC-FXT6D4S	800HC-FRXT6D4S
N.O. - S.M.C.B.∗❄	O X	X O	800TC-FX6A1S	800TC-FXLE6A1S	800TC-FXT6A1S	800HC-FRXT6A1S
S.M.C.B. - S.M.C.B∗❄	X X	O O	**800TC-FX6A5S**	**800TC-FXLE6A5S**	**800TC-FXT6A5S**	**800HC-FRXT6A5S**

Note: X = Closed/O = Open **Note:** These caps are only available in plastic.

Note: Emergency stop push buttons are compliant with EN ISO 13850 and EN/IEC 60947-5-5 Standards when using N.C.L.B. contact blocks.

❄ The Self Monitoring Contact Block (S.M.C.B.) is composed of a N.C.L.B. contact wired in series with a N.O. monitoring contact. The N.O. monitoring contact automatically closes when the S.M.C.B. is properly installed onto the E-stop operator. If the S.M.C.B. is separated from the E-stop operator, the N.O. monitoring contact will automatically open.



800 T – FX 1 A1
a b c d e

a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Head Type‡		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
FX	Mushroom head (push-pull)	—
FXC	90 mm anodized aluminum head (push-pull)	—
FXJ	Jumbo mushroom head (push-pull)	—
FXJE	Jumbo mushroom head (push-pull) with "E-Stop"	—
FXL	63 mm anodized aluminum head (push-pull)	—
FXLE	63 mm anodized aluminum head (push-pull) with "E-Stop"	—
FXT	Push-pull/twist-to-release	FRXT
FXJT	Jumbo head push-pull with twist-to-release	FRXJT

d

Color Cap	
Code	Color
Blank	No cap§
1	Green
2	Black
3	Orange
4	Grey
5	White
6	Red
7	Blue
9	Yellow

e

Contact Block(s)			
Code	Operator Position Out	Operator Position In	Description
Blank	—	—	No contacts on operator
Standard			
D1	O	X	1 N.O.
D2	X	O	1 N.C.
D4	X	O	1 N.C.L.B.
A	O X	X O	1 N.O. - 1 N.C.
A1	O X	X O	1 N.O. - 1 N.C.L.B.
A5	X X	O O	2 N.C.L.B.

e (cont'd)

Contact Block(s)			
Code	Operator Position Out	Operator Position In	Description
Blank	—	—	No contacts
PenTUFF (Low Voltage)			
D1V	O	X	1 N.O.
D2V	X	O	1 N.C.
D4V	X	O	1 N.C.L.B.
AV	O X	X O	1 N.O. - 1 N.C.
Class 1, Div. 2/Zone 2			
Logic Reed			
D1R	O	X	1 N.O.
D2R	X	O	1 N.C.
AR	O X	X O	1 N.O. - 1 N.C.
Sealed Switch			
D1P	O	X	1 N.O.
D2P	X	O	1 N.C.
AP	O X	X O	1 N.O. 1 N.C.
Stackable Sealed Switch			
D1Y	O	X	1 N.O.
D2Y	X	O	1 N.C.
AY	O X	X O	1 N.O. - 1 N.C.

Note: X = Closed/O = Open

∗ Normally closed late break contact. When button is pushed from the OUT to IN position, the mechanical detent action of the operator occurs before electrical contacts change state. When the button is pulled from the IN in the OUT position, the electrical contacts change state before the mechanical detent occurs.

‡ Devices with N.C.L.B. contacts meet EN ISO 13850 and IEC 60947-5-5 standards for emergency stop applications.

§ Not valid with head Type J or JT.

30.5 mm Push Buttons

Push-Pull Operators

3-Position Push-Pull Devices, Non-Illuminated

Note: A jumbo or large legend plate is recommended, if space allows.



3-Position Push-Pull
Cat. No. 800T-FXM6A7



3-Position Push-Pull
Cat. No. 800H-FRXM6A7

	Operator Position			Operator Position		
	Momentary	Maintained	Maintained	Momentary	Maintained	Momentary
Contact Type	Out	Center	In	Out	Center	In
N.C.- N.C.L.B.∗	X X	O X	O O	X X	O X	O O

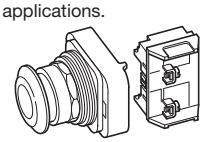
	Type 4/13	Type 4/4X/13	Type 4/13	Type 4/4X/13
	Push-Pull❄	Push-Pull❄	Push-Pull❄	Push-Pull❄
Button Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Red	**800T-FXM6A7**	**800H-FRXM6A7**	**800T-FXN6A7**	800H-FRXN6A7

Note: X = Closed/O = Open

∗ Normally closed late break contact. When button is pushed from the OUT to IN position, the mechanical detent action of the operator occurs before electrical contacts change state. When the button is pulled from the IN to the OUT position, the electrical contacts change state before the mechanical detent occurs.

❄ Devices with N.C.L.B. contacts meet EN ISO 13850 and IEC 60947-5-5 standards for emergency stop applications.

800 T ___ – FX M 1 A7
a b c d e f



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Head Type❄		
800T Type 4/13	Description	800H Type 4/4X/13
Code		Code
FX	Mushroom head (push-pull)	FRX
FXC	90 mm anodized aluminum head (push-pull)	—
FXJ	Jumbo mushroom head (push-pull)	FRXJ
FXL	63 mm anodized aluminum head (push-pull)	—

d

Operator Function			
Code	Operator Position		
	Out	Center	In
M	Momentary	Maintained	Maintained
N	Momentary	Maintained	Momentary

e

Color Cap	
Code	Color
Blank	No cap‡
1	Green
2	Black
3	Orange
4	Grey
5	White
6	Red
7	Blue
9	Yellow

f

Contact Block(s)				
Code	Operator Position			Description
	Out	Ctr.	In	
Blank	—	—	—	No contacts
Standard				
A	O X	O O	X O	1 N.O. - 1 N.C.
A1	O X	O X	X O	1 N.O. - 1 N.C.L.B.
A7	X X	O X	O O	1 N.C. - 1 N.C.L.B.
B6	X X X X	O X O X	O O O O	2 N.C. - 2 N.C.L.B.
Pen*TUFF* (Low Voltage)				
AV	O X	O O	X O	1 N.O. - 1 N.C.

f (cont'd)

Contact Block(s)				
Code	Operator Position			Description
	Out	Ctr.	In	
Class 1, Div. 2/Zone 2				
Logic Reed				
AR	O X	O O	X O	1 N.O. - 1 N.C.
Sealed Switch				
AP	O X	O O	X O	1 N.O. - 1 N.C.
Stackable Sealed Switch				
AY	O X	O O	X O	1 N.O. - 1 N.C.

Note: X = Closed/O = Open

❄ Devices with N.C.L.B. contacts meet EN ISO 13850 and IEC 60947-5-5 standards for emergency stop applications.

‡ Not valid with head Type J.

10

2-Position Red Push-Pull and Push-Pull/Twist Release Devices, Illuminated

Note: A jumbo or large legend plate is recommended, if space allows.



Illuminated 2-Position Push-Pull
Cat. No. 800T-FXP16RA1



2-Position Push-Pull
Cat. No. 800T-FXJEP16RA1



Illuminated 2-Position Push-Pull/Twist
Cat. No. 800T-FXTP16RA1



Illuminated 2-Position Push-Pull/Twist
Cat. No. 800H-FRXTP16RA1

Type	Lamp Type	Volts	Color	Contacts	Operator Position: Maintained Out	Operator Position: Maintained In	Type 4/13: Push-Pull — 40 mm❖ Cat. No.	Type 4/13: Push-Pull — 60 mm with "E-Stop"❖ Cat. No.	Type 4/13: Push-Pull/Twist Release❖ Cat. No.	Type 4/4X/13: Push-Pull/Twist Release❖ Cat. No.
Operator Only✶				No Contacts			**800T-FXS00X**	—	800T-FXTS00X	**800H-FRXTS00X**
Full Voltage	Incan.	24V AC/DC	Red	N.O. - N.C.L.B. ❄	O	X	**800T-FXQ24RA1**	800T-FXJEQ24RA1	**800T-FXTQ24RA1**	**800H-FRXTQ24RA1**
Full Voltage	No Lamp	0…250V AC/DC	No Lens	N.O. - N.C.L.B. ❄	X	O	800T-FXQN25XA1	—	800T-FXTQN25XA1	800H-FRXTQN25XA1
Universal	LED	12…130V AC/DC	Red	N.O. - N.C.L.B. ❄	O	X	**800T-FXQH2RA1**	**800T-FXJEQH2RA1**	**800T-FXTQH2RA1**	**800H-FRXTQH2RA1**
Transformer	Incan.	120V AC	Red	N.O. - N.C.L.B. ❄	O	X	**800T-FXP16RA1**	800T-FXJEP16RA1	**800T-FXTP16RA1**	**800H-FRXTP16RA1**
Transformer	Incan.	240V AC	Red	N.O. - N.C.L.B. ❄	O	X	**800T-FXP26RA1**	800T-FXJEP26RA1	800T-FXTP26RA1	800H-FRXTP26RA1
Transformer	LED	120V AC	Red	N.O. - N.C.L.B. ❄	O	X	**800T-FXPH16RA1**	800T-FXJEPH16RA1	**800T-FXTPH16RA1**	**800H-FRXTPH16RA1**
Transformer	LED	240V AC	Red	N.O. - N.C.L.B. ❄	O	X	800T-FXPH26RA1	800T-FXJEPH26RA1	800T-FXTPH26RA1	800H-FRXTPH26RA1
Transformer	No Lamp	120V AC	No Lens	N.O. - N.C.L.B. ❄	O	X	800T-FXPN16XA1	—	800T-FXTPN16XA1	800H-FRXTPN16XA1

Note: X = Closed/O = Open

Note: Emergency stop push buttons are compliant with EN ISO 13850 and EN/IEC 60947-5-5 Standards when using N.C.L.B. contact blocks.

✶ Operator only supplied without power module, lamp, lens cap, or contact blocks.

❄ Normally closed late break contact. When button is pushed from the OUT to IN position, the mechanical detent action of the operator occurs before electrical contacts change state. When the button is pulled from the IN to the OUT position, the electrical contacts change state before the mechanical detent occurs.

❖ Consult your local Rockwell Automation sales office or Allen-Bradley distributor for availability of illuminated E-stops with Self Monitoring Contact Blocks (SMCBs).

800 T – FX T PH 16 R A1
a b c d e f g h

a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Head Type§		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
FX	Mushroom head	FRX
FXJ	Jumbo mushroom	FRXJ
FXJE	Jumbo mushroom (push-pull) with "E-Stop"	—

d

Operator Function	
Code	Description
Blank	Push-pull♠
T	Push-pull/twist

e

Illumination Options	
Transformer	
Code	Description
P	Incandescent
PH	LED
Full Voltage	
Q	Incandescent
QH	Universal LED
Dual Input	
D	Diode type
DT	Transformer — relay type
DTH	Transformer — relay type LED

f

Voltage‡	
Transformer	
Code	Description
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
Full Voltage	
24	24V AC/DC
10	120V AC/DC
20	240V AC/DC
Universal LED	
2	12…130V AC/DC
Dual Input	
16	120V AC
24	24V AC/DC (dual input diode only)

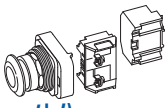
g

Color Cap	
Code	Color
X	No cap (not valid with head Type J)
A	Amber
B	Blue
C	Clear
G	Green
R	Red
W	White

h

Target		
Contact		
N.O.	O	X
N.C./ N.C.L.B.	X	O

Contact Blocks	
Code	Description
Blank	No contacts
Standard	
D1	1 N.O.
D2	1 N.C.
D4	1 N.C.L.B.
A	1 N.O. - 1 N.C.
A1	1 N.O. - 1 N.C.L.B.
A5	2 N.C.L.B.
Pen*TUFF* (Low Voltage)	
D1V	1 N.O.
D2V	1 N.C.
D4V	1 N.C.L.B.
AV	1 N.O. - 1 N.C.



h (cont'd)

Contact Blocks	
Code	Description
Class 1, Div. 2/Zone 2	
Logic Reed	
D1R	1 N.O.
D2R	1 N.C.
AR	1 N.O. - 1 N.C.
Sealed Switch	
D1P	1 N.O.
D2P	1 N.C.
AP	1 N.O. - 1 N.C.
Stackable Sealed Switch	
D1Y	1 N.O.
D2Y	1 N.C.
AY	1 N.O. - 1 N.C.

‡ See page 10-20 for additional voltage code options.

§ Devices with N.C.L.B. contacts meet EN ISO 13850 and IEC 60947-5-5 standards for emergency stop applications.

♠ Push-Pull is available only with Bul. 800T.

⌘ Diode type dual input provides circuit isolation via opposing diodes. Not recommended for use with solid-state outputs.

30.5 mm Push Buttons

Push-Pull Operators

3-Position Push-Pull Devices, Illuminated



Illuminated 3-Position Push-Pull
Cat. No. 800T-FXMP16RA7



Illuminated 3-Position Push-Pull
Cat. No. 800H-FRXMP16A7

	Operator Position			Operator Position		
	Momentary	Maintained	Maintained	Momentary	Maintained	Momentary
Contacts	Out	Center	In	Out	Center	In
N.C.-	X	O	O	X	O	O
N.C.L.B.∗	X	X	O	X	X	O

Type	Lamp Type	Volts	Color	Type 4/13 Cat. No.‡	Type 4/4X/13 Cat. No.‡	Type 4/13 Cat. No.‡	Type 4/4X/13 Cat. No.‡
Operator Only❄				800T-FXMS00X	800H-FRXMS00X	800T-FXNS00X	800H-FRXNS00X
Full Voltage	Incandescent	24V AC/DC	Red	**800T-FXMQ24RA7**	800H-FRXMQ24RA7	**800T-FXNQ24RA7**	800H-FRXNQ24RA7
	No Lamp	0…250V AC/DC	No Lens	800T-FXMQN25XA7	800H-FRXMQN25XA7	800T-FXNQN25XA7	800H-FRXNQN25XA7
Universal	LED	12…130V AC/DC	Red	**800T-FXMQH2RA7**	800H-FRXMQH2RA7	**800T-FXNQH2RA7**	800H-FRXNQH2RA7
Transformer	Incandescent	120V AC	Red	**800T-FXMP16RA7**	**800H-FRXMP16RA7**	**800T-FXNP16RA7**	**800H-FRXNP16RA7**
	LED	120V AC		**800T-FXMPH16RA7**	800H-FRXMPH16RA7	800T-FXNPH16RA7	800H-FRXNPH16RA7
	No Lamp	120V AC	No Lens	800T-FXMPN16XA7	800H-FRXMPN16XA7	800T-FXNPN16XA7	800H-FRXNPN16XA7

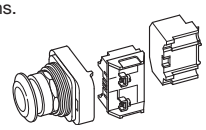
Note: X = Closed/O = Open

∗ Normally closed late break contact. When button is pushed from the OUT to IN position, the mechanical detent action of the operator occurs before electrical contacts change state. When the button is pulled from the IN to the OUT position, the electrical contacts change state before the mechanical detent occurs.

❄ Operator only supplied without power module, lamp, lens cap, or contact blocks.

‡ Devices with N.C.L.B. contacts meet EN ISO 13850 and EN/IEC 60947-5-5 standards for emergency stop applications.

800 T – FX M PH 16 R A1
a b c d e f g h



a

Protection Rating	
Code	Description
T	Metal, Type 4/13
H	Plastic, Type 4/4X/13

b

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

c

Head Type‡		
800T Type 4/13 Code	Description	800H Type 4/4X/13 Code
FX	Mushroom head	FRX
FXJ	Jumbo mushroom	FRXJ

d

Operator Function			
Code	Operator Position		
	Out	Ctr.	In
M	Mom.	Main.	Main.
N	Mom.	Main.	Mom.
Mom. – Momentary, Main. – Maintained.			

e

Illumination Options	
Transformer	
Code	Description
P	Incandescent
PH	LED
Full Voltage	
Q	Incandescent
QH	Universal LED
Dual Input	
D	Diode type
DT	Transformer — relay type
DTH	Transformer — relay LED

f

Voltage§	
Transformer	
Code	Description
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
Full Voltage	
24	24V AC/DC
10	120V AC/DC
20	240V AC/DC
Universal LED	
2	12…130V AC/DC
Dual Input	
16	120V AC
24	24V AC/DC♠

g

Color Cap	
Code	Color
X	No cap (not valid with head Type J)
A	Amber
B	Blue
C	Clear
G	Green
R	Red
W	White

h

Target			
Contact			
N.O.	O	O	X
N.C.	X	O	O
N.C.L.B.	X	X	O
Contact Blocks			
Code	Description		
Blank	No contacts on operator		
Standard			
A	1 N.O. - 1 N.C.		
A1	1 N.O. - 1 N.C.L.B.		
A7	1 N.C. - 1 N.C.L.B.		
Pen*TUFF* (Low Voltage)			
AV	1 N.O. - 1 N.C.		
Class 1, Div. 2/Zone 2			
Logic Reed			
AR	1 N.O. - 1 N.C.		
Sealed Switch			
AP	1 N.O. - 1 N.C.		
Stackable Sealed Switch			
AY	1 N.O. - 1 N.C.		

§ See page 10-20 (Table f) for additional voltage code options.

‡ Devices with N.C.L.B. contacts meet EN ISO 13850 and EN/IEC 60947-5-5 standards for emergency stop applications.

⌘ Diode type dual input provides circuit isolation via opposing diodes. Not recommended for use with solid-state outputs.

♠ Dual input diode only.

Potentiometer Devices∗❄



Cat. No. 800T-U24



Cat. No. 800H-UR4

Resistance	Type 4/13 Potentiometer‡ Cat. No.	Type 4/4X/13 Potentiometer‡ Cat. No.	Resistance	Type 4/13 Potentiometer‡ Cat. No.	Type 4/4X/13 Potentiometer‡ Cat. No.
Operator Only without Resistive Element	**800T-N37§**	**800H-N102§**	25 kΩ	**800T-U37**	800H-UR37
			50 kΩ	**800T-U41**	**800H-UR41**
150 Ω	**800T-U4**	**800H-UR4**	75 kΩ	800T-U46	800H-UR46
500 Ω	**800T-U12**	**800H-UR12**	100 kΩ	**800T-U49**	**800H-UR49**
1000 Ω	**800T-U13**	**800H-UR13**	150 kΩ	**800T-U50**	800H-UR50
1500 Ω	**800T-U16**	**800H-UR16**	400 kΩ	800T-U54	800H-UR54
2500 Ω	**800T-U19**	**800H-UR19**	500 kΩ	**800T-U55**	800H-UR55
5000 Ω	**800T-U24**	**800H-UR24**	1 MΩ	**800T-U57**	**800H-UR57**
10 kΩ	**800T-U29**	**800H-UR29**	2 MΩ	800T-U59	800H-UR59
15 kΩ	**800T-U34**	800H-UR34	3 MΩ	800T-U62	800H-UR62
20 kΩ	**800T-U35**	**800H-UR35**	4 MΩ	800T-U64	800H-UR64

∗ Single turn operation with 312° rotation.
❄ Does not meet Class 1 Div. 2 applications.
‡ Rated for 300V AC/DC, 2 W maximum (6V DC minimum). Specify Bulletin 800TC or 800HC for finger-safe potentiometers. Example: **Cat. No. 800T-U29** becomes **Cat. No. 800TC-U29**.
§ For use with Type J potentiometers having a shaft length of 7/8 in. (22.2 mm) and a shaft diameter of 1/4 in. (6.3 mm).

Mechanically Interlocked Maintained Push Button Devices



Cat. No. 800T-FA22A



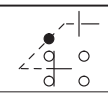
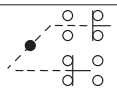
Cat. No. 800T-FB16A



Cat. No. 800T-FC16F



Cat. No. 800H-CRA22A

Contact Arrangement		Type 4/13 Button Position: Button Type/Color➢			Type 4/4X/13 Bootless♣	
Contact Type	Configuration/ Position	Upper: Flush/Black Lower: Flush/Black Cat. No.	Upper: Flush/Green Lower: Extended/ Red Cat. No.	Upper: Flush/Green Lower: Mushroom/ Red Cat. No.	Upper: Flush/Green Lower: Extended/ Red Cat. No.	Upper: Flush/Black Lower: Flush/Black Cat. No.
1 N.O. - 1 N.C.		**800T-FA22A**	**800T-FB16A**	**800T-FC16A**	800H-CRB16A	800H-CRA22A
2 N.O. - 2 N.C.		800T-FA22F	**800T-FB16F**	**800T-FC16F**	800H-CRB16F	800H-CRA22F
No Contact	—	800T-FA22	800T-FB16	800T-FC16	800H-CRB16	800H-CRA22

➢ Consult your local Rockwell Automation sales office or Allen-Bradley distributor for other operator types and combinations.
♣ If booted operators are desired, refer to page 10-39 to order boots separately.

30.5 mm Push Buttons

Specialty Operators

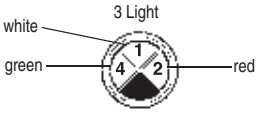
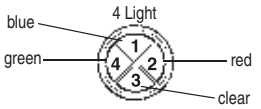
Cluster Pilot Light Devices (Bul. 800T Only)∗



Color Cap Only With Lamps
Cat. No. 800T-N249



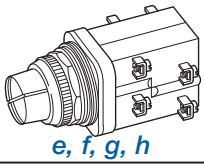
Complete Unit
Cat. No. 800T-PC416

Type	Lamp Type	Volts	Type 4/13 Color Cap With Lamps Cat. No.	Type 4/13 Complete Unit Cat. No.
2-Light Color Cap with Lamps 	Incandescent	24V AC/DC Full Voltage	800T-N257	**800T-QC224**
	LED	24V AC/DC Full Voltage	800T-N257L	**800T-QCL224**
	Incandescent	120V AC, 50/60 Hz Transformer	**800T-N52**	**800T-PC216**
	LED	120V AC, 50/60 Hz Transformer	800T-N52L	**800T-PCL216**
3-Light Color Cap with Lamps 	Incandescent	24V AC/DC Full Voltage	800T-N254	**800T-QC324**
	LED	24V AC/DC Full Voltage	800T-N254L	800T-QCL324
	Incandescent	120V AC, 50/60 Hz Transformer	**800T-N51**	**800T-PC316**
	LED	120V AC, 50/60 Hz Transformer	800T-N51L	**800T-PCL316**
4-Light Color Cap with Lamps 	Incandescent	24V AC/DC Full Voltage	800T-N251	**800T-QC424**
		120V AC, 50/60 Hz Transformer	**800T-N50**	**800T-PC416**

800T – PC 3 16 W R X R

a b c d e f g h

Position 1 Position 2 Position 3 Position 4



a

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

b

Power Module Type	
Code	Description
QC	Full voltage
PC	Transformer

c

Illumination Options and No. of Units	
Incandescent	
Code	Description
2	2 unit cluster
3	3 unit cluster
4	4 unit cluster
LED❄‡§♣	
L2	2 unit cluster
L3	3 unit cluster
L4	4 unit cluster

d

Voltage Options	
Full Voltage	
Code	Description
06	6V AC/DC
12	12V AC/DC
24	24V AC/DC
Transformer	
16	120V AC, 50/60 Hz

e, f, g, h

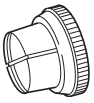
Color Options	
Code	Color
Blank (All 4 Positions)	Standard unit➢
X	No color
A	Amber
B	Blue
C	Clear
G	Green
R	Red
W	White

Custom Lens Caps for Cluster Pilot Lights

800T –N249 R G A W

a b c d e f

Position 1 Position 2 Position 3 Position 4



a

No. of Lamps/Voltage	
Transformer	
Code	Description
N50	4 lamps, 120V AC, 50/60 Hz
N51	3 lamps, 120V AC, 50/60 Hz
N52	2 lamps, 120V AC, 50/60 Hz
N249	4 lamps, 6V AC/DC
N250	4 lamps, 12V AC/DC
N251	4 lamps, 24V AC/DC
N252	3 lamps, 6V AC/DC
N253	3 lamps, 12V AC/DC
N254	3 lamps, 24V AC/DC
N255	2 lamps, 6V AC/DC
N256	2 lamps, 12V AC/DC
N257	2 lamps, 24V AC/DC

b

Illumination Options	
Code	Description
Blank	Incandescent
L	LED❄

c, d, e, f

Code	Description
Blank (All Positions)	Standard unit➢
A	Amber
B	Blue
C	Clear
G	Green
R	Red
W	White
X	No color

∗ Rated Type 4/13 indoor only.
❄ LEDs are available in red, green and amber only; lens color matches LED color. Exception: the white lens is supplied with an amber LED.
‡ White lenses use amber LEDs.
§ LEDs could be adversely affected when used with solid-state outputs.
♣ 6V and 12V are positive polarity. 24V LEDs are bipolar.
➢ See table above for standard unit colors.

18 mm Small Pilot Lights Type 4/13, Class I, Division 2



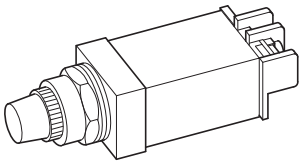
18 mm Pilot Light
Cat. No. 800T-PS16R



18 mm Push-to-Test Pilot Light
Cat. No. 800T-PST16R

Type	Lamp	Voltage	Color	Pilot Light Cat. No.	Push-To-Test Cat. No.
Transformer	Incandescent	120V AC 50/60 Hz	Red	**800T-PS16R**	**800T-PST16R**
	LED			800T-PSH16R	800T-PSTH16R
Dual Input Diode	Incandescent	120V AC		**800T-PSD16R**	—
		24V AC/DC		800T-PSD24R	—
Dual Input Transformer	Incandescent	120V AC/DC 50/60 Hz		800T-PSDT16R	—
Full Voltage	Incandescent	24V AC/DC		**800T-QS24R**	**800T-QST24R**
	LED	24V AC/DC		**800T-QSH24R**	800T-QSTH24R
		120V AC		**800T-QSH10R**	800T-QSTH10R
	Neon	120V AC/DC	Amber	**800T-RS10A**	800T-RST10A

800T – PS D ___ 16 R
a b c d e



a

Power Module Type	
Code	**Description**
PS	Transformer (or dual input)
QS	Full voltage
RS	Neon∗

b

Lamp Test Options	
Code	**Description**
Blank	No test option
D	Dual input diode
DT	Dual input transformer relay➢
T	Push-to-test➢

∗ Neon is only available in amber or clear.
‡ LEDs available in red, green, amber, blue, and white. LED color matches lens color, except clear lens supplied with white LED and white lens supplied with amber LED. All LEDs except 120V have an internal shunt resistor for use with solid-state outputs.
♣ Dual input diode only.
➢ Class 1, Division 2 rating not available. Push-to-test rated for Type 13 only.

c

Illumination Options	
Transformer/Full Voltage/Dual Input	
Code	**Description**
Blank	Incandescent
H	LED‡
Neon	
Blank	No options

d

Voltage	
Transformer	
Code	**Description**
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
Full Voltage Incandescent	
12	12V AC/DC
24	24V AC/DC
Full Voltage LED	
10	120V AC
13	130V AC/DC
24	24V AC/DC
Neon	
10	120V AC/DC
20	240V AC/DC
Dual Input	
16	120V AC 50/60 Hz
24	24V AC/DC♣

e

Lens Color	
Plastic	
Code	**Description**
Blank	No lens
A	Amber
B	Blue
C	Clear
G	Green
R	Red
W	White

30.5 mm Push Buttons

Specialty Operators

1-, 2-, 3-, 4-Way Toggle Switches (Bul. 800T only)

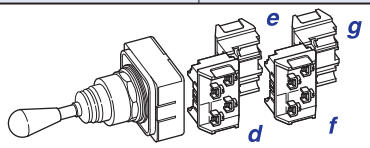
Switch Type	Lever Movement	Handle Position					Type 4/13	
							Spring Return Operation	Maintained Operation
		Up	Left	Center	Right	Down	Cat. No.	Cat. No.
2 Way	↕	X	—	O	—	O	**800T-T2H3EEXX**	**800T-T2H1EEXX**
		O	—	O	—	X		
	↔	—	X	O	O	—	**800T-T2F3DDXX**	**800T-T2F1DDXX**
		—	O	O	X	—		
4 Way	✛	X	O	O	O	O	**800T-T4T8AAXX**	**800T-T4R1AAXX**
		O	X	O	O	O		
		O	O	O	X	O		
		O	O	O	O	X		

Note: X = Closed/O = Open

800T ____ – **T2** **H2** **E** **E** **X** **X**

a *b* *c* *d* *e* *f* *g*

d Right, *e* Left, *f* Right, *g* Left



a

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

b

Operator Type	
Code	Description
T1	1-way toggle
T2	2-way toggle
T3	3-way toggle
T4	4-way toggle

c

Lever Movement and Function						
Type	Function Code		Description			
			↑	←	→	↓
1-Way	↑ A	1	M	—	—	—
		2	S	—	—	—
	← B	1	—	M	—	—
		2	—	S	—	—
	→ C	1	—	—	M	—
		2	—	—	S	—
	↓ D	1	—	—	—	M
		2	—	—	—	S
2-Way	E	1	M	M	—	—
		2	M	S	—	—
		3	S	S	—	—
		4	S	M	—	—
	F	1	—	M	M	—
		2	—	M	S	—
		3	—	S	S	—
		4	—	S	M	—
2-Way	G	1	—	—	M	M
		2	—	—	M	S
		3	—	—	S	S
		4	—	—	S	M
	H	1	M	—	—	M
		2	M	—	—	S
		3	S	—	—	S
		4	S	—	—	M
2-Way	J	1	M	—	M	—
		2	M	—	S	—
		3	S	—	S	—
		4	S	—	M	—
	K	1	—	M	—	M
		2	—	M	—	S
		3	—	S	—	S
		4	—	S	—	M

c (cont'd)

Lever Movement and Function						
Type	Function Code		Description			
			↑	←	→	↓
3-Way	L	1	M	M	M	—
		2	M	M	S	—
		3	M	S	M	—
		4	M	S	S	—
		5	S	M	M	—
		6	S	S	M	—
		7	S	M	S	—
		8	S	S	S	—
	N	1	—	M	M	M
		2	—	M	M	S
		3	—	M	S	M
		4	—	M	S	S
		5	—	S	M	M
		6	—	S	S	M
		7	—	S	M	S
		8	—	S	S	S
3-Way	P	1	M	—	M	M
		2	M	—	M	S
		3	M	—	S	M
		4	M	—	S	S
		5	S	—	M	M
		6	S	—	S	M
		7	S	—	M	S
		8	S	—	S	S
	Q	1	M	M	—	M
		2	M	M	—	S
		3	M	S	—	M
		4	M	S	—	S
		5	S	M	—	M
		6	S	S	—	M
		7	S	M	—	S
		8	S	S	—	S
4-Way	✛ R	1	M	M	M	M
		2	M	M	M	S
		3	M	M	S	M
		4	M	M	S	S
		5	M	S	M	M
		6	M	S	S	M
		7	M	S	M	S
		8	M	S	S	S
	✛ T	1	S	M	M	M
		2	S	M	M	S
		3	S	M	S	M
		4	S	M	S	S
		5	S	S	M	M
		6	S	S	S	M
		7	S	S	M	S
		8	S	S	S	S

d, e, f, g

Contact Blocks	
Code	Description
Blank (all pos.)	No contacts
Standard	
D	1 N.O.
E	1 N.C.
G	1 N.O.E.M.
J	1 N.C.L.B.
A	1 N.O. - 1 N.C.
X	No contacts in this position
Pen*TUFF* (Low Voltage)	
H	1 N.O.
U	1 N.C.
I	1 N.O.E.M.
Q	1 N.C.L.B.
F	1 N.O. - 1 N.C.
Class 1, Div. 2/Zone 2	
Logic Reed	
V	1 N.O.
W	1 N.C.
T	1 N.O. - 1 N.C.
Sealed Switch	
R	1 N.O.
S	1 N.C.
P	1 N.O. - 1 N.C.
Stackable Sealed Switch	
5	1 N.O.
6	1 N.C.
7	1 N.O. - 1 N.C.

Note: M = Maintained, S = Spring Return

∗ **XA2** and **XA2R** contact blocks cannot be stacked upon, but they can stack on other contact blocks.

Table 1. Contact Block Code

Contact Block Substitution	
Combination	Code
Standard	
D + E	A
D + D	∗ M
E + E	N
J + D	B
J + E	C

Table 2. 1-2-3-4 Way Toggle Switch Cam Targets

Contact Configuration					Suffix Code	
Position					Contact/Side	
Up	Left	Center	Right	Down	Right Side	Left Side
O	X	O	O	O	D, H, V, R, 5	—
O	O	O	O	X	E, U, W, S, 6	—
X	O	X	X	X	J, Q	—
X	X	X	X	O	G, I	—
X	O	O	O	O	—	E, U, W, S, 6
O	O	O	X	O	—	D, H, V, R, 5
O	X	X	X	X	—	G, I
X	X	X	O	X	—	J, Q

10

Selector Push Button Devices (Bul. 800T only)



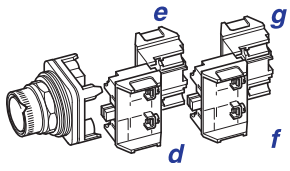
Selector Push Button
Cat. No. 800T-K2AAXX

Contact Type	Button Color	Button Type	Contact Position	Selector Sleeve Left		Selector Sleeve Right		Type 4/13 Selector Push Button
				Button Free	Button Depressed	Button Free	Button Depressed	Cat. No.
1 N.O. - 1 N.C.	Black	Flush	Right	O	X	O	O	**800T-KE2DEXX**
			Left	O	O	X	O	
2 N.O. - 2 N.C.	Black	Flush	Right	O O	X O	O X	X O	**800T-K2AAXX**
			Left	O O	X O	O X	X O	
	Black	Flush	Right	O X	X O	O X	O X	**800T-KC2AAXX**
			Left	O X	O X	O X	X O	

Note: X = Closed/O = Open

800T – KD 2 G J D E

a	*b*	*c*	*d*	*e*	*f*	*g*
			Right	Left	Right	Left



a

Finger-Safe Guards	
Code	Description
Blank	No guards
C	Guards on terminals

b

Cam and Head Type	
Code	Description
K	A cam with flush operator
KA	A cam with extended operator
KB	B cam with flush operator
KC	C cam with flush operator
KD	D cam with flush operator
KE	E cam with flush operator
Note: See Table 1 for Target description of each cam.	

c

Color Cap	
Code	Color
1	Green
2	Black
6	Red

d, e, f, g

Contact Blocks	
Code	Description
Blank (all pos.)	No contacts on operator
Standard	
D	1 N.O.
E	1 N.C.
G	1 N.O.E.M.
J	1 N.C.L.B.
A	1 N.O. - 1 N.C.
X	No contacts in this position
Pen*TUFF* (Low Voltage)	
H	1 N.O.
U	1 N.C.
I	1 N.O.E.M.
Q	1 N.C.L.B.
F	1 N.O. - 1 N.C.

d, e, f, g (cont'd)

Contact Blocks	
Code	Description
Class 1, Div. 2/Zone 2	
Logic Reed	
V	1 N.O.
W	1 N.C.
T	1 N.O. - 1 N.C.
Sealed Switch	
R	1 N.O.
S	1 N.C.
P	1 N.O. - 1 N.C.
Stackable Sealed Switch	
5	1 N.O.
6	1 N.C.
7	1 N.O. - 1 N.C.

Table 2. Contact Block Reduction Rules

Contact Block Substitution	
Standard	
Combination	Substitute Code
D + E	A
D + D	M*
E + E	N
J + D	B
J + E	C

Table 1. Selector Push Button Cam Targets (Note: X = Closed/O = Open)

Sleeve Position				Cam Description									
				KA/K		KB		KC		KD		KE	
Button Free	Button Pressed	Button Free	Button Pressed	Contact Block Side									
				Right	Left	Right	Left	Right	Left	Right	Left	Right	Left
O	O	O	X	—	—	—	D, H, V, R, 5	—	D, H, V, R, 5	—	—	—	—
O	O	X	O	E, U, W, S, 6	E, U, W, S, 6	—	—	—	—	—	E, U, W, S, 6	—	E, U, W, S, 6
O	O	X	X	—	—	—	—	—	—	E, U, W, S, 6	—	E, U, W, S, 6	—
O	X	O	O	—	—	—	—	D, H, V, R, 5	—	D, H, V, R, 5	—	D, H, V, R, 5	—
O	X	O	X	D, H, V, R, 5	D, H, V, R, 5	D, H, V, R, 5	—	—	—	—	D, H, V, R, 5	—	D, H, V, R, 5
O	X	X	O	—	—	—	—	—	—	—	—	—	—
X	O	X	O	J or Q	J or Q	E, U, W, S, 6	—	—	—	—	J or Q	—	J or Q
X	X	O	O	—	—	—	—	—	—	G or I	—	G or I	—
X	X	O	X	G or I	G or I	—	—	—	—	—	G or I	—	G or I
X	O	X	X	—	—	—	—	E, U, W, S, 6	—	J or Q	—	J or Q	—
X	X	X	O	—	—	—	E, U, W, S, 6	—	E, U, W, S, 6	—	—	—	—

10

Cylinder Lock Push Button Devices (Bul. 800T only)



Cylinder Lock Push Button
Cat. No. 800T-E15A



Mushroom Style Cylinder Lock
Cat. No. 800T-E15M6A

Type of Cylinder Lock	Lock Position	Type 4/13	
		Standard Cylinder Lock	Red Mushroom Cylinder Lock
		Cat. No.∗	Cat. No.∗❄
Spring Bolt — Lock can be set with key when button is in the OUT position. Button will lock when depressed. Key removable in any position. 1 N.O. - 1 N.C.	IN	**800T-E15A**	**800T-E15M6A**
Dead Bolt A — Button can only be operated with the key in the lock. Key removable in locked position only. 1 N.O. - 1 N.C.	IN	**800T-E24A**	**800T-E24M6A**
	OUT	**800T-E14A**	800T-E14M6A
Dead Bolt B — Button can be operated with or without the key inserted in the lock. Key removable in any position. 1 N.O. - 1 N.C.	IN	800T-E12A	**800T-E12M6A**
	OUT	**800T-E11A**	800T-E11M6A

∗ Each device supplied with 2 keys. Replacement key part no. for standard E158 is X-144218.
❄ For jumbo size mushroom cap, change **M** to **J**. Example: **Cat. No. 800T-E15M6A** becomes **Cat. No. 800T-E15J6A**.

Momentary Padlocking Mushroom Head Devices (Bul. 800T only) ‡



Padlocking Mushroom Button
Cat. No. 800T-D6QA



Padlocking Jumbo Mushroom Button
Cat. No. 800T-D6LQA

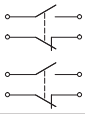
Contact Type		Button Color	Type 4/13	
			Standard Size Metal Mushroom Head	Jumbo Size Metal Mushroom Head
			Cat. No.§	Cat. No.§
No Contact		Red	**800T-D6Q**	800T-D6LQ
	1 N.O.		800T-D6QD1	800T-D6LQD1
	1 N.C.		**800T-D6QD2**	800T-D6LQD2
	1 N.O. - 1 N.C.		**800T-D6QA**	800T-D6LQA

‡ Allows locking in the depressed position. Will hold N.C. contacts open, but might not hold N.O. contacts closed.
§ To order without the padlocking attachment, change **Q** to **F**. Example: **Cat. No. 800T-D6QA** becomes **Cat. No. 800T-D6FA**

Momentary Wobble Stick Push Button Devices (Bul. 800T Type 13 only)



Wobble Stick Unit
Cat. No. 800T-M1B

Contact Type		Wobble Stick♣
		Cat. No.
No Contacts		800T-M1
	1 N.O.	800T-M1D1
	1 N.O. - 1 N.C.	**800T-M1A**
	2 N.O. - 2 N.C.	800T-M1B

♣ Can be operated from any angle.

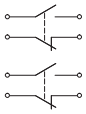
Momentary Contact Flip Lever Devices (Bul. 800H Type 4/4X only)



Flip Lever Operator
Cat. No. 800H-WK42B



Flip Lever Operator
Cat. No. 800H-WK61B

Contact Type	Button Color	Legend Marking	Flip Lever Cat. No.
No Contacts	Grey	START	**800H-WK42**
		No Legend∗	**800H-WK4**
	Red❄	STOP	**800H-WK61**
		No Legend∗	**800H-WK6**
 1 N.O. - 1 N.C.	Grey	START	**800H-WK42A**
		No Legend∗	**800H-WK4A**
	Red❄	STOP	**800H-WK61A**
		No Legend∗	**800H-WK6A**
 2 N.O. - 2 N.C.	Grey	START	**800H-WK42B**
		No Legend∗	**800H-WK4B**
	Red❄	STOP	**800H-WK61B**
		No Legend∗	**800H-WK6B**

∗ Legend plate can be ordered separately. Refer to accessories section.
❄ Locking provision is supplied as standard on red units.

800H ___ – WK ___ ___ ___
a ***b*** ***c*** ***d***

a

Finger-Safe Guards	
Code	**Description**
Blank	No guards
C	Guards on terminals

b

Operator Color	
Code	**Description**
4	Grey
6	Red

c

Operator Types			
Code	**Description**	**Code**	**Description**
—	Blank	20	OUT
1	STOP	21	RAISE
2	START	22	RESET
3	CLOSE	23	REVERSE
4	DOWN	24	RIGHT
5	EMERG. STOP	25	RUN
6	FAST	26	SECOND SPEED
7	FORWARD	27	SLOW
8	FULL SPEED	28	TEST
9	HIGH	29	THIRD SPEED
10	IN	30	UP
11	INCH	31	O
12	JOG	32	I
13	LEFT	33	AVANT
14	LOW	34	OUVRIR
15	LOW SPEED	35	ARRIER
16	LOWER	36	MARCHE
17	OFF	37	ESSAI
18	ON	38	ARRET
19	OPEN		

d

Contact Block(s)	
Code	**Description**
Blank	No contacts
Standard	
D1	1 N.O.
D2	1 N.C.
D3	1 N.O.E.M.
D4	1 N.C.L.B.
D5	1 N.O. (Mini)
D6	1 N.C. (Mini)
A1	1 N.C.L.B. - 1 N.O.
A2	2 N.O.
A4	2 N.C.
A7	1 N.C.L.B. - 1 N.C.
A	1 N.O. - 1 N.C.
B	2 N.O. - 2 N.C.
Class 1, Div. 2/Zone 2	
Sealed Switch	
D1P	1 N.O.
D2P	1 N.C.
AP	1 N.O. - 1 N.C.
BP	2 N.O. - 2 N.C
Stackable Sealed Switch	
D1Y	1 N.O.
D2Y	1 N.C.
A2Y	2 N.O.
A4Y	2 N.C.
AY	1 N.O. - 1 N.C.
BY	2 N.O. - 2 N.C

d (cont'd)

Contact Block(s)	
Code	**Description**
Pen*TUFF* (Low Voltage)	
D1V	1 N.O.
D2V	1 N.C.
D3V	1 N.O.E.M.
D4V	1 N.C.L.B.
AV	1 N.O. - 1 N.C.
BV	2 N.O. - 2 N.C.
Class 1, Div. 2/Zone 2	
Logic Reed	
D1R	1 N.O.
D2R	1 N.C.
A2R	2 N.O.‡
A4R	2 N.C.
AR	1 N.O. - 1 N.C.
BR	2 N.O. - 2 N.C.

10

30.5 mm Push Buttons

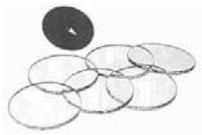
Specialty Operators

Break-Glass Push Button Stations (Bul. 800T only)

Complete Station

	Description	Contact Type	Cat. No.
 *Cat. No. 800T-NX114*	**Break-Glass Push Button Station** Red push button station in a Type 4/13 enclosure incorporates either one or two snap-action contact blocks, which are operated when the small glass window is broken. Includes STOP legend.	1 N.O. - 1 N.C.	**800T-NX114**
		2 N.O. - 2 N.C.	**800T-NX115**

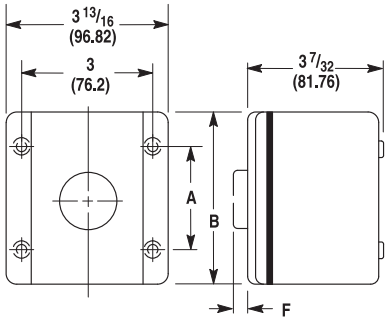
Miscellaneous Kits

	Description	Contact Type	Cat. No.
 *Cat. No. 800T-S6M*	**Unit Only Kit** The break-glass unit less the enclosure is available as a kit to install into the customer's enclosure. The kit includes the contact unit, the hammer and chain and five extra glass discs with one button tack. This kit does not include legend plate. For legend plates, see page 10-48.	1 N.O. - 1 N.C.	**800T-S6M**
		2 N.O. - 2 N.C.	**800T-S6N**
 *Cat. No. 800T-NXM*	**Replacement Snap Action Contact Block Kit** This kit is used to replace the snap action contact block.	1 N.O. - 1 N.C.	800T-NXM
		2 N.O. - 2 N.C.	800T-NXN
	Description		Cat. No.
 *Cat. No. 800T-N28*	**Glass Disc Kit** Each replacement kit for break-glass push button units or stations consists of six glass discs and one button tack.		**800T-N28**

Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Break-Glass Station



A = 2 3/4 (69.85)
B = 4 3/16 (106.38)
F = 9/16 (14.28)

Custom-Built Stations



Description

The table on page 10-5 lists the most commonly used Bulletin 800T/800H push button stations. Stations not listed in this table may be ordered as custom-built stations.

Cat. No.

The cat. no. used to identify custom-built Bulletin 800T push button stations will be cat. no. listed for enclosure only. The letter **Z** will be substituted for the letter **W** and a station serial no. will be added.

Ordering Information

The following information is required when ordering custom-built push button stations.

1. Cat. no. of enclosure.
2. Cat. no. of control units.
3. Legend plate cat. no. and/or marking for each unit.
4. Specify vertical/horizontal mounting.
5. Specify desired operator mounting sequence. Inclusion of a sketch is recommended. If no information is given, standard configuration will be used.

Enclosures

No. of Operator Openings	Surface Mount♣		Flush Mount	Pendant Type	
	Die Cast✶ (Type 4/13)	Sheet Metal (Type 13)	Die Cast Face Plate (Type 4/13)	One Hole in Bottom (Type 13)	Openings in Cover (Type 13)
					
	Cat. No. 800T-2TZ	*Cat. No. 800T-6TJZ*	*Cat. No. 800T-2ZT*	*Cat. No. 800T-2PZ*	*Cat. No. 800T-2PY*
	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
1	**800T-1TZ**❄	—	**800T-1ZT**	—	—
2	**800T-2TZ**❄	—	800T-2ZT	800T-2PZ	**800T-2PY**
3	**800T-3TZ**❄	—	800T-3ZT	800T-3PZ	800T-3PY
4	**800T-4TZ**❄	—	800T-4ZT	800T-4PZ	800T-4PY
5	—	—	—	800T-5PZ	800T-5PY
6‡	**800T-6TZ**❄	—	800T-6ZT	800T-6PZ	800T-6PY
6§	**800T-6THZ**❄	**800T-6TJZ**	800T-6ZTH	—	—
7	—	—	—	800T-7PZ	800T-7PY
8	—	—	—	800T-8PZ	800T-8PY
9	**800T-9TZ**	800T-9TJZ	800T-9ZT	800T-9PZ	800T-9PY
10	—	—	—	800T-10PZ	800T-10PY
12	**800T-12TZ**	800T-12TJZ	800T-12ZT	—	—
16	800T-16TZ	800T-16TJZ	800T-16ZT	—	—
20	—	800T-20TJZ	—	—	—
25	—	800T-25TJZ	—	—	—

Note: Specialty enclosures available. Please refer to KB Q69259778.
Note: Enclosure and conduit dimensions are detailed on page 10-61.
♣ Bottom conduit entry. Grounding provision provided.
✶ Enclosure depth will accommodate one shallow and one mini-contact block stacked.
❄ Add suffix **Y** to the cat. no. for yellow painted enclosure. Example: **Cat. No. 800T-1TZY**.
‡ One vertical row.
§ Two vertical rows of three holes.

Custom-Built Stations (800H only)



Cat. No.

The cat. no. used to identify custom-built Bulletin 800H push button stations will be cat. no. listed for enclosure only. The letter **W** is substituted for the letter **Z** and a station serial no. will be added.

Ordering Information

The following information is required when ordering custom-built push button stations:
1. Cat. no. of enclosure.
2. Cat. no. of control units.
3. Legend plate cat. no. and/or marking for each unit.
4. Specify vertical/horizontal mounting.
5. Specify operator mounting sequence that you want. Including a sketch is recommended. If information not given, standard configuration will be used.

Enclosures (800H only)



Stainless Steel
Cat. No. 800H-2HZ4



Rosite Glass Polyester
Cat. No. 800H-2HZ4R



Fiberglass
Cat. No. 800H-2HZ4Y



Thermoplastic Polyester
Cat. No. 800H-2HZ4C

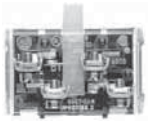
No. of Operator Openings	Conduit Hubs No.	Conduit Hubs Dia. [in.]	Stainless Steel (#304) Type 4/4X/13∗ Cat. No.	Rosite Glass Polyester Type 4/4X/13 Cat. No.	No. of Operator Openings	Conduit Openings No.	Conduit Openings Dia. [in.]‡	Fiberglass❄ Type 4/4X/13 Cat. No.	Thermoplastic Polyester♣➢ Type 4/4X Cat. No.
0§	1	3/4	800H-0HZ4	—	1	1	3/4	**800H-1HZ4Y**	**800H-1HZ4C**
1	1	3/4	**800H-1HZ4**	**800H-1HZ4R**	2	1	1	**800H-2HZ4Y**	800H-2HZ4C
1	2	3/4	—	800H-1HZ4RM1	3	1	1	**800H-3HZ4Y**	800H-3HZ4C
1	1	1	—	800H-1HZ4RM2	4	—	—	—	800H-4HZ4C
2	1	3/4	**800H-2HZ4**	**800H-2HZ4R**	—	—	—	—	—
2	2	3/4	800H-2HZ4M1	800H-2HZ4RM1	—	—	—	—	—
2	1	1	800H-2HZ4M2	800H-2HZ4RM2	—	—	—	—	—
3	1	3/4	**800H-3HZ4**	**800H-3HZ4R**	—	—	—	—	—
3	2	3/4	800H-3HZ4M1	800H-3HZ4RM1	—	—	—	—	—
4	1	3/4	**800H-4HZ4**	**800H-4HZ4R**	—	—	—	—	—
4	2	3/4	800H-4HZ4M1	800H-4HZ4RM1	—	—	—	—	—
5	1	1	**800H-5HZ4**	—	—	—	—	—	—
6	1	1	800H-6HZ4	800H-6HZ4R	—	—	—	—	—
7	1	1	800H-7HZ4	—	—	—	—	—	—
8	1	1	800H-8HZ4	—	—	—	—	—	—

Note: Other combinations of conduit hub sizes are available upon request. Enclosure and conduit dimensions are detailed on page 10-61.
∗ Grounding screw provided with stainless steel enclosure.
❄ Extra deep. Accommodates two levels of stackable sealed switch contact blocks.
‡ Conduit hubs must be ordered separately. For 3/4 in. hub, order **Cat. No. 1490-N9**. For 1 in. hub, order **Cat. No. 1490-N10**.
§ Identical to **Cat. No. 800H-1HZ4** but without mounting holes.
♣ No conduit openings provided.
➢ Yellow thermoplastic enclosures may be ordered by adding a **Y** to the cat. no. Example: **Cat. No. 800H-1HZ4C** becomes **Cat. No. 800H-1HZ4CY**.

Contact Blocks

Packaged in kit form for field installation. All necessary mounting hardware is provided with each contact block kit. **Contact ratings are listed on page 10-4.**

Note: It is not recommended to mount more than four contact blocks on any one non-illuminated operator (maximum two blocks deep). Contact blocks cannot be stacked onto power modules, so illuminated operators are limited to two contact blocks. Sealed switch contact blocks are not stackable and are limited to two blocks per operator. Time delay contacts are only available as one circuit per operator.



Shallow Block



PenTUFF™ (Low Voltage) Contact Block



Logic Reed Block



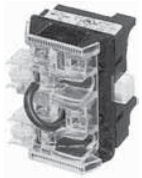
Sealed Switch Block



Stackable Sealed Switch Block

Contact Type	Shallow Block∗❄		PenTUFF (Low Voltage) Block∗❄		Logic Reed Block‡		Sealed Switch Block‡		Stackable Sealed Switch Block‡	
	Cat. No.	Code	Cat. No.	Code	Cat. No.	Code	Cat. No.	Code	Cat. No.	Code
1 N.O.	**800T-XD1**	D	**800T-XD1V**	H	**800T-XD1R**	V	**800T-XD1P**	R	**800T-XD1Y**	5
1 N.C.	**800T-XD2**	E	**800T-XD2V**	U	**800T-XD2R**	W	**800T-XD2P**	S	**800T-XD2Y**	6
1 N.O.E.M.	**800T-XD3**	G	**800T-XD3V**	I	—	—	—	—	—	—
1 N.C.L.B.	**800T-XD4**	J	**800T-XD4V**	Q	—	—	—	—	—	—
1 N.O. - N.C.	**800T-XA**	A	**800T-XAV**	F	**800T-XAR**	T	**800T-XAP**	P	**800T-XAY**	7
2 N.O.	**800T-XA2§**	M	—	—	**800T-XA2R§**	Y	—	—	**800T-XA2Y**	8
2 N.C.	**800T-XA4**	N	—	—	**800T-XA4R**	Z	—	—	**800T-XA4Y**	9
1 N.C.L.B. - 1 N.O.	**800T-XA1**	B	—	—	—	—	—	—	—	—
1 N.C.L.B. - 1 N.C.	**800T-XA7**	C	—	—	—	—	—	—	—	—

Note: Modular suffix codes can be used when specifying selector switches with multiple contact blocks.



Self Monitoring Contact Block

Contact Type	S.M.C.B.∗➢	
	Cat. No.	Code
1 N.C.L.B. (wired in series with 1 N.O. monitoring contact)	**800TC-XD4S**	3



Mini Block



Time Delay Block



MaxDuty Block

Contact Type	Mini Block∗		Time Delay Block♣	MaxDuty Block	
	Cat. No.	Code	Cat. No.	Cat. No.	Code
1 N.O.	**800T-XD5**	K	**800T-XT**	**800T-XD1M**	1
1 N.C.	**800T-XD6**	L	800T-XS	**800T-XD2M**	2
1 N.C.L.B.	—	—	—	**800T-XD4M**	4

Note: Modular suffix codes can be used when specifying selector switches with multiple contact blocks.

∗ Contact blocks with normally closed contacts meet direct drive positive opening standard requirements when properly fused to IEC 269-1 and 269-2. Shallow/mini contacts: 10 A gl or N type cartridge fuse. PenTUFF contacts: 6 A gl or N type cartridge fuse.
❄ Specify Bulletin 800TC for finger-safe contact blocks. Example: **Cat. No. 800T-XA** becomes **Cat. No. 800TC-XA.**
‡ 800T operator using sealed switch and logic reed contact blocks and installed in a suitable enclosure are UL Listed as suitable for use in Class I, Division 2/Zone 2 hazardous locations.
§ Additional contacts cannot be stacked on XA2 and XA2R contact blocks.
♣ For contact ratings, see page 10-4.
➢ For use with 2-position push-pull or push-pull/twist operators only. Must be mounted on the first level of the operator. The N.O. monitoring contact automatically closes when the S.M.C.B. is properly installed onto the operator. If the S.M.C.B. is separated from the operator, the N.O. monitoring contact automatically opens.

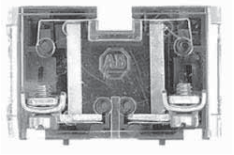


Shallow Contact Block Hardware

Description	Cat. No.
Contact Block Mounting Screw	**800T-N335**
Screw Retainer	**800T-N336**
Actuator Extender	**800T-N337**

Power Modules

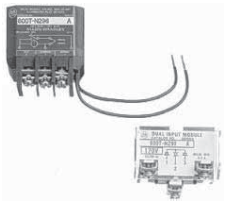
Packaged in kit form for field installation. Lamps are listed on page 10-45.



Full Voltage Power Module
Cat. No. 800T-N330



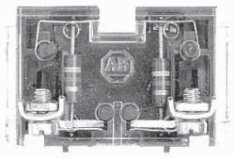
Transformer Power Module
Cat. No. 800T-N326



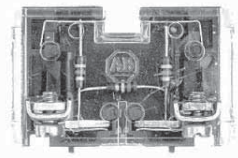
Dual Input Power Modules
Cat. No. 800T-N296 (Transformer)
Cat. No. 800T-N290N (Diode)

Full Voltage§		Transformer§		Dual Input		
Lamp Voltage	Cat. No.	Voltage	Cat. No.	Type	Voltage	Cat. No.
6…130V AC/DC	**800T-N330**	48V AC 50/60 Hz	800T-N325	Transformer✶	120V AC	800T-N296
		120V AC 50/60 Hz	**800T-N326**	Diode Type❄	24V AC/DC	800T-N291N
		240V AC 50/60 Hz	**800T-N327**		120V AC/DC	800T-N290N
		277V AC 50/60 Hz	800T-N327Y	—	—	—
		480V AC 50/60 Hz	**800T-N328**	—	—	—
240V AC/DC‡	800T-N331	600V AC 50/60 Hz	800T-N329	—	—	—

✶ Transformer type dual input provides circuit isolation via a miniature type relay. This module is used in conjunction with a 120V transformer.
❄ Diode type dual input provides circuit isolation via opposing diodes. Not recommended for use with solid-state outputs and neon indicators.
‡ 240V full voltage module contains 50% dropping resistors for use with a 120V incandescent lamp.
§ Specify Bulletin 800TC for finger-safe power modules. Example: **Cat. No. 800T-N330** becomes **Cat. No. 800TC-N330.**



Resistor Power Module
Cat. No. 800T-N332



Neon Power Module
Cat. No. 800T-N333

Resistor (10% Drop)➢		Neon♣➢	
Voltage	Cat. No.	Voltage	Cat. No.
120V AC/DC	800T-N332	120V AC/DC	800T-N333
		240V AC/DC	800T-N334

♣ Neon modules contain resistors.
➢ Specify Bulletin 800TC for finger-safe power modules. Example: **Cat. No. 800T-N332** becomes **Cat. No. 800TC-N332.**

Universal LED Module



Voltage	Cat. No.
12…130V AC/DC	800TC-N374

Trigger Action E-Stop Latches



Cat. No. 800T-N380



Cat. No. 800T-N379

Description	Cat. No.
Illuminated type	800T-N380
Non-illuminated type	800T-N379

Replacement Color Caps

Color caps listed below are for field replacement on installed devices or for completion of devices ordered with color caps omitted.



Push-Pull



Push-Pull/Twist



Push-Pull Jumbo



Push-Pull/Twist Jumbo

Push-Pull Color Caps, Illuminated

Color	800T Push-Pull Cat. No.	800H Push-Pull Cat. No.	800T/H Push-Pull/Twist Cat. No.	800T/H Push-Pull Jumbo Cat. No.	800T/H Push-Pull/Twist Jumbo Cat. No.
Amber	**800T-N159A**	800H-N112A	800T-N301A	800T-N209A	800T-N306A
Blue	**800T-N159B**	800H-N112B	800T-N301B	800T-N209B	800T-N306B
Clear	**800T-N159C**	800H-N112C	800T-N301C	800T-N209C	800T-N306C
Green	**800T-N159G**	**800H-N112G**	800T-N301G	800T-N209G	800T-N306G
Red	**800T-N159R**	**800H-N112R**	**800T-N301R**	**800T-N209R**	800T-N306R
White	**800T-N159W**	800H-N112W	800T-N301W	800T-N209W	800T-N306W



Illuminated Mushroom



Illuminated Jumbo Mushroom



Standard



Push-to-Test



Glass Caps for Pilot Lights

Color	800T/H Push Button Color Caps, Illuminated		800T/H Pilot Light Color Caps			Glass Caps for 800T Pilot Lights
	Mushroom	Jumbo Mushroom	Standard∗	Push-to-Test∗	18 mm	
	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Amber	**800T-N304A**	800T-N305A	**800T-N26A**	**800T-N42**	**800T-N122A**	800T-N22
Blue	800T-N304B	800T-N305B	**800T-N26B**	**800T-N43**	**800T-N122B**	800T-N23
Clear	800T-N304C	800T-N305C	**800T-N26C**	**800T-N45**	800T-N122C	800T-N25
Green	**800T-N304G**	800T-N305G	**800T-N26G**	**800T-N41**	**800T-N122G**	800T-N21
Red	**800T-N304R**	**800T-N305R**	**800T-N26R**	**800T-N40**	**800T-N122R**	800T-N20
White	800T-N304W	800T-N305W	**800T-N26W**	**800T-N44**	**800T-N122W**	800T-N24

∗ Available in bulk quantities of 20. Add suffix (-BP) to the cat. no. and order in multiples of 20.



Plastic Mushroom



Plastic Jumbo Mushroom



Padlocking Metal Mushroom



Metal Jumbo Mushroom

Push Button Color Caps, Non-Illuminated

Button Color	800T Plastic Mushroom Cat. No.	800H Plastic Mushroom Cat. No.	800T Plastic Jumbo Mushroom Cat. No.	800H Plastic Jumbo Mushroom Cat. No.	800T Padlocking Metal Mushroom Cat. No.	800T Metal Jumbo Mushroom Cat. No.
Red	**800T-N246R**	**800H-N114A**	**800T-N247R**	800H-N115A	**800T-N311R**	∗ **800T-N248R**
Green	**800T-N246G**	800H-N114B	**800T-N247G**	800H-N115B	800T-N311G	∗ 800T-N248G
Black	**800T-N246B**	800H-N114H	**800T-N247B**	800H-N115H	800T-N311B	∗ 800T-N248B
Orange	800T-N246O	800H-N114F	800T-N247O	800H-N115F	800T-N311O	❄ 800T-N248O
Grey	800T-N246GR	800H-N114G	800T-N247GR	800H-N115G	800T-N311GR	800T-N248GR
Blue	800T-N246BL	800H-N114C	800T-N247BL	800H-N115C	800T-N311BL	∗ 800T-N248BL
Yellow	**800T-N246Y**	800H-N114E	800T-N247Y	800H-N115E	800T-N311Y	∗ 800T-N248Y
Natural	—	—	—	—	—	‡ 800T-N248
White	800T-N246W	800H-N114L	—	800H-N115L	—	—

For padlocking jumbo mushroom style:
∗ change listed cat. no. from **248** to **313**. Example: **Cat. No. 800T-N248G** becomes **Cat. No. 800T-N313G**.
❄ change listed cat. no. from **Cat. No. 800T-N248O** to **Cat. No. 800T-N313**.
‡ change listed cat. no. from **Cat. No. 800T-N248** to **Cat. No. 800T-N313GR**.

10

Replacement Color Caps, Continued

Color caps listed below are for field replacement on installed devices or for completion of devices ordered with color caps omitted.



Push-Pull



Push-Pull/Twist



Push-Pull Jumbo



Push-Pull/Twist Jumbo

	800T/H Push-Pull Color Caps, Non-Illuminated			
	Push-Pull	Push-Pull/Twist	Push-Pull Jumbo	Push-Pull/Twist Jumbo
Button Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Red	**800T-N160A**	**800T-N302A**	**800T-N208A**	**800T-N307A**
Green	**800T-N160B**	800T-N302B	800T-N208B	800T-N307B
Blue	800T-N160C	800T-N302C	800T-N208C	800T-N307C
Yellow	**800T-N160E**	**800T-N302E**	800T-N208E	800T-N307E
Orange	800T-N160F	800T-N302F	800T-N208F	800T-N307F
Grey	800T-N160G	800T-N302G	800T-N208G	800T-N307G
Black	**800T-N160H**	800T-N302H	800T-N208H	800T-N307H
White	800T-N160L	800T-N302L	800T-N208L	800T-N307L

Selector Switch Knobs, Illuminated



Standard Knob



Knob Lever

	800T Knob Type		800H Knob Type	
	Standard Knob	Knob Lever	Standard Knob	Knob Lever
Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Amber	**800T-N297A**	**800T-N298A**	800H-N154A	800H-N155A
Blue	800T-N297B	800T-N298B	800H-N154B	800H-N155B
Clear	**800T-N297C**	800T-N298C	800H-N154C	800H-N155C
Green	**800T-N297G**	**800T-N298G**	800H-N154G	800H-N155G
Red	**800T-N297R**	**800T-N298R**	800H-N154R	800H-N155R
White	**800T-N297W**	800T-N298W	800H-N154W	800H-N155W

Selector Switches

Standard Knob Lever | Coin Slot Wing Lever



Description	Item	Color	Cat. No.
800T **Knobs and Actuators for Selector Switches** Selector switch knobs can be changed in the field. Standard knob and knob levers can be ordered with white inserts or with a packet of colored inserts which includes one insert of each color.	Standard Knob	White	**800T-N230F**
		Kit	**800T-N230**
	Knob Lever	White	**800T-N231F**
		Kit	**800T-N231**
	Wing Lever	Grey	**800T-N238**
		Red	800T-N238A
	Coin Slot	Black Only	**800T-N239**
800H Knob	Standard Knob	White	**800H-N145F**



Description	Color	Cat. No.
800T/H **Color Insert Kits** Available on Selector switches with removable color inserts. Standard knob and knob levers use the same insert. If color **All** is selected, a packet of color inserts will be furnished which includes one of each color. Color Insert kits can also be ordered with operators at no additional charge.	Red	**800T-N124**
	Green	**800T-N125**
	Blue	**800T-N126**
	Yellow	**800T-N127**
	White	**800T-N128**
	Orange	**800T-N286**
	All	**800T-N123**

Booted Selector Switch Knobs, Non-Illuminated (800H only)



Cat. No. 800H-NR5

Insert Material	Material							
	Chlorosulfonated Polyethylene‡		Silicone •‡		Urethane ••‡		Ethylene • Propylene ••‡	
	Cat. No.		Cat. No.		Cat. No.		Cat. No.	
Brass	∗	**800H-NR5**	∗	800H-NR101	∗	800H-NR100	∗	800H-NR103
Stainless Steel		800HS-NR5		800HS-NR101		800HS-NR100		800HS-NR103

∗ Color insert packet (Cat. No. 800T-N123) is included in each kit.
‡ Dots printed on the inside of the boot identify the boot material.

Protective Boots

Protective Boot for Illuminated Push Buttons



Cat. No. 800H-N11



Cat. No. 800H-N12

Description	Type	Cat. No.
May be added to guarded units, units without guard or Push-to-Test devices. This protective boot guards against the entrance of foreign materials reaching the opening between the button and locking ring.	Boot without Guard	**800H-N11**
	Boot with Guard	**800H-N12**

Protective Boots for Non-Illuminated Push Buttons❄

Boots supplied with control stations and components are made of a chlorosulfonated polyethylene material with stainless steel insert ring. To order boots with silicone, urethane, or ethylene propylene material, see the table below. Material application information shown below.



Cat. No. 800H-N5A

Insert Material	Boot Color	Material			
		Chlorosulfonated Polyethylene‡	Silicone •‡	Urethane ••‡	Ethylene • Propylene ••‡
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
Stainless steel§	Red	**800H-N5A**	**800H-N101R**	**800H-N100R**	800H-N103R
	Green	**800H-N5B**	**800H-N101G**	**800H-N100G**	800H-N103G
	Black	**800H-N5H**	**800H-N101B**	**800H-N100B**	800H-N103B
	Yellow	**800H-N5E**	**800H-N101Y**	800H-N100Y	—
	Blue	**800H-N5C**	800H-N101BL	800H-N100BL	—

❄ May be added to flush or extended head push button units to protect against foreign materials reaching the opening between the button and the locking ring.
§ Series B boots incorporate a stainless steel insert as standard.
‡ Dots printed on the inside of the boot identify the boot material.

10

Protective Boot Application Information

– **Chlorosulfonated Polyethylene (synthetic rubber)**
Very resistant to attack by oxidizing chemicals such as concentrated sulfuric acid and hypochlorite solutions. Also resistant to attack by oils and performs well in a wide range of other chemicals and solvents. Good flex and high impact resistance. This is the standard boot material supplied with 800H NEMA Type 4/4X push buttons unless otherwise specified.
– **Silicone**
Superior high temperature resistance. Particularly suited for use where organic acids or vegetable oils may be present. Also superior resistance to the effects of outdoor use, such as oxygen, ozone, and weather.
– **Urethane**
Excellent resistance to mechanical failure. Most durable boot material. Particularly suited for use where lubricating oils and automotive fuels may be present. Also well-suited for outdoor use.
– **Ethylene-propylene**
Particularly suited for high temperature applications. Resistant to attack by many acids and alkalies, detergents, phosphate esters, ketones, alcohols, and glycols. Outstanding service in areas with hot water and steam wash downs.

Potentiometer Replacement Knobs

Description	Cat. No.
Type 4/13 (800T)	40274-073-55
Type 4/4X/13 (800H)	40274-073-54

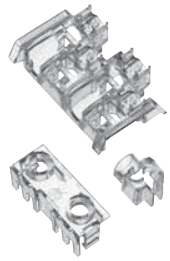
Push Buttons

	Description	Cat. No.
 *Cat. No. 800T-N179 (Operators not included)*	**Bul. 800T/H** **Mechanical Interlock** Used on momentary contact push button units. Guards against closing the N.O. contacts of one button while the other button's N.O. contacts are closed. Buttons remain momentary. For maintained units, see page 10-25.	**800T-N179**
 *Cat. No. 800T-N12*	**Bul. 800T** **Rocker Arm Operating Lever** The rocker arm lever operates two flush head or one flush with one extended head momentary contact push button units spaced 1-27/32 in. (46.8 mm) center-to-center. Legend plates must be ordered separately and should be inverted 180° prior to engraving and installation.	800T-N12

Miscellaneous

	Description	Cat. No.
 *Cat. No. 800T-N245*	**Bul. 800T/H** **Mounting Ring Wrench** This wrench will simplify tightening or loosening the octagonal mounting ring used on Bul. 800T units. This wrench is double-ended and can be used for 18 mm and 30 mm pilot light mounting rings.	**800T-N245**
 *Cat. No. 800T-N209RE1*	**Bul. 800T/H** **Jumbo Push-Pull Cap** For use on Bul. 800T or 800H push-pull operators. Fits on illuminated and non-illuminated devices.	**800T-N209RE1**
	Bul. 800T **63 mm Red Anodized Aluminum Cap** For use on Bul. 800T non-illuminated push-pull devices.	800T-N210R
	Bul. 800T **63 mm Red Anodized Aluminum Cap with "E-Stop"** For use on Bul. 800T non-illuminated push-pull devices.	800T-N210RE
	Bul. 800T **90 mm Gold Anodized Aluminum Cap** For use on Bul. 800T non-illuminated push-pull devices.	800T-N211GL
 *Cat. No. 800T-N300*	**Bul. 800T** **Bonding Bracket** The bonding bracket establishes an electrical circuit between the mounting surface and metal operator bushing for grounding purposes; recommended for installations which require CSA approval. Necessary mounting hardware is included. Order Cat. No. 800T-N300 for back-of-panel bracket. Order Cat. No. 800T-N300F for front-of-panel bracket.	**800T-N300** 800T-N300F
 *Cat. No. 800E-ALR1*	**Bul. 800T/H** **Lens/Bulb Removal Tool** The small end of this tool provides quick and easy removal of any incandescent or LED lamp.	**800F-ALR1**

Miscellaneous, Continued

	Description	Cat. No.
 *Cat. No. 800T-N323* *Cat. No. 800T-N324* *Cat. No. 800T-N322* *IEC Finger-Safe Accessories*	**Bul. 800T/H** **IEC Finger-Safe Terminal Guards** Snap-on accessories which provide IEC, IP2X and VGB finger-safe protection. Single terminal guards for single circuit contact blocks, full voltage modules, LED modules, etc. (800T-XD1, -XD2, -XD3, -XD4, -XD5, -XD6, -XAP, -XD1P, -XD2P, -PC…, and -QC…)∗ **Note:** Must be ordered in multiples of 100 pieces.	**800T-N322**
	Transformer covers for transformer only. **Note:** Must be ordered in multiples of 25 pieces.	**800T-N324**
	Multi-terminal side cover for use on single or double circuit contact blocks. (800T-XA, -XA1, -XA2, -XA4, -XA7, -XAR, -XA2R, -XA4R, -XD1R, and -XD2R) **Note:** Must be ordered in multiples of 25 pieces.	**800T-N323**
 *Cat. No. 800T-N292*	**Grey Bul. 800T** **Trim Washer** Used to mount the operator properly when a legend plate is not being used. **Note:** Must be ordered in multiples of 10 pieces.	**800T-N292**
	Plastic Bul. 800H **Trim Washer** Used to mount the operator properly when a legend plate is not being used. **Note:** Must be ordered in multiples of 10 pieces.	800H-N148
 *Cat. No. 800T-N293*	**Metal Bul. 800T** **Thrust Washer** Used to prevent rotation of operators in a keyed or notched hole. **Note:** Must be ordered in multiples of 10 pieces.	**800T-N293**
	Plastic Bul. 800H **Thrust Washer** Used to prevent rotation of operators in a keyed or notched hole. **Note:** Must be ordered in multiples of 10 pieces.	800H-N146
 *Cat. No. 800T-N188*	**Bul. 800T** **Etching Fluid** Used to blacken freshly engraved aluminum legend plates.	**800T-N188**

	Description	Color	Cat. No.
 *Cat. No. 800T-N1*	**Bul. 800T/H** **Closing Button** Where an enclosure or flush plate with more than the required number of openings is used, this neat-appearing button can be supplied to close the unused openings.	Grey	**800T-N1**
		Black	**800T-N1B**

∗ Power modules excluding transformers and dual inputs

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Locking Attachments

	Description	Cat. No.
 *Cat. No. 800T-N2 (Padlock not included)*	**Bul. 800T** **Extended Head Push Button Padlocking Attachments** Permits locking in the depressed position. Locks the normally closed contact in the open position. For extended head non-illuminated momentary push buttons.	**800T-N2**
 *Cat. No. 800T-N10 (Padlock not included)*	**Bul. 800T** **Flush Head Push Button Padlocking Attachments** Permits locking in the depressed position. Locks the normally closed contact in the open position. For flush head push button.	**800T-N10**
 *Cat. No. 800T-N315 (Padlock not included)*	**Bul. 800T** **Momentary Mushroom Padlocking Attachments** For Bul. 800T non-illuminated momentary mushroom push button. Requires use of Cat. No. 800T-N311 mushroom cap. This device is used to lock the mushroom button in a depressed position.	**800T-N315**
 *Cat. No. 800T-N314 (Padlock not included)*	**Bul. 800T/H** **Push-Pull Padlocking Attachment** For 2-position push-pull and push-pull/twist release illuminated and non-illuminated operators. Use on standard head only (40 mm dia.). Locks the normally closed contacts open only. Conversion of normally closed late break contacts to standard normally closed contacts are recommended when using this accessory. Made of stainless steel.	**800T-N314**
 *Cat. No. 800T-N163 (Padlock not included)*	**Bul. 800T/H** **Padlocking Cover** Guards against unauthorized operation for non-illuminated, standard knob selector switches and potentiometers. Stainless steel and clear plastic construction.	**800T-N163**
	Bul. 800T/H **Trigger Action Padlocking Attachment** For 2-position trigger action E-stops with 45 mm heads.	800T-N378

Locking Attachments, Continued

	Description		Cat. No.
 *Cat. No. 800H-N140 (Padlock not included)*	**Bul. 800T/H** **Padlocking Cover** Guards against unauthorized operation. For non-illuminated push buttons, 2-position push-pull or twist-release units, and standard knob selector switches. When applying Cat. No. 800H-N140 on 2-position maintained push-pull units, cover will lock only when the button is in depressed position. Padlocking cover includes blank legend plate for customer marking. **Note:** A pre-marked legend plate is available.The words OPEN COVER TO OPERATE are on the front and PULL-TO-START-PUSH-TO-STOP are on the rear. To order legend plate only, specify Cat. No. 800H-W174L.		**800H-N140**
 *Cat. No. 800T-NX446 (Padlock not included)*	**Bul. 800T** **2- and 3-Position Non-illuminated Selector Switch Padlocking Attachment — Standard Knob** Padlocking guard for 2- and 3-position selector switches with standard knob operators only. Locks selector switch in any maintained position.∗		**800T-NX446**
 *Cat. No. 800H-N141R (Padlock not included)*	Description	Position	Cat. No.
	Bul. 800H **2- and 3-Position Selector Switch with Padlocking Guards** Padlocking guard for 2- and 3-position selector switches with standard knob operators only.	Left	**800H-N141L**
		Center	800H-N141C
		Right	**800H-N141R**
		All	**800H-N141A**
 *Cat. No. 800T-NX446A (Padlock not included)*	**Bul. 800T** **4-Position Selector Switch Attachment — Standard Knob** Kit includes selector switch and guard (padlock not included). Padlocking guard for 4-position selector switches with standard knob operators only. Locks selector switch in any maintained position.∗		800T-NX446A
	Description	Position	Cat. No.
 *Cat. No. 800H-N316J (Padlock not included)*	**Bul. 800T/H** **Non-Illuminated Selector Switch Padlocking Attachment** 2-, 3-, and 4-position selector switch padlocking attachments. Can be used to lock operators in a desired position. For 3-position selector switches, this device can also be used to lock out a left or right position as shown in the photo to the left.	For 2- and 3-Position Selector Switches	
		Left	**800T-N316L**
		Center	**800T-N316C**
		Right	**800T-N316R**
		Window Center through Right - Prevent Left Operation	800T-N316J
		Window Center through Left - Prevent Right Operation	800T-N316K
		For 4-Position Selector Switches	
		Left (Pos. 1)	800T-N317L
		Center Left (Pos. 2)	800T-N317CL
		Center Right (Pos. 3)	800T-N317CR
		Right (Pos. 4)	800T-N317R
 *Cat. No. 800H-N4162L (Padlock not included)*	**Bul. 800T/H** **Illuminated Selector Switch Padlocking Attachment** 2- and 3-position selector switch padlocking attachments for illuminated selector switches. Stainless steel material	For 2-Position Selector Switches	
		Left	**800T-N4162L**
		Right	800T-N4162R
		For 3-Position Selector Switches	
		Left	800T-N4163L
		Center	800T-N4163C
		Right	800T-N4163R
		Window Center through Right - Prevent Left Operation	800T-N4163J
		Window Center through Left - Prevent Right Operation	800T-N4163K

∗ Diameter of hasp is 11/32 in. (8.73 mm)

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Guards

	Description	Type	Cat. No.
 *Cat. No. 800T-N13*	**Bul. 800T** **Push Button Guards** Momentary push button guards to reduce the risk of accidental operation.	1 in. guard for non-illuminated	**800T-N13**
		1/2 in. guard for non-illuminated	**800T-N143**
		1-1/2 in. guard for illuminated	**800T-N93**
		1-1/2 in. guard for non-illuminated with locking attachment	800T-N39
 *Cat. No. 800H-N152*	**Bul. 800H** **Illuminated Push Button Guard** This guard provides additional protection against accidental operation of the push button unit. 1-1/2 in. (38.1 mm) guard for illumination units.		**800H-N152**
 *Cat. No. 800T-N226*	**Bul. 800T** **18 mm Guard** Provides side protection for 18 mm pilot lights.		**800T-N226**
 *Cat. No. 800H-N153*	**Bul. 800H** **Stainless Steel Guard** Used on non-illuminated push buttons that have protective boots as shown on page 10-39.		**800H-N153**
 *Cat. No. 800T-N129*	**Bul. 800T** **Mushroom Push Button Guards** Momentary mushroom guards for standard and jumbo mushroom push buttons. Reduces the risk of accidental operation.	Standard guard	**800T-N129**
		Standard guard with set screw	**800T-N165**
		Jumbo guard	**800T-N151**
		Jumbo guard with set screw	**800T-N154**
	Description	Type of Finish	Cat. No.
 *Cat. Nos. 800T-N310 and 800T-NX1320*	**Bul. 800T/H** **Protective Guard** Protective ring for Bul. 800T 2-position push-pull operators. Illuminated or non-illuminated. Often used to avoid unintentional tripping of E-stop operators. This guard is used with standard size button (40 mm dia.).	Stainless steel	**800T-N310**
		Black	**800T-NX1320**
	Description	Operator Size	Cat. No.
 *Cat. No. 800T-N310J*	**Bul. 800T/H** **Jumbo Protective Guard** Protective ring for Bul. 800T 2-position push-pull operators. Illuminated or non-illuminated. Often used to avoid unintentional tripping of E-stop operators.	60 mm (Jumbo)	**800T-N310J**
		63 mm	800T-N310L
Cat. No. 800T-N381	**Bul. 800T/H** **Protective Guard** Protective ring for Bul. 800T trigger action E-stop operators.	45 mm	800T-N381
		60/63 mm	800T-N381L
 *Cat. No. 800T-N339*	**Bul. 800T/H** **Ramp Guard** For Bul. 800T/800H 2- and 3-position illuminated and non-illuminated push-pull units. Standard size button only (40 mm dia.).		**800T-N339**

Replacement Lamps

Pilot Lights, Illuminated Push Buttons, Illuminated Push-Pull, Illuminated Push-Pull/Twist to Release, and Illuminated Selector Switches

Lamp	Type	Current, Typical	Lamp Voltage	ANSI No.	Catalog Voltage Code	Cat. No.
Incandescent	Full Voltage Transformer	150 mA/250 mA	6.3V AC	755/1866	6, 16, 26, 36, 46, 56, 76	✶ **800T-N65**
	Full Voltage	80 mA	14V AC/DC	756	12	✶ 800T-N141
		70 mA	24V AC/DC	757	24	✶ **800T-N157**
		50 mA	48V AC/DC	1835	48	✶ 800T-N365
	Full Voltage Resistor	22 mA	120V AC/DC	949	10, 11	✶ **800T-N169**
	Flashing	150 mA	6V AC/DC	267	6	✶ **800T-N212**
	Dual Input Diode	57 mA	24V AC/DC	24 MB	24	✶ 800T-N180
		21 mA	120V AC	90 MB	16	✶ 800T-N261
Neon 	—	2 mA	120V AC/DC	B2A	10, 20	**609-N9**
Lamp	**Type**	**Current, Typical❄**	**Lamp Voltage**	**Leakage Current**	**Code**	**Cat. No.❄**
LED‡	Universal	13 mA @ 24V DC 8.5 mA @ 120V AC‡	3V§	3 mA	2	800T-N376x
	Transformer	60	6V	14 mA	16, 26, 46, 56	800T-N377x

✶ Item is sold in multiples of 5. Order quantity of 5 to receive package of 5 pieces.
❄ To complete the cat. no. replace the **x** with the first letter of the desired color: **G**reen, **R**ed, or **W**hite.
‡ Typical current consumption values indicated are relative to the input of the power module.
§ Lamp is intended for use with power module Cat. No. 800TC-N374 which has an input voltage rating of 12 …130V AC/DC.

Legacy LED Lamps♣

Lamp	Type	Current, Typical➢	Lamp Voltage	Leakage Current	Catalog Voltage Code	Cat. No.⌘
LED❖	Full Voltage	13 mA/22 mA	12V AC/DC	3 mA	12	800T-N362x
		20 mA/21 mA	24V AC/DC	3 mA	24	800T-N319x
		12 mA/17 mA	32V AC/DC	3 mA	32	800T-N363x
		9 mA/14 mA	48V AC/DC	3 mA	48	800T-N364x
		3.3 mA/6 mA	120V AC	—	10	800T-N320x
		4.5 mA/6.2 mA	130V AC/DC	3 mA	13	800T-N321x
	Transformer	50 mA	6V AC	14 mA	6, 16, 26, 36, 46, 56, 76	800T-N318x
	Flashing	18 mA	24V AC/DC	—	N/A	✦ 800T-N319Fx

♣ In full voltage applications, these lamps are intended to be used with power module Cat. No. 800T-N330.
❖ All LEDs except 120V have an internal shunt resistor for use with solid-state outputs. LEDs will not illuminate below listed leakage current.
➢ Typical current draw varies with LED color. The first mA value is for a green or blue LED and the second mA value is for a red or amber LED.
⌘ To complete the cat. no. replace the **x** with the first letter of the desired color: **A**mber, **G**reen, **R**ed, **B**lue, or **W**hite. White LEDs only available in 6V, 24V, 120V, and 130V.
✦ Flashing rate is 2 Hz.

Cluster Pilot Lights

Lamp	Type	Current, Typical	Lamp Voltage	ANSI No.	Cat. No.✶
Incandescent	Full Voltage Transformer	195 mA	6V AC/DC	381	**800T-N258**
	Full Voltage	73 mA	12V AC/DC	382	800T-N259
		37 mA	24V AC/DC	387	**800T-N260**
Lamp	**Type**	**Current, Typical**	**Lamp Voltage**	**Polarity**	**Cat. No.♠**
LED	Full Voltage Transformer	45 mA	6V AC/DC	Positive	800T-N340x
	Full Voltage	36 mA	12V AC/DC	Positive	800T-N341x
		14 mA	28V AC/DC	Bi-Polar	[11] **800T-N80x**

✶ Item is sold in multiples of 5. Order quanitity of 5 to receive package of 5 pieces.
♠ To complete the cat. no., replace the **x** with the first letter of the desired color: **A**mber, **G**reen, or **R**ed only.
[11] For use with 24V AC/DC rated devices.

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Replacement Keys for Cylinder Lock 2-, 3-, and 4-Position Selector Switches (800T only)

Cylinder Lock Key Option Code	Series Key Number	Cat. No.	Cylinder Lock Key Option Code	Series Key Number	Cat. No.
Blank (standard key)	D018 (standard key)	**X-181170**	15	T112❄	40269-087-01
03	D020✶	**X-307922**	16	T115❄	40269-087-02
04	D025✶	**X-307923**	17	T324❄	40269-087-03
05	D335✶	**X-307924**	18	T382❄	40269-087-04
06	D429✶	**X-307925**	19	T404❄	40269-087-05
07	D461✶	**X-307926**	20	T171❄	40269-087-06
08	D111✶	X-307927	21	T484❄	40269-087-07
09	D587✶	X-307928	22	T547❄	40269-087-08
10	D682✶	X-307929	23	T569❄	40269-087-09
11	D713✶	X-307930	24	T692❄	40269-087-10
12	D900✶	**X-307931**	25	T752❄	40269-087-11
13	D992✶	X-307932	26	T178❄	40269-087-12
14	D118✶	X-307933			

✶ Uses master key DM81, AB Cat. No. X-433358.
❄ Uses master key 15T, AB Cat. No. X-433359.

Replacement Keys for Push Button Switches with Cylinder Locks (800T only)

Lock Key Option Code			Series Key Number	Cat. No.
Spring Bolt	Dead Bolt A	Dead Bolt B		
Blank (standard key)	Blank (standard key)	Blank (standard key)	E158 (standard key)	**X-144218**
44	32	20	E109	X-386233
45	33	21	E131	X-386234
46	34	22	E100	X-386235
47	35	23	E115	X-386236
48	36	24	E120	X-386237
49	37	25	E104	X-386238
50	38	26	E108	X-386239
51	39	27	E132	X-386240
52	40	28	E144	X-386241
53	41	29	E157	X-386242
54	42	30	E101	X-386243
55	43	31	E102	40274-250-01
66	61	56	E106	40274-250-07
67	62	57	E111	40274-250-02
68	63	58	E117	40274-250-14
69	64	59	E125	40274-250-21
70	65	60	E130	40274-250-26

Blank and Custom Legend Plates — Aluminum, Type 4/13 (800T)

Blank/Custom Legend Plates



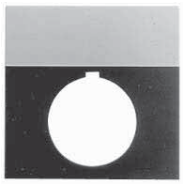
Standard Legend Plate



Jumbo Legend Plate

Legend Plate Color	Standard Cat. No.	Jumbo Cat. No.
Grey	**800T-X559**	**800T-X559J**
Red	**800T-X621**	**800T-X621J**
Yellow	**800T-X679**	800T-X679J
Grey (with custom text)	**800T-X559E**	800T-X559JE
Red (with custom text)	800T-X621E	800T-X621JE
Yellow (with custom text)	800T-X679E	800T-X679JE

Specialty Legend Plates



Automotive Legend Plate



Half Round Legend Plate

Legend Plate Color	Automotive Cat. No.	Half Round∗ Cat. No.
Grey (blank)	**800T-X700**	800T-X59
Red (blank)	**800T-X701**	800T-X121
Grey (with custom text)	800T-X700E	800T-X59E
Red (with custom text)	800T-X701E	800T-X121E

Note: Include text with custom legends.
∗ All half round legend plates must be ordered in quantities of 25.

Custom Text Guidelines

Legend Size	No. of Lines	Max. No. of Characters per Line
Standard	1 line of 2 lines of	14 14
Jumbo	5 lines	14
Automotive	4 lines	20

Custom Legend Plates for 4-Way Toggle and Cluster Pilot Lights

Legend Size	Cat. No.‡	Color	Text Options❄
Standard	800T-X619E	Aluminum (with custom text)	2 lines of up to 14 characters on top 1 line of up to 14 characters on bottom 1 vertical line of up to 7 characters on left side 1 vertical line of up to 7 characters on right side
			1 vertical line of up to 9 characters on left side 1 vertical line of up to 9 characters on right side

❄ Rule sets listed are mutually exclusive; only one can be chosen.
‡ For blank toggle or cluster pilot legend, order Cat. No. 800T-X619.

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Blank and Custom Legend Plates — Aluminum, Type 4/13 (800T), Continued

Specialty Legend Plates



Cat. No. 800T-X618



Cat. No. 800T-X647Y



Cat. No. 800T-X646

Type	Start/Stop Legend Plates	Emergency Stop Legend Plates		
	Grey	Yellow	Yellow (Large Size)	Yellow IEC Ring
	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Push-to-Stop Pull-to-Start or Push-to-Stop Twist or Pull Release	**800T-X618**	**800T-X618Y**	**800T-X647Y**	—
Blank	—	—	**800T-X645Y**	**800T-X646**
Custom	—	—	800T-X645YE	—
Emergency Stop	—	—	—	**800T-X646EM**

Potentiometer Legend Plates



Cat. No. 800T-X609



Cat. No. 800T-X608

Type	Cat. No.
Potentiometer with graduated markings	∗ **800T-X609**
SPEED	**800T-X608**

∗ For graduated markings with a custom text, order Cat. No. 800T-X609E and specify up to two lines of text, 14 characters per line.

18 mm Legend Plates



Type A Legend Plate
Cat. No. 800T-N515

Description	Cat. No.
Blank	
Type A	**800T-N515**
Type B	**800T-N516**
With Custom Marking❄	
Type A with Text	800T-N515E
Type B with Text	800T-N516E

❄ Text must be supplied.

Custom Text Guidelines

Legend Type	Number of Lines	Maximum Number of Characters per Line
A	1	9
B	2	13

Standard Legend Plates – Aluminum, Type 4/13 (Bul. 800T)



Standard Legend Plate



Jumbo Legend Plate

Marking	Standard Cat. No.	Jumbo Cat. No.	Marking	Standard Cat. No.	Jumbo Cat. No.
AUTO-OFF-HAND	**800T-X501**	800T-X501J	ON-OFF	**800T-X622**	800T-X622J
AUTO-MAN-OFF	**800T-X625**	800T-X625J	OPEN	**800T-X531**	800T-X531J
CLOSE	**800T-X502**	800T-X502J	OPEN-CLOSE	**800T-X532**	800T-X532J
CYCLE START	**800T-X562**	800T-X562J	OPEN-OFF-CLOSE	**800T-X533**	800T-X533J
DOWN	**800T-X503**	800T-X503J	OUT	**800T-X534**	800T-X534J
EMERG. STOP (Yellow)	**800T-X504Y**	—	POWER ON	**800T-X639**	800T-X639J
EMERG. STOP (Red)∗	**800T-X504**	**800T-X504J**	RAISE	**800T-X535**	800T-X535J
EMERGENCY STOP (Red)∗	**800T-X648**	**800T-X648J**	RAISE-LOWER	**800T-X536**	800T-X536J
FAST	**800T-X505**	800T-X505J	RAISE-OFF-LOWER	**800T-X537**	800T-X537J
FEED START	**800T-X566**	800T-X566J	RESET	**800T-X538**	800T-X538J
FEED STOP	**800T-X567**	800T-X567J	REVERSE	**800T-X539**	800T-X539J
FOR.-REV.	**800T-X506**	800T-X506J	RUN	**800T-X540**	800T-X540J
FOR.-OFF-REV.	**800T-X507**	800T-X507J	RUN-INCH	800T-X634	800T-X634J
FORWARD	**800T-X508**	800T-X508J	RUN-JOG	**800T-X541**	**800T-X541**
FOURTH SPEED	800T-X624	800T-X624J	SAFE-RUN	**800T-X542**	800T-X542J
FULL SPEED	**800T-X509**	800T-X509J	SECOND SPEED	800T-X543	800T-X543J
HAND-AUTO	**800T-X510**	800T-X510J	SPEED❄	**800T-X608**	—
HAND-OFF-AUTO	**800T-X511**	800T-X511J	SLOW	**800T-X544**	800T-X544J
HIGH	**800T-X512**	800T-X512J	SLOW-FAST	**800T-X545**	800T-X545J
HIGH-LOW	**800T-X513**	800T-X513J	SLOW-OFF-FAST	**800T-X546**	800T-X546J
HIGH-OFF-LOW	**800T-X514**	800T-X514J	START	**800T-X547**	800T-X547J
IN	**800T-X515**	800T-X515J	START-JOG	**800T-X548**	800T-X548J
INCH	**800T-X516**	800T-X516J	START-STOP	**800T-X549**	800T-X549J
JOG	**800T-X517**	800T-X517J	STOP (Red)	**800T-X550**	**800T-X550J**
JOG FORWARD	**800T-X518**	800T-X518J	STOP-START	**800T-X551**	800T-X551J
JOG REVERSE	**800T-X519**	800T-X519J	SUMMER-OFF-WINTER	800T-X553	800T-X553J
JOG RUN	**800T-X520**	800T-X520J	SUMMER-WINTER	800T-X552	800T-X552J
JOG-SAFE-RUN	**800T-X522**	800T-X522J	TEST	**800T-X554**	800T-X554J
JOG-STOP-RUN	**800T-X521**	800T-X521J	THIRD SPEED	800T-X555	800T-X555J
LEFT-RIGHT	**800T-X523**	800T-X523J	UP	**800T-X556**	800T-X556J
LOCAL-REMOTE	**800T-X638**	800T-X638J	UP-DOWN	**800T-X557**	800T-X557J
LOW	**800T-X524**	800T-X524J	UP-OFF-DOWN	**800T-X558**	800T-X558J
LOW SPEED	800T-X525	800T-X525J	O (Red)	800T-X640	800T-X640J
LOWER	**800T-X526**	800T-X526J	I	800T-X641	800T-X641J
OFF	**800T-X527**	800T-X527J	O I	800T-X642	800T-X642J
OFF-COOLANT-ON	**800T-X528**	800T-X528J	I O II	800T-X643	800T-X643J
OFF-ON	**800T-X529**	800T-X529J	—	—	—
ON	**800T-X530**	800T-X530J	—	—	—

∗ These legend plates do not comply with E-Stop standards that specify a yellow background, such as IEC 60947-5-5 and NFPA 79.
❄ Potentiometer type with graduated markings.

Legend Plates – Plastic, Type 4/4X/13 (800H)



Standard Legend Plate
Cat. No. 800H-W100



Jumbo Legend Plate
Cat. No. 800H-W100J



Automotive Legend Plate
Cat. No. 800H-W100A

Blank/Custom Legend Plates Type 4/4X			
	Standard	Jumbo	Automotive
Legend Plate Color	Cat. No.	Cat. No.	Cat. No.
Grey (Blank)	**800H-W100**	**800H-W100J**	**800H-W100A**
Red (Blank)	**800H-W300**	**800H-W300J**	800H-W300A
White (Blank)	**800H-W500**	**800H-W500J**	**800H-W500A**
Yellow (Blank)	800H-W700	800H-W700J	**800H-W700A**
Grey (with Custom Text)	800H-W100E	800H-W100JE	800H-W100AE
Red (with Custom Text)	800H-W300E	800H-W300JE	800H-W300AE
White (with Custom Text)	800H-W500E	800H-W500JE	800H-W500AE
Yellow (with Custom Text)	800H-W700E	800H-W700JE	800H-W700AE

Note: Include text with custom legends.

Custom Text Guidelines

Legend Size	Number of Lines	Maximum Number of Characters per Line
Standard	1 Line of 2 Lines of	13 13
Jumbo	5 Lines	13
Automotive	4 Lines	16



Potentiometer Legend Plate
Cat. No. 800H-W080

Potentiometer Legends	
Legend Marking	Cat. No.
Graduated Markings Only	**800H-W080**
SPEED	**800H-W081**
Custom Legend with Graduated Marking	800H-W080E



Cat. No. 800H-W196



Cat. No. 800H-W797A



Cat. No. 800H-W690

	Start/Stop Legend Plates	Emergency Stop Legend Plates	
	Grey	Yellow (Large Size)	Yellow IEC Ring
Type	Cat. No.	Cat. No.	Cat. No.
Push-to-Stop Pull-to-Start	**800H-W196**	**800H-W797A**	—
Blank	—	**800H-W700A**	**800H-W690**
Custom	800H-W100E	800H-W700AE	—

Standard Legend Plates – Plastic, Type 4/4X/13 (800H)



Grey Legend Plate
Type 4/4X



White Legend Plate
Type 4/4X

Marking	Grey Type 4/4X Cat. No.	White Type 4/4X Cat. No.	Marking	Grey Type 4/4X Cat. No.	White Type 4/4X Cat. No.
AUTO OFF HAND	**800H-W154**	800H-W554	LOWER	800H-W115	800H-W515
AUTO MAN OFF	800H-W059	800H-W459	MAN AUTO	**800H-W031**	800H-W431
CLOSE	**800H-W101**	800H-W501	MAN OFF AUTO	**800H-W062**	800H-W462
CYCLE START	800H-W006	800H-W406	MOTOR RUN	800H-W008	800H-W408
CYCLE STOP (Red)	**800H-W376**	—	MOTOR STOP (Red)	800H-W375	—
DECREASE	800H-W002	800H-W402	OFF	**800H-W116**	800H-W516
DOWN	**800H-W102**	800H-W502	OFF COOLANT ON	800H-W052	800H-W452
EMERG. STOP (Red)∗	**800H-W372**	—	OFF LOC REMOTE	800H-W061	—
EMERGENCY STOP (Red)∗	**800H-W373**	—	OFF MAN AUTO	800H-W060	800H-W460
FAST	800H-W104	800H-W504	OFF ON	**800H-W133**	**800H-W533**
FEED START	800H-W007	—	ON	**800H-W117**	**800H-W517**
FEED STOP (Red)	800H-W377	—	OPEN	**800H-W118**	800H-W518
FOR. REV.	800H-W132	800H-W532	OPEN CLOSE	**800H-W134**	800H-W534
FOR. OFF REV.	800H-W152	800H-W552	OPEN OFF CLOSE	800H-W153	800H-W553
FORWARD	**800H-W105**	800H-W505	OUT	800H-W119	800H-W519
FOURTH SPEED	800H-W010	—	POWER ON	**800H-W001**	800H-W401
FULL SPEED	800H-W106	800H-W506	PULL-TO-START	800H-W198	—
HAND AUTO	**800H-W131**	800H-W531	PUSH-TO-STOP (Red)	800H-W378	—
HAND OFF AUTO	**800H-W151**	**800H-W551**	RAISE	800H-W120	800H-W520
HIGH	800H-W107	800H-W507	RAISE LOWER	800H-W034	—
HIGH LOW	800H-W030	—	RAISE OFF LOWER	800H-W156	800H-W556
HIGH LOW OFF	800H-W058	—	RESET	**800H-W121**	**800H-W521**
HIGH OFF LOW	800H-W155	800H-W555	REVERSE	**800H-W122**	800H-W522
IN	800H-W108	800H-W508	RIGHT	800H-W005	800H-W405
INCH	800H-W109	800H-W509	RUN	**800H-W123**	800H-W523
INCREASE	800H-W003	—	RUN INCH	800H-W037	—
JOG	**800H-W110**	800H-W510	RUN JOG	800H-W032	—
JOG FORWARD	800H-W111	800H-W511	SAFE RUN	800H-W033	—
JOG REVERSE	800H-W112	800H-W512	SECOND SPEED	800H-W124	800H-W524
JOG RUN	800H-W135	800H-W535	SLOW	800H-W125	800H-W525
JOG SAFE RUN	800H-W051	—	SLOW FAST	800H-W136	800H-W536
JOG STOP RUN	800H-W057	—	SLOW OFF FAST	800H-W157	800H-W557
LEFT	800H-W004	800H-W404	SPEED❄	**800H-W081**	800H-W481
LEFT RIGHT	800H-W036	—	SPEED❄	800H-W182	—
LOC OFF REMOTE	800H-W055	800H-W455	START	**800H-W126**	**800H-W526**
LOW	800H-W113	800H-W513	START JOG	800H-W138	800H-W538
LOW HIGH	800H-W035	—	START JOG STOP	800H-W158	800H-W558
LOW OFF HIGH	800H-W056	—	START RUN STOP	800H-W054	—
LOW SPEED	800H-W114	800H-W514	START STOP	800H-W137	800H-W537

∗ These legend plates do not comply with E-Stop standards that specify a yellow background, such as IEC 60947-5-5 and NFPA 79.
❄ Potentiometer type with graduated markings.

Standard Legend Plates – Plastic, Type 4/4X/13 (800H)



Grey Legend Plate
Type 4/4X



White Legend Plate
Type 4/4X

Marking	Grey Type 4/4X Cat. No.	White Type 4/4X Cat. No.	Marking	Grey Type 4/4X Cat. No.	White Type 4/4X Cat. No.
UP	**800H-W009**	800H-W409	STOP (Red)	**800H-W371**	—
UP DOWN	800H-W039	—	STOP RUN START	800H-W053	—
UP OFF DOWN	800H-W160	800H-W560	STOP START	800H-W038	800H-W438
O (Red)	800H-W184	—	SUMMER OFF WINTER	800H-W159	800H-W559
O I	800H-W185	800H-W582	SUMMER WINTER	800H-W139	800H-W539
I	800H-W181	800H-W581	TEST	**800H-W128**	800H-W528
I O II	800H-W183	800H-W583	THIRD SPEED	800H-W129	800H-W529

Flip Lever Legend Plates (for use with Series D operators)

Marking	Grey — Type 4/4X Cat. No.	Marking	Grey — Type 4/4X Cat. No.	Marking	Grey — Type 4/4X Cat. No.
Blank	**800H-W200**	LOW	800H-W213	RUN	800H-W223
Customer-Specified∗	**800H-W200E**	BAS	800H-W213F	EN MARCHE	800H-W223F
CLOSE	800H-W201	LOW SPEED	800H-W214	SECOND SPEED	800H-W224
FERMER	800H-W201F	VITESSE MIN	800H-W214F	VITESSE 2	800H-W224F
DOWN	**800H-W202**	LOWER	800H-W215	SLOW	800H-W225
DESCENDRE	800H-W202F	ABAISSER	800H-W215F	LENT	800H-W225F
FAST	800H-W204	OFF	800H-W216	START	800H-W226
RAPIDE	800H-W204F	ARRÊTER	800H-W216F	MARCHE	800H-W226F
FORWARD	800H-W205	ON	800H-W217	TEST	800H-W228
AVANT	800H-W205F	DÉMARRER	800H-W217F	ESSAI	800H-W228F
FULL SPEED	800H-W206	OPEN	800H-W218	THIRD SPEED	800H-W229
VITESSE MAX	800H-W206F	OUVRIR	800H-W218F	VITESSE 3	800H-W229F
HIGH	800H-W207	OUT	800H-W219	I	800H-W281
HAUT	800H-W207F	SORTIR	800H-W219F	O	800H-W284
IN	800H-W208	RAISE	800H-W220	LEFT	800H-W286
ENTRER	800H-W208F	ÉLEVER	800H-W220F	GAUCHE	800H-W286F
INCH	800H-W209	RESET	800H-W221	RIGHT	800H-W287
POUCE	800H-W209F	RÉARMER	800H-W221F	DROITE	800H-W287F
JOG	800H-W210	REVERSE	800H-W222	UP	800H-W288
À COUPS	800H-W210F	ARRIERE	800H-W222F	EN HAUT	800H-W288F

∗ 12 characters max.

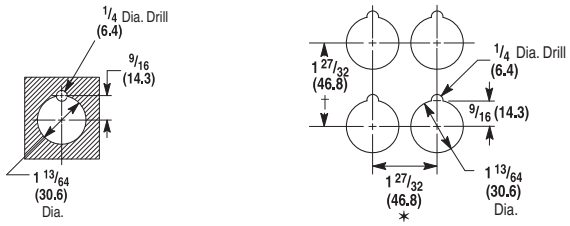
Marking	Red — Type 4/4X Cat. No.
Blank	800H-W400
Customer-Specified∗	**800H-W400E**
EMERG. STOP	800H-W472
ARRÊT URGENT	800H-W472F
STOP	800H-W471
ARRET	**800H-W471F**
O	800H-W484

∗ 12 characters max.

Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Mounting Instructions for Push Buttons with Shallow Blocks, Mini Blocks, Logic Reed Blocks, Sealed Switch Blocks, and Time Delay Blocks (see footnotes for exceptions)



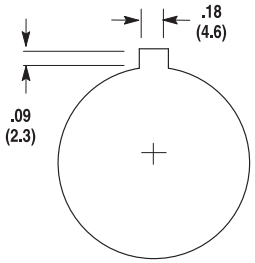
* Change to 2-1/4 in. (57.2 mm) for transformer type pilot light, push-to-test pilot lights, illuminated selector switches, and all push-pull buttons.
  Note: Large legend plate requires minimum horizontal spacing of 2-15/32 in. (62.7 mm).

❄ Vertical minimum spacing dimension changes for the following legend plates: jumbo 2-15/32 in. (62.7 mm); large 2-7/16 in. (61.9 mm); cluster pilot light and 2-, 3-, 4-way switches 2-1/16 in. (52.4 mm).

Panel Thickness — Kits are shipped with three 1/16 in. (1.58 mm) gaskets. Refer to table below for number of washers required for various panel thicknesses.

Sketch illustrates the minimum distance between centerlines when mounting Bulletin 800T/H controls either side-by-side, facing each other, or one above the other. When control units are mounted so that the contact block terminals face each other, the 2-1/4 in. (57.2 mm) dimension must be used in order to get proper electrical clearance. When control units are mounted so that the contact block terminals do not face each other, the 1-27/32 in. (46.8 mm) dimension can be used.

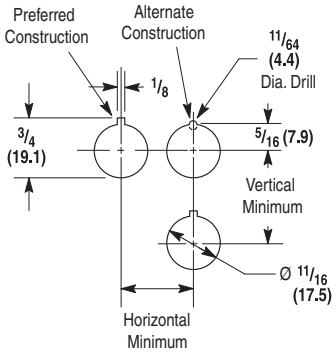
Typical Panel Cut-Out



	1/16 in. (1.6 mm) (16 Gauge)	7/64 in. (2.8 mm) (12 Gauge) 9/64 in. (3.6 mm) (10 Gauge)	3/16 in. (4.8 mm) Panel	Thicker Than 3/16 in. (4.8 mm) Panel	Thicker Than 1/4 in. (6.4 mm) Panel
800T	3 washers	2 washers	1 washer	Counterbore to 3/16 in. (4.8 mm)	Counterbore to 3/16 in. (4.8 mm)
800H	4 washers	3 washers	2 washers	1 washer	Counterbore to 1/4 in. (6.4 mm)

Mounting Instructions for 18 mm Small Pilot Lights

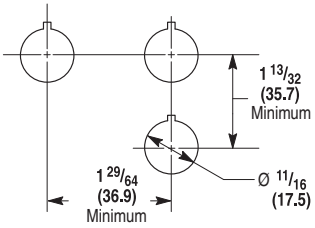
Type A Legend Plate



Cat. No. 800T-N515

Device	Dimensions	
	Horizontal	Vertical
800T-PS, PSD, PST, QS, QST and RST	31/32 (24.6)	1-5/32 (29.4)
800T-PSDT	1-3/64 (26.6)	1-15/64 (31.4)

Type B Legend Plate



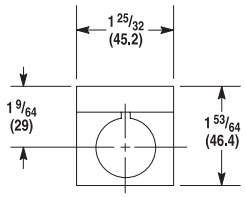
10

30.5 mm Push Buttons

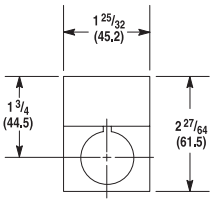
Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

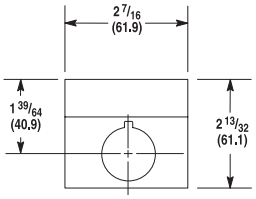
Legend Plate Dimensions (Bul. 800T Only)



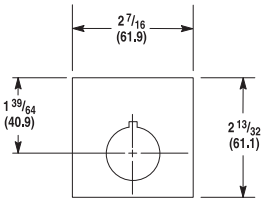
Standard Legend Plate



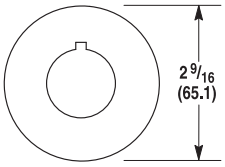
Jumbo Legend Plate



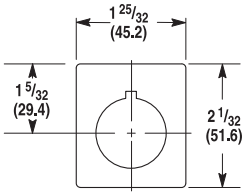
Large Legend Plate (Automotive Industry Type)



Large Size Push-Pull/Twist Legend Plate Cat. No. 800T-X647∗



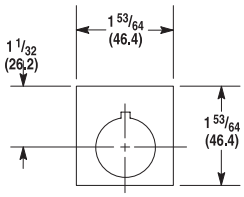
Round Cat. No. 800T-X646∗



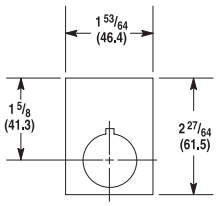
Cluster Pilot Light and 2-3-4 Way Switch Silver Legend Plate Cat. No. 800T-X619

∗ For panel mounting only. Not for use with Allen-Bradley enclosures.

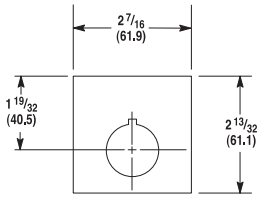
Legend Plate Dimensions (Bul. 800H Only)



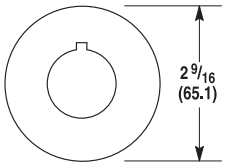
Type 4/4X Standard Legend Plate



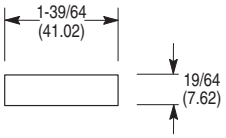
Type 4/4X Jumbo Legend Plate



Type 4/4X Large Legend Plate (Automotive Industry Type)



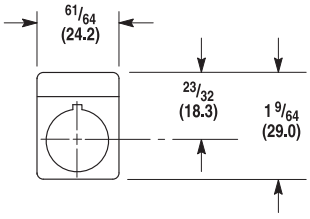
Type 4/4X Round



Type 4/4X Standard Legend Plate (Flip Lever Operators)

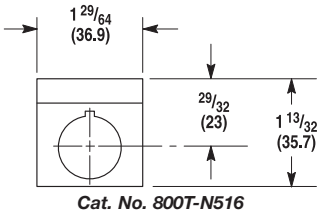
Legend Plate Dimensions (Bul. 800T 18 mm Pilot Lights Only)

Legend Plate for Small Pilot Light
Type A Legend



Cat. No. 800T-N515

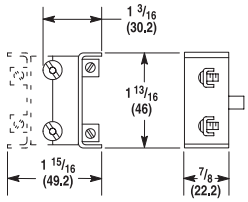
Legend Plate for Small Pilot Light
Type B Legend



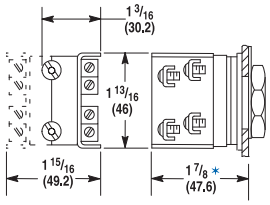
Cat. No. 800T-N516 (Automotive Industry Type)

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

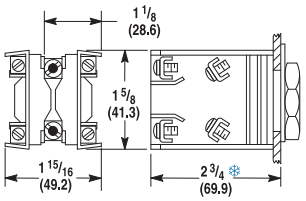
Blocks (Bul. 800T Only)



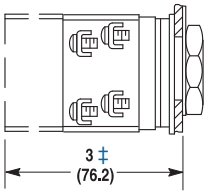
Mini Contact Block
7/8 (22.2) Deep



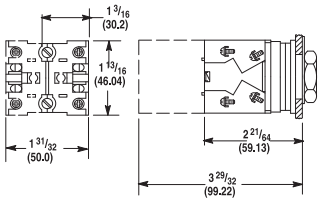
Shallow, PenTUFF,
and Logic Reed Contact Blocks
1-1/8 (28.6) Deep



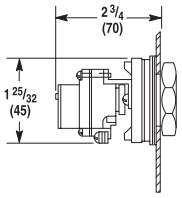
Sealed Switch Block
2 (50.8) Deep



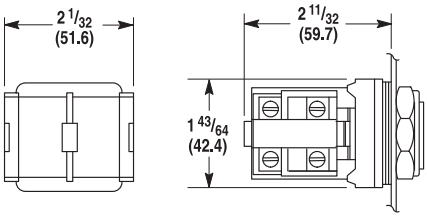
Tandem Mounting
(2 shallow contact
blocks stacked)



Stackable Sealed Switch Block
1.58 (40.1) Deep



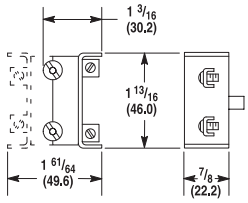
Time Delay Contact Block
(For Push Buttons Only)



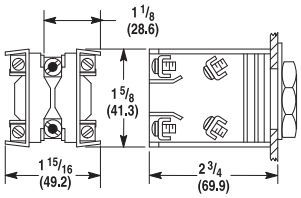
Snap Action Contact Block (For Push Button Only)

∗ Dimension shown is for push buttons. Selector switch dimension is 2-1/32 in. (51.6 mm).
❄ Dimension shown is for push buttons. Selector switch dimension is 2-27/32 in. (72.2 mm).
‡ Dimension shown is for push buttons. Selector switch dimension is 3-5/32 in. (80.2 mm).

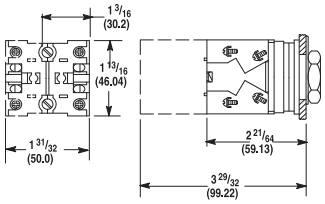
Blocks (Bul. 800H Only)



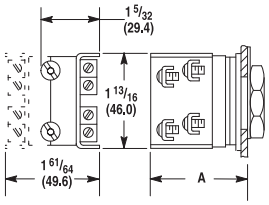
Mini Contact Block



Sealed Switch Block
2 (50.8) Deep



Stackable Sealed Switch Block
1.58 (40.1) Deep



Shallow, PenTUFF and Logic
Reed Contact Blocks

Dim.	Momentary Push Button	Maintained Push Button	Selector Switch
A	2 (50.8)	2 (50.8)	1-29/32 (48.4)

Operator Extension Behind Panel — When mounted with thrust washer, trim washer, or notched legend plate and correct number of rubber washers.

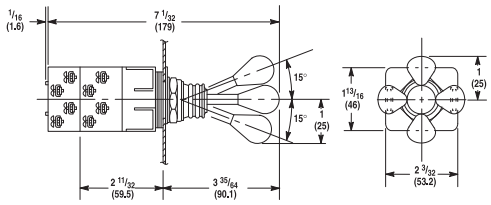
10

30.5 mm Push Buttons

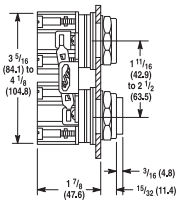
Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Push Buttons and Switches (Bul. 800T Only)

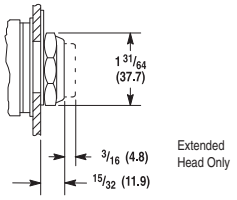


2-3-4 Way Switch
Shipping Wt. with 2 Contact Blocks 6 oz (0.17 kg)
Shipping Wt. with 4 Contact Blocks 8-1/2 oz (0.24 kg)

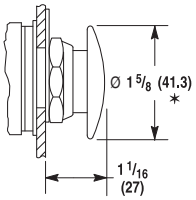


Mechanically Interlocked Maintained Contact Push Button
Shipping Wt. 1 lb (0.45 kg)

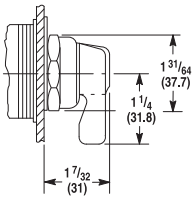
Push Buttons and Pilot Lights



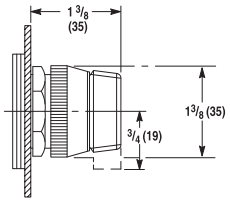
Flush and Extended Head Push Button
Shipping Wt. 5-1/2 oz (0.15 kg)



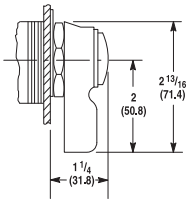
Mushroom Head Push Button
Shipping Wt. 7-1/2 oz (0.21 kg)



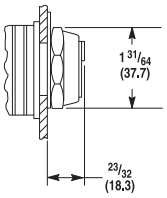
Non-Illuminated Knob Lever and Standard Knob Selector Switch
Shipping Wt. 6 oz (0.17 kg)



Illuminated Knob Lever and Standard Knob Selector Switch
Shipping Wt. 6 oz (0.17 kg)



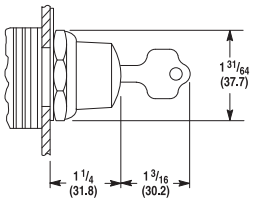
Wing Lever Selector Switch
Shipping Wt. 8 oz (0.22 kg)



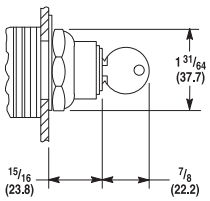
Coin Slot Selector Switch
Shipping Wt. 6 oz (0.17 kg)

∗ Except jumbo which is 2-1/4 (57.2).

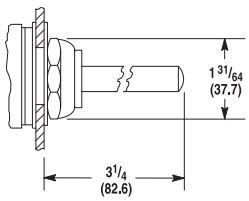
Operator Extension in Front of Panel (Bul. 800T Only)



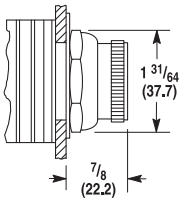
Key Operated Selector Switch
Shipping Wt. 12 oz (0.34 kg)



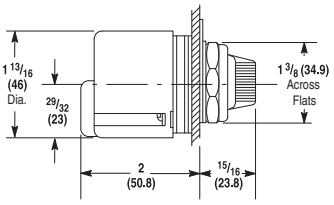
Push Button with Cylinder Lock
Shipping Wt. 12 oz (0.34 kg)



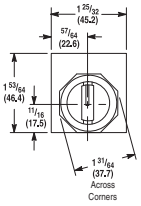
Wobble Stick
Shipping Wt. 9 oz (0.25 kg)



Selector Push Button
Shipping Wt. 6 oz (0.17 kg)

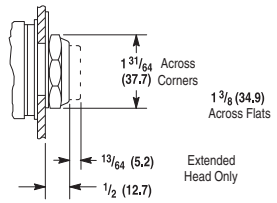


Type J Potentiometer Unit
Shipping Wt. 4 oz (0.11 kg)

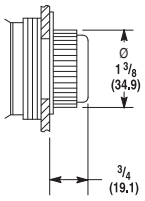


Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

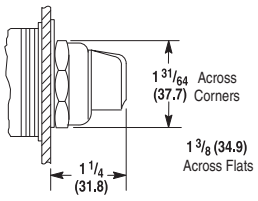
Push Buttons and Switches (Bul. 800H Only)



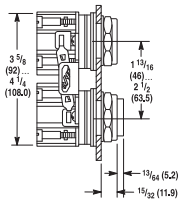
Bootless Flush and Extended Head Momentary Contact Push Button
Shipping Weight. 5-1/2 oz (0.16 kg)



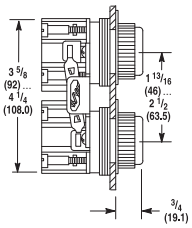
Booted Flush and Extended Head Momentary Contact Push Button
Shipping Weight. 5-1/2 oz (0.16 kg)



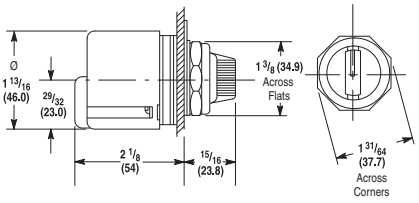
Standard Knob Selector Switch Non-Illuminated
Shipping Weight. 6 oz (0.17 kg)



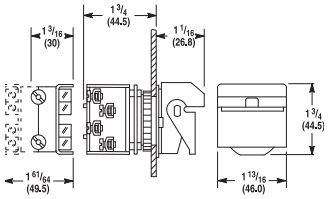
Bootless Maintained Contact Push Buttons



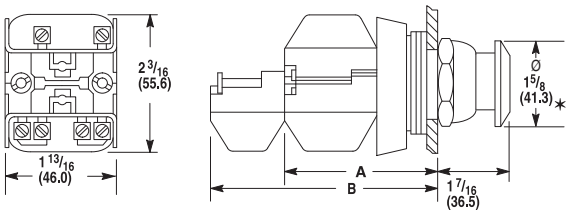
Booted Maintained Contact Push Buttons
Shipping Weight. 1 lb (0.45 kg)



Type J Potentiometer Unit
Shipping Weight. 7 oz (0.20 kg)



Type 4 Flip Lever
Shipping Weight. 8 oz (0.14 kg)



Mushroom Head — Maintained and Momentary

Non-Illuminated Mushroom and Push-Pull Push Buttons

Cat. No. Suffix	Description	Dimensions		Shipping Weights
D4	One Shallow Block	A	2-1/32 (51.6)	5 oz (0.14 kg)
A1, A5 and A7	Two Shallow blocks	A	2-1/32 (51.6)	6 oz (0.17 kg)
B6	Two Shallow Blocks and Two Mini Blocks	B	2-7/8 (73.0)	8 oz (0.22 kg)

* Jumbo versions are 2-1/4 (57.2).

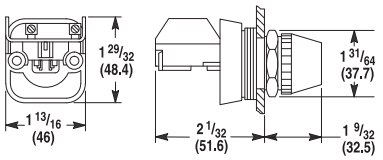
10

30.5 mm Push Buttons

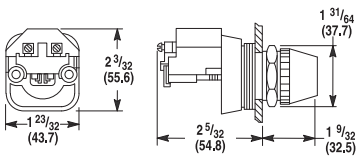
Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

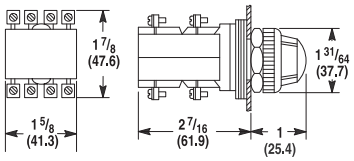
Pilot Light and Illuminated Devices (Bul. 800T Only)



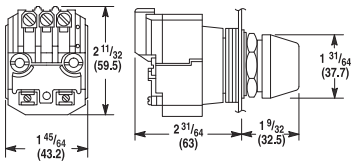
Full Voltage, Neon and Dual Input Pilot Light
Shipping Wt. 5 oz (0.14 kg)



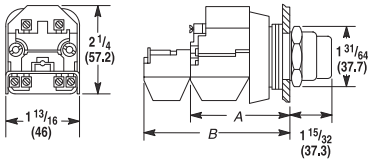
Transformer Type Pilot Light
Shipping Wt. 8 oz (0.22 kg)



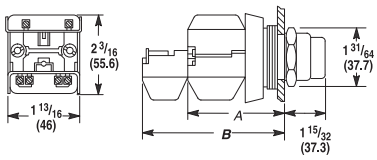
Cluster Pilot Light
Shipping Wt. 12 oz (0.34 kg)



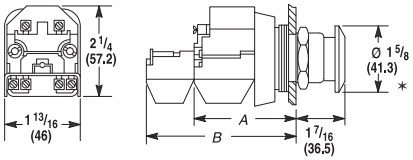
Dual Input Transformer Type Pilot Light



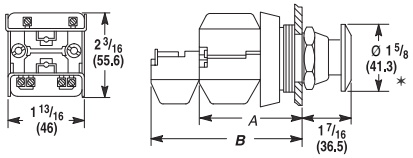
Transformer Type (Push-to-Test Pilot Light and Illuminated Push Button)



Full Voltage, Neon and Dual Input Type (Push-to-Test Pilot Light and Illuminated Push Button)



Push-Pull and Twist or Pull Release Units (Transformer Type Illuminated)



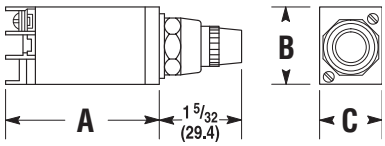
Push-Pull and Twist or Pull Release Units (Full Voltage, Neon and Dual Input Illuminated and All Non-Illuminated)

∗ Jumbo mushroom versions are 2-1/4 in. (57.2 mm) diameter.

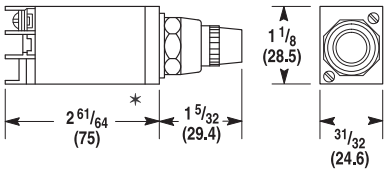
Push-to-Test Pilot Lights Illuminated Push Buttons and Illuminated Push-Pull Buttons								Non-Illuminated Push-Pull Buttons				
Cat. No. Suffix❄	Description	Transformer Type			Full Voltage or Neon Type			Cat. No. Suffix	Description	Transformer Type		
			Dim.	Ship. Wt.		Dim.	Ship. Wt.				Dim.	Ship. Wt.
D4	Transformer or Terminal Module and One Shallow Contact Block	A	2-5/32 (54.8)‡	9 oz. (0.25 kg)	A	2-1/32 (51.6)	7 oz. (0.25 kg)	D4	One Shallow Contact Block	A	2-1/32 (51.6)	5 oz. (0.14 kg)
A1 and A7	Transformer or Terminal Module and One Shallow Block and One Mini Contact Block	B	2-7/8 (73)	10 oz. (0.28 kg)	B	2-7/8 (73)	8 oz. (0.22 kg)	A4 A5 A7	Two Shallow Contact Blocks	A	2-1/32 (51.6)	6 oz. (0.17 kg)
AP D1P D2P	Transformer or Terminal Module and One Sealed Switch Contact Block	A	3-1/32 (77)	10 oz. (0.28 kg)	A	2-29/32 (73.8)	8 oz. (0.22 kg)	B6	Two Shallow Blocks and Two Mini Contact Blocks	B	2-7/8 (73)	8 oz. (0.22 kg)

❄ Applies to illuminated push-pull push buttons only.
‡ Dual input type pilot light dimension is 2-13/32 in. (61.1 mm).

18 mm Small Pilot Lights



Small Pilot Light Including Push-To-Test
Shipping Weight 3 oz (0.08 kg)



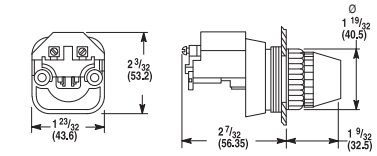
Small Pilot Light Dual Input (Diode)
Shipping Weight 3 oz (0.08 kg)

Device	A	B	C
800T-PS, -PSD, -PST, -QS, -QST, and -RST	2-1/4 (57.2)	1-1/16 (27)	27/32 (21.4)
800T-PSDT	2-61/64 (75)	1-15/64 (31.4)	31/32 (24.6)

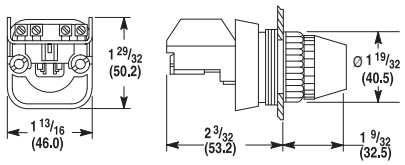
∗ Transfer dual input pilot light dimension is 2-31/32 in. (75.4 mm).

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

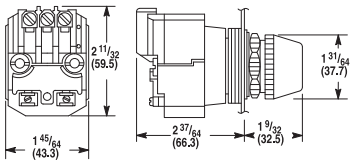
Push-to-Test Pilot Light and Illuminated Devices (Bul. 800H Only)



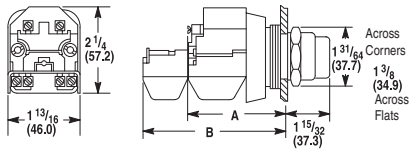
Transformer Type Pilot Light (Incandescent and LED)
Shipping Weight. 12 oz (0.34 kg)



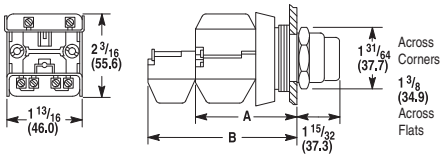
Full Voltage and Dual Input Diode Type Pilot Light (Incandescent, Neon, LED)
Shipping Weight. 5 oz (0.14 kg)



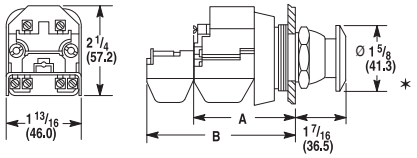
Dual Input Transformer Type Pilot Light
Shipping Weight. 14 oz (0.40 kg)



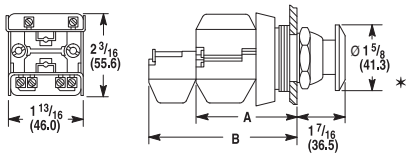
Push-to-Test Pilot Light and Illuminated Push Button
(Transformer Type: Incandescent, LED)



Push-to-Test Pilot Light and Illuminated Push Button
(Full Voltage: Incandescent, LED, Neon; and Dual Input Type)



Momentary Mushroom, Push-Pull and Twist or Pull Release Units
(Transformer Type: Incandescent, LED; Illuminated)



Momentary Mushroom, Push-Pull and Twist or Pull Release Units
(Full Voltage: Incandescent, LED, Neon; and Dual Input Illuminated)

Push-to-Test Pilot Lights
Illuminated Push Buttons, Illuminated Push-Pull and Twist or Pull Release Push Buttons

Cat. No. Suffix❄	Description	Transformer Type			Full Voltage or Neon Type		
		Dimension		Shipping Weight	Dimension		Shipping Weight
D4	Transformer or Terminal Module and One Shallow Contact Block	A	2-5/32 (54.8)‡	9 oz. (0.25 kg)	A	2-1/32 (51.6)§	7 oz. (0.20kg)
A1 and A7	Transformer or Terminal Module, One Shallow Block and One Mini Contact Block	B	2-7/8 (73)	10 oz. (0.28 kg)	B	2-7/8 (73)	8 oz. (0.22 kg)
AP	Transformer or Terminal Module and One Sealed Switch Contact Block	B	2-29/32 (73.8)	10 oz. (0.28 kg)	B	2-29/32 (73.8)	8 oz. (0.22 kg)

∗ Jumbo mushroom versions are 2-1/4 in. (57.2 mm) diameter.
❄ Applies to illuminated push-pull push buttons only.
‡ Dual input type pilot light dimension is 2-13/32 in. (61.1 mm).
§ Dual input type pilot light dimension is 2-9/32 in. (57.9 mm).

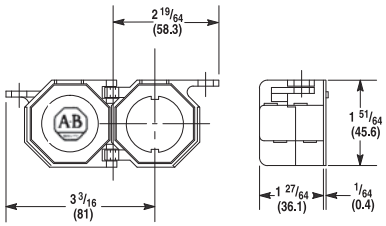
10

30.5 mm Push Buttons

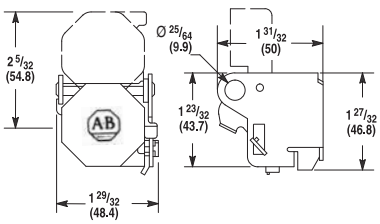
Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

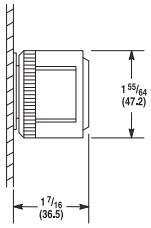
Accessories



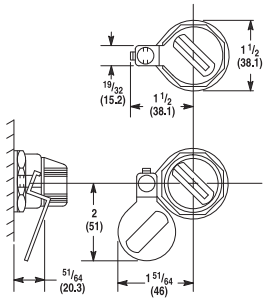
Push Button Padlocking Cover
(not for use with Jumbo Mushroom Head devices)
Shipping Wt. 1 oz (0.03 kg)



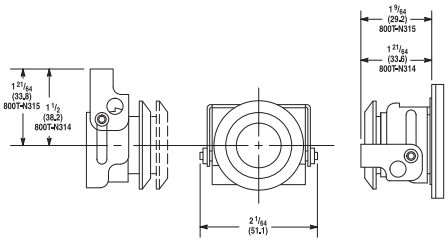
Selector Switch and Potentiometer Unit Padlocking Cover



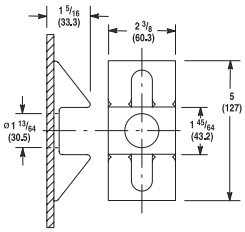
Protective Ring and Push-Pull Illuminated or Non-Illuminated Operators



Selector Switch Padlocking Attachment

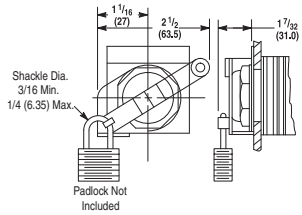


Push-Pull Padlocking Attachment and Metal Mushroom Push Button Padlocking Attachment

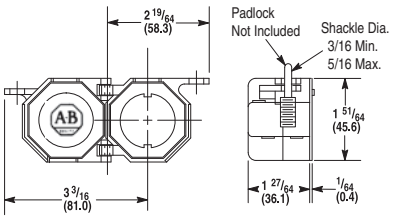


Ramp Guard for Push-Push Illuminated or Non-Illuminated Operators

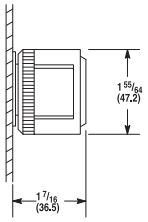
Accessories (Bul. 800H Only)



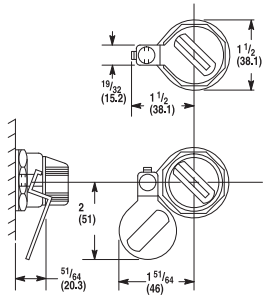
Locking Attachment for Extended, Non-Illuminated Push Buttons



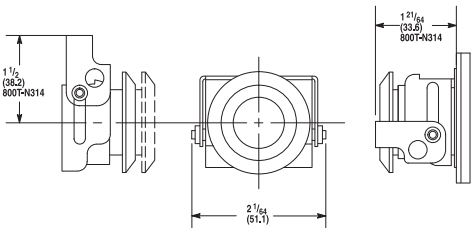
800H-N140 Locking Cover for 2-Position Non-Illuminated Maintained Twist or Pull Release and Standard Knob Selector Switch (1-5/8 (41.3) Mushroom Head only)



Protective Ring for 2-Position Push-Pull/Twist Illuminated or Non-Illuminated Operators



Non-Illuminated Selector Switch Padlocking Adjustment

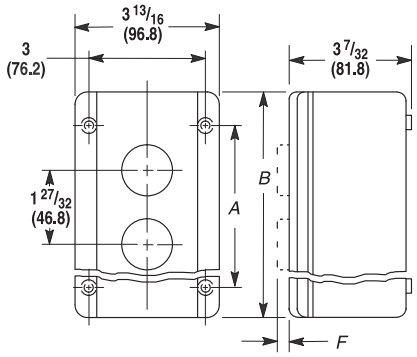


Push-Pull/Twist Padlocking Attachment

10

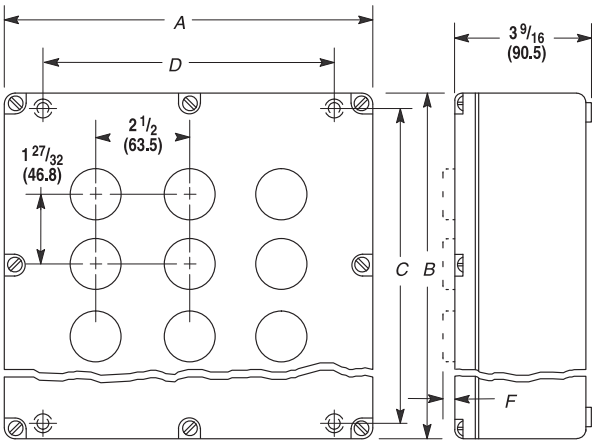
Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Die Cast Enclosures (Bul. 800T Only)



Enclosure Dimensions					
	No. of Units				
Dim.	1	2	3	4	6
A	2-3/4 (69.9)	4-1/2 (114.3)	6-1/4 (158.8)	8 (203.2)	12-1/8 (308)
B	4-3/16 (106.4)	5-7/8 (144.2)	7-9/16 (192.1)	9-1/2 (241.3)	13-1/2 (342.4)

Note: Mounting holes (4) — Screw shaft 13/64 in. (5.16 mm) max. diameter.



Enclosure Dimensions				
	No. of Units			
Dim.	6	9	12	16
A	7-1/4 (184.2)	9-3/4 (247.7)	9-3/4 (247.7)	12-1/2 (317.5)
B	9 (228.6)	9 (228.6)	11 (279.4)	11 (279.4)
C	8-1/4 (209.6)	8-1/4 (209.6)	10-1/8 (257.2)	10-1/8 (257.2)
D	5-3/8 (136.5)	7-7/8 (200)	7-7/8 (200)	10-5/8 (269.9)

Note: Mounting holes (4) — Screw shaft 7/32 in. (5.56 mm) max. diameter.

F Dimension

Type of Unit		Dimension F
Push Buttons	Flush Extended Extended Mushroom Selector Cylinder Lock	15/32 (11.9) 21/32 (16.7) 1 (25.4) 7/8 (22.2) 1-13/16 (46)
Selector Switches	Standard Cylinder Lock Coin Slot	1-7/32 (30.9) 2-7/16 (61.9) 3/4 (19.1)
Pilot Light		1-1/8 (28.6)
Potentiometers		1-1/16 (27)

Conduit Openings

		No. of Units∗						
General Class	Description	1...4	6	9	12	16	20	25
Surface Mounted Enclosure	Die Cast	3/4 in. 14 N.P.T.	1 in. 11-1/2 N.P.T.	1 in. 11-1/2 N.P.T.	1 in. 11-1/2 N.P.T.	1-1/2 in. 11-1/2 N.P.T.	—	—

∗ Number of units that can be mounted in the enclosure.

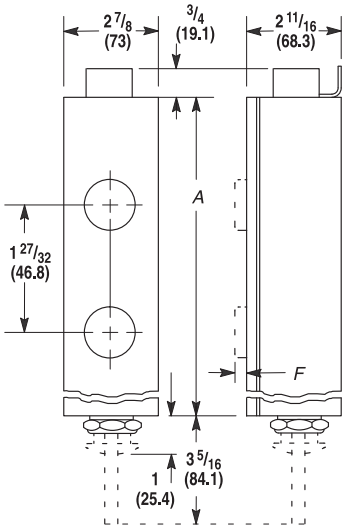
30.5 mm Push Buttons

Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

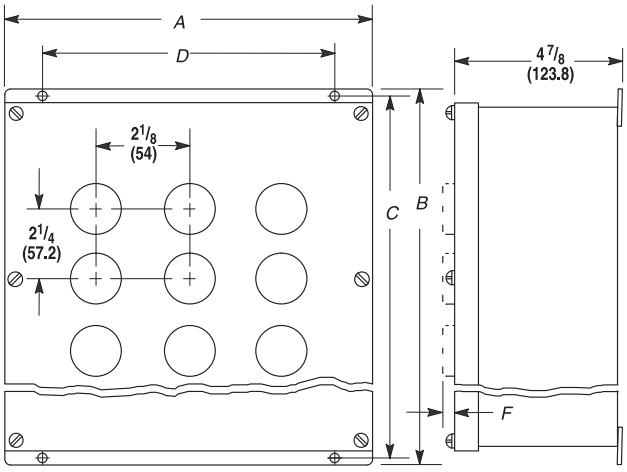
Enclosures (Bul. 800T Only), Continued

Pendant Stations



No. of Units	Dimension A
2	5-13/16 (147.6)
3	7-21/32 (194.5)
4	9-1/2 (241.3)
5	11-11/32 (288.1)
6	13-3/16 (335)
7	15-1/32 (381.7)
8	16-7/8 (428.6)
9	18-23/32 (475.4)
10	20-9/16 (522.3)

Sheet Metal Enclosures



Dim.	Enclosure Dimensions — No. of Units 6	9	12	16	20	25
A	6-15/16 (176.2)	8-11/16 (220.7)	8-11/16 (220.7)	10-7/16 (265.1)	10-7/16 (265.1)	12-1/2 (317.5)
B	11-1/8 (282.6)	11-1/8 (282.6)	13-1/2 (342.9)	13-1/2 (342.9)	15-7/8 (403.2)	15-7/8 (403.2)
C	10-1/2 (266.7)	10-1/2 (266.7)	12-7/8 (370)	12-7/8 (370)	15-1/4 (387.4)	15-1/4 (387.4)
D	5 (127)	6-3/4 (171.5)	6-3/4 (171.5)	8-1/2 (215.9)	8-1/2 (215.9)	10-1/4 (260.4)

Note: Mounting holes (4) — Screw shaft 7/32 in. (5.56 mm) max. diameter.

F Dimension

Type of Unit		Dimension F
Push Buttons	Flush Extended Extended Mushroom Selector Cylinder Lock	15/32 (11.9) 21/32 (16.7) 1 (25.4) 7/8 (22.2) 1-13/16 (46)
Selector Switches	Standard Cylinder Lock Coin Slot	1-7/32 (30.9) 2-7/16 (61.9) 3/4 (19.1)
Pilot Light		1-1/8 (28.6)
Potentiometers		1-1/16 (27)

10

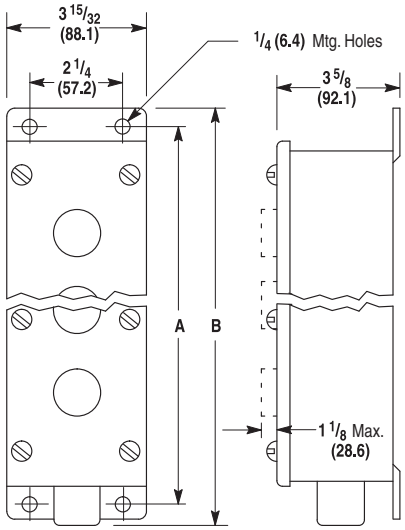
Conduit Openings

General Class	Description	No. of Units∗ 1...4	6	9	12	16	20	25
Surface Mounted Enclosure	Sheet Metal	None — Drilled to suit by customer.						
Pendant Type Enclosure	with Opening in Bottom	No. of Units∗ 2...5			6...10			
		1 (25.4) Conduit Hub			1-1/4 (31.8) Conduit Hub			
	with Opening in Cover	1 (25.4) Conduit Hub			1-1/4 (31.8) Conduit Hub			

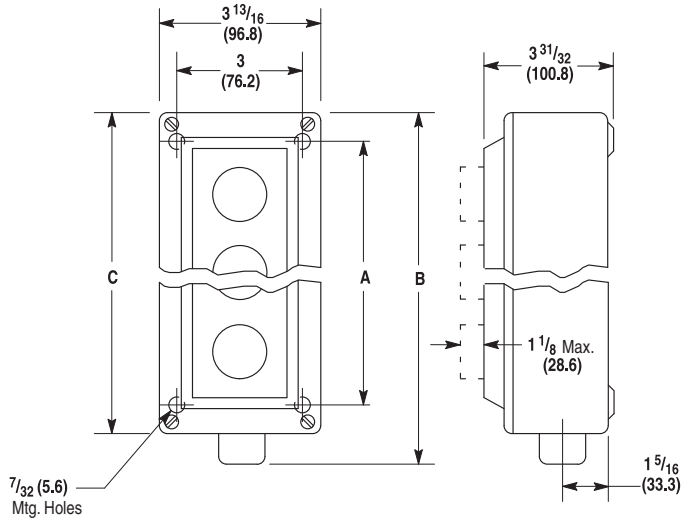
∗ Number of units that can be mounted in the enclosure.

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Enclosures (Bul. 800H Only)



Type 4/4X/13 Stainless Steel
Watertight, Oiltight, Corrosion Resistant Enclosure



Type 4/4X/13 Rosite Glass Polyester
Watertight, Oiltight, Corrosion Resistant Enclosure

Dimension	Type 4/4X/13 Stainless Steel Number of Units							
	1	2	3	4	5	6	7	8
A	5-5/32 (131)	7 (177.8)	8-27/32 (224.6)	10-11/16 (271.5)	12-17/32 (318.3)	14-3/8 (365.1)	16-7/32 (412)	18-1/16 (458.8)
B	6-13/32 (162.7)	8-1/4 (209.6)	10-1/8 (257.2)	11-31/32 (304)	14-1/32 (356.4)	15-7/8 (403.2)	17-3/4 (450.8)	19-19/32 (497.7)
C	—				—			
Conduit Knockout Size	—				—			
Pipe Tap Size	3/4 (19.1)				1 (25.4)			
Approximate Shipping Wt. [lbs (kg)]	2-3/4 (1.3)	3-3/4 (1.7)	4-3/4 (2.2)	5-3/4 (2.6)	6-3/4 (3.1)	7-3/4 (3.5)	8-3/4 (4)	9-3/4 (4.4)

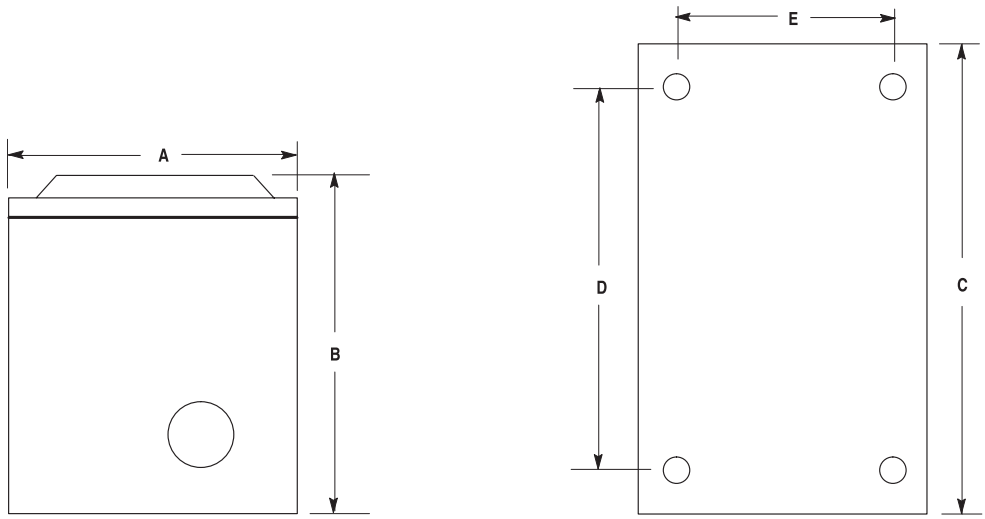
Dimension	Type 4/4X/13 Rosite Number of Units					
	1	2	3	4	5	6
A	4-1/2 (114.3)	4-1/2 (114.3)	6-1/4 (158.8)	8 (203.2)	12-1/8 (308)	12-1/8 (308)
B	7-1/32 (178.6)	7-1/32 (178.6)	8-23/32 (221.5)	10-21/32 (270.7)	14-7/8 (377.8)	14-7/8 (377.8)
C	5-7/8 (149.2)	5-7/8 (149.2)	7-9/16 (192)	9-1/2 (241.8)	13-1/2 (342.9)	13-1/2 (342.9)
Conduit Knockout Size	—				—	
Pipe Tap Size	3/4 (19.1)				1 (25.4)	
Approximate Shipping Wt. [lbs (kg)]	2 (0.9)	2 (0.9)	2-1/2 (1.1)	3 (1.4)	4 (1.8)	4 (1.8)

30.5 mm Push Buttons

Approximate Dimensions

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

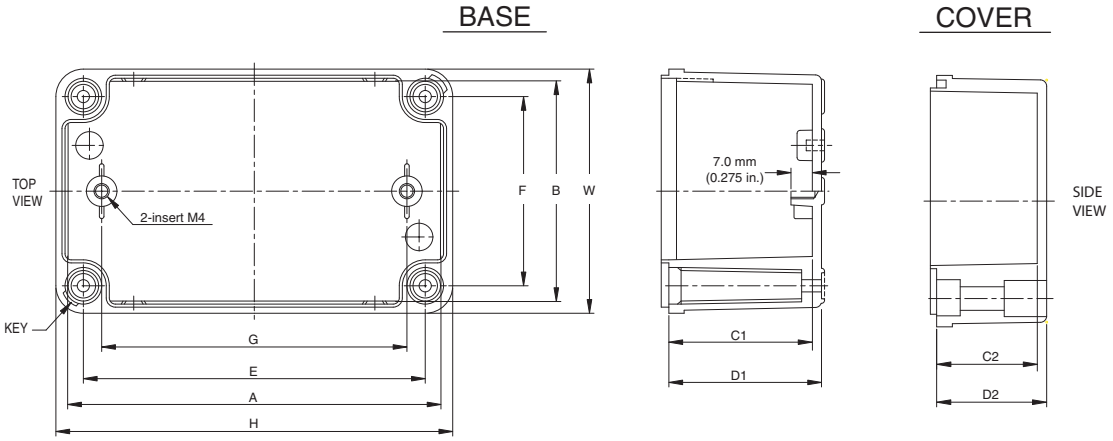
Enclosures (Bul. 800H Only), Continued



Dimension	Fiberglass Type 4/4X/12/13		
	Number of Units		
	1	2	3
A x B x C	4-1/2 x 5-3/16 x 6 (114.3 x 131.8 x 152.4)	4-1/2 x 5-3/16 x 8 (114.3 x 131.8 x 203.2)	6-1/2 x 5-7/16 x 8 (165.1 x 138.1 x 203.2)
D x E	4-3/4 x 2 (120.7 x 50.8)	6-3/4 x 2 (171.5 x 50.8)	6-3/4 x 4 (171.5 x 101.6)
Conduit Knockout Size	3/4 (19.1)	1 (25.4)	1 (25.4)
Approximate Shipping Wt. [lb (kg)]	2 (0.9)	1/4 (1.0)	3 (1.4)

Dimensions are shown in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Enclosures (Bul. 800H Only), Continued

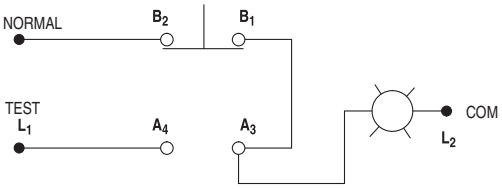


Thermoplastic Polyester Type 4/4X

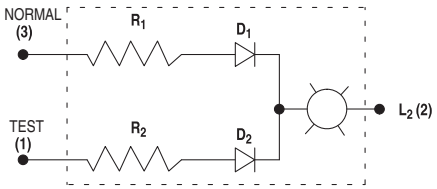
Cat. No.	Overall Dimension				Inside Dimension				Enclosure Mounting Dimension		Mounting Plate Mounting Dim.
	H	W	D1	D2	A	B	C1	C2	E	F	G
800H-1HZ4__	110 (4.33)	80 (3.15)	50 (1.97)	20 (0.79)	104 (4.09)	74 (2.91)	46.5 (1.83)	16.5 (0.65)	92 (3.62)	62 (2.44)	80 (3.15)
800H-2HZ4__	130 (5.12)	80 (3.15)	50 (1.97)	35 (1.38)	120 (4.72)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	112 (4.41)	62 (2.44)	100 (3.94)
800H-3HZ4__	180 (7.09)	80 (3.15)	50 (1.97)	35 (1.38)	170 (6.69)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	162 (6.38)	62 (2.44)	150 (5.91)
800H-4HZ4__	250 (9.84)	80 (3.15)	50 (1.97)	35 (1.38)	240 (9.45)	70 (2.76)	46.5 (1.83)	31.5 (1.24)	232 (9.13)	62 (2.44)	220 (8.66)

Typical Pilot Light Wiring Diagrams

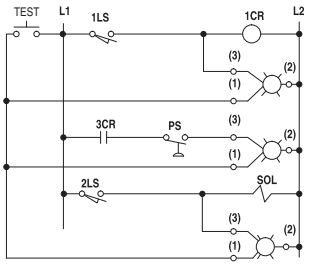
See applicable codes and laws



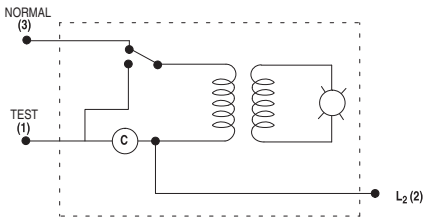
Push-to-Test Pilot Light Device Schematic



Dual Input Diode Pilot Light Device Schematic



Dual Input Pilot Light Typical Application Wiring Diagram



Dual Input Pilot Light Transformer Type Device Schematic

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22.5 mm Push Buttons

Product Overview



Bulletin 800F Plastic and Metal Operators

- 22.5 mm mounting hole
- IP65/66, Type 4/4X/13
- Internationally rated operators

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Bulletin 800FP Plastic Operators

- IP65/66, Type 4/4X/13
- Engineering grade thermoplastics
- Chemical-resistant for harsh environments



Bul. 800FP Plastic Operators

Bulletin 800FM Metal Operators

- IP65/66, Type 4/13
- Die-cast metal construction
- Chrome-plated



Bul. 800FM Die-Cast Metal Operators

Overview, Continued

3-Across x 2-Deep Back-of-Panel (6 Circuits Max.)

- Rugged snap-fit design for plastic or metal latch
- Stackable contact blocks
- Rotating collar for easy one-hand latch removal
- Color-coded contact block plungers for contact identification

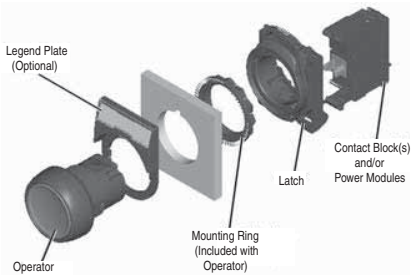


Plastic Latch with Contact Block



Metal Latch with Contact Block

Assembly Overview



Specifications*

Front-of-Panel (Operators)

Description		Plastic (Bulletin 800FP)	Metal (Bulletin 800FM)
Mechanical Ratings			
Vibration (assembled to panel)		Tested at 10…2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. for 3 hr duration, no damage	
Shock		Tested at 1/2 cycle sine wave for 11 ms; no damage at 100 G	
Degree of protection❄		IP65/66 (Type 3/3R/4/4X/12/13)	IP65/66 (Type 3/3R/4/12/13)
Mechanical durability per EN 60947-5-1 (Annex C)	10 000 000 Cycles	Momentary push buttons, momentary mushroom	
	1 000 000 Cycles	Multi-function, selector switch, key selector switch, selector jog, SensEject™ key selector switch	
	500 000 Cycles	Non-illuminated push-pull E-stop‡	
	300 000 Cycles	Twist-to-release E-stop, illuminated push-pull E-stop‡, alternate action push buttons	
	100 000 Cycles	Potentiometer, toggle switch	
Operating forces (typical with one contact block)		Flush/extended = 5 N, E-stop = 36 N Mushroom = 9 N	
Operating torque (typical application with one contact block)		Selector switch = 0.25 N•m (2.2 lb•in)	
Mounting torque	Plastic	1.7 N•m (15 lb•in)	
	Metal	4.4 N•m (40 lb•in)	
Environmental			
Temperature range (operating)		-25…+70 °C (-13…+158 °F)§	
Temperature range (short term storage)		-40…+85 °C (-40…+185 °F)	
Humidity		50…95% RH from 25…60 °C (77…140 °F)	

* Performance Data — see page Important-3 of the Industrial Controls catalog.
❄ Momentary mushroom operators are IP65. Plastic keyed operators are IP66, Type 4/13; not Type 4X.
‡ Limit of four contact blocks max. for these devices.
§ Operating temperatures below 0 °C (32 °F) are based on the absence of freezing moisture and liquids, UL Recognized to 55 °C (131 °F) - Incandescent module max. 40 °C (104 °F).

Product Certifications

Certifications	UR/UL, CSA, CCC, CE
Standards Compliance — CE Marked	NEMA ICS-5; UL 508, EN ISO 13850, EN 60947-1, EN 60947-5-1, EN 60947-5-5
Terminal Identification	EN/IEC 60947-1
Shipping Approvals	ABS
RoHS	✓

Back-of-Panel Components*

Electrical Ratings				
Standard contact block ratings		A600, Q600 600V AC AC 15, DC 13 to IEC/EN 60947-5-1 and UL 508, 17V, 5 mA min.		
Low voltage contact block ratings❄		5V, 1 mA DC min. C300, R150, AC 15, DC 13 to EN 60947-5-1 and UL 508		
	Nominal Voltage	**Range**	**Current Draw**	**Frequency**
LED Module Ratings	24…120V AC/DC 24V AC 24V DC 120V AC 240V AC	20…132V AC/DC 10…29V AC 10…30V DC 102…132V AC 204…264V AC	15 mA (AC), 12 mA (DC) 31 mA 24 mA 6 mA 6 mA	50/60 Hz, DC 50/60 Hz DC 50/60 Hz 50/60 Hz
Thermal current		10 A max. enclosed (40 °C ambient) to UL508, EN 60947-5-1		
Insulation voltage (U_i)		Screw terminal = 690V, spring-clamp = 300V		
Wire capacity (screw terminal)‡		#18…12 AWG (0.75…2.5 mm²) Max. (2) #14 AWG or (1) #12 AWG		
Wire capacity (spring-clamp terminal)		#18…14 AWG (0.75…1.5 mm²) One per spring clamp, two spring clamps per terminal		
Recommended tightening torque on screw terminals		0.7…0.9 N•m (6…8 lb•in)		
Dielectric strength (minimum)		2500V for one minute		
External short circuit protection	Standard blocks	10 A type gL/gG cartridge fuse to EN 60269-2-1 or gN (Class J to UL 248-8 or Class C to UL 248-4)		
	Low voltage contact blocks	6 A type gL/gG cartridge fuse to EN 60269-2-1 or gN (Class J to UL 248-8 or Class C to UL 248-4)		
Electrical shock protection		Finger-safe conforming to IP2X		
Mechanical Ratings				
Vibration (assembled to panel)		Tested at 10…2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. 6 hr		
Shock		Tested at 1/2 cycle sine wave for 11 ms and no damage at 100 G max.		
Contact durability per EN 60947-5-1 (Annex C)		10 000 000 cycles		
Contact operation	N.O.	Slow double make and break		
	N.C. & S.M.C.B.	Slow double make and break — positive opening ⊖		
	N.O.E.M.	Double break / double make, early make		
	N.C.L.B.	Double break / double make, late break — positive opening ⊖		
	N.C.E.B.	Double break / double make, early break — positive opening ⊖		
Push button travel to change electrical state		N.C. and N.O.E.M.	1.5 mm (0.060 in.)	
		N.O. and N.C.L.B.	2.5 mm (0.1 in.)	
Operating forces (typical)	Single circuit contact block	3.4 N		
	Dual circuit contact block	5…6.5 N		
Illumination				
LED Dominant Wavelength	Green Red Yellow Blue White	525 nm 629 nm 590 nm 470 nm —		
LED Luminous Intensity	Green Red Yellow Blue White	780 mcd 780 mcd 600 mcd 168 mcd 360 mcd		
Incandescent maximum wattage		2.6 W		
Materials				
Springs		Stainless steel and zinc coated music wire		
Electrical contacts	Standard	Silver-nickel		
	Low voltage	Gold-plated over silver		
Terminals	Screw	Brass		
	Spring-clamp	Silver-plated brass		

* Performance Data — see page Important-3 of the Industrial Controls catalog.
❄ Low voltage contacts are recommended for applications below 17V, 5 mA.
‡ Wires less than #18 AWG (0.75 mm²) may not hold in terminal securely.

Material Listing

Component	For Use with	Material Used
Panel gasket	All operators	Nitrile, TPE
Diaphragm seal	Illuminated push button, non-illuminated push button	Automotive industry acceptable silicone
K-seal	Selector switch, key selector switch, push/twist-to-release E-stop, key E-stop, push/pull mushroom	Nitrile
Diaphragm retainer, return spring I	Illuminated push button, non-illuminated push button, momentary mushroom	Stainless steel
Return spring II	Reset, selector switch, key selector switch, alternate action, push/twist-to-release E-stop, key E-stop, push/pull mushroom	Zinc-coated music wire
Button cap/mushroom head	Non-illuminated push button, momentary mushroom, reset, push/twist-to-release E-stop, key E-stop, push/pull mushroom, multi-function	PBT/polycarbonate blend
2-color molded button cap	Non-illuminated push button	PBT/polycarbonate blend
Lens	Multi-function	Acetal
Lens, knob	Illuminated push button, illuminated momentary mushroom, illuminated selector switch	Polyamide
Knob	Non-illuminated selector switch	Glass-filled polyamide
Plastic bezel/bushing I	Non-illuminated push button, illuminated push button, momentary mushroom, selector switch, key selector switch, push/twist-to-release E-stop, key E-stop, push/pull mushroom, multi-function, reset	Glass-filled polyamide
Plastic bezel/bushing II, jam nut	Pilot light, reset jam nut, reset pushers	Glass-filled PBT
Metal bezel/bushing	All metal operators	Zinc
Diffuser	Illuminated push button, pilot light	Polycarbonate
Legend frames	—	Glass-filled polyamide
Plastic mounting ring	All plastic operators	Glass-filled polyamide
Metal mounting ring	All metal operators	Chromated zinc
Plastic latch	—	Glass-filled polyamide
Metal latch	—	Chromated zinc + stainless steel
Plastic enclosure	—	PBT/polycarbonate blend
Metal enclosure	—	Aluminum
Terminal screws	LED module, incandescent module, contact blocks	Zinc-plated steel with chromate
Terminals	LED module, incandescent module, contact blocks	Brass with silver-nickel contacts
Spring clamps	LED module, incandescent module, contact blocks	Stainless steel
Lamp socket	Incandescent module	Brass
Housing	Incandescent module, LED module	Glass-filled polyamide
Low-voltage terminals	Contact blocks	Gold-plated silver-nickel contacts
Low-voltage spanner	Contact blocks	Gold-plated silver-nickel contacts
Spanner	Contact blocks	Brass with silver-nickel contacts
Boot	Toggle Switch, illuminated push button, non-illuminated push button, multi-function illuminated and non-illuminated	Automotive industry acceptable silicone

22.5 mm Push Buttons

Quick Selection

Quick Selection
Components

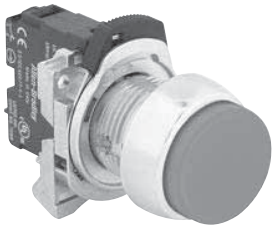
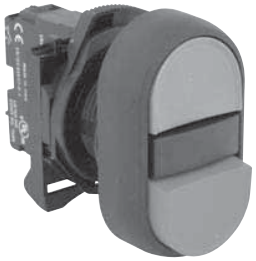
Operator Style	Description	Color	Construction	Pkg. Quantity	Cat. No.
 *Flush Operator* ***Cat. No. 800FP-F3***	Non-illuminated, flush push button	Black	Plastic	1	**800FP-F2**
	Non-illuminated, flush push button	Green			**800FP-F3**
	Non-illuminated, extended push button	Red			**800FP-E4**
	Non-illuminated, flush push button	Black	Metal		**800FM-F2**
	Non-illuminated, flush push button	Green			**800FM-F3**
	Non-illuminated, extended push button	Red			**800FM-E4**
 *Flush Operator* ***Cat. No. 800FM-LF4***	Illuminated, flush push button	Green	Plastic	1	**800FP-LF3**
	Illuminated, extended push button	Red			**800FP-LE4**
	Illuminated, flush push button	Yellow			**800FP-LF5**
	Illuminated, flush push button	Green	Metal		**800FM-LF3**
	Illuminated, extended push button	Red			**800FM-LE4**
	Illuminated, flush push button	Yellow			**800FM-LF5**
 *Diffused Pilot Light* ***Cat. No. 800FP-P7***	Diffused pilot light	Green	Plastic	1	**800FP-P3**
		Red			**800FP-P4**
		Yellow			**800FP-P5**
		Green	Metal		**800FM-P3**
		Red			**800FM-P4**
		Yellow			**800FM-P5**
 *Selector Switch* ***Cat. No. 800FP-SM32***	Non-illuminated, 2-position, maintained selector switch	Black	Plastic	1	**800FP-SM22**
	Non-illuminated, 3-position, maintained selector switch				**800FP-SM32**
	Non-illuminated, 3-position, spring return from both positions selector switch				**800FP-SB32**
	Non-illuminated, 2-position, maintained selector switch		Metal		**800FM-SM22**
	Non-illuminated, 3-position, maintained selector switch				**800FM-SM32**
	Non-illuminated, 3-position, spring return from both positions selector switch				**800FM-SB32**
 *40 mm Trigger Action Twist-to-Release Mushroom* ***Cat. No. 800FP-MT44***	Non-illuminated, 40 mm twist-to-release maintained mushroom (plastic)	Red	Plastic	1	**800FP-MT44**
	Non-illuminated, 40 mm push-pull maintained mushroom				**800FP-MP44**
	Non-illuminated, 40 mm twist-to-release maintained mushroom (metal)		Metal		**800FM-MT44**
	Non-illuminated, 40 mm push-pull maintained mushroom				**800FM-MP44**

Back of Panel	Description	Pkg. Quantity	Cat. No.
 *Power Module with Latch* ***Cat. No. 800F-MN3G***	Metal latch	10	**800F-ALM**
	Plastic latch		**800F-ALP**
	Normally open contact block		**800F-X10**
	Normally closed contact block		**800F-X01**
	Integrated LED module with plastic latch — Red LED	1	∗ 800F-PNxR
	Integrated LED module with plastic latch — Green LED		∗ 800F-PNxG
	Integrated LED module with plastic latch — White LED		∗ 800F-PNxW
	Integrated LED module with metal latch — Red LED		∗ 800F-MNxR
	Integrated LED module with metal latch — Green LED		∗ 800F-MNxG
	Integrated LED module with metal latch — White LED		∗ 800F-MNxW

∗ To complete the cat. no., replace the **x** with one of the following voltage codes: **3** = 24V, **5** = 120V, **7** = 240V.

Complete Devices*

Non-Illuminated Push Buttons, Momentary (Screw Terminal Connections)

	Description	Type of Contact N.O.	Type of Contact N.C.	Color	Construction	Pkg. Quantity	Cat. No.
 *Cat. No. 800FP-F3PX10*	Flush	1	—	Green	Plastic operator/plastic latch	1	**800FP-F3PX10**
				Black			**800FP-F2PX10**
				Green	Metal operator/metal latch		**800FM-F3MX10**
				Black			**800FM-F2MX10**
 *Cat. No. 800FM-E4MX01*	Extended	—	1	Red	Plastic operator/plastic latch		**800FP-E4PX01**
					Metal operator/metal latch		**800FM-E4MX01**
 *Cat. No. 800FP-U2E4F3PX10*	Multi-function (Flush/extended)	1	1	Green/ Red	Plastic operator/plastic latch		**800FP-U2E4F3PX11**
					Metal operator/metal latch		**800FM-U2E4F3MX11**
				Green "1"/ Red "0"	Plastic operator/plastic latch		**800FP-U2EFFEPX11**
					Metal operator/metal latch		**800FM-U2EFFEMX11**

Non-Illuminated Selector Switches (Screw Terminal Connections)

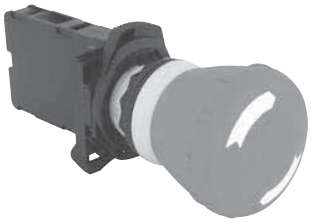
	Description	Type of Contact N.O.	Type of Contact N.C.	Style	Construction	Pkg. Quantity	Cat. No.
 *Cat. No. 800FP-SM22PX10*	Standard lever, black	1	—	2-position maintained	Plastic operator/plastic latch	1	**800FP-SM22PX10**
		1	1	2-position maintained	Plastic operator/plastic latch		**800FP-SM22PX11**
		1	—	2-position maintained	Metal operator/metal latch		**800FM-SM22MX10**
		1	1	2-position maintained	Metal operator/metal latch		**800FM-SM22MX11**
		2	—	3-position maintained	Plastic operator/plastic latch		**800FP-SM32PX20**
		2	—	3-position maintained	Metal operator/metal latch		**800FM-SM32MX20**

* For complete devices not listed and configuration assistance, see RAISE product selection software (http://www.ab.com/raise).

10

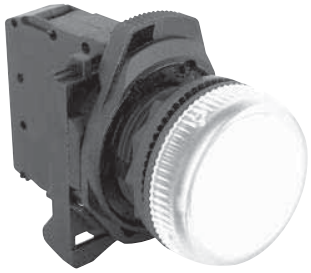
Complete Devices, Continued∗

Non-Illuminated Emergency Stop Operators, Ø 40 mm, Red (Screw Terminal Connections)

	Description	Type of Contact❄ N.O.	Type of Contact❄ N.C.	Construction	Pkg. Quantity	Cat. No.
 *Cat. No. 800FP-MT44PX01S*	Twist-to-Release	—	1	Plastic operator/plastic latch	1	**800FP-MT44PX01S**
		—	1	Metal operator/metal latch		**800FM-MT44MX01S**
		1	1	Plastic operator/plastic latch		**800FP-MT44PX11S**
		1	1	Metal operator/metal latch		**800FM-MT44MX11S**

❄ Self-monitoring contact block included when N.C. is specified.

Pilot Lights with Integrated LED Modules (Screw Terminal Connections)

	Voltage	Style	Construction	Pkg. Quantity	Cat. No.
 *Cat. No. 800FP-P7PN3W*	24V AC/DC	Green	Plastic operator/plastic latch	1	**800FP-P3PN3G**
		Red			**800FP-P4PN3R**
		Yellow			**800FP-P5PN3Y**
		Blue			**800FP-P6PN3B**
		White			**800FP-P7PN3W**
	120V AC	Green			**800FP-P3PN5G**
		Red			**800FP-P4PN5R**
		Yellow			**800FP-P5PN5Y**
		Blue			**800FP-P6PN5B**
		White			**800FP-P7PN5W**
	240V AC	Green			**800FP-P3PN7G**
		Red			**800FP-P4PN7R**
		Yellow			**800FP-P5PN7Y**
		Blue			**800FP-P6PN7B**
		White			**800FP-P7PN7W**

∗ For complete devices not listed and configuration assistance, see RAISE product selection software (http://www.ab.com/raise).

Momentary Push Button Operators, Non-Illuminated — Flush, Extended, Guarded



Flush Operator
Cat. No. 800FP-F3



Extended Operator
Cat. No. 800FM-E4



Guarded Operator
Cat. No. 800FP-G6

Color	Pkg. Quantity	Flush		Extended	
		Plastic	Metal	Plastic	Metal
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
Black	1	**800FP-F2**	**800FM-F2**	**800FP-E2**	**800FM-E2**
Green		**800FP-F3**	**800FM-F3**	**800FP-E3**	**800FM-E3**
Red		**800FP-F4**	**800FM-F4**	**800FP-E4**	**800FM-E4**

800F P – F 3 –
a b c d

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
F	Flush
E	Extended
G	Guarded

c

Color Cap	
Code	Color
0	Orange
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue
8	Grey∗
9	No cap
X	Assortment pack❄

d

Packaging	
Code	Description
Blank	1 per package
BP	10 per package‡

∗ Available in flush only.
❄ Assortment pack contains one cap of each color, not available in BP packaging.
‡ Only available with no color cap (**9** from Table c).

22.5 mm Push Buttons

Product Selection

Momentary Push Button Operators, Non-Illuminated — with Two-Color Molded Legend Caps



Flush Operator
Cat. No. 800FP-F301

Button Color	Text Color	Legend Text	Pkg. Quantity	Flush		Extended	
				Plastic	Metal	Plastic	Metal
				Cat. No.	Cat. No.	Cat. No.	Cat. No.
Green	White	START	1	**800FP-F301**	**800FM-F301**	–	–
		I		**800FP-F306**	**800FM-F306**	–	–
Red	White	STOP		**800FP-F402**	**800FM-F402**	**800FP-E402**	**800FM-E402**
		O		–	–	**800FP-E405**	**800FM-E405**
Black	White	→		**800FP-F208**	**800FM-F208**	800FP-E208	800FM-E208

800F P – F 3 01
a b c d

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
F	Flush
E	Extended
G	Guarded

c

Color Cap	
Code	Color
0	Orange
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue

d

Legend Text∗❄‡§	
Code	Text
Blank	No Text
01	START
02	STOP
05	O
06	I
08	→
09	Forward♣
10	Reverse♣
11	R

∗ For custom laser-engraved legend cap, order “no cap” option on page 10-73 plus custom laser-engraved cap on page 10-115.
❄ White and yellow caps have black text. All other color caps have white text.
§ Legend button cap supplied loose for customer installation.
♣ Available for flush only.
‡ Valid color cap/legend text codes include:

Color	Text	
	Flush Caps	Extended Caps
White	FORWARD, REVERSE, START, I,→ , R	→ , R
Black	FORWARD, REVERSE, → , R	STOP, O,→ , R
Green	FORWARD, REVERSE, START, I,→	→
Red	FORWARD, REVERSE, STOP, O, →	STOP, O,→
Yellow	FORWARD, REVERSE, →	→
Blue	FORWARD, REVERSE, → , R	→ , R

Momentary Push Button Operators, Illuminated — Flush, Extended, Guarded



Flush Operator
Cat. No. 800FM-LF4



Extended Operator
Cat. No. 800FP-LE3



Guarded Operator
Cat. No. 800FP-LG3

Color	Pkg. Quantity	Flush		Extended	
		Plastic	Metal	Plastic	Metal
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
Green	1	**800FP-LF3**	**800FM-LF3**	**800FP-LE3**	**800FM-LE3**
Red		**800FP-LF4**	**800FM-LF4**	**800FP-LE4**	**800FM-LE4**
Yellow		**800FP-LF5**	**800FM-LF5**	**800FP-LE5**	**800FM-LE5**
Clear		**800FP-LF7**	**800FM-LF7**	**800FP-LE7**	**800FM-LE7**

800F P – LE 3 –
a b c d

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
LF	Flush
LE	Extended
LG	Guarded

c

Color Cap ∗	
Code	Color
0	Amber❄
3	Green
4	Red
5	Yellow❄
6	Blue❄
7	Clear
9	No cap

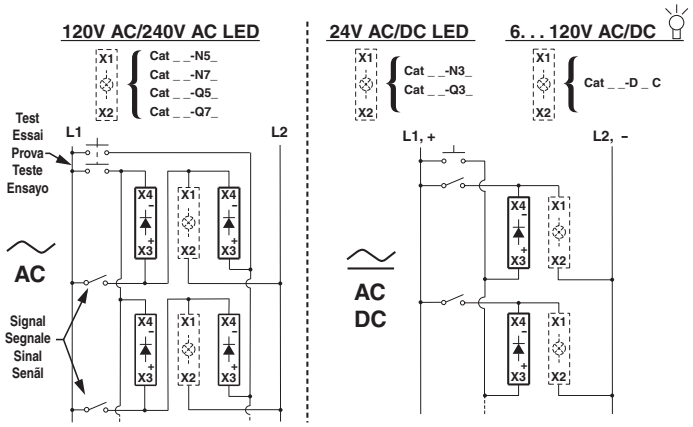
d

Packaging	
Code	Description
Blank	1 per package
BP	10 per package‡

∗ For custom laser-engraved operator, order operator with applicable lens cap color plus custom laser-engraved diffuser; see page 10-115.
❄ When using LED for illumination, a white LED is recommended.
‡ Only available with no color cap (**9** from Table c).

Push-to-Test Push Button Device Schematic

Illuminated push buttons may be wired as a push-to-test device by using the following schematic and Cat. No. 800F-XD7 Diode module from page 10-111.



22.5 mm Push Buttons

Product Selection

Alternate Action Operators — Non-Illuminated



Cat. No. 800FM-FA3

800F M – FA 3
a b c

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type∗	
Code	Description
FA	Non-illuminated, flush, alternate action

c

Color Cap❄	
Code	Color
0	Orange
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue
9	No cap
X	Assortment pack

∗ Must use N.O.E.M. or N.C. contacts.
❄ For custom laser-engraved legend cap, order "no cap" option plus custom laser-engraved cap on page 10-115.

Alternate Action Operators — Illuminated



Cat. No. 800FP-LFA3

800F P – LFA 3
a b c

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type§♣	
Code	Description
LFA	Illuminated, flush, alternate action

c

Color Cap➢	
Code	Color
0	Amber⌘
3	Green
4	Red
5	Yellow⌘
6	Blue⌘
7	Clear
9	No lens

§ Must use N.O.E.M. or N.C. contacts.
♣ LED module required for illumination, can not use incandescent module.
➢ For custom laser-engraved operator, order operator with applicable lens cap color plus custom laser-engraved diffuser on page 10-115.
⌘ Use of a white LED is recommended.

Pilot Light Operators∗



Plastic Pilot Light
Cat. No. 800FP-P7



Metal Pilot Light
Cat. No. 800FM-P4

Color	Pkg. Quantity	Plastic Cat. No.	Metal Cat. No.
Green	1	**800FP-P3**	**800FM-P3**
Red		**800FP-P4**	**800FM-P4**
Yellow		**800FP-P5**	**800FM-P5**

800F P – P 3 –
a b c d

a

Operator Construction	
Code	**Description**
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	**Description**
P	Diffuser

c

Lens Cap∗	
Code	**Color**
0	Amber❄
3	Green
4	Red
5	Yellow❄
6	Blue❄
7	Clear
9	No lens

d

Packaging	
Code	**Description**
Blank	1 per package
BP	10 per package

∗ For custom laser-engraved pilot light, order pilot light with applicable lens cap color plus custom laser-engraved diffuser on page 10-115.
❄ When using LED for illumination, a white LED is recommended.

10

2-Position Selector Switch Operators, Non-Illuminated



Standard Knob
Cat. No. 800FP-SM22



Knob Lever
Cat. No. 800FP-HM22

Switching Angle



Target Table and Operator Position∗		
Contact Type§		
N.O.	O	X
N.C.	X	O

Note: X = Closed/O = Open

§ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

Color	Operator Type	Pkg. Quantity	Standard Knob	
			Plastic	Metal
			Cat. No.	Cat. No.
Black with White Insert		1	**800FP-SM22**	**800FM-SM22**

∗ Target table for spring return from left is reversed from what is shown in the table.

800F P – S M2 2 ___ – ___
a b c d e f

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
S	Standard knob
H	Knob lever❄

c

Operator Function	
Code	Type
M2	Maintained (60° switching angle)
L2	Spring return from left (60° switching angle)
R2	Spring return from right (60° switching angle)

d

Knob/Insert Color		
Code	Knob Color	Insert Color
2	Black	White

e

Orientation	
Code	Description
Blank	Standard
N	90° offset‡

f

Packaging	
Code	Description
Blank	1 per package
BP	10 per package♣

❄ 30 mm hole spacing will not work if knob lever is used. See page 10-125 for recommended operator panel spacing.
‡ For use in vertical mount Bul. 800F enclosures.
♣ Not available with 90° offset orientation.

2-Position Selector Switch Operators, Illuminated §



Standard Knob
Cat. No. 800FP-LSM26

Switching Angle



Target Table and Operator Position∗		
Contact Type➢		
N.O.	O	X
N.C.	X	O

Note: X = Closed/O = Open
➢ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

Color	Operator Type	Pkg. Quantity	Standard Knob	
			Plastic	Metal
			Cat. No.	Cat. No.
Green		1	**800FP-LSM23**	**800FM-LSM23**
Red			**800FP-LSM24**	**800FM-LSM24**
Yellow			**800FP-LSM25**	**800FM-LSM25**

∗ Target table for spring return from left is reversed from what is shown in the table.

800F P – LS M2 3 ____
a b c d e

a

Operator Construction	
Code	Description❄
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
LS	Standard knob
LH	Knob lever♣

c

Operator Function	
Code	Type
M2	Maintained (60° switching angle)
L2	Spring return from left (60° switching angle)
R2	Spring return from right (60° switching angle)

d

Knob/Insert Color		
Code	Knob Color	Insert Color
0	Amber➢	White
3	Green	White
4	Red	White
5	Yellow➢	Black
6	Blue➢	White
7	Clear	Black

e

Orientation	
Code	Description
Blank	Standard
N	90° offset‡

❄ LED module required for illumination, can not use incandescent module.
‡ For use in vertical mount enclosures.
§ Crevices may exist on product that may be unsuitable for certain applications. Please consult your local Rockwell Automation sales office or Allen-Bradley distributor.
♣ Only available in clear.
➢ Use of a white LED is recommended.

10

3-Position Selector Switch Operators, Non-Illuminated

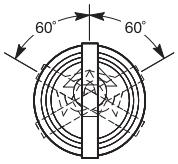


Standard Knob
Cat. No. 800FP-SM32



Knob Lever
Cat. No. 800FM-HM32

Switching Angle



Target Table and Operator Position (60° Switching Angle)				
Contact Type♣	Position on Mounting Latch			
N.O.	Left	X	O	O
	Right	O	O	X
	Center	X	O	X
	Center CL‡	X	O	O
	Center CR‡	O	O	X
N.C.	Left	O	X	X
	Right	X	X	O
	Center	O	X	O
	Center CL‡	O	X	X
	Center CR‡	X	X	O

Note: X = Closed/O = Open

♣ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

Color	Operator Type	Pkg. Quantity	Standard Knob		Knob Lever	
			Plastic	Metal	Plastic	Metal
			Cat. No.	Cat. No.	Cat. No.	Cat. No.
Black with White Insert		1	**800FP-SM32**	**800FM-SM32**	**800FP-HM32**	**800FM-HM32**
			800FP-SB32	**800FM-SB32**	**800FP-HB32**	**800FM-HB32**

800F P – S M3 2 ____ ____

a b c d e f

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
S	Standard knob
H	Knob lever✶

c

Operator Function	
Code	Type
M3	Maintained
L3	Spring return from left
R3	Spring return from right
B3	Spring return from left and right

d

Knob/Insert Color		
Code	Knob Color	Insert Color
2	Black	White

e

Orientation	
Code	Description
Blank	Standard
N	90° offset❄

f

Operation	
Code	Description
Blank	Standard
CL	Center left‡
CR	Center right‡

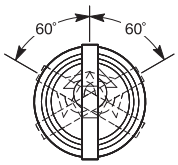
✶ 30 mm hole spacing will not work if knob lever is used. See page 10-125 for recommended operator panel spacing.
❄ For use in vertical mount enclosures.
‡ The center contact block can have the same target output as the left or right contact block, by specifying center left (CL) or center right (CR) option.

3-Position Selector Switch Operators, Illuminated ‡



Standard Knob
Cat. No. 800FP-LSM37

Switching Angle



Target Table and Operator Position (60° Switching Angle)				
Contact Type♣	Position on Mounting Latch			
N.O.	Left	X	O	O
	Right	O	O	X
N.C.	Left	O	X	X
	Right	X	X	O

Note: X = Closed/O = Open

♣ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

Operator Type	Pkg. Quantity	Green		Red		Yellow	
		Plastic	Metal	Plastic	Metal	Plastic	Metal
		Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
	1	**800FP-LSM33**	**800FM-LSM33**	**800FP-LSM34**	**800FM-LSM34**	**800FP-LSM35**	**800FM-LSM35**
		800FP-LSR33	**800FM-LSR33**	**800FP-LSR34**	800FM-LSR34	**800FP-LSR35**	**800FM-LSR35**
		800FP-LSL33	**800FM-LSL33**	**800FP-LSL34**	800FM-LSL34	**800FP-LSL35**	800FM-LSL35
		800FP-LSB33	**800FM-LSB33**	**800FP-LSB34**	**800FM-LSB34**	**800FP-LSB35**	**800FM-LSB35**

800F P – LS M3 3 ___

a *b* *c* *d* *e*

a

Operator Construction	
Code	Description∗
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
LS	Standard knob
LH	Knob lever§

c

Operator Function	
Code	Type
M3	Maintained
L3	Spring return from left
R3	Spring return from right
B3	Spring return from left and right

d

Knob/Insert Color		
Code	Knob Color	Insert Color
0	Amber➢	White
3	Green	White
4	Red	White
5	Yellow➢	Black
6	Blue➢	White
7	Clear	Black

e

Orientation	
Code	Description
Blank	Standard
N	90° offset❄

∗ LED module required for illumination, can not use incandescent module.
❄ For use in vertical mount 800F enclosures.
‡ Crevices may exist on product that may be unsuitable for certain applications. Please consult your local Rockwell Automation sales office or Allen-Bradley distributor.
§ Only available in clear.
➢ Use of a white LED is recommended.

10

4-Position Selector Switch Operators, Non-Illuminated



Standard Knob
Cat. No. 800FP-SM42

Target Table and Operator Position∗					
Contact Type§	Position on Mounting Latch				
N.O.	Left	O	O	X	O
	Right	X	O	O	O
	Center	X	O	X	O
	Center CL	O	O	X	O
	Center CR	X	O	O	O
N.C.E.B.	Left	O	O	O	X
	Right	O	X	O	O
	Center CL	O	O	O	X
	Center CR	O	X	O	O
N.C.L.B.	Left	X	X	O	X
	Right	O	X	X	X
	Center	O	X	O	X
	Center CL	X	X	O	X
	Center CR	O	X	X	X

Note: X = Closed/O = Open
§ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

	Standard Knob — Maintained		
	Plastic	Metal	
Color	Cat. No.	Cat. No.	Pkg. Quantity
Black with White Insert	**800FP-SM42**	**800FM-SM42**	1

800F P – S M4 2 ____ ____
a b c d e f

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
S	Standard knob
H	Knob lever

c

Operator Function	
Code	Type
M4	Maintained (45° switching angle)

d

Knob/Insert Color		
Code	Knob Color	Insert Color
2	Black	White

e

Orientation	
Code	Description
Blank	Standard
N	90° offset❄

f

Operation	
Code	Description
Blank	Standard
CL	Center left‡
CR	Center right‡

∗ Must use N.O., N.C.E.B., or N.C.L.B. contact blocks only. Cannot use N.C. or N.O.E.M. contact blocks with 4-position selector switch.
❄ For use in vertical mount enclosures.
‡ The center contact block can have the same target output as the left or right contact block, by specifying center left (CL) or center right (CR) option.

2-Position Key-Operated Selector Switches, Non-Illuminated



Key Selector Switch
Cat. No. 800FP-KM21R

Switching Angle



Contact Type➢	Target Table and Operator Position✶	
N.O.	O	X
N.C.	X	O

Note: X = Closed/O = Open
➢ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

Key Removal Position	Operator Type	Pkg. Quantity	Key Selector Switch Operators	
			Plastic	Metal
			Cat. No.	Cat. No.
Left		1	**800FP-KM21**	**800FM-KM21**
Both			**800FP-KM23**	**800FM-KM23**

✶ Target table for spring return from left is reversed from what is shown in the table.

800F M – KM2 1 ____
a b c d

a

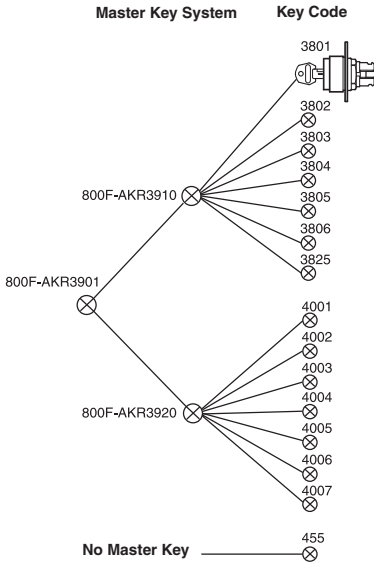
Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type		
Code	Type	
KM2	Maintained (60° switching angle)	
KL2	Spring return from left (60° switching angle)	
KR2	Spring return from right (60° switching angle)	

c

Key Removal Position❄		
Code	Position	
1	Left	
2	Right	
3	Both	



d

Ronis Key Lock‡§♣	
Code	Key No.
Blank	3825 (Standard)
R	455
01R	3801
02R	3802
03R	3803
04R	3804
05R	3805
06R	3806
27R	4001
28R	4002
29R	4003
30R	4004
31R	4005
32R	4006
33R	4007

❄ Key removal in maintained positions only.
‡ Keyed operators are IP66, Type 4/13.
§ Not intended for high security applications. Interoperability is possible with certain key/cylinder lock combinations. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for interoperability information.
♣ For replacement Ronis keys, see Accessories, page 10-111.

3-Position Key-Operated Selector Switches, Non-Illuminated

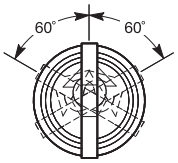


Key-Operated Selector Switch
Cat. No. 800FP-KM31R



Key-Operated Selector Switch
Cat. No. 800FM-KM31R

Switching Angle



Target Table and Operator Position				
Contact Type➢	Position on Mounting Latch			
N.O.	Left	X	O	O
	Right	O	O	X
	Center	X	O	X
N.C.	Left	O	X	X
	Right	X	X	O
	Center	O	X	O

Note: X = Closed/O = Open
➢ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

Key Removal Position	Operator Position	Pkg. Quantity	Key Selector Switch Operators	
			Plastic	Metal
			Cat. No.	Cat. No.
Left		1	**800FP-KM31**	**800FM-KM31**
All			**800FP-KM33**	**800FM-KM33**
Center			**800FP-KM34**	**800FM-KM34**
Center			**800FP-KB34**	**800FM-KB34**

800F M – KM3 3 ____
a b c d

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
KM3	Maintained
KR3	Spring return from right
KL3	Spring return from left
KB3	Spring return from both

c

Key Removal Position∗	
Code	Type
1	Left
3	All
4	Center
5	Left/center
7♣	Center/right

d

See page 10-83 for optional key codes❄‡§

∗ Key removal in maintained positions only.
❄ Keyed operators are IP66, Type 4/13.
‡ Not intended for high security applications. Interoperability is possible with certain key/cylinder lock combinations. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for interoperability information.
§ For replacement Ronis keys, see Accessories, page 10-111.
♣ Key removal position only valid with operator types 800F_-KM3 and 800F_-KL3.

Emergency Stop Operators∗

Non-Illuminated Twist-to-Release, Push-Pull



60 mm Non-Illuminated Twist-to-Release
Cat. No. 800FP-MT64



40 mm Non-Illuminated Push-Pull
Cat. No. 800FP-MP44

Color	Size	Pkg. Quantity	Twist-to-Release (Trigger Action)		Push-Pull (Trigger Action)	
			Plastic	Metal	Plastic	Metal
			Cat. No.	Cat. No.	Cat. No.	Cat. No.
Red	30	1	**800FP-MT34**	**800FM-MT34**	—	—
	40		**800FP-MT44**	**800FM-MT44**	**800FP-MP44**	**800FM-MP44**
	60		**800FP-MT64**	**800FM-MT64**	—	—

Illuminated — Twist-to-Release, Push-Pull‡



40 mm Illuminated Twist-to-Release
Cat. No. 800FP-LMT44



40 mm Mushroom Push/Pull
Cat. No. 800FM-LMP44

Color	Size	Pkg. Quantity	Twist-to-Release (Trigger Action)		Push-Pull (Trigger Action)	
			Plastic	Metal	Plastic	Metal
			Cat. No.	Cat. No.	Cat. No.	Cat. No.
Red	30	1	—	—	**800FP-LMP34**	**800FM-LMP34**
	40		**800FP-LMT44**	**800FM-LMT44**	**800FP-LMP44**	**800FM-LMP44**
	60		**800FP-LMT64**	**800FM-LMT64**	**800FP-LMP64**	**800FM-LMP64**

Key Release Mushroom Operator



40 mm Non-Illuminated Key Release
Cat. No. 800FP-MK44

Color	Size	Pkg. Quantity	Ronis Key Lock (Trigger Action)❄	
			Plastic	Metal
			Cat. No.	Cat. No.
Red	40 mm	1	**800FP-MK44**	**800FM-MK44**

∗ All emergency stop operators are EN ISO 13850 compliant with standard NC, NCLB, or self-monitoring contact blocks.
‡ LED module required for illumination, can not use incandescent module.
❄ For key options, see page 10-88.

10

2-Position Push-Pull Operators, Non-Illuminated — Twist-to-Release (Trigger Action), Push-Pull (Trigger Action)∗⌘



40 mm Trigger Action
Twist-to-Release Mushroom
Cat. No. 800FP-MT44



40 mm Trigger Action
Push-Pull Mushroom
Cat. No. 800FP-MP44



90 mm Half-Dome
Cat. No. 800FP-MP94

		40 mm Mushroom (Trigger Action) Twist-to-Release		40 mm Mushroom (Trigger Action) Push-Pull	
		Plastic	Metal	Plastic	Metal
Color	Pkg. Quantity	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Red	1	**800FP-MT44**	**800FM-MT44**	**800FP-MP44**	**800FM-MP44**

800F P – MT4 4 ____
a b c d

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Push, Twist-to-Release➢	
Code	Type
MT3	30 mm color cap
MT4	40 mm color cap
MT6	60 mm color cap
Push-Pull✦	
Code	Type
MP4	40 mm color cap
Half-Dome Push-Pull✦	
Code	Type
MP9	90 mm color cap❄

c

Color Cap	
Code	Color
2	Black
3	Green
4	Red
5	Yellow
6	Blue

d‡§♣

Engraving	
Code	Description
Blank	No engraving on cap
LE	EMO laser engraved
E	EMO printed

∗ All emergency stop operators are EN ISO 13850 compliant with standard NC, NCLB, or self-monitoring contact blocks.
⌘ E-Stop operators, latch, and contact block combinations have been third-party tested for B10d values. B10d values can be found in publication SAFETY-SR001_-EN-E.
➢ Only available with red color cap.
‡ For EMO guards, see page 10-109.
§ Only available on 40 mm color cap.
♣ Only available on red, 40 mm push, twist-to-release operator type (MT44).
❄ Half-dome operators only available with black, red, and yellow color caps.
✦ Limit of four contact blocks max. for these devices.

2-Position Push-Pull Operators, Illuminated — Twist-to-Release (Trigger Action), Push-Pull (Trigger Action)✶❄✦



40 mm Illuminated Twist-to-Release
Cat. No. 800FP-LMT44



40 mm Mushroom Push/Pull
Cat. No. 800FM-LMP44



90 mm Half-Dome
Cat. No. 800FP-LMP94

		40 mm Mushroom (Trigger Action) Twist-to-Release		40 mm Mushroom (Trigger Action) Push-Pull	
		Plastic	Metal	Plastic	Metal
Color	Pkg. Quantity	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Red	1	**800FP-LMT44**	**800FM-LMT44**	**800FP-LMP44**	**800FM-LMP44**

800F P – LMP4 3
a b c

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Push, Twist-to-Release‡§	
Code	Type
LMT4	40 mm color cap
LMT6	60 mm color cap
Push-Pull❖	
Code	Type
LMP3	30 mm color cap
LMP4	40 mm color cap
LMP6	60 mm color cap
Half-Dome Push-Pull❖	
Code	Type
LMP9	90 mm color cap⌘

c

Lens Cap Color	
Code	Color
3	Green
4	Red
5	Yellow➢
6	Blue♣

✶ LED module required for illumination, can not use incandescent module.
❄ All emergency stop operators are EN ISO 13850 compliant with standard NC, NCLB, or self-monitoring contact blocks.
✦ E-Stop operators, latch, and contact block combinations have been third-party tested for B10d values. B10d values can be found in publication SAFETY-SR001_-EN-E.
‡ Only available with red color cap.
§ 60 mm version has black arrows; 30 and 40 mm versions have white arrows.
➢ Use of a white LED is recommended.
♣ Only available with 40 mm Push-Pull color cap (**LMP4** from Table b).
⌘ Half-dome operators only available with red and yellow lens cap colors.
❖ Limit of four contact blocks max. for these devices.

2-Position Non-Illuminated Operators — Mushroom, Key Release (Trigger Action)∗♣



40 mm Key Release Mushroom
Cat. No. 800FP-MK44

Color	Pkg. Quantity	2-Position (Trigger Action) 40 mm Mushroom Key Release	
		Plastic	Metal
		Cat. No.	Cat. No.
Red	1	**800FP-MK44**	**800FM-MK44**

Note: For replacement Ronis keys, see Accessories, page 10-111. Key release mushroom operators use key no. 3825.

800F P – MK4 4 ____
a b c d

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Key Release Mushroom	
Code	Type
MK4	40 mm

c

Lens Cap Color	
Code	Color
4	Red

d

Ronis Key Lock❄‡§	
Code	Key No.
Blank	3825 (Standard)
R	455
01R	3801
02R	3802
03R	3803
04R	3804
05R	3805
06R	3806
27R	4001
28R	4002
29R	4003
30R	4004
31R	4005
32R	4006
33R	4007

∗ All emergency stop operators are EN ISO 13850 compliant with standard NC, NCLB, or self-monitoring contact blocks.
♣ E-Stop operators, latch, and contact block combinations have been third-party tested for B10d values. B10d values can be found in publication SAFETY-SR001_-EN-E.
❄ Keyed operators are IP66, Type 4/13.
‡ Not intended for high security applications. Interoperability is possible with certain key/cylinder lock combinations. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for interoperability information.
§ For replacement Ronis keys, see Accessories, page 10-111.

3-Position Push-Pull Operators, Illuminated & Non-Illuminated — Mushroom♣



Illuminated 3-Position Push-Pull
Cat. No. 800FM-LMP44E3

Target Table and Operator Position✶			
Contact Type✦	Out	Center	In
N.O.	O	O	X
N.C.E.B.	X	O	O
N.C.L.B.	X	X	O

Note: X = Closed/O = Open
✦ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

Operator Function	Operator Type	Color	Pkg. Quantity	Cat. No.
Momentary Out, Maintained Center, Momentary In	Non-Illuminated	Black§	1	800FM-MM42E3
		Green		800FM-MM43E3
		Red➢		**800FM-MM44E3**
	Illuminated❄	Amber‡		**800FM-LMM40E3**
		Green		**800FM-LMM43E3**
		Red		**800FM-LMM44E3**
		Blue‡		800FM-LMM46E3
		Clear‡		800FM-LMM47E3
Momentary Out, Maintained Center, Maintained In	Non-Illuminated	Black§	1	800FM-MP42E3
		Green		800FM-MP43E3
		Red➢		**800FM-MP44E3**
	Illuminated❄	Amber‡		**800FM-LMP40E3**
		Green		**800FM-LMP43E3**
		Red		**800FM-LMP44E3**
		Blue‡		800FM-LMP46E3
		Clear‡		800FM-LMP47E3

800F M – L MM 4 4 E3
a b c d e f

a

Operator Construction	
Code	Description
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
Blank	Non-illuminated
L	Illuminated❄

c

Operator Function	
Code	Description
MM	Momentary out, Maintained center, Momentary in
MP	Momentary out, Maintained center, Maintained in

d

Cap Size	
Code	Description
4	40 mm plastic

e

Cap Color	
Code	Description
0	Amber‡⌘
2	Black§
3	Green
4	Red
6	Blue‡⌘
7	Clear‡⌘

f

Positions	
Code	Description
E3	3-position

♣ Sold as stand-alone operator only. Not available as a composite catalog number.
✶ Must use N.O., N.C.E.B., or N.C.L.B. contact blocks only. Cannot use N.C. or N.O.E.M. contact blocks with 3-position push-pull operators.
❄ LED module required for illumination. Cannot use incandescent module.
‡ Available in illuminated only.
⌘ Use of white LED is recommended.
§ Available in non-illuminated only.
➢ Replacement caps are available for this device. Order Cat. No. 800F-AMP4.

22.5 mm Push Buttons

Product Selection

Momentary Push Button Operators, Non-Illuminated — Mushroom∗



40 mm Mushroom
Cat. No. 800FM-MM42



60 mm Mushroom
Cat. No. 800FP-MM63



90 mm Mushroom
Cat. No. 800FP-MM94

Color	Pkg. Quantity	40 mm Mushroom		60 mm Mushroom	
		Plastic	Metal	Plastic	Metal
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
Black	1	**800FP-MM42**	**800FM-MM42**	**800FP-MM62**	**800FM-MM62**
Green		**800FP-MM43**	**800FM-MM43**	**800FP-MM63**	**800FM-MM63**
Red		**800FP-MM44**	**800FM-MM44**	**800FP-MM64**	**800FM-MM64**
Yellow		**800FP-MM45**	**800FM-MM45**	800FP-MM65	**800FM-MM65**
Blue		**800FP-MM46**	**800FM-MM46**	800FP-MM66	800FM-MM66

800F P – MM4 3
a b c

a

Operator Construction	
Code	Description
P	Round plastic operator (IP65, Type 4/4X/13)
M	Round metal operator (IP65, Type 4/13)

b

Size and Operator Type	
Code	Type
MM4	40 mm momentary
MM6	60 mm momentary
MM9	90 mm momentary❄

c

Color Cap	
Code	Color
2	Black
3	Green
4	Red
5	Yellow
6	Blue

∗ Momentary mushroom operators are IP65 rated.
❄ Only available with black, red, and yellow cap colors.

10

Momentary Push Button Operators, Illuminated — Mushroom∗



40 mm Mushroom
Cat. No. 800FP-LMM43

Color	Pkg. Quantity	40 mm Mushroom	
		Plastic	Metal
		Cat. No.	Cat. No.
Green	1	**800FP-LMM43**	**800FM-LMM43**
Red		**800FP-LMM44**	**800FM-LMM44**
Yellow		**800FP-LMM45**	**800FM-LMM45**
Blue		**800FP-LMM46**	**800FM-LMM46**
Clear		800FP-LMM47	800FM-LMM47

800F P – LMM4 3
a b c

a

Operator Construction	
Code	Description
P	Round plastic operator (IP65, Type 4/4X/13)
M	Round metal operator (IP65, Type 4/13)

b

Size and Operator Type	
Code	Type
LMM4	40 mm momentary

c

Lens Cap Color	
Code	Color
3	Green
4	Red
5	Yellow❄
6	Blue❄
7	Clear❄

∗ Momentary mushroom operators are IP65 rated.
❄ When using LED for illumination, a white LED is recommended.

10

2-Function Momentary Multi-Operator, Non-Illuminated

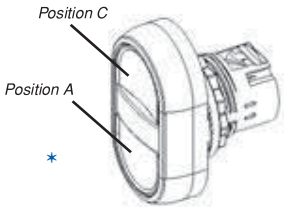


2-Function Momentary Multi-Operator Non-Illuminated
Cat. No. 800FP-U2E4F3

Position A			Position C			Pkg. Quantity	Plastic
Color	Type	Text	Color	Type	Text		Cat. No.
Red	Extended	Blank	Green	Flush	Blank	1	**800FP-U2E4F3**
		O			I		**800FP-U2EFFE**
		STOP			START		**800FP-U2EBFA**

800F P – U2 E 4 F 3 (with button caps)
a b c d e f

800F P – U2 X (without button caps)
a b c



a

Operator Construction	
Code	Description
P	Plastic operator (IP66, Type 4/4X)
M	Metal operator (IP66, Type 4)

b

Operator Type	
Code	Description
U2	Two-function

c

Operator Type — Position A*	
Code	Description
F	Flush
E	Extended
X	No caps (all positions)❄

d

Operator Color Cap/Text — Position A‡	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue
A	Green with “Start” text
B	Red with “Stop” text
C	White with “Start” text
D	Black with “Stop” text
E	Green with “I” text
F	Red with “O” text
G	White with “I” text
H	Black with “O” text

e

Operator Type — Position C*	
Code	Description
F	Flush
E	Extended

f

Operator Color Cap/Text — Position C‡	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue
A	Green with “Start” text
B	Red with “Stop” text
C	White with “Start” text
D	Black with “Stop” text
E	Green with “I” text
F	Red with “O” text
G	White with “I” text
H	Black with “O” text

10

* Position 1 of the latch (left position when viewed from the back) corresponds to position A of the operator. Position 2 of the latch (right position when viewed from the back) corresponds to position C of the operator.
❄ For custom-engraved caps, order “no caps” option plus custom engraved caps on page 10-115.
‡ Valid color cap/legend text codes include:

	Text	
Color	Flush Caps	Extended Caps
White	START, I	—
Black	—	STOP, O
Green	START, I	—
Red	—	STOP, O

2-Function Momentary Multi-Operator, Illuminated∗

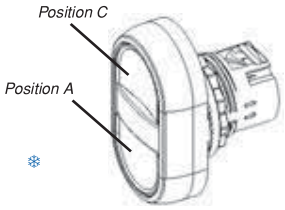


2-Function Momentary Multi-Operator Illuminated
Cat. No. 800FP-LU2E2E1

Position A			Position B	Position C			Pkg. Quantity	Plastic
Color	Type	Text	Type	Color	Type	Text		Cat. No.
Red	Extended	Blank	White Pilot Light	Green	Flush	Blank	1	**800FP-LU2E4F3**
		O				I		**800FP-LU2EFFE**
		STOP				START		**800FP-LU2EBFA**

800F P – LU2 E 4 F 3 (with button caps)
a b c d e f

800F P – LU2 X (without button caps)
a b c



a

Operator Construction	
Code	Description
P	Plastic operator (IP66, Type 4/4X)
M	Metal operator (IP66, Type 4)

b

Operator Type∗	
Code	Description
LU2	Two-function Illuminated

c

Operator Type — Position A❄	
Code	Description
F	Flush
E	Extended
X	No caps (all positions)‡

d

Operator Color Cap/Text — Position A§	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue
A	Green with “Start” text
B	Red with “Stop” text
C	White with “Start” text
D	Black with “Stop” text
E	Green with “I” text
F	Red with “O” text
G	White with “I” text
H	Black with “O” text

e

Operator Type — Position C❄	
Code	Description
F	Flush
E	Extended

f

Operator Color Cap/Text — Position C§	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue
A	Green with “Start” text
B	Red with “Stop” text
C	White with “Start” text
D	Black with “Stop” text
E	Green with “I” text
F	Red with “O” text
G	White with “I” text
H	Black with “O” text

∗ LED module required for illumination, can not use incandescent module.
❄ Position 1 of the latch (left position when viewed from the back) corresponds to position A of the operator. Position 2 of the latch (right position when viewed from the back) corresponds to position C of the operator. Position 3 of the latch (center position) is reserved for the power module.
‡ For custom-engraved caps, order “no caps” option plus custom engraved caps on page 10-115.
§ Valid color cap/legend text codes include:

	Text	
Color	Flush Caps	Extended Caps
White	START, I	—
Black	—	STOP, O
Green	START, I	—
Red	—	STOP, O

10

22.5 mm Push Buttons

Product Selection

3-Function Momentary Multi-Operator, Non-Illuminated

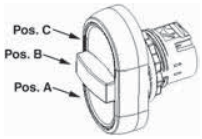


3-Function Momentary Multi-Operator Non-Illuminated
Cat. No. 800FP-U3E4F34

Position A			Position B			Position C			Pkg. Quantity	Plastic
Color	Type	Text	Color	Type	Text	Color	Type	Text		Cat. No.
Green	Flush	Blank	Red	Extended	Blank	Green	Flush	Blank	1	**800FP-U3F3F34**

800F P – U3 E 4 F 3 4 (with button caps)
a b c d e f g

800F P – U3 X (without button caps)
a b c



a

Operator Construction	
Code	Description
P	Plastic operator (IP66, Type 4/4X)
M	Metal operator (IP66, Type 4)

b

Operator Type	
Code	Description
U3	Three-function

c

Operator Type — Position A∗	
Code	Description
F	Flush
E	Extended
X	No caps (all positions)❄‡

d

Operator Color Cap/Text — Position A§	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue

d (cont'd)

Operator Color Cap/Text — Position A§	
Code	Description
A	Green with “Start” text
B	Red with “Stop” text
C	White with “Start” text
D	Black with “Stop” text
E	Green with “I” text
F	Red with “O” text
G	White with “I” text
H	Black with “O” text

e

Operator Type — Position C∗	
Code	Description
F	Flush
E	Extended

f

Operator Color Cap/Text — Position C§	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue

f (cont'd)

Operator Color Cap/Text — Position C§	
Code	Description
A	Green with “Start” text
B	Red with “Stop” text
C	White with “Start” text
D	Black with “Stop” text
E	Green with “I” text
F	Red with “O” text
G	White with “I” text
H	Black with “O” text

g

Operator Color Cap/Text — Position B∗‡	
Code	Description
4	Red
B	Red with “Stop” text
F	Red with “O” text

∗ Position 1 of the latch (left position when viewed from the back) corresponds to position A of the operator. Position 2 of the latch (right position when viewed from the back) corresponds to position C of the operator. Position 3 of the latch (center position) corresponds to position B of the operator.
❄ For custom-engraved caps, order “no caps” option plus custom engraved caps on page 10-115.
‡ For “no caps” option, (position B) center cap available as red, no text only.
§ Valid color cap/legend text codes include:

	Text	
Color	Flush Caps	Extended Caps
White	START, I	—
Black	—	STOP, O
Green	START, I	—
Red	—	STOP, O

Reset Operators — Mechanical and/or Electrical Reset



Reset Operator
Cat. No. 800FP-R611

Button Color	Legend Text	Pkg. Quantity	Flush — Round	
			Plastic	Metal
			Cat. No.	Cat. No.
Blue	R	1	**800FP-R611**	**800FM-R611**
	No Legend		**800FP-R6**	**800FM-R6**

800F M – R 6 11
a b c d

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Type
R	Reset∗❄

c

Color Cap	
Code	Color
1	White
2	Black
6	Blue

d

Legend Text	
Code	Text
Blank	No text
11	R

∗ Will accept latch and up to four single circuit contact blocks or two dual circuit contact blocks; no contacts allowed in center position.
❄ 11 mm reset stroke length.

Threaded Reset Rod Reset Operators



Threaded Reset Rod with 35 mm Pusher
Cat. No. 800F-ATR19L

Rod Length [mm]‡	Rod Length Adjustability [mm]	Pkg. Quantity	Threaded Reset Rod	
			10 mm Pusher	35 mm Pusher
			Cat. No.	Cat. No.
40	34…52	1	**800F-ATR01**	800F-ATR01L
55	50…67		800F-ATR02	800F-ATR02L
85	80…98		**800F-ATR04**	800F-ATR04L
115	110…128		800F-ATR06	800F-ATR06L
145	141…159		**800F-ATR08**	800F-ATR08L
315	34…326		§ **800F-ATR19**	§ 800F-ATR19L

‡ If contact blocks are used, they must have a minimum rod length of 55 mm for one level of contact blocks and 85 mm for two levels of contact blocks.
§ Rod is threaded along its entire length for ease of cutting to desired length.

10

Single Turn Potentiometer Assembly❄‡§



Series B



Series A

Resistive Element	Series B Cat. No.	Series A Cat. No.♣
None (Operator Only)∗	**800FP-POT**	800FP-POTA
150 Ω	**800FP-POT1**	800FP-POT1A
500 Ω	**800FP-POT2**	800FP-POT2A
1000 Ω	**800FP-POT3**	800FP-POT3A
2500 Ω	**800FP-POT4**	800FP-POT4A
5000 Ω	**800FP-POT5**	800FP-POT5A
10000 Ω	**800FP-POT6**	800FP-POT6A

∗ The Cat. No. 800FP-POT is a complete operator assembly supplied without the resistive element, used with potentiometers having a shaft diameter of 6.0 mm (0.23 in.) and a shaft length of 50.0 mm (1.97 in.), or a shaft diameter of 6.4 mm (0.25 in.) and a shaft length of 22.5 mm (0.88 in.). This operator is used with Type "J" potentiometers only.
❄ Rated 300V AC/DC, 2 W max.
‡ A latch is not needed.
§ Additional hole spacing required for potentiometers. See page 10-125 for panel hole spacing requirements.
♣ Not stocked. Longer lead-time.

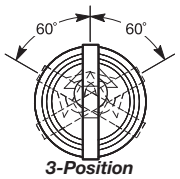
Key Operated Selector Switch - SensEject™

Patented Spring-Loaded Key Ejection System





2-Position Switching Angle



3-Position Switching Angle

Operator Construction	Operator Type	Key Eject Position	Key Option§	Spare Keys	Contact Blocks	Cat. No.➢
Round Metal Operator — SensEject is IP6X (dust-tight) Type 1	2-Position Maintained	*Left with Key Eject*	Zadi Key 06Z	800F-AKE006	None	800FM-KEM2106Z
					1 N.O.; 1 N.C.	**800FM-KEM2106ZMX11**
	3-Position Spring Return from Both	*Center with Key Eject*	Zadi Key 01Z	800F-AKE001	None	800FM-KEB3401Z
					2 N.O.; 3 N.C.	800FM-KEB3401ZMX23

§ Not intended for high security applications. Interoperability is possible with certain key/cylinder lock combinations. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for interoperability information.
➢ Includes latch and spacer block.

Selector Push Button Operators∗



Selector Jog Operator
Cat. No. 800FM-SJ23

Target Table and Operator Position (2-Position)

Contact Type❄	Position on Mounting Latch	Selector Left Free	Selector Left Depressed	Selector Right Free	Selector Right Depressed
N.O.	Left	O	X	O	O
N.O.	Right	O	O	O	X
N.O.	Center	O	X	O	X
N.C.	Left	X	O	X	X
N.C.	Right	X	X	X	O
N.C.	Center	X	O	X	O

Note: X = Closed/O = Open

Target Table and Operator Position (3-Position)

Contact Type❄	Position on Mounting Latch	Selector Left Free	Selector Left Depressed	Selector Center Free	Selector Center Depressed	Selector Right Free	Selector Right Depressed
N.O.	Left	O	X	O	X	O	O
N.O.	Right	O	O	O	X	O	X
N.O.	Center	O	X	O	X	O	X
N.C.	Left	X	O	X	O	X	X
N.C.	Right	X	X	X	O	X	O
N.C.	Center	X	O	X	O	X	O

Note: X = Closed/O = Open

❄ Contact selection is limited to the following options; consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

800F P – SJ 2 2
a b c d

a

Operator Construction	
Code	Description
P	Round plastic operator (IP66, Type 4/4X/13)
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
SJ	Selector jog

c

Operator Function	
Code	Description
2	2-position
3	3-position

d

Color Cap	
Code	Description
2	Black
3	Green

∗ Buttons cannot be engraved.

10

Toggle Switch Operators∗❄



Toggle Switch Operator
Cat. No. 800FM-JM2

Target Table and Operator Position (2-Position)

Contact Type§	Position on Mounting Latch	Toggle Left	Center	Toggle Right
N.O.	Left	O	O	X
N.O.	Right	X	O	O
N.O.	Center	X	O	X
N.C.	Left	X	X	O
N.C.	Right	O	X	X
N.C.	Center	O	X	O

Note: X = Closed/O = Open

Target Table and Operator Position (4-Position)‡

Contact Type§	Position on Mounting Latch	Toggle Up	Toggle Left	Center	Toggle Right	Toggle Down
N.O.	Left	X	O	O	O	O
N.O.	Right	O	X	O	O	O
N.O.	Center	X	X	O	O	O
N.C.L.B.	Left	O	X	X	X	X
N.C.L.B.	Right	X	O	X	X	X
N.C.L.B.	Center	O	O	X	X	X
N.C.E.B.	Left	O	O	O	O	X
N.C.E.B.	Right	O	O	O	X	O

Note: X = Closed/O = Open

§ Contact selection is limited to the following options, consult your local Rockwell Automation sales office or Allen-Bradley distributor for other options.

800F M – J M2
a b c

a

Operator Construction	
Code	Description
M	Round metal operator (IP66, Type 4/13)

b

Operator Type	
Code	Description
J	Toggle switch

c

Operator Function	
Code	Description
M2	2-position, maintained
R2	2-position, momentary
M4	4-position, maintained
R4	4-position, momentary

∗ Use legend plates 800F-34_ and 800F-35_.
❄ Silicone boot comes standard with toggle switch, please see page 10-108 for replacement boots.
‡ Must use N.O., N.C.E.B., or N.C.L.B. contact blocks only. Cannot use N.C. or N.O.E.M. contact blocks with 4-position toggle switch.

Back-of-Panel Components

Contact Blocks with Latch — Composite

800F – P X 0 1 E
a b c d e



a

Style	
Code	Description
P	Plastic latch
M	Metal latch

b

Contact Block(s) Termination Style∗	
Code	Description
X	Screw termination
Q	Spring-clamp termination

∗ Six circuits maximum allowable.

c

N.O. (Normally Open) Circuits	
Code	Description
0	No contact
1	1 N.O.
2	2 N.O.
3	3 N.O.
4	4 N.O.
5	5 N.O.
6	6 N.O.

d

N.C. (Normally Closed) Circuits	
Code	Description
0	No contact
1	1 N.C.
2	2 N.C.
3	3 N.C.
4	4 N.C.
5	5 N.C.
6	6 N.C.

e

Specialty Contact Block(s)	
Code	Description
Blank	Standard blocks
V	Low voltage — QuadCONNECT™
E	N.O. early make
L	N.C. late break
B	N.C. early break
S	N.C. self-monitoring

Power Modules with Latch — Composite

800F – M N 3 G
a b c d



a

Style	
Code	Description
P	Plastic latch
M	Metal latch

b

Power Module Type‡§	
Code	Description
D	Incandescent module, screw termination
N	Integrated LED module, screw termination
Q	Integrated LED module, spring-clamp termination

c

Voltage	
Code	Description
0	No bulb♣
1	6V AC/DC♣
2	12V AC/DC♣
3	24V AC/DC
4	48V AC/DC♣
5	120V AC
7	240V AC➢

d

Lamp Color⌘	
Code	Description
C	Incandescent
R	Red LED
G	Green LED
Y	Amber LED
W	White LED
B	Blue LED

‡ LED modules for use with all illuminated operators. Incandescent module for use with pilot lights, momentary push buttons, and momentary mushroom operators only.
§ Four circuits maximum allowable when power module is used. Contact blocks cannot be stacked on power module.
♣ Only available for incandescent module.
➢ Only available for integrated LED module.
⌘ For best illumination results, LED color should match lens color. For yellow operator, select a white LED.

10

Back-of-Panel Components, Continued

Power Modules with Contact Blocks and Latch — Composite

800F –	P	N	5	R	X	1	0	E
	a	*b*	*c*	*d*	*e*	*f*	*g*	*h*

a

Style	
Code	Description
P	Plastic latch
M	Metal latch

b

Power Module Type∗❄	
Code	Description
D	Incandescent module, screw termination
N	Integrated LED module, screw termination
Q	Integrated LED module, spring-clamp termination

c

Voltage	
Code	Description
0	No bulb‡
1	6V AC/DC‡
2	12V AC/DC‡
3	24V AC/DC
4	48V AC/DC‡
5	120V AC
7	240V AC§

d

Lamp Color♣	
Code	Description
C	Incandescent
R	Red LED
G	Green LED
Y	Amber LED
W	White LED
B	Blue LED

e

Contact Block(s) Termination Style	
Code	Description
X	Screw termination
Q	Spring-clamp termination

f

N.O. (Normally Open) Circuits	
Code	Description
0	No contact
1	1 N.O.
2	2 N.O.
3	3 N.O.
4	4 N.O.

g

N.C. (Normally Closed) Circuits	
Code	Description
0	No contact
1	1 N.C.
2	2 N.C.
3	3 N.C.
4	4 N.C.

h

Specialty Contact Block(s)	
Code	Description
Blank	Standard blocks
V	Low voltage — QuadCONNECT™
E	N.O. early make
L	N.C. late break
B	N.C. early break
S	N.C. self-monitoring

∗ Four circuits maximum allowable when power module is used. Contact blocks cannot be stacked on power module.
❄ LED modules for use with all illuminated operators. Incandescent module for use with pilot lights, push buttons, and momentary mushroom operators only.
‡ Only available for incandescent module.
§ Only available for integrated LED module.
♣ For best illuminated results, LED should match lens color. For yellow operator, select a white LED.

Back-of-Panel Components, Continued

Other

	Description	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-ALM*	**Metal Mounting Latch** These are zinc-plated, metal die cast mounting latches. **Note:** Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.	10	**800F-ALM**
	Note: Sold only in multiples of 100. Order (quantity of) 100 to receive one package of 100 pieces.	100	**800F-ALM-BP**
 *Cat. No. 800F-ALP*	**Plastic Mounting Latch** **Note:** Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.	10	**800F-ALP**
	Note: Sold only in multiples of 100. Order (quantity of) 100 to receive one package of 100 pieces.	100	**800F-ALP-BP**

	Description	Contact Type	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-X10*	**Contact Block** **Note:** Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	N.O.	10	**800F-X10**
		N.C.		**800F-X01**
		N.O. low voltage — QuadCONNECT™		**800F-X10V**
		N.C. low voltage — QuadCONNECT™		**800F-X01V**
		N.O.L.M.		♣ **800F-X10N**
		N.O.E.M.		**800F-X10E**
		N.O.E.E.M.		➢ 800F-X10M
		N.C.L.B.		**800F-X01L**
		N.C.E.B.		✶ **800F-X01B**
		Self-Monitoring		❄ **800F-X01S**
		Dual circuit of 2 N.O.		❄ **800F-X20D**
		Dual circuit of 2 N.C.		❄ **800F-X02D**
		Dual circuit of 1 N.O.-1 N.C.		❄ **800F-X11D**
		N.O. with stab terminals		800F-X10T
		N.C. with stab terminals		800F-X01T
		N.O. spring-clamp		**800F-Q10**
		N.C. spring-clamp		**800F-Q01**
		N.O. spring-clamp low-voltage — QuadConnect™		**800F-Q10V**
		N.C. spring-clamp low-voltage — QuadConnect™		**800F-Q01V**
		N.O.E.M. spring-clamp		**800F-Q10E**
		N.C.L.B. spring clamp		**800F-Q01L**
		N.C.E.B. spring-clamp		✶ **800F-Q01B**
		Ring lug N.O.		‡§ **800F-R10**
		Ring lug N.C.		‡§ **800F-R01**
	Note: Sold only in multiples of 100. Order (quantity of) 100 to receive one package of 100 pieces. Latch not included.	N.O.	100	**800F-X10-BP**
		N.C.		**800F-X01-BP**

♣ For use with **Cat. No. 800FP-CB_** and **Cat. No. 800FP-CC_** operators.
➢ For use with **Cat. No. 800FP-CC_** operators.
✶ Only for use with 4-position selector switch, 4-position toggle switch, or 3-position push-pull operator.
❄ Cannot stack.
‡ Cannot be used in a composite catalog number.
§ Replacement screws are available (Cat. No. 800F-ARS1)

Back of Panel Components, Continued

Other

	Description	Volts	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-D3C*	**Incandescent Module** For use with pilot lights, push buttons, and momentary mushroom operators. **Note:** Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	No bulb	10	**800F-D0C**
		6V AC/DC		**800F-D1C**
		12V AC/DC		**800F-D2C**
		24V AC/DC		**800F-D3C**
		48V AC/DC		**800F-D4C**
		120V AC/DC		**800F-D5C**
 *Cat. No. 800F-N3G*	**Integrated LED Module** For use with all illuminated devices. For best results, LED should match lens color. For amber operators, use yellow LED. **Note:** Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	24…120V AC/DC	10	∗ **800F-NUx**
		24V AC/DC		∗ **800F-N3x**
		120V AC		∗ **800F-N5x**
		240V AC		∗ **800F-N7x**
		24V AC/DC spring-clamp		∗ 800F-Q3x
		120V AC spring-clamp		∗ 800F-Q5x
		240V AC spring-clamp		∗ 800F-Q7x
		24V AC/DC ring lug		❄‡ 800F-R3x

	Description	Contact Material	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-BX01*	**Base Mounted Contact Block** Base mounted contact blocks can be used in plastic or metal enclosures. **Note:** Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	N.O.	10	**800F-BX10**
		N.C.		**800F-BX01**
		N.O. low voltage — QuadConnect™		800F-BX10V
		N.C. low voltage — QuadConnect™		**800F-BX01V**
		N.O.E.M.		**800F-BX10E**
		N.C.L.B.		**800F-BX01L**
		N.O. spring-clamp		**800F-BQ10**
		N.C. spring-clamp		**800F-BQ01**

	Description	Volts	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-BN3R*	**Base Mounted Integrated LED Module** Base mounted modules can be used in plastic or metal enclosures. For best illumination results, LED should match lens color. **Note:** Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Latch not included.	24V AC/DC	10	∗ **800F-BN3x**
		120V AC		∗ **800F-BN5x**
		240V AC		∗ **800F-BN7x**

∗ To complete the cat. no., replace the **x** with one of the following letters for the desired color: **Y** = Amber, **R** = Red, **G** = Green, **B** = Blue, **W** = White.
❄ Cannot be used in a composite catalog number.
‡ Replacement screws are available (Cat. No. 800F-ARS1)

Plastic and Metal Enclosures



Plastic Enclosure
Cat. No. 800F-3PM



Metal Enclosure
Cat. No. 800F-5MM

Plastic Enclosures (Latch or Base Mounting)

- Accepts two-piece snap-in legends
- One-hole enclosure accepts 60 mm emergency stop legends
- UL Listed, CSA Certified

Metal Enclosures (Latch or Base Mounting)

- Feed-through design
- Accepts two-piece snap-in legends
- Includes base mount adapter

Type	Pkg. Quantity	Enclosures							
		Plastic (IP66, 4/4X)				Metal — Die Cast (IP66, 4/13)❄			
		PG Conduit Knockouts		Metric Conduit Knockouts		PG Conduit Openings		Metric Conduit Openings	
		Cat. No.		Cat. No.		Cat. No.		Cat. No.	
1-hole	1	✶‡	**800F-1PP**	✶‡	**800F-1PM**	♣	**800F-1MP**	♣	**800F-1MM**
2-hole		✶‡	**800F-2PP**	✶‡	**800F-2PM**	♣	**800F-2MP**	♣	**800F-2MM**
3-hole		✶‡	**800F-3PP**	✶‡	**800F-3PM**	♣	**800F-3MP**	♣	**800F-3MM**
4-hole		✶‡	**800F-4PP**	✶‡	**800F-4PM**	—		—	
5-hole		—		—		➢	**800F-5MP**	➢	**800F-5MM**
6-hole		✶§	**800F-6PP**	✶§	**800F-6PM**	—		—	
1-hole (yellow)		✶	**800F-1YP**	✶	**800F-1YM**	♣	**800F-1MYP**	♣	800F-1MYM
1-hole (yellow) latch only		—		—		♣	800F-1LYP	♣	800F-1LYM
1-hole (yellow) dual circuit		❄	800F-1YPD	❄	800F-1YMD	—		—	

✶ Can only use single deep contact block.
❄ Can stack contact blocks two deep or one dual circuit contact block.
‡ Knockouts: PG (PG11/16), Metric (M16/20)
§ Knockouts: PG (PG16), Metric (M25)
♣ Openings: PG (PG16), Metric (M20)
➢ Openings: PG (PG16), Metric (M32)

Assembled Stations

Enclosure Material	Operator Type	Illumination Voltage	Contact Configuration	Cat. No.	
				PG Knockouts	Metric Knockouts
1-Hole, Yellow Plastic	Red 90 mm momentary	Non-illuminated	1 N.C.	800F-1YP1M94	800F-1YM1M94
			1 N.O./1 N.C.	800F-1YP2M94	800F-1YM2M94
			2 N.C.	800F-1YP3M94	800F-1YM3M94
1-Hole, Grey Plastic	Black 90 mm momentary		1 N.O./1 N.C.	800F-1PP2M92	800F-1PM2M92
	Black Push Button		1 N.O.	800F-1PP1	800F-1PM1
	"0-1" 2-Position Selector Switch		1 N.O.	800F-1PP2	800F-1PM2
	"OFF-ON" 2-Position Selector Switch		1 N.O. / 1 N.C.	800F-1PP3	800F-1PM3
	↔ (Flush Black)		1 N.O.	800F-1PP4	—
2-Hole, Grey Plastic	Start and Stop Push Buttons		1 N.O./1 N.C.	800F-2PP1	—
3-Hole, Grey Plastic	↑ (Flush Black) O (Extended Red) ↓ (Flush Black)		4 N.O./1 N.C.	**800F-3PP1**	—

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1-Hole Enclosure E-Stop Station



Cat. No. 800F-1YP4

Enclosure Material	Quick Connect		Operator Type	Illumination Voltage	Contact Configuration	Cat. No.	
						PG Knockouts	Metric Knockouts
Yellow Plastic	N/A		Twist-to-Release 40 mm	Non-Illuminated	1 N.C.	**800F-1YP1**	**800F-1YM1**
					1 N.O. / 1 N.C.	**800F-1YP2**	**800F-1YM2**
					2 N.C.	**800F-1YP3**	**800F-1YM3**
			Key Release 40 mm		1 N.C.	800F-1YP4	800F-1YM4
					1 N.O. / 1 N.C.	800F-1YP5	**800F-1YM5**
					2 N.C.	800F-1YP6	800F-1YM6
			Twist-to-Release 60 mm		2 N.C.	800F-1YP7	—
					1 N.O. / 2 N.C.	800F-1YP8	—
			Twist-to-Release 40 mm	24V AC/DC	1 N.C.	—	800F-1YML1
				120V AC		—	800F-1YML2
				240V AC		—	800F-1YML3
			Red half dome	Non-illuminated	1 N.C.	800F-1YP1HD	800F-1YM1HD
					1 N.O./1 N.C.	800F-1YP2HD	800F-1YM2HD
					2 N.C.	800F-1YP3HD	800F-1YM3HD
				24V AC/DC	1 N.C.	—	800F-1YML1HD
				120V AC		—	800F-1YML2HD
				240V AC		—	800F-1YML3HD
	AC Micro*	5-pin	Twist-to-Release 40 mm	Non-Illuminated	2 N.C. — Low voltage	—	800F-1YMQ53V
		6-pin			1 N.O. / 2 N.C.	—	800F-1YMQA
	DC Micro*	4-pin		Non-Illuminated/EMO/Guard	1 N.C.	—	800F-NX1
				Non-Illuminated	1 N.C.	—	800F-1YMQ1
					1 N.O. / 1 N.C.	—	800F-1YMQ2
					2 N.C.	—	800F-1YMQ3
				Non-Illuminated/EMO/Guard		—	800F-1YMQ3VEG
		5-pin		Non-Illuminated		—	800F-1YMQ3V
	Mini Receptacle *	4-pin		Non-Illuminated	1 N.C.	—	800F-1YMQ41
				24V AC/DC	1 N.O. / 1 N.C.	—	800F-1YMQ44
		6-pin		24V AC/DC	1 N.O./1 N.C.	—	800F-1YMQ4
				120V AC	1 N.O. / 1 N.C.	—	800F-1YMQ5
				240V AC	1 N.O. / 1 N.C.	—	800F-1YMQ6
Grey Metal	N/A		Twist-to-Release 40 mm	Non-Illuminated	1 N.C.	—	800F-1MM1
			Twist-to-Release 40 mm	Non-Illuminated	1 N.O. / 1 N.C.	—	800F-1MM2
			Twist-to-Release 40 mm	Non-Illuminated	2 N.C.	—	800F-1MM3
			Key Release 40 mm	Non-Illuminated	1 N.C.	—	800F-1MM4
			Key Release 40 mm	Non-Illuminated	1 N.O. / 1 N.C.	—	800F-1MM5
			Key Release 40 mm	Non-Illuminated	2 N.C.	—	800F-1MM6
	Mini Receptacle *	6-pin	Twist-to-Release 40 mm	24V AC/DC	1 N.O./1 N.C.	—	800F-1MYMQ4
			Twist-to-Release 40 mm	120V AC	1 N.O./1 N.C.	—	800F-1MYMQ5
			Twist-to-Release 40 mm	240V AC	1 N.O./1 N.C.	—	800F-1MYMQ6

* Please reference Assembled Station Pin Out Chart on page 10-126

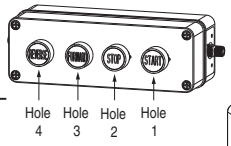
Assembled Stations with DeviceNet

2-Hole

800F – _____ _____ _____ _____ _____ _____ _____

a *b* *c* *d* *c* *d* *e*

(Hole 1 c+d) *(Hole 2 c+d)*

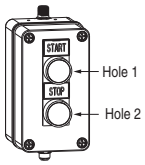


3-Hole

800F – _____ _____ _____ _____ _____ _____ _____ _____

a *b* *c* *d* *c* *d* *c* *d* *e*

(Hole 1 c+d) *(Hole 2 c+d)* *(Hole 3 c+d)*



4-Hole

800F – _____ _____ _____ _____ _____ _____ _____ _____ _____ _____

a *b* *c* *d* *c* *d* *c* *d* *c* *d* *e*

(Hole 1 c+d) *(Hole 2 c+d)* *(Hole 3 c+d)* *(Hole 4 c+d)*



4-Hole Assembled Station
Cat. No. 800F-VHA3A4J3J4J

a

Mounting Orientation	
Code	Description
V	Vertical✶
H	Horizontal

b

Enclosure Style/Legends	
Code	Description
A	2-hole/legend frames
B	3-hole/legend frames
C	4-hole/legend frames
D	2-hole/no legend frames
E	3-hole/no legend frames
F	4-hole/no legend frames
H	2-hole/E-stop only no legend frames❄

c

Operator Types	
Code	Description
A	Non-illuminated flush button
B	Non-illuminated extended button
C	Non-illuminated guarded button
D	Illuminated flush button✦
E	Illuminated extended button✦
F	Illuminated guarded button✦
G	Non-illuminated 2-pos. selector switch
H	Non-illuminated 3-pos. selector switch
J	Pilot light (diffused)
K	Hole plug❖
L	Non-illuminated TTR E-stop‡❖
M	Non-illuminated push pull‡❖
N	2-pos. key selector switch
P	3-pos. key selector switch
R	Non-illuminated 40 mm mushroom
T	E-stop key release‡❖
U	Potentiometer§❖
W	Illuminated push pull
X	Illuminated 2-pos. maintained selector switch
Y	Illuminated 3-pos. maintained selector switch
Z	Illuminated 40 mm mushroom

d

Color/Text	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue
7	Clear
8	Grey♣
9	No cap
0	Amber
A	Green with "Start" text
B	Red with "Stop" text
C	Black with "→" symbol
D	Black with "←" symbol
E	Black with "↑" symbol
F	Black with "↓" symbol
G	Green with "I" symbol
H	Red with "O" symbol
L	Blue with "R" text
M	Red with yellow metal guard♠
N	Yellow with yellow metal guard♠

e

I/O Version➢	
Code	Description
Blank	No external I/O
A	1 input/1 output (sinking)
B	1 input/1 output (sourcing)
C	2 input
D	2 output (sinking)
E	2 output (sourcing)
F	1 E-stop block⌘
G	2 E-stop block⌘
H	2 input/2 output
J	2 input/2 output (sinking)
K	2 input/2 output (sourcing)
L	1 input/1 output (sinking) + 1 E-stop block⌘
M	1 input/1 output (sourcing) + 1 E-stop block⌘
N	1 input/1 output (sinking) + 2 E-stop block⌘
P	1 input/1 output (sourcing) + 2 E-stop block⌘
Q	2 input + 1 E-stop block⌘
R	2 input + 2 E-stop block⌘
T	2 output (sinking) + 1 E-stop block⌘
U	2 output (sourcing) + 1 E-stop block⌘
V	2 output (sinking) + 2 E-stop block⌘
W	2 output (sourcing) + 2 E-stop block⌘
X	2 input + 1 input/1 output (sinking)
Y	2 input + 1 input/1 output (sourcing)

✶ Selector Switches in a vertical mount enclosure are mounted with a horizontal orientation.
❄ Enclosure Style/Legend option H from Table b can only select one operator from Table c. Valid options are L,M and T. Also see footnote ‡
‡ Operator Types L, M, and T from Table c may be used as emergency stops. To be valid as an E-Stop, operators must use color/text option 4 from Table d and it must be placed in the last hole position in the enclosure, where a yellow round E-stop legend plate is provided. An E-Stop connector also must be chosen from Table e. Also see footnote ⌘
§ Potentiometer allowed in first hole position only.
♣ Available in flush only.
➢ This is an 8-in/4-out device. 2-in and 1-out are assigned to each hole position in the enclosure. If a 2-hole enclosure is selected, 4-in and 2-out are assigned internally and up to 4 unassigned I/O points can be assigned to external connectors. This device contains up to two physical external I/O connectors. The "+" symbol in the Description field of table e indicates that two external connectors exist. If an E-Stop connector is used, 2 unassigned I/O points can be assigned to the other connector.
⌘ External I/O Versions F, L, M, Q, T, and U receive only one contact block for the external E-Stop string. These connectors are rated 3 A. If more than 3 A of current is needed or if there are two E-Stop strings, use External I/O Versions G, N, P, R, V and W. These versions receive two contact blocks. This allows for 6 A of switching or for two E-Stop strings.
✦ Cannot be ordered with "No Cap" (**9** from Table d - Color/Text).
❖ Operator Types K, L, M, T, and U from Table c are not available with legend frames.
♠ Only available with non-illuminated push-pull operator (**M** from Table c).

Pendant Stations (Latch Mounting)∗

- Blank legend cap marking
- Connector not included. See Accessories, page 10-107, for ordering information.



Pendant Station
Cat. No. 800F-P25

Type	Pkg. Quantity	Pendants Yellow Plastic (IP66, 4/4X/13) Cat. No.
1 hole in face	1	**800F-P15**
2 holes in face		**800F-P25**
1 hole in bottom		800F-P35
1 hole in face / 1 hole in bottom		800F-P45

Assembled Two-Hole Pendant Stations∗



Pendant Station
Cat. No. 800F-PN2

Pre-Wired Pendant Station with Mini Quick Disconnect Connector	
Push Button and Contact Selection	Cat. No.
Green flush (no text) in face with 1 N.O. contact; Red pilot light in bottom with 1 N.O. contact; 24V AC/DC	800F-PN2
White flush (with up arrow — ↑) with 1 N.O./1 N.C. contact; Black flush (with down arrow — ↓) with 1 N.O./1 N.C. contact	800F-P251
Black flush (with "Forward" text) with 1 N.O./1 N.C. contact; Black flush (with "Reverse" text) with 1 N.O./1 N.C. contact	800F-P252
Black flush (with "On" text) with 1 N.O. contact; Black flush (with "Off" text) with 1 N.C. contact	800F-P253
Green flush (with "Start" text) with 1 N.O. contact; Red flush (with "Stop" text) with 1 N.C. contact	800F-P254
2 flush black push buttons (no text), each with 1 N.O. contact	800F-P255
DeviceNet Pendant Station with Mini Quick Disconnect Connector	
Options	Cat. No.
Green flush push button in face, red pilot light in bottom; 24V DC	800F-PND2

∗ Can only use single deep contact block.

Miscellaneous

	Description	Type	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-AHA1*	**30.5 mm to 22.5 mm Hole Size Adapter** This adapter allows a 22.5 mm push button operator to be installed in a panel with existing 30.5 mm mounting holes. **Note:** Comes with anti-rotation washer (800F-ALC1).	Metal	1	**800F-AHA1**
 *Cat. No. 888N-M4AF1-1F*	**Quick Disconnect** Male receptacle for pendant stations.	4-pin		**888N-M4AF1-1F**
		5-pin		**888N-M5AF1-1F**
	Description	Material	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-ARP*	**Replacement Mounting Rings**	Plastic	10❄	**800F-ARP**
		Metal		**800F-ARM**
	Description		Pkg. Quantity	Cat. No.
 *Cat. No. 800F-AW2*	**Mounting Ring Wrench** This mounting ring wrench is used to tighten plastic or metal mounting rings quickly and securely.		1	**800F-AW2**
 *Cat. No. 800F-ALR1*	**Bulb Removal Tool** For quick and easy removal of lamps from incandescent modules.			**800F-ALR1**
 *Cat. No. 1492-MS5X9*	**Snap-In Marker** This item can be used for circuit identification on all back-of-panel components.		—	✶
 *Cat. No. 800F-ATK2*	**Stab Terminals** Can be used with all single circuit contact blocks. Minimum spacing requirements apply. See instruction sheet for details. **Note:** Sold only in multiples of 100. Order (quantity of) 100 to receive one package of 100 pieces.		100	**800F-ATK2**
 *Cat. No. 800F-AGS1*	**Ground Screws** These are self-tapping #6-32 (M3.5) ground screws for metal latches.		10❄	800F-AGS1
 *Cat. No. 800F-AGS2*	**Ground Screws** This accessory is used for grounding on Bulletin 800F plastic enclosures only.			**800F-AGS2**

✶ See Terminal Block section for ordering information.
❄ Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.

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Miscellaneous, Continued

	Description	Panel Thickness with Legend Plates	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-ALC1*	**Locking Washer (Anti-Rotation Washer)** This item provides an extra anti-rotation feature for rotary operators such as selector switches.	1…4 mm	10‡	**800F-ALC1**
		1…5 mm		**800F-ALC2**
	Description		**Pkg. Quantity**	**Cat. No.**
 *Cat. No. 800F-ATW1*	**Replacement Trim Washer** This accessory comes standard with all enclosures. It must be used if using base-mounted contact blocks/power modules without legend plates.			**800F-ATW1**
 *Cat. No. 800F-A3BA*	**Replacement Base Mount Adapter** This accessory comes standard with all metal enclosures. It is required when using metal enclosures with base-mounted contact blocks or base-mounted power modules.		10‡	**800F-A3BA**
 *Cat. No. 800F-ABZ1*	**Square Bezel** Gives round operator a square appearance. This item is made of plastic. Not for use with toggle switch operators.			800F-ABZ1
	Description	**Material**	**Pkg. Quantity**	**Cat. No.**
 *Cat. No. 800F-ABJS*	**Replacement Boot** for Toggle Switch	Silicone	1	**800F-ABJS**
		Nitrile		800F-ABJN
 *Cat. No. 800F-N2*	**Hole Plug** used to plug 22.5 mm holes.	Black plastic		**800F-N2**
		Grey plastic		**800F-N8**
 *Cat. No. 800F-ACP*	**Selector Switch Tabs** Changes functionality of selector switch from normal to CenterLeft or CenterRight.		10‡	800F-ACP

‡ Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.

Guards

	Description	Type	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-AMRG*	**Protective Ring** for use with non-illuminated 2-position maintained and illuminated/non-illuminated 3-position mushroom operators (40 mm only)	Shiny metal	1	**800F-AMRG**
		Black		800F-AMRGB
		Yellow Metal		800F-AMRGY
 *Cat. No. 800F-A6PR5*	**Plastic Guard** for use with the following operators: • 40 mm E-stop (SEMI Standards Compliant) • 40 mm illuminated/non-illuminated alternate action and momentary operators • 60 mm illuminated/non-illuminated momentary operators • Selector switches (standard knob and key operated) • Potentiometers	Yellow, round		**800F-A6PR5**
 *Cat. No. 800F-AMEGY*	**Narrow Plastic Guard** for use with the following operators: • Illuminated and non-illuminated momentary mushroom operators (40 mm) only • Bul. 800FD monolithic E-stops (SEMI standards compliant) • Flush/extended/guarded push buttons • Alternate action operators • Selector switches (standard knob and key operated) • Potentiometers	Yellow		**800F-AMEGY**
 *Cat. No. 800F-AMMG*	**40 mm Protective Guard** used with illuminated and non-illuminated momentary mushroom operators (40 mm) only.	Shiny Metal		**800F-AMMG**
 *Protective Boots*	Clear silicone **Protective Boot** used on illuminated and non-illuminated, flush and extended operators.	Flush push button	10❄	**800F-AB7**
		Extended push button		**800F-ABE7**
		3-position multi-function		**800F-AUB1**
		2-position multi-function		**800F-AUB2**

❄ Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.

10

Locking Attachments

	Description	Type	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-AFL1*	**Locking Attachments** are used to lock push button in the depressed position. -N.C. contacts are open -N.O. contacts may or may not be open -N.C.L.B. contacts may or may not be closed -N.O.E.M contacts are closed	Flush momentary, non-illuminated	1	**800F-AFL1**
 *Cat. No. 800F-AEL1*		Extended momentary, non-illuminated		**800F-AEL1**
 *Cat. No. 800F-AML1*		Momentary mushroom		**800F-AML1**
 *Cat. No. 800F-AML2*		Maintained mushroom		**800F-AML2**

	Description	Lock Position	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-ASL2L*	**Selector Switch Locking Attachment** Locks standard knob selector switch in specified position	2-position selector switches, left lock	1	**800F-ASL2L**
		3-position selector switches, center lock		**800F-ASL3C**
 *Cat. No. 800F-ASL23A*	**Selector Switch Locking Attachment** Ability to put two locks on standard knob selector switch.	2- or 3-position selector switches, all positions		**800F-ASL23A**

	Description	Type	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-AL01*	**Locking Cover** Used on flush, extended and guarded momentary and alternate action operators, and standard knob selector switch operators.	—	1	**800F-AL01**

Other Accessories

	Description	PQ	Key No. (Std)	Cat. No.	Key No. (Std)	Cat. No.
 *Cat. No. 800F-AKR3825*	**Replacement Ronis Key** Standard replacement key is Cat. No. 800F-AKR3825.	1❄	3825	**800F-AKR3825**	3910∗	**800F-AKR3910**
			455	**800F-AKR455**	3920∗	800F-AKR3920
			3801	**800F-AKR3801**	4001	**800F-AKR4001**
			3802	**800F-AKR3802**	4002	800F-AKR4002
			3803	**800F-AKR3803**	4003	800F-AKR4003
			3804	800F-AKR3804	4004	800F-AKR4004
			3805	800F-AKR3805	4005	800F-AKR4005
			3806	800F-AKR3806	4006	800F-AKR4006
			3901∗	**800F-AKR3901**	4007	800F-AKR4007

	Description	Volts	PQ	Cat. No.
 *Cat. No. 800F-XD7*	**Diode Module** For lamp checking circuits. Latch not included.	up to 600V AC	10‡	**800F-XD7**
	Null Block For wire terminations only.			800F-NX70

	Description	PQ	Cat. No.
 *Cat. No. 800F-30WN*	**Potentiometer Legend Plate** Scale 1…10	10‡	**800F-30WN**
 *Cat. No. 800F-30WG*	**Potentiometer Legend Plate** Graphical scale		**800F-30WG**

	Description	Resistance	PQ	Cat. No.
 *Cat. No. 800F-AC1*	**Replacement Resistive Elements** for the 800FP Potentiometer operator.	150 Ω	1	800F-AC1
		500 Ω		800F-AC2
		1000 Ω		800F-AC3
		2500 Ω		800F-AC4
		5000 Ω		**800F-AC5**
		10000 Ω		**800F-AC6**

PQ = Pkg. Quantity
∗ Master key. See page 10-83 for details.
❄ Standard package quantity is one set with two keys.
‡ Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.

Replacement Lamps for Incandescent Module

Lamp	Type	Typical Current	Voltage	ANSI No.	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-N130*	Full Voltage Incandescent	150 mA	6V AC/DC	755	10§	**800F-N65**
		80 mA	12V AC/DC	756		800F-N141
		70 mA	24V AC/DC	757		**800F-N157**
		50 mA	48V AC/DC	1835		**800F-N48**
		22 mA	130V AC/DC	949		**800F-N130**
 *Cat. No. 800F-N240*	Neon	2 mA	240V AC	—		**800F-N240**
	LED	50 mA	6V AC/DC	—		♣ 800T-N318x
		12 mA/17 mA	32V AC/DC	—		♣ 800T-N363x
		9 mA/14 mA	48V AC/DC	—		♣ 800T-N364x
		4.5 mA/6.2 mA	130V AC/DC	—		♣ 800T-N321x

§ Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.
♣ To complete the cat. no., replace the **x** with one of the following letters for the desired color: **A** = Amber; **B** = Blue; **G** = Green; **R** = Red; **W** = White. White LEDs only available in 6V and 130V.

Caps, Diffusers, Lenses

Color caps listed below are for completion of devices ordered with color caps omitted.

Accessory Color Caps (without Text)



Color	Pkg. Quantity	Color Caps, Non-Illuminated∗ Momentary Extended Cat. No.	Momentary Flush/Guarded Cat. No.	Alternate Action Flush Cat. No.
Orange	10	800F-AE0	800F-AF0	800F-AFA0
White		**800F-AE1**	**800F-AF1**	800F-AFA1
Black		**800F-AE2**	**800F-AF2**	800F-AFA2
Green		**800F-AE3**	**800F-AF3**	**800F-AFA3**
Red		**800F-AE4**	**800F-AF4**	800F-AFA4
Yellow		**800F-AE5**	**800F-AF5**	800F-AFA5
Blue		**800F-AE6**	**800F-AF6**	800F-AFA6
Grey		—	**800F-AF8**	—

Accessory Color Caps — Multi-Function Operators (without Text)



Color	Pkg. Quantity	Color Caps, Non-Illuminated∗ Flush Cat. No.	Extended Cat. No.
White	10	800F-AFU1	**800F-AEU1**
Black		800F-AFU2	**800F-AEU2**
Green		800F-AFU3	800F-AEU3
Red		800F-AFU4	800F-AEU4
Yellow		800F-AFU5	800F-AEU5
Blue		800F-AFU6	800F-AEU6

Accessory Color Lens Caps and Pilot Light Lenses (without Text)



Color	Pkg. Quantity	Illuminated Color Lens Caps∗❄ — Flush, Alternate Action Cat. No.	Illuminated Color Lens Caps∗❄ — Extended, Guarded Cat. No.	Pilot Light Lenses∗❄ — Standard Lens Cat. No.
Amber	10	**800F-ALF0**	**800F-ALE0**	**800F-AP0**
Green		**800F-ALF3**	**800F-ALE3**	**800F-AP3**
Red		**800F-ALF4**	**800F-ALE4**	**800F-AP4**
Yellow		**800F-ALF5**	**800F-ALE5**	**800F-AP5**
Blue		**800F-ALF6**	800F-ALE6	**800F-AP6**
Clear		**800F-ALF7**	**800F-ALE7**	**800F-AP7**

∗ Sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.
❄ Includes diffuser.

Operator Diffusers (without Text)



Cat. No. 800F-AD3

Description	Pkg. Quantity	Diffusers Cat. No.
Illuminated Push Buttons — Flush	10	**800F-AD2**
Pilot Lights		**800F-AD3**
Illuminated Push Buttons — Extended, Guarded		800F-AD4

Two-Color Molded Legend Caps — Non-Illuminated Push Buttons

800F – AF 3 01
a b c



Cat. No. 800F-15YSE112

a

Button Cap Type	
Code	Description
AF	Flush
AE	Extended

b

Color Cap	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue

c

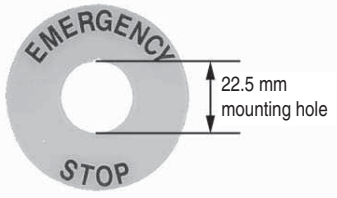
Legend Text❄‡	
English	
Code	Description
01	START
02	STOP
05	O
06	I
08	→
09	FORWARD✶
10	REVERSE✶
11	R

✶ Available in flush only.
❄ White and yellow caps have black text. All other color caps have white text.
‡ Valid color cap text codes include:

Color	Text	
	Flush Caps	Extended Caps
White	FORWARD, REVERSE, START, I, →, R	→, R
Black	FORWARD, REVERSE, →, R	STOP, O, →, R
Green	FORWARD, REVERSE, START, I, →	→
Red	FORWARD, REVERSE, STOP, O, →	STOP, O, →
Yellow	FORWARD, REVERSE, →	→
Blue	FORWARD, REVERSE, →, R	→, R

Emergency Stop Legend Plates§

800F – 15YS
a b



a

Size/Color (Yellow)	
Code	Description
15Y	60 mm round (30.5 mm mounting hole)
15YS	60 mm round (22.5 mm mounting hole)➢
16Y	90 mm round (22.5 mm mounting hole)➢

b

Text	
Code	Description
Blank	No text
E112	EMERGENCY STOP
F112	ARRÊT D'URGENCE⌘
S112	PARADA DE EMERGENCIA
G112	NOT HALT
T112	ARRESTO EMERGENZA
N112	NÖDSTOPP, EMERGENCY STOP⌘

b (cont'd)

Text	
Code	Description
W112	NØDSTOPP, EMERGENCY STOP⌘
A112	NØDSTOP
B112	EMERGENCY STOP, ARRÊT D'URGENCE, PARADA DE EMERGENCIA⌘
D112	NOODSTOP⌘
M112	NOT HALT, ARRESTO EMERGENZA, ARRÊT D'URGENCE✦
	EMERGENCY STOP, ARRÊT D'URGENCE, NOT HALT❖
L112	NEYÐARSTOPP, NEYÐARSTOPP⌘
H112	NÖD-STOP, HÄTÄ-SEIS, NÖD-STOP⌘

§ Sold only multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.
➢ Not for use with base mounted contact blocks.
⌘ Not available on 15YS version.
✦ Text printed on the 15Y version only.
❖ Text printed on the 15YS & 16Y versions only.

Legend Plates

Ordering Information∗❄§

Standard Text/Symbols

1. Select the cat. no. for the appropriate legend size and color from the Selection Tables on this page.
2. Complete the cat. no. by adding the appropriate suffix no. selected from pages 10-116…10-119. Font size is automatically determined by the number of characters, as shown in the following table. Do not add the font code to the cat. no.

Font Size	No. of Characters		
	One-Piece Legend Plate	Two-Piece Legend Plate	Special Multi-Function Legend Plate
K (small)	>14	>13	>6
S (standard)	≤14	≤13	≤6

Example: **Cat. No. 800F-11WE101** identifies a white, 30 x 40 mm snap-in legend plate and frame with AUTO engraved on it.



Custom Text (text found on pages 10-116…10-119)

1. Select the cat. no. for the appropriate legend size and color from the Selection Tables on this page.
2. Add **E100** followed by the font code (K, S, L) from the following table.

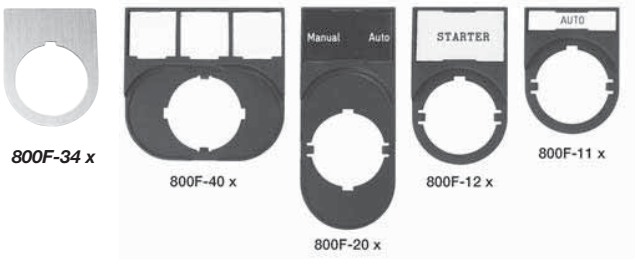
Font Size	Type of Legend Plate							
	One-Piece			Two-Piece			Special Multi-Function	
	Max. Char. per Line	Max. No. of Lines		Max. Char. per Line	Max. No. of Lines		Max. Char. per Line	Max. No. of Lines
		30 x 40 mm	30 x 50 mm		30 x 40 mm	30 x 50 mm or 30 x 60 mm		
K (small)	16	2	5	15	2	5	7	3
S (standard)	14	2	3	13	1	3	6	3
L (large)	10	1	3	9	1	3	4	2

3. Complete the cat. no. by adding custom text to the order item's memo text or notes field.

Example: **Cat. No. 800F-12WE100K**, with **STARTER** text entered into memo text on order, identifies a white, 30 x 50 mm snap-in legend plate and frame with custom text STARTER engraved in small font.



Selection Tables♣



Type	Description	Cat. No. (Blank)	Cat. No. (with Text Symbols)
30 x 40 mm 2-piece snap-in plate and frame	Red with white text	800F-11RE100	800F-11R❑❑❑❑
	White with black text	**800F-11WE100**	800F-11W❑❑❑❑
	Black with white text	**800F-11BE100**	800F-11B❑❑❑❑
	Aluminum with black text	800F-11AE100	800F-11A❑❑❑❑
30 x 50 mm 2-piece snap-in plate and frame	White with black text	**800F-12WE100**	800F-12W❑❑❑❑
	Black with white text	**800F-12BE100**	800F-12B❑❑❑❑
	Aluminum with black text	800F-12AE100	800F-12A❑❑❑❑
30 x 60 mm 2-piece snap-in plate and frame	White with black text	800F-20WE100	800F-20W❑❑❑❑
	Black with white text	800F-20BE100	800F-20B❑❑❑❑
	Aluminum with black text	800F-20AE100	800F-20A❑❑❑❑
Special multi-function 4-piece snap-in plates and frame	White with black text	800F-40WE100	—
	Black with white text	800F-40BE100	—
	Aluminum with black text	800F-40AE100	—
30 x 40 mm 1-piece	Red with white text	800F-34RE100	800F-34R❑❑❑❑
	White with black text	**800F-34WE100**	800F-34W❑❑❑❑
	Black with white text	**800F-34BE100**	800F-34B❑❑❑❑
	Aluminum with black text	**800F-34AE100**	800F-34A❑❑❑❑
30 x 50 mm 1-piece	Red with white text	**800F-35RE100**	800F-35R❑❑❑❑
	White with black text	**800F-35WE100**	800F-35W❑❑❑❑
	Black with white text	**800F-35BE100**	800F-35B❑❑❑❑
	Aluminum with black text	**800F-35AE100**	800F-35A❑❑❑❑
30 x 40 mm snap-in plate only	Red with white text	800F-17RE100	800F-17R❑❑❑❑
	White with black text	**800F-17WE100**	800F-17W❑❑❑❑
	Black with white text	800F-17BE100	800F-17B❑❑❑❑
	Aluminum with black text	800F-17AE100	800F-17A❑❑❑❑
30 x 50 mm snap-in plate only	White with black text	800F-18WE100	800F-18W❑❑❑❑
	Black with white text	**800F-18BE100**	800F-18B❑❑❑❑
	Aluminum with black text	800F-18AE100	800F-18A❑❑❑❑
Special multi-function snap-in plate only‡	White with black text	800F-42WE100	800F-42W❑❑❑❑
	Black with white text	800F-42BE100	800F-42B❑❑❑❑
	Aluminum with black text	800F-42AE100	800F-42A❑❑❑❑
30 x 66 mm 1-piece	Yellow with black text	800F-37YE100	800F-37Y❑❑❑❑

Legend Plate Frame — 2-Piece Snap-In∗			
Type	Cat. No.	Type	Cat. No.
30 x 40 mm	**800F-110**	30 x 60 mm	**800F-200**
30 x 50 mm	**800F-120**	Special multi-function‡	800F-400

∗ Blank legend frames sold only in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces. Legends with standard text/symbols or custom text are packaged in quantities of 1.
❄ Font code **K** = 0.08 in; font code **S** = 0.10 in; font code **L** = 0.14 in.
‡ Three snap-in plates are required for each legend frame.
§ For configuration assistance, see RAISE product selection software.
♣ Plate dimensions found on pages 10-122…10-123.

Custom Laser-Engraved Caps and Diffusers

Ordering Information∗❄§

Standard Text/Symbols

1. Select the cat. no. for the appropriate product and color from the Configurator Tables on this page.
2. Complete the cat. no. by adding the appropriate suffix no. selected from pages 10-116…10-119.

Example: **Cat. No. 800F-AF3CE166** identifies a flush, green cap with custom-engraved text ON.

3. Font size is automatically determined by the number of characters. ‡ Do not add a font code to the cat. no.

Font Size	No. of Characters
12 pt.	7
16 pt.	5…6
20 pt.	1…4

Custom Text (text found on pages 10-116…10-119)

1. Select the cat. no. for the appropriate product and color from the Configurator Tables on this page.
2. Add **E100** followed by the font code (G, H, J), based on the number of custom characters.
3. Complete the cat. no. by adding custom text to the order item's memo text or notes field.

Example: **Cat. No. 800F-AF3CE100J**, with **FILL** text entered into memo text on order, identifies a flush, green push button cap with custom laser-engraved text FILL in large font.

Font Size	No. of Characters	Max. No. of Lines
G (small) (12 pt.)	7	1
H (standard) (16 pt.)	5…6	1
J (large) (20 pt.)	1…4	1

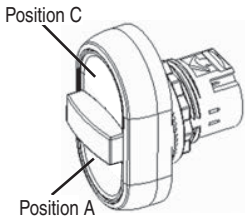
Custom Symbols/Graphics (symbols found on page 10-116)

1. Select the cat. no. for the appropriate product and color from the Configurator Tables on this page.
2. Add U100 to identify the custom symbol or graphic.
3. Please contact your local Allen-Bradley sales office to submit the graphic.

Example: **Cat. No. 800F-AD3CU100**

∗ Package quantity of one for all laser-engraved caps and diffusers.
❄ Standard font is Arial Narrow.
‡ Seven characters maximum allowable.
§ For configuration assistance, see RAISE product selection software.

Configurator Tables



Multi-Function Cap Positions

Push Button, Multi-Function Caps

800F – A F (*a*) 1 (*b*) C 

a

Type	
Code	**Description**
E	Push button extended cap
F	Push button flush cap
FA	Alternate action cap
FAU	Multi-function flush cap (for position A)
EAU	Multi-function extended cap (for position A)
FCU	Multi-function flush cap (for position C)
ECU	Multi-function extended cap (for position C)

b

Color	
Code	**Description**
0	Amber
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue

Pilot Light Diffuser

800F – AD3C

Illuminated Push Button Diffusers

800F – AD2C **(Flush or Alternate Action)**

800F – AD4C **(Extended and Guarded)**



10

Legend Texts

Standard Symbols∗

Marking	Description	Std.	Suffix No.
(Blank)	Blank	—	U100
	—	—	U112
	START❄‡§♣	ISO 71	U219
	—❄‡§♣	ISO 72	U220
	START❄‡§♣	ISO 5232	U221
	CONTINUOUS MOTION LEFT, RIGHT➢	—	U226
	CONTINUOUS MOTION UP, DOWN➢	—	U227
O	STOP	—	U228
I	STEP 1	—	U229
II	STEP 2	—	U230
O-I	STOP-START➢	—	U231
I-O	START-STOP➢	—	U232
I-II	—➢	—	U233
I-O-II	—➢	—	U234
-O-I	—➢	—	U236
-O-	—➢	—	U237
I-II-III	—➢	—	U240
	CONTINUOUS MOTION	—	U241
	CONTINUOUS MOTION	—	U242
	CONTINUOUS MOTION	—	U243
III	STEP 3	—	U249
O-	—➢	—	U256
I-O-I	START-STOP-START➢	—	U282
0-1-2	—➢	—	U285
IV	STEP 4	—	U604
V	STEP 5	—	U605
	CONTINUOUS MOTION	ISO 1	U700
	LINEAR MOTION TWO DIRECTIONS	ISO 2	U701
	VERTICAL MOTION	—	U702
	INTERRUPTED MOTION❄§	—	U703
	LIMITED MOTION❄§	ISO 4	U704
	LIMITED MOTION AND RETURN❄§	ISO 5	U705
	OSCILLATING MOTION, CONTINUOUS CYCLE❄§	—	U706
	CONTINUOUS ROTATION TO RIGHT❄§	DIN 100, ISO 7A	U707

Marking	Description	Std.	Suffix No.❄§
	CONTINUOUS ROTATION TO LEFT	ISO 7B	U708
	INTERRUPTED ROTATION TO LEFT	—	U710
	INTERRUPTED ROTATION TO RIGHT	—	U711
	DIRECTION OF SPINDLE SPEED	—	U717
	FEED	ISO 16	U720
	REDUCED SPEED	—	U723
	RAPID FEED	—	U724
	NORMAL FEED	—	U725
	LONGITUDINAL FEED	—	U726
	TRANSVERSE FEED	—	U727
	RAPID TRANSVERSE	ISO 26	U728
	THREADING	—	U729
	INCREASE	ISO 28	U730
	DECREASE	ISO 29	U731
	CONVENTIONAL MILLING	—	U736
	CLIMB MILLING	—	U737
	ELECTRIC MOTOR	ISO 41	U800
	TURNING SPINDLE	—	U803
	DRILLING SPINDLE	—	U804
	MILLING SPINDLE	—	U805
	GRINDING SPINDLE	—	U806
	PUMP	ISO 48	U807
	COOLANT PUMP	—	U808
	LUBRICATION PUMP	—	U809
	HYDRAULIC SYSTEMS PUMP	—	U810
	HYDRAULIC MOTOR	—	U811
	TRACER	—	U812
	SHEAR PIN CONSTRUCTION	ISO 91	U850
	ATTENTION/DANGER	DIN 131, ISO 92	U851
	CAUTION	ISO 93	U852
	MAIN SWITCH	ISO 94	U853
	ACOUSTIC WARNING EQUIPMENT	DIN 155	U854
—	—	—	—

∗ Items in grey shaded table cells only available on legend plates. Not available as laser-engraved text on button caps, illuminated push button diffusers, or pilot light diffusers.
❄ Not available on -11 or -17 legend plates.
‡ Not available on -12, -18, or -20 legend plates.
§ Not available on -34 legend plates.
♣ Not available on -35 legend plates.
➢ Not available on -42 legend plates.

Standard Symbols, Continued

Marking	Description	Std.	Suffix No.❄§
	SETUP	DIN 986	U855
	COOLANT FLUID	ISO 101	U875
	LIGHT	ISO 139, 102	U876
	WEIGHT	—	U877
	REFILLING	DIN 256, ISO 104	U878
	FULL LEVEL	—	U879
	DRAIN	DIN 257, ISO 106	U880
	OVERFLOW	DIN 258, ISO 105	U881
	OIL LUBRICATION	DIN 175, ISO 107	U882
	BLOWING UNIT	DIN 263, ISO 108	U883
	SUCTION UNIT	DIN 264, ISO 109	U884
	STEPLESS OPERATION	ISO 61	U900
	CLAMP OR TIGHTEN	ISO 63A	U901
	CLAMP OR TIGHTEN	—	U902
	LOOSEN	ISO 64A	U903
	LOOSEN	—	U904
	BRAKE ON	ISO 65	U905
	BRAKE RELEASE	ISO 66	U906
	AUTO CYCLE	—	U907
	MANUAL	DIN 35	U908
	START	ISO 69	U909
	STOP	ISO 70	U910
	TAKE ACTION WHEN CONTROL IS OPERATING	—	U912
	ENGAGE	DIN 46, ISO 74	U913
	DISENGAGE	DIN 45, ISO 75	U914
	ENGAGE TRACE	—	U917
	DISENGAGE TRACE	—	U918
	CHANGE SPEED ONLY IN STOPPED POSITION	—	U919
	CHANGE SPEED ONLY WHEN IN MOTION	—	U920
	CONTINUOUS ADJUSTMENT	ISO 62	U921
	AUTOMATIC OR SEMIAUTOMATIC CYCLE	DIN 267	U922
R	RESET	—	U924

❄ Not available on -11 or -17 legend plates.
§ Not available on -34 legend plates.

10

Legend Texts, Continued

Standard Text∗

English

Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.
(Blank)	E100	FOR-OFF-REV➢	E261	LAST STOP	E278	PULL TO RESET	E176	START	E208
I-O-AUTO§♣➢	E235	FOR-REV➢	E253	LEFT	E145	PUMP STOP	E290	START CYCLE	E209
ACCU-STOP➢	E284	FOR-STOP-REV➢	E254	LEFT-RIGHT➢	E146	PURGE	E271	START-JOG➢	E210
AT SPEED	E285	FORWARD	E120	LOCAL-REMOTE➢	E147	PUSH TO STOP	E179	START-STOP➢	E211
AUTO	E101	FORWARD-AUTO-REVERSE➢	E121	LOW	E148	PUSH TO STOP-TWIST OR PULL, RELEASE❄§➢	E262	STOP	E212
AUTO-O-HAND§♣➢	E250			LOW-HIGH➢	E149			STOP-CYCLE➢	E213
AUTO-HAND➢	E102	FORWARD-OFF-REVERSE➢	E122	LOW-OFF-HIGH➢	E150	PUSH-TO-TEST	E181	STOP-RESET➢	E214
AUTO-MAN-OFF➢	E103			LOW SPEED	E151	RAISE	E182	STOP-START➢	E215
AUTO-MANUAL➢	E286	FORWARD-STOP-REVERSE➢	E123	LOWER	E152	RAISE-LOWER➢	E183	SUMMER-OFF-WINTER➢	E216
AUTO-OFF-HAND➢	E104			LOW-OFF-RAISE➢	E153	RAISE-OFF-LOWER➢	E184		
BLOWER	E268	FORWARD-REVERSE➢	E124	LOWER-RAISE➢	E154	READY	E185	SUMMER-WINTER➢	E217
BRAKE	E105			MANUAL	E155	RESET	E186	SUPPLY ON	E218
BYPASS-OFF-DRIVE§♣➢	E297	FULL SPEED	E125	MAN-O-AUTO§♣➢	E238	RETURN	E187	TEST	E219
BYPASS ON§♣➢	E295	HAND	E126	MAN-AUTO➢	E258	REV-FOR➢	E260	TRANSFER➢	E220
BYPASS START§♣➢	E299	HAND-I-AUTO§♣➢	E239	MANUAL-AUTO➢	E156	REVERSE	E188	TRIP	E221
BYPASS STOP§♣➢	E298	HAND-O-AUTO➢	E283	MAN-OFF-AUTO➢	E259	REVERSE-FORWARD➢	E189	UNCLAMP	E222
CLAMP	E106	HAND-AUTO➢	E127	MANUAL-OFF-AUTO➢	E157			UP	E223
CLOSE	E107	HAND-OFF-AUTO➢	E128	MOTOR RUN	E158	REVERSE-OFF-FORWARD➢	E190	UP-DOWN➢	E224
CYCLE START	E108	HAND OFF	E264	MOTOR RUNNING	E159			UP-OFF-DOWN➢	E225
DECREASE➢	E109	HAND ON	E263	MOTOR START	E160	RIGHT	E191		
DRIVE-START➢	E287	HAND START	E265	MOTOR STOP	E161	RIGHT-LEFT➢	E192		
DRIVE-STOP➢	E288	HAND STOP	E266	MOTOR STOPPED	E162	ROTATE CW	E246		
DOWN	E110	HEAT	E270	NO FLIP	E275	ROTATE CCW	E247		
DOWN-OFF-UP➢	E111	HIGH	E129	OFF	E163	RUN	E193		
DRIVE ON§♣➢	E296	HIGH-LOW➢	E130	OFF CIRCUIT	E244	RUN-JOG➢	E194		
EMERG STOP	E251	HIGH-OFF-LOW➢	E131	OFF-COOLANT-ON➢	E164	RUN-SAFE-JOG➢	E195		
EMERGENCY➢	E248	IN	E132	OFF-LIGHT-ON➢	E272	RUNNING	E243		
EMERGENCY OFF➢	E294	IN-OUT➢	E133	OFF-ON➢	E165	SAFE	E196		
EMERGENCY STOP➢	E112	INCH	E134	ON	E166	SAFE-RUN➢	E197		
ENABLE	E279	INCH-REV➢	E257	ON CIRCUIT	E245	SETUP	E198		
ENTER	E277	INCH-REVERSE➢	E135	ON-OFF➢	E167	SETUP-RUN➢	E302		
ERROR	E273	INCH-RUN➢	E136	ON-OFF-AUTO➢	E168	SETUP-SERVICE➢	E199		
EXHAUSTER➢	E269	INCREASE➢	E137	ON-STOP-SAFE➢	E169	SEQUENCE-TEST➢	E200		
FAULT	E113	INSPECT	E274	OPEN	E170	SLOW	E201		
FAST	E114	JOG	E138	OPEN-CLOSE➢	E171	SLOWER	E202		
FAST-OFF-SLOW➢	E289	JOG-FOR➢	E255	OPEN-OFF-CLOSE➢	E172	SLOWEST	E203		
FASTER	E115	JOG-FORWARD➢	E139	OUT	E173	SLOW-FAST➢	E204		
FEED START	E116	JOG-OFF-RUN➢	E140	OVERLOAD➢	E267	SLOW-OFF-FAST➢	E205		
FEED STOP	E117	JOG-REV➢	E256	OVERLOAD TRIP➢	E174	SLOW-STOP-FAST➢	E206		
FEEDER OFF	E118	JOG-REVERSE➢	E141	OVERLOAD RESET➢	E175	SLOW-OFF-START➢	E207		
FEEDER ON	E119	JOG-RUN➢	E142	POWER OFF	E177	SLOW SPEED	E291		
FIFO	E276	JOG-SAFE-RUN➢	E143	POWER ON	E178	SOFT STOP	E292		
FOR-AUTO-REV➢	E252	JOG-STOP-RUN➢	E144	PULL TO START	E180	SPEED	E293		

∗ Items in grey shaded table cells only available on legend plates. Not available as laser-engraved text on button caps, illuminated push button diffusers, or pilot light diffusers.

❄ Not available on -11 or -17 legend plates.

§ Not available on -34 legend plates.

♣ Not available on -35 legend plates.

➢ Not available on -42 legend plates.

Legend Texts, Continued

Standard Text, Continued*

French

Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.
A-COUPS	F138	AVANT-ARRÊT-ARRIÈRE➢	F122	DESCENDRE➢	F110	HORS MANUEL	F249	MARCHE-ARRÊT➢	F211
ACCU-STOP➢	F280			DROIT	F191	LENT	F201	MONTER	F182
ARRIÈRE	F188	AVANT-ARRIÈRE➢	F124	EN	F247	LENT-ARRÊT-VITE➢	F205	OUVRIR	F170
ARRÊT	F163	AV-ARR➢	F290	EN CIRCUIT	F245	M FORCEE	F284	PANNE	F113
ARRÊT D'ENTR	F289	AV-HORS-ARR➢	F253	EN MANUEL	F250	MANUEL	F126	RAP-HORS-LENT➢	F285
ARRÊT DOUX	F288	BAS	F148	FERMER	F107	MANUEL-ARRÊT-AUTO➢	F128	RAPIDE	F114
ARRÊT D'URGENCE➢	F112	BAS-ARRÊT-HAUT➢	F150	FREINAGE➢	F105			RÉGLER	F198
ARRÊT-MANUEL	F251	DEMAR. D-ENTR	F283	GAUCHE	F145	MANUEL-AUTO➢	F127	SURCHARGE➢	F254
ARRÊT-MARCHE➢	F165	DEMAR.-MAN.	F252	HAUT	F129	MANUEL-HORS-AUTO➢	F157	VARIATEUR ALIMENTÉ§♣➢	F293
ARRÊT POMPE	F286	DÉRIV-ARRÉT-EFN§♣➢	F294	HAUT-HORS-BAS➢	F131			VIT. ATTEINT	F281
AUTO	F101	DÉRIV ARRÉT§♣➢	F295	HORS	F246	MARCHE	F166	VIT. LENTE	F287
AUTO-MANUAL➢	F282	DÉRIV MARCHE§♣➢	F296	HORS CIRCUIT	F244	—	—	VITESSE	F291
AVANT	F120	DÉRIVATION ALIMENTÉ§♣➢	F292	HORS-EN➢	F248	—	—	—	—

Spanish

Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.
ABRIR	S170	ARRANQUE	S166	DERECHA	S191	MARCHA	S208	PARADA-MARCHA➢	S165
ADELANTE➢	S120	ATRÁS	S188	EN SERVICIO➢	S243	MARCHA-PARO➢	S211	PARO	S163
ADELANTE-ATRÁS➢	S124	BAJADA	S152	IZQUIERDA➢	S145	PARADA	S212	SUBIDA	S182
ADELANTE-PARADA-ATRÁS➢	S123	BAJAR	S110	MANUAL	S126	PARADA DE EMERGENCIA➢	S112	SUBIR	S223
		CERRAR	S107	MANUAL-AUTO➢	S127			—	—

German

Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.
AB	G110	EINRICHTEN➢	G198	LANGSAM	G201	ÖFFNEN	G170	VOR	G120
AUF	G223	HAND	G126	LINKS	G145	RECHTS	G191	VOR-AUS-ZURÜCK➢	G122
AUS	G163	HAND-AUS-AUTO➢	G128	LINKS-RECHTS➢	G146	SCHNELL	G114	VOR-ZURÜCK➢	G124
AUS-EIN➢	G165	HAND-AUTO➢	G127	NIEDRIG⌘	G148	SENKEN	G152	ZU	G107
BETRIEB	G243	HEBEN	G182	NIEDRIG-AUS-HOCH➢	G150	STÖRUNG	G113	ZURÜCK	G188
EIN	G166	HOCH	G129	NOT AUS	G112	—	—	—	—

Italian

Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.
ABBASSARE➢	T152	AVANTI-DISINS-INDIETRO➢	T122	DISCESA	T110	IN SERVIZIO➢	T243	MARCIA-ARRESTO➢	T211
ALTO	T129			DISINS-INS➢	T165	LENTO	T201	PREPARARE➢	T198
APRIRE	T223	AVANTI-INDIETRO➢	T124	DISINSERITO➢	T163	MANUALE	T126	RAPIDO	T114
ARRESTO	T212	BASSO	T148	DISTURBO➢	T113	MANUALE-AUTO➢	T127	ROTAZIONE CW➢	T246
ARRESTO EMERGENZA➢	T112	BASSO-DISINS-ALTO➢	T150	EMERGENZA➢	T248	MANUALE-DISINS-AUTO➢	T128	ROTAZIONE CCW➢	T247
		DESTRA	T191	INDIETRO➢	T188			SALITA	T182
AUTOMATICO➢	T101	CHIUDERE➢	T107	INSERITO➢	T166	MARCIA	T208	SINISTRA➢	T145
AVANTI	T120	—	—	—	—	—	—	—	—

Swedish

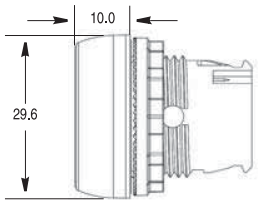
Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.	Marking	Suffix No.
BACK	N188	HÖGER	N191	NERN	110	UPP	N223	VÄNSTER	N145
FRAM	N120	—	—	—	—	—	—	—	—

* Items in grey shaded table cells only available on legend plates. Not available as laser-engraved text on button caps, illuminated push button diffusers, or pilot light diffusers.
§ Not available on -34 legend plates.
➢ Not available on -42 legend plates.
♣ Not available on -35 legend plates.
⌘ Only available on legend plates and AD2 or AD4 diffusers.

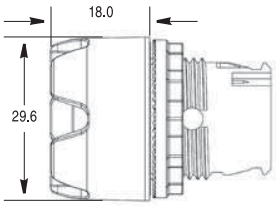
Approximate Dimensions

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes. Refer to RAISE software for additional dimensional information.

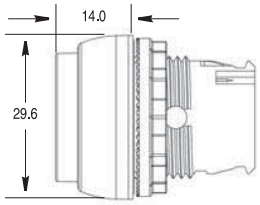
Non-Illuminated and Illuminated Momentary Flush Push Button Operators



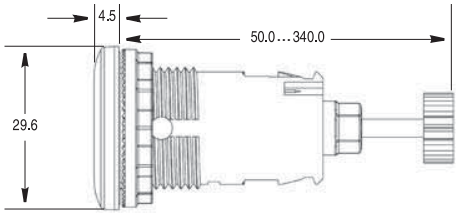
Illuminated Momentary Guarded Push Button Operators



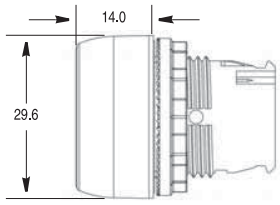
Illuminated and Non-Illuminated Momentary Extended Push Button Operators



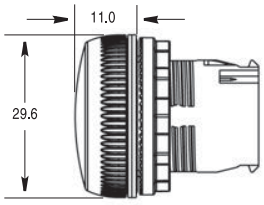
Reset Operators with Reset Rod



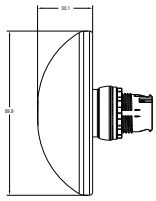
Non-Illuminated Guarded, Illuminated and Non-Illuminated Alternate Action Push Button Operators



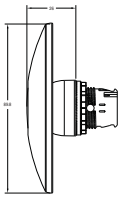
Pilot Light Operators



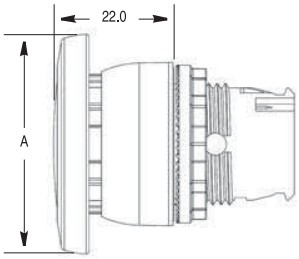
90 mm Half Dome



90 mm Mushroom

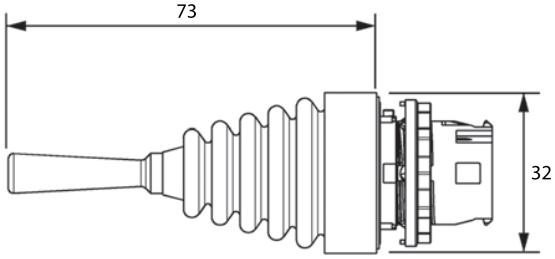


Illuminated and Non-Illuminated Momentary Mushroom Operators 40 mm and 60 mm

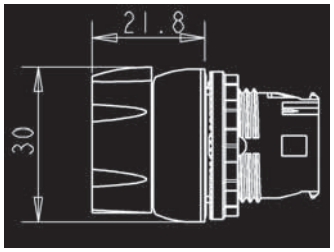


Operator	A
40 mm	39.8
60 mm	59.8

Toggle Switch Operators

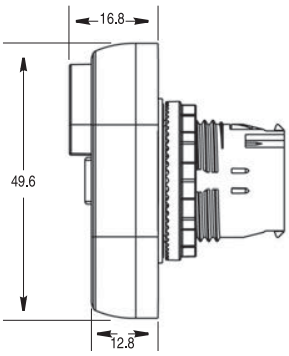


Selector Jog Operators

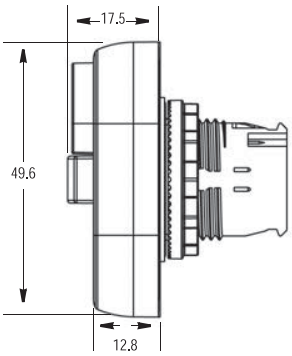


Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes.

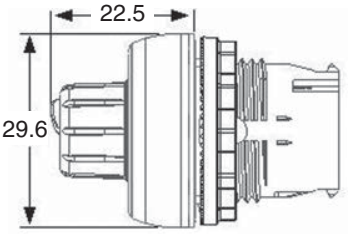
Illuminated and Non-Illuminated 2-Position Multi-Function Operators



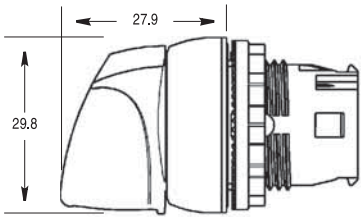
Non-Illuminated 3-Position Multi-Function Operators



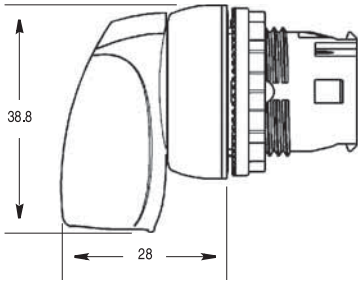
Potentiometer Operator



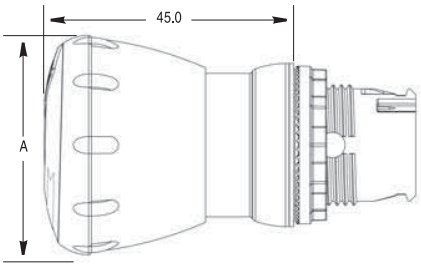
Illuminated and Non-Illuminated Knob Selector Switch Operators



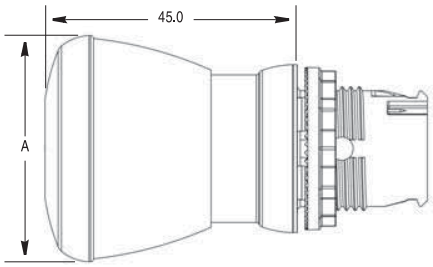
Non-Illuminated Knob Lever Selector Switch Operators



Illuminated and Non-Illuminated Twist-to-Release Operators 30 mm, 40 mm, and 60 mm

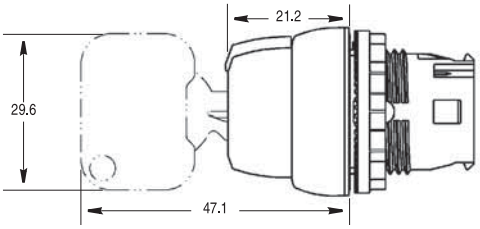


Illuminated and Non-Illuminated Push-Pull Mushroom Operators 30 mm, 40 mm, and 60 mm

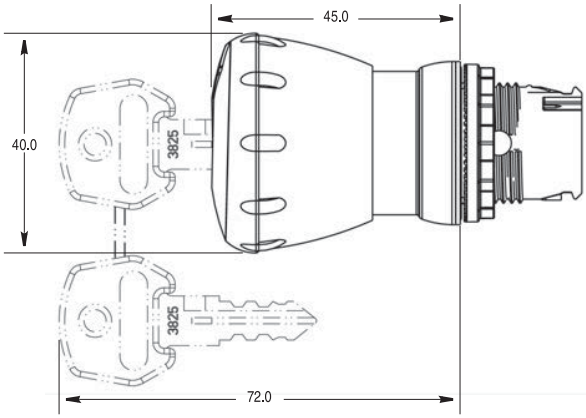


Operator	A
30 mm	30.0
40 mm	40.0
60 mm	60.0

Key Selector Switch and Key Ejected SensEject Operators



Mushroom Key Release Operator 40 mm



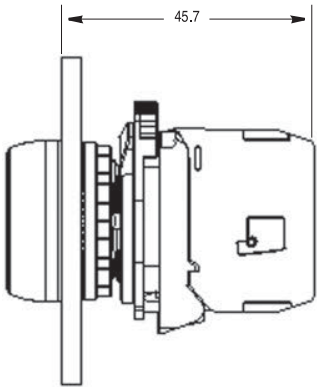
10

22.5 mm Push Buttons

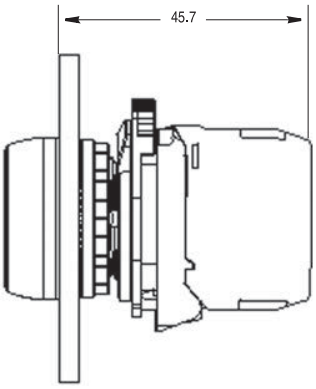
Approximate Dimensions

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes.

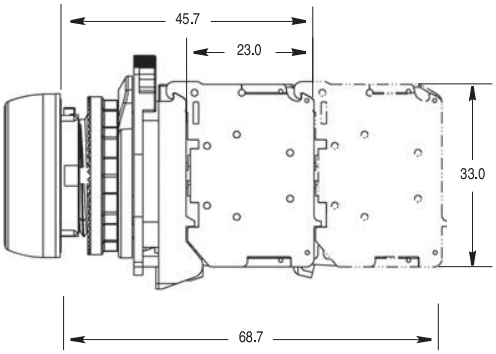
Back-of-Panel Components — Incandescent Module with Latch



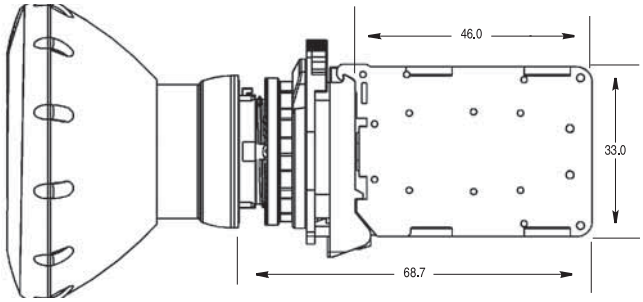
Back-of-Panel Components — LED Module with Latch



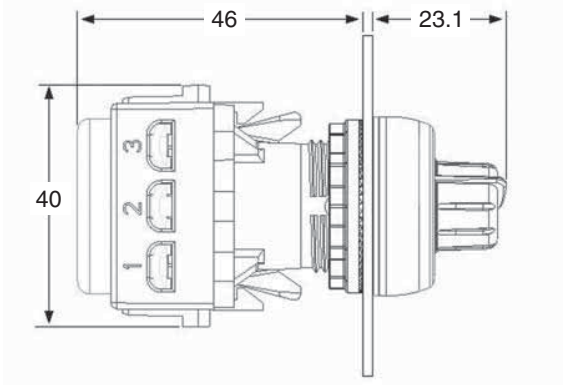
Back-of-Panel Components — Contact Cartridges with Latch



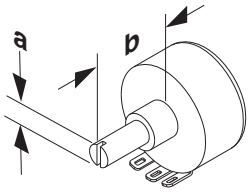
Back-of-Panel Components — Dual Circuit Contact Block or Self Monitoring Contact Block (Max. of 1 Deep)



Potentiometer with Resistive Element



Customer Supplied Resistive Element



	Max.		Min.
a (Ø Dia.)	6.4 (0.252)	5.9 (0.232)	5.7 (0.224)
b (Length)	24 (0.945)	32 (1.26)	14 (0.551)

Dimensions in millimeters (inches).

30 x 40 mm Snap-In Legend Plate

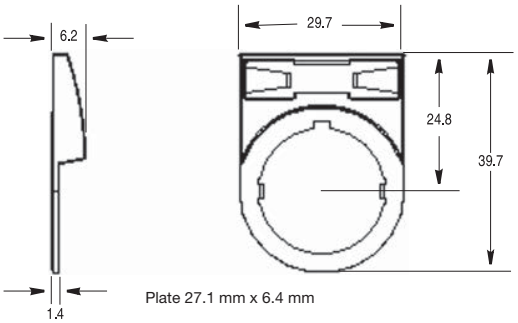


Plate 27.1 mm x 6.4 mm

30 x 50 mm Snap-In Legend Plate

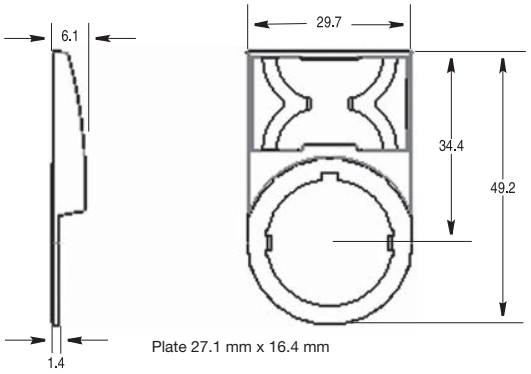
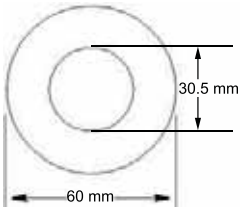


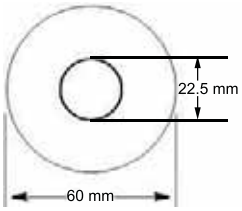
Plate 27.1 mm x 16.4 mm

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes.

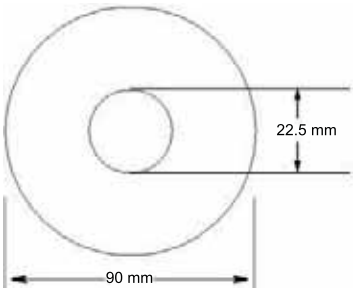
60 mm Round Legend — 15Y



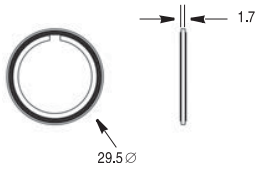
60 mm Round Legend — 15YS



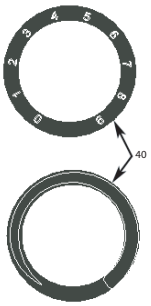
90 mm Round Legend



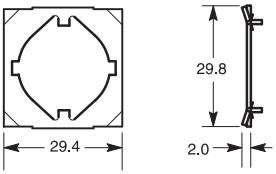
Trim Washer



Potentiometer Legend Plate (Series A)



Anti-Rotation Washer



30 x 60 mm Snap-In Legend Plate

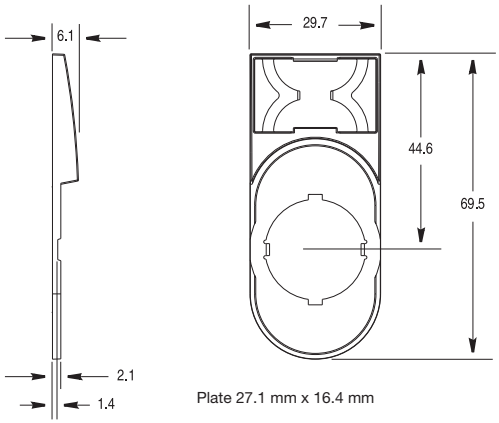
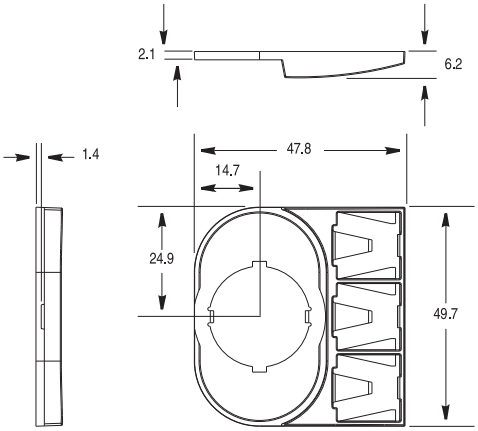
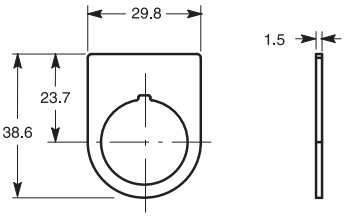


Plate 27.1 mm x 16.4 mm

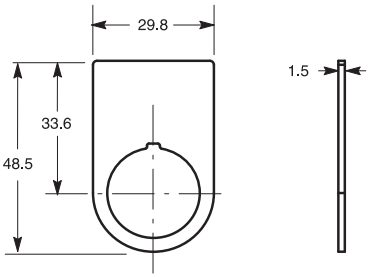
Special Multi-Function Snap-In Legend Plate



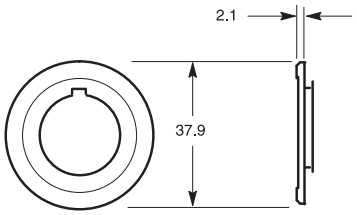
30 x 40 mm One-Piece Legend Plate



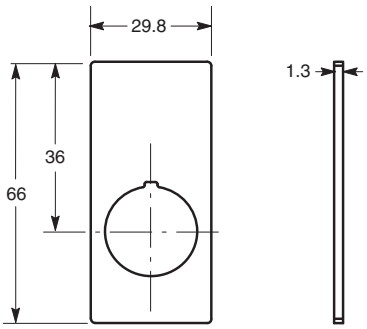
30 x 50 mm One-Piece Legend Plate



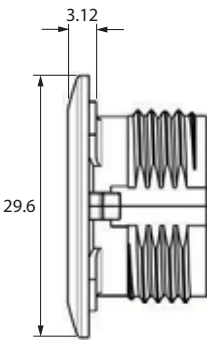
30 mm to 22.5 mm Hole Adapter



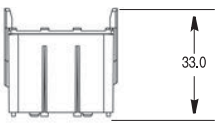
30 x 66 mm One-Piece Legend Plate

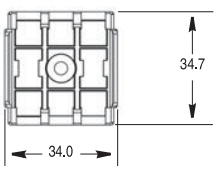


Hole Plug



Base Mount Adapter





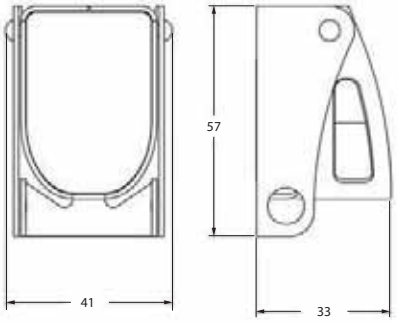
Note: Panel thickness range is 1.0…6.0 mm maximum.
Panel thickness reduced to 4 mm (standard anti-rotation washer) or 5 mm (thin anti-rotation washer) when optional legend plates are used.

22.5 mm Push Buttons

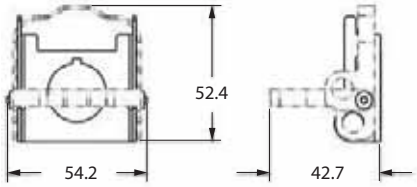
Approximate Dimensions

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes.

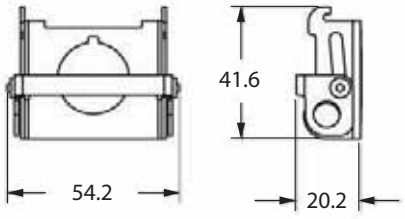
Locking Cover



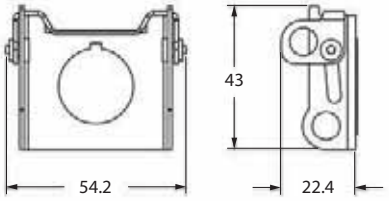
Maintained Mushroom Locking Attachment



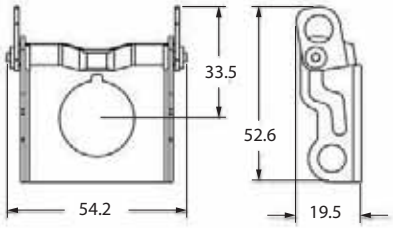
Momentary Mushroom Locking Attachment



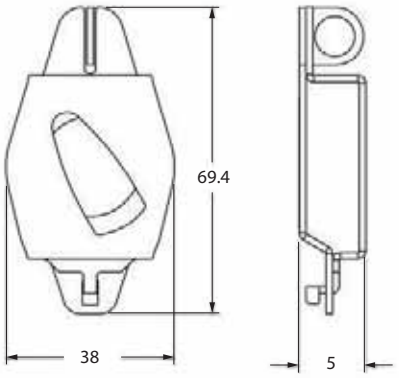
Extended Non-Illuminated Locking Attachment



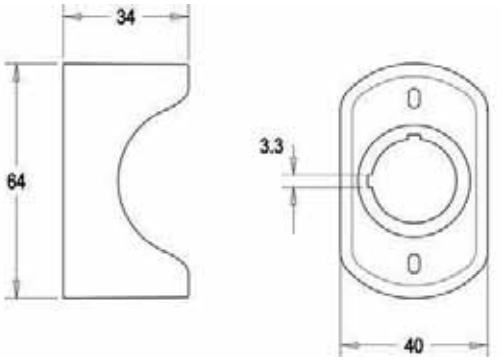
Flush Non-Illuminated Locking Attachment



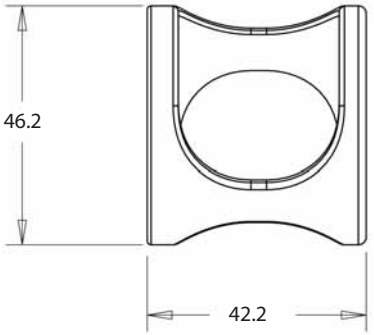
Selector Switch Locking Cover (Same for all Lock Positions)



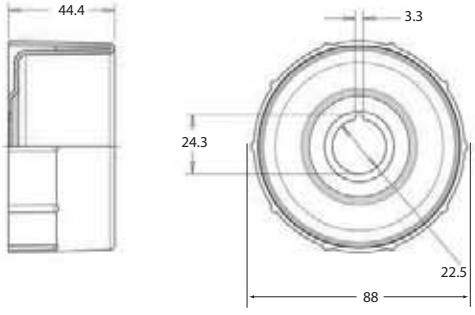
Narrow Guard



Protective Ring



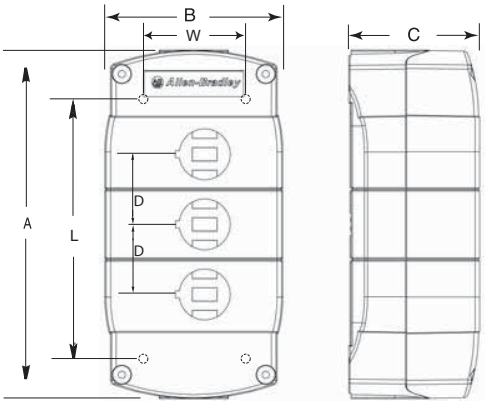
Plastic Guard



10

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes.

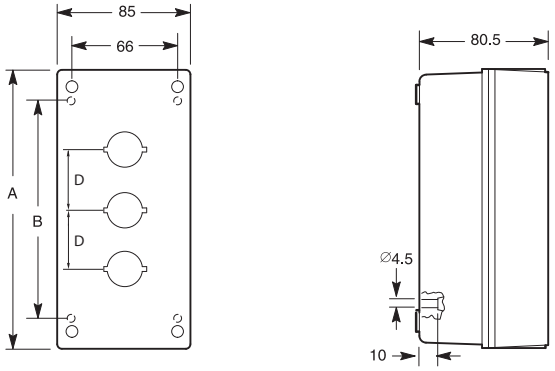
Plastic Enclosures❄



Cat. No.	No. of Holes	A	B	C	D	Mounting Holes W	Mounting Holes L
800F-1P∗	1	85	89	58	—	58	59
800F-1Y∗D		85	89	74	—	58	65
800F-2P∗	2	124	79	58	31	48	102.5
800F-3P∗	3	155	79	58	31	48	133
800F-4P∗	4	186	79	58	31	48	164.5
800F-6P∗	6	248	87	64	31	55	224

❄ Mounting screw — pan head with diameter ≤ 7 mm.

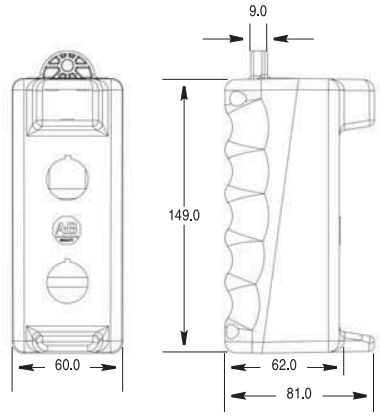
Metal Enclosures



Cat. No.	No. of Units (Holes)	A	B	D
800F-1M∗	1	99	62	—
800F-2M∗	2	137	100	37.5
800F-3M∗	3	174	137	37.5
800F-5M∗	5	249	212	37.5

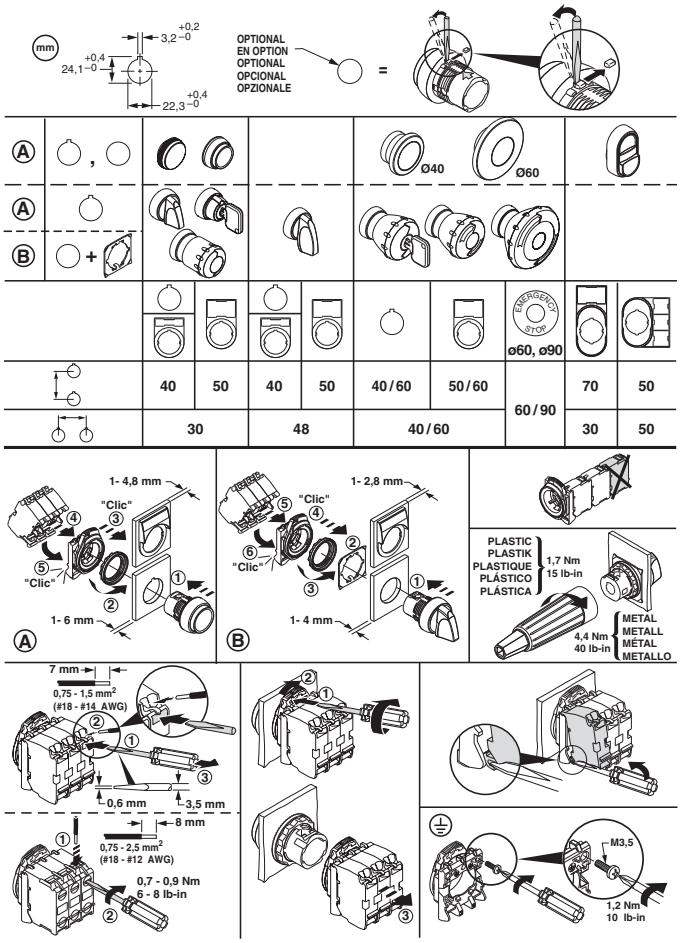
∗ **P** = PG conduit holes or **M** = Metric conduit holes

Pendant Stations



Note: Cable opening = 21.2 mm diameter

Instruction Sheet

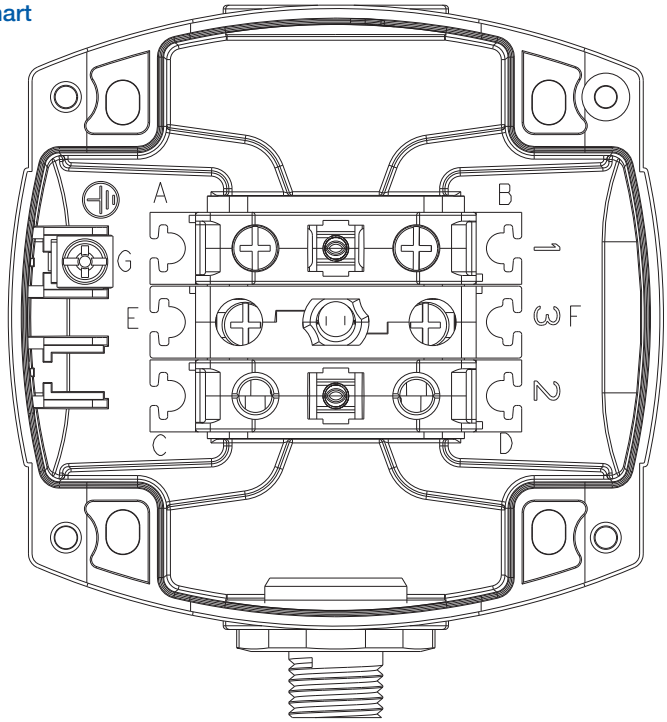


10

22.5 mm Push Buttons

Approximate Dimensions

Assembled Station Pin Out Chart



Cat. No.	Connector Style / No. of Pins	Location 1	A to Pin #	B to Pin #	Location 2	C to Pin #	D to Pin #	Location 3	E to Pin #	F to Pin #	G to Pin #
800F-1YMQ53V	AC Micro / 5-pin	BX01V	1	2	BX01V	4	5	—	—	—	3
800F-1YMQA	AC Micro / 6-pin	BX01	1	5	BX01	2	6	BX10	3	4	—
800F-NX1	DC Micro / 4-pin	BX01	1/4	2/3	—	—	—	—	—	—	—
800F-1YMQ1		BX01	1/4	2/3	—	—	—	—	—	—	—
800F-1YMQ2		BX10V	2	4	BX01V	1	3	—	—	—	—
800F-1YMQ3		BX01V	1	3	BX01V	2	4	—	—	—	—
800F-1YMQ3VEG		BX01V	1	3	BX01V	2	4	—	—	—	—
800F-1YMQ3V	DC Micro / 5-pin	BX01V	1	2	BX01V	4	5	—	—	—	3
800F-1YMQ41	Mini Receptacle / 4-pin	BX01	2	4	—	—	—	—	—	—	—
800F-1YMQ44		BX10	1	J	BX01	2	4	BN3R	3	J	J
800F-1YMQ4	Mini Receptacle / 6-pin	BX10	1	J	BX01	6	5	BN3R	2	J	J
800F-1YMQ5		BX10	1	J	BX01	6	5	BN5R	2	J	J
800F-1YMQ6		BX10	1	J	BX01	6	5	BN7R	2	J	J
800F-1MYMQ4		BX10	1	J	BX01	6	5	BN3R	2	J	J
800F-1MYMQ5		BX10	1	J	BX01	6	5	BN5R	2	J	J
800F-1MYMQ6		BX10	1	J	BX01	6	5	BN7R	2	J	J

J = Jumper



Bulletin 800FC — Configured Pendant Stations

- 3-, 5-, 7-, and 9-button configurations
- 1-, 2-, and 3-speed push buttons
- IP66, NEMA Type 4/4X/13
- Finger-safe contact blocks
- Buttons are flush-mounted with the enclosure to reduce accidental operation
- Use of standard Bul. 800F extended push buttons
- Electrical and mechanical interlocks

Bulletin 800FP — 1-, 2-, and 3-Speed Operators

- IP65/IP66, NEMA Type 4/4X/13
- Engineering grade thermoplastics
- Chemical-resistant for harsh environments
- Booted operator

Mechanical Interlock

- 1-, 2-, and 3-speed operators
- Screw-down mounting
- 3-across x 1 deep contact blocks
- Snap-down contact blocks
- Bifurcated and Quad Connect contact blocks
- Color-coded contact blocks

Table of Contents

Product Selection 10-128
Catalog Number Explanation 10-132
Accessories..... 10-134
Specifications..... 10-136
Approximate Dimensions ∗..... 10-138

Product Certifications

Certifications	UR/UL, CSA, CCC, CE
Standards Compliance	NEMA ICS-5, UL 508, CSA C22.2 No. 14, EN ISO 13850, EN 60947-1, EN 60947-5-1, EN 60947-5-5
Terminal Identification	EN/IEC 60947-1
RoHS	✓

Operator Mounting - Vertical vs. Horizontal Definition

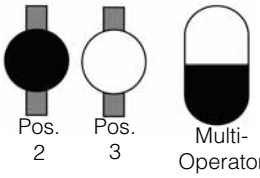
Due to the design of the enclosures, operators are mounted in both a vertical and horizontal orientation. The easiest way to visualize the operator orientation is by observing the contact block direction attached to the operators . If the contact blocks are mounted vertically the operator is mounted vertically in the enclosure. Vertical mounted operators are only found in position 2 & 3 of the 3-hole enclosure. If the contact blocks are mounted horizontally the operator is mounted horizontally in the enclosure. Horizontal mounted operators are found in position 1 of the 3-hole enclosure and all positions of the 5-...9-hole enclosures. It is necessary to know this when ordering individual operators for populating at the customer location.

Operator Sequence when using a Mechanical Interlock

The 1-, 2-, and 3-speed operators can be mounted with either our standard **Cat. No. 800F-ALP** latch or a mechanical interlocking latch (**Cat. No. 800FC-ALP**).
For the 3-hole enclosure, the mechanical interlock can only be located in positions 2 & 3, with the black operator being located in position 2 and the white operator being located in position 3.
For the 5-…9-hole enclosures, the mechanical interlock can be located in any two adjacent positions. For the 5-…9-hole enclosures, the white operator will be located in position X of the mechanical interlock and the black operator will be located in position X+1 of the mechanical interlock.

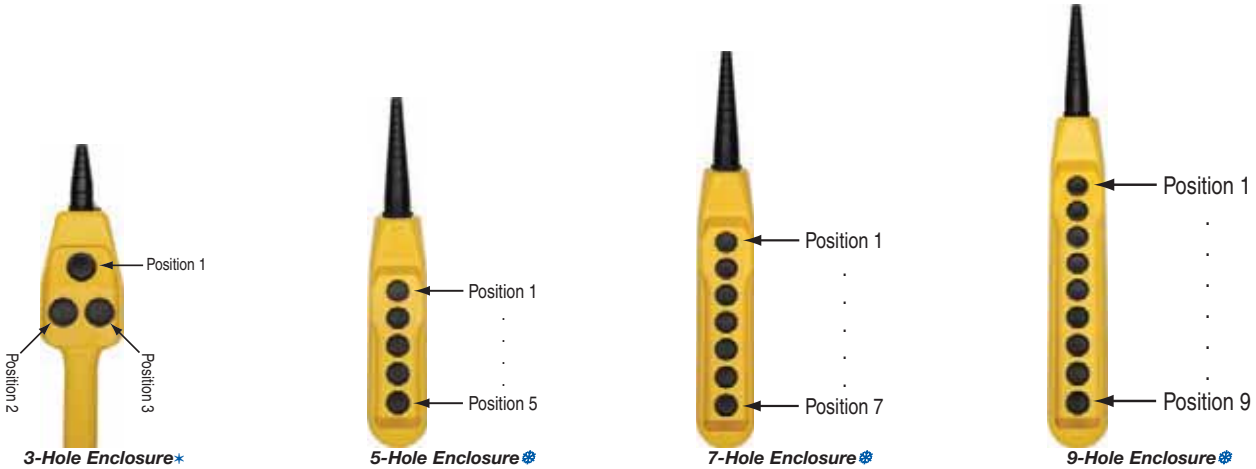
Operator Assembly Sequence and Mounting Orientation

Vertical Mount Operators



Horizontal Mount Operators





3-Hole Enclosure∗ ***5-Hole Enclosure❄*** ***7-Hole Enclosure❄*** ***9-Hole Enclosure❄***

∗ Operator in Position 1 is mounted horizontal, contact blocks are horizontal. Operators in Positions 2 & 3 are mounted vertical, contact blocks are vertical.
❄ Operators in all positions are mounted horizontal, contact blocks are horizontal.

10

22.5 mm Configured Pendant Stations

Product Selection

Product Selection
Enclosures

Enclosure Type	Pkg. Quantity	Pendants — Yellow Plastic IP66 Cat. No.∗
3-hole	1	**800FC-3Z**
5-hole		**800FC-5Z**
7-hole		**800FC-7Z**
9-hole		**800FC-9Z**

∗ Housings supplied with cable sleeve, hanger ring, cable clamp, wire guides, and gasket.



Cat. No. 800FC-3Z



Cat. No. 800FC-7Z

1-, 2-, and 3-Speed Operators §♣

800FP – C A 1 U243

a b c



a

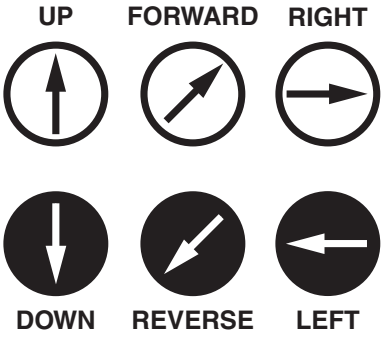
Operator Type	
Code	Description
A	1-speed single arrow
D	1-speed double arrow
B	2-speed
C	3-speed❄

❄ Proper contact block assembly of these devices is required. Please see contact block information on page 104.

b

Cap Color	
Code	Description
1	White
2	Black

Arrow Direction Chart



c

	Symbol					
	Code	Valid with *Table a* Selections:	Description‡			
			Vertical Mounting		Horizontal Mounting	
			Black with White Arrow	White with Black Arrow	White with Black Arrow	Black with White Arrow
	U100	A, B, C	Blank	Blank	Blank	Blank
			One-Speed Operators			
	U241	A	DOWN	UP	—	—
	U243		—	—	RIGHT	LEFT
	U244		REVERSE	FORWARD	—	—
	U246		—	—	FORWARD	REVERSE
	U700		LEFT	RIGHT	UP	DOWN
	U261	D	DOWN FAST	UP FAST	—	—
	U263		—	—	RIGHT FAST	LEFT FAST
	U264		REVERSE FAST	FORWARD FAST	—	—
	U266		—	—	FORWARD FAST	REVERSE FAST
	U260		LEFT FAST	RIGHT FAST	UP FAST	DOWN FAST
			Two-Speed Operators			
	U271	B	2-speed DOWN	2-speed UP	—	—
	U273		—	—	2-speed RIGHT	2-speed LEFT
	U274		2-speed REVERSE	2-speed FORWARD	—	—
	U276		—	—	2-speed FORWARD	2-speed REVERSE
	U270		2-speed LEFT	2-speed RIGHT	2-speed UP	2-speed DOWN
			Three-Speed Operators			
	U291	C	3-speed DOWN	3-speed UP	—	—
	U293		—	—	3-speed RIGHT	3-speed LEFT
	U294		3-speed REVERSE	3-speed FORWARD		
	U296				3-speed FORWARD	3-speed REVERSE
	U290		3-speed LEFT	3-speed RIGHT	3-speed UP	3-speed DOWN

Note: Please see page 104 for proper latch and contact block configurations.
‡ Text (DOWN, UP, LEFT, etc.) indicates arrow direction. Text is **not** printed on operators.
§ Cat. No. 800F-ALP (standard latch) and Cat. No. 800FC-ALP (mechanical interlock latch) can be used with these operators.
♣ Booted style of operators for pendant stations.

Bul. 800F Two-Position Twist-to-Release and Twist-to-Release/Push-Pull Operators



Description	Operator Cat. No.	Guard Cat. No.
Twist-to-release — Red	**800FP-MT44PX01**	—
Twist-to-release — Red, illuminated	800FP-LMT44PN§RX01	—
Keyed twist-to-release — Red	800FP-MK44PX01	—
Twist-to-release or push-pull — Red, monolithic	**800FD-MT44X01**	—
Twist-to-release or push-pull — Red, monolithic with guard, monolithic	**800FD-MT44X01**	**800F-AMEGY**

§ Select **3** for 24V AC/DC or **5** for 120V AC.

Bul. 800F Push Button Operators and Caps — Extended & Non-Illuminated ∗



Cap Color	Description	Symbol Definition	Operator Cat. No.	Cap Cat. No.	Complete Operator Cat. No.	Composite Cat. No./ No Electrical Interlock❄	Composite Cat. No./ Electrical Interlock❄
Black	Blank	—	**800FP-E2**	—	—	800FP-E2PX10	800FP-E2PX11
	LEFT or DOWN	Single arrow 0°	**800FP-E9**	**800F-AE208**	800FP-E208	800FP-E208PX10	**800FP-E208PX11**
	REVERSE	Single arrow 45°		**800F-AE2CU244**	**800FP-E2U244**	800FP-E2U244PX10	800FP-E2U244PX11
	LEFT FAST or DOWN FAST	Double arrow 0°		**800F-AE2CU261**	800FP-E2U261	800FP-E2U261PX10	800FP-E2U261PX11
	REVERSE FAST	Double arrow 45°		800F-AE2CU264	800FP-E2U264	800FP-E2U264PX10	800FP-E2U264PX11
White	Blank	—	**800FP-E1**	—	—	800FP-E1PX10	800FP-E1PX11
	UP or RIGHT	Single arrow 0°	**800FP-E9**	**800F-AE108**	800FP-E108	800FP-E108PX10	**800FP-E108PX11**
	FORWARD	Single arrow 45°		**800F-AE1CU244**	**800FP-E1U244**	800FP-E1U244PX10	800FP-E1U244PX11
	UP FAST or RIGHT FAST	Double arrow 0°		**800F-AE1CU261**	800FP-E1U261	800FP-E1U261PX10	800FP-E1U261PX11
	FORWARD FAST	Double arrow 45°		800F-AE1CU264	800FP-E1U264	800FP-E1U264PX10	800FP-E1U264PX11
Green	Blank	—	**800FP-E3**	—	—	800FP-E3PX10	—
	START/ALARM	Start/Alarm	**800FP-E9**	**800F-AE3CU222**	800FP-E3U222	800FP-E3U222PX10	
	START	Start symbol		800F-AE3CU909	**800FP-E3U909**	800FP-E3U909PX10	
Red	Blank	—	**800FP-E4**	—	—	800FP-E4PX10	
	STOP	Stop symbol	**800FP-E9**	**800F-AE405**	**800FP-E405**	800FP-E405PX10	
Yellow	Blank	—	**800FP-E5**	—	—	800FP-E5PX10	
	ALARM	Alarm	**800FP-E9**	800F-AE5CU223	800FP-E5U223	800FP-E5U223PX10	
Blue	Blank	—	**800FP-E6**	—	—	**800FP-E6PX10**	
	R	Reset symbol	**800FP-E9**	**800F-AE611**	800FP-E611	800FP-E611PX10	

❄ For 24V AC/DC units, add **V** for low voltage contact blocks. Example: **Cat. No. 800FP-E5PX10** becomes **Cat. No. 800FP-E5PX10V**.
∗ Mechanical interlock is not allowed.

Bul. 800F Push Button Operators — Extended & Illuminated ∗



Lens Color	Operator Cat. No.	Composite Cat. No.
Green	**800FP-LE3**	800FP-LE3PN§GX10
Red	**800FP-LE4**	800FP-LE4PN§RX10
Yellow	**800FP-LE5**	800FP-LE5PN§WX10
Blue	**800FP-LE6**	800FP-LE6PN§BX10
Clear	**800FP-LE7**	800FP-LE7PN§WX10

§ Select **3** for 24V AC/DC or **5** for 120V AC.
∗ Mechanical interlock is not allowed.

Bul. 800F Selector Switch Operators — Maintained & Non-Illuminated



Number of Positions	Keyed	Operator Cat. No.	Composite Cat. No.❄
2	No	**800FP-SM22**	**800FP-SM22PX11**
	Yes	**800FP-KM21**	800FP-KM21PX11
3	No	**800FP-SM32**	**800FP-SM32PX20**
	Yes	**800FP-KM34**	800FP-KM34PX20

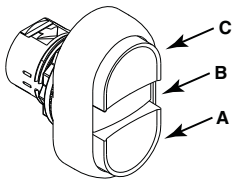
❄ For 24V AC/DC units, add **V** for low voltage contact blocks. Example: **Cat. No. 800FP-E5PX10** becomes **Cat. No. 800FP-E5PX10V**.

10

22.5 mm Configured Pendant Stations

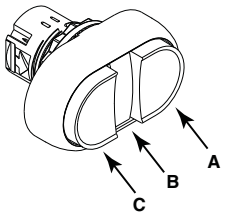
Product Selection

Bul. 800F Multi Operators and Caps— Extended ‡∗





Vertical Mounting





Horizontal Mounting

Description	Symbol Definition	Illumination	Operator Cat. No.	Position A Cap Cat. No.	Position C Cap Cat. No.	Back of Panel Cat. No.❄
Blank (black and white cap)	—	Non-Illuminated	**800FP-U2X**	**800F-AEU2**	**800F-AEU1**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
Vertical Mounting						
UP (white)/DOWN (black)	Single arrow 0°	Non-Illuminated	**800FP-U2X**	**800F-AECU2CU241**	**800F-AECU1CU241**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
RIGHT (white)/LEFT (black)	Single arrow 90°	Non-Illuminated	**800FP-U2X**	**800F-AECU2CU700**	**800F-AECU1CU700**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
FORWARD (white)/REVERSE (black)	Single arrow 45°	Non-Illuminated	**800FP-U2X**	800F-AECU2CU244	**800F-AECU1CU244**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
UP FAST (white)/DOWN FAST (black)	Double arrow 0°	Non-Illuminated	**800FP-U2X**	**800F-AECU2CU261**	**800F-AECU1CU261**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
RIGHT FAST (white)/LEFT FAST (black)	Double arrow 90°	Non-Illuminated	**800FP-U2X**	800F-AECU2CU260	800F-AECU1CU260	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
FORWARD FAST (white)/REVERSE FAST (black)	Double arrow 45°	Non-Illuminated	**800FP-U2X**	800F-AECU2CU264	800F-AECU1CU264	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
Horizontal Mounting						
LEFT (black)/RIGHT (white)	Single arrow 90°	Non-Illuminated	**800FP-U2X**	**800F-AECU1CU241**	**800F-AECU2CU241**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
DOWN (black)/UP (white)	Single arrow 0°	Non-Illuminated	**800FP-U2X**	**800F-AECU1CU242**	**800F-AECU2CU242**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
REVERSE (black)/FORWARD (white)	Single arrow 45°	Non-Illuminated	**800FP-U2X**	**800F-AECU1CU245**	**800F-AECU2CU245**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
LEFT FAST (black)/UP FAST (white)	Double arrow 90°	Non-Illuminated	**800FP-U2X**	**800F-AECU1CU261**	**800F-AECU2CU261**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
DOWN FAST (black)/UP FAST (white)	Double arrow 0°	Non-Illuminated	**800FP-U2X**	**800F-AECU1CU262**	**800F-AECU2CU262**	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20
REVERSE FAST (black)/FORWARD FAST (white)	Double arrow 45°	Non-Illuminated	**800FP-U2X**	800F-AECU1CU265	800F-AECU2CU265	**800F-PX20**
		Illuminated	**800FP-LU2X**			800F-PN§WX20

§ Select **3** for 24V AC/DC or **5** for 120V AC.
❄ For 24V AC/DC units, add **V** for low voltage contact blocks. Example: **Cat. No. 800F-PX20** becomes **Cat. No. 800F-PX20V**
‡ Electrical interlock cannot be performed within the pendant enclosure.
∗ Mechanical interlock is not allowed.

Bul. 800F Pilot Lights — Monolithic



Lens Color	Lamp Voltage	Cat. No.
Green	24V AC/DC	**800FD-P3N3**
	120V AC	**800FD-P3N5**
Red	24V AC/DC	**800FD-P4N3**
	120V AC	**800FD-P4N5**
Yellow	24V AC/DC	**800FD-P5N3**
	120V AC	**800FD-P5N5**
Blue	24V AC/DC	**800FD-P6N3**
	120V AC	**800FD-P6N5**
Clear	24V AC/DC	**800FD-P7N3**
	120V AC	**800FD-P7N5**

Bul. 800F Potentiometer Operators∗



Resistive Element (Ω)	Cat. No.
150	**800FP-POT1**
500	**800FP-POT2**
1000	**800FP-POT3**
2500	**800FP-POT4**
5000	**800FP-POT5**
10 000	**800FP-POT6**

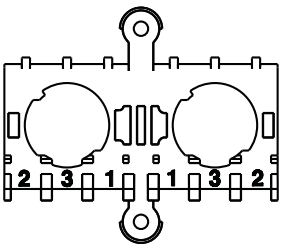
∗ Only available in Position 1 for a 3-hole enclosure, Positions 1 and/or 5 for a 5-hole enclosure, Positions 1 and/or 7 for a 7-hole enclosure, and positions 1 and/or 9 for a 9-hole enclosure. No latches are required.

Bul. 800F Hole Plug

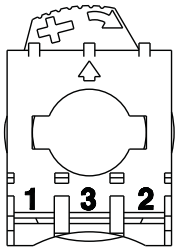


Color	Cat. No.
Black plastic	**800F-N2**

1-, 2-, and 3-Speed Contact Block Assemblies



Cat. No. 800FC-ALP



Cat. No. 800F-ALP

Operator Type	Interlock Type	Composite Cat. No.	Separate Catalog Numbers: Latch Cat. No.	Contact Block Location 1 Cat. No.	Contact Block Location 2 Cat. No.	Contact Block Location 3 Cat. No.
1-speed	No interlock	**800F-PX10E**	**800F-ALP**	—	—	**800F-X10E**
	Electrical interlock	800F-PX11C	**800F-ALP**	**800F-X01B**		
	Mechanical interlock§	**800F-LX20C**	**800FC-ALP**	—		
	Electrical & mechanical interlock§	800F-LX22C	**800FC-ALP**	**800F-X01B**		
2-speed	No interlock	800F-PX20C	**800F-ALP**	—	**800F-X10N** (Speed 2)	**800F-X10E** (Speed 1)
	Electrical interlock	800F-PX21C	**800F-ALP**	**800F-X01B**		
	Mechanical interlock§	800F-LX40C	**800FC-ALP**	—		
	Electrical & mechanical interlock§	800F-LX42C	**800FC-ALP**	**800F-X01B**		
3-speed	No interlock	❄ 800F-PX30C	**800F-ALP**	**800F-X10N**	**800F-X10E** (Speed 2)	800F-X10M (Speed 1)‡
	Mechanical interlock§	❄ 800F-LX60C	**800FC-ALP**	**800F-X10N** (Speed 3)		

❄ Contact blocks come preassembled onto latch.
‡ For proper operation, **Cat. No. 800F-X10M** must be mounted in position 3 of either the mechanical or standard latch.
§ When ordering separate components, two pieces of each contact block must be ordered, one for each operator.

22.5 mm Configured Pendant Stations

Catalog Number Explanation

800FC –

a	*b*	*b_1*	*c*	*c_1*	*d*	*d_1*	*e*	*e_1*	*f*	*f_1*	*g*	*g_1*	*h*	*h_1*	*j*	*j_1*	*k*	*k_1*
	Pos. 1		*Pos. 2*		*Pos. 3*		*Pos. 4*		*Pos. 5*		*Pos. 6*		*Pos. 7*		*Pos. 8*		*Pos. 9*	
	3-…9-hole										*5-…9-hole*							

Note: A code from Tables *b…k* **and** *b_1…k_1* must be specified for each operator to create a valid cat. no.

a

Enclosure Code					
Voltage	Legend Plate	3-Hole	5-Hole	7-Hole	9-Hole
		Code	Code	Code	Code
24V AC/DC	No	2	4	6	8
120V AC		3	5	7	9
24V AC/DC	Yes	A	C	E	G
120V AC		B	D	F	H

∗ Only available in position 1 of a 3-hole enclosure and in positions 1 & 2 of a 5-…9-hole enclosure.

❄ Monolithic style device provided.

‡ For a 3-hole enclosure, when a mechanical interlock (c1 & d1 = M or B) is selected with a 1-…3-speed operator, the black operator will be located in position 2 of the enclosure and the opposite white operator will be placed in position 3 of the enclosure (Example: ABMAFM or BDMBUM).
For a 5-...9-hole enclosure, when a mechanical interlock (b1…k1 = M or B) is selected with a 1-…3-speed operator, the white operator will be located in position X of the mechanical interlock and the opposite black operator will be placed in position X+1 of the mechanical interlock (Example: AFMABM or BUMBDM).

§ Interlock and/or rubber boot selection = N (no interlock, no additional boots) is **not** allowed.

♣ Interlock and/or rubber boot selection = E (electrical interlock, no additional boots) is **not** allowed.

➢ Interlock and/or rubber boot selection = M (mechanical interlock) is **not** allowed.

⌘ Interlock and/or rubber boot selection = B (electrical and mechanical interlock) is **not** allowed.

✦ Interlock and/or rubber boot selection = R (no interlock, additional rubber boot) is **not** allowed.

❖ Interlock and/or rubber boot selection = S (electrical interlock, additional rubber boot) is **not** allowed.

♠ Only available in position 1 for a 3-hole enclosure, positions 1 and/or 5 for a 5-hole enclosure, positions 1 and/or 7 for a 7-hole enclosure, and positions 1 and/or 9 for a 9-hole enclosure.

[11] For proper installation, a trim washer or Cat. No. 800F-36_ legend plate must be installed with this operator.

b_1…k_1

Interlock and/or Rubber Boot	
Code	Description
N	No interlock, no additional boots
E	Electrical interlock, no additional boots
M	Mechanical interlock, boots standard‡
B	Electrical and mechanical interlock, boots standard‡
R	No interlock, additional rubber boot
S	Electrical interlock, additional rubber boot

b…k

Operator Type		
Single Speed Operators for use with Mechanical Interlock‡✦❖[11]		
Code	**Description**	**Legend Plate Text (When Selected)**
A2	Black operator (no text or symbol)	Blank
AB	Black operator with arrow (reverse — down/left)	O/H CRANE, REVERSE
AD	Black operator with arrow (down)	LIFT, DOWN
AL	Black operator with arrow (left)	HOIST, LEFT
A1	White operator (no text or symbol)	Blank
AF	White operator with arrow (forward — up/right)	O/H CRANE, FORWARD
AR	White operator with arrow (right)	HOIST, RIGHT
AU	White operator with arrow (up)	LIFT, UP
Fast Single Speed Operators for use with Mechanical Interlock‡✦❖[11]		
Code	**Description**	**Legend Plate Text (When Selected)**
DB	Black operator with **double** arrow (reverse fast — down/left)	O/H CRANE, REVERSE, FAST
DD	Black operator with **double** arrow (down fast)	LIFT, DOWN FAST
DL	Black operator with **double** arrow (left fast)	O/H CRANE, LEFT FAST
DF	White operator with **double** arrow (forward fast — up/right)	O/H CRANE, FORWARD, FAST
DR	White operator with **double** arrow (right fast)	O/H CRANE, RIGHT FAST
DU	White operator with **double** arrow (up fast)	LIFT, UP FAST
Two-Speed Operators for use with Mechanical Interlock‡✦❖[11]		
Code	**Description**	**Legend Plate Text (When Selected)**
B2	Black operator (no text or symbol)	Blank
BB	Black operator with arrow (reverse — down/left)	1-2 SPEED, O/H CRANE, REVERSE
BD	Black operator with arrow (down)	1-2 SPEED, LIFT, DOWN
BL	Black operator with arrow (left)	1-2 SPEED, HOIST, LEFT
B1	White operator (no text or symbol)	Blank
BF	White operator with arrow (forward — up/right)	1-2 SPEED, O/H CRANE, FORWARD
BR	White operator with arrow (right)	1-2 SPEED, HOIST, RIGHT
BU	White operator with arrow (up)	1-2 SPEED, LIFT, UP
Three-Speed Operators for use with Mechanical Interlock‡§♣✦❖[11]		
Code	**Description**	**Legend Plate Text (When Selected)**
C2	Black operator (no text or symbol)	Blank
CB	Black operator with arrow (reverse — down/left)	1-2-3 SPEED, O/H CRANE, REVERSE
CD	Black operator with arrow (down)	1-2-3 SPEED, LIFT, DOWN
CL	Black operator with arrow (left)	1-2-3 SPEED, HOIST, LEFT
C1	White operator (no text or symbol)	Blank
CF	White operator with arrow (forward — up/right)	1-2-3 SPEED, O/H CRANE, FORWARD
CR	White operator with arrow (right)	1-2-3 SPEED, HOIST, RIGHT
CU	White operator with arrow (up)	1-2-3 SPEED, LIFT, UP

b...k, continued

Operator Type			
Emergency Stop Operators✶♣➢⌘✦❖			
Code	**Description**		**Legend Plate Text (When Selected)**
MT	Red operator — twist-to-release		Not provided
ME	Illuminated red operator — twist-to-release		
MK	Red operator — keyed twist-to-release		
MM	Red operator — twist-to-release/push-pull❄		
MG	Red operator with guard — twist-to-release/push-pull❄		
Standard Extended Push Buttons — Non-Illuminated➢⌘			
Code	**Description**		**Legend Plate Text (When Selected)**
E2	Black operator (no text or symbol)		Blank
ED	Black operator with arrow (down)		LIFT, DOWN
EL	Black operator with arrow (left)		HOIST, LEFT
EB	Black operator with arrow (reverse — down/left)		O/H CRANE, REVERSE
FD	Black operator with **double** arrow (down fast)		LIFT, DOWN FAST
FL	Black operator with **double** arrow (left fast)		O/H CRANE, LEFT FAST
FB	Black operator with **double** arrow (reverse fast — down/left)		O/H CRANE, REVERSE, FAST
E1	White operator (no text or symbol)		Blank
EU	White operator with arrow (up)		LIFT, UP
ER	White operator with arrow (right)		HOIST, RIGHT
EF	White operator with arrow (forward — up/right)		O/H CRANE, FORWARD
FU	White operator with **double** arrow (up fast)		LIFT, UP FAST
FR	White operator with **double** arrow (right fast)		O/H CRANE, RIGHT FAST
FF	White operator with **double** arrow (forward fast — up/right)		O/H CRANE, FORWARD, FAST
E3	Green operator (no text or symbol)♣❖		Blank
EQ	Green operator with Start/Alarm symbol♣❖		START, ALARM
EN	Green operator with Start symbol♣❖		START
E4	Red operator (no text or symbol)♣❖		Blank
ES	Red operator with Stop symbol♣❖		STOP
E5	Yellow operator (no text or symbol)♣❖		Blank
EA	Yellow operator with Alarm symbol♣❖		ALARM
E6	Blue operator (no text or symbol)♣❖		Blank
R6	Blue operator with R♣❖		RESET
Standard Extended Push Buttons — Illuminated♣➢⌘❖			
Code	**Description**		**Legend Plate Text (When Selected)**
L3	Green operator (no text or symbol)		Blank
L4	Red operator (no text or symbol)		Blank
L5	Yellow operator (no text or symbol)		Blank
L6	Blue operator (no text or symbol)		Blank
L7	Clear operator (no text or symbol)		Blank
Selector Switches♣➢⌘✦❖			
Code	**Description**		**Legend Plate Text (When Selected)**
SH	2-position	Standard-maintained	O-I
KH		Keyed-maintained	
SJ	3-position	Standard-maintained	I-O-II
KJ		Keyed-maintained	

Note: Footnote explanations on previous page.

b...k, continued

Operator Type		
2- Function Multi-Operator Push Buttons♣➢⌘❖		
Code	**Description**	**Legend Plate Text (When Selected)**
VV	Black/white operator with arrow (down & up)	Not provided
VW	Black/white operator with arrow (left & right)	
VX	Black/white operator with arrow (reverse & forward)	
WV	Black/white operator, illuminated, with arrow (down & up)	
WW	Black/white operator, illuminated, with arrow (left & right)	
WX	Black/white operator, illuminated, with arrow (reverse & forward)	
XV	Black/white operator with **double** arrows (down fast & up fast)	
XW	Black/white operator with **double** arrows (left fast & right fast)	
XX	Black/white operator with **double** arrows (reverse fast & forward fast)	
YV	Black/white operator, illuminated, with **double** arrows (down fast & up fast)	
YW	Black/white operator, illuminated, with **double** arrows (left fast & right fast)	
YX	Black/white operator, illuminated, with **double** arrows (reverse fast & forward fast)	
Pilot Lights❄♣➢⌘✦❖		
Code	**Description**	**Legend Plate Text (When Selected)**
P0	Amber LED	Blank
P3	Green LED	Blank
P4	Red LED	Blank
P5	Yellow LED	Blank
P6	Blue LED	Blank
P7	Clear LED	Blank
Potentiometers♣➢⌘✦❖♠		
Code	**Description**	**Legend Plate Text (When Selected)**
1P	Black operator — 150 Ω	Blank
2P	Black operator — 500 Ω	Blank
3P	Black operator — 1000 Ω	Blank
4P	Black operator — 2500 Ω	Blank
5P	Black operator — 5000 Ω	Blank
6P	Black operator — 10 000 Ω	Blank
Hole Plug♣➢⌘✦❖		
Code	**Description**	**Legend Plate Text (When Selected)**
N2	Black hole plug	Blank

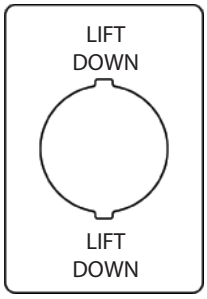
$b_1...k_1$

Interlock and/or Rubber Boot	
Code	**Description**
N	No interlock, no additional boots
E	Electrical interlock, no additional boots
M	Mechanical interlock, boots standard‡
B	Electrical and mechanical interlock, boots standard‡
R	No interlock, additional rubber boot
S	Electrical interlock, additional rubber boot

10

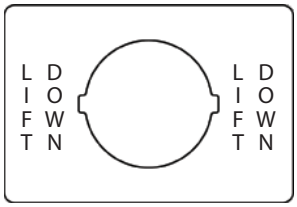
Accessories
Engraved Legend Plates

Vertical



Cat. No. 800F-36VE416

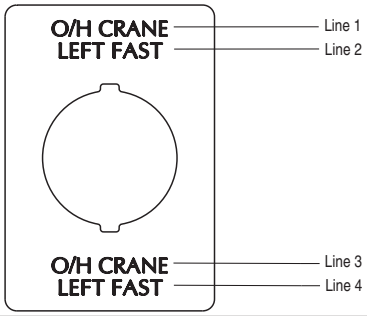
Horizontal

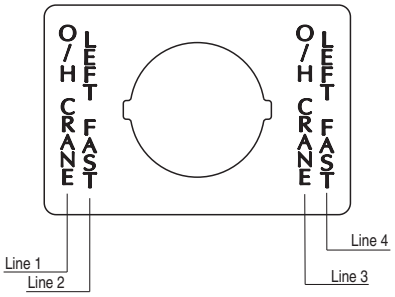


Cat. No. 800F-36HE416

Description	Cat. No.	Description	Cat. No.
Blank	800F-36BE100	1-2-3 SPEED, O/H CRANE, FORWARD	800F-36§E411
O-I	800F-36§U231	1-2-3 SPEED, O/H CRANE, REVERSE	800F-36§E412
I-O-II	800F-36§U234	ALARM	800F-36§E413
RESET	800F-36§E186	HOIST, LEFT	800F-36§E414
START	800F-36§E208	HOIST, RIGHT	800F-36§E415
STOP	800F-36§E212	LIFT, DOWN	800F-36§E416
1-2 SPEED, HOIST, LEFT	800F-36§E401	LIFT, DOWN FAST	800F-36§E417
1-2 SPEED, HOIST, RIGHT	800F-36§E402	LIFT, UP	800F-36§E418
1-2 SPEED, LIFT, DOWN	800F-36§E403	LIFT, UP FAST	800F-36§E419
1-2 SPEED, LIFT, UP	800F-36§E404	O/H CRANE, FORWARD	800F-36§E420
1-2 SPEED, O/H CRANE, FORWARD	800F-36§E405	O/H CRANE, FORWARD, FAST	800F-36§E421
1-2 SPEED, O/H CRANE, REVERSE	800F-36§E406	O/H CRANE, LEFT FAST	800F-36§E422
1-2-3 SPEED, HOIST, LEFT	800F-36§E407	O/H CRANE, REVERSE	800F-36§E423
1-2-3 SPEED, HOIST, RIGHT	800F-36§E408	O/H CRANE, REVERSE, FAST	800F-36§E424
1-2-3 SPEED, LIFT, DOWN	800F-36§E409	O/H CRANE, RIGHT FAST	800F-36§E425
1-2-3 SPEED, LIFT, UP	800F-36§E410	START, ALARM	800F-36§E426
		❄ Custom text	800F-36§E100∗

§ For vertically mounted operators, add a **V** to the cat. no. Example: **Cat. No. 800F-36§E186** becomes **Cat. No. 800F-36VE186**.
For horizontally mounted operators, add an **H** to the cat. no. Example: **Cat. No. 800F-36§E186** becomes **Cat. No. 800F-36HE186**.
∗ Font code (**K**, **S**, **L**) must be selected from the following table.
❄ Please fill in the custom text fax sheet found on page 112 to ensure accuracy of legend plate engraving.





Font Size	Vertical Mounting (V)		Horizontal Mounting (H)	
	Max. Characters Per Line	Max. No. of Lines	Max. Characters Per Line	Max. No. of Lines
K (small)	16	4	9	4
S (standard)	14	4	8	4
L (large)	10	2	7	2

	Description		Pkg. Quantity	Cat. No.
	Plastic mounting latch		10	**800F-ALP**
	Mechanical interlock latch		1	✶ **800FC-ALP**
	Replacement wire guide✦		10	800FC-AWG
	Replacement trim washer		10	**800F-ATW1**
	Insulated side jumper		50	**1492-SJ5A-24** **1492-SJ5A-10**
	Hole plug		1	**800F-N2**
	Description	Type	Pkg. Quantity	Cat. No.
	Contact block	N.O.	10	**800F-X10**
		N.C.		**800F-X01**
		N.O. low voltage — QuadCONNECT™		**800F-X10V**
		N.C. low voltage — QuadCONNECT™		**800F-X01V**
		N.C.E.B.		**800F-X01B**
		NOEM❄		**800F-X10E**
		NOLM‡		**800F-X10N**
		NOEEM➢		♣ 800F-X10M
	Cable sleeve	3-hole (M20 x 1.5)	1	**800FC-AS3**
		5-…9-hole (M32 x 1.5)		**800FC-AS5**
	Protective boot	Extended push button	10	⌘ **800F-ABE7**
		2-position multi-operator		⌘ **800F-AUB2**
	Narrow plastic guard	Yellow	1	**800F-AMEGY**
	Integrated LED module	24V AC/DC	10	§ 800F-N3x
		120V AC		§ 800F-N5x

✶ Only for use with 1-, 2-, and 3-speed operators.
❄ First contact closure of 1- and 2-speed operators.
‡ Second contact closure of 2-speed operators and third contact closure of 3-speed operators.
➢ First contact closure of 3-speed operators.
♣ For proper operation, **Cat. No. 800F-X10M** must be mounted in position 3 of the mechanical or standard latch.
⌘ Not for use with 1-, 2-, and 3-speed operators.
§ To complete the cat. no., replace the **x** with one of the following letters for the desired color: **Y** = Amber, **R** = Red, **G** = Green, **B** = Blue, **W** = White.
✦ Wire guides are provided with enclosures.

Specifications*

Front-of-Panel (Operators)

Mechanical Ratings		
Description		**Plastic (Bulletin 800FP)**
Vibration (assembled to panel)		Tested at 10…2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. for 3 hr duration, no damage
Shock		Tested at 1/2 cycle sine wave for 11 ms; no damage at 100 G
Degree of protection❄		IP66 (Type 4/4X/13)
Mechanical durability per EN 60947-5-1 (Annex C)	10 000 000 Cycles	Momentary push buttons
	1 000 000 Cycles	Multi-function, selector switch, key selector switch
	300 000 Cycles	Twist-to-release E-stop, illuminated push-pull E-stop, alternate action push buttons
	100 000 Cycles	Potentiometer, toggle switch
Operating forces (typical with one contact block)		Flush/extended = 5 N, E-stop = 36 N
Operating torque (typical application with one contact block)		Selector switch = 0.25 N•m (2.2 lb•in)
Mounting torque		1.7 N•m (15 lb•in)
Environmental		
Temperature range (operating)		-25…+70 °C (-13…+158 °F)‡
Temperature range (short term storage)		-40…+85 °C (-40…+185 °F)
Humidity		50…95% RH from 25…60 °C (77…140 °F)

* Performance Data — see page Important-3 of the Industrial Controls catalog.
❄ Plastic keyed operators are IP66, Type 4/13; not Type 4X.
‡ Operating temperatures below 0 °C (32 °F) are based on the absence of freezing moisture and liquids, UL Recognized to 55 °C (131 °F) - Incandescent module max. 40 °C (104 °F) - fully populated 9-hole pendant enclosure 45 °C (113 °F) with 75 °C wire.

Note: Use UL Listed type S or SJ cords, with a smooth outer jacket rated for wet locations use (marked W) and oil resistant outer covering (marked O) such as SOW or SJOW with copper wire, rated 75 °C min., 18…12 AWG, with an overall OD of 7.5…15 mm for the small cable sleeve (**Cat. No. 800FC-AS3**) and 9…22.5 mm for the large cable sleeve (**Cat. No. 800FC-AS5**).

Material Listing

Component	For Use with	Material Used
Panel gasket	All operators	Nitrile, TPE
Diaphragm seal	Illuminated push button, non-illuminated push button	Automotive industry acceptable silicone
K-seal	Selector switch, key selector switch, push/twist-to-release E-stop, key E-stop	Nitrile
Diaphragm retainer, return spring I	Illuminated push button, non-illuminated push button	Stainless steel
Return spring II	Selector switch, key selector switch, alternate action, push/twist-to-release E-stop, key E-stop	Zinc-coated music wire
Button cap	Non-illuminated push button, push/twist-to-release, E-stop, key E-stop, multi-function	PBT/polycarbonate blend
2-color molded button cap	Non-illuminated push button	PBT/polycarbonate blend
Lens	Multi-function	Acetal
Lens, knob	Illuminated push button	Polyamide
Knob	Non-illuminated selector switch	Glass-filled polyamide
Plastic bezel/bushing I	Non-illuminated push button, illuminated push button, selector switch, key selector switch, push/twist-to-release E-stop, key E-stop, multi-function	Glass-filled polyamide
Plastic bezel/bushing II	Pilot light	Glass-filled PBT
Diffuser	Illuminated push button, pilot light	Polycarbonate
Plastic mounting ring	All plastic operators	Glass-filled polyamide
Plastic latch	—	Glass-filled polyamide
Mechanical interlock latch	—	Glass-filled polyamide
Plastic enclosure	—	PBT/polycarbonate blend
Terminal screws	LED module, contact blocks	Zinc-plated steel with chromate
Terminals	LED module, contact blocks	Brass with silver-nickel contacts
Housing	LED module	Glass-filled polyamide
Low-voltage terminals	Contact blocks	Gold-plated silver-nickel contacts
Low-voltage spanner	Contact blocks	Gold-plated silver-nickel contacts
Spanner	Contact blocks	Brass with silver-nickel contacts
Boot	Illuminated push button, non-illuminated push button, multi-function illuminated and non-illuminated	Automotive industry acceptable silicone

Back-of-Panel Components*

Electrical Ratings				
Standard contact block ratings		A600, Q600 600V AC AC 15, DC 13 to IEC/EN 60947-5-1 and UL 508, 17V, 5 mA min.		
Low voltage contact block ratings❄		5V, 1 mA DC min. C300, R150, AC 15, DC 13 to EN 60947-5-1 and UL 508		
	Nominal Voltage	**Range**	**Current Draw**	**Frequency**
LED Module Ratings	24V AC 24V DC 120V AC 240V AC	10…29V AC 10…30V DC 70…132V AC 180…264V AC	31 mA 24 mA 25 mA 22 mA	50/60 Hz DC 50/60 Hz 50/60 Hz
Thermal current		10 A max. enclosed (40 °C ambient) to UL508, EN 60947-5-1		
Insulation voltage (U_i)		Screw terminal = 690V, spring-clamp = 300V		
Wire capacity (screw terminal)‡		#18…12 AWG (0.75…2.5 mm²) Max. (2) #14 AWG or (1) #12 AWG		
Wire capacity (spring-clamp terminal)		#18…14 AWG (0.75…1.5 mm²) One per spring clamp, two spring clamps per terminal		
Recommended tightening torque on screw terminals		0.7…0.9 N•m (6…8 lb•in)		
Dielectric strength (minimum)		2500V for one minute		
External short circuit protection	Standard blocks	10 A type gL/gG cartridge fuse to EN 60269-2-1 or gN (Class J to UL 248-8 or Class C to UL 248-4)		
	Low voltage contact blocks	6 A type gL/gG cartridge fuse to EN 60269-2-1 or gN (Class J to UL 248-8 or Class C to UL 248-4)		
Electrical shock protection		Finger-safe conforming to IP2X		
Mechanical Ratings				
Vibration (assembled to panel)		Tested at 10…2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. 6 hr		
Shock		Tested at 1/2 cycle sine wave for 11 ms and no damage at 100 G max.		
Contact durability per EN 60947-5-1 (Annex C)		10 000 000 cycles		
Contact operation	N.O.	Slow double make and break		
	N.C.	Slow double make and break — positive opening 		
	N.O.E.M.	Double break / double make, early make		
	N.C.L.B.	Double break / double make, late break — positive opening 		
	N.C.E.B.	Double break / double make, early break — positive opening 		
	N.O.E.E.M.	Double break / double make, early early make		
	N.O.L.M.	Double break / double make, late make		
Standard push button travel to change electrical state		N.C. and N.O.E.M.	1.5 mm (0.060 in.)	
		N.O. and N.C.L.B.	2.5 mm (0.1 in.)	
Multi-speed push button travel to change electrical state		N.O.E.E.M.	3 mm (0.12 in.)	
		N.C.E.B.	4 mm (0.16 in.)	
		N.O.L.M.	7 mm (0.28 in.)	
Operating forces (typical)	Single-circuit contact block	3.4 N		
	Dual-circuit contact block	5…6.5 N		
Illumination				
LED Dominant Wavelength	Green Red Yellow Blue White	525 nm 629 nm 590 nm 470 nm —		
LED Luminous Intensity	Green Red Yellow Blue White	780 mcd 780 mcd 600 mcd 168 mcd 360 mcd		
Materials				
Springs		Stainless steel and zinc coated music wire		
Electrical contacts	Standard	Silver-nickel		
	Low voltage	Gold-plated over silver		
Terminals	Screw	Brass		
	Spring-clamp	Silver-plated brass		

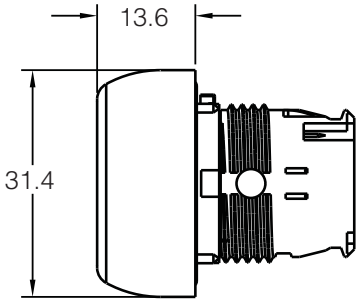
* Performance Data — see page Important-3 of the Industrial Controls catalog.
❄ Low voltage contacts are recommended for applications below 17V, 5 mA.
‡ Wires less than #18 AWG (0.75 mm²) may not hold in terminal securely.

22.5 mm Configured Pendant Stations

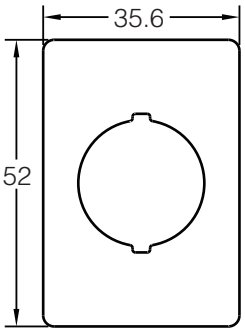
Approximate Dimensions

Approximate Dimensions ∗

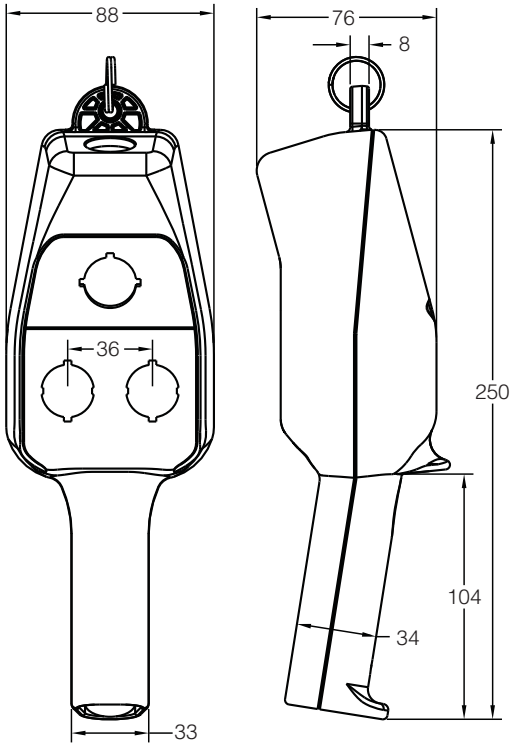
Bul. 800FC 1-, 2-, and 3-Speed Operator



Bul. 800FC Legend Plate

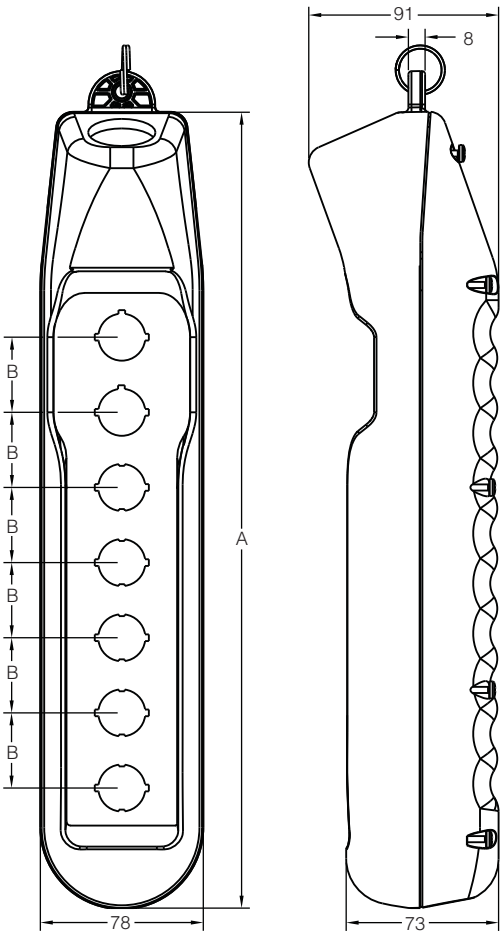


Bul. 800FC Pendant Station (3-Hole)



Bul. 800FC Pendant Station (5-, 7-, and 9-Hole)

Cat. No.	No. of Holes	A	B
800FC-4/5/C/D	5	309	36
800FC-6/7/E/F	7	381	36
800FC-8/9/G/H	9	453	36



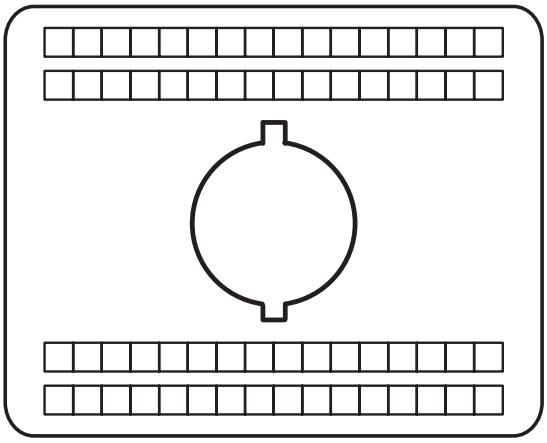
∗ For Bul. 800F operator dimensions, see page 10-120.

10

Custom Text Fax/Scan Sheet

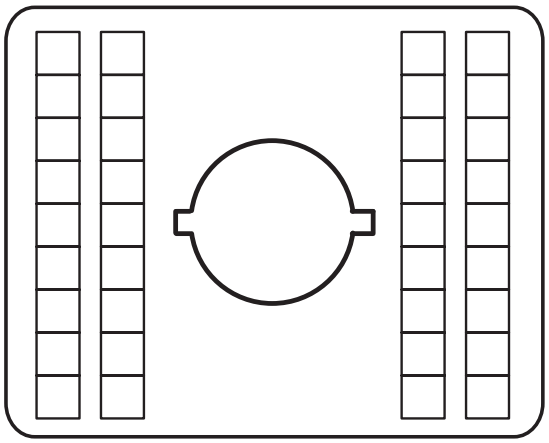
Order/Item _____

Vertical Mounting

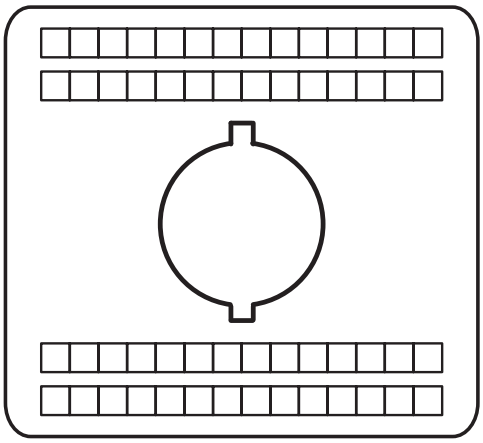


Cat. No. 800F-36VE100K

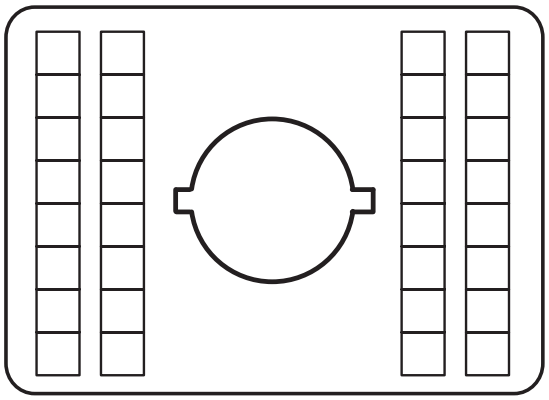
Horizontal Mounting



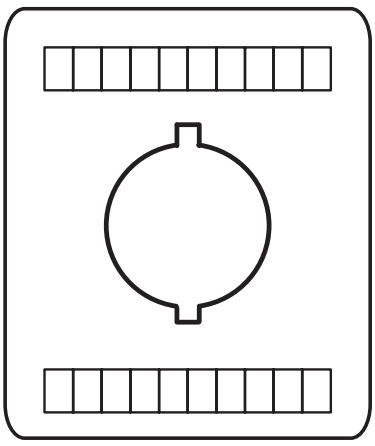
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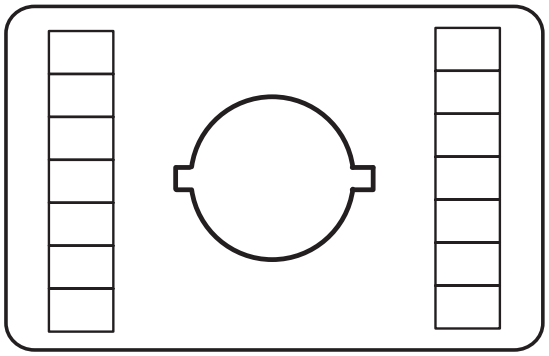
Cat. No. 800F-36VE100S



Cat. No. 800F-36HE100S



Cat. No. 800F-36VE100L



Cat. No. 800F-36HE100L

10

22.5 mm Monolithic Push Buttons

Product Overview/Selection



Bulletin 800FD Monolithic Push Buttons

With a single catalog number, you can now order a fully assembled product for easy stocking and installation. Designed to meet worldwide standards, the Bul. 800FD monolithic line includes E-stops and pilot lights with either LED or incandescent options.

- Ease of installation
- Low back-of-panel profile (45.7 mm)
- Aesthetic design complements the Bul. 800F modular line
- Anti-rotation tab provides accurate alignment and can be easily removed for use in panels without notches
- Lowest cost of installation
- Made of industrial-grade thermoplastic for superior chemical resistance
- Designed to meet worldwide standards
- Compatible with Bul. 800F accessories and enclosures
- Ring lug capability

Table of Contents

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Mushroom/E-Stops... 10-142
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Approximate Dimensions..... 10-145

Product Selection

Momentary Push Button Operators, Non-Illuminated



Operator Type	Cap Color	Pkg. Quantity	Contact Configuration		
			1 N.O.	1 N.C.	1 N.O. & 1 N.C.
			Cat. No.	Cat. No.	Cat. No.
Flush	Black	1	**800FD-F2X10**	**800FD-F2X01**	800FD-F2X11
	Green		**800FD-F3X10**	800FD-F3X01	**800FD-F3X11**
	Red		**800FD-F4X10**	800FD-F4X01	**800FD-F4X11**

800FD – F 3 01 X 11

a b c d e

a

Operator Type	
Code	Description
F	Flush
E	Extended

b

Color Cap	
Code	Color
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue

c

Legend Text∗❄	
Code	Text
—	No text (blank)
01	START
02	STOP
05	O
06	I
08	→
09	FORWARD
10	REVERSE
11	R

∗ White and yellow caps have black text. All other color caps have white text.

❄ Valid color cap/legend text combinations are as follows:

Color	Text	
	Flush Caps	Extended Caps
White	START, I, → , FORWARD, REVERSE, R	→ , R
Black	→, FORWARD, REVERSE, R	STOP, O,→ , R ‡
Green	START, I, →, FORWARD, REVERSE	→
Red	→, FORWARD, REVERSE	STOP, O,→ ‡
Yellow	→, FORWARD, REVERSE	→
Blue	→, FORWARD, REVERSE, R	→ , R

‡ "STOP" or "O" color cap/legend text are not available for "10" or "20" contact modules.

d

Termination Style	
Code	Description
X	Standard screw
R	Ring lug

e

Contact Module		
Code	Number of N.O.	Number of N.C.
01	0	1
10	1	0
11	1	1
02	0	2
20	2	0

Pilot Light Devices — LED



Lens & LED Color	Pkg. Quantity	Voltage		
		24V AC/DC	120V AC	240V AC
		Cat. No.	Cat. No.	Cat. No.
Green	1	**800FD-P3N3**	**800FD-P3N5**	**800FD-P3N7**
Red		**800FD-P4N3**	**800FD-P4N5**	**800FD-P4N7**
Yellow		**800FD-P5N3**	**800FD-P5N5**	800FD-P5N7

800FD – P [3] N [7] [ ]
a *b* *c*

a

Lens Cap	
Code	Color
0	Amber
3	Green
4	Red
5	Yellow
6	Blue
7	Clear

b

Voltage	
Code	Type
3	24V AC/DC
5	120V AC
7	240V AC

c

Termination Style	
Code	Description
Blank	Standard screw
R	Ring lug

Pilot Light Devices — Incandescent

Lens & LED Color	Pkg. Quantity	Voltage	
		24V AC/DC	120V AC
		Cat. No.	Cat. No.
Green	1	**800FD-P3D3**	**800FD-P3D5**
Red		**800FD-P4D3**	**800FD-P4D5**
Yellow		**800FD-P5D3**	**800FD-P5D5**

800FD – P [3] D [5] [ ]
a *b* *c*

a

Lens Cap	
Code	Color
0	Amber
3	Green
4	Red
5	Yellow
6	Blue
7	Clear
9	No lens∗

b

Voltage	
Code	Type
0	No Bulb❄
1	6V AC/DC
2	12V AC/DC
3	24V AC/DC
4	48V AC/DC
5	120V AC/DC

c

Termination Style	
Code	Description
Blank	Standard screw
R	Ring lug

∗ Only valid with "no bulb" option.
❄ Only valid with "no lens" option.

10

22.5 mm Monolithic Push Buttons

Product Selection

Selector Switch Operators, Non-Illuminated



Operator Type	Contact Configuration	Pkg. Quantity	2-Postition Cat. No.	3-Postition Cat. No.
Maintained	1 N.O.	1	**800FD-SM22X10**	—
	1 N.C.		**800FD-SM22X01**	—
	2 N.O.		**800FD-SM22X20**	**800FD-SM32X20**
	2 N.C.		800FD-SM22X02	800FD-SM32X02
	1 N.O. & 1 N.C.		**800FD-SM22X11**	**800FD-SM32X11**
Spring Return From Both	2 N.O.		—	**800FD-SB32X20**
	2 N.C.		—	800FD-SB32X02
	1 N.O. & 1 N.C.		—	800FD-SB32X11

800FD – S L 3 2 X 11

a *b* *c*

a

Operator Function	
Code	Description
M2	Maintained, 2-position
L2	Return from left, 2-position
R2	Return from right, 2-position
M3	Maintained, 3-position
L3	Return from left, 3-position
R3	Return from right, 3-position
B3	Return from both, 3-position

b

Termination Style	
Code	Description
X	Standard screw
R	Ring lug

c

Contact Module		
Code	Number of N.O.	Number of N.C.
01❄	0	1
10❄	1	0
11	1	1
02	0	2
20	2	0

❄ Only available for 2-position selector switch.

2-Position Selector Switch

Knob Position				
Contacts/ Contact Position	Left	Right	Left	Right
01	X	—	O	—
10	—	O	—	X
11	X	O	O	X
02	X	X	O	O
20	O	O	X	X

3-Position Selector Switch

Knob Position						
Contacts/ Contact Position	Left	Right	Left	Right	Left	Right
11	O	O	X	O	X	X
02	O	X	X	X	X	O
20	X	O	O	O	O	X

Note: X = Closed/O = Open

Note: X = Closed/O = Open

2-Position Push-Pull/Twist-to-Release Mushroom Operators, Non-Illuminated‡♣



Color	Contacts	Pkg. Quantity	Cat. No.
Red	1 N.C.	1	**800FD-MT44X01**
	2 N.C.		**800FD-MT44X02**

800FD – MT4 4 X 11

a *b* *c*

a

Color Cap	
Code	Description
2	Black
3	Green
4	Red
4E	Red - EMO
5	Yellow
6	Blue

b

Termination Style	
Code	Description
X	Standard screw
R	Ring lug

c

Contact Module∗		
Code	Number of N.O.	Number of N.C.
01	0	1
11	1	1
02	0	2

∗ E-stops must contain at least one N.C. circuit.
‡ All E-stop operators are EN/ISO 13850 compliant when using at least one N.C. contact block.
♣ E-Stop operators, latch, and contact block combinations have been third-party tested for B10d values. B10d values can be found in publication SAFETY-SR001_-EN-E.

Plastic Enclosures — 1-Hole Only

- Feed-through design
- Knockout sizes: PG 11/16
- Not UL Listed or CSA Certified
- Monolithic or latch-mounted contact blocks
- Double insulated □



Type	Pkg. Quantity	Plastic Enclosures (IP66, NEMA 4/4X/13)∗ Grey Cat. No.	Plastic Enclosures (IP66, NEMA 4/4X/13)∗ Yellow Cat. No.
1-hole	1	**800FD-1P**	**800FD-1PY**

∗ Can only use single deep contact block.

Assembled Stations

Enclosure Color	Quick Connect		Operator Type	Contact Configuration	Cat. No.
Grey	N/A		2-position selector switch	1 N.O.	800FD-1SP5
				1 N.O./1 N.C.	800FD-1SP6
	DC Micro	4-pin			800FD-1SP6Q
Yellow	N/A		Red 40 mm push-pull/twist-to-release	1 N.O./1 N.C.	800FD-1SYP2
	DC Micro	4-pin			800FD-1SYP2Q

Accessories

Replacement Lamps

Lamp	Type	Typical Current	Voltage	ANSI No.	Pkg. Quantity	Cat. No.
 *Cat. No. 800F-N130*	Full Voltage Incandescent	150 mA	6V AC/DC	755	10‡	**800F-N65**
		80 mA	12V AC/DC	756		800F-N141
		70 mA	24V AC/DC	757		**800F-N157**
		50 mA	48V AC/DC	1835		**800F-N48**
		22 mA	130V AC/DC	949		**800F-N130**
 *Cat. No. 800F-N240*	Neon	2 mA	240V AC	—		**800F-N240**

Replacement Lenses

Lens Color	Pkg. Quantity	Cat. No.
Amber	10‡	800FD-AP0
Green		**800FD-AP3**
Red		**800FD-AP4**
Yellow		800FD-AP5
Blue		800FD-AP6
Clear		800FD-AP7

‡ Sold in multiples of 10. Order (quantity of) 10 to receive one package of 10 pieces.

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Specifications*

Mechanical Ratings				
Vibration (assembled to panel)		Tested at 10…2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. for 3 hr duration, no damage		
Shock		Tested at 1/2 cycle sine wave for 11 ms; no damage at 100 G		
Degree of protection		IP66 (Type 3/3R/4/4X/12/13)		
Mechanical durability per EN 60947-5-1 (Annex C)	300 000 cycles	Selector switch		
		Push-pull/twist-to-release E-stop		
	2 000 000 cycles	Momentary push buttons		
Operating forces		E-stop = 36 N		
Operating torque (typical application with one contact block)		Selector switch = 0.25 N•m		
Contact operation	N.O.	Slow double make and break		
	N.C.	Slow double make and break - positive opening ⊝→		
Push button travel to change electrical state	N.O.	2.5 mm (0.1 in.)		
	N.C.	1.5 mm (0.060 in.)		
Environmental				
Temperature range (operating)		-25…+60 °C (-13…+140 °F)❄		
Temperature range (short term storage)		-40…+85 °C (-40…+185 °F)		
Humidity		50…95% RH from 25…60 °C (77…140 °F)		
Electrical Ratings				
Standard contact block ratings		B300, R300 AC 15, DC 13 300 VAC EN/IEC 60947-5-1 and UL 508, 17V, 5 mA min.		
	Nominal Voltage	**Range**	**Current Draw**	**Frequency**
LED module ratings	24V AC 24V DC 120V AC 240V AC	20…26V AC 18…30V DC 102…132V AC 204…264V AC	32 mA 24 mA 22 mA 22 mA	50/60 Hz DC 50/60 Hz 50/60 Hz
Thermal current		5 A max. enclosed (40 °C ambient) to UL 508, EN/IEC 60947-5-1		
Insulation voltage (U_i)		300V		
Wire capacity (screw terminal)		#18…14 AWG (0.75…2.5 mm²) Max. (2) #14 AWG, uses same size wire only		
Recommendations for ring lug termination option‡		6.35 mm (0.250 in.) Max. outer diameter with 3.8 mm (0.148 in.) hole diameter		
Recommended tightening torque on screw terminals		0.7…0.9 N•m (6…8 lb•in)		
Dielectric strength (minimum)		2500V for one minute		
External short circuit protection		5 A Type gL/gG cartridge fuse to EN 60269-2-1 or gN (Class J to UL 248-8 or Class CC to UL 248-4)		
Electrical shock protection		Finger-safe conforming to IP2X		
Illumination				
LED dominant wavelength	Green	525 nm		
	Red	629 nm		
	Yellow	590 nm		
	Blue	470 nm		
	White	—		
LED luminous intensity	Green	780 mcd		
	Red	780 mcd		
	Yellow	600 mcd		
	Blue	168 mcd		
	White	360 mcd		
Incandescent maximum wattage		2.6 W		

* Performance Data — see page Important-3 of the Industrial Controls catalog.
❄ Operating temperatures below 0 °C (32 °F) are based on the absence of freezing moisture and liquids.
‡ 3M MV018-R/S (#22…18 AWG) or 3M MVU14-6R/S (#16…14 AWG)

Specifications, Continued*

Materials				
Springs	Stainless steel and zinc coated music wire		Lens (pilot light)	Acrylic
Electrical contacts	Brass with silver-nickel contacts		Bezel/bushing, housing	Glass-filled polyester
Terminals	Brass and phosphor bronze		Legend frames	Glass-filled polyamide
Panel gasket	Nitrile and polyester-based TPE		Mounting ring	Glass-filled polyamide
Seal	Nitrile		Terminal screws	Zinc-plated steel with chromate
Button cap/mushroom head	Polyester/polycarbonate blend		Lamp socket	Brass and Phosphor bronze

* Performance Data — see page Important-3 of the Industrial Controls catalog.

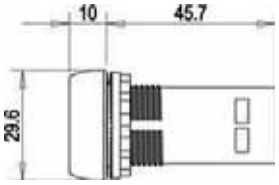
Product Certifications

Certifications	UL, CSA, CCC, CE
Conformity to standards — CE Marked	UL 508, EN/ISO 13850, EN 60947-1, EN 60947-5-1, EN 60947-5-5
Terminal identification	EN/IEC 60947-1

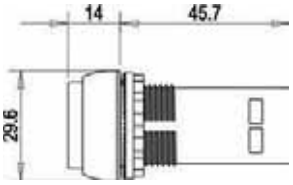
Approximate Dimensions

Dimensions in millimeters. Dimensions are not intended to be used for manufacturing purposes. Refer to RAISE software for additional dimensional information.

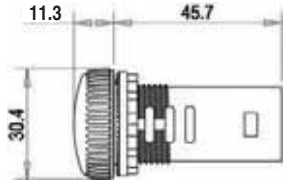
Momentary Push Button Operators — Flush



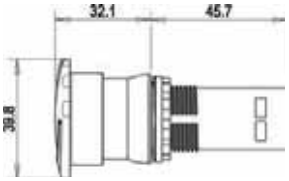
Momentary Push Button Operators — Extended



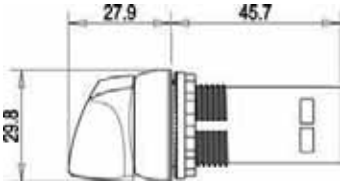
Pilot Light Devices



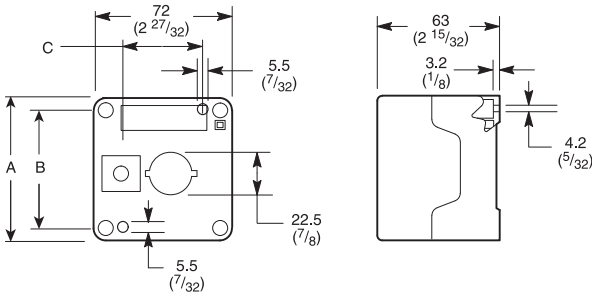
2-Position Push-Pull/Twist-to-Release Mushroom Operators



Selector Switch Operators

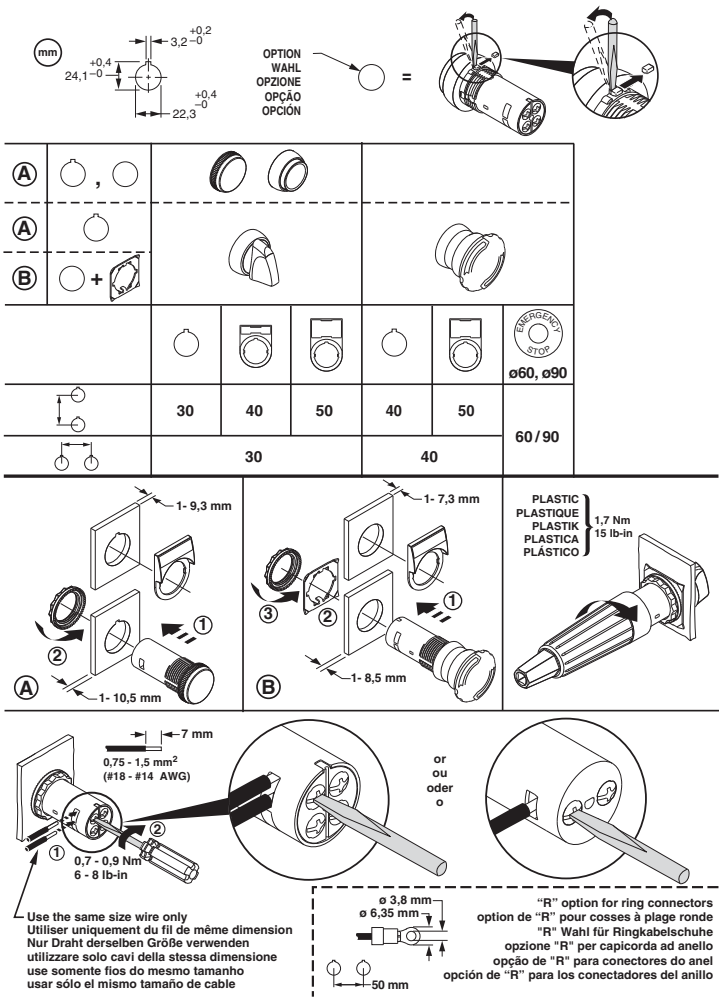


Plastic Enclosures



Plastic Enclosures					
Cat. No.	No. of Units (Holes)	A	B	C	Weight
800FD-1P	1	72 (2-27/32)	59 (2-5/16)	41 (1-5/8)	95 g (3.5 oz)
800FD-1PY					

Instruction Sheet



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Bulletin 800B — 16 mm Push Buttons

- Designed to worldwide standards (UL, CSA, CE, and CCC)
- Durable materials
  - Operators are made of corrosion-proof plastic to ensure long push button life
  - Consistent coloring and illumination make these easy to identify for the life of the operator
- Ease of installation
- Ergonomic design
  - Contoured button surface
- Dependable sealing
  - IP66 and Type 4/13
  - Diaphragm seals: linear travel devices, pilot lights
  - V-seals: selector switches, high pressure sealing
  - K-seals: emergency stops, dual wiping action
- Reliable low voltage switching
  - Gold-plated snap action contacts
  - Reliable operation in applications below 24V DC, 5 mA down to 5V DC, 1 mA
- Enhanced E-stop functionality
  - Anti-tease feature standard (trigger-action)
  - EN13850 and EN 60947-5-5 compliant
  - Direct Drive mechanism (positive actuation)

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Approximate Dimensions 10-151

Standards Compliance and Certifications

Certifications	UR, CSA, CCC, CE
Standards Compliance	UL 508, EN ISO 13850, EN 60947-1, EN 60947-5-1, EN 60947-5-5
Terminal Identification	EN/IEC 60947-1
RoHS Compliant	✓

Push Button & Pilot Light Operators*

	Cat. No.			
Operator Type	Round	Square	Rectangle	Large Square
Momentary, push button/ pilot light	**800B-EPA**	**800B-EPB**	**800B-EPC**	**800B-EPD**
Maintained, push button	**800B-EAA**	**800B-EAB**	**800B-EAC**	**800B-EAD**

Note: Package Quantity = 1

* All operators are sold without a lens cap and diffuser.

Lens Cap with Diffuser§



Cat. No.
800B-ALA3



Cat. No.
800B-ALB4



Cat. No.
800B-ALC5



Cat. No.
800B-ALD6

	Cat. No.			
Lens Color	Round	Square	Rectangle	Large Square
Green	**800B-ALA3**	**800B-ALB3**	**800B-ALC3**	**800B-ALD3**
Red	**800B-ALA4**	**800B-ALB4**	**800B-ALC4**	**800B-ALD4**
Yellow	**800B-ALA5**	**800B-ALB5**	**800B-ALC5**	**800B-ALD5**
Blue	**800B-ALA6**	**800B-ALB6**	**800B-ALC6**	**800B-ALD6**
White	**800B-ALA7**	**800B-ALB7**	**800B-ALC7**	**800B-ALD7**

Note: Package Quantity = 1

§ For illuminated devices, LED bulbs are color specific. (Green LED bulb with green lens caps, red LED bulbs with red lens cap, white LED bulbs used with yellow, blue, and white lens cap.) Incandescent bulbs can be used with any lens cap color.

Selector Switch Operators❄

Operator Type	2-Position Selector Switches		3-Position Selector Switches	
				
	Maintained	Return from Right	Maintained	Return from Both
Cat. No.	**800B-SM2A**	**800B-SR2A**	**800B-SM3A**	**800B-SB3A**
Operator Type				
	Keyed, Maintained	Keyed, Return from Right	Keyed, Maintained	Keyed, Return from Both
Cat. No.	**800B-KM2A**	**800B-KR2A**	**800B-KM3A**	**800B-KB3A**

Note: Package Quantity = 1

Target Table and Operator Position

Contact Block Cat. No.	Contact Block Location	Contact Type	2-Position Target Table		3-Position Target Table		
							
800B-PS11	Top	NA	—	—	—	—	—
	Bottom	N.C.	X	O	O	X	X
		N.O.	O	X	X	O	O
800B-PS22	Top	N.C.	X	O	X	X	O
		N.O.	O	X	O	O	X
	Bottom	N.C.	X	O	O	X	X
		N.O.	O	X	X	O	O
800B-PT01	Top	NA	—	—	—	—	—
	Bottom	N.C.	X	O	O	X	X
800B-PT02	Top	N.C.	X	O	X	X	O
	Bottom		X	O	O	X	X
800B-PT11	Top	N.O.	O	X	O	O	X
	Bottom	N.C.	X	O	O	X	X

Note: X = Closed/O = Open

❄ To illuminate a selector switch, add either an LED or incandescent bulb. All selector switches have a clear lens. Green and red LED bulbs can be used to change the selector switch color.

Emergency Stop Operators — Non-Illuminated, Twist-to-Release (Trigger Action)‡

	Description	Pkg. Quantity	Cat. No.
 *Cat. No. 800B-MT*	Emergency stop operator	1	**800B-MT**

‡ Operator is EN ISO 13850 compliant with standard N.C. contact blocks.

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Contact Block/Latch Module

	Description	Pkg. Quantity	Cat. No.
	Push Button/Selector Switch		
 *Cat. No. 800B-PS11*	1 N.O./1 N.C. snap action	1	**800B-PS11**
 *Cat. No. 800B-PS22*	2 N.O./2 N.C. snap action	1	**800B-PS22**
	Pilot Light		
 *Cat. No. 800B-PL*	Dummy block	1	**800B-PL**
	Emergency Stop/Push Button/Selector Switch		
 *Cat. No. 800B-PT01*	1 N.C. slow make/break	1	**800B-PT01**
 *Cat. No. 800B-PT02*	2 N.C. slow make/break	1	**800B-PT02**
 *Cat. No. 800B-PT11*	1 N.O./1 N.C. slow make/break	1	**800B-PT11**

Replacement Bulbs

	Description	Lamp Color	Lamp Voltage	Pkg. Quantity	Cat. No.
	LED bulb∗	Green	12…24V AC/DC	1	**800B-N3G**
			120V AC		**800B-N5G**
		Red	12…24V AC/DC		**800B-N3R**
			120V AC		**800B-N5R**
		White	12…24V AC/DC		**800B-N3W**
			120V AC		**800B-N5W**
	Incandescent bulb❄	Clear	6V AC/DC		**800B-N1C**
			12V AC/DC		**800B-N2C**
			24V AC/DC		**800B-N3C**

∗ Not available in 6V AC/DC.
❄ Not available in 120V AC.

Accessories

	Description	Pkg. Quantity	Cat. No.
 *Cat. No. 800B-ARP*	Replacement mounting ring	10	**800B-ARP**
 *Cat. No. 800B-AW2*	Mounting ring wrench	1	**800B-AW2**
 *Cat. No. 800B-ALR1*	Bulb removal tool	1	**800B-ALR1**
 *Cat. No. 800B-ALR2*	Lens removal tool	1	**800B-ALR2**
 *Cat. No. 800B-ALW1*	Locking washer (anti-rotation)	10	**800B-ALW1**
 *Cat. No. 800B-ATK*	Stab connector (insulated)	10	**800B-ATK**
 *Cat. No. 800B-N2*	Hole plug	10	**800B-N2**
 *Cat. No. 800B-AK1*	Replacement key	1	**800B-AK1**
 *Cat. No. 800B-APCB*	Printed circuit board pin socket	10	**800B-APCB**
 *Cat. No. 800B-15YE112*	Emergency stop legend plate	1	**800B-15YE112**
 *Cat. No. 800B-ABZB*	Square bezel	10	**800B-ABZB**
 *Cat. No. 800B-ABZC*	Rectangle bezel	10	**800B-ABZC**
 *Cat. No. 800B-ABZD*	Large square bezel	10	**800B-ABZD**

Specifications

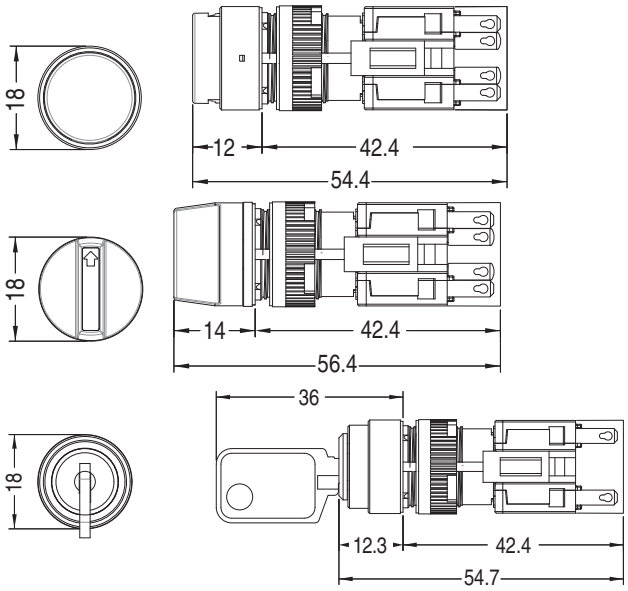
Mechanical Ratings		
Vibration (assembled to panel)		Tested at 10…2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. for 6 hr duration, no damage
Shock		Tested at 1/2 cycle sine wave for 11 ms; no damage at 100 G
Degree of protection❄		IP66, Type 4/4X/13
Mechanical durability per EN 60947-5-1 (Annex C)	2 000 000 Cycles	Push buttons – momentary
	1 000 000 Cycles	Push buttons – maintained
	250 000 Cycles	Selector switch
	200 000 Cycles	Key selector switch
	200 000 Cycles	Twist-to-release E-stop
Operating forces (typical with one contact block)		Extended = 5…8 N E-stop = 14…16 N
Operating torque (typical application with one contact block)		Selector switch = 0.06 N•m (0.5 lb•in)
Mounting torque		1.1 N•m (10 lb•in)
Environmental		
Temperature range (operating)		-25…+55 °C (-13…+131 °F)
Temperature range (short term storage)		-40…+70 °C (-40…+158 °F)
Humidity		50…95% RH from 25…60 °C (77…140 °F)

Mechanical Ratings — Contact Blocks			
Vibration (assembled to panel)		Tested at 10…2000 Hz, 1.52 mm displacement (peak-to-peak) max./10 G max. 6 hr	
Shock		Tested at 1/2 cycle sine wave for 11 ms and no damage at 100 G max.	
Contact durability		200 000 cycles (Cat. No. 800B-PS_)	
Contact operation	N.O. / N.C.	Snap action	
	N.C.	Slow make/break positive opening ⊖	
	N.O.	Slow make/break	
Push button travel to change electrical state		1.4 mm (0.06 in.)	
Operating forces (typical)		1 contact block = 3 N 2 contact blocks = 6 N	
Electrical Ratings			
Standard contact block ratings		AC 15, B300, 1.5 A/240V AC, 3 A/120V AC DC 13, R300, 0.1 A/250V DC, 0.22 A/125V DC	
LED Module ratings	**Nominal Voltage**	**Current**	**Frequency**
	12…24V AC 12…24V DC 120V AC	12 mA 12 mA 9 mA	50/60 Hz DC 50/60 Hz
Thermal current		I_{th} = 5 A (AC), I_{th} = 1 A (DC)	
Insulation voltage (U_i)		300V	
Stab termination		2.8 X 0.5 mm	
Dielectric strength (minimum)		1500V 1 min.	
External short circuit protection – standard blocks		6 A type gL/gG cartridge fuse to EN 60269-2-1 or gN (Class J to UL 248-8 or Class C to UL 248-4)	
Electrical shock protection		Finger-safe conforming to IP2X	

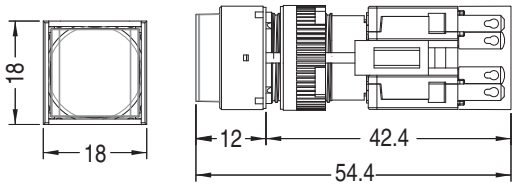
Illumination		
LED Dominant wavelength	Green Red White	525 nm 624 nm —
LED Luminous intensity	Green Red White	500 mcd 400 mcd 1000 mcd
Incandescent maximum wattage		1.2 W
Materials		
Springs		Stainless steel and gold-plated, high-carbon steel
Electrical contacts		Gold-plated silver
Stab terminals		Phosphor bronze with gold or nickel plating
Lenses		Polycarbonate

Approximate Dimensions

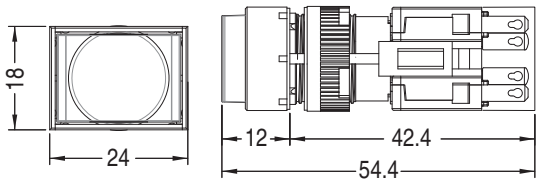
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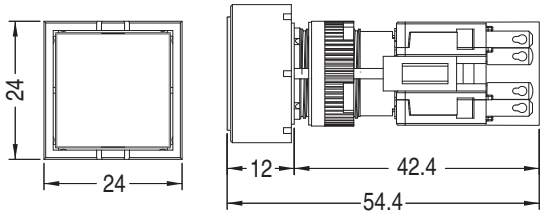
Square



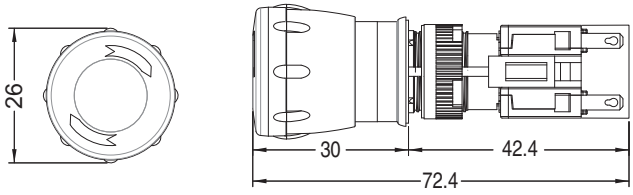
Rectangle



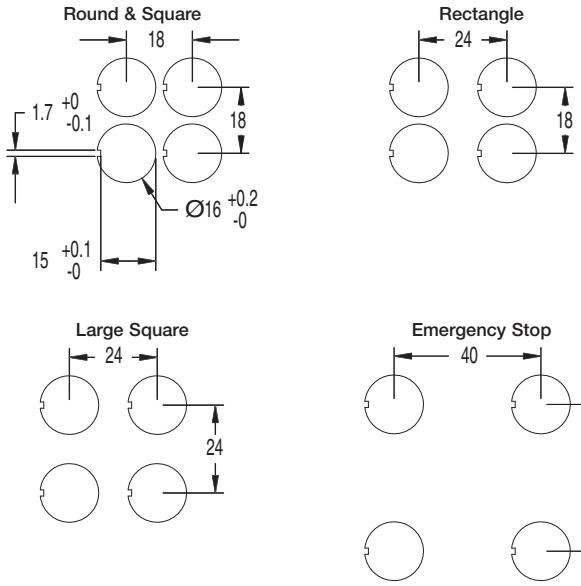
Large Square



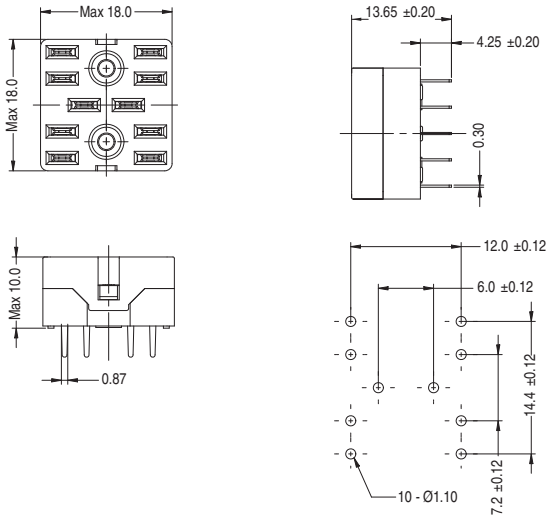
Emergency Stop



Hole Patterns



Printed Circuit Board Pin Socket



10

Hazardous Location Push Buttons

Product Overview/Specifications



Bulletin 800H/Hazardous Location Push Buttons

- Hazardous locations push buttons and stations
- Classes I, II & III Divisions 1 & 2
- 3/4 in. - 14 NPSM barrel
- Type 7 & 9
- Explosion-proof operators

Table of Contents

See below.

Standards Compliance

UL698, UL1604
CSA 22.2, No. 14

Certifications

Enclosures:
UL Listed (File No. E71673 Guide No. NNNY)
Devices:
UL Listed (File No. E10314 Guide No. NOIV)
Stations:
CSA (File No. LR11924)

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Knobs & Caps	10-176
Boots & Guards	10-177
Plugs & Locking Attachments	10-178
Miscellaneous	10-179
Replacement Lamps	10-180
Legend Plates	10-181
Appoximate Dimensions	10-183

Description

Application

When properly mounted in a Type 7 & 9 enclosure, Bulletin 800H Type 7 & 9 operators are designed to meet the requirements of the National Electrical Code for Class I, Divisions 1 & 2, Groups B, C & D Hazardous Gas; Class II, Divisions 1 & 2, Groups E, F and G Hazardous Dust; and, Class III Hazardous Fiber Locations. In addition, the single gang shallow base, Cat. No. 800H-IHZX7, meets Class I, Group B requirements. This Type 7 & 9 equipment is listed by Underwriters Laboratories, Inc.

Per National Electrical Code:

Zone 1. In Class I, Zone 1 locations, all wiring methods permitted for Class I, Division 1 locations and Class I, Zone 0 or Zone 1 locations, including requirements for sealing, shall be permitted.

Zone 2. In Class I, Zone 2 locations, all wiring methods permitted for Class I, Division 2, Class I, Division 1 or Division 2, and Class I, Zone 0 or Zone 1 locations, including requirements for sealing, shall be permitted.

10

Operator Construction

The Allen-Bradley line of hazardous location devices features copper-free (less than 0.4 of 1% copper content) die cast aluminum bushings and mounting rings, Type #316 stainless steel operating shafts and an O-ring seal for added corrosion resistance. These components mount into a threaded hole (3/4 in.-14 NPSM) in a suitable enclosure.

Bulletin 800H Type 7 & 9 components are available in two basic formats: standard barrel (Bulletin 800H) and long barrel (Bulletin 800HL). Standard barrel devices are suitable for mounting in panel thickness up to 1 in.; Long barrel devices are suitable for mounting in panel thickness greater than 1 in. and no thicker than 2-1/2 in. Both style operators offer a unique locking bracket which provides an anti-turn feature to guard against loosening. The mounting rings in front of the panel are knurled to provide a second means of tightening each unit into the panel.

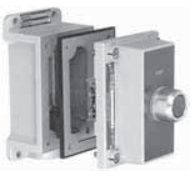
Outdoor Use

Bulletin 800H Type 7 & 9 stations and enclosures are not configured for outdoor use as standard. A Type 3 rating is available, while maintaining Type 7 & 9 integrity of the enclosure, by the addition of a Type 3 sealing flange and an approved drain. The sealing flange shown below may be purchased as an option or as an accessory. A Type 4 rating can be achieved by using sealing nuts to seal the push button operators in addition to using the sealing flange. Sealing nuts are available as accessories (see page 10-179.)

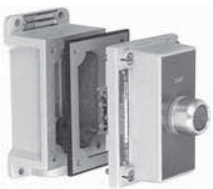
Elimination of Conduit Seal Off Requirement

Bulletin 800H Type 7 & 9 units may be installed with a variety of sealing options. By utilizing either a sealing well or flanged sealing well, these stations may be installed without a conduit seal off in most applications (subject to applicable codes and laws). The sealing wells shown below may be purchased as an option or as an accessory. Sealing wells are also available with an integral Type 3 flange seal for outdoor applications.

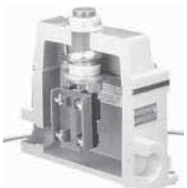
Sealed switch contact blocks are another way to eliminate the need for conduit seal fittings in most applications (subject to applicable codes and laws). Sealed switch contact blocks may be purchased as an option on assembled stations by changing the Bulletin No. from 800H to 800R. Sealed switch contact blocks can be ordered as an accessory (see page 10-175). A push button station with a sealed switch contact block is shown below.



Type 3 Flange Seal



Sealing Wells



Sealed Switch Contact Blocks

Specifications*

Electrical Ratings		
Contact Ratings		Refer to the contact ratings tables below.
Dielectric Strength		2200V for one minute, 1300V for one minute (Logic Reed)
Electrical Design Life Cycles		1 000 000 at max. rated load, 200 000 at max. rated load (Logic Reed)
Mechanical Ratings		
Vibration		10…2000 Hz 1.52 mm displacement (peak-to-peak) Max./10 G Max. (except Logic Reed)
Shock		1/2 cycle sine wave for 11 ms ≥ 25 G (contact fragility) and no damage at 100 G
Degree of Protection		Type 7 & 9 Explosion Proof (Type 3 and Type 4 ratings available with accessories)
Mechanical Design Life Cycles		
Push Buttons		250 000 minimum
Potentiometers		100 000 minimum
All other devices		200 000 minimum
Contact Operation		Shallow and mini contact blocks: slow double make and break Logic Reed & sealed switch contact blocks: snap-action
Wire Guage/Terminal Screw Torque		# 18…12 AWG/6…8 lb•in
Typical Operating Forces		
Operators without contact blocks:		Flush, extended, standard mushroom, jumbo mushroom: 2.9 lb max. Jumbo and extended aluminum mushroom head: 3.95 lb maximum Maintained selector switch: 4.0 in•lb maximum
Spring Return Selector Switches:		5 in•lb to stop, 0.2 in•lb to return
Illuminated Push Buttons and Push-to-Test Pilot Lights		5.6 lb maximum
2-Position Push-Pull		9 lb maximum push or pull
3-Position Push-Pull		12 lb maximum push to in position or pull to center position (15 lb maximum pull to out position)
Contact Blocks:	800T-XA	1 lb
	Logic Reed	1 lb maximum
	Sealed Switch	3 lb maximum at 0.205 in. plunger travel
	Stackable Sealed Switch	1 lb maximum
Environment		
Temperature Range	Operating	–4…+13 °F (–20…+55 °C)
	Storage	–40…+185 °F (–40…+85 °C)
Note: Operating temperatures below freezing are based on the absence of freezing moisture and liquids.		
Humidity		50% at +104 °F (+40 °C)

* Performance Data — See page Important-3.
❄ External thread major diameter: 1.034 in. max., 1.024 in. min. Internal thread minor diameter: 0.958 in. min., 0.970 in. max.

Standard Contact Ratings

Maximum thermal continuous current I_{th} 10 A AC/2.5 A DC.
Bulletin 800H Type 7 & 9 units with 800T-XA contacts have ratings as follows:

Max. Oprtnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 600	AC-15	A600	120…600	7200VA	720VA
			72…120	60 A	720VA
			24…28❄	60 A	10 A
DC 600	DC-13	Q600	28…600	69VA	
			24…28❄	2.5 A	

❄ For applications below 24V and 24 mA, Pen*TUFF*™, Logic Reed or stackable sealed switch contacts are recommended.

Sealed Switch Contact Ratings

Maximum continuous current I_{th} 5 A.

Max. Oprtnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 600	AC-15	B600	120…600	3600VA	360VA
			0…120	30 A	3 A
DC 300	DC-13	P300	24…300	138VA	
			0…24	5.0 A	

Stackable Sealed Switch Contact Ratings

Maximum continuous current I_{th} 3 A. Bulletin 800T units have control circuit ratings with sealed switch contact blocks as follows:

Max. Oprtnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 300	AC-15	C300	120…300	1800VA	180VA
			0…120	15 A	1.5 A
DC 150	DC-13	Q150	24…150	69VA	
			0…24	2.5 A	

Logic Reed Contact Ratings

Maximum: 150V AC, 0.15 A, 8 VA and 30V DC, 0.06 A, 1.8 VA.

Should only be used with resistive loads.

Pen*TUFF*™ (Low Voltage) Contact Ratings

Minimum DC: 5V, 1 mA

Maximum thermal continuous current Ith 2.5 A AC/1.0 A DC.
Bulletin 800H units with 800T-XAV contacts have ratings as follows:

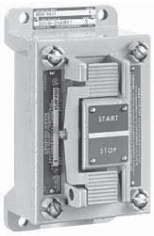
Max. Oprtnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 300	AC-15	C300	120…300	1800VA	180VA
			0…120	15 A	1.5 A
DC 150	DC-13	R150	24…150	28VA	
			0…24	1.0 A	

10

Hazardous Location Push Buttons

Product Selection

Complete Assembled Stations (Supplied with 3/4 in. Dead End Conduit Entry — Cat. No. 800H-1HZX7)

	Operator	Contact Symbol	Contact Action	Legend Marking	Lever Type Actuator*‡ Cat. No.	Component Type Buttons❄‡ Cat. No.
 *Cat. No. 800H-1HA7*	One Push Button	1 N.O. 1 N.C.	Momentary	STOP	800H-1HA7	800H-1HA7P
				START	800H-1HB7	800H-1HB7P
				JOG	800H-1HJ7	800H-1HJ7P
				No Legends	800H-1HX7	800H-1HX7P
 *Cat. No. 800H-2HA7P*	Two Push Buttons	1 N.O. 1 N.C. Each Button Each Button	Momentary	START STOP	**800H-2HA7**	**800H-2HA7P**
				FOR REV	800H-2HB7	800H-2HB7P
				RAISE LOWER	800H-2HD7	800H-2HD7P
				OPEN CLOSE	800H-2HF7	800H-2HF7P
				No Legends	800H-2HX7	800H-2HX7P
 *Cat. No. 800H-2HAM7*	2-Position Selector Switch	1 N.O. 1 N.C.	Maintained	START STOP	**800H-2HAM7**	—
				ON OFF	800H-2HCM7	800H-R2HC7
				OPEN CLOSE	800H-2HGM7	800H-R2HG7
				RUN STOP	800H-2HJM7	—
				HAND AUTO	800H-2HLM7	800H-R2HA7
				No Legends	800H-2HXM7	800H-R2HX7
 *Cat. No. 800H-R3HA7*	3-Position Selector Switch	1 N.O. 1 N.C.	—	HAND OFF AUTO	—	**800H-R3HA7**
				No Legends	—	800H-R3HX7
 *Cat. No. 800H-2HAD10R7*	One Pilot Light, Dual Push Buttons	120V AC/DC Full Volt./Red 1 N.O. 1 N.C.	—	No Legend START STOP	—	**800H-2HAD10R7**
				Marking other than listed - consult your local Allen-Bradley distributor	—	800H-2HXD10R7

* Operators have integral padlocking attachment.
❄ STOP is extended red, START is flush green, all others are flush black.
‡ Supplied with standard shallow contact blocks. For stations with sealed switch contacts, change Bulletin number from 800H to 800R. A deep enclosure is required.

Momentary Contact Push Button Units, Non-Illuminated



Flush Head Unit
Cat. No. 800H-AP1A



Extended Head Unit
Cat. No. 800H-BP6B

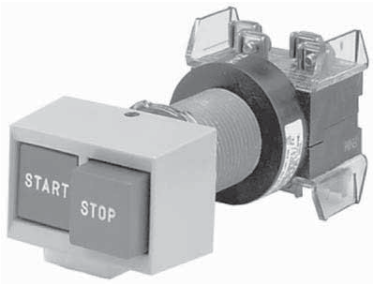


Mushroom Head Unit
Cat. No. 800H-DP6A

Contact Type	Button Color	Flush Head Cat. No.∗	Extended Head Cat. No.∗	Mushroom Head Cat. No.∗
No Contact	Green	800H-AP1	800H-BP1	800H-DP1
	Black	**800H-AP2**	800H-BP2	800H-DP2
	Red	800H-AP6	800H-BP6	800H-DP6
1 N.O.	Green	**800H-AP1D1**	800H-BP1D1	800H-DP1D1
	Black	**800H-AP2D1**	**800H-BP2D1**	800H-DP2D1
	Red	800H-AP6D1	800H-BP6D1	800H-DP6D1
1 N.C.	Green	800H-AP1D2	800H-BP1D2	800H-DP1D2
	Black	800H-AP2D2	800H-BP2D2	800H-DP2D2
	Red	800H-AP6D2	**800H-BP6D2**	800H-DP6D2
1 N.O. - 1 N.C.	Green	**800H-AP1A**	800H-BP1A	800H-DP1A
	Black	**800H-AP2A**	800H-BP2A	800H-DP2A
	Red	**800H-AP6A**	**800H-BP6A**	**800H-DP6A**
2 N.O. - 2 N.C.	Green	800H-AP1B	800H-BP1B	800H-DP1B
	Black	800H-AP2B	800H-BP2B	800H-DP2B
	Red	800H-AP6B	800H-BP6B	800H-DP6B

∗ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-AP1.

Dual Momentary Contact Push Button Units



Dual Push Button Unit
Cat. No. 800H-DPH16AXX64

Contact Arrangement		Legend Marking		
Type	Contacts	Left	Right	Cat. No.❄
2 N.O. - 2 N.C.		START (Flush/Green)	STOP (Extended/Red)	**800H-DPH16AAXX64**
		ON (Flush/Black)	OFF (Flush/Black)	800H-DPH22AAXX50
		OPEN (Flush/Black)	CLOSE (Flush/Black)	800H-DPH22AAXX57
		UP (Flush/Black)	DOWN (Flush/Black)	800H-DPH22AAXX66
		Blank (Flush/Black)	Blank (Flush/Black)	800H-DPH22AAXX

❄ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-DPH16AAXX64.

10

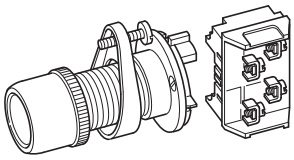
Hazardous Location Push Buttons

Product Selection

Momentary Contact Push Button Units, Non-Illuminated

800 H – AP 1 ____ A

a b c d e



a

Barrel Type	
Code	Description
H	Standard barrel length
HL	Long barrel

b

Operator Type	
Code	Description
AP	Flush head
BP	Extended head
DP	Mushroom head
DPX	Mushroom head less color cap

c

Color Cap	
Code	Description
Blank	Used only when ordering operator type DPX (Table b)
1	Green
2	Black
3	Orange
4	Grey
6	Red
7	Blue
9	Yellow

d

Special Mushroom Head	
Code	Description
Blank	No special head
J	Jumbo mushroom head — plastic
L	Jumbo mushroom head — metal

Note: Special mushroom head options only apply to mushroom head operator type DP (Table b).

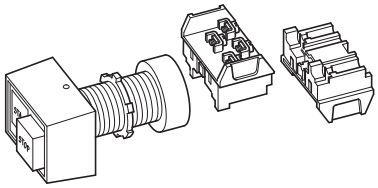
e

Contact Block(s)∗	
Standard	
Code	Description
Blank	No contacts
D1	1 N.O.
D2	1 N.C.
D5	1 N.O. (Mini)
D6	1 N.C. (Mini)
A2	2 N.O.
A4	2 N.C.
A	1 N.O. - 1 N.C.
B	2 N.O. - 2 N.C.
H	3 N.O. - 3 N.C.
C	4 N.O. - 4 N.C.
Pen*TUFF* (Low Voltage)	
Code	Description
D1V	1 N.O.
D2V	1 N.C.
AV	1 N.O. - 1 N.C.
BV	2 N.O. - 2 N.C.
HV	3 N.O. - 3 N.C.
CV	4 N.O. - 4 N.C.

Dual Push Button Units

800 H – DP H 16 AAXX 64

a b c d e f



a

Barrel Type	
Code	Description
H	Standard barrel
HL	Long barrel

b

Operator Type	
Code	Description
DP	Dual push button

c

Mounting	
Code	Description
H	Horizontal
B	Vertical

d

Color of Button	
Code	Description
16	Left green flush/right red extended
22	Left black flush/right black flush

e

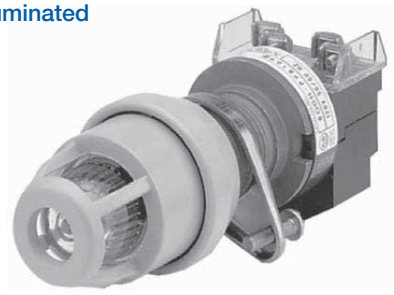
Contact Block(s)∗		
Code	Contact Arrangement	
	Left button for horizontal Top button for vertical	Right button for horizontal Bottom button for vertical
AAXX	1 N.O. - 1 N.C.	1 N.O. - 1 N.C.
AAAA	2 N.O. - 2 N.C.	2 N.O. - 2 N.C.

f

Marking		
Code	Description	
	Left button for horizontal Top button for vertical	Right button for horizontal Bottom button for vertical
Blank	No mark specified	No mark specified
64	START	STOP
50	ON	OFF
51	FORWARD	REVERSE
57	OPEN	CLOSE
66	UP	DOWN
99❄	Marking specified	Marking specified

∗ For sealed switch and Logic Reed contact blocks, see page 10-175.
❄ To order with special marking, specify marking; seven characters maximum per button, single line only.

Momentary Contact Push Button Units, Illuminated



Extended Head with Guard
Cat. No. 800H-PPB16M

Type	Lamp	Supply Voltage	Lens Color♣	Extended Head with Guard Cat. No.§❖
Operator only➢				800H-QPB00XX
Full Voltage	Incandescent	24V AC/DC	Multi-color kit	**800H-QPB24M**
		120V AC/DC		**800H-QPB10M**
	No lamp	0…250V AC/DC	No lens	800H-QPBN25
Universal	LED	12…130V AC/DC	Multi-color kit	800H-QPBH2M
Transformer	Incandescent	120V AC 50/60 Hz	Multi-color kit	800H-PPB16M
	LED			800H-PPBH16M
	No lamp		No lens	800H-PPBN16

♣ Units ship with multi-color insert packet including amber, blue, green, red, and white.
§ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-QPB2M.
❖ Includes as standard one Cat. No. 800T-XA (1 N.O./1 N.C.) contact block.
➢ Operator only supplied without power module, lamp, lens cap, or contact blocks.

Potentiometer Units‡



Potentiometer Unit
Cat. No. 800H-UP24

Resistance	Potentiometer✶ Cat. No.⌘	Resistance	Potentiometer✶ Cat. No.⌘
Operator Only (without Resistive Element)	800H-NP37❄	2.5 kΩ	**800H-UP19**
		5 kΩ	**800H-UP24**
1 kΩ	**800H-UP13**	10 kΩ	**800H-UP29**

✶ Rated for 300V AC/DC, 2W maximum.
❄ For use with Type J potentiometers having a shaft length of 7/8 in. (22.2 mm) and a shaft diameter of 1/4 in. (6.3 mm).
‡ Single-turn operation with 312° rotation.
⌘ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-UP13.

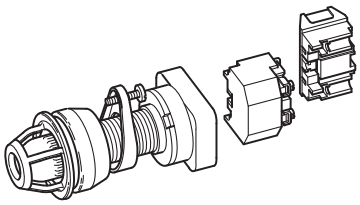
Hazardous Location Push Buttons

Product Selection

Momentary Contact Push Button Units, Illuminated

800 H – PPB H 16 M

a b c d e f



a

Operator Type	
Code	**Description**
H	Standard barrel length
HL	Long barrel

b

Power Module Type	
Code	**Description**
PPB	Transformer (or dual input)
QPB	Full voltage/Universal

c

Illumination Options	
Code	**Description**
Blank	Incandescent
H	LED
Dual Input	
D	Diode type, incandescent§
T	Transformer — relay type, incandescent
TH	Transformer — relay type, LED

d

Voltage	
Transformer	
Code	**Description**
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
46	480V AC 50/60 Hz
56	600V AC 50/60 Hz
Full Voltage — Incandescent	
24	24V AC/DC
10	120V AC/DC
20	240V AC/DC
Universal — LED	
2	12…130V AC/DC
Dual Input	
16	120V AC
24	24V AC/DC⌘

e

Lens Color	
Code	**Color**
Blank	No lens, with standard contacts 1 N.O. - 1 N.C.
X	No lens if ordering any contacts other than standard 1 N.O. - 1 N.C.
M	Multi-color✶

f

Contact Block(s)✦	
Standard	
Code	**Description**
Blank	1 N.O. - 1 N.C.
X	No contacts
D1	1 N.O.
D2	1 N.C.
A2	2 N.O.
A4	2 N.C.
Pen*TUFF* (Low Voltage)	
Code	**Description**
D1V	1 N.O.
D2V	1 N.C.
AV	1 N.O. - 1 N.C.

§ Diode type dual input provides circuit isolation via opposing diodes. Not recommended for use with solid-state outputs and neon indicators.
⌘ Dual input diode only.
✶ Multi-color insert packet includes amber, blue, green, red, and white.
✦ For sealed switch and Logic Reed contact blocks, see page 10-175.

2-Position Push-Pull Units, Non-Illuminated



2-Position Push-Pull
Cat. No. 800H-FPX6A5

Contact Type	Operator Position: Maintained Out	Operator Position: Maintained In	Button Color	Push-Pull Cat. No.∗
N.C.L.B.	X	O	Red	**800H-FPX6D4**
N.O. - N.C.L.B.	O X	X O	Red	**800H-FPX6A1**
N.C.L.B. - N.C.L.B.	X X	O O	Red	**800H-FPX6A5**

Note: X = Closed/O = Open
∗ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-FPX6D4.

3-Position Push-Pull Units, Non-Illuminated



3-Position Push-Pull
Cat. No. 800H-FPXM6A7

Contact Type	Operator Position: Momentary Out	Operator Position: Maintained Center	Operator Position: Maintained In	Button Color	Push-Pull Cat. No.❄
N.C. - N.C.L.B.	X X	O X	O O	Red	800H-FPXM6A7

Contact Type	Operator Position: Momentary Out	Operator Position: Maintained Center	Operator Position: Momentary In	Button Color	Push-Pull Cat. No.❄
N.C. - N.C.L.B.	X X	O X	O O	Red	800H-FPXN6A7

Note: X = Closed/O = Open
❄ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-FPXM6A7.

10

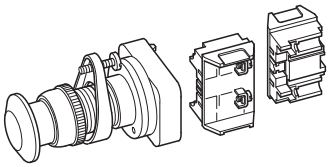
Hazardous Location Push Buttons

Product Selection

2-Position Push-Pull Units, Non-Illuminated

800 H – FPX ___ 1 A1

a b c d e



a

Barrel Type	
Code	Description
H	Standard barrel length
HL	Long barrel

b

Operator Type	
Code	Description
FPX	Push-pull unit

c

Head Type	
Code	Description
Blank	Mushroom head
J	Jumbo mushroom head∗

d

Color Cap	
Code	Color
Blank	No cap
1	Green
2	Black
4	Grey (silver)
6	Red
7	Blue
9	Yellow (gold)

e

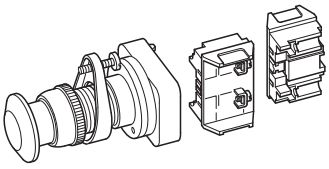
Contact Block(s)			
Standard			
Code	Operator Position		Description
	Out	In	
Blank	—	—	No contacts
A1	O X	X O	1 N.O. - 1 N.C.L.B.∗
A5	X X	O O	2 N.C.L.B.∗
D1	O	X	1 N.O.
D4	X	O	1 N.C.L.B.∗
Pen*TUFF* (Low Voltage)			
D1V	O	X	1 N.O.
AV	O X	X O	1 N.O. - 1 N.C.
Note: X = Closed/O = Open.			

∗ Normally closed late break contact. When button is pushed from the OUT to the IN position, the mechanical detent action of the operator occurs before electrical contacts change state. When the button is pulled from the IN to the OUT position, the electrical contacts change state before the mechanical detent occurs.

3-Position Push-Pull Units, Non-Illuminated

800 H – FPX ___ M 1 A7

a b c d e f



a

Barrel Type	
Code	Description
H	Standard barrel length
HL	Long barrel

b

Operator Type	
Code	Description
FPX	Push-pull unit

c

Head Type	
Code	Description
Blank	Mushroom head
J	Jumbo mushroom head❄

❄ Not valid with color cap option **Blank** (no cap).

d

Operator Function			
Code	Operator Position		
	Out	Center	In
M	Momentary	Maintained	Maintained
N	Momentary	Maintained	Momentary

e

Color Cap	
Code	Color
Blank	No cap
1	Green
2	Black
4	Grey (silver)
6	Red
7	Blue
9	Yellow (gold)

f

Contact Block(s)				
Standard				
Code	Operator Position			Description
	Out	Ctr.	In	
Blank	—	—	—	No contacts
A	O X	O O	X O	1 N.O. - 1 N.C.
A1	O X	O X	X O	1 N.O. - 1 N.C.L.B.
A7	X X	O X	O O	1 N.C. - 1 N.C.L.B.
B6	X X	O X	O O	2 N.C. - 2 N.C.L.B.
Pen*TUFF* (Low Voltage)				
AV	O X	O O	X O	1 N.O. - 1 N.C.
Note: X = Closed/O = Open.				

2-Position Push-Pull Units, Illuminated



Illuminated 2-Position Push-Pull
Cat. No. 800H-FPXP16RA1

Type	Lamp Type	Supply Voltage	Lens Color∗	Contacts	Operator Position: Maintained Out	Operator Position: Maintained In	Cat. No.❄
Operator only‡				No contacts			800H-FPXQ00
Full voltage	Incandescent	24V AC/DC	Multi-color kit	N.O. - N.C.L.B.	O	X	800H-FPXQ24MA1
		120V AC/DC			X	O	**800H-FPXQ10MA1**
	No lamp	0…250V AC/DC	No lens	No contacts			800H-FPXQN25
Universal	LED	12…130V AC/DC	Multi-color kit	N.O. - N.C.L.B.	O X	X O	800H-FPXQH2MA1
Transformer	Incandescent	120V AC, 50/60 Hz	Multi-color kit	N.O. - N.C.L.B.	O X	X O	800H-FPXP16MA1
	LED						800H-FPXPH16MA1
	No lamp		No lens	No contacts			800H-FPXPN16

Note: X = Closed/O = Open.

3-Position Push-Pull Units, Illuminated



Illuminated 3-Position Push-Pull
Cat. No. 800H-FPXMP16RA7

Operator Position (800H-FPXM)				Operator Position (800H-FPXN)			
	Momentary	Maintained	Maintained		Momentary	Maintained	Momentary
Contacts	Out	Center	In	Contacts	Out	Center	In
N.C. - N.C.L.B.	X X	O X	O O	N.C. - N.C.L.B.	X X	O X	O O

Type	Lamp Type	Supply Voltage	Lens Color∗	Cat. No.❄	Cat. No.❄
Operator only‡				800H-FPXMQ00	800H-FPXNQ00
Full voltage	Incandescent	24V AC/DC	Multi-color kit	800H-FPXMQ24MA7	800H-FPXNQ24MA7
		120V AC/DC		**800H-FPXMQ10MA7**	**800H-FPXNQ10MA7**
	No lamp	0…250V AC/DC	No lens	800H-FPXMQN25	800H-FPXNQN25
Universal	LED	12…130V AC/DC	Multi-color kit	800H-FPXMQH2MA7	800H-FPXNQH2MA7
Transformer	Incandescent	120V AC, 50/60 Hz	Multi-color kit	800H-FPXMP16MA7	800H-FPXNP16MA7
	LED			800H-FPXMPH16MA7	800H-FPXNPH16MA7
	No lamp		No lens	800H-FPXMPN16	800H-FPXNPN16

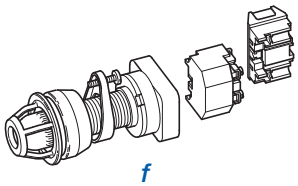
Note: X = Closed/O = Open
∗ Units ship with multi-color insert packet including amber, blue, green, red, and white.
❄ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800HL-FPXQH2MA1.
‡ Operator only supplied without power module, lamp, lens cap, or contact blocks.

Hazardous Location Push Buttons

Product Selection

2- and 3-Position Push-Pull Units, Illuminated

800	H	– FPX		PH	16	M	A1
	a	*b*	*c*	*d*	*e*	*f*	*g*



a

Barrel Type	
Code	Description
H	Standard barrel length
HL	Long barrel

b

Operator Type	
Code	Description
FPX	Push-pull unit

c

Operator Function			
2-Position			
Code	Description		
Blank	Push-pull		
3-Position			
Code	Operator Position		
	Out	Ctr.	In
M	Mom.	Main.	Main.
N	Mom.	Main.	Mom.

Note: Mom. - Momentary
Main. - Maintained

d

Illumination Options	
Transformer	
Code	Description
P	Incandescent
PH	LED
Full Voltage	
Code	Description
Q	Incandescent
QH	Universal LED
Dual Input	
Code	Description
D	Dual input — diode§
DT	Dual input — transformer relay
DTH	Dual input transformer — relay LED

e

Voltage	
Transformer	
Code	Description
16	120V AC 50/60 Hz
26	240V AC 50/60 Hz
46	480V AC 50/60 Hz
56	600V AC 50/60 Hz
Full Voltage — Incandescent	
Code	Description
24	24V AC/DC
10	120V AC/DC
20	240V AC/DC
Universal — LED	
Code	Description
2	12…130V AC/DC
Dual Input	
Code	Description
16	120V AC
24	24V AC/DC✦

f

Color Cap	
Code	Color
Blank	No lens with no contacts
X	No lens with contacts
M	Multi-color✶

g

Contact Blocks	
Standard	
Code	Color
Blank	No contacts
D1	1 N.O.
D4	1 N.C.L.B.⌘
A	1 N.O. - 1 N.C.
A1	1 N.O. - 1 N.C.L.B.⌘
A2	2 N.O.
A5	2 N.C.L.B.
A7	1 N.C. - 1 N.C.L.B.⌘
Pen*TUFF* (Low Voltage)	
Code	Description
D1V	1 N.O.
D2V	1 N.C.
AV	1 N.O. - 1 N.C.
Logic Reed	
Code	Color
D1R	1 N.O.
D2R	1 N.C.
AR	1 N.O. - 1 N.C.
A2R	2 N.O.
A4R	2 N.C.

Table 1. Target Selection

2-Position				3-Position			
g Code	Out	In	Contact Description	Out	Center	In	g Code
A, AV, R	O X	X O	N.O. N.C.	O X	O O	X O	A, AV, AR
A1	O X	X O	N.O. N.C.L.B.	O X	O X	X O	A1
A2	O X	O X	N.O. N.O.	— —	— —	— —	—
A5	X O	X O	N.C.L.B N.C.L.B	— —	— —	— —	—
—	— —	— —	N.C. N.C.L.B.	X X	O X	O O	A7
D1, D1V, D1R	O	X	N.O.	—	—	—	—
D4	X	O	N.C.L.B.	—	—	—	—

✶ Multi-color insert packet includes amber, blue, green, red, and white.
§ Diode type dual input provides circuit isolation via opposing diodes. Not recommended for use with solid-state outputs and neon indicators.
⌘ Normally closed late break contact. When button is pushed from the OUT to the IN position, the mechanical detent action of the operator occurs before electrical contacts change state. When the button is pulled from the IN to the OUT position, the electrical contacts change state before the mechanical detent occurs.
✦ Dual input diode only.

2-Position Selector Switch Units, Non-Illuminated



Standard Knob Operator
Cat. No. 800H-HP2KB6AXXX



Knob Lever Operator
Cat. No. 800H-HP17KB6AXXX



Metal Wing Lever Operator
Cat. No. 800H-HP11KBAXXX

Contact Type	Operator Position		Contact Action M = Maintained S = Spring Return	Standard Knob	Knob Lever	Wing Lever
				Cat. No.‡	Cat. No.‡	Cat. No.‡
No Contacts	—	—	M M	**800H-HP2KB6**	800H-HP17KB6	800H-HP11KB6
			S→M∗	800H-HP4KL8	800H-HP4KL8	800H-HP4KL8
1 N.O.	O	X	M M	**800H-HP2KB6DXXX**	800H-HP17KB6DXXX	800H-HP11KB6DXXX
			S→M∗	800H-HP4KL8DXXX	800H-HP18KL8DXXX	800H-HP15KL8DXXX
			M←S	800H-HP5KL8DXXX	800H-HP19KL8DXXX	800H-HP16KL8DXXX
1 N.O. - 1 N.C.	O X	X O	M M	**800H-HP2KB6AXXX**	800H-HP17KB6AXXX	800H-HP11KB6AXXX
			S→M∗	800H-HP4KL8AXXX	800H-HP18KL8AXXX	800H-HP15KL8AXXX
			M←S	800H-HP5KL8AXXX	800H-HP19KL8AXXX	800H-HP16KL8AXXX
2 N.O. - 2 N.C.	O X O X	X O X O	M M	**800H-HP2KB6AAXX**	800H-HP17KB6AAXX	800H-HP11KB6AAXX
			S→M∗	800H-HP4KL8AAXX	800H-HP18KL8AAXX	800H-HP15KL8AAXX
			M←S	800H-HP5KL8AAXX	800H-HP19KL8AAXX	800H-HP16KL8AAXX

Note: X = Closed/O = Open



2-Position Cylinder Lock Operator
Cat. No. 800H-HP31KB6AXXX

Contact Type	Operator Position		Contact Action M = Maintained S = Spring Return	Cylinder Lock		
				Key Removal Left❄	Key Removal Right❄	Key Removal Both❄
				Cat. No.‡	Cat. No.‡	Cat. No.‡
No Contacts	—	—	M M	800H-HP31KB6	800H-HP32KB6	800H-HP33KB6
			M←S	800H-HP48KL8	—	—
1 N.O.	O	X	M M	800H-HP31KB6DXXX	800H-HP32KB6DXXX	800H-HP33KB6DXXX
			S→M∗	—	800H-HP42KL8DXXX	—
			M←S	800H-HP48KL8DXXX	—	—
1 N.O. - 1 N.C.	O X	X O	M M	**800H-HP31KB6AXXX**	800H-HP32KB6AXXX	800H-HP33KB6AXXX
			S→M∗	—	800H-HP42KL8AXXX	—
			M←S	800H-HP48KL8AXXX	—	—
2 N.O. - 2 N.C.	O X O X	X O X O	M M	800H-HP31KB6AAXX	800H-HP32KB6AAXX	800H-HP33KB6AAXX
			S→M∗	—	800H-HP42KL8AAXX	—
			M←S	800H-HP48KL8AAXX	—	—

Note: X = Closed/O = Open
∗ Target tables are reversed from those shown.
❄ Key removable from maintained positions only. Devices supplied with 2 keys. Replacement part number for standard D018 key is X-181170.
‡ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-HP48KL8.

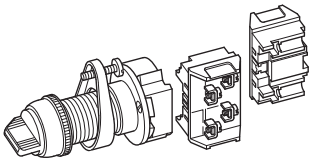
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Hazardous Location Push Buttons

Product Selection

2-Position Selector Switch Units, Non-Illuminated

	a	b	c	d	e	f	
800	H	– HP	A	2	KB6	AXXX	(Knob/Wing Lever)
800	H	– HP	31		KB6	AXXX	(Cylinder Lock)



a

Barrel Type	
Code	Description
H	Standard barrel length
HL	Long barrel

b

Number of Positions	
Code	Description
HP	2-position

c

Knob Insert Colors∗	
Code	Color
Blank	White
X	Packet of colored inserts❄
Metal Wing Lever Colors	
Code	Color
A	Red
Blank	Grey

c_1

Key Removal Position	
Maintained	
Code	Operator Function
31	Key removal — left
32	Key removal — right
33	Key removal — both
Spring Return From Left	
Code	Operator Function
42	Key removal — right‡
Spring Return From Right	
Code	Operator Function
48	Key removal — left

d

Operator Type and Function	
Standard Knob	
Code	Operator Function
2	Maintained
4	Spring return from left‡
5	Spring return from right
Knob Lever	
Code	Operator Function
17	Maintained
18	Spring return from left‡
19	Spring return from right
Metal Wing Lever	
Code	Operator Function
11	Maintained
15	Spring return from left‡
16	Spring return from right

d_1

Optional Keys			
Code	D Series Key No.	Code	T Series Key No.
Blank	D018 (std. key)	15	T112
03	D020	16	T115
04	D025	17	T324
05	D335	18	T382
06	D429	19	T404
07	D461	20	T171
08	D111	21	T484
09	D587	22	T547
10	D682	23	T569
11	D713	24	T692
12	D900	25	T752
13	D992	26	T178
14	D118	—	—

e

Cam Option	
Code	Description
KB6	Cam for maintained operators
KL8	Cam for spring return operators

f

Contact Block(s)			
Standard			
Code	Description		
	Contact Configuration	2-Position	
Blank	No contacts	—	—
DXXX	1 N.O.	O	X
EXXX	1 N.C.	X	O
MXXX	2 N.O.	O	X
		O	X
NXXX	2 N.C.	X	O
		X	O
AXXX	1 N.O. - 1 N.C.	O	X
		X	O
AAXX	2 N.O. - 2 N.C.	O	X
		X	O
		O	X
		X	O
PenTUFF (Low Voltage)			
Code	Description		
	Contact Configuration	2-Position	
HXXX	1 N.O.	O	X
UXXX	1 N.C.	X	O
FXXX	1 N.O. - 1 N.C.	O	X
		X	O
FFXX	2 N.O. - 2 N.C.	O	X
		X	O
		O	X
		X	O
Note: X = Closed/O = Open.			

∗ Each standard and knob lever operator is factory assembled with a white insert. Other colors are available, factory assembled, if ordered in quantities of 10 or more.
❄ One insert of each color (blue, green, orange, red, and yellow).
‡ Target tables are reversed from those shown.

3-Position Selector Switch Units, Non-Illuminated



Standard Knob Operator
Cat. No. 800H-JP2KB7AXXX



Knob Lever Operator
Cat. No. 800H-JP17KB7AXXX



Metal Wing Lever Operator
Cat. No. 800H-JP11KB7AXXX

Contact Type	Operator Position			M = Maintained S = Spring Return	Standard Knob	Knob Lever	Metal Wing Lever
					Cat. No.‡	Cat. No.‡	Cat. No.‡
No Contacts	—	—	—	M M M	**800H-JP2KB7**	800H-JP17KB7	800H-JP11KB7
				S→M M	800H-JP4KB7	800H-JP18KB7	800H-JP15KB7
				M M←S	800H-JP5KB7	800H-JP19KB7	800H-JP16KB7
				S→M←S	800H-JP91KB7	800H-JP20KB7	800H-JP141KB7
1 N.O. - 1 N.C.	O X	O O	X O	M M M	**800H-JP2KB7AXXX**	800H-JP17KB7AXXX	800H-JP11KB7AXXX
				S→M M	800H-JP4KB7AXXX	800H-JP18KB7AXXX	800H-JP15KB7AXXX
				M M←S	800H-JP5KB7AXXX	800H-JP19KB7AXXX	800H-JP16KB7AXXX
				S→M←S	**800H-JP91KB7AXXX**	800H-JP20KB7AXXX	800H-JP141KB7AXXX
2 N.O. - 2 N.C.	O X O X	O O O O	X O X O	M M M	**800H-JP2KB7AAXX**	800H-JP17KB7AAXX	800H-JP11KB7AAXX
				S→M M	800H-JP4KB7AAXX	800H-JP18KB7AAXX	800H-JP15KB7AAXX
				M M←S	800H-JP5KB7AAXX	800H-JP19KB7AAXX	800H-JP16KB7AAXX
				S→M←S	800H-JP91KB7AAXX	800H-JP20KB7AAXX	800H-JP141KB7AAXX

Note: X = Closed/O = Open



3-Position Cylinder Lock Operator
Cat. No. 800H-JP42KB7AXXX

Contact Type	Operator Position			M = Maintained S = Spring Return	Cylinder Lock		
					Key Removal Left	Key Removal Center	Key Removal All∗
					Cat. No.‡	Cat. No.‡	Cat. No.‡
No Contacts	O	X	X	M M M	800H-JP41KB7	800H-JP42KB7	800H-JP44KB7
				S→M∗	—	800H-JP50KB7	800H-JP51KB7
				M←S	800H-HP5KL8DXXX	800H-JP38KB7	800H-JP73KB7
				M M	—	800H-JP631KB7	—
1 N.O. - 1 N.C.	O X	O O	X O	M M M∗	800H-JP41KB7AXXX	800H-JP42KB7AXXX	800H-JP44KB7AXXX
				M←S	—	800H-JP50KB7AXXX	800H-JP51KB7AXXX
				M M←S	800H-JP69KB7AXXX	800H-JP38KB7AXXX	800H-JP73KB7AXXX
				S→M←S	—	800H-JP631KB7AXXX	—

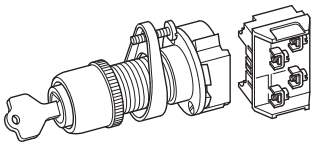
Note: X = Closed/O = Open
∗ Key removable in maintained positions only.
‡ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-JP41KB7.

10

Hazardous Location Push Buttons

Product Selection

3-Position Selector Switch Units, Non-Illuminated



800	H	–	JP		2	KB7	AAXX	(Knob/Wing Lever)
	a		*b*	*c*	*d*	*e*	*f*	

800	H	–	JP	41		KB7	AAXX	(Cylinder Lock)
	a		*b*	c_1	d_1	*e*	*f*	

a

Barrel Type	
Code	Description
H	Standard barrel length
HL	Long barrel

b

Number of Positions	
Code	Description
JP	3-position

c

Knob Insert Colors∗	
Code	Color
Blank	White knob insert or cylinder lock operator
X	Packet of colored inserts❄
Metal Wing Lever Colors	
Code	Color
A	Red
Blank	Grey

c_1

Cylinder Lock Operators	
Maintained Position	
Code	Locking Position
41	Left
42	Center
43	Right
44	All
45	Left and center
46	Right and left
47	Right and center
Spring Return from Left	
Code	Locking Position
50	Center
52	Right
51	Right and center
Spring Return from Right	
Code	Locking Position
69	Left
38	Center
73	Left and center
Spring Return from Both	
Code	Locking Position
631	Center

d

Knob/Lever Type Operators	
Standard Knob	
Code	Operator Function
2	Maintained
4	Spring return from left
5	Spring return from right
91	Spring return from both
Knob Lever	
Code	Operator Function
17	Maintained
18	Spring return from left
19	Spring return from right
20	Spring return from both
Metal Wing Lever§	
Code	Operator Function
11	Maintained
15	Spring return from left
16	Spring return from right
141	Spring return from both

d_1

Operator Type/Function‡	
Standard Knob	
Code	Key No.
Blank	D018 (standard key)
Note: Refer to page 10-164 for additional key option codes.	

e

Cam Option	
Code	Description
KB7	Standard cam KB7
KA1	Cam KA1
KA7	Cam KA7
Note: For additional Cam descriptions, see Table 5.	

f

Contact Block Option	
Code	Description
Blank	No contacts
AXXX	Two contact targets for a given cam as shown in the W (white side) column of Table 5.
AAXX	Two contact targets for a given cam as shown in the W (white side) column of Table 1 **and** 2 contact targets for the same cam as shown in the B (black side) column of Table 5. (One **Cat. No. 800T-XA** contact block per side. Two contact blocks total.)
AAAA	Four contact targets for a given cam as shown in the W (white side) column of Table 5 **and** 4 contact targets for the same cam as shown in the B (black side) column of Table 5. (Two **Cat. No. 800T-XA** contact blocks per side. Four contact blocks total.)

Table 5. Cam and Contact Block Functionality Table

| Contact Block Suffix Code | Contact Block Side | Circuits | Cam Codes | | |

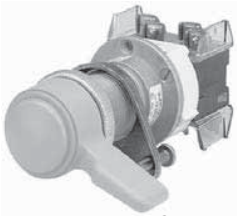
4-Position Selector Switch Units, Non-Illuminated



Standard Knob Operator
Cat. No. 800H-NP2KF4AAXX



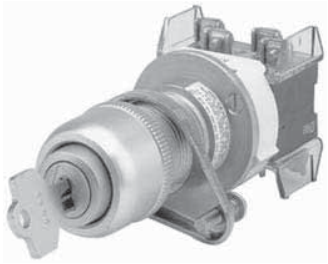
Knob Lever Operator
Cat. No. 800H-NP17KF4AAXX



Metal Wing Lever Operator
Cat. No. 800H-NP11KF4AAXX

Contact Type	Operator Position				M = Maintained S = Spring Return	Standard Knob Cat. No.‡	Knob Lever Cat. No.‡	Metal Wing Lever Cat. No.‡
No Contacts	—	—	—	—	M M M M	800H-NP2KF4	800H-NP17KF4	800H-NP11KF4
					S→M M M	800H-NP3KF4	800H-NP29KF4	800H-NP13KF4
					M M M←S	800H-NP9KF4	800H-NP30KF4	800H-NP14KF4
2 N.O. - 2 N.C.	X O O O	O X O O	O O X O	O O O X	M M M M	800H-NP2KF4AAXX	800H-NP17KF4AAXX	800H-NP11KF4AAXX
					S→M M M	800H-NP3KF4AAXX	800H-NP29KF4AAXX	800H-NP13KF4AAXX
					M M M←S	800H-NP9KF4AAXX	800H-NP30KF4AAXX	800H-NP14KF4AAXX

Note: X = Closed/O = Open



Cylinder Lock Operator
Cat. No. 800H-NP32KF4AAXX

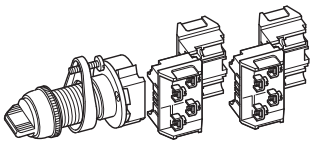
Contact Type	Operator Position				M = Maintained S = Spring Return	Cylinder Lock Key Removal Position 2 Cat. No.‡	Key Removal Position 3 Cat. No.‡	Key Removal All∗ Cat. No.‡
No Contacts	—	—	—	—	M M M M	800H-NP32KF4	800H-NP33KF4	800H-NP61KF4
					S→M M M	800H-NP132KF4	800H-NP133KF4	800H-NP154KF4
					M M M←S	800H-NP232KF4	800H-NP233KF4	800H-NP251KF4
2 N.O. - 2 N.C.	X O O O	O X O O	O O X O	O O O X	M M M M	800H-NP32KF4AAXX	800H-NP33KF4AAXX	800H-NP61KF4AAXX
					S→M M M	800H-NP132KF4AAXX	800H-NP133KF4AAXX	800H-NP154KF4AAXX
					M M M←S	800H-NP232KF4AAXX	800H-NP233KF4AAXX	800H-NP251KF4AAXX

Note: X = Closed/O = Open
∗ Key removable in maintained positions only.
‡ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-NP32KF4.

Hazardous Location Push Buttons

Product Selection

4-Position Selector Switch Units, Non-Illuminated



800	H	– NP		2	KF4	AAXX	(Knob/Wing Lever)
	a	*b*	*c*	*d*	*e*	*f*	
800	H	– NP	31		KF4	AAXX	(Cylinder Lock)
	a	*b*	*c*$_1$	*d*$_1$	*e*	*f*	

a

Barrel Type	
Code	Description
H	Standard barrel length
HL	Long barrel

b

Number of Positions	
Code	Description
NP	4-position

c

Knob Insert Colors✶	
Code	Color
Blank	White
X	Packet of colored inserts❄
Metal Wing Lever Colors	
Code	Color
A	Red
Blank	Grey

c1

Key Removal Position and Operator Function	
Maintained	
Code	Operator Function
31	Key removal position 1
32	Key removal position 2
33	Key removal position 3
34	Key removal position 4
61	Key removal all positions

c1 (cont'd)

Key Removal Position and Operator Function	
Spring Return From Position 1 to Position 2	
Code	Operator Function
132	Key removal position 2
133	Key removal position 3
134	Key removal position 4
154	Key removal positions 2, 3, and 4
Spring Return From Position 1 to Position 2	
Code	Operator Function
231	Key removal position 1
232	Key removal position 2
233	Key removal position 3
251	Key removal positions 1, 2, and 3

d

Operator Function and Knob Type	
Standard Knob	
Code	Operator Function
2	Maintained
3	Spring return from position 1 to position 2
9	Spring return from position 4 to position 3
Knob Lever	
Code	Operator Function
17	Maintained
29	Spring return from position 1 to position 2
30	Spring return from position 4 to position 3

d (cont'd)

Operator Function and Knob Type	
Metal Wing Lever	
Code	Operator Function
11	Maintained
13	Spring return from position 1 to position 2
14	Spring return from position 4 to position 3

d1

Optional Keys§	
D Series	
Code	Description
Blank	D018 (standard key)

e

Cam Option	
Code	Description
KF4	F cam (standard)
KG4	G cam
KK4	K cam
KM4	M cam
KP4	P cam
KH4	Overlapping cam

f

Contact Block Option	
Code	Description
Blank	No contacts
AAXX	Two contact targets for a given cam as shown in the W (white side) column of Table 1 **and** 2 contact targets for the same cam as shown in the B (black side) column of Table 1. (One **Cat. No. 800T-XA** contact block per side. Two contact blocks total)

f (cont'd)

Contact Block Option	
Code	Description
AAAA	Four contact targets for a given cam as shown in the W (white side) column of Table 1 **and** 4 contact targets for the same cam as shown in the B (black side) column of Table 1. (Two **Cat. No. 800T-XA** contact blocks per side. Four contact blocks total.)
PenTUFF (Low Voltage)	
Code	Description
FFXX	Two contact targets for a given cam as shown in the W (white side) column of Table 1 **and** 2 contact targets for the same cam as shown in the B (black side) column of Table 1. (One **Cat. No. 800T-XAV** contact block per side. Two contact blocks total)
FFFF	Four contact targets for a given cam as shown in the W (white side) column of Table 1 **and** 4 contact targets for the same cam as shown in the B (black side) column of Table 1. (Two **Cat. No. 800T-XAV** contact blocks per side. Four contact blocks total.)

Table 1. Selector Switch Cam Targets

Contact Block Suffix Code	Contact Block Side	Circuits	Cam Description																							
			KF4				KG4				KK4♣				KM4♣				KP4				KN4‡			
↑ AAAA FFFF ↓	↑ AAXX FFXX ↓	White	A	X	O	O	O	X	X	O	O	O	O	X	X	X	O	O	O	O	O	X	O	X	O	O
			B	O	X	O	O	O	X	O	O	X	X	O	O	O	X	X	O	O	X	O	O	O	O	O	X
		Black	A	O	O	O	X	X	O	O	O	X	O	O	X	O	O	O	X	O	O	X	X	O	O	X	O
			B	O	O	X	O	O	O	O	X	O	X	X	O	O	X	O	O	X	O	O	O	X	O	O	O
		White	A	X	O	O	O	X	X	O	O	O	O	X	X	X	O	O	O	O	O	O	X	O	X	O	O
			B	O	X	O	O	O	O	X	O	X	X	O	O	O	X	X	O	O	X	O	O	O	O	O	X
		Black	A	O	O	O	X	X	O	O	O	X	O	O	X	O	O	O	X	O	O	X	X	O	O	X	O
			B	O	O	X	O	O	O	O	X	O	X	X	O	O	X	O	O	X	O	O	O	X	O	O	O

Note: W = White B = Black. X = Closed/O = Open. For additional targets and overlapping cams, see Publication 800T-2.8.

✶ Each standard and knob lever operator is factory assembled with a white insert. Other colors available, factory assembled, if ordered in quantities of 10 or more.

❄ One insert of each color (blue, green, orange, red, and yellow).

‡ Overlapping cam.

§ Devices supplied with 2 keys. Replacement part number for standard D018 key is X-181170

♣ Not available with wing lever operator.

Pilot Light Units



Transformer Type Pilot Light
Cat. No. 800H-PP16M



Push-to-Test Pilot Light
Cat. No. 800H-PPT16M



Pigtail Pilot Light
Cat. No. 800H-LP24M

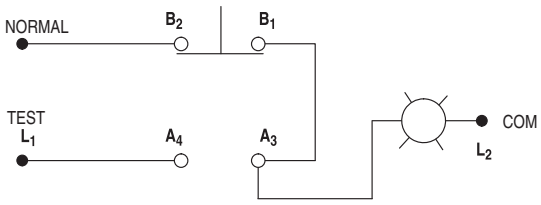
Type	Lamp Type	Supply Voltage	Lens Color✶	Pilot Light Cat. No.❄	Push-to-Test Cat. No.❄‡	Pigtail Cat. No.❄§
Operator only♣				800H-QPN00	800H-QPB00XX	—
Full voltage	Incandescent	24V AC/DC	Multi-color kit	800H-QP24M	800H-QPT24M	800H-LP24M
		120V AC/DC		**800H-QP10M**	**800H-QPT10M**	**800H-LP10M**
	No lamp	0…250V AC/DC	No lens	800H-QPN25	800H-QPTN25	800H-LPN25
	LED	24V AC/DC	Multi-color kit	—	—	800H-LPH24M
		120V AC		—	—	800H-LPH10M
Universal	LED	12…130V AC/DC	Multi-color kit	**800H-QPH2M**	800H-QPTH2M	—
Transformer	Incandescent	120V AC, 50/60 Hz	Multi-color kit	**800H-PP16M**	800H-PPT16M	—
	LED			800H-PPH16M	800H-PPTH16M	—

✶ Units ship with multi-color insert packet including amber, blue, green, red, and white.
❄ For long barrel versions, add an **L** to the cat. no. **Example:** Cat. No. 800H**L**-QPH2M
‡ Includes one standard Cat. No. 800T-XA (1 N.O./1 N.C.) contact block.
§ Pigtail length is 7 in.
♣ Operator only supplied without power module, lamp, lens cap, or contact blocks.

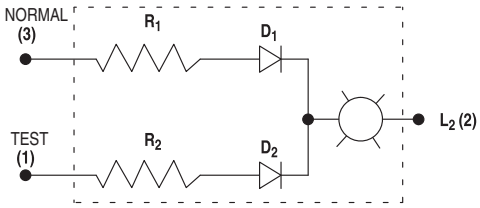
Typical Pilot Light Wiring Diagrams

See applicable Codes and Laws.

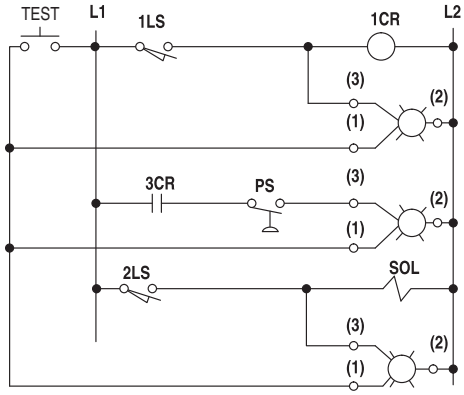
Push-to-Test Pilot Light Device Schematic



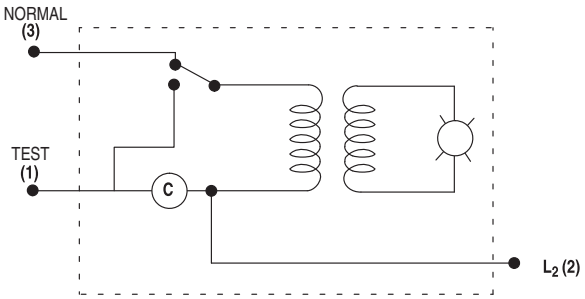
Dual Input Diode Pilot Device Schematic



Dual Input Pilot Light Typical Application Wiring Diagram



Dual Input Pilot Light Transformer Type Device Schematic



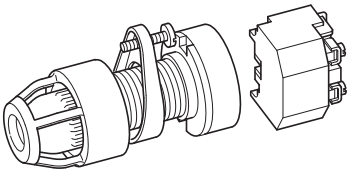
10

Hazardous Location Push Buttons

Product Selection

Pilot Light Units

800	H	–	PP	T		16	M
	a		*b*	*c*	*d*	*e*	*f*



a

Barrel Type	
Code	Description
H	Standard barrel length
HL	Long barrel

b

Power Module Type	
Code	Description
PP	Transformer (or dual input)
QP	Full voltage/Universal
LP	Pigtail — full voltage❄
LPK	Pigtail — full voltage❄ (for dual push buttons)

c

Lamp Test Options	
Code	Description
Blank	No test option
T	Push-to-test
D	Dual input — diode‡
DT	Dual input — transformer relay‡

d

Illumination Option	
Code	Description
Blank	Incandescent
H	LED♣

e

Voltage	
Transformer	
Code	Description
16	120V AC, 50/60 Hz
26	240V AC, 50/60 Hz
46	480V AC, 50/60 Hz
56	600V AC, 50/60 Hz
Full Voltage — Incandescent	
Code	Description
24	24V AC/DC
10	120V AC/DC
20	240V AC/DC
Universal — LED	
Code	Description
2	12…130V AC/DC
Dual Input	
Code	Description
16	120V AC
24	24V AC/DC✦
Pigtail	
Code	Description
24	24V AC/DC
10	120V AC/DC
20	240V AC/DC

f

Lens Color	
Code	Color
Blank	No lens with no contacts
M	Multi-color✶

Note: Push-to-test pilot light is supplied with a factory jumpered 800T-XA, 1 N.O - 1 N.C contact block.
✶ Multi-color insert packet includes amber, blue, green, red, and white
❄ Lamp test options is not available with pigtail.
‡ Only available with power module type code **PP**.
♣ LED illumination option is not available with diode type dual input lamp test options.
✦ Dual input diode only.

Ordering Information for Stations

Stations

Bulletin 800H Type 7 & 9 stations are available as factory assembled or as components for field assembly.

Factory-Assembled Stations

Bulletin 800H Type 7 & 9 control stations are designed to meet the requirements of the National Electrical Code. These stations are listed by Underwriters Laboratories, Inc. for Class I, Divisions 1 & 2, Groups C & D Hazardous Gases or Vapors, Class II, Divisions 1 & 2, Groups E, F & G Hazardous Dust and Class III Hazardous Fiber Locations. In addition the single gang shallow base, **Cat. No. 800H-IHZX7**, meets Class I, Group B requirements as defined in the National Electrical Code.

Factory-assembled stations may be ordered in three ways:

- **Standard**, factory-assembled stations listed on page 10-154.
- **Custom**, factory-assembled stations can be ordered by following the instructions listed on this page.

Components for Field Assembled Stations

Eight-gang maximum∗. These 2- and 3-gang modules may be assembled into the multi-gang stations by installing a coupler kit between the enclosures. These separate bases, covers, or bases with covers are Underwriters Laboratories, Inc. listed when properly assembled. These enclosures meet the requirements of Class I, Division 1 & 2, Groups C & D, Class II, Divisions 1 & 2, Groups E, F & G, and Class III hazardous locations as defined in the National Electrical Code. Bulletin 800H Type 7 & 9 components are designed for these modular enclosures and are UL Listed for this purpose.

Note: Components may be assembled as multi-gang units up to an **eight-gang maximum**∗.

To select components for field assembly, follow the instructions for ordering a custom-built station.

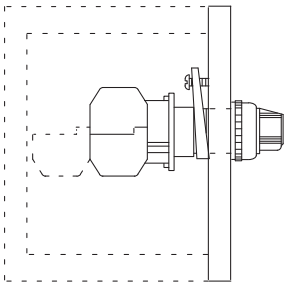
Instructions for Ordering Custom-Built Stations

1. Select operators required from page 10-154. (If lever type, select covers from page 10-172 and go to Step 3).
2. Select covers based on mounting requirements on page 10-172.
3. Select an assembled base from page 10-173 in accordance with the number of covers selected in Step 2.
4. Select legend plates from page 10-181…10-182 (and accessories, if required, from pages page 10-175…10-179).
5. If a particular sequence of operators or mounting orientation (vertical versus horizontal) is required, include a rough sketch.

Station Design Guidelines

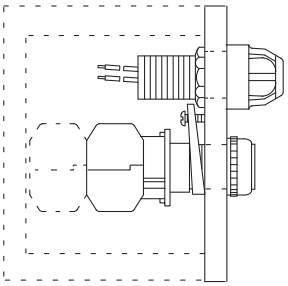
(Also see Applicable Codes and Standards)

1. Push-to-test pilot lights, illuminated push buttons, push-to-pull units, 4-position selector switches, and all operators with two contact blocks fastened along side one another or with a power module and contact block along side one another must be installed in a single hole cover.
2. Dual push button units may only be installed in a single-hole cover or the specially designed two-hole cover (Cat. No. 800H-NP33), which can accommodate the dual push button and the special pigtail pilot light (Cat. No. 800H-LPK10R).
3. When two components are installed in one cover, contact blocks are restricted to one side of the operator. Contact blocks of each operator must face each other.
4. One level of contact blocks is maximum in a shallow base or deep base when used with a sealing well. Contact blocks, except sealed switch type, may be mounted two deep in other bases.
5. If sealed switch contact blocks or a sealing well are used, a deep enclosure is required.
6. a. START push buttons should be green or black flush, installed to the left or above STOP push buttons.
   b. EMERGENCY STOP push buttons should be a red mushroom.
   c. STOP push buttons should be red extended, installed to the right or below START push button.
   d. STOP push buttons should be installed in the last position (bottom or right) of each unit when required.
   e. Pilot lights should be installed in the first position (top or left side) of each unit when required.



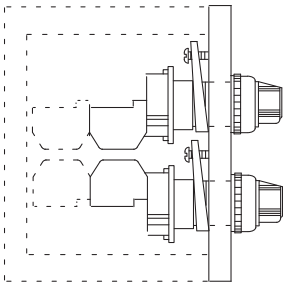
Design Guideline #1

Push-to-test pilot lights, illuminated push buttons, push-pull units, 4-position selector switches, all operators with two contact blocks fastened along side one another or with a power module and contact block along side one another must be installed in a single hole cover.



Design Guideline #2

Dual push button units may only be installed in a single hole cover or the specially designed two hole cover (Cat. No. 800H-NP33), which can accommodate the dual push button and the special pigtail pilot light (Cat. No. 800H-LPK10R).



Design Guideline #3

When two components are installed in one cover, contact blocks are restricted to one side of the operator. Contact blocks of each operator must face each other.

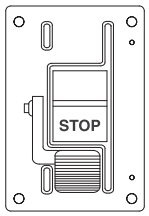
Design Guideline #4

One level of contact blocks is maximum in a shallow base or deep base when used with a sealing well. Contact blocks, except sealed switch type, may be mounted two deep in other bases.

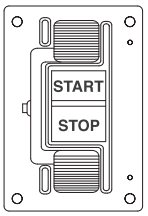
∗ Flange width is designed to comply with Underwriters Laboratories standards to enclosures with an internal free volume of up to 300 cubic inches (a maximum 8-gang assembly).

Covers, Lever Type Actuator

Note: Lever type covers are furnished without contact blocks. Legend plate for half lever is **STOP**; full lever momentary and maintained is a **START-STOP**. To order without legend plate, add suffix **X** to the cat. no.



Half Lever

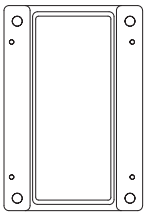


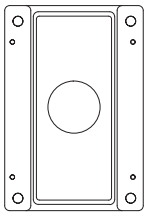
Double Lever Momentary

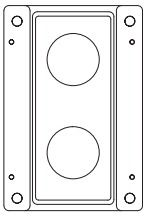
Half Lever	Double Lever Momentary	Double Lever Maintained	Double Lever Momentary/Maintained∗
Cat. No.	Cat. No.	Cat. No.	Cat. No.
800H-NP14	**800H-NP15**	800H-NP16	800H-NP34

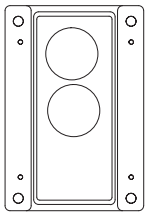
∗ A normally open circuit configuration is recommended for use behind this momentary lever and a late break normally closed circuit configuration is required for use behind the maintained lever to achieve proper functioning of the device.

Covers, Component Type Button







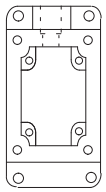


Blank	One Hole❄	Two Hole‡	Two Hole Special§
Cat. No.	Cat. No.	Cat. No.	Cat. No.
800H-NP32	**800H-NP30**	**800H-NP31**	**800H-NP33**

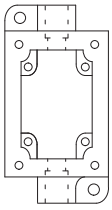
❄ One-hole covers use a jumbo legend plate only.
‡ Two-hole covers use a standard legend plate only.
§ This special two-hole cover can accommodate the pigtail pilot light (**Bulletin 800H-LPK10** series), the dual push button or any non-illuminated unit. Legend plates (**Cat. No. 800H-Y140J** green and red split-field) and (**Cat. No. 800H-Y141J** grey full field), are the only legend plates suitable for use with this cover.

Assembled Bases (for Field Assembly and Custom Stations)

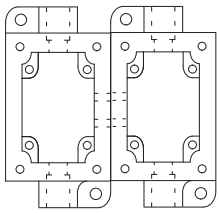
Enclosure Covers — See enclosure cover tables for a complete listing of covers for these bases.
Special Conduit Entries — For conduit entries not listed, consult your local Rockwell Automation sales office or Allen-Bradley distributor.



1-Gang Shallow✶

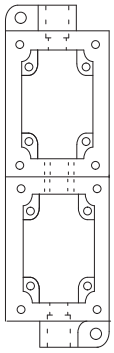


1-Gang Deep❄

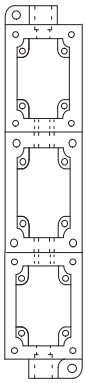


2-Gang Horizontal❄

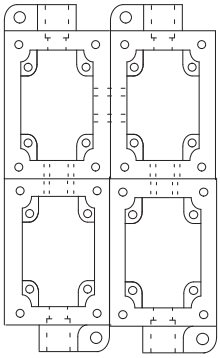
Conduit Entry	Cat. No.	Cat. No.	Cat. No.
3/4 in. Dead End	**800H-1HZX7**	**800H-1HVX7**	—
3/4 in. Feed Through	—	**800H-1HVX7M1**	—
1 in. Dead End	—	800H-1HVX7M2	**800H-2HHX7**
1 in. Feed Through	—	800H-1HVX7M3	—



2-Gang Vertical❄

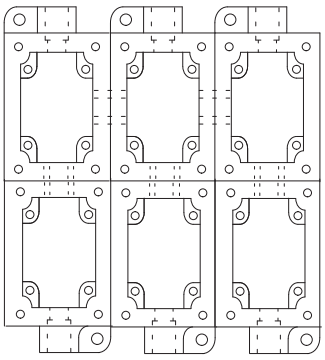


3-Gang Vertical❄

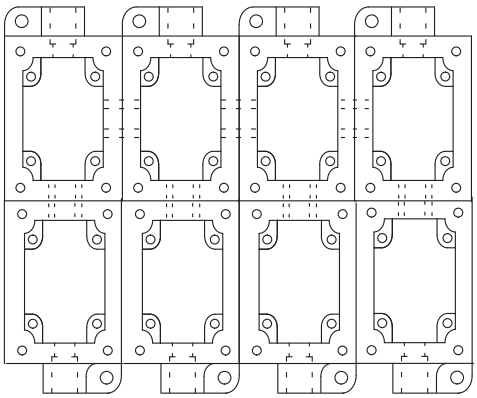


4-Gang❄

Conduit Entry	Cat. No.	Cat. No.	Cat. No.
1 in. Feed Through	**800H-2HYX7**	800H-3HYX7	800H-4HVX7



6-Gang❄



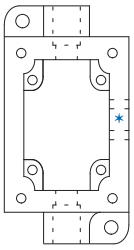
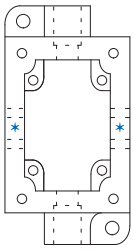
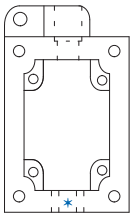
8-Gang❄

Conduit Entry	Cat. No.	Cat. No.
1 in. Feed Through	800H-6HVX7	800H-8HVX7

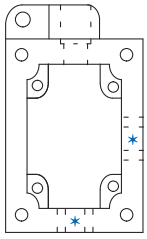
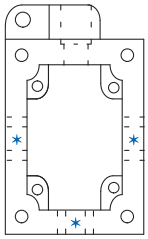
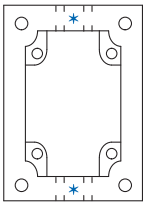
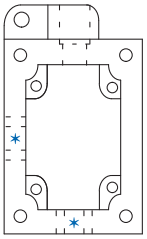
✶ Shallow base cannot accommodate sealing well, sealed switched contact blocks, or stacked contact blocks. Shallow base rated for Group B.
❄ Deep base can accommodate sealing well, sealed switch contact blocks, or up to 2 deep standard contact blocks.

10

Bases for Multi-Gang Stations

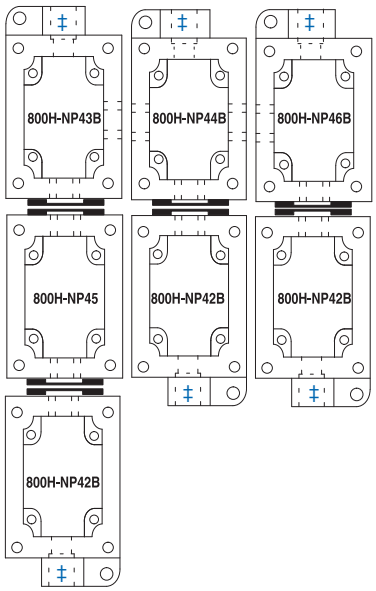




Conduit Sizes	Cat. No.	Cat. No.	Cat. No.
3/4 in. Feed Through	800H-NP40C	800H-NP41C	—
1 in. Feed Through	**800H-NP40D**	800H-NP41D	—
3/4 in. Dead End	—	—	800H-NP42A
1 in. Dead End	—	—	800H-NP42B

Conduit Sizes	Cat. No.	Cat. No.	Cat. No.	Cat. No.
3/4 in. Dead End	800H-NP43A	800H-NP44A	—	800H-NP46A
1 in. Dead End	800H-NP43B	**800H-NP44B**	—	800H-NP46B
None	—	—	800H-NP45	—

Example:
7-gang base with 1 in. through-feed conduit consists of:
3-**Cat. No. 800H-NP42B**
1-**Cat. No. 800H-NP43B**
1-**Cat. No. 800H-NP44B**
1-**Cat. No. 800H-NP45**
1-**Cat. No. 800H-NP46B**
6-**Cat. No. 800H-NP7**
Plus up to four 1 in. plugs (**Cat. No. 800H-NP11**) to close unused conduit openings.
Caution: Do not assemble more than eight enclosure gangs together, to avoid exceeding the internal volume for which the flame path of these enclosures is designed.



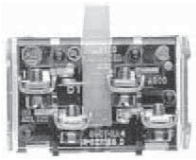
∗ When coupling modular enclosures together, a coupler kit (**Cat. No. 800H-NP7**) is required between enclosures.
‡ 1 in. conduit through-feed (all gangs).

Modifications and Accessories

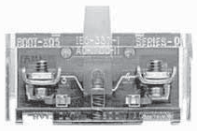
Contact Blocks♣

Packaged in kit form for field installation. All necessary mounting hardware is provided with each contact block kit. Contact ratings are listed on page 10-153.

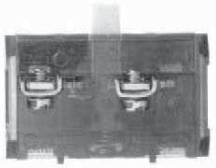
Note: It is not recommended to mount more than four contact blocks on any one unit (maximum two blocks deep). Sealed switch contact blocks are limited to two blocks per unit maximum.



Shallow Block



Mini Block



PenTUFF (Low Voltage) Contact Block

Contact Type	Shallow Block∗❄‡	Mini Block∗‡	PenTUFF (Low Voltage) Block∗❄‡
	Cat. No.	Cat. No.	Cat. No.
1 N.O.	**800T-XD1**	**800T-XD5**	**800T-XD1V**
1 N.C.	**800T-XD2**	**800T-XD6**	**800T-XD2V**
1 N.O.E.M.	**800T-XD3**	—	**800T-XD3V**
1 N.C.L.B.	**800T-XD4**	—	**800T-XD4V**
1 N.O. - N.C.	**800T-XA**	—	**800T-XAV**
2 N.O.	**800T-XA2**	—	—
2 N.C.	**800T-XA4**	—	—
1 N.C.L.B. - 1 N.O.	**800T-XA1**	—	—
1 N.C.L.B. - 1 N.C.	**800T-XA7**	—	—

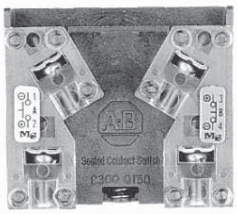
∗ To determine if a conduit seal-off is necessary, see page 10-179 for sealing well information.
❄ Specify Bulletin 800TC for finger-safe contact blocks. Example: **Cat. No. 800TC-XA**.
‡ Contact blocks with normally closed contacts meet direct drive positive opening standard requirements.



Logic Reed Block



Sealed Switch Block



Stackable Sealed Switch Block

Contact Type	Logic Reed Block§	Sealed Switch Block§	Stackable Sealed Switch Block§
	Cat. No.	Cat. No.	Cat. No.
1 N.O.	**800T-XD1R**	**800T-XD1P**	**800T-XD1Y**
1 N.C.	**800T-XD2R**	**800T-XD2P**	**800T-XD2Y**
1 N.O. - 1 N.C.	**800T-XAR**	**800T-XAP**	**800T-XAY**
2 N.O.	**800T-XA2R**	—	**800T-XA2Y**
2 N.C.	**800T-XA4R**	—	**800T-XA4Y**

§ To determine if a conduit seal-off is necessary, see page 10-179 for sealing well information.
♣ Refer to 800T/H section, page 10-35, for additional contact blocks and accessories.

10

Modifications and Accessories, Continued

Replacement Color Caps (Illuminated)



Pilot Light
Cat. No. 800H-N104M



Push-to-Test Pilot Light
Cat. No. 800H-N105M



Illuminated Push Button
Cat. No. 800H-N106M



Illuminated Push-Pull
Cat. No. 800H-NP50M

	Pilot Light	Push-to-Test Pilot Light	Illuminated Push Button	Illuminated Push-Pull
Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Multi-color kit	800H-N104M	800H-N105M	800H-N106M	800H-NP50M

Replacement Color Caps (Non-Illuminated)



Momentary Mushroom —Standard (Plastic)
Cat. No. 800T-N246R



Momentary Mushroom —Jumbo (Metal)
Cat. No. 800T-N248R



Push-Pull — Standard (Metal)
Cat. No. 800H-NP51C



Push-Pull — Jumbo (Metal)
Cat. No. 800H-NP52A

	Momentary Mushroom — Standard (Plastic)	Momentary Mushroom — Jumbo (Metal) ∗	Push-Pull Standard (Metal)	Push-Pull Jumbo (Metal)
Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Red	**800T-N246R**	**800T-N248R**	800H-NP51A	800H-NP52A
Green	**800T-N246G**	800T-N248G	800H-NP51B	800H-NP52B
Blue	800T-N246BL	800T-N248BL	800H-NP51C	800H-NP52C
Yellow	**800T-N246Y**	800T-N248Y	800H-NP51E	800H-NP52E
Black	**800T-N246B**	800T-N248B	800H-NP51H	800H-NP52H
Grey	800T-N246GR	800T-N248GR	800H-NP51G	—
Natural	—	800T-N248	—	—

∗ To order plastic jumbo mushroom caps, replace **248** with **247**. Plastic not available in natural color.
Example: **Cat. No. 800T-N248R** becomes **Cat. No. 800T-N247R**.

Replacement Knobs and Dual Push Button Assembly



Standard Knob
Cat. No. 800H-N130F



Knob Lever
Cat. No. 800H-131F



Wing Lever
Cat. No. 800H-N138



Dual Push Button
Cat. No. 800H-NP39

	Standard Knob	Knob Lever	Wing Lever❄	Dual Push Button
Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.
White	**800H-N130F**	800H-N131F	—	—
Kit (Complete)‡	800H-N130	800H-N131	—	—
Grey	—	—	800H-N138	—
Red	—	—	800H-N138A	—
Green Red	—	—	—	800H-NP39

❄ Standard finish is grey.
‡ Kit includes knob and packet of inserts (**Cat. No. 800T-N123**). Refer to color insert kits on page 10-179.

10

Modifications and Accessories, Continued

Boots—Non-Illuminated Momentary Contact Push Buttons Units

Note: For Bul. 800H/HL Type 7&9 operators, order one adapter and one boot per operator.

Adapters

Push Button Type	Cat. No.
Flush head	800H-NPAF
Extended head	800H-NPAE

Boots

Boots supplied with control stations and components are made of a chlorosulfonated polyethylene material with stainless steel insert ring. To order boots with silicone, urethane, or ethylene propylene material, see the table below. Material application information shown below.



Cat. No. 800H-N5A

Insert Material	Boot Color	Material			
		Chlorosulfonated Polyethylene‡	Silicone •‡	Urethane ••‡	Ethylene • Propylene ••‡
		Cat. No.	Cat. No.	Cat. No.	Cat. No.
Stainless steel§	Red	**800H-N5A**	**800H-N101R**	**800H-N100R**	800H-N103R
	Green	**800H-N5B**	**800H-N101G**	**800H-N100G**	800H-N103G
	Black	**800H-N5H**	**800H-N101B**	**800H-N100B**	800H-N103B
	Yellow	**800H-N5E**	**800H-N101Y**	800H-N100Y	—
	Blue	**800H-N5C**	800H-N101BL	800H-N100BL	—

❄ May be added to flush or extended head push button units to protect against foreign materials reaching the opening between the button and the locking ring.
§ Series B boots incorporate a stainless steel insert as standard.
‡ Dots printed on the inside of the boot identify the boot material.

Booted Knobs



Booted Standard Knob Selector Switch
Cat. No. 800H-NP5



Booted Knob Lever Selector Switch
Cat. No. 800H-NPE5

Switch Type	Boot Material∗			
	Chlorosulfonated Polyethylene	Silicone •	Urethane ••	Ethylene • Propylene ••
	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Standard Knob Selector Switch❄	800H-NP5	800H-NP101	800H-NP100	800H-NP103
Knob Lever Selector Switch❄	800H-NPE5	800H-NPE101	800H-NPE100	800H-NPE103

∗ Dots printed on the inside of the boot identify the boot material.
❄ Includes color insert kit.

Push Button Guards and Mushroom Push Button Guards



Cat. No. 800H-NP19



Cat. No. 800H-NP13



Cat. No. 800H-NP9



Cat. No. 800H-NP12

Push Buttons, Pilot Lights and Push-to-Test	Extra Long Guard (1 in.) for Push Button	Mushroom	Jumbo Mushroom
Cat. No.	Cat. No.	Cat. No.	Cat. No.
800H-NP19	800H-NP13	800H-NP9	800H-NP12

Protective Rings



Protective Ring for 2-Position Push-Pull
Cat. No. 800H-NP40



Jumbo Protective Ring for 2-Position Push-Pull
Cat. No. 800H-NP40J

Protective Ring for Push-Pull Devices		
Description	Type	Cat. No.
Protective ring for Bul. 800H 2-position non-illuminated push-pull operators. Often used to avoid unintentional tripping of E-stop operators. Available for standard size button (40 mm) or for jumbo button (60 mm).	For standard size button	**800H-NP40**
	For jumbo size button	**800H-NP40J**

General Accessories

Plugs

	Description	Cat. No.	
 *Cat. No. 800H-NP7*	**Coupler** Used for both horizontal and vertical assembly.	**800H-NP7**	
	Description	**Type**	Cat. No.
 *Cat. No. 800H-NP1 (Operators not included)*	**Closing Plug** Whenever an enclosure with more than the required number of openings is used, this plug can be used to close the unused openings. Includes synthetic O-ring washer.	For Cover Hole	**800H-NP1**
		For Base Coupler Hole	**800H-NP3**
	Description	**Size**	Cat. No.
 *Cat. No. 800H-NP10 (Operators not included)*	**Conduit Entry Plug** This plug can be used to plug unused conduit openings in Type 7 and 9 bases.	3/4 in.	800H-NP10
		1 in.	**800H-NP11**

Locking Attachments

	Description	Cat. No.
 *Cat. No. 800H-NP2 (Padlock not included)*	**Push Button Padlocking Attachments** This device permits locking in the depressed position on extended head push button units only.	800H-NP2
 *Cat. No. 800H-NP17 (Padlock not included)*	**Dual Push Button Extended Head Padlocking Attachments** This device permits locking for dual push button — extended head units only.	800H-NP17

General Accessories, Continued
Locking Attachments

	Description	Cat. No.
 *Cat. No. 800H-NP4 (Padlock not included)*	**Padlocking Cover** Padlocking cover is used for Type 7 and 9 selector switches, non-illuminated push buttons (except mushrooms) and non-illuminated 2-position push-pull units, but not for potentiometer units. **Note:** Push-pull units will only lock in the depressed position. Padlocking cover includes blank legend plate for customer marking. A pre-marked legend plate entitled OPEN COVER TO OPERATE (front view) and PULL-TO-START-PUSH-TO-STOP (rear view) is available. To order legend plate only, specify Cat. No. 800H-W174L.	**800H-NP4**

Miscellaneous

		Description	Style	No. of Wires	Cat. No.
 *Cat. No. 800H-NPRD91*	 *Cat. No. 800H-NPD93*	**Sealing Well with or without Integral Type 3 Flange Seal** These sealing wells can only be used with bases having 1 in. conduit entries. They reduce costs usually necessary with other conduit seal fittings for most installations (subject to applicable codes and laws) while maintaining Type 7 and 9 integrity. When using a sealing well with integral flange seal for Type 3 outdoor applications, an approved drain fitting must be provided. (Refer to National Electrical Code.)	With Integral Flange Seal, Type 3, 7, and 9	2	800H-NPRD90
				4	800H-NPRD91
				6	800H-NPRD92
				8	800H-NPRD93
			Without Integral Flange Seal, Type 7 and 9	2	800H-NPD90
				4	800H-NPD91
				6	800H-NPD92
				8	800H-NPD93

	Description	Style	Cat. No.
 *Cat. No. 800H-NP20*	**Type 3 Flange Seal** This seal provides a Type 3 rating while maintaining Type 7 and 9 integrity. An approved drain (see listing) is required for condensation when using this option (refer to National Electrical Code). For a Type 4 rating, use sealing nuts to seal the push button operators in addition to using the flange seal. Sealing kit is comprised of flange seal and sealing nut. They are used with the Allen-Bradley enclosures listed on page 10-154 for outdoor applications.	Flange Seal	**800H-NP20**
		Drain for 3/4 in. Conduit Opening	**800H-NP21**
		Drain for 1 in. Conduit Opening	800H-NP22
 *Cat. No. 800H-NP21*		Type 4 Sealing Nut	**800H-N479**
		Type 4 Sealing Kit	**800H-N479F**

	Description	Color	Cat. No.
 *Cat. No. 800H-NP23R*	**Color Insert Kit** These color insert kits are used with illuminated push buttons, pilot lights, push-pull, and push-to-test push buttons (order quantity of 1 to receive kit of 5 inserts).	Red	800H-NP23R
		Green	800H-NP23G
		Amber	800H-NP23A
		Blue	800H-NP23B
		White	800H-NP23W
		One of each color	800H-NP23

10

Replacement Lamps

Pilot Lights, Illuminated Push Buttons, Illuminated Push-Pull, Illuminated Push-Pull/Twist to Release, and Illuminated Selector Switches

Lamp	Type	Current, Typical	Lamp Voltage	ANSI No.	Catalog Voltage Code		Cat. No.
Incandescent	Full Voltage Transformer	150 mA/250 mA	6.3V AC	755/1866	6, 16, 26, 36, 46, 56, 76	✶	**800T-N65**
	Full Voltage	80 mA	14V AC/DC	756	12	✶	800T-N141
		70 mA	24V AC/DC	757	24	✶	**800T-N157**
		50 mA	48V AC/DC	1835	48	✶	800T-N365
	Full Voltage Resistor	22 mA	120V AC/DC	949	10, 11	✶	**800T-N169**
	Flashing	150 mA	6V AC/DC	267	6	✶	**800T-N212**
	Dual Input Diode	57 mA	24V AC/DC	24 MB	24	✶	800T-N180
		21 mA	120V AC	90 MB	16	✶	800T-N261
Neon 	—	2 mA	120V AC/DC	B2A	10, 20		**609-N9**
Lamp	**Type**	**Current, Typical❄**	**Lamp Voltage**	**Leakage Current**	**Code**		**Cat. No.❄**
LED‡	Universal	13 mA @ 24V DC 8.5 mA @ 120V AC‡	3V§	3 mA	2		800T-N376x
	Transformer	60	6V	14 mA	16, 26, 46, 56		800T-N377x

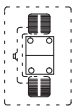
✶ Item is sold in multiples of 5. Order quantity of 5 to receive package of 5 pieces.
❄ To complete the cat. no. replace the **x** with the first letter of the desired color: **G**reen, **R**ed, or **W**hite.
‡ Typical current consumption values indicated are relative to the input of the power module.
§ Lamp is intended for use with power module Cat. No. 800TC-N374 which has an input voltage rating of 12 …130V AC/DC.

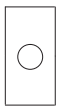
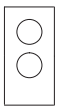
Legacy LED Lamps♣

Lamp	Type	Current, Typical➢	Lamp Voltage	Leakage Current	Catalog Voltage Code		Cat. No.⌘
LED❖	Full Voltage	13 mA/22 mA	12V AC/DC	3 mA	12		800T-N362x
		20 mA/21 mA	24V AC/DC	3 mA	24		800T-N319x
		12 mA/17 mA	32V AC/DC	3 mA	32		800T-N363x
		9 mA/14 mA	48V AC/DC	3 mA	48		800T-N364x
		3.3 mA/6 mA	120V AC	—	10		800T-N320x
		4.5 mA/6.2 mA	130V AC/DC	3 mA	13		800T-N321x
	Full voltage	50 mA	6V AC	14 mA	6, 16, 26, 36, 46, 56, 76		800T-N318x
	Flashing	18 mA	24V AC/DC	—	N/A	✦	800T-N319Fx

♣ In full voltage applications, these lamps are intended to be used with power module Cat. No. 800T-N330.
❖ All LEDs except 120V have an internal shunt resistor for use with solid-state outputs. LEDs will not illuminate below listed leakage current.
➢ Typical current draw varies with LED color. The first mA value is for a green or blue LED and the second mA value is for a red or amber LED.
⌘ To complete the cat. no. replace the **x** with the first letter of the desired color: **A**mber, **G**reen, **R**ed, **B**lue, or **W**hite. White LEDs only available in 6V, 24V, 120V, and 130V.
✦ Flashing rate is 2 Hz.

Legend Plates



Blank Legend Plates

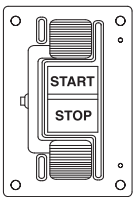
	Lever Style	Standard Size	Jumbo Size	Special Jumbo Size
	Use 1 lever style legend with each lever type cover (Cat. Nos. 800H-NP14, -NP15, -NP16 or -NP34)	Use 2 standard size legends with each standard 2 hole cover (Cat. No. 800H-NP31)	Use 1 jumbo size legend with each standard 1 hole cover (Cat. No. 800H-NP30)	Use 1 special jumbo legend with each special 2 hole cover (Cat. No. 800H-NP33) Ex: Dual Push Button/ Pigtail Pilot Light
Legend Plate Color	**Cat. No.**	**Cat. No.**	**Cat. No.**	**Cat. No.**
Grey	—	**800H-Y59**	**800H-Y59J**	800H-Y141J
Red	—	**800H-Y121**	**800H-Y121J**	—
Green	—	**800H-Y136**	800H-Y136J	—
Yellow	—	800H-Y700	800H-Y700J	—
Top Grey — Bottom Grey	800H-Y222	—	—	—
Top Grey — Bottom Red	800H-Y223	—	—	—
Left Green — Right Red	—	—	—	800H-Y140J
Grey with Potentiometer Graduations	—	**800H-Y109**	800H-Y109J	—

Custom Legend Plates

	Lever Style	Standard Size	Jumbo Size	Special Jumbo Size
	Use 1 lever style legend with each lever type cover (Cat. Nos. 800H-NP14, -NP15, -NP16 or -NP34)	Use 2 standard size legends with each standard 2 hole cover (Cat. No. 800H-NP31)	Use 1 jumbo size legend with each standard 1 hole cover (Cat. No. 800H-NP30)	Use 1 special jumbo legend with each special 2 hole cover (Cat. No. 800H-NP33) Ex: Dual Push Button/ Pigtail Pilot Light
Legend Plate Color	**Cat. No.**	**Cat. No.**	**Cat. No.**	**Cat. No.**
Grey	—	∗ 800H-Y59E	∗ 800H-Y59JE	∗ 800H-Y141JE
Red	—	∗ 800H-Y121E	∗ 800H-Y121JE	—
Green	—	∗ 800H-Y136E	∗ 800H-Y136JE	—
Yellow	—	800H-Y700E	800H-Y700JE	—
Top Grey — Bottom Grey	∗ 800H-Y222E	—	—	—
Top Grey — Bottom Red	∗ 800H-Y223E	—	—	—
Left Green — Right Red	—	—	—	∗ 800H-Y140JE
Grey with Potentiometer Graduations	—	∗ 800H-Y109E	∗ 800H-Y109JE	—

∗ Horizontally mounted engraved legend plates (with standard or custom marking) are available. Add the letter **H** after the **Y** in the cat. no.
Example: **Cat. No. 800H-Y222E** becomes **800H-YH222E**.

Lever Style Legend Plates with Standard Markings



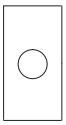
Legend Marking Upper/Lower	Cat. No.	Legend Marking Upper/Lower	Cat. No.
HAND AUTO	800H-Y228	OPEN CLOSE	800H-Y205
JOG RUN	800H-Y227	RUN STOP (Red)	800H-Y226
JOG STOP (Red)	800H-Y206	START STOP (Red)	800H-Y200
ON OFF	800H-Y225	—	—

10

Legend Plates, Continued

Legend Plates with Standard Markings





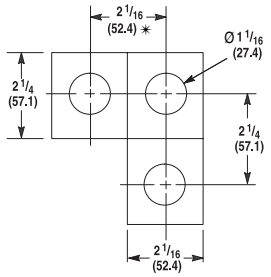
Legend Marking	Standard Size Cat. No.	Jumbo Size Cat. No.	Legend Marking	Standard Size Cat. No.	Jumbo Size Cat. No.
AUTO-OFF-HAND	**800H-Y1**	800H-Y1J	ON	**800H-Y30**	800H-Y30J
AUTO-MAN-HAND	800H-Y125	800H-Y125J	OPEN	**800H-Y31**	800H-Y31J
CLOSE	**800H-Y2**	800H-Y2J	OPEN-CLOSE	800H-Y32	800H-Y32J
CYCLE START	800H-Y62	800H-Y62J	OPEN-OFF-CLOSE	800H-Y33	800H-Y33J
DOWN	**800H-Y3**	800H-Y3J	OUT	800H-Y34	—
EMERG. STOP (Red)	**800H-Y4**	**800H-Y4J**	PUSH TO STOP-PULL TO START	800H-Y118	800H-Y118J
FAST	800H-Y5	800H-Y5J	POWER ON	800H-Y139	800H-Y139J
FEED START	800H-Y66	800H-Y66J	RAISE	800H-Y35	800H-Y35J
FEED STOP	800H-Y67	800H-Y67J	RAISE-LOWER	800H-Y36	800H-Y36J
FOR.-REV.	800H-Y6	800H-Y6J	RAISE-OFF-LOWER	800H-Y37	800H-Y37J
FOR.-OFF-REV.	800H-Y7	800H-Y7J	RESET	**800H-Y38**	800H-Y38J
FORWARD	800H-Y8	800H-Y8J	REVERSE	**800H-Y39**	800H-Y39J
FOURTH SPEED	800H-Y124	800H-Y124J	RUN	**800H-Y40**	800H-Y40J
FULL SPEED	800H-Y9	800H-Y9J	RUN-INCH	800H-Y134	800H-Y134J
HAND-AUTO	**800H-Y10**	800H-Y10J	RUN-JOG	800H-Y41	800H-Y41J
HAND-OFF-AUTO	**800H-Y11**	800H-Y11J	SAFE-RUN	800H-Y42	800H-Y42J
HIGH	800H-Y12	800H-Y12J	SECOND SPEED	800H-Y43	800H-Y43J
HIGH-LOW	800H-Y13	800H-Y13J	SLOW	800H-Y44	800H-Y44J
HIGH-OFF-LOW	800H-Y14	800H-Y14J	SLOW-FAST	800H-Y45	800H-Y45J
IN	800H-Y15	800H-Y15J	SLOW-OFF-FAST	800H-Y46	800H-Y46J
INCH	800H-Y16	800H-Y16J	SPEED∗	**800H-Y108**	800H-Y108J
JOG	**800H-Y17**	800H-Y17J	START (Green)	**800H-Y47**	800H-Y47J
JOG FORWARD	800H-Y18	800H-Y18J	START-JOG	800H-Y48	800H-Y48J
JOG REVERSE	800H-Y19	800H-Y19J	START-STOP	800H-Y49	800H-Y49J
JOG-RUN	800H-Y20	800H-Y20J	STOP (Red)	**800H-Y50**	**800H-Y50J**
JOG-SAFE-RUN	800H-Y22	800H-Y22J	STOP-START	800H-Y51	800H-Y51J
JOG-STOP-RUN	800H-Y21	800H-Y21J	SUMMER-OFF-WINTER	800H-Y53	800H-Y53J
LEFT-RIGHT	800H-Y23	800H-Y23J	SUMMER-WINTER	800H-Y52	800H-Y52J
LOW	800H-Y24	800H-Y24J	TEST	800H-Y54	800H-Y54J
LOW SPEED	800H-Y25	—	THIRD SPEED	800H-Y55	—
LOWER	800H-Y26	800H-Y26J	UP	**800H-Y56**	800H-Y56J
OFF	800H-Y27	800H-Y27J	UP-DOWN	800H-Y57	800H-Y57J
OFF-COOLANT-ON	800H-Y28	800H-Y28J	UP-OFF-DOWN	800H-Y58	800H-Y58J
OFF-ON	**800H-Y29**	800H-Y29J	—	—	—

∗ Graduated potentiometer type.

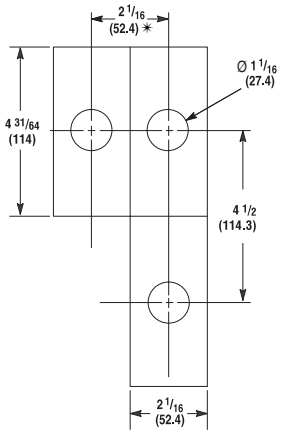
Approximate Dimensions and Shipping Weights

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Standard Legend Plate (used with two-hole cover)



Jumbo Legend Plate (used with one-hole cover)



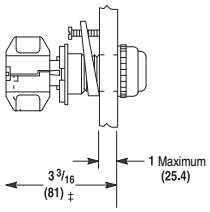
Note: Mounting hole requirements for components — 3/4 in. - 14 NPSM.✳

✳ External thread major diameter: 1.034 in. max., 1.024 in. min.
Internal thread minor diameter: 0.958 in. min., 0.970 in. max.

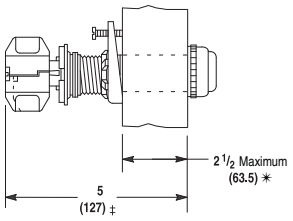
❄ Sketch illustrates the minimum distance between center lines when mounting Bulletin 800H units with legend plates either side by side or one above the other in non Allen-Bradley enclosures. **Minimum spacing without legend plate:** When units are mounted so that the contact block terminals face each other, the 2-1/4 in. (57.2 mm) dimension must be used in order to get proper electrical clearance. When control units are mounted so that the contact block terminals do not face each other, the 1-27/32 in. (46.8 mm) dimension can be used.

Panel Thickness Requirements

Standard Barrel [devices will fit panels up to 1 in. (25.4 mm)]



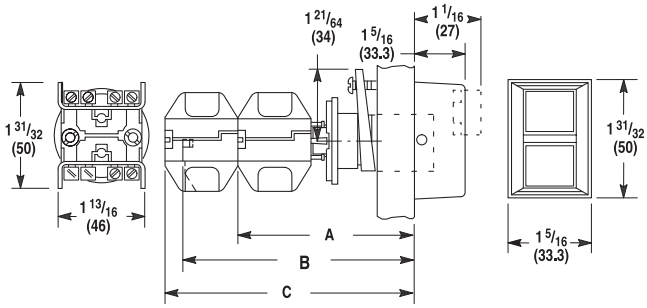
Long Barrel [devices will fit panels up to 2-1/2 in. (63.5 mm)]



❄ When mounting in a panel thicker than 2-1/8 in. (54 mm) locking bracket not required.
‡ This dimension for push buttons only.

Push Buttons

Dual Head



Dim.	A	B	C	Ship. Wt. [oz (kg)]
Standard Barrel	3-5/16 (84.1)	4-3/16 (106.4)	4-7/16 (112.7)	10-3/8 (0.30)
Long Barrel	4-19/32 (116.7)	5-15/32 (138.9)	5-23/32 (145.2)	13 (0.37)

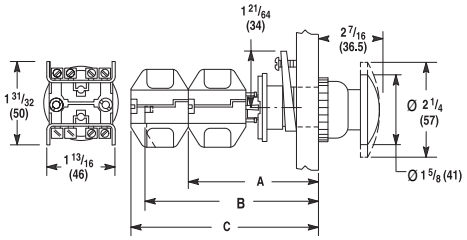
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Approximate Dimensions and Shipping Weights, Continued

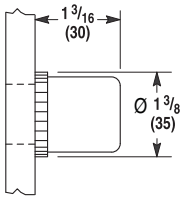
Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Push Buttons

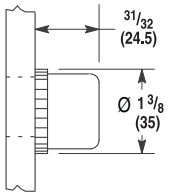
Mushroom Head



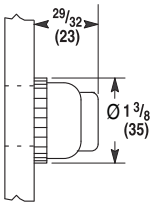
Push Button with Extra Long Guard



Flush Head



Extended Head

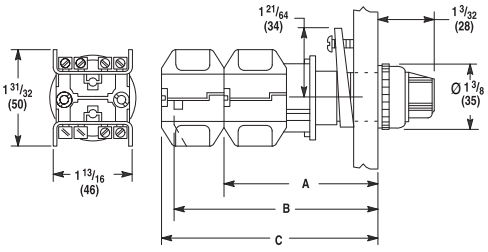


Type	Standard Barrel				Long Barrel			
	A ∗	B	C	Ship. Wt. [oz (kg)]	A ❄	B	C	Ship. Wt. [oz (kg)]
Mushroom, Flush and Extended Head	3-3/16 (81)	4-1/8 (105)	4-3/8 (111)	9-7/8 (0.28)	5 (127)	5-7/8 (149.2)	6-1/8 (155.6)	13-5/16 (0.38)
Extra Long Guard	3-3/16 (81)	4-1/8 (105)	4-3/8 (111)	10-7/8 (0.31)	5 (127)	5-7/8 (149.2)	6-1/8 (155.6)	14-5/16 (0.40)

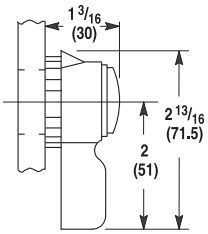
∗ When using sealed switch contact block, this dimension is 4-1/16 in. (103 mm).
❄ When using sealed switch contact block, this dimension is 5-7/8 in. (149.2 mm).

Selector Switches

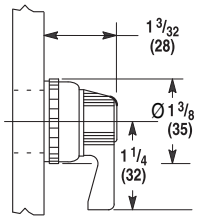
Standard Operator



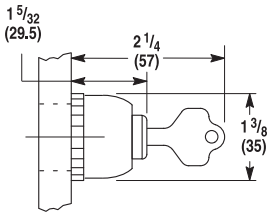
Knob Lever Operator



Wing Lever Operator



Cylinder Lock Operator



Type	Standard Barrel				Long Barrel			
	A ∗	B	C	Ship. Wt. [oz (kg)]	A ❄	B	C	Ship. Wt. [oz (kg)]
Standard and Knob Lever	3-3/16 (81)	4-1/8 (105)	4-3/8 (111)	9-1/2 (0.27)	5 (127)	5-7/8 (149.2)	6-1/8 (155.6)	14-3/8 (0.41)
Wing Lever	3-3/16 (81)	4-1/8 (105)	4-3/8 (111)	10-1/2 (0.30)	5 (127)	5-7/8 (149.2)	6-1/8 (155.6)	15 (0.42)
Cylinder Lock	3-3/16 (81)	4-1/8 (105)	4-3/8 (111)	11-1/4 (0.32)	5 (127)	5-7/8 (149.2)	6-1/8 (155.6)	16 (0.45)

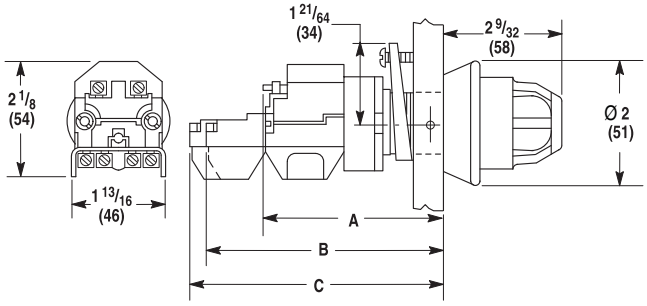
∗ When using sealed switch contact block, this dimension is 4-1/16 in. (103 mm).
❄ When using sealed switch contact block, this dimension is 5-7/8 in. (149.2 mm).

Approximate Dimensions and Shipping Weights, Continued

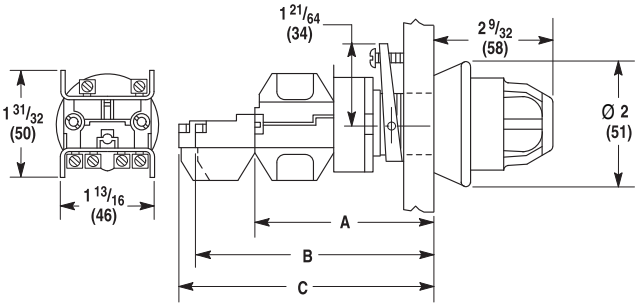
Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Illuminated Push Buttons or Push-to-Test Pilot Lights

Transformer Type



Full Voltage, Dual Input or Neon Type

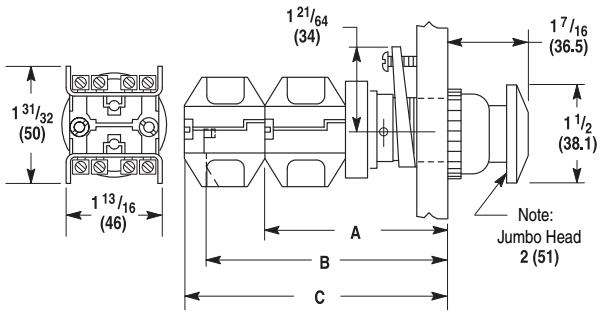


Illuminated Push Buttons, Push-to-Test Pilot Lights

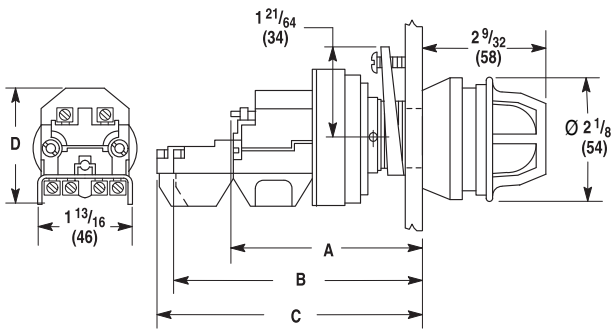
Description	Style	A ∗	B	C	Ship. Wt. [oz (kg)]
Transformer Type	Standard Barrel	3-5/32 (80.2)	3-29/32 (99)	4-1/8 (105)	14 (0.40)
	Long Barrel	5-1/16 (128.6)	5-13/16 (147.6)	6-1/16 (154)	16-3/16 (0.45)
Full Voltage Dual Input or Neon Type	Standard Barrel	3-1/32 (77)	3-29/32 (99)	4-1/8 (105)	11-5/8 (0.33)
	Long Barrel	4-15/16 (125.4)	5-13/16 (147.6)	6-1/16 (154)	13-7/16 (0.38)

Push-Pull Units

Non-Illuminated



Illuminated



Push-Pull Units

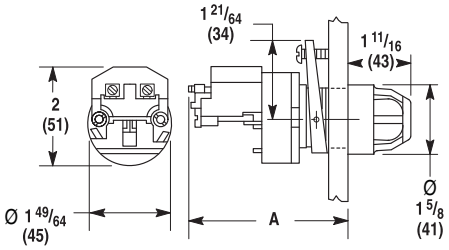
Description	Style	A ∗	B	C	D	Ship. Wt. [oz (kg)]
Illuminated Transformer Type	Standard Barrel	3-9/16 (90.5)	4-9/16 (115.9)	4-5/8 (117.5)	2-1/8 (54)	15-1/2 (0.44)
	Long Barrel	4-21/32 (118.3)	5-13/32 (137)	5-21/32 (143.7)	2-1/8 (54)	17-7/16 (0.49)
Illuminated Full Voltage Type	Standard Barrel	3-7/16 (87.3)	4-9/16 (115.9)	4-5/8 (117.5)	1-31/32 (50)	12-13/16 (0.33)
	Long Barrel	4-17/32 (115.1)	5-13/32 (137)	5-21/32 (143.7)	1-31/32 (50)	14-3/4 (0.41)
Non-Illuminated Push-Pull Units	Standard Barrel	3-1/2 (88.9)	4-3/8 (111.1)	4-5/8 (117.5)	—	11-1/8 (0.32)
	Long Barrel	4-17/32 (115.1)	5-13/32 (137)	5-21/32 (143.7)	—	12-5/16 (0.34)

∗ When using sealed switch contact block add 7/8 in. (22.2 mm) to the listed dimension.

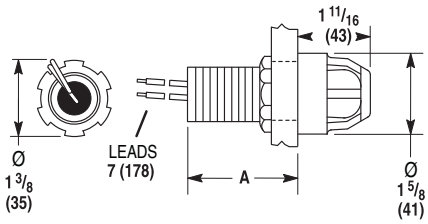
Approximate Dimensions and Shipping Weights, Continued

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

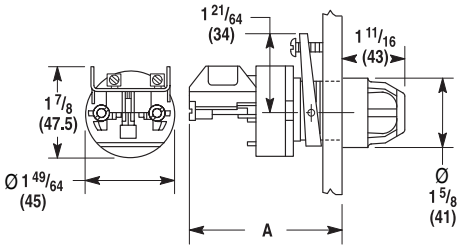
Pilot Lights



Transformer Type

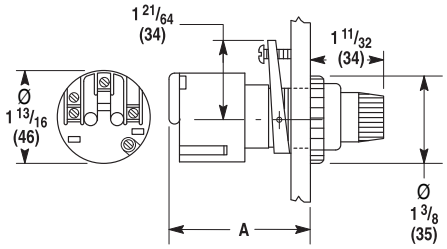


Full Voltage, Pigtail Type



Description	Style	A	Ship. Wt. [oz (kg)]
Transformer type and dual input transformer type pilot lights	Standard Barrel	3-5/32 (80)	8-9/16 (0.24)
	Long Barrel	4-9/16 (115.9)	30-1/4 (0.85)
Full voltage, neon or dual input diode and resistor type pilot lights	Standard Barrel	3-1/32 (77)	5-13/16 (0.17)
	Long Barrel	4-7/16 (112.7)	27-1/2 (0.77)
Full voltage pigtail type pilot lights	Standard Barrel	2-3/16 (55.5)	5-5/8 (0.16)
	Long Barrel	3-43/64 (94)	8-5/16 (0.24)

Potentiometer Units



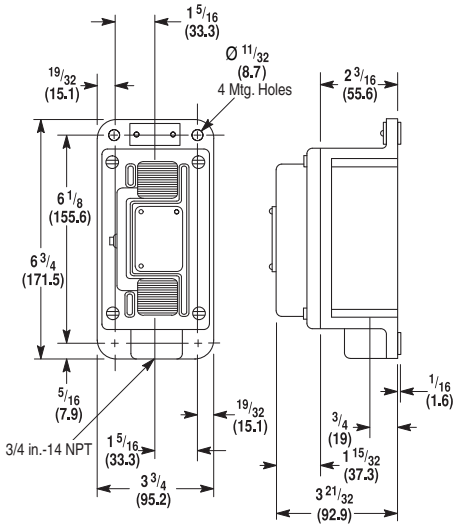
Style	A	Ship. Wt. [oz (kg)]
Standard barrel	3-1/8 (79.5)	5-3/8 (0.16)
Long barrel	4-1/2 (114.3)	8 (0.23)

Approximate Dimensions and Shipping Weights, Continued

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

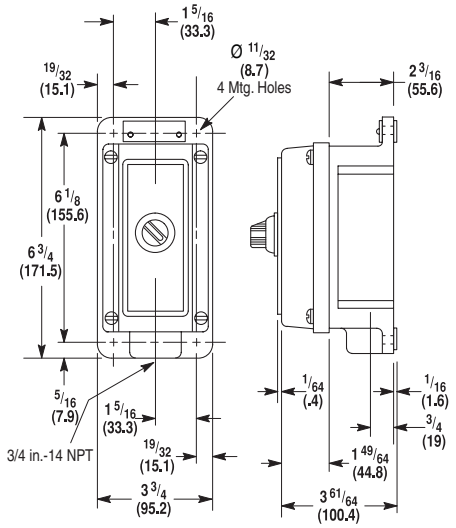
Shallow Base Stations

Figure 1
Shallow Base Station Lever Type



Shipping Wt. 3 lbs (1.36 kg)

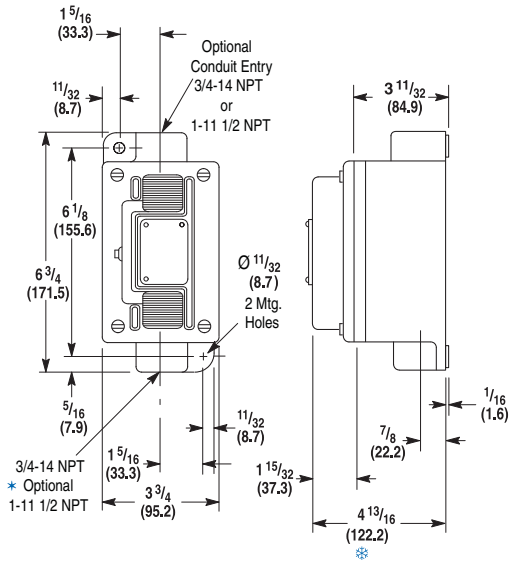
Figure 2
Shallow Base Station Component Type
1-Gang (1 or 2 devices)



Shipping Wt. 3-1/2 lbs (1.58 kg)

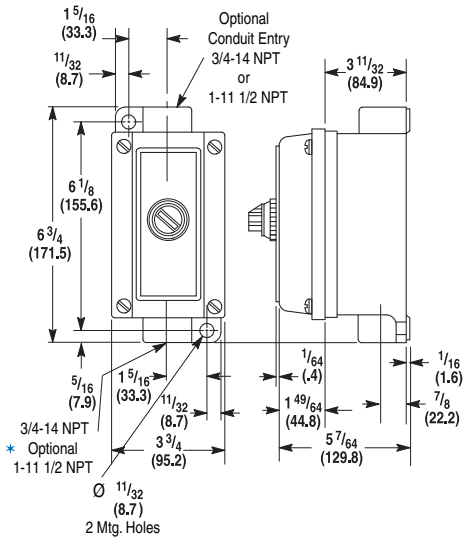
Deep Base Stations

Figure 3
Deep Base Station Lever Type
1-Gang



Shipping Wt. 4 lbs (1.81 kg)

Figure 4
Deep Base Component Lever Type
1-Gang (1 or 2 devices)



Shipping Wt. 4-1/2 lbs (2.04 kg)

✶ When using a flange seal, an approved drain fitting must be provided (refer to National Electrical Code).
❄ When used add the following to the max. depth: Flange seal add 3/16 in. (4.8 mm). Sealing well with or without integral flange seal add 1/2 in. (12.7 mm).

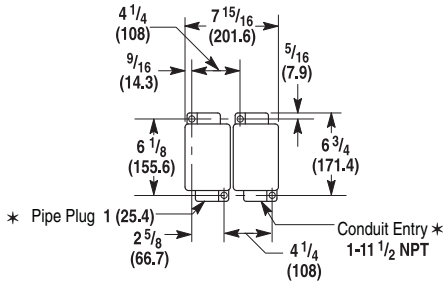
Approximate Dimensions and Shipping Weights, Continued

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

Factory-Assembled Stations

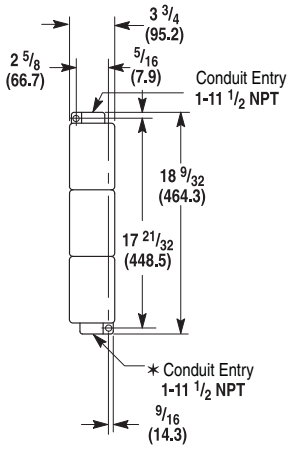
For depth dimension refer to Figure 3 or 4 on page 10-187.

Figure 3
Control Station, 2-Gang (up to 4 devices)



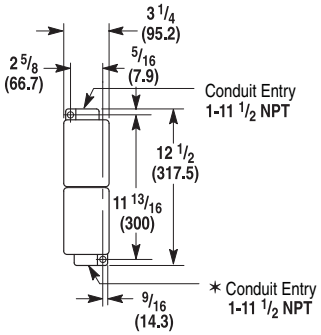
Shipping Wt. 10 lbs (4.54 kg)

Figure 4
Control Station, 3-Gang (up to 6 devices)



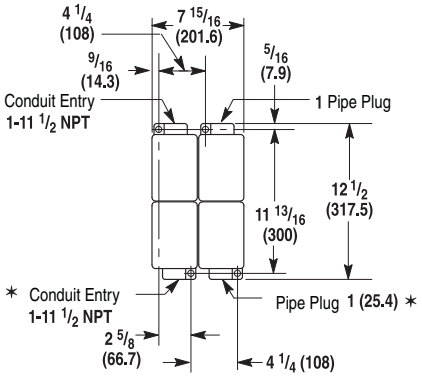
Shipping Wt. 16 lbs (7.26 kg)

Figure 5
Control Station, 2-Gang (up to 4 devices)



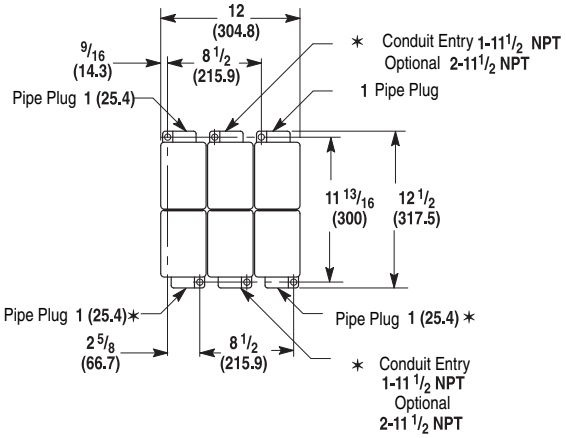
Shipping Wt. 10 lbs (4.54 kg)

Figure 6
Control Station, 4-Gang (up to 8 devices)



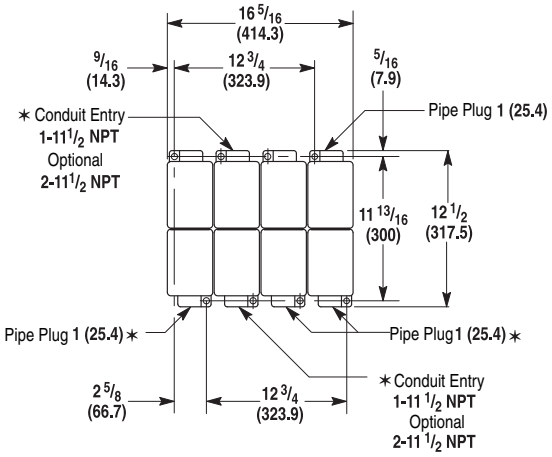
Shipping Wt. 20 lbs (9.07 kg)

Figure 7
Control Station, 6-Gang (up to 12 devices)



Shipping Wt. 32 lbs (14.5 kg)

Figure 8
Control Station, 8-Gang (up to 16 devices)



Shipping Wt. 40 lbs (18.1 kg)

30.5 mm Push Button Stations Hermetically Sealed for Division 2/Zone 2



Bulletin 800R — 30.5 mm Push Button Stations Hermetically Sealed for Division 2/Zone 2

- Hazardous location push button stations
- Classes I and II Division 2/Zone 2
- 30.5 mm mounting hole
- Types 4/13 and 4/4X/13

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Custom-Built Stations..... 10-192
Enclosures Only 10-192
Approximate Dimensions..... 10-193

Specifications*

Electrical Ratings		
Contact Ratings		Refer to the contact ratings (page 10-190).
Dielectric Strength		2200V for one minute, 1300V for one minute (Logic Reed)
Electrical Design Life Cycles		1 000 000 at maximum rated load, 200 000 at maximum rated load (Logic Reed)
Mechanical Ratings		
Vibration		10…2000 Hz 1.52 mm displacement (peak-to-peak) Max./10 G Max. (except Logic Reed)
Shock		1/2 cycle sine wave for 11 ms ≥25 G (contact fragility) and no damage at 100 G
Degree of Protection		Type 4/4X/13, 4/13; Watertight/Corrosion-Resistant IEC 529 IP66/65
Mechanical Design Life Cycles		
Push Buttons	(Momentary, Non-Illuminated) (Momentary, Illuminated) (Push-Pull/Twist-to-Release)	1 000 0000 min. 250 000 min. 250 000 min.
Selector Switches	(Non-Illuminated) (Illuminated)	1 000 000 min. 200 000 min.
All other devices		200 000 min.
Contact Operation		Logic Reed and sealed switch contact blocks: single break magnetic
Typical Operating Forces		
Operators without contact blocks		Flush, extended, standard mushroom, jumbo plastic mushroom: 2 lb max. Maintained selector switch: 3.6 in•lb maximum
Spring Return Selector Switches		3.6 in•lb to stop
		0.2 in•lb to return
Illuminated Push Buttons and Push-to-Test Pilot Lights		5 lb maximum
3-Position Push-Pull		8 lb maximum push to in position or pull to center position (15 lb maximum pull to out position)
Push-Pull and Push-Pull/Twist		9 lb maximum push or pull
		30 in•oz maximum twist, 6 in•oz minimum return
Contact Blocks	Logic Reed Sealed Switch Stackable Sealed Switch	1 lb maximum 3 lb maximum at 0.205 in. plunger travel 1 lb maximum
Environment		
Temperature Range	Operating Storage	-40...+131 °F (-40...+55 °C) -40...+185 °F (-40...+85 °C)
Note: Operating temperatures below freezing are based on the absence of moisture and liquids. Consult your local Rockwell Automation sales office or Allen-Bradley distributor for use in lower temperature applications.		
Humidity		50% at 104 °F (40 °C)

* Performance Data — See page Important-3.

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30.5 mm Push Button Stations Hermetically Sealed for Division 2/Zone 2

Product Overview

Control Stations

Bulletin 800R control stations are designed for Division 2/Zone 2 hazardous locations. They consist of Bulletin 800H (Type 4/4X/13) or Bulletin 800T (Type 4/13) operators with sealed contact blocks. Bulletin 800R units are available as factory assembled stations or as components for field assembly.

Hazardous Locations

Since the contacts are enclosed in a hermetically sealed chamber, the contact block is suitable for use in Class I and II, Division 2/Zone 2 Groups A, B, C, D, F and G hazardous locations and is listed by Underwriters Laboratories for this class of service. Complete stations as shown on page 2-23 can be used for Class I and II Division 2/Zone 2 applications. The individual components shown in the 800T and 800H sections are also suitable for Class I and II Division 2/Zone 2 locations providing they are suitably mounted by the customer in an enclosure as required for the application and by applicable codes and laws.
Per National Electrical Code: Zone 2. In Class I, Zone 2 locations, all wiring methods permitted for Class I, Division 2, Class I, Division 1 or Division 2, and Class I, Zone 0 or Zone 1 locations, including requirements for sealing, shall be permitted.
Note: Allen-Bradley Logic Reed contact blocks are also listed by Underwriters Laboratories for the Division 2/Zone 2 hazardous locations listed above.

CAUTION:

The complete stations and individual components listed herein **are not suitable for use in Class I and II Division 1 hazardous locations**. For Class I and II Division 1 hazardous locations, order Bulletin 800H Type 7 & 9 stations and units.

Sealed Switch Contact Ratings

Maximum continuous current I_{th} 5 A. Bulletin 800T and 800H units have control circuit ratings with sealed switch contact blocks as follows:

Max. Opertnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 600	AC-15	B600	120…600 0…120	3600 VA 30 A	360 VA 3 A
DC 300	DC-13	P300	24…300 0…24	138 VA 5.0 A	

Stackable Sealed Switch Contact Ratings

Maximum continuous current I_{th} 2.5 A. Bulletin 800T and 800H units have control circuit ratings with sealed switch contact blocks as follows:

Max. Opertnl. Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 300	AC-15	C300	120…300 0…120	1800 VA 15 A	180 VA 1.5 A
DC 150	DC-13	Q150	24…150 0…24	69 VA 2.5 A	

Logic Reed Contact Ratings

Maximum DC: 30V, 0.06 A Maximum AC: 150V, 0.15 A
Should only be used with resistive loads.

Standards Compliance

- UL 1604
- CSA C22.2, No. 213

Certifications

- UL Listed (File No. E10314, Guide No. NOIV)
- CSA Certified (File No. LR11924)

30.5 mm Push Button Stations Hermetically Sealed for Division 2/Zone 2

Complete Assembled Stations

Class I, Division 2/Zone 2

Push button operators for Class I, Division 2/Zone 2 are offered in Bulletin 800T/H, page 10-2.



Surface Mount
Cat. No. 800R-1TA



Stainless Steel
Booted Operator Station
Cat. No. 800R-1HA4T



Stainless Steel
Bootless Operator Station
Cat. No. 800R-1HA4TL



Rosite
Booted Operator Station
Cat. No. 800R-1HA4R



Rosite
Bootless Operator Station
Cat. No. 800R-1HA4RL

Operator	Contact Symbol	Contact Action	Button Type	Button Color	Legend Marking	Cast Aluminum Enclosures∗	Stainless Steel Enclosures❄	Rosite Glass Polyester Enclosures❄
						Surface Mount	Bootless Operator Station‡	
						Cat. No.	Cat. No.	Cat. No.
One Push Button	1 N.O. - 1 N.C.	Momentary	Flush	Green	START	800R-1TB	800R-1HB4TL	800R-1HB4RL
			Extended	Red	STOP	800R-1TA	800R-1HA4TL	800R-1HA4RL
			Flush	Black	No Legend	800R-1TX	800R-1HX4TL	800R-1HX4RL
Two Push Buttons	1 N.O. - 1 N.C. Each Button	Momentary	Flush Extended	Green Red	START STOP	800R-2TA	800R-2HA4TL	800R-2HA4RL
			Flush Flush	Black Black	No Legend No Legend	800R-2TX	800R-2HX4TL	800R-2HX4RL
One Pilot Light, Two Push Buttons	1 N.O. - 1 N.C. Each Button	Momentary	120V AC Flush Extended	Red Green Red	No Legend START STOP	800R-2TAR	800R-2HAR4TL	800R-2HAR4RL
			120V AC Flush Flush	Red Black Black	No Legend No Legend No Legend	800R-2TXR	800R-2HXR4TL	800R-2HXR4RL
3-Position Selector Switch	1 N.O. - 1 N.C.	Maintained	Knob Lever	Black with white insert	HAND OFF AUTO	800R-R3TA	800R-R3HA4TL	**800R-R3HA4RL**
			Knob Lever	Black with white insert	No Legend	800R-R3TX	800R-R3HX4TL	800R-R3HX4RL
One Push Button	1 N.O. - 1 N.C.	Maintained	Push-Pull/Twist	Red	EMRG.STOP	**800R-1TAM**	800R-1HAM4TL	800R-1HAM4RL
Two Push Buttons	1 N.O. - 1 N.C. Each Button	Maintained	Flush Extended	Green Red	START STOP	800R-2TAM	800R-2HAM4TL	800R-2HAM4RL
			Flush Flush	Black Black	No Legend No Legend	800R-2TXM	800R-2HXM4TL	800R-2HXM4RL

∗ Type 4/13.
❄ Type 4/4X/13.
‡ To order a control station with booted operators, remove the **L** from the end of the catalog number.
Example: **Cat. No. 800R-1HA4TL** becomes **Cat. No. 800R-1HA4T**.

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30.5 mm Push Button Stations Hermetically Sealed for Division 2/Zone 2

Product Selection

Custom-Built Stations



Description
The tables on page 10-191 list the most commonly used push button stations. Stations not listed in the table may be ordered as custom-built stations.

Cat. No.
The cat. no. used to identify custom-built Bulletin 800R push button stations, which are built at the factory, will be cat. nos. listed for the enclosure only, except letter **W** will be substituted for the letter **Z** and with a station serial number.

Ordering Information
The following information is required when ordering custom built push button stations.

1. Cat. no. of enclosure.
2. Cat. no. of control units.
3. Legend plate cat. no. and/or marking for each unit.
4. Specify vertical or horizontal mounting.
5. Specify desired operator mounting sequence. Inclusion of a sketch is recommended. If no information is given, standard configuration will be used.

Enclosures Only



Die Cast
Cat. No. 800R-2TZ



Stainless Steel
Cat. No. 800R-2HZ4



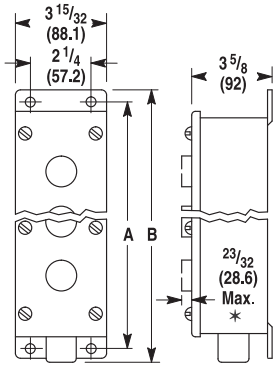
Rosite Glass Polyester
Cat. No. 800R-2HZ4R

	Die Cast (Type 4/13)	Stainless Steel (Type 4/4X/13)	Rosite Glass Polyester (Type 4/4X/13)
Units∗	Cat. No.	Cat. No.	Cat. No.
1	**800R-1TZ**	**800R-1HZ4**	**800R-1HZ4R**
2	**800R-2TZ**	**800R-2HZ4**	**800R-2HZ4R**
3	**800R-3TZ**	**800R-3HZ4**	**800R-3HZ4R**
4	800R-4TZ	**800R-4HZ4**	800R-4HZ4R
5	—	800R-5HZ4	—
6	800R-6TZ	800R-6HZ4	800R-6HZ4R

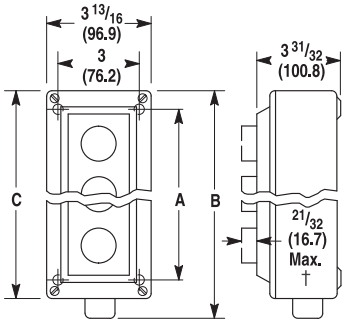
∗ Number of units that can be mounted in enclosure.
❄ Extra deep. Accomodates two levels of stackable sealed switch contact blocks.
Note: Enclosure and conduit dimensions are detailed on page 10-193, except for the fiberglass enclosures, which are found on 10-64.

Approximate Dimensions and Shipping Weights

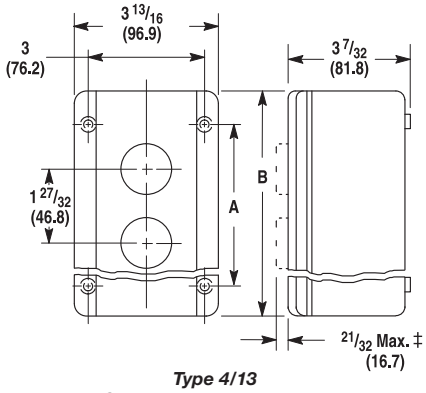
Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.



Type 4/4X/13
Stainless Steel
Watertight/Oiltight/Corrosion-Resistant Enclosure



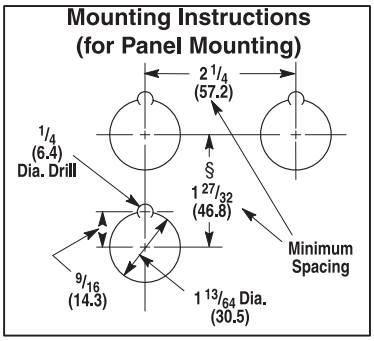
Type 4/4X/13
Rosite Glass Polyester
Watertight/Oiltight/Corrosion-Resistant Enclosure



Type 4/13
Cast Aluminum Enclosure
Watertight/Oiltight

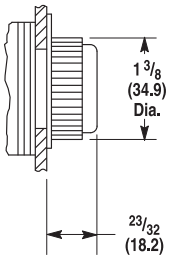
Dimension	Number of Units 1	2	3	4	5	6
Stainless Steel Type 4/4X/13						
A	5-5/32 (135)	7 (178)	8-27/32 (225)	10-11/16 (271)	12-17/32 (318)	14-3/8 (360)
B	6-13/32 (163)	8-1/4 (210)	10-1/8 (257)	11-31/32 (304)	14-1/32 (359)	15-7/8 (403)
Pipe Tap Size	3/4				1	
Glass Polyester Type 4/4X/13						
A	4-1/2 (114)	4-1/2 (114)	6-1/4 (159)	8 (203)	12-1/8 (308)	12-1/8 (308)
B	7-1/32 (181)	7-1/32 (181)	8-23/32 (221)	10-21/32 (271)	14-7/8 (378)	14-7/8 (378)
C	5-7/8 (149)	5-7/8 (149)	7-9/16 (192)	9-1/2 (241)	13-1/2 (343)	13-1/2 (343)
Pipe Tap Size	3/4				1	
Cast Aluminum Type 4/13						
A	2-3/4 (69.8)	4-1/2 (114)	6-1/4 (159)	8 (203)	—	12-1/8 (308)
B	4-3/16 (106)	5-7/8 (149)	7-9/16 (192)	9-1/2 (241)	—	13-1/2 (343)
Conduit Opening	3/4 in. 14 N.P.T.				—	1 in. 11-1/2 N.P.T.

Mounting Instructions (for Panel Mounting)

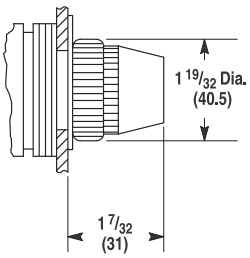


✶ Selector switch is 1-5/32 (29.4) maximum; pilot light is 1-7/32 (31).
❄ Selector switch is 1-3/32 (27.8) maximum; pilot light is 1-5/32 (29.4) maximum.
‡ Selector switch is 1-7/32 (30.9) maximum; pilot light is 1-9/32 (32.5).
§ Minimum vertical spacing dimension for jumbo legend plate is 2-15/32 (62.7).

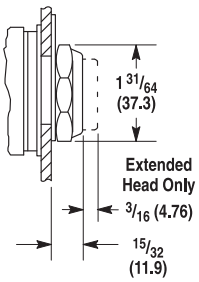
Operator Extension in Front of Panel♣



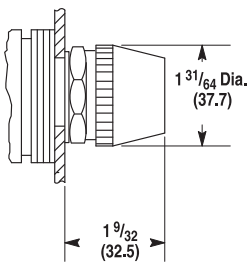
Type 4/4X/13
Booted Flush and Extended Head Push Button



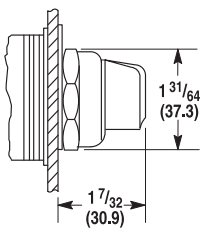
Type 4/4X/13
Pilot Light



Type 4/13 and Type 4/4X/13
Bootless Flush and Extended Head Push Button



Type 4/13
Pilot Light



Type 4/13 and Type 4/4X/13
Standard Knob Selector Switches

♣ See 10-49…10-56 for additional Type 4/13 outlines and for additional Type 4/4X/13 outlines.

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Bulletin 800G — Hazardous Location Push Buttons

- IP66, Type 4X
- Class I, Zone 1 and Zone 2
- Class I/Division 2 — Groups A, B, C, and D

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Specifications

Standard Assembled Stations

	Mechanical Ratings
Protection Type	II 2G Ex edm IIC T6 AEx edm IIC T6 Ex edm IIC T6
Certification	PTB 01 ATEX 1036 UL E10314 CE0044
Rated Insulation Voltage	Max. 690V AC
Rated current	Dependent on components used
Degree of Protection	IP66, Type 4X: -20…+60 °C (-4…+140 °F) IP54: -55…+60 °C (-67…+140 °F)
Enclosure Material	
Enclosure	Thermoplastic
Seals	EPDM
Cable Glands	
Standard	Plastic M20 x 1.5 for cable Ø 6…12 mm
Custom	Plastic M25 for cable Ø 13…18 mm 1/2 in. NPT conduit 3/4 in. NPT conduit
Wire/Cable Size	2.5 mm² (12 AWG) stranded max.
PE Conductor Terminals	4 x 2.5 mm² (12 AWG) stranded max.
Storage Temperature	-55…+70 °C (-67…+158 °F)
Operational Temperature Range	-55…+60 °C (-67…+140 °F)

Assembled Stations

Bulletin 800G control stations are designed for Class I, Zone 1 and 2 and Class 1/Division 2 hazardous location applications. They consist of Bulletin 800G front-of-panel components with back-of-panel components: contact blocks or power modules. Bulletin 800G units are available as factory assembled stations or as components for component replacement. Field assembled stations used in a Class I, Zone 1 or Zone 2 application must be inspected and certified by a third party.

Components

Since the back-of-panel components are enclosed in a flame-proof enclosure, they are suitable for use in **Class I, Zone 1 and Zone 2 Groups IIA, IIB, and IIC and Class I/Division 2, Groups A, B, C, and D hazardous locations and is listed by Underwriters Laboratories and certified by PTB for this class of service**. The components have “d” and “e” protection methods except for the cable termination. Cable termination has only “d” protection method, restricted by the cable and not the contacts.

CAUTION:
The assembled stations and individual components listed herein are not suitable for the use in Zone 0, Class I/Division 1 and Class II/Division 1 and Division 2 applications. For Class I and II/Division 1 hazardous locations, order Bulletin 800H Type 7 & 9 stations and units. For Class II/ Division 2 hazardous locations, order Bulletin 800R stations.

Back-of-Panel

Contact Block

Electrical Ratings						
	Screw Termination			Cable Termination		
Rated Insulation Voltage	690V			400V (Limited by the cable, not the contacts)		
Rated Voltage	250V (per ATEX certificates)		24V	250V (per ATEX certificates)		24V
Rated Operating Currents	16 A	10 A	1 A	16 A	10 A	1 A
Utilization Category	AC-12	AC-15	DC-13	AC-12	AC-15	DC-13
Thermal Continuous Current	16 A at 40 °C (104 °F), 11 A at 60 °C (140 °F)			16 A at 40 °C (104 °F), 11 A at 60 °C (140 °F)		
Contact Rating per UL 508	A600		P600	A600		P600
Max. Rated Voltage per UL Contact Rating	600V		600V	600V		600V
Max. “Make” Current at Rated Voltage per UL Contact Rating	12 A		0.2 A	12 A		0.2 A
Max. “Break” Current at Rated Voltage per UL Contact Rating	1.2 A		0.2 A	1.2 A		0.2 A
Thermal Continuous Test Current per UL Contact Rating	10 A		5 A	10 A		5 A
Short Circuit Protection	10 A Slow Blow, Type DT, gl			10 A Slow Blow, Type DT, gl		
Mechanical Ratings						
Protection Type	II 2G Ex de IIC Class I, Zone 1 AEx de IIC Class I, Zone 1 Ex de IIC			II 2G Ex d IIC T6 Class I, Zone 1 AEx d IIC T6 Class I, Zone 1 Ex d IIC T6		
Certification	PTB 01 ATEX 1040U UL E10314			PTB 01 ATEX 1039X UL E10314		
Contact Options	1 N.O. - 1 N.C. 2 N.O. 2 N.C.			1 N.O. - 1 N.C. 2 N.O. 2 N.C.		
Contact Material	$AgSnO_2$			$AgSnO_2$		
Housing Material	Thermoplastic			Thermoplastic		
Physical Shock Resistance	DIN IEC 68 part 2-27, 30 g 18 ms			DIN IEC 68 part 2-27, 30 g 18 ms		
Design Life	1 000 000 cycle mechanical life			1 000 000 cycle mechanical life		
Operating Force (Maximum)	22.2 N (5 lb) to open N.C. 15.6 N (3.5 lb) to close N.O. 28.9 N (6.5 lb) full travel			22.2 N (5 lb) to open N.C. 15.6 N (3.5 lb) to close N.O. 28.9 N (6.5 lb) full travel		
Temperature (Storage/Transport)	-55…+70 °C (-67…+158 °F)			-55…+70 °C (-67…+158 °F)		
Operational Temperature Range	-55…+60 °C (-67…+140 °F)			-55…+60 °C (-67…+140 °F)		
Wire/Cable Size	2.5 mm^2 (12 AWG) stranded max.			3 m (9.8 ft) long cable 4 x 1.5 mm^2 (9.1 mm/0.36 in. OD)		
Degree of Protection	IP20, with operators and enclosure IP66			With operators IP67		
Mounting	Base Mount: Secures to rail integral to enclosure base Panel Mount: Secures to operator with integral latch			Panel Mount: Secures to operator with integral latch		

Power Module

Electrical Ratings		
	Screw Termination	Cable Termination
Rated Insulation Voltage	300V	300V
Power Consumption	≤ 1 W	≤ 1 W
Lamp	Multi-LED (Red, Yellow, Green, White, Blue)	Multi-LED (Red, Yellow, Green, White, Blue)
Rated Voltage	12…60V DC 12…250V AC	24…60V DC 24…60V AC and 110…250V AC
Mechanical Ratings		
	Screw Termination	Cable Termination
Protection Type	II 2G Ex de IIC Class I, Zone 1 AEx de IIC Class I, Zone 1 Ex de IIC	II 2G Ex d IIC T6 Class I, Zone 1 AEx d IIC T6 Class I, Zone 1 Ex d IIC T6
Certifications	PTB 01 ATEX 1037U UL E10314	PTB 01 ATEX 1038X UL E10314
Housing Material	Thermoplastic	Thermoplastic
Physical Shock Resistance	DIN IEC 68 part 2-27, 30 g, 18 ms	DIN IEC 68 part 2-27, 30 g, 18 ms
Design Life	100 000 hours	100 000 hours
Storage/Transport Temperature	-55…+70 °C (-67…+158 °F)	-55 …+70 °C (-67…+158 °F)
Ambient Temperature Range	-55…+60 °C (-67…+140 °F)	-55…+60 °C (-67…+140 °F)
Wire/Cable Size	2.5 mm^2 (12 AWG) stranded max.	3 m (9.8 ft) long cable 4 x 1.5 mm^2 (9.1 mm/0.36 in. OD)
Degree of Protection	IP20, with operators and enclosure IP66	With operators IP67
Mounting	Base Mount: Secures to rail integral to enclosure base Panel Mount: Secures to operator with integral latch	Panel Mount: Secures to operator with integral latch

Back-of-Panel, Continued

Power Module/Contact Block Combination

Electrical Ratings				
	Screw Termination		Cable Termination	
Rated Insulation Voltage	300V		300V	
Power Consumption	≤ 1 W		≤ 1 W	
Lamp	Multi-LED (red, yellow, green, white, blue)		Multi-LED (red, yellow, green, white, blue)	
Rated Voltage	24…48V DC 24…250V AC		24…48V DC 24…250V AC	
Contact Rating per UL 508	A600	P600	A600	P600
Thermal Continuous Current	1 A	0.25 A	1 A	0.25 A
Max. Rated Voltage	600V	600V	600V	600V
Mechanical Ratings				
	Screw Termination		Cable Termination	
Protection Type		II 2G EEx de IIC Class I, Zone 1 AEx de IIC Class I, Zone 1 Ex de IIC		II 2G EEx d IIC T6 Class I, Zone 1 AEx d IIC T6 Class I, Zone 1 Ex d IIC T6
Certifications	PTB 01 ATEX 1037U UL E10314		PTB 01 ATEX 1038X UL E10314	
Housing Material	Thermoplastic		Thermoplastic	
Physical Shock Resistance	DIN IEC 68 part 2-27, 30 g, 18 ms		DIN IEC 68 part 2-27, 30 g, 18 ms	
Design Life	100 000 hours		100 000 hours	
Storage/Transport Temperature	-55…+70 °C (-67…+158 °F)		-30 …+70 °C (-22…+158 °F)	
Ambient Temperature Range	-55…+60 °C (-67…+140 °F)		-30…+60 °C (-22…+140 °F)	
Wire/Cable Size	2.5 mm² (12 AWG) stranded max.		3 m (9.8 ft) long cable 4 x 1.5 mm² (9.1 mm/0.36 in. OD)	
Degree of Protection	IP20, with operators and enclosure IP66		With operators IP67	
Mounting	Base Mount: Secures to rail integral to enclosure base Panel Mount: Secures to operator with integral latch		Panel Mount: Secures to operator with integral latch	

Front-of-Panel Operators

Mechanical Ratings							
Device	Operational Temperature	Operating Force *	Mechanical Design Life	Impact Resistance	Materials	Ingress Protection	Ex Protection Type
Push Button	-55…+70 °C (-67…+158 °F)	6.7 N (1.5 lb)	1 000 000 cycles	7 N•m	Thermoplastic Housing EPDM Seals	IP66 : -20…+70 °C (-4…+158 °F) IP54: -55…-20 °C (-67…-4 °F) Type 4X: -20…+70 °C (-4…+158 °F)	 II 2G EEx e II PTB 01 ATEX 1035U UL E10314
Selector Switch	-55…+70 °C (-67…+158 °F)	—					
Key Release Push Button	-55…+70 °C (-67…+158 °F)	15.6 N (3.5 lb)					
Key Release Mushroom	-55…+70 °C (-67…+158 °F)	15.6 N (3.5 lb)					
Mushroom	-55…+70 °C (-67…+158 °F)	6.7 N (1.5 lb)					
E-Stop	-55…+70 °C (-67…+158 °F)	44.5 N Push/ 89 N Pull (10 lb Push/ 20 lb Pull)	6000 cycles				
Pilot Light (Red, Yellow, White, Green, Blue)	-55…+70 °C (-67…+158 °F)	—	N/A	4 N•m			
Hole Plug	-55…+70 °C (-67…+158 °F)	—	N/A	7 N•m			
Illuminated Push Button	-55…+70 °C (-67…+158 °F)	6.7 N (1.5 lb)	1 x 10^6	7 N•m			
Key Selector Switch	-55…+70 °C (-67…+158 °F)	—	1 000 000 cycles	7 N•m			

* Does not include contact block.

Product Selection
Complete Assembled Stations

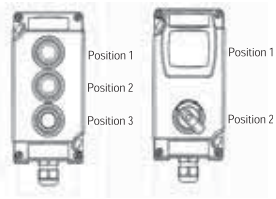
Enclosure Type	Button Type/Color	Legend Marking	Cat. No.
One-hole	Black push button	No legend	800G-1F2A3
	E-Stop	Emergency Stop/Arrêt D'urgence	800G-1E4A3
	Mushroom key release	No legend	800G-1B4A3
Cat. No. 800G-1E4A3	2-position maintained selector switch	No legend	800G-1HMA3
Two-hole	2 black push buttons	No legends	800G-2F2AF2A3
	Green push button Red push button	No legends	800G-2F3AF4A3
Cat. No. 800G-2FAAFBA3	Green push button Red push button	START STOP	800G-2FAAFBA3
Three-hole	Red LED Green push button Red push button	No legends	800G-3P4DF3AF4A3
	Red LED Green push button Red push button	No legend START STOP	800G-3P4DFAAFBA3
	Green push button Red push button E-Stop push/pull	No legend No legend Emergency Stop/Arrêt D'urgence	800G-3F3AF4AE4A3
Cat. No. 800G-3P4DF3AF4A3	Green push button Red push button E-Stop push/pull	START STOP Emergency Stop/Arrêt D'urgence	800G-3FAAFBAE4A3
Ammeter + 1 operator	1 A ammeter 2-position maintained selector switch	No legends	800G-3M1XHMA3
	5 A ammeter 2-position maintained selector switch	No legends	800G-3M5XHMA3
Cat. No. 800G-3M1XHMA3			

Hazardous Location Push Buttons

Product Selection

Complete Assembled Stations, Continued

	Size	Postion 1	Position 2	Position 3						Conduit Entry
800G –	2	F	3	M	F	4	N	___	___	___	3
	a	*b*	*c*	*d*	*b*	*c*	*d*	*b*	*c*	*d*	*e*



a

Enclosure Size	
Code	Description
1	1-hole
2	2-hole
3	3-hole

b

Operator/Meter	
Code	Description
B	Key release mushroom push button✶
D	Momentary mushroom push button❄
E	Push-pull mushroom push button✶
F	Non-illuminated flush push button♠
H	2-position selector switch❄
J	3-position selector switch❄
K	Key release push button
L	Illuminated push button — flush♣
M	Ammeter§
N	Hole plug❄
P	Pilot light♣

✶ Only available in red.
❄ Only available in black.
§ For ammeter, choose 3-hole enclosure with meter in pos. 1 and either an operator or hole plug in pos. 2 (i.e., Cat. No. 800G-3 M1X J1A or Cat. No. 800G-3 M1X N2X)
♣ Only available in white, green, red, yellow, and blue.
⌘ Only available for 3-position selector switch.
✦ For through-feed enclosure, selected conduit entry will be applied for both bottom and top entry.
❖ For use with illuminated push button only.
♠ Only available in white, black, green, red, or yellow.

c

Push Button Color/Text	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow
6	Blue
A	START (green background/white text)
B	STOP (red background/white text)
G	I (green background/white text)
H	O (red background/white text)
J	ON (green background/white text)
K	OFF (red background/white text)
Key Release	
1	Lockable in initial position, key removal in initial position
2	Lockable in both positions, key removal in both positions
3	Lockable in depressed position, key removal in depressed position
Selector Switch	
M	Maintained in all positions
B	Spring return from both positions⌘
L	Spring return from left⌘
R	Spring return from right⌘
Meters§	
1	1 A
5	5 A

d

Contact Block/Lamp Module	
Code	Description
A	1 N.O. - 1 N.C. base mount
M	2 N.O. base mount
N	2 N.C. base mount
D	Lamp module base mount (same color as requested lens color in Table c)
X	N/A (i.e., ammeter, hole plug)
K	1 N.O. with lamp module❖
L	1 N.C. with lamp module❖

e

Conduit Entry	
Bottom Entry	
Code	Description
Blank	M20X1.5 threaded hole
1	1/2 in. NPT conduit hub
2	3/4 in. NPT conduit hub
3	1 M20 plastic cable gland for cable diameter 6…12 mm
4	1 M25 plastic cable gland for cable diameter 13…18 mm
5	M20 blind plug
6	M25 blind plug
7	2 M20 plastic cable gland
8	1 M20 metal cable gland
9	1 M25 metal cable gland
0	2 M20 metal cable gland
Top Entry	
A	M20X1.5 threaded hole
B	1/2 in. NPT conduit hub
C	3/4 in. NPT conduit hub
D	1 M20 plastic cable gland for cable diameter 6…12 mm
E	1 M25 plastic cable gland for cable diameter 13…18 mm
F	M20 blind plug
G	M25 blind plug
H	2 M20 plastic cable gland
J	1 M20 metal cable gland
K	1 M25 metal cable gland
L	2 M20 metal cable gland
Through Feed✦	
M	M20X1.5 threaded hole
N	1/2 in. NPT conduit hub
P	3/4 in. NPT conduit hub
Q	1 M20 plastic cable gland for cable diameter 6…12 mm
R	1 M25 plastic cable gland for cable diameter 13…18 mm
T	M20 blind plug
U	M25 blind plug
V	2 M20 plastic cable gland
W	1 M20 metal cable gland
X	1 M25 metal cable gland
Y	2 M20 metal cable gland

Push Button, Non-Illuminated — Flush



Cat. No. 800G-F3

Color	Flush-Round Cat. No.
White	**800G-F1**
Black	**800G-F2**
Green	**800G-F3**
Red	**800G-F4**
Yellow	**800G-F5**

800G – F (a) 3 (b)

a

Operator Construction	
Code	Description
F	Flush operator

b

Color	
Code	Description
1	White
2	Black
3	Green
4	Red
5	Yellow

Double Push Button, Non-Illuminated — Flush



Cat. No. 800G-U2FX



Cat. No. 800G-V2FX

Description	Cat. No.❄
Double push button with curved base for use with Bul. 800G enclosures.	**800G-U2FX**
Double push button with flat base for use with customer provided enclosures.	**800G-V2FX**

❄ All double push buttons come with a multi-pack of color caps (red, green, black, white, and yellow).

Push Button, Illuminated — Flush



Cat. No. 800G-LF3

Color	Cat. No.
White	**800G-LF1**
Green	**800G-LF3**
Red	**800G-LF4**
Yellow	**800G-LF5**
Blue	**800G-LF6**

800G – LF (a) 3 (b)

a

Operator Construction	
Code	Description
LF	Illuminated flush operator

b

Color	
Code	Description
1	White
3	Green
4	Red
5	Yellow
6	Blue

Mushroom — Non-Illuminated and Key Release



Momentary Mushroom
Cat. No. 800G-M2



Key Release Mushroom
Cat. No. 800G-MKE



Push-Pull Mushroom
Cat. No. 800G-MPE

Color/Feature	Momentary Mushroom Cat. No.	Key Release Mushroom Cat. No.	Push-Pull Cat. No.
Black w/black bezel	**800G-M2**	—	—
E-Stop red w/ yellow bezel ∗	—	**800G-MKE**	**800G-MPE**

800G – M (a) 2 (b)

a

Operator Style		
Code		Description
M		Momentary
∗	MP	Push-pull
∗	MK	Key release

b

Color or Feature	
Code	Color
2	Black with black bezel
E	Red E-stop with yellow bezel and printing on head

∗ Only available in E-stop, option E from Table b.

10

Hazardous Location Push Buttons

Product Selection

Key Release



Cat. No. 800G-K14

Operator Style	Locking Position	Cat. No.
Key Release Push Button	Lockable in initial position, key removal in initial position	**800G-K14**
	Lockable in both positions, key removal in both positions	**800G-K16**
	Lockable in depressed position, key removal in depressed position	**800G-K24**

Selector Switch — Knob & Key Operated



Knob Selector Switch
Cat. No. 800G-SM3



Key Operated Switch
Cat. No. 800G-KSM33H

2-Postion Target Table

Contact Type		
N.O.	O	X
N.C.	X	O

3-Position Target Table

Contact Type	Pos. on Latch or Base			
N.O.	Top	O	O	X
	Bottom	X	O	O
N.C.	Top	X	X	O
	Bottom	O	X	X

Operator Style	Positions/Functions	Knob Selector Switch Cat. No.
2-Position	Maintained	**800G-SM2**
3-Position	S→M←S	**800G-SB3**
	S→M M	**800G-SL3**
	Maintained	**800G-SM3**
	M M←S	**800G-SR3**

Operator Style	Positions/Functions	Key Removal Position	Key Operated Switch Cat. No.
2-Position	Maintained	All	**800G-KSM23H**
3-Position	S→M←S	Center	**800G-KSB34H**
	S→M M	Right/center	**800G-KSL37H**
	Maintained	All	**800G-KSM33H**
	M M←S	Left/center	**800G-KSR35H**

800G – K 14
a b

a

Operator Style	
Code	Description
K	Key release push button

b

Locking Postion	
Code	Description
14	Lockable in initial position; key removal in initial position
16	Lockable in both positions; key removal in both positions
24	Lockable in depressed position; key removal in depressed position

800G – S M3 ____ ____
a b c d

a

Operator Style	
Code	Description
S	Knob
KS	Key operated

b

No. of Positions/Functions	
Code	Description
M2	2-position maintained
B3	3-position spring return left and right to center
L3	3-position spring return left to center
M3	3-position maintained
R2	2-position spring return right to left
R3	3-position spring return right to center

c

Key Removal		
Code		Description
Blank		For knob selector switches
✶	1	Left
✶	2	Right
✶	3	All
✶	4	Center
✶	5	Left/center
✶	6	Left/right
✶	7	Right/center

d

Knob Position		
Code		Description
❄	Blank	For latch mount or base mount in horizontal Bul. 800G enclosure
H		For base mount in vertical Bul. 800G enclosure

✶ Only available with key selector (Code **KS** from Table a).
❄ Only available with knob selector (Code **S** from Table a).

Pilot Light



Cat. No. 800G-P3

Operator Style	Color	Cat. No.
Pilot Light	White	**800G-P1**
	Green	**800G-P3**
	Red	**800G-P4**
	Yellow	**800G-P5**
	Blue	**800G-P6**

800G – P 3
a *b*

a

Operator Style	
Code	Description
P	Pilot light

b

Lens Color	
Code	Color
1	White
3	Green
4	Red
5	Yellow
6	Blue

Ammeter



Cat. No. 800G-AMP1B

Base Mount	
Amperage∗	Cat. No.
1 A	**800G-AMP1B**
5 A	**800G-AMP5B**

∗ Unit ships with a percent scale plate.

Enclosures — Plastic❄

Base mount only



Cat. No. 800G-1P

	Type	
	M20 Threaded Hole — Bottom Feed	3/4 in. Conduit — Bottom Feed
Type	Cat. No.	Cat. No.
1-Hole	**800G-1P**	800G-1P2
2-Hole	**800G-2P**	800G-2P2
3-Hole	**800G-3P**	800G-3P2
Ammeter Station	**800G-3PA**	800G-3PA2

❄ Bul. 800G enclosures are base mount only and will only work with base mount contact blocks.

800G – 3 P T 1
a *b* *c* *d*

a

Enclosure Size	
Code	Description
1	1-hole
2	2-hole
3	3-hole

b

Enclosure Style	
Code	Description
P	Plastic
PA	Plastic with ammeter window∗

∗ Only available in Enclosure Size 3.

c

Conduit Entry	
Code	Description
Blank	Bottom feed
T	Top feed
F	Through feed
X	No holes

d

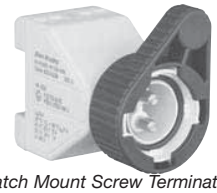
Conduit Style	
Code	Description
Blank	M20 x 1.5 threaded hole
1	1/2 in. NPT conduit hub
2	3/4 in. NPT conduit hub
3	M20 plastic cable gland
4	M25 plastic cable gland
5	M20 blind plug
6	M25 blind plug
7	Two M20 plastic cable glands
8	M20 metal cable gland
9	M25 metal cable gland
0	Two M20 metal cable glands

Back-of-Panel Components

Latch and Base Mount Contact Block



Base Mount
Cat. No. 800G-XBA



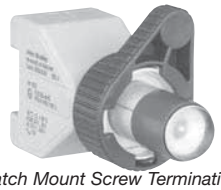
Latch Mount Screw Termination
Cat. No. 800G-XLSA

Contact	Base Mount	Latch Mount	
	Screw Termination	Screw Termination	Cable Termination
	Cat. No.	Cat. No.	Cat. No.
1 N.O. - 1 N.C.	**800G-XBA**	**800G-XLSA**	**800G-XLC3A**
2 N.O.	**800G-XBM**	**800G-XLSM**	**800G-XLC3M**
2 N.C.	**800G-XBN**	**800G-XLSN**	**800G-XLC3N**

Latch Mount and Base Mount Power Module*



Base Mount
Cat. No. 800G-DBG



Latch Mount Screw Termination
Cat. No. 800G-DLSG

Color	Base Mount	Latch Mount	
	Screw Termination	Screw Termination	Cable Termination
	Cat. No.	Cat. No.	Cat. No.
White	**800G-DBW**	**800G-DLSW**	800G-DLC3W
Green	**800G-DBG**	**800G-DLSG**	800G-DLC3G
Red	**800G-DBR**	**800G-DLSR**	**800G-DLC3R**
Yellow	**800G-DBY**	**800G-DLSY**	800G-DLC3Y
Blue	**800G-DBB**	**800G-DLSB**	800G-DLC3B

Note: Cable termination length is three meters.

Power Module with Contact Block*



Latch Mount
Cat. No. 800G-DBGXK

Color	Latch Mount	
	1 N.O.	1 N.C.
	Cat. No.	Cat. No.
White	800G-DLSWXK	800G-DLSWXL
Green	**800G-DLSGXK**	800G-DLSGXL
Red	800G-DLSRXK	800G-DLSRXL
Yellow	800G-DLSYXK	800G-DLSYXL
Blue	800G-DLSBXK	800G-DLSBXL

Note: For use with illuminated push button.

800G – XLS A
a *b*

a

Contact Block/Latch Type	
Code	Description
XB	Base mount
XLS	Latch mount with screw termination
XLC3	Latch mount with 3 m (9.84 ft) cable termination

b

Contact Configuration	
Code	Description
A	1 N.O. - 1 N.C.
M	2 N.O.
N	2 N.C.

800G – DB G
a *b*

a

Power Module/Latch Type	
Code	Description
DB	Base mount
DLS	Latch mount with screw termination
DLC3	Latch mount with 3 m (9.84 ft) cable termination

b

Color	
Code	Description
W	White
G	Green
R	Red
Y	Yellow
B	Blue

* Bul. 800G LED modules can only be powered from dry contact circuits (with no leakage current in the OFF state).

800G – DB G XK
a *b* *c*

a

Power Module/Latch Type	
Code	Description
DB	Base
DLS	Latch mount with screw termination
DLC3	Latch mount with 3 m (9.84 ft) cable termination

b

Color	
Code	Description
W	White
G	Green
R	Red
Y	Yellow
B	Blue

c

Contact Configuration	
Code	Description
XK	1 N.O.
XL	1 N.C.

* Bul. 800G LED modules can only be powered from dry contact circuits (with no leakage current in the OFF state).

Accessories

	Description	Pkg. Qty.	Cat. No.
 Cat. No. 800G-ACH2	1/2 in. NPT Conduit Hub	1	**800G-ACH1**
	3/4 in. NPT Conduit Hub	1	800G-ACH2
 Cat. No. 800G-ACG1	M20 Plastic Cable Gland (6…12 mm)	10	**800G-ACG1**
 Cat. No. 800G-ACG3	M25 Plastic Cable Gland (13…18 mm)	10	800G-ACG3
 Cat. No. 800G-ACG5	M20 Metal Cable Gland	10	800G-ACG5
 Cat. No. 800G-ACG7	M20S Metal Cable Gland	10	800G-ACG7
	M25 Metal Cable Gland	10	800G-ACG6
 Cat. No. 800G-AEB	Earth Bracket	10	800G-AEB
 Cat. No. 800G-AEP1	Earth Plate 1 M20	10	800G-AEP1
 Cat. No. 800G-AEP2	Earth Plate 2 M20	10	800G-AEP2
 Cat. No. 800G-AEP3	Earth Plate M25	10	800G-AEP3
 Cat. No. 800G-AM20P	M20 Stopping Plug	10	800G-AM20P
 Cat. No. 800G-AM25P	M25 Stopping Plug	10	800G-AM25P

	Description	Pkg. Qty.	Cat. No.
 Cat. No. 800G-AMNI	Mounting Nut	10	800G-AMN1
 Cat. No. 800G-APC_	10-printed push button inserts: Green "START"	10	800G-APC1
	10-printed push button inserts: Green "ON"	10	800G-APC2
	10-printed push button inserts: Green "I"	10	800G-APC3
	10-printed push button inserts: Red "STOP"	10	800G-APC4
	10-printed push button inserts: Red "OFF"	10	800G-APC5
	10-printed push button inserts: Red "O"	10	800G-APC6
 Cat. No. 800G-AW1	Mounting Ring Wrench	10	**800G-AW1**
 Cat. No. 800G-AEL90	90 mm yellow legend plate for E-Stop	10	**800G-AEL90**
 Cat. No. 800G-AFS	Flange set for connecting 2 enclosures	—	800G-AFS
	Locking cover with 30 mm hole for securement by bezel	—	800G-ALCB
 Cat. No. 800G-ACC_	White color cap insert	10	800G-ACC1
	Black color cap insert	10	800G-ACC2
	Green color cap insert	10	800G-ACC3
	Red color cap insert	10	800G-ACC4
	Yellow color cap insert	10	800G-ACC6
 Cat. No. 800G-ACC7	Contact block and power module ID blank label	10	800G-ACC7
 Cat. No. 800G-N2	Black Hole Plug	—	**800G-N2**

10

Legend Plate

Type	Description	Legend Plate without Text❄	Legend Plate with Text❄
		Cat. No.	Cat. No.
Legend plate frame with adhesive back legend plate, 30 x 4 mm∗	Silver background with black legend text	800G-11SE100	800G-11SxxxxK
Adhesive back legend plate, 30 x 4 mm	Silver background with black legend text	800G-17SE100	800G-17SxxxxK

Legend Frame

Type	Description	Cat. No.❄
Legend plate frame — snap-on, 30 x 4 mm∗	Legend plate frame	800G-110

∗ Not available for mushroom push buttons.
❄ Minimum order quantity of 5.

800G – 11 (a) S (b) E (c) 166 (d) K (e)

a

Type	
Code	Description
11	Legend plate and frame
17	Legend plate only

b

Insert Color	
Code	Description
S	Silver background with black legend text

c

Language	
Code	Description
E	English
F	French
G	German
T	Italian
S	Spanish
U	Universal symbol

d

Legend Identification
Refer to page 10-206

e

Type	
Code	Description
K	0.080 size font



Legend Frame
Cat. No. 800G-110

Adhesive Back Legend Plate
Cat. No. 800G-17SE100

Special Engraving

Besides the standard text and symbols listed on page 10-206, special legend plates are readily available.

To order:

- Select font code from table below.
- Specify desired text (please reference table below for restriction on characters and number of lines).

Type of Legend	Size	Font Size	Font Code	Approximate Size	Max. Characters/ Line	Max. Number of Lines	Example	Example (Legend Plate with Frame)
Legend Plate	30 x 4 mm	Small	K	SAMPLE	19	1	800G-17SE100K STARTER	800G-11SE100K STARTER

Legend Plates, Continued

Type	Description	Legend Plate without Text∗ Cat. No.	Legend Plate with Text∗ Cat. No.
Enclosure identification label, 50 x 15 mm	Silver background with black legend text	800G-AEL	800G-AEL_

∗ Minimum order quantity of 5.

800G – AEL (a) S (b) LINE 1 (c) , LINE 2 (d) , LINE 3 (e)

a

Insert Color	
Code	Description
AEL	Enclosure identification label with silver background and black text

b

Font Size	
Code	Description
S	0.10 size font
L	0.14 size font

c, d, e

Customized Text
Example of customer specified text based on max. characters per line and max. number of lines. When separated by a comma, the following text is to be engraved on the next line.

Blank Enclosure Identification Label
Cat. No. 800G-AEL

Special Engraving

To order:

- Select desired font code table below (notes the max. characters and max. no. of lines).
- Specify desired text (please reference table below for restriction on characters and number of lines).

Type of Legend	Size	Font Size	Font Code	Approximate Size	Max. Characters/Line	Max. Number of Lines	Example
Enclosure ID Label	50 x 15 mm	Standard	S	SAMPLE	25	3	800G-AELS MACHINE 1, L-R27
		Large	L	SAMPLE	19	2	800G-AELL MACH 1

10

Hazardous Location Push Buttons

Legend Texts

Universal

Marking	Suffix Number	Marking	Suffix Number
← – →	U226	I-O-II	U234
↑ – ↓	U227	I-II-III	U240
O	U228	↑	U241
I	U229	←	U242
II	U230	III	U249
I-O	U232	↓	U244
I-II	U233	→	U245
0-1-2	U285	I-O-I	U282

English

One-Word Marking

Marking	Suffix Number	Marking	Suffix Number
AUTO	E101	OFF	E163
CLOSE	E107	ON	E166
DOWN	E110	OPEN	E170
EMERGENCY STOP	E112	OUT	E173
FAULT	E113	POWER ON	E178
FAST	E114	PUSH-TO-TEST	E181
FORWARD	E120	RAISE	E182
HAND	E126	RESET	E186
HIGH	E129	REVERSE	E188
IN	E132	RIGHT	E191
INCH	E134	RUN	E193
JOG	E138	SLOW	E201
LEFT	E145	START	E208
LOW	E148	STOP	E212
LOWER	E152	UP	E223

Two-Word Marking

Marking	Suffix Number	Marking	Suffix Number
FOR-REV	E253	LEFT-RIGHT	E146
HAND-AUTO	E127	OFF-ON	E165
HIGH-LOW	E130	OPEN-CLOSE	E171
INCH-REVERSE	E135	RAISE-LOWER	E183
JOG-FOR	E255	SLOW-FAST	E204
JOG-REV	E256	START-STOP	E211
JOG-RUN	E142	UP-DOWN	E224

Three-Word Marking

Marking	Suffix Number	Marking	Suffix Number
FOR-STOP-REV	E254	LOW-OFF-HIGH	E150
FOR-OFF-REV	E261	RAISE-OFF-LOWER	E184
HAND-OFF-AUTO	E128	SLOW-OFF-FAST	E205
JOG-STOP-RUN	E144	SLOW-OFF-START	E207
		HAND-O-AUTO	E283

French

Marking	Suffix Number	Marking	Suffix Number
Auto	F101	Monter	F182
Fermer	F107	Arrière	F188
Descendre	F110	Droit	F191
Panne	F113	Régler	F198
Rapide	F114	Lent	F201
Avant	F120	Marche-Arrêt	F211
Avant-Arrêt-Arrière	F122	Hors Circuit	F244
Avant-Arrière	F124	En Circuit	F245
Manuel	F126	Hors	F246
Manuel-Auto	F127	En	F247
Manuel-Arrêt-Auto	F128	Hors-En	F248

French, Continued

Marking	Suffix Number	Marking	Suffix Number
Haut	F129	Hors Manuel	F249
Gauche	F145	En Manuel	F250
Bas	F148	Arrêt-Manuel	F251
Bas-Arrêt-Haut	F150	Demar. Man.	F252
Arrêt	F163	Av-Hors-Arr	F253
Arrêt-Marche	F165	Surcharge	F254
Marche	F166	M Forcee	F284
Ouvrir	F170	—	—

German

Marking	Suffix Number	Marking	Suffix Number
Zu	G107	Niedrig	G148
Ab	G110	Niedrig-Aus-Hoch	G150
Störung	G113	Senken	G152
Schnell	G114	Aus	G163
Vor	G120	Aus-Ein	G165
Vor-Aus-Zurück	G122	Ein	G166
Vor-Zurück	G124	Heben	G182
Hand	G126	Zurück	G188
Hand-Auto	G127	Rechts	G191
Hand-Aus-Auto	G128	Langsam	G201
Hoch	G129	Auf	G223
Links	G145	Betrieb	G243

Italian

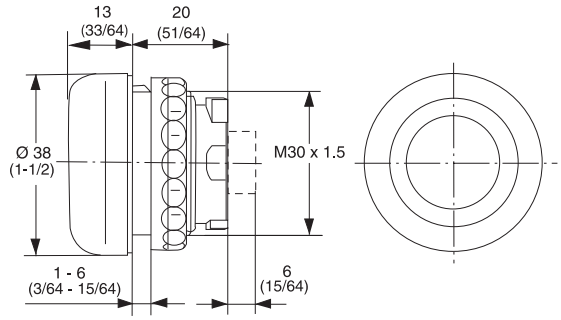
Marking	Suffix Number	Marking	Suffix Number
Automatico	T101	Disinserito	T163
Chiudere	T107	Disins-Ins	T165
Discesa	T110	Inserito	T166
Disturbo	T113	Salita	T182
Rapido	T114	Indietro	T188
Avanti	T120	Destra	T191
Avanti-Disins-Indietro	T122	Preparare	T198
Avanti-Indietro	T124	Lento	T201
Manuale	T126	Marcia	T208
Manuale-Auto	T127	Marcia-Arresto	T211
Manuale-Disins-Auto	T128	Arresto	T212
Alto	T129	Aprire	T223
Sinistra	T145	In Servizio	T243
Basso	T148	Rotazione CW	T246
Basso-Disins-Alto	T150	Rotazione CCW	T247
Abbassare	T152	Emergenza	T248

Spanish

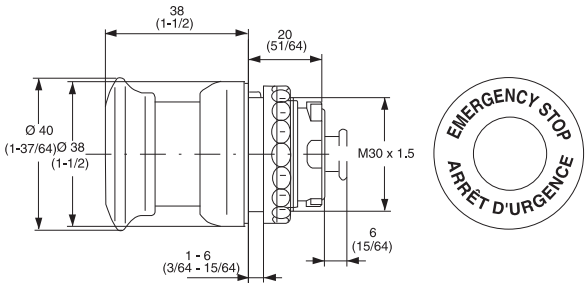
Marking	Suffix Number	Marking	Suffix Number
Cerrar	S107	Abrir	S170
Adelante	S120	Subida	S182
Adelante-Parada-Atrás	S123	Atrás	S188
Adelante-Atrás	S124	Derecha	S191
Manual	S126	Marcha	S208
Manual-Auto	S127	Marcha-Parada	S211
Izquierda	S145	Parada	S212
Bajada	S152	En Servicio	S243

Approximate Dimensions

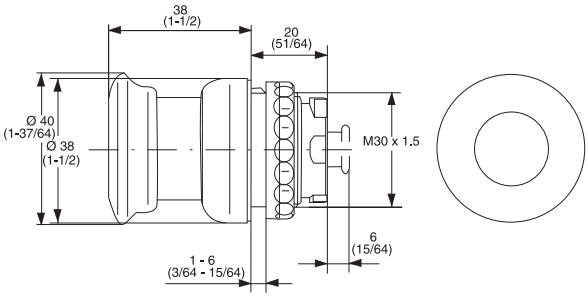
Dimensions in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



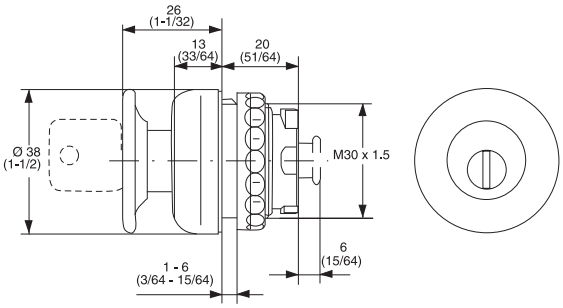
Push Buttons



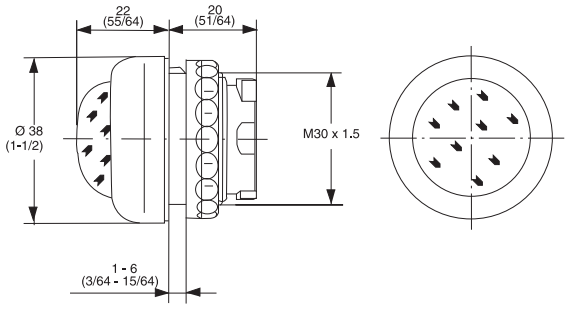
E-Stop



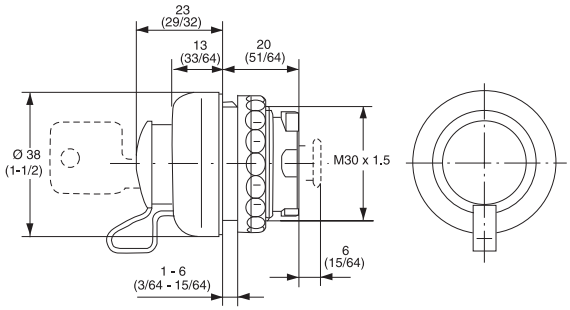
Mushroom



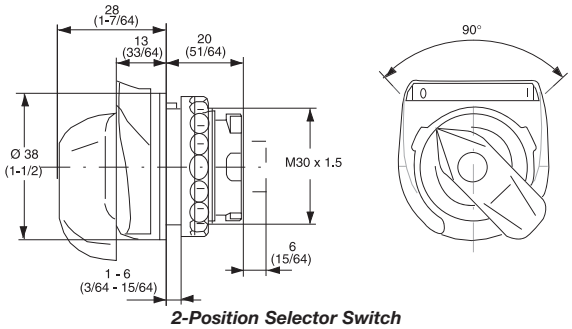
Key Release Mushroom



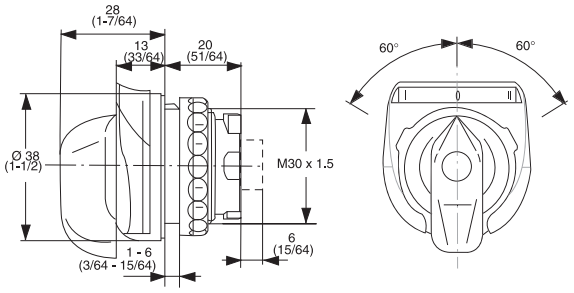
Pilot Light



Key Release



2-Position Selector Switch



3-Position Selector Switch

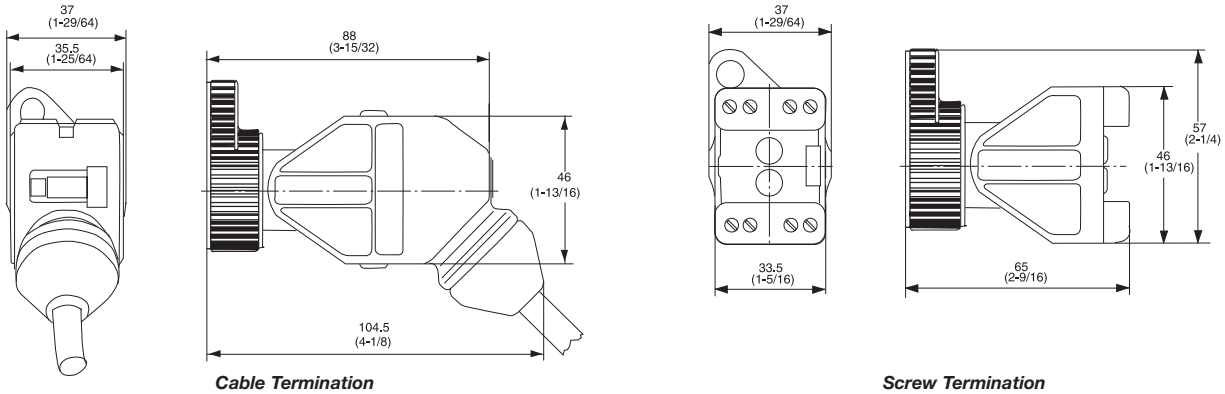
10

Hazardous Location Push Buttons

Approximate Dimensions

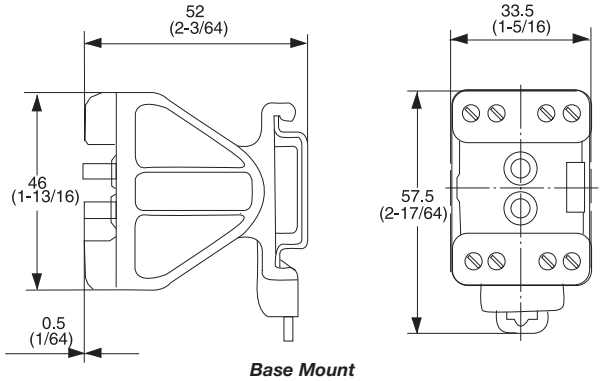
Dimensions are in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.

Contact Block



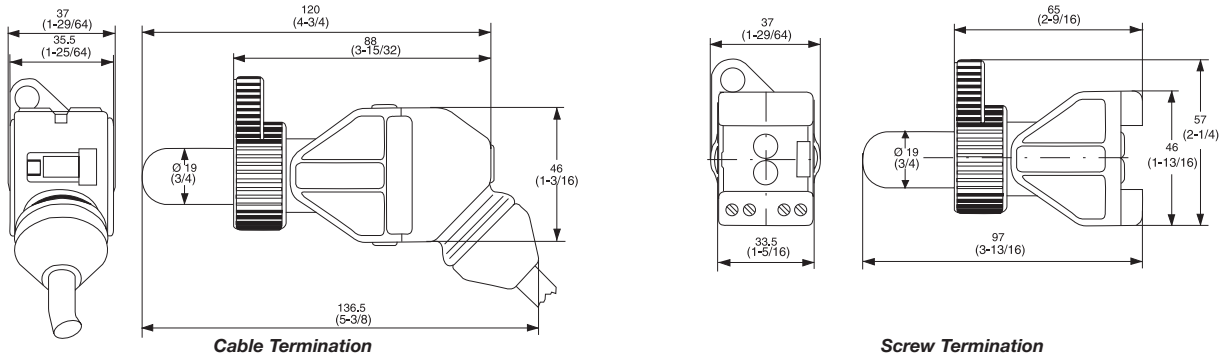
Cable Termination

Screw Termination



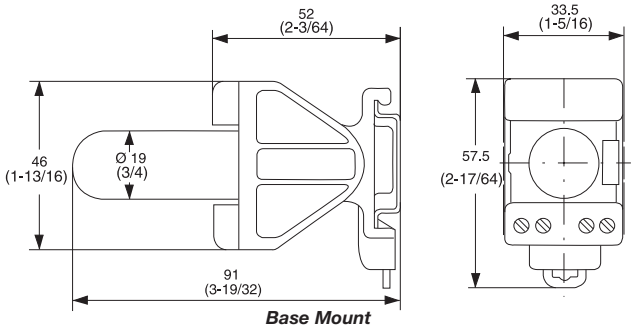
Base Mount

Power Module



Cable Termination

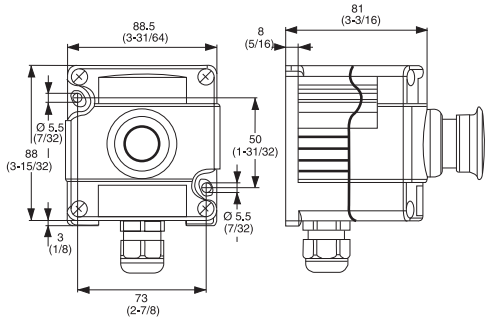
Screw Termination



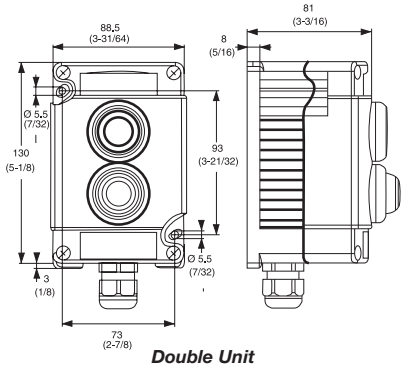
Base Mount

10

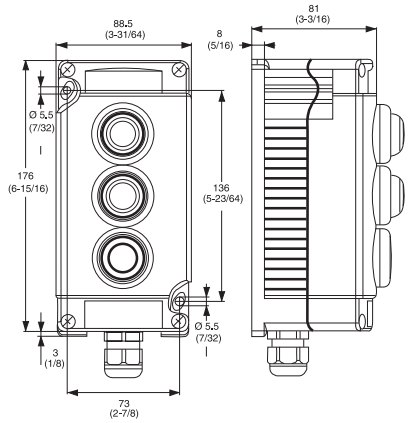
Dimensions are in millimeters (inches). Dimensions are not intended to be used for manufacturing purposes.



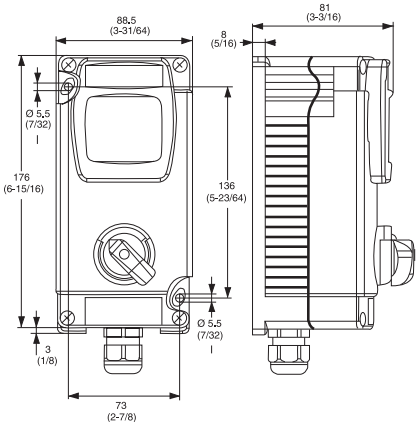
Single Unit



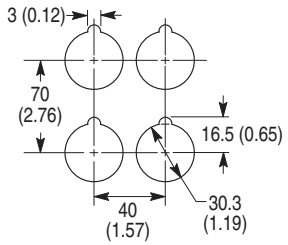
Double Unit



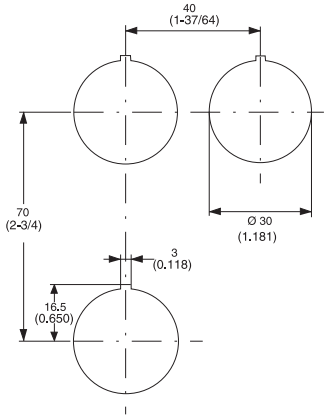
Triple Unit



Measuring Instrument with Actuator



Vertical & Horizontal Spacing



Mounting Dimension

10



Bulletin 800P — Palm-Operated Push Buttons

The Bulletin 800P palm-operated push button is designed for applications requiring electromechanical operation for safety, resistance to RFI, and an ergonomically sensitive design to reduce risk factors associated with cumulative trauma disorders.
Bulletin 800P units with articulated operation offer reduced operating force over standard drive units by permitting the button head to tilt for added comfort and mechanical advantage.
Bulletin 800P operators are intended for applications requiring two-hand control wiring, per OSHA standards.

Table of Contents

Product Selection 10-211
Accessories 10-212
Approximate Dimensions 10-213

Specifications*

Electrical Ratings		
Dielectric Strength		2200V for one minute
Electrical Design Life Cycles		1 000 000 at maximum rated load 200 000 at maximum rated load (Logic Reed)
Mechanical Ratings		
Vibration		10…2000 Hz 1.52 mm displacement (peak-to-peak) 10 G max.
Shock		Mechanical shock at 1/2 cycle sine wave for 11 ms
Contact Fragility	25 G 9 G 6 G	800T-XA1, -XA2, -XD1, -XD4, -XD2R, contact blocks 800T-XA, -XA4, -XD2, -XD3, -XAR, -XAV contact blocks 800T-XD1R No damage at 100 G all contact blocks
Degree of Protection		Type 1, 12, 4/13; watertight/oiltight 529 IP65
Mechanical Design Life Cycles	Push Buttons	1 000 000 minimum
Contact Operation	Shallow Contact Block Logic Reed	Slow, double make and break Snap action
Typical Operating Forces	Articulated	800T-XD1 and 800T-XD4 contact blocks 3.7 lb maximum at center of button, 2.7 lb at perimeter
	Standard Drive	3.7 lb
Environmental		
Temperature Range	Operating Storage	+32…+131 °F (0…+55 °C) -40…+185 °F (-40…+85 °C)

Note: Operating temperatures at 0 °C (32 °F) are based on the absence of freezing moisture and liquids.

* Performance Data — See page Important- 3.

10

Standard Contact Ratings

(IEC 947-5-1) (NEMA ICS 2-125) Maximum continuous current I_{th} 10 A. Bulletin 800P units have control circuit ratings with 800T-XA1, -XD1, -XD4, -XA2, -XA, -XA4, -XD2, and -XD3 contact blocks as follows:

Maximum Operational Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 600	AC-15	A600	120…600 72…120 24…72	7200VA 60 A 60 A	720VA 720VA 10 A
DC 600	DC-13	Q600	28…600 24…28	69VA 2.5 A	

(See page 10-213 for 800T-XAR, -XD1R, -XD2R data.)

PenTUFF™ (Low Voltage) Contact Ratings

Minimum DC: 5V, 1 mA. Maximum thermal continuous current Ith 2.5 A AC/1.0 A DC. Bulletin 800P units with Cat. No. 800T-XAV contacts have ratings as follows:

Maximum Operational Volts U_e	Utilization Category		Rated Operational Currents		
	IEC	NEMA	Volts U_e	Make	Break
AC 300	AC-15	C300	120…300 0…120	1800VA 15 A	180VA 1.5 A
DC 150	DC-13	R150	24…150 0…24	28VA 1.0 A	

Product Selection
Palm-Operated Push Buttons



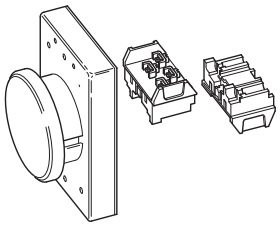
Palm-Operated Flush Mount Button
Cat. No. 800P-F2CA



Palm-Operated Surface Mount with Guard
Cat. No. 800P-S2CG1A

Operation Type	Contact Type	Guard Option	Flush Mounting	Surface Mounting
			Cat. No.	Cat. No.
Articulated	1 N.O. - 1 N.C.	None	**800P-F2CA**	**800P-S2C1A**
		Guard	**800P-F2CGA**	**800P-S2CG1A**
	2 N.O. - 2 N.C.	None	**800P-F2CB**	800P-S2C1B
		Guard	**800P-F2CGB**	**800P-S2CG1B**
Standard Drive	1 N.O. - 1 N.C.	None	**800P-F1CA**	**800P-S1C1A**
		Guard	**800P-F1CGA**	**800P-S1CG1A**
	2 N.O. - 2 N.C.	None	**800P-F1CB**	800P-S1C1B
		Guard	800P-F1CGB	800P-S1CG1B

800P – S 1 C G 1 A
a b c d e f



a

Operator Type	
Code	Description
F	Flush mount
S	Surface mount

b

Button Operation	
Code	Description
1	Standard drive
2	Articulated

∗ Only used for flush mounted operators.

c

Button Color	
Code	Description
C	Chrome
R	Red (painted)
Y	Yellow (painted)

d

Guard Option	
Code	Description
Blank	No guard
G	Side guard — yellow
H	Die cast — grey

e

Enclosure Openings	
Code	Description
Blank	No base∗
1	Single hub
2	Double hub

f

Contact Black	
Standard	
Code	Description
A	1 N.O. - 1 N.C.
B	2 N.O. - 2 N.C.
Pen*TUFF* (Low Voltage)	
Code	Description
AV	1 N.O. - 1 N.C.
BV	2 N.O. - 2 N.C.

Accessories

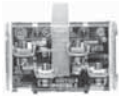
	Description	Button Color	Cat. No. Standard	Cat. No. Anti-Slip
 *Standard Button Cover* ***Cat. No. 800P-NCB***  *Anti-Slip Button Cover* ***Cat. No. 800P-NCG1***	**Button Covers** Button covers are used to reduce possible slipping due to fluids on the operator.	Red	**800P-NCR**	800P-NCR1
		Black	**800P-NCB**	800P-NCB1
		Green	**800P-NCG**	800P-NCG1
		Yellow	800P-NCY	800P-NCY1
	Description	**Style**	**Color**	**Cat. No.**
 *Side Guard* ***Cat. No. 800P-NBG1***  *Die Cast Guard* ***Cat. No. 800P-NBG***	**Guards** These guards prevent accidental activation of the button and protect it from damage. **Note:**Guards are required in most two hand safety applications (See OSHA and ANSI standards).	Side	Yellow	**800P-NBG1**
		Die Cast	Grey	**800P-NBG**
		Die Cast	Yellow	**800P-NBGY**
	Description	**Style**	**Cat. No.**	
 *Single Hub Base* ***Cat. No. 800P-B1***  *Double Hub Base* ***Cat No. 800P-B2***	**Bases** The conduit hub(s) on these replacement mounting bases come with a 3/4 in. opening.	Single Hub	**800P-B1**	
		Double Hub	**800P-B2**	
	Description	**Enclosure**	**Cat. No.**	
 *Standard Adapter* ***Cat. No. 800P-N150***  *FS Adaptor* ***Cat. No. 800P-N4***	**Adaptors** These adaptor flanges are used between the operator and the mounting base, when using a non-Allen-Bradley base.	Standard∗	**800P-N150**	
		FS	800P-N4	
	Description	**Marking**	**Cat. No.**	
 ***Legend Plates***	**Legend Plates** These legend plates can be mounted on the cover.	Blank (Grey)	800P-X107❄	
		Blank (Red)	800P-X129❄	
		START	**800P-X130**	
		STOP	**800P-X131**	
		INCH	800P-X132	
		RUN	**800P-X133**	
		RUN INCH	**800P-X134**	
		TOP STOP	800P-X135	

∗ Horizontal mounting holes are 2-3/8 in. (60.3 mm) center-to-center. Vertical mounting holes are 4-1/2 in. (114.3 mm) center-to-center.
❄ To order with custom engraved text, add suffix **E** and supply text. One or two lines of text with maximum of 5 characters per line.

Modifications and Accessories

Contact Blocks

Packaged in a kit form for field installation. All necessary mounting hardware is provided with each contact block kit. Contact ratings are listed on page 10-210.
Note: It is recommended to mount no more than four contact blocks on any one unit (maximum two blocks deep).


Shallow Block


PenTUFF (Low Voltage) Contact Block


Logic Reed Block

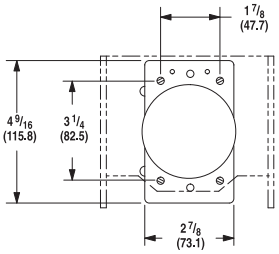
Contact Type	Shallow Block❄ Cat. No.	Pen*TUFF* Block❄ Cat. No.	Logic Reed Block‡ Cat. No.
1 N.O.	**800T-XD1**	**800T-XD1V**	**800T-XD1R**
1 N.C.	**800T-XD2**	**800T-XD2V**	**800T-XD2R**
1 N.O. - N.C.	**800T-XA**	**800T-XAV**	**800T-XAR**

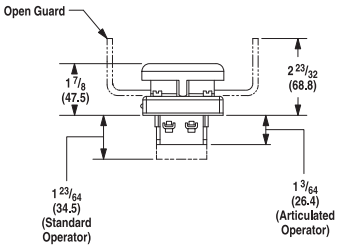
Note: Contact blocks with normally closed contacts meet direct drive positive opening standard requirements.
‡ Logic Reed blocks can be physically mounted on a Bul. 800P operator, but this combination is not UL Listed for Class 1 Div 2 hazardous applications.
❄ For contact ratings, see page 10-4.

Approximate Dimensions

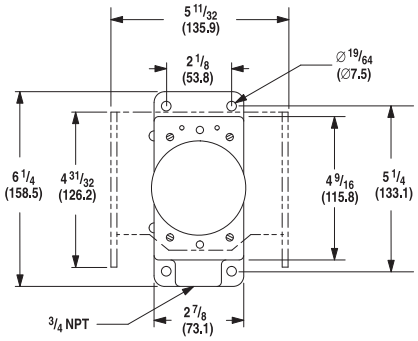
Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

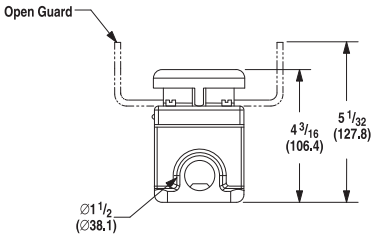
Flush Mounting



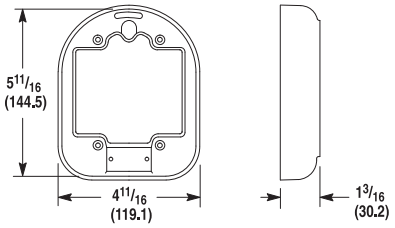


Surface Mounting

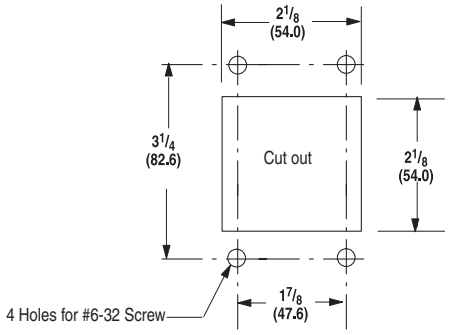




Die Cast Guard (800P-NBG or 800P-NBGY)



Cutout and mounting screw locations for a flush mounted cover



10

Zero-Force Touch Buttons™

Product Overview



Bulletin 800Z — Zero-Force Touch Buttons™

Bulletin 800Z Zero-Force Touch Buttons are ideally suited for use in two-hand machine control systems and highly repetitive applications.

Ergonomic Design — The contour shape fits the palm of the hand for ease of operation and helps deter attempts to defeat two-hand control.

Zero Force to Operate — The electronic design with two interlinked capacitive sensors in offset planes provides increased sensitivity and good ability for distinguishing between a person's hand, even through most industrial gloves, versus most foreign objects.

ATTENTION: Not recommended for use in applications where there is high probability for exposure to liquid (e.g., cutting fluid) on the sensing surface area.

Table of Contents

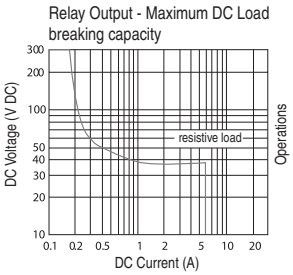
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General Purpose LIne 10-215
Heavy Industrial Line 10-216
Quick Disconnect Cables 10-216
Accessories..... 10-217
Wiring Diagram 10-219
Approximate Dimensions..... 10-220

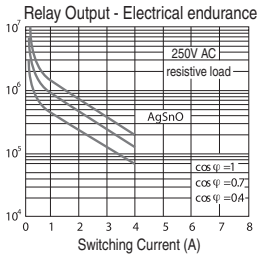
Specifications

Mechanical Ratings

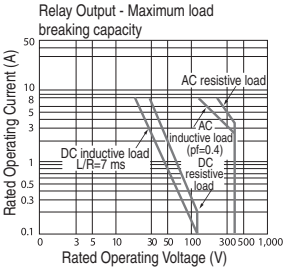
Description	General Purpose Line (800Z-G)	Heavy Industrial Line (800Z-H)
Mechanical Ratings		
Vibration Endurance	Tested @ 10 G, 1.52 mm displacement	
Mechanical Shock	Tested @ 100 G (mechanical durability)	
Degree of Protection	Type 4/4X/13 IP66 1200 psi Washdown	Type 4/13 IP66
Operating Force	Zero	
Electrical Ratings		
Input Voltage (Relay type)	Low Voltage: 10…40V DC, 20…30V AC Full Voltage (800Z-GF): 100…240V AC (+10%, -15%)	
Input Voltage (Solid-State type)	Low Voltage (800Z-GN/GP): 10…30V DC	
Electrical Design Life (Relay type)	Relay output 200 000 Operations @ 2 A inductive 4 A resistive	Relay output 150 000 Operations @ 5 A inductive 2.5 A resistive
Degree of Protection	—	IP2X
Wire Range		#22…12 AWG (0.5…4 mm²)
Tightening Torque		9 lb•in (1 N•m)
On-delay/Off-delay	Off 60 ms max. On 76 ms max.	
Current Draw (Solid-State type)	100 mA at 24V DC = 2.23 W (no external load)	
Environmental		
Temperature Range (Operating)	-25...+55 °C (-13…+131 °F)	
Temperature Range (Storage)	-40...+85 °C (-40…+185 °F)	
Humidity	95% RH from 25...50 °C (77…122 °F) (full operation)	
Materials		
Housing/Guard	Valox 357	
Gasket	BUNA-N	1/16 in. Cork-BUNA-N
Connector	Insulator material (micro connector) = nylon Insulator material (mini connector) = PVC	
Standards and Certifications		
Certifications	cULus, CE, C-TICK, CSA	
Standards Conformity	UL 508, CSA 22.2 No. 14, EN/IEC 60947-5-1, EN50081-2, EN61000-6-2, EN60954-1, EN60204-1	

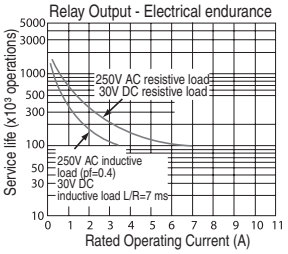
Load Life Curves for General Purpose Product Line





Load Life Curves for Heavy Industrial Line





Applications Detail

LED Blink Rate	Diagnostic	Description
** ** **	Power Up	Device touched during power up. Device will resume 10 seconds after removal of hand.
*** *** ***	Noise Detection	Device detected an unacceptable level of noise (>20 V/m). Device will resume once noise subsides.
**** **** ****	Margin Detection	A conductive film is building up on the sensing surface. Device will resume once cleared.

10

General Purpose Line — Momentary Touch Buttons



General Purpose
Cat. No. 800Z-GF2Q5



General Purpose
Cat. No. 800Z-GL3Q5B

Mounting Hole Size	Input Voltage	Output Type	Electrical Connection	No Guard Cat. No.	Black Guard Cat. No.
30.5 mm	100...240V AC	Relay Output	5-Pin QD	**800Z-GF3Q5**	**800Z-GF3Q5B**
			6 ft Cabled — 5-Wire	**800Z-GF3065**	**800Z-GF3065B**
	10...40V DC and 20...30V AC	Relay Output	5-Pin QD	**800Z-GL3Q5**	**800Z-GL3Q5B**
			6 ft Cabled — 5-Wire	**800Z-GL3065**	**800Z-GL3065B**
22.5 mm	100...240V AC	Relay Output	5-Pin QD	800Z-GF2Q5	**800Z-GF2Q5B**
			6 ft Cabled — 5-Wire	**800Z-GF2065**	**800Z-GF2065B**
	10...40V DC and 20...30V AC	Relay Output	5-Pin QD	**800Z-GL2Q5**	**800Z-GL2Q5B**
			6 ft Cabled — 5-Wire	**800Z-GL2065**	**800Z-GL2065B**

Use the configurator below to build a Bulletin 800Z touch button to suit your application.

800Z – G L 3 065 B
a b c d

a

Input Voltage and Output Type ‡	
Code	Description
Relay Output	
L	Input: 10…40V DC and 20…30V AC Output: relay
F	Input: 100…240V AC Output: relay
Transistor Output	
P	10…30V DC PNP (sourcing) output

b

Mounting Hole Size §	
Code	Description
2	22.5 mm
3	30.5 mm

c

Electrical Connection	
Code	Description
Sourcing Output ✶	
Q4	4-pin QD
064	6 ft (1.8 m) cabled
244	24 ft (7.2 m) cabled
Relay Output ❄	
Q5	5-pin QD
065	6 ft (1.8 m) cabled
245	24 ft (7.2 m) cabled

d

Guard Option	
Code	Description
Blank	No guard
B	Black guard
Y	Yellow guard

✶ These devices are transistor outputs.
❄ These devices have separate N.O. and N.C. output relays with a shared common.
‡ Safety relays should be used in conjunction with two relay output type Zero-Force Touch Buttons™ in 2-hand control applications. Order separately, safety relay 440R-D23171 for 24V, 440R-D23169 for 120V, 440R-D23168 for 240V.
§ 22.5 mm touch buttons use micro connector, 30.5 mm touch buttons use mini connector.

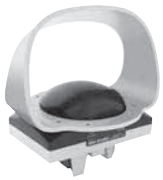
Zero-Force Touch Buttons™

Product Selection

Heavy Industrial Line — Momentary Touch Buttons



Heavy Industrial
Cat. No. 800Z-HF1



Heavy Industrial
Cat. No. 800Z-HL1Y

Button Type	Input Voltage	Output Type	Electrical Connection	No Guard Cat. No.	Yellow Guard Cat. No.
Flush Mount	10...40V DC and 20...30V AC	Relay Output	Terminal Block	**800Z-HL1**	**800Z-HL1Y**
	100...240V AC	Relay Output	Terminal Block	**800Z-HF1**	**800Z-HF1Y**

Use the configurator below to build a Bulletin 800Z touch button to suit your application.

800Z – H L 1 Y
a b c

a

Voltage ❄	
Code	Description
L	Input: 10…40V DC and 20…30V AC Output: relay
F	Input: 100…240V AC Output: relay

b

Mounting Type ✶	
Code	Description
1	Flush mounting

c

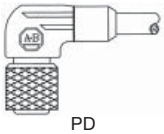
Guard Option	
Code	Description
Blank	No guard
Y	Yellow guard

✶ Heavy industrial devices have an 8-position terminal block connection. See wiring diagrams on page 4-53 for details.
❄ Safety relays should be used in conjunction with two relay output type Zero-Force Touch Buttons in 2-hand control applications. Order separately, safety relay 440R-D23171 for 24V, 440R-D23169 for 120V, 440R-D23168 for 240V.

Quick Disconnect Cables



PD



PD

889 D – F 4A C-2
a b c d

a

Mounting Hole Size	
Code	Description
D	22.5 mm (micro)
N	30.5 mm (mini)

‡ No right angle QD cable (micro) for 5-pin (Cat. No. 889D-R5A_).

b

QD Type	
Code	Description
F	Straight QD cable
R	Right angle QD cable

c

Pin Style	
Code	Description
4A	4 pin
5A	5 pin ‡

d

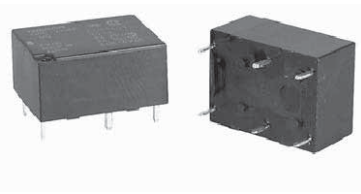
Cable Length/Type	
Code	Description
C-2	2 m (micro)
C-5	5 m (micro)
C-10	10 m (micro)
E-6F	6 ft. (mini)
E-12F	12 ft. (mini)
E-20F	20 ft. (mini)

Accessories — General Purpose

	Description		Cat. No.
  ***Cat. No. 800Z-G3AG1*** ***Cat. No. 800Z-G3AG2***	**Guards** These guards help protect against accidental activation of the touch button surface and protect it from damage. Can be used for both the 22.5 mm and 30.5 mm mounted products.	Yellow Plastic	**800Z-G3AG1**
		Black Plastic	**800Z-G3AG2**
 *Plastic Mounting Kit* ***Cat. No. 800Z-G2AH1***	**Mounting Ring Nut for 22.5 mm Holes** Used on 22.5 mm devices.		**800Z-G2AH1**
 *Plastic Mounting Kit* ***Cat. No. 800Z-G3AH1***	**Mounting Ring Nut for 30.5 mm Hole** Used on 30.5 mm devices.		800Z-G3AH1
 *Swivel Assembly* ***Cat. No. 60-2439***	**30.5 mm Swivel/Tilt Mounting Assembly** This bracket allows you to orient the touch button in any position. It can be mounted on any vertical or horizontal surface. Compatible with 30.5 mm mounting only.	2.25 in. (57 mm)	**60-2681**
		1.15 in. (29 mm)	**60-2439**
 ***Cat. No. 800E-AHA1***	**30.5 mm to 22.5 mm Hole Size Adapter** This adapter allows a 22.5 mm push button operator to be installed in a panel with existing 30.5 mm mounting holes.	Metal	**800F-AHA1**
		Black Metal	**800E-AHA2**

10

Accessories — Heavy Industrial

	Description		Cat. No.
 *Cat. No. 800Z-HAG1*	**Guard** This guard helps protects against accidental activation of the touch surface and protects it from damage. Mounting screws are included.	Yellow Plastic	**800Z-HAG1**
 *Single Hub Base* **Cat. No. 800P-B1**  *Double Hub Base* **Cat. No. 800P-B2**	**Mounting Bases** The heavy industrial line products mount directly on these bases. The conduit hub(s) come with a 3/4 inch opening.	1	**800P-B1**
		2	**800P-B2**
 *Cat. No. 800P-N150*	**Adapter** This adapter is used if mounting touch button onto a 4-1/2 in. x 2-3/8 in. (114.3 x 60.3 mm) enclosure pattern.		**800P-N150**
 *Cat. No. 800Z-N12*	**Replacement Relay** **Note:** Package quantity of 2.	10...264V	**800Z-N12**
 *Cat. No. 800Z-HAH1*	**Replacement Screws**	Guard-to-Base Mounting **Note:** package quantity of 4	800Z-HAH1
		Base Mounting **Note:** package quantity of 4	800Z-HAH2

10

Wiring Diagrams — Touch Button Terminations

General Purpose Line

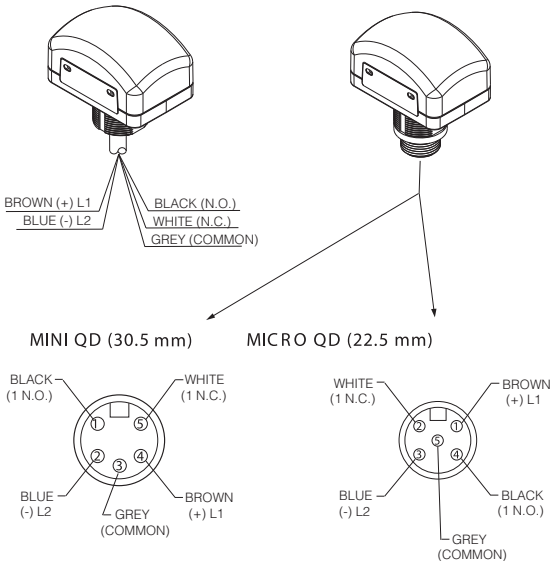
Electrical Connections: 10...40V DC and 20...30V AC Input Voltage (Relay Output); 100...240V AC Input Voltage (Relay Output)

Note: Separate N.O. and N.C. output relays with shared common.

5-Conductor Cabled (Relay Output)

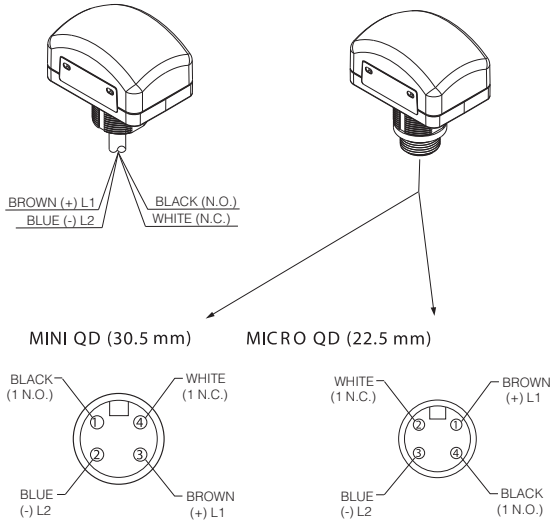
For 800Z-GL_ _ _

For 800Z-GF_ _ _

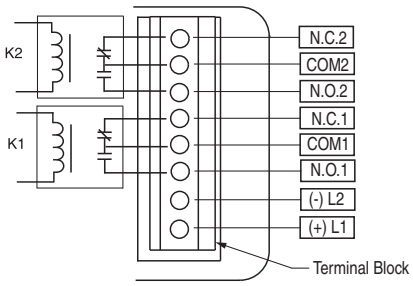


Electrical Connections: 10...30V DC Input Voltage (Transistor Output); 150 mA Max. per Circuit Output

4-Conductor Cabled



Heavy Industrial Line

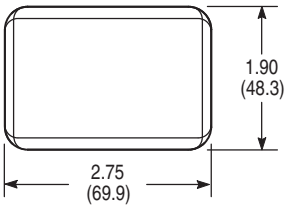


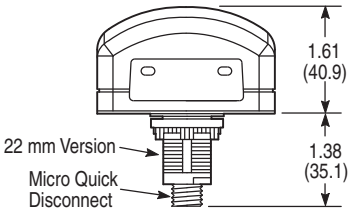
10

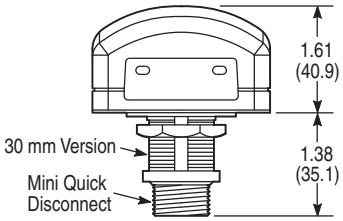
Approximate Dimensions

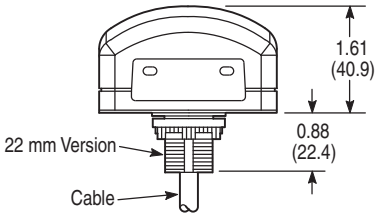
Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

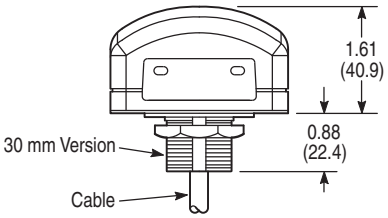
General Purpose



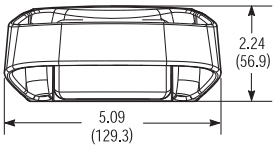


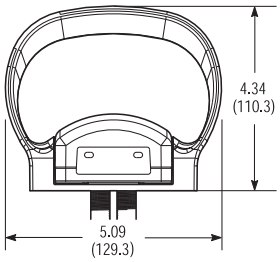




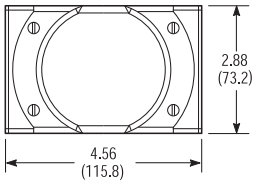


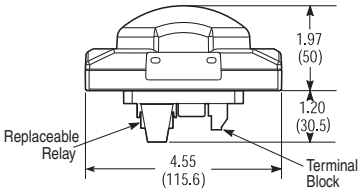
General Purpose With Guard



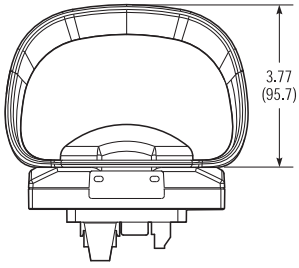


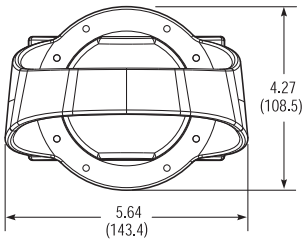
Heavy Industrial



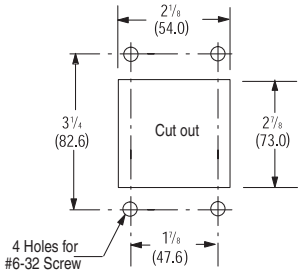


Heavy Industrial With Guard





Cutout and Mounting Screw Locations for a Flush Mounted Cover





Bulletin 800L — 12, 18, 22, and 30 mm Indicators

- Economical, commercial-grade indicators
- LED/strobe/incandescent
- Shallow back-of-panel depth
- Type 4/4X/13, watertight/oiltight (12 mm is Type 1)
- 18, 22, and 30 mm devices are rated for use in Class 1 Div. 2 Groups A, B, C, D and Class 2 Div. 2 Groups F, G.

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Product Selection ..... this page
Approximate Dimensions..... 10-222

Standards Compliance

UL 508

Certifications

cULus Listed (File No. E14840, Guide No. NKCR, NKCR7)
EN60947-5-1
CSA C22.2, No. 14
CE Marked

Specifications*

Mechanical Ratings		
Vibration	10…2000 Hz 1.52 mm displacement (peak-to-peak) max./10 G max	
Shock	1/2 cycle sine wave for 11 ms ≥ 25 G	
Degree of protection	12 mm: Type 1 18, 22, and 30 mm: Type 1/4/4X/12/13; watertight/oiltight IEC 529 IP66	
Environment		
Temperature range	Operating	-40…+131 °F (-40…+55 °C)
	Storage	-40…+185 °F (-40…+85 °C)
Humidity		50% at 104 °F (40 °C)
Lamp Ratings		
Lamp life	Incandescent	5 000 Hrs.
	LED	100 000 Hrs.
	Strobe	1 000 000 Flashes
Flash frequency	Strobe	1…2 Hz

* Performance Data — See Important- 3.

Product Selection

12 mm Indicators

	6 in. Pigtail Leads		Terminals	
	24V DC	120V AC	24V DC	120V AC
Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Amber	**800L-12L24A**	**800L-12L10A**	**800L-12L24AS**	**800L-12L10AS**
Blue	**800L-12L24B**	**800L-12L10B**	**800L-12L24BS**	**800L-12L10BS**
Clear	**800L-12L24C**	**800L-12L10C**	**800L-12L24CS**	**800L-12L10CS**
Green	**800L-12L24G**	**800L-12L10G**	**800L-12L24GS**	**800L-12L10GS**
Red	**800L-12L24R**	**800L-12L10R**	**800L-12L24RS**	**800L-12L10RS**

18 mm Indicators

	LED*			Incandescent	
	24V AC/DC	120V AC	240V AC	24V AC/DC	120V AC/DC
Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Amber	**800L-18L24A**	**800L-18L10A**	**800L-18L20A**	**800L-18C24A**	**800L-18C10A**
Blue	**800L-18L24B**	**800L-18L10B**	**800L-18L20B**	**800L-18C24B**	**800L-18C10B**
Clear	**800L-18L24C**	**800L-18L10C**	**800L-18L20C**	**800L-18C24C**	**800L-18C10C**
Green	800L-18L24G	800L-18L10G	**800L-18L20G**	**800L-18C24G**	**800L-18C10G**
Red	**800L-18L24R**	**800L-18L10R**	**800L-18L20R**	**800L-18C24R**	**800L-18C10R**

22 mm Indicators

	LED*			Incandescent		Strobe	
	24V AC/DC	120V AC	240V AC	24V AC/DC	120V AC/DC	24V AC/DC	120/240V AC
Color	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Amber	**800L-22L24A**	**800L-22L10A**	**800L-22L20A**	**800L-22C24A**	**800L-22C10A**	800L-22S24A	**800L-22S10A**
Blue	800L-22L24B	**800L-22L10B**	**800L-22L20B**	**800L-22C24B**	**800L-22C10B**	**800L-22S24B**	**800L-22S10B**
Clear	**800L-22L24C**	**800L-22L10C**	**800L-22L20C**	**800L-22C24C**	**800L-22C10C**	**800L-22S24C**	**800L-22S10C**
Green	**800L-22L24G**	**800L-22L10G**	**800L-22L20G**	**800L-22C24G**	**800L-22C10G**	**800L-22S24G**	**800L-22S10G**
Red	**800L-22L24R**	**800L-22L10R**	**800L-22L20R**	**800L-22C24R**	**800L-22C10R**	**800L-22S24R**	800L-22S10R

* LED color matches lens color specified. White LED supplied for clear selection.

Product Selection, Continued

30 mm Indicators

Color	LED∗			Incandescent		Strobe	
	24V AC/DC	120V AC	240V AC	24V AC/DC	120V AC/DC	24V AC/DC	120/240V AC
	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.	Cat. No.
Amber	800L-30L24A	**800L-30L10A**	**800L-30L20A**	**800L-30C24A**	**800L-30C10A**	**800L-30S24A**	**800L-30S10A**
Blue	**800L-30L24B**	**800L-30L10B**	**800L-30L20B**	**800L-30C24B**	**800L-30C10B**	**800L-30S24B**	**800L-30S10B**
Clear	**800L-30L24C**	**800L-30L10C**	**800L-30L20C**	**800L-30C24C**	**800L-30C10C**	**800L-30S24C**	**800L-30S10C**
Green	**800L-30L24G**	**800L-30L10G**	**800L-30L20G**	**800L-30C24G**	**800L-30C10G**	**800L-30S24G**	**800L-30S10G**
Red	**800L-30L24R**	**800L-30L10R**	**800L-30L20R**	**800L-30C24R**	**800L-30C10R**	**800L-30S24R**	**800L-30S10R**

∗ LED color matches lens color specified. White LED supplied for clear selection.

800L – 30 L 24 R
a b c d

a

Indicator Size	
Code	Description
12	12 mm
18	18 mm∗
22	22.5 mm
30	30.5 mm

b

Illumination Type	
Code	Description
C	Incandescent
L	LED❄§
S	Xenon strobe❄

c

Voltage	
Code	Description
24	24V AC/DC♣
10	120V AC
20	240V AC‡

d

Lens Color	
Code	Description
R	Red
G	Green
A	Amber
B	Blue
C	Clear

∗ 18 mm indicators are only available with LED or incandescent illumination. For 18 mm devices with 120V incandescent lamps, it is recommended that the lens is changed with lamp replacement.
❄ LED and Xenon strobe lamps are integral to indicators and are not field replaceable. Entire indicator must be replaced upon lamp failure.
‡ Incandescent illumination not available in 240V option. For 240V strobe, order voltage code **10** (Table c) as strobe is rated for both 120V/240V AC.
§ LED color will match lens color specified. White LED supplied for clear lens.
♣ 12 mm devices are only available with LED illumination (24V DC or 120V AC).

Replacement Parts

Replacement Lens Caps

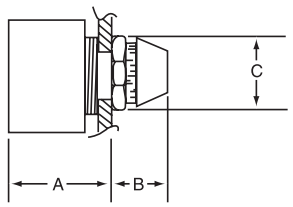
Color	18 mm	22 mm	30 mm
Red	**800L-N18R**	**800L-N22R**	**800T-N26R**
Green	**800L-N18G**	**800L-N22G**	**800T-N26G**
Amber	**800L-N18A**	**800L-N22A**	**800T-N26A**
Blue	**800L-N18B**	**800L-N22B**	**800T-N26B**
Clear	**800L-N18C**	**800L-N22C**	**800T-N26C**

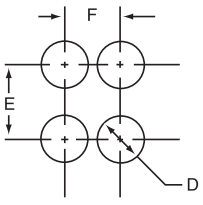
Replacement Lamps➢

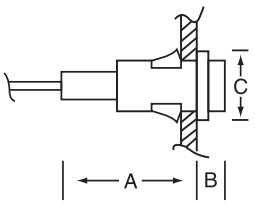
Lamp Type	Voltage	ANSI No.	Cat. No.
Incandescent	24V AC/DC	757	**800T-N157**
	120V AC/DC	949	**800T-N169**

➢ LED and Xenon strobe lamps are integral to indicators and are not field replaceable. Entire indicator must be replaced upon lamp failure.

Approximate Dimensions







Indicator	A	B	C	D	E	F
	Inches (mm)					
12 mm	1-3/32 (27.8)	5/16 (7.9)	5/8 (15.8)	1/2 (12.7)	3/4 (19.0)	11/16 (17.5)
18 mm	1-21/64 (33.7)	57/64 (22.6)	1-1/32 (26.2)	3/4 (18.6)	2-9/32 (58.0)	1-1/8 (28.6)
22 mm	1-21/64 (33.7)⌘	57/64 (22.6)	1-7/32 (31.0)	15/16 (22.6)	2-9/32 (58.0)	1-8/32 (32.5)
30 mm	1-9/16 (39.7)⌘	1-9/64 (29.0)	1-19/32 (40.5)	1-13/64 (30.6)	2-9/32 (58.0)	1-29/32 (48.5)

⌘ For devices with strobe illumination, Dimension A for 22 mm is 2-7/8 in. (73 mm) and for 30 mm devices it is 3-1/8 in. (79 mm).



Bulletin 800S — Standard Duty Stations

Bulletin 800S standard duty push button stations are used in control circuits. They offer compact size and dependable peformance.

NEMA Type 1 general purpose stations have been designed for greater operating flexibility and ease of wiring. The cover of the station contains the entire contact mechanism. Wiring terminals are located in the base. Spring type, silver plated contacts connect the two assemblies. This unique construction will speed up installation and maintenance. Operating buttons can be rotated 90° to make them suitable for horizontal mounting. This change can be made in the field.

NEMA Type 4 enclosures are die cast aluminum. Standard stations are supplied with a 3/4 in. pipe tap at the bottom.

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Approximate Dimensions..... 10-226

Pilot Lights

- Push button stations with pilot lights can operate on either 120V or 240V by changing connections. A red pilot lens is supplied.

Selector Switches

- All two-position Bulletin 800S standard duty selector switch stations can be changed to three-position in the field, and the three-position selector switches can be changed to two-position. Instructions for changing are included with each station.
- In addition to the standard marking, all selector switches are supplied with adhesive backed metal legend plates, marked as follows: OFF-ON, FOR-REV, HAND-AUTO, OPEN-CLOSE, HIGH-LOW, SUMMER-WINTER, SUMMER-OFF-WINTER, HIGH-OFF-LOW, OPEN-OFF-CLOSE, FOR-OFF-REV, HAND-OFF-AUTO.

Product Selection

Complete Assembled Stations



Flush Mount Units fit a standard GEM or Handy Type Wall Box. Contact Symbol 3 Cat. No. 800S-2AS

Type 1 Flush Mount Unit* — Wall Box not included			
		Grey Painted Flush Plate	Stainless Steel Flush Plate
Legend Marking	Contact Symbol➤	Cat. No.	Cat. No.
START STOP	3	**800S-2AS**	800S-2ASQ

* Not rated for DC operation.



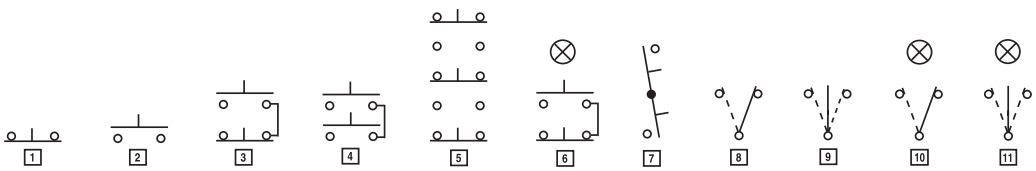
Cat. No. 800S-2SAP



Cat. No. 800S-2SCM

Momentary Contact Buttons and Pilot Light — 120V or 240V, Type 1.			Maintained Contact Buttons — Type 1		
Legend Marking	Contact Symbol➤	Cat. No.	Legend Marking	Contact Symbol➤	Cat. No.
No Legend START STOP	6	**800S-2SAP**	No Legend ON OFF	7	800S-2SCM
			No Legend START STOP	7	**800S-2SBM**

➤Contact Symbols



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Standard Duty Stations

Product Selection

Complete Assembled Stations, Continued



Cat. No. 800S-R3SX



Cat. No. 800S-R2SXP

Selector Switches — Type 1				Selector Switch and Pilot Light — 120V or 240V, Type 1			
Legend Marking	Operator Type	Contact Symbol➤	Cat. No.	Legend Marking	Operator Type	Contact Symbol➤	Cat. No.
OFF-ON	2-Position Selector Switch	8	800S-R2SX	No Legend OFF-ON	Pilot Light, 2-Position Selector Switch	10	800S-R2SXP
HAND-OFF-AUTO	3-Position Selector Switch	9	**800S-R3SX**	No Legend HAND OFF AUTO	Pilot Light, 3-Position Selector Switch	11	800S-R3SXP



Cat. No. 800S-2SA



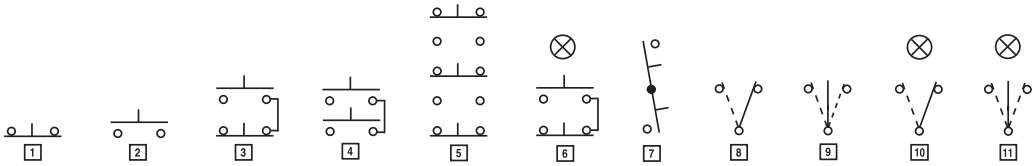
Cat. No. 800S-2SA4

Momentary Contact Buttons		Contact Symbol➤	Type 1	Type 4 Die Cast Aluminum Enclosure ✶❄
Legend Marking	Contact Type		Cat. No.	Cat. No.
STOP	1 N.C.	1	**800S-1SA**	800S-1SA4
	1 N.O.	2	800S-1SAK	800S-1SAK4
START	—	2	800S-1SB	800S-1SB4
START STOP	1 N.O. - 1 N.C.	3	**800S-2SA**	**800S-2SA4**
	1 N.O. - 1 N.O.	4	800S-2SAK	800S-2SAK4
FOR REV	—	4	**800S-2SB**	800S-2SB4
OPEN CLOSE	—	4	800S-2SF	800S-2SF4
ON OFF	1 N.O. - 1 N.C.	3	800S-2SE	800S-2SE4
	1 N.O. - 1 N.O.	4	800S-2SEK	800S-2SEK4
RAISE LOWER	—	4	**800S-2SD**	800S-2SD4
UP DOWN	—	4	**800S-2SC**	**800S-2SC4**
FAST SLOW STOP	—	5	800S-3SF	—
FOR REV STOP	—	5	**800S-3SA**	—
OPEN CLOSE STOP	—	5	**800S-3SD**	—
RAISE LOWER STOP	—	5	800S-3SB	—
UP DOWN STOP	—	5	**800S-3SC**	—

✶ Not rated for DC operation.

❄ Flip levers permit attachment of lock without additional accessory.

➤Contact Symbols



Contact Ratings

(IEC 337-1) (NEMA ICS 2-125) Maximum Continuous Current I_{th} 5 A. Bulletin 800S push button stations have control circuit ratings as follows:

Maximum Operational Voltage U_e	Utilization Category		Rated Operational Current		
	IEC	NEMA	Volts U_eUe	Make ►][◄	Break ◄][►
AC 600	AC-11	B600	480…600	3600VA	360VA
			240…480	3600VA	360VA
			120…240	30 A	3.0 A
DC 600	DC-11	P600	28…600	138VA	
			24…28‡	5.0 A	

‡ For applications below 24V and 24 mA, Bulletin 800T units with Logic Reed, sealed switch, or stackable sealed switch contact blocks are recommended.

Accessories

Complete Assembled Stations

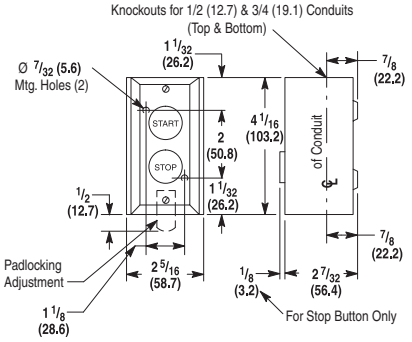
	Description	Cat. No.
 *Cat. No. 800S-N90R*	**Pilot Light Lens** Red lens replacement cap.	**800S-N90R**
 *Cat. No. 800S-N60*	**Lamp** 120V lamp	**800S-N60**
 *Cat. No. 800S-N1*	**Locking Attachments** This device is used with extended push buttons or 2-position selector switches.	**800S-N1**
	This device is used with 3-position selector switches, to lock in the right or left position.	800S-N4

10

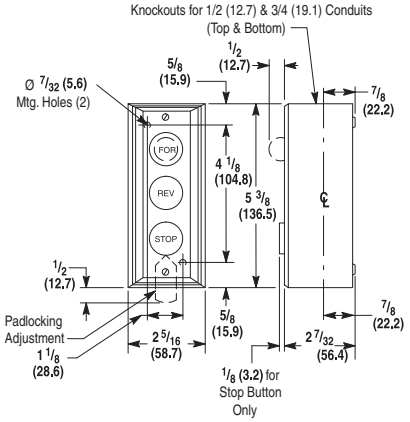
Approximate Dimensions and Shipping Weights

Dimensions in inches (millimeters). Dimensions are not intended to be used for manufacturing purposes.

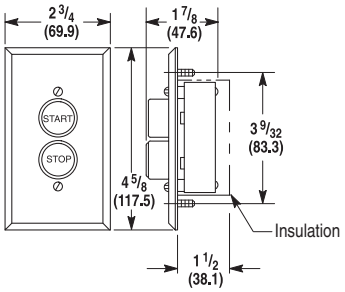
Type 1 — General Purpose Enclosures



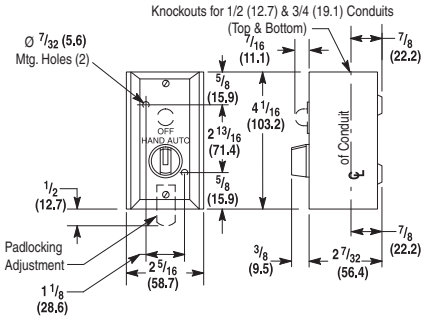
One- and Two-Unit Surface Mounting Stations Shipping Wt. 1 lb (0.45 kg)



Two-Unit Flush Mounting Station Shipping Wt. 2 lbs (0.91 kg)

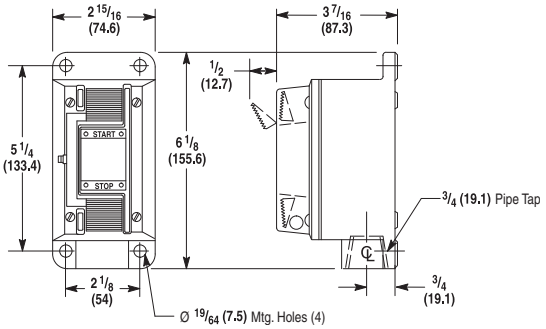


Three-Unit Surface Mounting Station Shipping Wt. 1 lbs (0.45 kg)

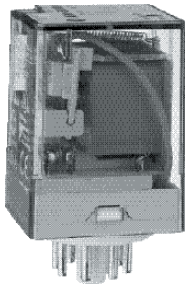


Selector Switch Surface Mounting Station Shipping Wt. 1 lb (0.45 kg)

Type 4 — Watertight Enclosure



Shipping Wt. 3 lb (1.36 kg)



Bulletin 700-HA — Tube Base Relay

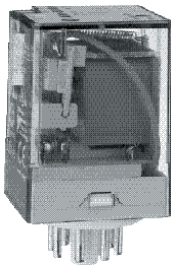
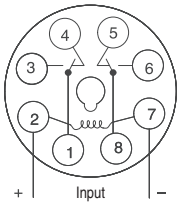
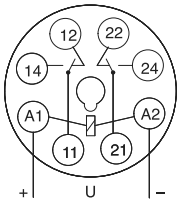
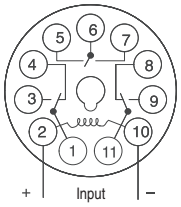
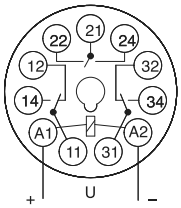
- 10 A contact rating
- DPDT, 3PDT
- Pin-style terminals
- Standard ON/OFF flag indicator
- Options: LED, push-to-test and manual override, socket-mounted surge suppressor module, or multi-function timer
- Contact choices: standard silver nickel, bifurcated silver nickel, or bifurcated with gold plating

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Product Selection

Bulletin 700-HA Tube Base Relay with PIN Terminals (Single Contact) — Mechanical ON/OFF Indicator included∗

	Description	Contact Rating	Wiring Diagrams U.S./Canada	Wiring Diagrams International	Coil Voltage	Cat. No.❄‡§
	DPDT 2-pole 2 Form C Single AgNi Contact	10 A B300			6V AC	**700-HA32A06**
					12V AC	**700-HA32A12**
					24V AC	**700-HA32A24**
					120V AC	**700-HA32A1**
					240V AC	**700-HA32A2**
					277V AC	**700-HA32A27**➢
					6V DC	**700-HA32Z06**
					12V DC	**700-HA32Z12**
					24V DC	**700-HA32Z24**
					36V DC	700-HA32Z36
					48V DC	**700-HA32Z48**
					60V DC	700-HA32Z60
					80V DC	700-HA32Z80
					110V DC	**700-HA32Z1**
					125V DC	**700-HA32Z01**
	Sockets		***700-HN125***	***700-HN100*** ***700-HN204***	140V DC	700-HA32Z3
					220V DC	700-HA32Z2➢
	3PDT 3-pole 3 Form C Single AgNi Contact	10 A B300			6V AC	700-HA33A06
					12V AC	**700-HA33A12**
					24V AC	**700-HA33A24**
					120V AC	**700-HA33A1**
					240V AC	**700-HA33A2**
					6V DC	700-HA33Z06
					12V DC	**700-HA33Z12**
					24V DC	**700-HA33Z24**
					48V DC	**700-HA33Z48**
					60V DC	700-HA33Z60
					80V DC	700-HA33Z80
					110V DC	**700-HA33Z1**
					125V DC	**700-HA33Z01**
	Sockets		***700-HN126***	***700-HN101*** ***700-HN205***	140V DC	700-HA33Z3
					220V DC	700-HA33Z2➢

∗ For Time Module and Surge Suppressor Module, see page 9-12.
❄ LED Option: Add suffix (**-4**) to the selected Bulletin 700-HA Relay Cat. No., except for the 240V AC Units, add (**-4L**).
‡ Push-to-test, Manual Override, and LED Option: Add suffix (**-3-4**) to the selected Bulletin 700-HA Relay Cat. No., except for the 240V AC units, add (**-3-4L**).
§ Push-to-test and Manual Override option: Add suffix (**-3**) to the selected Bulletin 700-HA relay.
➢ LED not available for 220V DC and 277V AC coils.

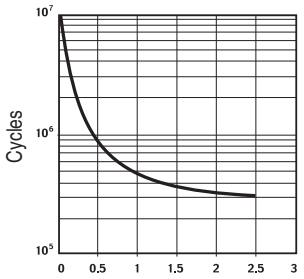
General Purpose Relays

Specifications

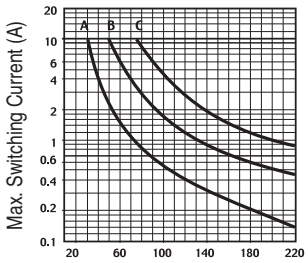
Cat. No. 700-HA...				
Electrical Ratings				
Pilot Duty Rating❄		NEMA B300		
Rated Thermal Current (I_{th})		HA = 10 A – 120V, 240V HAX = 6 A – 120V, 240V		
Rated Insulation Voltage (U_i)		250V IEC – 300V UL/CSA		
Contacts	Inductive	**Make**	**Break**	**Hp**
		►][◄	◄][►	
	120V AC	30 A	3 A	1/3
	240V AC	15 A	1.5 A	1
	General Purpose	10 A, 240V AC		
	Resistive	10 A, 30V DC		
Min. Low Energy Permissible Load		HA = 10V, 5 mA HAX = 5V, 2 mA		
Permissible Coil Voltage Variation		Pickup: 80…110% of Nominal Voltage at 50 Hz 80…110% of Nominal Voltage at 60 Hz 80…110% of Nominal Voltage at DC		
Coil Consumption ±10%	AC Coils	**50 Hz**	**60 Hz**	
	Inrush	3.3 VA	2.85 VA	
	Sealed	2.2 VA	1.9 VA	
	DC Coils	1.3 W		
Must Dropout Voltage		20% of nominal V AC 10% of nominal V DC		
Max. Contact Resistance		50 MΩ (700-HA and 700-HAB) 30 MΩ (700-HAX)		
Design Specification/Test Requirements				
Electrical				
Pole-to-Pole		1000V		
Contact to Coil		3600V		
Contact to Frame		4000V		
Electrical Life (Operating)		100 000 min.		
Mechanical				
Degree of Protection (Open Type) IEC 529		IP 40		
Mechanical Life Cycles (AC/DC)		> 20 x 10^6/ 50 x 10^6		
Switching Frequency Operations		3600/HR		
Coil Voltages		See Product Selection		
Operating Time	Max. Pickup	10 ms		
	Max. Dropout	10 ms		
Maximum Operating Rate		4 Ops/s		
Vibration	Endurance	5 G		
	Operational	2.5 G		
Shock	Endurance	50 G		
	Operational	9 G		
Environmental				
Temperature	Operating	AC/DC	–40…+70 °C	
	Storage	AC/DC	–40…+100 °C	
Altitude		2000 m (6560 ft)		
Construction				
Insulating Material		Molded High-Dielectric Material		
Enclosure		Transparent Dust Cover		
Contact Material		700-HA:	10 A– AgNi	
		700-HAX:	6 A–Bifurcated/Gold Plating AgNi	
Terminal Markings on Socket		In accordance with EN50 0005		
Sockets		8-Pin Socket — 700-HN100, -HN125, -HN204 11-Pin Socket — 700-HN101, -HN126, -HN205		
Certifications		cURus Recognized (File No. E3125, Guide NLDX2/NLDX8), cULus Listed when used with Bulletin 700-HN sockets noted above (File No. E3125, Guide NLDX/NLDX7), CE Marked, CSA Certified, UR Certified (File 229473)		
Standards		UL508, CSA C22.2 No. 14, EN 61810-1, EN 60255-23		

✶ Performance Data – See this catalog, Important- 3.
❄ NEMA Rating Chart is in publication 700-SG003*

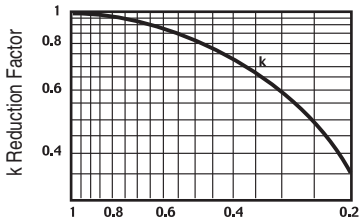
700-HA Relay Performance Graphs



Contact life vs. AC1 load at 1,800 cycles/h



Breaking capacity for DC1 load at 1,800 cycles/h.



Load reduction factor vs. cos ϕ

A *= load applied to one contact*
B *= load applied to two contacts in series*
C *= load applied to three contacts in series*

Time Module Cat. No. 700-HT3		
Electrical Ratings		
Operating Voltage Range		12…240V AC (50/60 Hz) 12…240V DC
Power Consumption		0.1 W (12V) 1.0 W (230V)
Mechanical		
Degree of Protection of Input (B1) Terminal		IP 20 (Guarded Terminal)
Input Terminal Wire Range		1.0 x 0.2 mm²…2.5 mm² (24 AWG…14 AWG) 2.0 x 0.2 mm²…1.5 mm² (24 AWG…16 AWG)
Input Terminal Torque Range		0.45…0.8 Nm (4…7 lb-in.)
LED Indicator		Red
Repeat Accuracy❄		±1%
Recovery Time		<50 ms
Selectable Timing Ranges		Three DIP switches, seven ranges (set from 5…100% of range): 1 s, 10 s, 100 s, 10 min, 100 min, 10 h, 100 h
Selectable Timing Modes		Three DIP switches, eight modes: 1. Power On–Delay 2. Power On One-Shot 3. Power On Repeat Cycle, On Start 4. Signal On-Delay and Signal Off-Delay 5. Signal Off-Delay 6. Signal On-One-Shot 7. Signal Off-One-Shot 8. Signal On and Signal Off Watchdog Monitor
Adjustable Trimmer Scale Accuracy		±5% of Time Range
Environmental		
Temperature	Operating	–20 °C…+50 °C (–4 °F…+122 °F)
	Storage	–55 °C…+85 °C (–67…+185 °F)
Altitude		2000 m (6560 ft)
Construction		
Enclosure		Gray Plastic Housing
Mounting with Socket Only		8- or 11-Pin Socket with Module Plug
Sockets		700-HN204 (8-Pin with Plug) 700-HN205 (11-Pin with Plug)
Certifications		cURus Recognized (File No. E14843, Guide NRNT2/NRNT8), CE Marked
Standards		UL508, CSA C22.2 No. 14, EN 61810-1, EN 60255-23

✶ Performance Data - See this publication, Important 3.
❄ At constant voltage and temperature.

Timing Charts, Cat. No. 700-HT3 Multi-Function Time Module (t = Time Range 0.05 s...100 h)

Terms:
U is Power Input
R is Relay Output
S Signal, **+A1** Socket, **B1** Timer
t is the resulting Time Delay (Red LED)

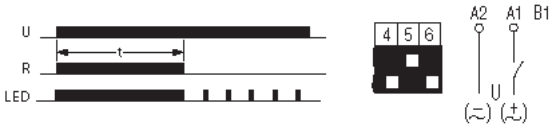
1. Power On-Delay

Apply power (U) to timer. Relay contacts (R) change state after time delay (t) is complete. Contacts return to their shelf state when power is removed. Terminal B1 is not used in this mode.



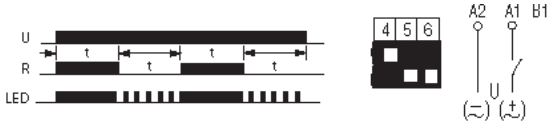
2. Power On One-Shot

Apply power (U) to timer. Relay contacts (R) change state immediately and the time delay begins. When the time delay (t) is complete, contacts return to their shelf state. Contacts return to their shelf state when power is removed. Terminal B1 is not used in this mode.



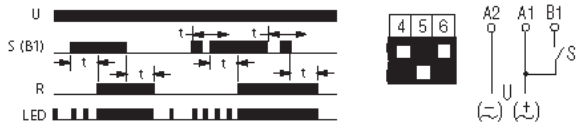
3. Power On Repeat Cycle, On Start

Apply power (U) to timer. Relay contacts (R) change state immediately and the time delay (t) begins. When the time delay is complete, the contacts return to their shelf state for time delay (t) (time on = time off). This cycle will repeat until the power is removed. Terminal B1 is not used in this mode.



4. Signal On-Delay and Signal Off-Delay

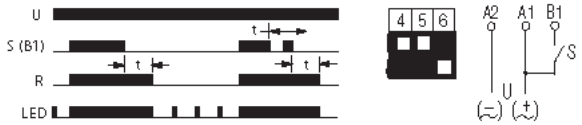
Apply power (U) to timer. When the signal (S) is closed the time delay (t) begins, after the time delay is complete the relay contacts (R) change state. Opening the signal starts the time delay, after the time delay is complete the contacts return to their shelf state. If the signal is closed or opened before the time delay is complete, the time delay is reset. Contacts return to their shelf state when power is removed.



Cat. No. 700-HT3 Timing Modes, Time Description, Timing Charts, and DIP Switch Selections

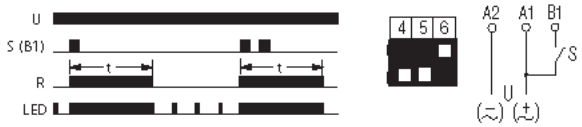
5. Signal Off-Delay

Apply power (U) to timer. When the signal (S) is closed, the relay contacts (R) change state immediately. When the signal is opened, the time delay (t) begins. If the signal is closed before the time delay is complete, the time delay is reset and the relay remains energized. When the time delay is complete, the contacts return to their shelf state. Contacts return to their shelf state when power is removed.



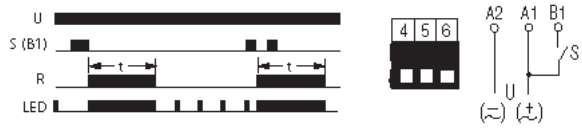
6. Signal On One-Shot

Apply power (U) to timer. When the signal (S) is closed, the relay contacts (R) change state immediately and the time delay (t) begins. After the time delay begins, opening or closing the signal will not reset the time delay. When the time delay is complete, the contacts return to their shelf state. Contacts return to their shelf state when power is removed.



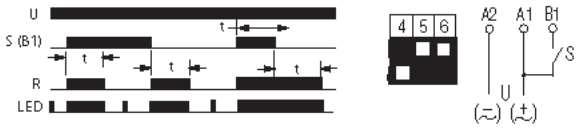
7. Signal Off One-Shot

Apply power (U) to timer. When the signal (S) is closed and then opened, the relay contacts (R) change state immediately and the time delay (t) begins. After the time delay begins, opening or closing the signal will not reset the time delay. When the time delay is complete, the contacts return to their shelf state. Contacts return to their shelf state when power is removed.



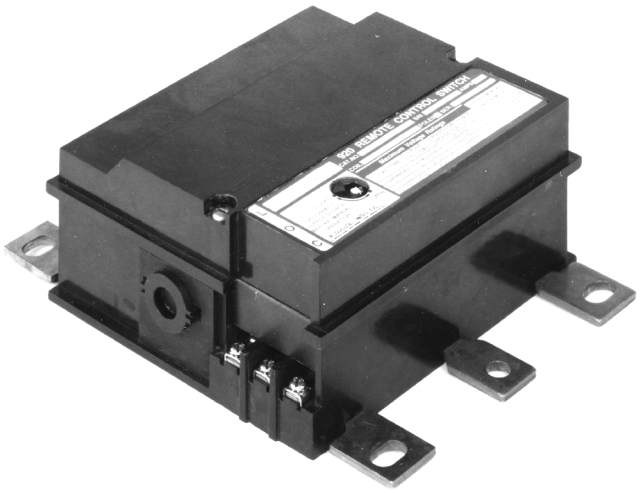
8. Signal On and Signal Off Watchdog Monitor

Apply power (U) to timer. When the signal (S) is closed, the relay contacts (R) energize immediately and the time delay (t) begins. If the signal is opened before the time delay is complete, the relay remains energized and the time delay is reset. When the time delay is complete the contacts return to their shelf state. If the signal is opened after the time delay is complete, the relay contacts energize immediately and the same time delay begins. Continuous cycling of the signal at a rate that is faster than the time delay will cause the relay contacts to remain energized. Contacts return to their shelf state when power is removed.



Installation Manual

ASCO® 920 Remote Control Switches 30 through 225 ampere sizes



This Installation Manual is for green nameplate ASCO 920s only. For black nameplate ASCO 920s refer to Owner's Manual 2D4920 R16.

ASCO 920 Remote Control (RC) Switches are pre–tested and ready to use. Installation requires mounting and connection of service cables (or bus) and control circuit wires. An experienced licensed electrician should install the RC Switch.

Each ASCO 920 RC Switch has a ratings / identification label defining load types and maximum voltage ratings. Use the switch only within the limits shown on this label.

⚠ DANGER

DANGER is used in this manual to warn of high voltages capable of causing shock, burns, or death.

⚠ WARNING

WARNING is used in this manual to warn of possible personal injury.

⚠ CAUTION

CAUTION is used in this manual to warn of possible equipment damage.

⚠ WARNING

Do not exceed the values on the rating label. Exceeding the rating can cause personal injury or serious equipment damage.

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	page
Installation & Maintenance	1
Troubleshooting & Parts Kits	2
Optional Accessories	3
Wiring & Outline Diagrams	back of manual

Catalog Number Identification with Elements Explained

Typical ASCO 920 catalog no. for 3 pole, 100 amp, 208 volt 60 Hz control, with subpanel and enclosed Remote Control Switch:

920	3	100	6	1		C
Product	**Phase Poles**	**Amperes**	**Control Voltage**	**Subpanel**	**Accessories**	**Enclosure**
920	2 – single phase 3 – three phase	30 60 75 100 150 200 225	3 110 – 120 V 6 208 – 240 V 7 265 – 277 V 9 440 – 480 V G 550 – 600 V X other voltages 50 – 60 Hz	0 – without 1 – with	X – if accessories ordered blank – none	C – blank – open type

ASCO Power Technologies® 50 Hanover Road, Florham Park, New Jersey 07932–1591 USA
For sales or service call 1 800 800–2726 (ASCO) www.ascopower.com

ASCO POWER TECHNOLOGIES CANADA PO Box 1238, 17 Airport Road, Brantford, Ontario, Canada N3T 5T3

381333–005 B

EMERSON Network Power

INSTALLATION

⚠ CAUTION

To prevent malfunction or shortened life, protect the switch from construction grit and metal chips.

Mounting: Two *Outline and Mounting Diagrams* are furnished; one for enclosed switches, the other for open–type switches. Select the appropriate diagram and mount the RC Switch (in any position). All mounting details and instructions are shown on the diagram.

⚠ WARNING

RC Switches on subpanels must be mounted with supplied insulator bushings and insulator pieces. Be sure the insulator pieces are behind the switch and use the insulator bushings under the hardware.

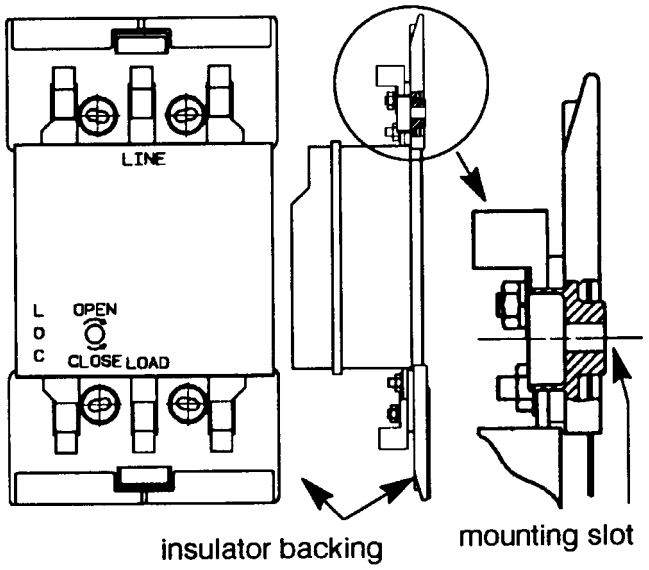


Figure 1. Required insulator bushings and backing insulators for RC Switches mounted on subpanels.

Service Connections: For panelboard mounting, the extended bus plates provide both the mechanical support and the electrical connection. Switches on subpanels are furnished with solderless lugs for copper or aluminum wire. *Outline and Mounting Diagram* lists wire sizes accepted.

Remove surface oxides from wires by cleaning with a wire brush. When aluminum conductor is used, apply joint compound to conductor. Tighten conductor and carefully wipe away excess compound. Maintain proper electrical clearance between live metal parts and grounded metal.

Control Line Connections: Control circuit connections designated *L*, *O*, *C* are supplied with clamp type terminals. These terminals accept wire sizes #14–10 AWG Cu. Simply insert appropriate control wires and tighten terminal clamp screws. See the *Wiring Diagram*.

⚠ CAUTION

Tighten all electrical connections; refer to the torque specified on the label on the RC Switch.

Table A lists the maximum distances and minimum wire sizes that can be run between a control station and one ASCO 920 switch.

Table A – Line Run

Min. Wire Size AWG	Maximum Distance (feet) [1] for these AC Control Voltages			
	120 V	208 V	240 V	277 V
14	750	1650	2760	3950
12	1200	2600	4300	6350
10	2000	4200	6900	10000

[1] For ambient temperatures to 40˚C.

⚠ CAUTION

Do not exceed these distances for proper switch operation.

Line run can be extended by use of Auxiliary Control Relays. See page 3.

Table B provides the ASCO 920 coil inrush current and minimum control circuit fuse sizes.

Table B – Inrush Current / Minimum Fuse

Amps	Inrush Current / Fuse (amps) [2] for these AC Control Voltages				
	120 V	208 V	240 V	277 V	480 V
Inrush	11.3	5.15	6.4	7	7
Fuse	3	1.5	1.5	1.5	3

[2] Fuse value listed will also protect ASCO 920 against abnormal operating conditions.

MAINTENANCE

Annual preventive maintenance will insure high reliability and long life for the ASCO 920 RC Switch.

Keep the Switch clean. De–energize all sources, then brush and vacuum away any excessive dust accumulation.

Maintain Switch Lubrication. Under normal service, relubrication is not required. Renew factory lubrication if switch is subjected to severe dust or abnormal operating conditions, and if the coil is replaced. Only use Lubrication Kit 625549; do not use oil or any other type of lubricant.

Inspect Main Current–Carrying Contacts. De–energize all sources, then remove cover to check contact condition. Discoloration or slight pitting does not affect contact efficiency. Replace the contacts when they become pitted, excessively worn, or appear to be overheated.

⚠ CAUTION

The arc chutes are held in place by the cover. If the arc chutes are removed, be sure they are put back in place with "top" visable. Make sure the cover is fully seated before tightening the cover screws. (Do not over–tighten).

MANUAL OPERATION

A means for manual operation is provided for maintenance purposes only. The switch must be completely de–energized. Open the supply source circuit breaker to the ASCO 920. Label, tape, and disconnect the control circuit wires from terminals *L*, *0*, and C.

⚠ WARNING

Do manually operate the RC Switch until all power sources (service & control) and all loads are deenergized (open circuit breakers).

A slotted socket in the cover directly connects to the solenoid operator mechanism. Use a medium blade screwdriver to turn the socket 1/4 turn clockwise to close or counterclockwise to open. See Figure 2 below.

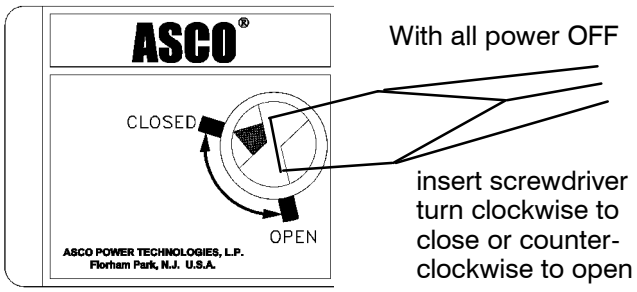


Figure 2. Socket in nameplate for manual operation
ALL POWER MUST BE OFF BEFORE TURNING !

TROUBLESHOOTING

Note any Optional Accessories that may have been furnished with the ASCO 920 and review their operation.

⚠ DANGER

Deenergize all power sources to the Remote Control Switch before working on it.

RC Switch opens and closes repeatedly.

1. **Check Wiring.** Make sure control stations are not calling on the ASCO 920 to open and to close at the same time. See Wiring Diagram.
2. **Check Control Station.** Make sure control stations do not have overlapping contacts.

RC Switch tries to open or close, but cannot.

1. **Check Voltage.** Make sure control line voltage is at least 90% of nameplate coil voltage.
2. **Check Line Run & Wire Size.** Make sure control line size and distance is within the requirements of Table A, page 1.
3. **Check VA Burden of Transformer.** If a transformer is used in the control line, make sure it can handle the VA burden required. See Table B, page 1.

REPLACEMENT PARTS KITS

For convenience, replacement contacts and coils are sold in kit form. Select kits by noting switch ampere size, number of poles, and coil control voltage as specified on the nameplate. The kits can be ordered from any ASI, 1–800–800–ASCO. (2726).

For other parts, and service procedures, refer to Service Bulletin 381339–015. This publication is supplied with the kits. When converting to a control voltage different from originally furnished, request a new nameplate.

Coil Kits for these AC Control Voltages			
110–120 V	208–240 V	265–277 V	440–480 V
605326–001	605326–008	605326–002	605326–003

ASCO 920 amp. size	Contact Kits		Coil Control Contact Kit	Lubrication Kit [3]
	2 Pole	3 Pole		
30–100	331709	331703	331713	625549
150–225	331710	331704		

[3] Lubrication points: core and link inside the core tube, operator spring, and rotating weight pin.

OPTIONAL ACCESSORIES

Pilot Lights, Optional Accessory 9

These pilot lights, if furnished, are connected and installed in the enclosure door, or are supplied loose for open type switches. Each neon light requires a 1/2" diameter round hole and can be installed in panels up to 0. 1" thick. See the Wiring Diagram. Acc. 9s can be added later in Kit form. Kit voltage must be the same as RC Switch control voltage (coil).

Acc. 9A light comes on when main contacts are closed.

Acc. 9B light comes on when main contacts are open.

A resistor is used for 208–277 V RC control. It is supplied on a terminal block with connections labeled 1, 2.

Acc.	Description	Kit
9A	110–120 V	333270–006
	208–277 V	333270–007
9B	110–120 V	333271–006
	208–277 V	333271–007

Auxiliary Contacts, Optional Accessory 14

Acc. 14 auxiliary contacts are installed on the right side of the ASCO 920. Terminals accept wire size #14 AWG Cu.

Acc.	Description	Kit
14A 14B	two auxiliary contacts (14A & 14B) with bracket, cam, and screws	607039

Auxiliary Relays, Optional Acc. 47, 48, 49

Optional auxiliary relays (Acc. 47, 48, 49) are useful:
– When the control station is located at a distance greater than allowable ASCO 920 line run (Table A, page 1).
– When controlling device doesn't have adequate current–carrying capability to control RC (Table B, page 1).
– When the controlling device is a single–pole single–throw contact, which requires a 2–wire control line.
– When Form 3 (start–stop) control is required.

The relays have a low VA burden: Acc. 47 has 3.0 VA for ac, 2.5 watts for dc; Acc. 48 & 49 have 2.0 VA for ac, 1.2 watts for dc. Acc. 47 & 48 terminals accept wire sizes #22–12 AWG Cu; Acc. 49 accepts #18–12 AWG Cu. The relays are mounted and wired to the RC on enclosed switches, or supplied loose with open type switches.

Two–Wire Control, Optional Accessory 47

Acc. 47 is an auxiliary relay panel for 2–wire control of the ASCO 920, The relay panel must be energized to close the ASCO 920 contacts, and de–energized to open the ASCO 920 contacts. Therefore, use a single–pole, maintained–type control station (Acc. 53B or 53C). Order **Catalog 32lA40** and specify relay coil voltage.

Three–Wire Control, Optional Accessory 48

Acc. 48 is an auxiliary relay panel for 3–wire control of the ASCO 920. It has two relays. One relay must be energized to open the ASCO 920 contracts; the other relay must be energized to close the ASCO 920 contacts. Therefore, use a single–pole, double–throw, momentary–type control station (Acc. 53A). Order **Catalog 321A36** and specify relay coil voltage. See the Wiring Diagram.

Form 3 Control, Optional Accessory 49

Acc. 49 is an auxiliary relay for Form 3 control of the ASCO 920. This relay must be energized to close the ASCO 920 contacts; the relay must be de–energized to open the ASCO 920 contacts. Therefore, use one normally open and one normally closed separate control stations (Acc. 53D). Order a mounting socket kit and plug–in relay listed below (specify relay control voltage).

Acc.	Description				Kit
49	mounting socket kit				295855
Acc.	AC Control	Relay	Acc.	DC Control	Relay
49A	24 V	115206	49F	12 V	115274
49B	120 V	115201	49G	24 V	115277
49C	208 V	115210	49H	32 V	115279
49D	240 V	115202	49I	48 V	115283
49E	277 V	115213	49J	110 V	115271

Control Line Fuses, Optional Accessory 52

These control line fuses are mounted for enclosed switches, or are supplied loose for open type switches. Fuse block has #10–32 terminal screws. The cartridge fuses are suitable for ac only as listed on *Wiring Diagram*.

Acc.	Description	Kit
52A	one 15 amp, 300 Vac type SC fuse for 300 Vac max. grounded	333272
52B	two 15 amp 300 Vac type SC fuses for 300 Vac max. ungrounded	333273
52C	two 15 amp 600 Vac type KTK fuses for 301–600 Vac max. ungrounded	333274

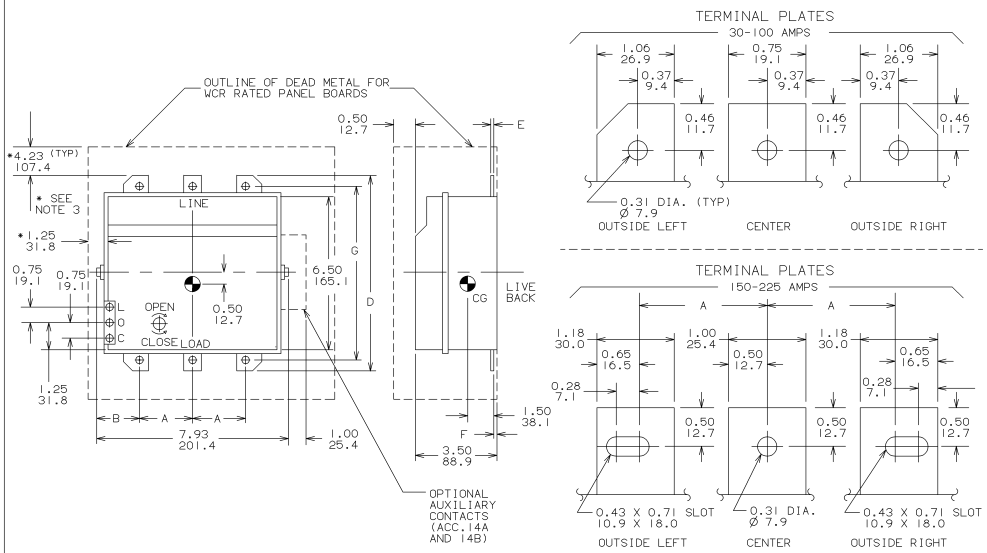
Door–Mounted Controls, Optional Acc. 53

These manual controls are connected and mounted on the enclosure door, or are supplied loose for open type switches. See the *Composite Wiring Diagram*.

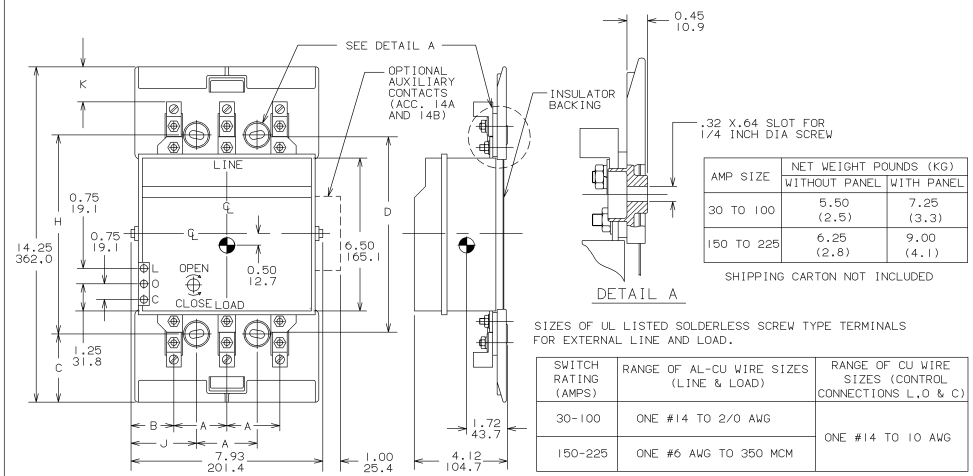
Acc.	Description	Kit
53A	momentary toggle switch with center–off position for 3–wire control	333275
53B	3–position selector switch (HOA) used with Acc. 47 for 2–wire control	333276
53C	maintained toggle switch used with Acc. 47 for 2–wire control	333277
53D	2 momentary toggle switches (1 normally closed, 1 norm. open) used with Acc. 49 for form 3 control	333278

AMP SIZE	OPEN TYPE DIMENSIONS (WITH AND WITHOUT SUB PANEL)									
	A	B	C	D	E	F	G	H	J	K
30A-100A	2.25 57.2	1.71 43.4	2.94 74.7	8.31 211.1	0.12 0.3	0.16 4.1	7.37 187.2	8.37 212.6	2.83 71.9	1.44 36.6
150A-225A	2.87 72.9	1.08 27.4	2.87 72.9	9.50 241.3	0.18 4.6	0.09 2.3	8.50 215.9	8.50 215.9	2.52 64.0	0.31 7.9

30 THRU 225 AMP WITHOUT SUB PANEL



30 THRU 225 AMP WITH SUB PANEL



AMP SIZE	NET WEIGHT POUNDS (KG)	
	WITHOUT PANEL	WITH PANEL
30 TO 100	5.50 (2.5)	7.25 (3.3)
150 TO 225	6.25 (2.8)	9.00 (4.1)

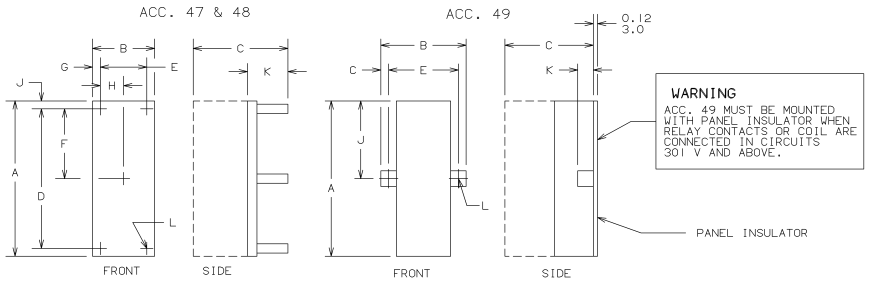
SHIPPING CARTON NOT INCLUDED

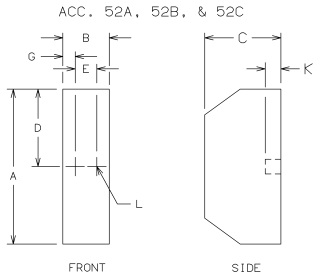
SIZES OF UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL LINE AND LOAD.

SWITCH RATING (AMPS)	RANGE OF AL-CU WIRE SIZES (LINE & LOAD)	RANGE OF CU WIRE SIZES (CONTROL CONNECTIONS L,O & C)
30-100	ONE #14 TO 2/0 AWG	ONE #14 TO 10 AWG
150-225	ONE #6 AWG TO 350 MCM	

OPT ACC	DESCRIPTION	OPTIONAL ACCESSORIES OPEN TYPE DIMENSIONS										
		A	B	C	D	E	F	G	H	J	K	L
47	RELAY FOR TWO WIRE CONTROL	6.50 165.1	2.00 50.8	3.37 85.6	6.12 155.4	1.62 41.1	3.06 77.7	0.18 4.6	0.81 20.6	0.18 4.6	0.87 22.1	0.17 Ø4.3
48	RELAY FOR THREE WIRE CONTROL											
49	FORM THREE CONTROL RELAY	3.18 80.7	1.87 47.5	3.12 79.2	—	1.62 41.1	—	0.12 3.0	—	1.59 40.4	0.25 6.4	0.16 Ø4.1
52A	ONE(1) FUSE-300V AC MAXIMUM-GROUNDED	3.00 76.2	0.85 21.6	1.14 29.0	1.50 38.1	0.36 9.1	—	0.25 6.4	—	—	0.16 4.1	0.14 Ø3.6
52B	TWO(2) FUSES-300V AC MAXIMUM-UNGROUNDED											
52C	TWO(2) FUSES-301-600V AC-UNGROUNDED											

OPTIONAL ACCESSORIES





GENERAL NOTES

1. FOR TWO POLE SWITCHES OMIT CENTER POLE.
2. LINE AND LOAD CONNECTIONS ARE REVERSIBLE.
3. THESE DIMENSIONS FOR MINIMUM PROXIMITY TO GROUNDED METAL PARTS BASED ON 22KA SYM. QUALIFICATION TESTS.
4. INSTALLATION MANUAL 381333-005, IS FURNISHED WITH EACH REMOTE CONTROL SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.

FOR ENCLOSED TYPE DIMENSIONS REFER TO COMPOSITE ENCLOSURE DRAWING GS 331-850.

FOR WIRING DIAGRAM REFER TO COMPOSITE DRAWING GS 331-851.

INCHES MM

THIRD ANGLE PROJECTION

CATALOG NO. _____
CERTIFIED
TO ASCO® S.O. _____
DATE _____ BY _____

COMPUTER GENERATED DRAWING

ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

	BY	DATE
DRAWN	TEK	4/83
CHECKED	CR	4/83
DFTG APVL	FM	4/83
ENGR APVL	PDG	4/83

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AL ☒ AP ☒

COMPOSITE OUTLINE AND MOUNTING DIMENSIONS FOR OPEN TYPE 2 OR 3 POLE

ASCO® 920 REMOTE CONTROL SWITCH

ER NO	ITEM CHGD	CHG	DATE	APVL
207167	SEE ECN	M	01/09/06	BWM
150085	SEE ECN	L	12-11-98	JJC
133964	SEE ECN	K	03/22/95	JW
124926	SEE ECN	J	03/01/93	RJ
119013	SEE ECN	H	12/20/91	RJ
112512	SEE ECN	G	04/17/90	RJ
91955	SEE ER	F	1/9/86	FM

DS 331849

CHG LTR M

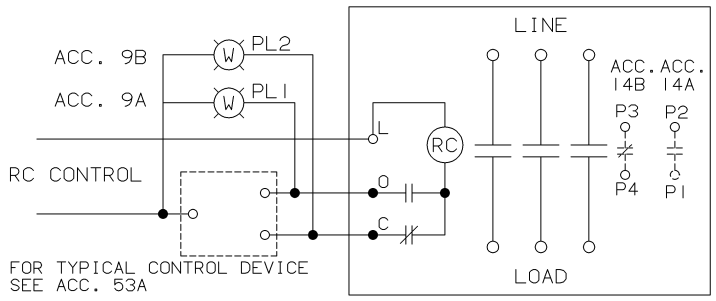
OPTIONAL ACCESSORIES

ACC. 9 PILOT LIGHTS

NOTE: INSTALLED AND CONNECTED FOR ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

☐ ACC. 9A-PILOT LIGHT INDICATES MAIN CONTACTS ARE CLOSED.

☐ ACC. 9B-PILOT LIGHT INDICATES MAIN CONTACTS ARE OPEN.



ACC. 14 AUXILIARY CONTACTS

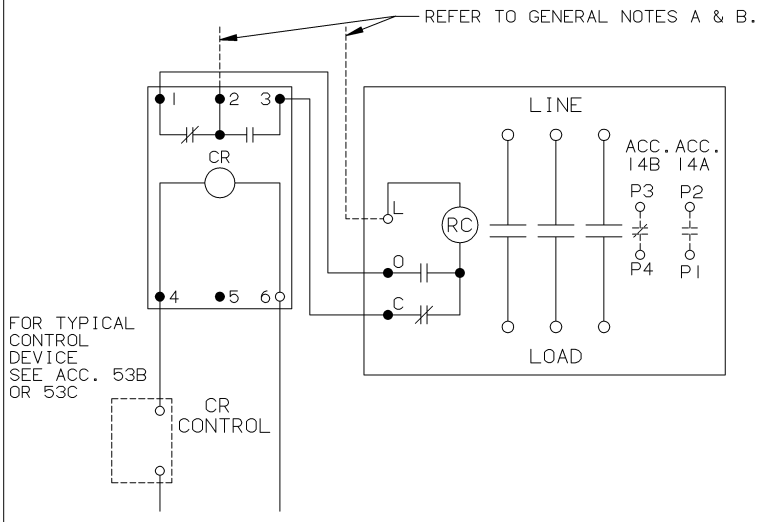
☐ ONE (1) ACC. 14A & ONE (1) ACC.14B SUPPLIED.
ACC. 14A-AUXILIARY CONTACT, P1/P2, CLOSED WHEN MAIN CONTACTS ARE CLOSED.
RATED 10A AT 480V 60HZ, GENERAL USE.
ACC. 14B-AUXILIARY CONTACT, P3/P4, CLOSED WHEN MAIN CONTACTS ARE OPEN.
RATED 10A AT 480V 60HZ, GENERAL USE.

ACC. 22 NEUTRAL PLATE

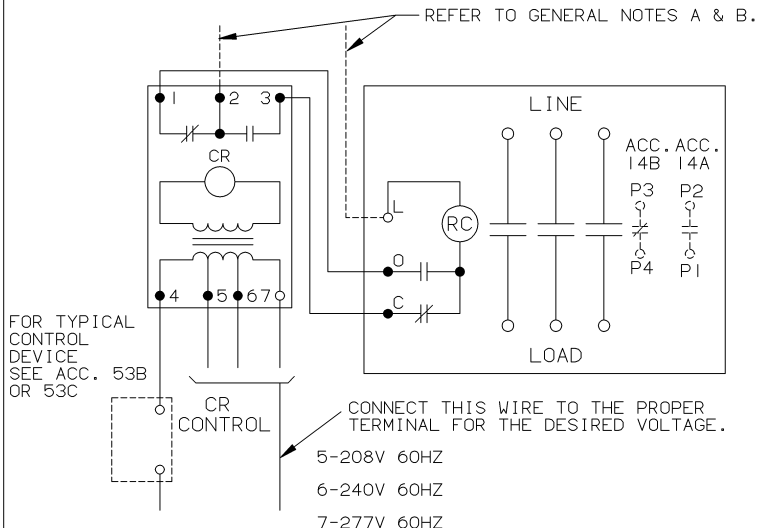
☐ SOLID NEUTRAL, FULL RATED TERMINALS AL-CU. MOUNTED ON ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

ACC. 47 AUXILIARY RELAY FOR 2 WIRE CONTROL

☐ ACC. 47A-120V 60HZ OR 120VDC
☐ ACC. 47C- 24V 60HZ OR 24VDC

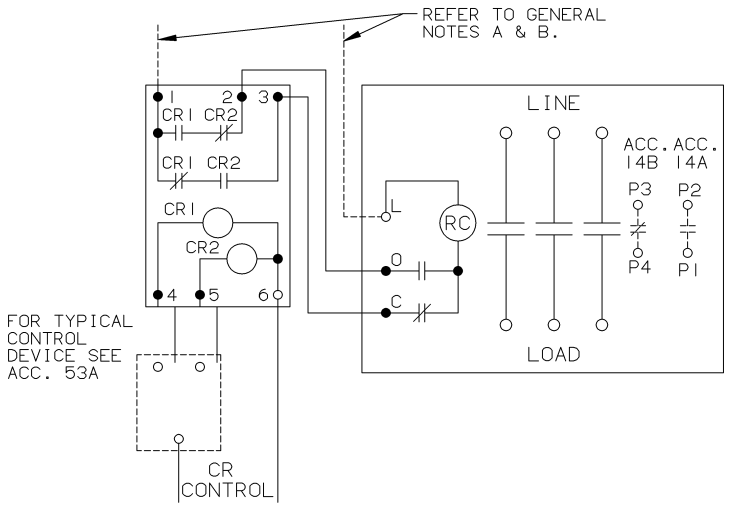


☐ ACC. 47B-208V, 240V, OR 277V 60HZ



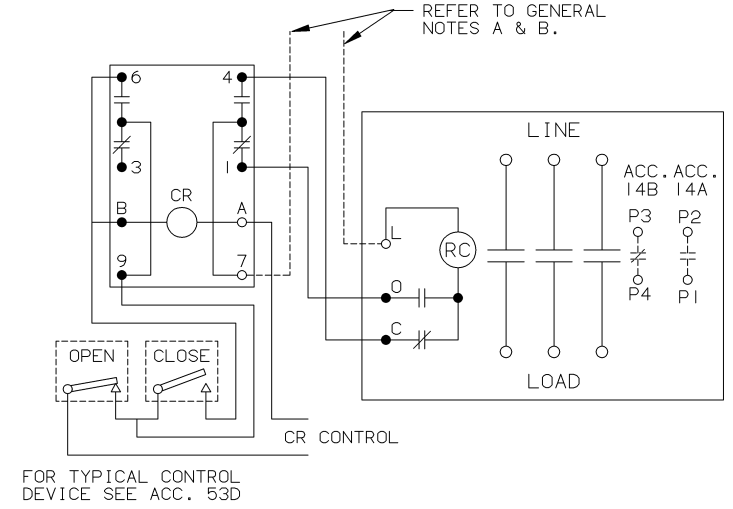
ACC. 48 AUXILIARY RELAY FOR 3 WIRE CONTROL

☐ ACC. 48A- 24V 60HZ
☐ ACC. 48B-120V 60HZ
☐ ACC. 48C-208V 60HZ
☐ ACC. 48D-240V 60HZ
☐ ACC. 48E-277V 60HZ
☐ ACC. 48F- 12V DC
☐ ACC. 48G- 24V DC
☐ ACC. 48H- 32V DC
☐ ACC. 48I- 48V DC
☐ ACC. 48J-110V DC



ACC. 49 AUXILIARY RELAY FOR FORM 3 CONTROL

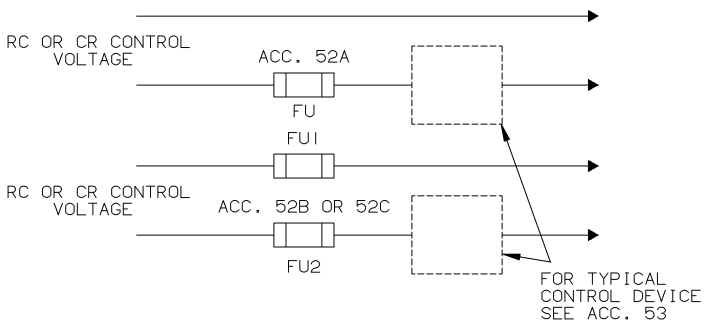
☐ ACC. 49A- 24V 60HZ
☐ ACC. 49B-120V 60HZ
☐ ACC. 49C-208V 60HZ
☐ ACC. 49D-240V 60HZ
☐ ACC. 49E-277V 60HZ
☐ ACC. 49F- 12V DC
☐ ACC. 49G- 24V DC
☐ ACC. 49H- 32V DC
☐ ACC. 49I- 48V DC
☐ ACC. 49J-110V DC



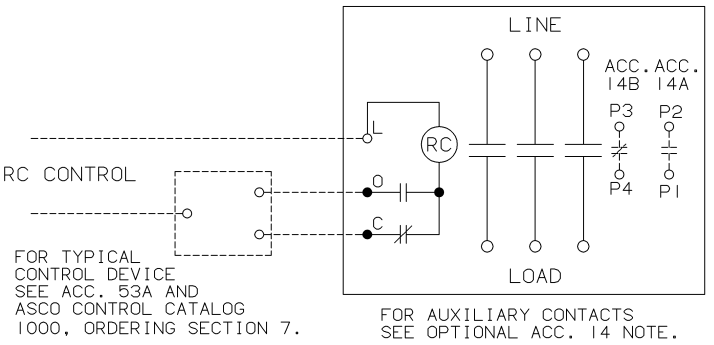
ACC. 52 CONTROL LINE FUSE(S)

NOTES: INSTALLED AND CONNECTED ON ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.
CONTROL LINE FUSE(S) SUITABLE FOR AC ONLY.

☐ ACC. 52A-ONE 15A,300V,TYPE SC FUSE FOR 300V MAXIMUM-GROUNDED.
☐ ACC. 52B-TWO 15A,300V,TYPE SC FUSES FOR 300V MAXIMUM-UNGROUNDED.
☐ ACC. 52C-TWO 15A,600V TYPE KTK FUSES FOR 301-600V MAXIMUM-UNGROUNDED.



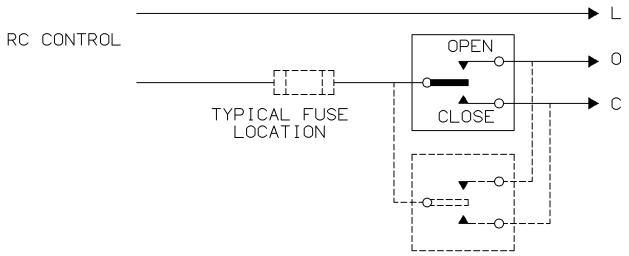
STANDARD REMOTE CONTROL SWITCH



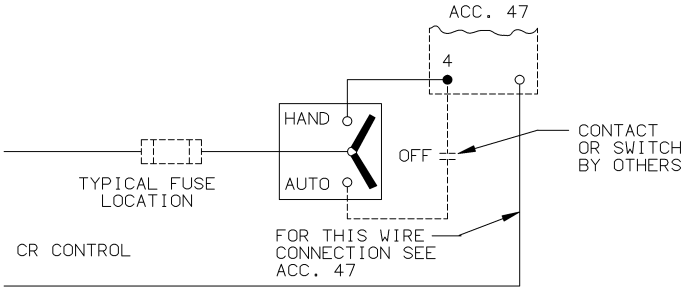
ACC. 53 DOOR MOUNTED CONTROL

NOTES: INSTALLED AND CONNECTED ON ENCLOSED TYPES. SHIPPED LOOSE FOR OPEN TYPES.

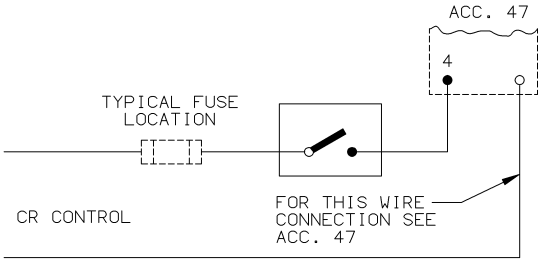
☐ ACC. 53A-MOMENTARY TOGGLE SWITCH WITH CENTER OFF POSITION FOR 3 WIRE CONTROL. TWO CONTROL STATIONS SHOWN IN PARALLEL.



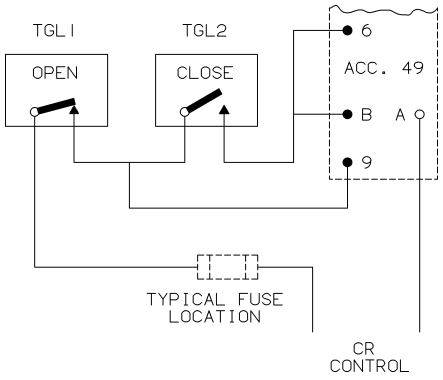
☐ ACC. 53B-H.O.A. SWITCH - CAN ONLY BE USED WITH ACC. 47; RELAY FOR 2 WIRE CONTROL.



☐ ACC. 53C-ONE POLE, SINGLE THROW, MAINTAINED TYPE TOGGLE SWITCH FOR USE WITH ACC. 47; RELAY FOR 2 WIRE CONTROL.



☐ ACC. 53D-TWO MOMENTARY ACTION TOGGLE SWITCHES, USED WITH ACC. 49; RELAY FOR FORM 3 CONTROL.



FOR OPEN TYPE DIMENSIONS REFER TO COMPOSITE OUTLINE DRAWING GS 331-849.

FOR ENCLOSED TYPE DIMENSIONS REFER TO COMPOSITE ENCLOSURE DRAWING GS 331-850.

GENERAL NOTES

A. ACCESSORY INTERWIRING IS SUPPLIED ON ENCLOSED TYPE SWITCHES ONLY.

B. WHEN RC COIL AND LINE VOLTAGE ARE THE SAME THE RC CONTROL VOLTAGE CAN BE DERIVED FROM THE LINE POLES OF THE RC SWITCH.

C. OMIT CENTER POLE FOR TWO POLE SWITCHES.

D. ○ INDICATES CUSTOMER CONNECTION POINTS.
● INDICATES FACTORY CONNECTION POINTS.

E. CONNECTION POINTS THAT HAVE BOTH CUSTOMER AND FACTORY CONNECTIONS ARE SHOWN AS CUSTOMER CONNECTIONS.

F. MAIN CONTACTS ARE SHOWN IN OPEN POSITION WITH CONTROL LINE DE-ENERGIZED SEE RATINGS BELOW.

G. FOR RC INRUSH AND LINE RUN VALUES REFER TO CATALOG.

J. LINE AND LOAD TERMINALS ARE REVERSIBLE.

K. INSTALLATION MANUAL 381333-005, IS FURNISHED WITH EACH REMOTE CONTROL SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF THE SWITCH.

MAIN CONTACT MAXIMUM VOLTAGE RATINGS
OPEN OR CLOSED

LOAD TYPE	POLES TO LOAD	
	1	2 FOR 1Ø & DC, 3 FOR 3Ø
BALLAST	277VAC	480VAC
TUNGSTEN	250VAC	250VAC
GENERAL	347VAC	600VAC
*DC-RESISTANCE ONLY	125VAC	250VAC
* 75 AMPS OR SWITCH RATING, WHICHEVER IS LESS		

LEGEND

DEVICE DESIGNATOR	DEVICE
RC	REMOTE CONTROL SWITCH
PL	PILOT/INDICATING LIGHT
CR	CONTROL RELAY

COMPUTER GENERATED DRAWING

BASIC CATALOG NUMBERS			VOLT CODE	SUB PNL CODE	OPT ACC CODE	ENCLOSURE CODE	
ASCO	POLES	AMPS					
920	2 OR 3	30	3 6 7 9 G X	0 (WITHOUT) 1 (WITH)	X	C	ADD SUFFIX LETTER FOR ENCLOSED TYPE
		60					
		75					
		100					
		150					
		200					
		225					OPEN TYPE

CONTROL VOLTAGE CODE DESCRIPTION
OPERATING FREQUENCIES 50-60 HZ

3	110-120V
6	208-240V
7	265-277V
9	440-480V
G	550-600V
X	OTHER VOLTAGES

CATALOG NUMBER _____
CERTIFIED TO ASCO® S.O. _____
DATE _____ BY _____

COMPOSITE WIRING DIAGRAM
ASCO® 920 REMOTE CONTROL SWITCH

	BY	DATE
DRAWN	TEK	4/83
CHECKED	CR	4/83
DFTG APL	FM	4/83
ENG APL	PDG	4/83

ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.
AL ☒ AP ☒

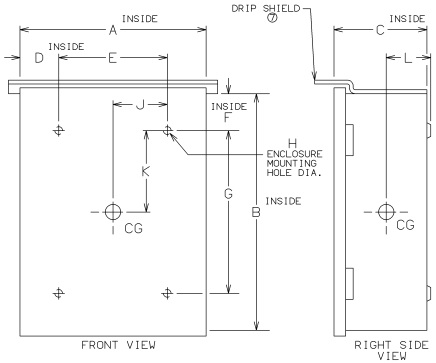
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E.R. NO.	ITEM CHGD.	CHG.	DATE	APVD.
207167	SEE ECN	K	01/09/06	BWM
119013	SEE ECN	J	12/20/91	RJ
102418	REVISED	H	10/05/87	FM
84344	REVISED	G	11/19/84	FM
83652	SEE ER	F	2/24/84	PDG

DS 331851

CHG LTR: K

NEMA TYPE 1 & 2 ENCLOSURES



NEMA TYPE 1 SURFACE MOUNTED, NEMA TYPE 1 FLUSH MOUNTED(2) NEMA TYPE 1 WITH GASKET, & NEMA TYPE 2(7) ENCLOSURES WITH 2 & 3 WIRE FUSED OR UNFUSED CONTROL OR FORM 3 CONTROL, OR WITH NEUTRAL PLATE ONLY.

AMP SIZE	DIMENSIONAL DATA											NET WEIGHT POUNDS (KG)	
	A	B	C	D	E	F	G	H	J	K	L	NEMA TYPE 1	NEMA TYPE 2
30 TO 100	13.00 330.2	18.25 463.6	4.50 114.3	1.00 25.4	11.00 279.4	1.00 25.4	16.25 412.8	0.31 Ø7.9	5.10 129.5	7.83 198.8	2.20 55.9	23.00 (10.4)	24.50 (11.1)
150 TO 225	13.00 330.2	24.00 609.6	4.50 114.3	1.00 25.4	11.00 279.4	1.00 25.4	22.00 558.8	0.31 Ø7.9	5.10 129.5	10.80 274.3	2.00 50.8	28.50 (12.9)	30.00 (13.6)

SOUNDPROOF ENCLOSURES

NEMA TYPE 1 SURFACE MOUNTED, NEMA TYPE 1 FLUSH MOUNTED(2) & NEMA TYPE 1 WITH GASKET ENCLOSURES WITH 2 & 3 WIRE FUSED OR UNFUSED CONTROL OR FORM 3 CONTROL, WITH OR WITHOUT NEUTRAL PLATE.

AMP SIZE	DIMENSIONAL DATA											NET WEIGHT POUNDS (KG)
	A	B	C	D	E	F	G	H	J	K	L	NEMA TYPE 1
30 TO 100	20.00 508.0	20.00 508.0	6.62 168.1	2.50 63.5	15.00 381.0	1.06 26.9	17.87 453.9	0.31 Ø7.9	7.40 188.0	9.04 229.6	3.00 76.2	45.00 (20.8)
150 TO 225	20.00 508.0	24.00 609.6	6.62 168.1	2.50 63.5	15.00 381.0	1.06 26.9	21.87 555.5	0.31 Ø7.9	7.50 190.5	11.04 280.4	3.20 81.3	50.31 (22.8)

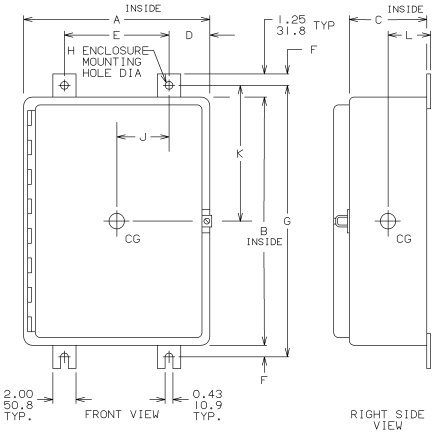
NOTES

1. ENCLOSURES CONSTRUCTED IN ACCORDANCE WITH UL STANDARD 508 (ANSI C33.76-1971)
2. MATERIAL-16 GAUGE (.0598, 1.5 MM) SHEET STEEL
3. STANDARD FINISH-LIGHT GRAY ANSI #61.
4. SINGLE DOOR, HINGED ON RIGHT SIDE WITH PULL RING FRICTION CATCH ON 30-100 AMP (13 X 18.25, 330.2 X 463.6 MM) SIZE AND KEY LOCKING PANEL BOARD CATCH ON 30-100 AMP (20.00 X 20.00, 508.0 X 508.0 MM) AND ALL 150-225 AMP SIZES.
5. FULL WIRING GUTTERS AND 0.5 DIA, Ø12.7 MM PILOT KNOCKOUT PROVIDED TOP AND BOTTOM.
6. FLUSH MOUNTED ENCLOSURES HAVE REMOVABLE FLUSH DOOR TRIM. TRIM OVERLAPS 1.00, 25.4 MM ON ALL SIDES.
7. NEMA TYPE 2 ENCLOSURES ARE PROVIDED WITH GASKETING AND TOP MOUNTED DRIP SHIELD THAT EXTENDS 1.00, 25.4 MM BEYOND THE FRONT AND SIDES OF THE ENCLOSURE. PILOT KNOCKOUTS PROVIDED IN BOTTOM ONLY.
8. INSTALLATION MANUAL 381333-005, IS FURNISHED WITH EACH REMOTE CONTROL SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF SWITCH.

SIZES OF UL LISTED SOLDERLESS SCREW TYPE TERMINALS FOR EXTERNAL LINE AND LOAD.

SWITCH RATING (AMPS)	RANGE OF AL-CU WIRE SIZES (LINE & LOAD)	RANGE OF CU WIRE SIZES (CONTROL CONNECTIONS L, O, & C)
30-100	ONE #14 TO #1/0 AWG	ONE #14 TO #10 AWG
150-225	ONE #6 AWG TO 350 MCM	

NEMA TYPE 3R, 4, & 12 ENCLOSURES



NEMA TYPE 3R, 4, & 12 ENCLOSURES WITH 2 AND 3 WIRE FUSED OR UNFUSED CONTROL OR FORM 3 CONTROL, WITH OR WITHOUT NEUTRAL PLATE.

AMP SIZE	DIMENSIONAL DATA											NET WEIGHT POUNDS (KG)
	A	B	C	D	E	F	G	H	J	K	L	NEMA TYPES 3R, 4, & 12
30 TO 100	20.00 508.0	20.00 508.0	6.00 152.4	3.00 76.2	14.00 355.6	0.62 15.7	21.25 539.8	0.43 Ø10.9	7.00 177.8	10.73 272.5	3.10 78.7	50.00 (22.7)
150 TO 225	20.00 508.0	24.00 609.6	6.00 152.4	3.00 76.2	14.00 355.6	0.62 15.7	25.25 641.4	0.43 Ø10.9	7.00 177.8	12.73 323.3	3.10 78.7	61.25 (27.8)

NOTES

1. ENCLOSURES CONSTRUCTED IN ACCORDANCE WITH UL STANDARD 508 (ANSI C33.76-1971)
2. MATERIAL-14 GAUGE (.0747, 1.9 MM) SHEET STEEL WITH CONTINUOUSLY WELDED SEAMS
3. STANDARD FINISH-LIGHT GRAY ANSI #61.
4. SINGLE DOOR, HINGED ON LEFT SIDE WITH PADLOCK HASP, PLATED DOOR CLAMPS ON THREE (3) SIDES FOR NEMA TYPE 3R AND 4, AND ONE (1) SIDE FOR NEMA TYPE 12.
5. NO KNOCKOUTS PROVIDED.
6. FULL WIRING GUTTERS PROVIDED OM TOP AND BOTTOM.
8. INSTALLATION MANUAL 381333-005, IS FURNISHED WITH EACH REMOTE CONTROL SWITCH. REFER TO THIS PUBLICATION PRIOR TO INSTALLATION AND OPERATION OF SWITCH.

FOR OPEN TYPE DIMENSIONS REFER TO COMPOSITE OUTLINE DRAWING JS331-849.

FOR WIRING DIAGRAM REFER TO COMPOSITE DRAWING JS331-851.

CATALOG NO. _____
CERTIFIED TO ASCO® S. O. _____
DATE _____ BY _____

INCHES MM | THIRD ANGLE PROJECTION

COMPUTER GENERATED DRAWING

ASCO® ASCO POWER TECHNOLOGIES, L.P.
FLORHAM PARK, NEW JERSEY 07932 U.S.A.

	BY	DATE
DRAWN	JTT	4/83
CHECKED	CR	4/83
DFTG APVL	FM	4/83
ENGR APVL	PDG	4/83

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AL ☒ AP ☒

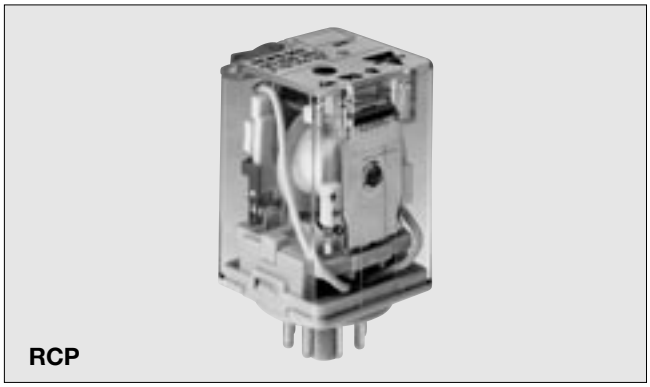
COMPOSITE OUTLINE AND MOUNTING DIMENSIONS FOR ENCLOSED TYPE 2 OR 3 POLE ASCO® 920 REMOTE CONTROL SWITCHES

ER NO	ITEM CHGD	CHG	DATE	APVL
207167	SEE ECN	H	01/09/06	BWM
112512	SEE ECN	G	04/18/90	RJ
84344	SEE ER	F	10/16/84	FM
83652	SEE ER	E	2/24/84	PDG
79822	REDRAWN	D	19APR83	PDG

DS 331850

CHG LTR: H

Industrial Relay
Type RCP
Monostable



- 8 or 11-pin socket mounting
- Exceptionally reliable general purpose relay
- Long life (minimun 100.000 electrical operations)
- Switching capacity 10 A
- AC coils 6 to 230 VAC
- DC coils 6 to 110 VDC
- 2 or 3 change over contacts
- Industry standard octal/undecal type termination
- Matched sockets available
- Standard with LED, Push with arm and Flag

Product Application

- Lift-Elevators
- Mooving Stairs
- Textile machines
- Wood working machines
- Plastic molding machines
- Ceramic working machines

Ordering Key

120VAC

RCP 8 002 24 ~~DC~~

Type
No. of pins
Contact code
Rated coil voltage
DC / AC

Type Selection

Contact configuration		Contact rating	Contact code
2 change over contacts	(DPDT {2-form C})	10 A	**002**
3 change over contacts	(3PDT {3-form C})	10 A	**003**

Coil Characteristics, DC (20°C)

Nominal voltage VDC	Pick-up voltage VDC	Drop-out voltage VDC	Max. allowable voltage VDC	Coil resistance tolerance Ω ±10%
6	4.8	0.6	7.2	23.5
12	9.6	1.2	14.4	95.0
24	19.2	2.4	28.8	430.0
48	38.4	4.8	57.6	1630.0
100	80.0	10.0	120.0	6800.0
110	88.0	11.0	132.0	7300.0

Coil Characteristics, AC (20°C)

Nominal voltage VAC	Pick-up voltage VAC	Drop-out voltage VAC	Max. allowable voltage VAC	Coil resistance tolerance Ω ±10%
6	4.8	1.8	7.2	3.9
12	9.6	3.6	14.4	16.3
24	19.2	7.2	28.8	70.0
48	38.4	14.4	57.6	315.0
115/120	88.0	36.0	132.0	1600.0
230	176.0	72.0	264.0	6800.0

Contact Characteristics

Arrangement	002/003	UL rating
Contact rating (with resistive load)	**10 A 30 VDC 250 VAC**	**10 A 30 VDC 250 VAC 1/3 HP at 240 VAC**
Material	**Silver alloy**	
Initial contact resistance Max. (at 1 A 6 VDC)	**50 mΩ**	
Current Max. switching current	**10 A**	

Arrangement	002 / 003
Voltage	
Max. switching voltage	**120 VDC - 250 VAC**
Max. switching power	**280 W - 2500 VA**
Life	
Electrical life	**$1x10^5$ ops**
Mechanical life	**$1x10^7$ ops**

Specifications are subject to change without notice

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CARLO GAVAZZI

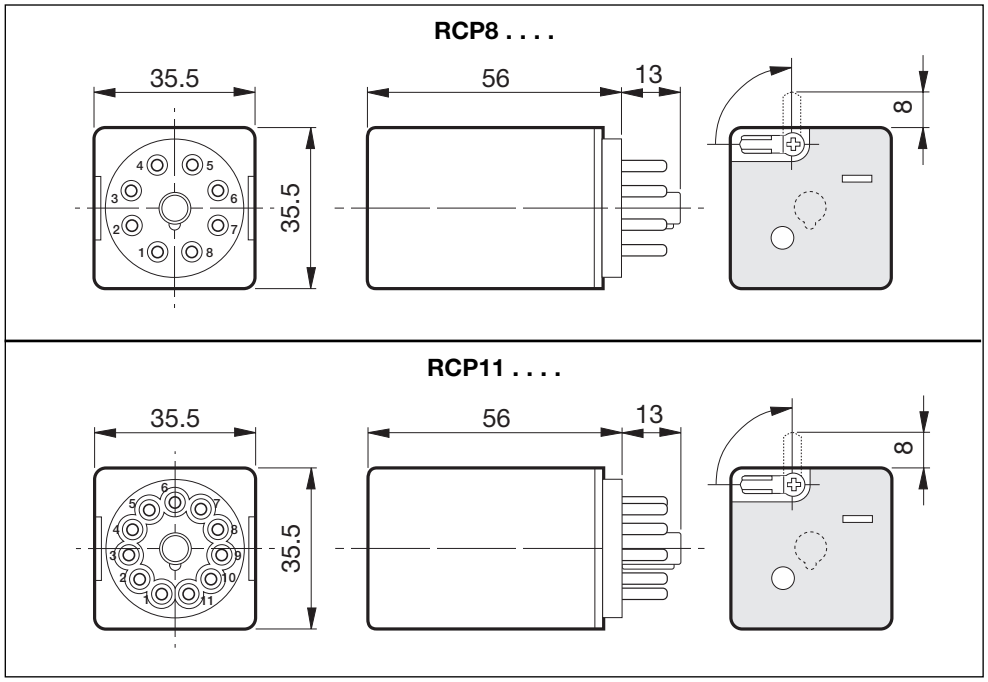
Insulation

Test Voltage (1 min.) Between open contacts Between coil and contacts	 **1000 Vr.m.s** **1500 Vr.m.s**	**Initial insulation resistance**	**500 MΩ - 500 VDC**

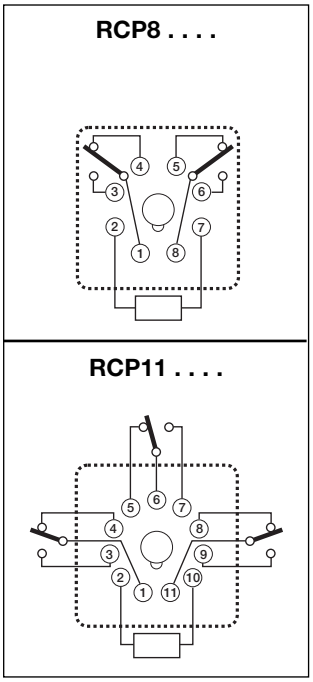
General Data

Nominal coil power	**1.5 W / 2.5 VA**	**Vibration resistance**	**10 to 55 Hz 1.5 mm**
Operating time (At nominal voltage)	**30 ms**	**Shock resistance** Functional Destructive	 **100 m/s²** **500 m/s²**
Release time (At nominal voltage)	**20 ms**	**Humidity**	**98%, +40°C**
Temperature rise (At nominal voltage)	**50 °C**	**Termination**	**Octal/Undecal-type plug**
Ambient temperature	**-40° C to +55° C**	**Construction**	**Dust cover**
		Weight	**~ 85 g**

Dimensions

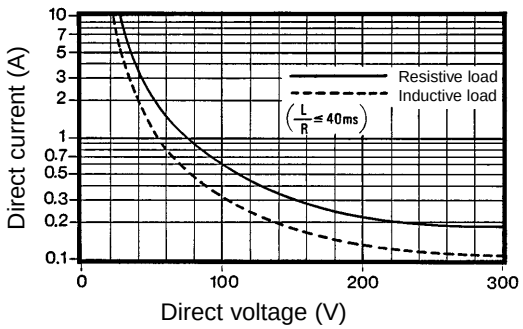


Wiring Diagrams

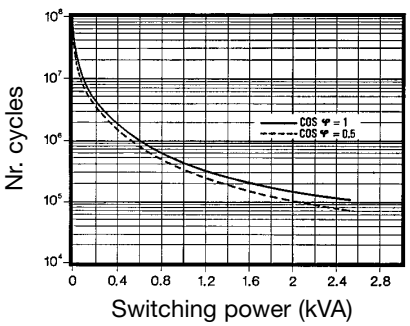


Diagrams

1 Max. switching power in DC



2 Expected electrical life at 250 VAC



Approvals

USA CND D I

The approvals stated are not generally applicable to all the relay versions.

For further information please apply for relevant data sheets ref. **3.84.00.10.x**

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CAROL® BRAND

Cord & Cordset Products

FOR INDUSTRIAL, COMMERCIAL AND SPECIALTY APPLICATIONS









General Cable

Cord & Cordset

This catalog contains in-depth information on the most comprehensive line of cord and cordset products. General Cable's flexible cord products are available today for commercial, industrial and specialty applications. Our contractor-grade extension cords, specialty cords, utility lights and accessories provide power for tools and equipment, and temporary lighting on residential, commercial and industrial job sites.

The product and technical sections have been developed with an easy-to-use "spec-on-a-page" format. They feature the latest information on Carol cord and cordset products, from applications and construction to detailed technical and specification data. There's also a user-friendly numerical catalog number index.

Our products are readily available through our network of authorized stocking distributors and distribution centers.

General Cable

All information in this catalog is presented solely as a guide to product selection and is believed to be reliable. All printing errors are subject to correction in subsequent releases of this catalog. Although General Cable has taken precautions to ensure the accuracy of the product specifications at the time of publication, the specifications of all products contained herein are subject to change without notice.

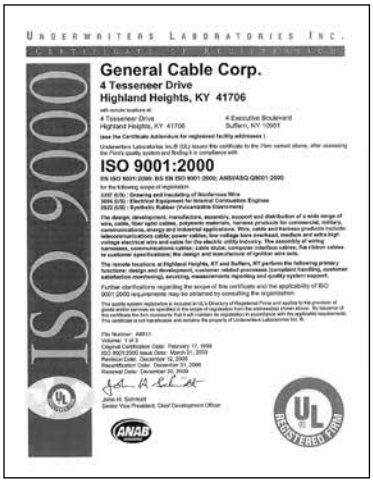
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Delivering Solutions

THAT KEEP YOU CONNECTED

QUALITY


UNDERWRITERS LABORATORIES INC.

CERTIFICATE OF REGISTRATION

General Cable Corp.
4 Tesseneer Drive
Highland Heights, KY 41706

ISO 9001:2000

ISO 9000

ANAB

UL REGISTERED FIRM

General Cable is committed to developing, producing, and marketing products that exceed performance, quality, value and safety requirements of our customers. General Cable's goal and objectives reflect this commitment, whether it's through our focus on customer service, continuous improvement and manufacturing excellence demonstrated by our TL9000-registered business management system, the independent third-party certification of our products, or the development of new and innovative products. Our aim is to deliver superior performance from all of General Cable's processes and to strive for world-class quality throughout our operations.

INTERNATIONAL ISO 9002 CERTIFICATION

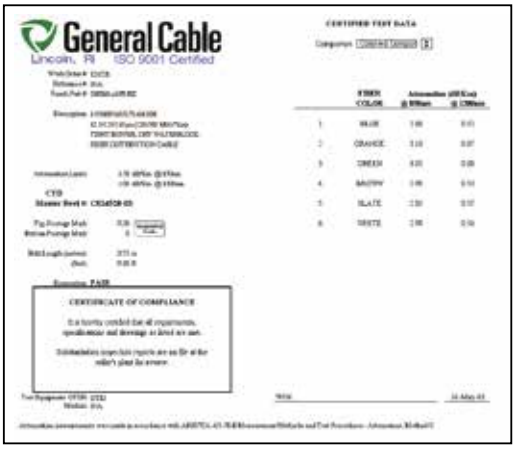
ETL LISTED c US Intertek

RUS Compliant

EIA ELECTRONIC INDUSTRIES ALLIANCE TIA/EIA 568B

RoHS Compliant Directive 2002/95/EC

c UL us LISTED


General Cable
Lincoln, RI ISO 9001 Certified

CERTIFIED TEST DATA

CERTIFICATE OF COMPLIANCE

CUSTOMER SERVICE



General Cable is dedicated to customer service and satisfaction. Call our team of professionally trained sales associates at

800-243-8020

with any questions to meet your application needs.

GENERALCABLE.COM

What's New?

SAY YES TO CLEAN. NO TO GRIME.



General Cable offers its durable rubber cord products with GenClean™, its proprietary new cleanable jacket technology. Cables with the GenClean jacket permit organic remnants to be more readily removed in a wash cycle, which reduces the environmental conditions for microbial growth in industries such as food and beverage. Learn more about GenClean on page 9.

CHARGING FORWARD WITH PORTABLE POWER FOR HYBRID & ELECTRIC VEHICLES



General Cable's line of Carol® Brand CarolGrene™ Ultra Flex® EV Cables supplies charging power for all electric vehicles on the market today and is compatible with commercial and residential charging applications. The CarolGrene EV line, when terminated in accordance with electric vehicle industry standards, is the most comprehensive product offering, with three standard jacket types: CarolGrene EV All-Rubber Jacket, CarolGrene EVE Thermoplastic Elastomer (TPE) Jacket, and CarolGrene EVT Polyvinylchloride (PVC) Jacket. To find out more about these products, please see pages 47-48.

WITH 17 FREE®, LESS MEANS MORE



General Cable now offers Carol® Brand 17 FREE® types SOOW and SJOOW portable cord. The 17 FREE line is completely free of halogens, meaning it contains no chlorine, fluorine, bromine or iodine. The cables in this line are both economically viable and look and install like traditional cable constructions. They may also qualify for LEED credits under the U.S. Green Building Council's program. In addition to these two cord products, which appear on pages 14 and 16, General Cable also offers Gen*SPEED*® Brand Premise, NextGen® Brand Fiber Optic, Carol® Brand Coaxial Cable, and XHHW-2.

GENERAL CABLE IN STOCK AT YOUR SERVICE



General Cable is your ALL IN supplier with in-stock commercial, industrial and residential cables. With over 50 years of experience, General Cable is at your service with industry-leading Carol® Brand wire and cable products. Our people may come to work for us, but on the job, we work for you. Go ALL IN with us and win big with Carol Brand!



YES TO CLEAN. NO TO GRIME.

General Cable proudly brings you GenClean™, its proprietary new cleanable jacket technology developed for rubber portable cord used in the food and beverage industry.

Cables with a GenClean jacket permit organic remnants to be more readily removed in a wash cycle, which reduces the environmental conditions conducive to microbial growth. GenClean's cleanable rubber jacketing has been tested with many solvents and has proven itself in the toughest of environments! And its super tough jacket construction is built to withstand daily abuse, temperature extremes (-50°C to 105°C) and high-stress industrial environments. It is also abrasion-, cut-, heat-, flame-, sunlight- and chemical-resistant.

GenClean™ Jacket

Scan the QR code to learn more about Super Vu-Tron® Supreme featuring the GenClean™ jacket technology

Interested in GenClean?

Call us today at 800.243.8020 and tell us what size and conductor count you're looking for in your rubber cord and we'll produce a test sample for you.

General Cable

www.generalcable.com 1.800.243.8020

PRODUCT SELECTION LOCATOR

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One Company
Connecting The World



POWERFUL PRESENCE · PRODUCTS PERFORMANCE · PEOPLE

General Cable has been a wire and cable innovator for over 170 years, always dedicated to connecting and powering people's lives. Today, with approximately 14,000 employees and approaching $6 billion in revenues, we are one of the largest wire and cable manufacturers in the world.

Our company serves customers through a network of 38 manufacturing facilities in our core markets and has worldwide sales representation and distribution. We are dedicated to the production of high-quality aluminum, copper and fiber optic wire and cable and systems solutions for the energy, construction, industrial, specialty and communications sectors. With a vast portfolio of products to meet thousands of diverse application requirements, we continue to invest in research and development in order to maintain and extend our technology leadership by developing new materials, designing new products, and creating new solutions to meet tomorrow's market challenges.

In addition to our strong brand recognition and strengths in technology and manufacturing, General Cable is also competitive in such areas as distribution and logistics, marketing, sales and customer service. This combination enables us to better serve our customers globally and as they expand into new geographic markets.

General Cable offers our customers all the strengths and value of a large company, but our people give us the agility and responsiveness of a small one. We service you globally and locally.

General Cable | ONE COMPANY
CONNECTING THE WORLD

Visit our Website at
www.generalcable.com

General Cable

Corporate Social Responsibility

CREATING SHARED VALUE

General Cable believes corporate social responsibility (CSR) is about creating shared value. That means keeping a dual focus in our business decisions: what is good for us as a company and what contributes to the greater good of the communities in which we live and work.



SAFETY

Working safer by working together

General Cable has one worldwide safety vision and goal – ***ZERO & BEYOND***. We measure safety performance globally, share best practices and implement sound health and safety management systems. Many of our facilities worldwide are OHSAS 18001 (safety management system) certified. All North American facilities have implemented an equivalent health and safety management system. General Cable was a pioneer in obtaining the OHSAS 18001 Certificate for Occupational Health and Safety Management Systems in Europe and North Africa.



SUSTAINABILITY

Responsible practices in daily operations

As a global leader in the wire and cable industry, General Cable recognizes its role and responsibility in promoting sustainability. Our strongest business value is continuous improvement in all areas of our company. Across our many businesses, the quest to introduce new and better products through continuous improvement in environmental designs reflects our commitment to achieving industry-leading standards and responding proactively to global environmental issues. General Cable was the first cable manufacturer to obtain certification for its environmental management system, in accordance with the ISO 14001 and EMAS Standards.



CITIZENSHIP

A commitment to being good citizens

Being responsible citizens in our communities is of the utmost importance to us. Unequivocal honesty, integrity, forthrightness and fair dealing have long been part of General Cable's core values and are expected globally in all of our business relationships with our customers, employees, suppliers, neighbors and competitors. Our company leaders and employees strive to make a difference throughout a host of volunteer activities and financial support, improving the communities in which we live and work.



INNOVATION

Technologies that power and connect the world

General Cable is delivering innovation that matters. We are focusing on R&D expertise and investing in developing wire and cable solutions that meet the challenges confronting our customers and the world. In working together and using all the ingenuity and creativity we have, we will reach the goal of being the preeminent supplier of wire and cabling solutions in the industry, with both green constructions and designs for the ever-growing renewable energy market.

A commitment to achieving industry-leading standards
and responding proactively to environmental global issues.

+1.859.572.8000
info@generalcable.com

Visit www.GeneralCableCSR.com
to learn more.

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Portable Cord Specifications

1

When specifying and purchasing portable cord products, application details are important and often essential in determining the right product for the right job. Often, the same application can be served using one or more products.

Accurate understanding of the application and the environment where the cable is being used will often point to the product line providing the correct cord products. For those extreme application environments or very specific technical requirements, General Cable's engineering and customer service **Wire Wizards** are eager to assist you. We will help you find the right cable for your needs.

This easy-to-use checklist outlines the key questions you will need to ask to determine the right cable for a particular application:

1. What is the application? (identifies where cable is being used)
   a. Environmental Conditions
   b. Temperature/Humidity (minimum/maximum ranges)
   c. Moisture (will the cable be submerged or exposed to weather, rain, etc.?)
   d. Dirt/Dust
   e. Chemical Exposure (gases, oils, alkalis, acids, cleaning materials)
   f. Critical Service/ Reliability Needs
2. What is the voltage? See **page 2** for additional information regarding **Voltage Drop.**
3. What is the amperage? See **page 3** for additional information regarding **Ampacity.**
4. What is the gauge size?
5. How many conductors are required for the application?
6. What is the stranding? (some applications require higher count stranding for better flexibility)
7. What is the overall length needed? (important in calculating voltage drop)
8. Is any special color-coding of conductors needed?
9. Does this cable need agency approvals (UL, CSA, MSHA, RoHS, etc.)?

Answers to these questions will help you determine the right product for the application. While this information is sufficient for most application requirements, good engineering practices are still essential.

General Cable's customer service and engineering **Wire Wizards** are ready to help you in finding the right cord product for all of your application needs. Our **Wire Wizards** have the skill and knowledge to select and even custom-engineer cord products for your most demanding and challenging applications.

Voltage Drop: Picking the Right Cable for the Long Run

BY SAM FRIEDMAN, DIRECTOR, TECHNICAL SERVICES — CAROL® BRAND CORD PRODUCTS — GENERAL CABLE

Reliability may not be a tangible item that's installed alongside a new furnace or wired into a dock-side crane, but nonetheless, it is an essential "accessory" that can mean the difference between overtime and lost time; in-stock and out-of-stock; perfect fits and refits. Being labeled as "unreliable" can mean ruin for a business, regardless of what you're making, installing or servicing. That's why it is vital to understand simple yet often overlooked problems, like voltage drop, in product applications.

Voltage drop is the reduction in voltage in an electrical circuit between the source and load. For equipment to operate properly, it must be supplied with the right amount of power, which is measured in watts: current (amps) times voltage (volts). Motors, generators, tools — anything that runs on electricity is rated for power, as in a 100-watt light bulb. The correct amount of power enables equipment to meet its designed power rating and operate efficiently. Incorrect or insufficient power amounts can result in inefficient operation, wasteful power usage, and even equipment damage. That is why understanding voltage drop calculations and selecting the correct cable for each application is so important.

The National Electrical Code (NEC) catalogs the requirements for safe electrical installations and represents the primary document for guidance in the United States. Providing direction for both trained professionals and end users, these codes set the foundation for the design and inspection of electrical installations. So how does the Code treat voltage drop issues? For branch circuits, look to NEC (NFPA 70) Section 215.2(A)(3) footnote 2 and Section 210.19(A)(1) footnote 4. Both advise that conductors for feeders to dwelling units should be sized to prevent voltage drop exceeding 3% and maximum total voltage drop on both feeders and branch circuits should not exceed 5% for "reasonable efficiency of operation."

In addition, look to NEC (NFPA 70) Section 647.4 (D) when dealing with sensitive electronic equipment. It states that voltage drop on any branch circuit shall not exceed 1.5% and the combined voltage drop on branch-circuit and feeder conductors shall not exceed 2.5%. It is important to note that much of the equipment manufactured today contains sensitive electronics.

Ampacity, a cable's electric current-carrying capacity, is also connected to voltage drop. The Code stresses the importance of accounting for voltage drop when considering a cable's ampacity rating and the need to satisfy both requirements. NEC Section 310.15 (A)(1) states that ampacity tables do not take voltage drop into consideration.

For DC current, voltage drop is proportional to amount of current flow and wire resistance. In AC circuits, total impedance and power factor (power loss ratio) also need to be considered. Since wire resistance is a factor of wire size, material and length of run, it is important to choose the proper wire size for length of run to keep voltage drop at the desired level.

To simplify your voltage drop calculations, turn to the *Carol Brand Cord & Cordset Catalog* and/or our online resources. Use either the "Voltage Drop Calculations" table on page 84 in the catalog or download a PDF of the catalog by visiting:

www.generalcable.com/GeneralCable/en-US/Products/CordandCordsetProducts/Catalog/

Wherever you find it — in print or online — this table makes calculating project voltage drop straightforward and easy. For example, let's say your project involves a 100-foot run of 12/3 SOOW wire, 12 amps line current for equipment, line circuit of 120 volts AC, 3 phase, 100% power factor. According to the calculation table, the factor is 3190. Next, multiply current times distance (feet) times factor: 12 x 100 x 3190 = 3,828,000. Finally, place a decimal in front of the last six figures, and the result is the volts lost — voltage drop = 3.8 volts (3.2% of overall voltage).

So, to ensure the reliability of your products/installations/service calls, be sure to account for voltage drop when making your cable selections. While it is mainly a nuisance issue, voltage drop can affect equipment efficiency, power consumption and potential damage to sensitive electronics and other systems. Fortunately, these issues are easily avoided, especially when you rely upon the NEC codes and standards that relate to voltage drop — each of which provides useful guidance in ensuring the success of your application.

By selecting a cable with the correct voltage drop characteristics, you will optimize the operation of your connected equipment, increase your efficiencies and prevent equipment damage. And that's a pretty good payoff, in the short term or the long run.

Still need help? Carol's Wire Wizards are ready with first-class customer support, printed catalog materials and detailed product specifications. Please give us a call at 1.800.243.8020, send us an e-mail at info@generalcable.com or visit www.generalcable.com.

General Cable Wire Wizard℠

CAROL® BRAND

General Cable

Portable Power Cords:
Why Choose Rubber?



ADVANTAGES

Thermoset rubber delivers superior performance. Thermoset compounds have been vulcanized by heat and will not soften or distort from their formed shape when exposed to excessive heat or open flame. On the contrary, thermoplastics will deform under high temperatures, resulting in degradation of their physical attributes. Rubber not only exhibits excellent heat-resistant characteristics; it offers other advantages as well.

- Flexibility
- Durability
- Tear Resistance
- Abrasion Resistance
- Melt Resistance
- Oil, Water and Chemical Resistance
- Impact Resistance

APPLICATIONS

Since rubber was first introduced, it has been the product of choice for portable power applications. It is more durable in the harsh conditions encountered in the following environments:

- Mining and Submersible Pumps
- Control Circuits
- Motors and Associated Machinery
- Temporary and Portable Power
- Construction Equipment
- Portable Tools and Equipment
- Portable Appliances

PRODUCT OFFERING

Cable Types: SOOW, SJOOW, SO and SJ
Voltage: 600V and 300V
Gauges: 2 AWG to 18 AWG
Conductors: 1 to 50
Jacket Color: Black (standard) and Yellow
Compliances: UL, CSA, MSHA

Carolprene® **Super Vu-Tron®**

GenClean™ Jacket

CAROL® BRAND

General Cable

Rubber Portable Power Cords

General Cable's Carol® Brand rubber portable cords, which are manufactured in the U.S.A., are an obvious choice for portable power applications. Rubber surpasses plastic compounds in flexibility, high temperature performance, durability and more. This quick reference guide summarizes the key performance differences among the various portable cord compounds available in today's market.

Properties	Thermoplastic PVC	Thermoplastic Elastomer	Thermoset Rubber	Benefits of Thermoset Rubber Products
GenClean™ Jacketing			✓	Permits organic remnants to be more easily removed from a rubber jacket in a wash cycle, which reduces the environmental conditions conducive to microbial growth
Hot Oil Resistance			✓	Thermoset rubber will maintain mechanical integrity in high temperature oil
High Temperature Performance			✓	Thermoset rubber is heat-cured, so it will not melt at high temperatures
Flexibility at Room Temperature		✓	✓	Thermoset rubber and thermoplastic elastomer are more flexible at room temperature than PVC
Flexibility at Low Temperatures			✓	Thermoset rubber will stay more flexible while approaching low temperatures
Industrial Abrasion Resistance			✓	Thermoset rubber products are preferred in industrial applications
Wear Resistance			✓	Field experience has proven thermoset rubber cords to be the most durable products on the market
Electrical Resistance			✓	Thermoset rubber insulation compounds have lower dielectric constants, providing greater dielectric strength than thermoplastic products
Tear Resistance			✓	Thermoset rubber jackets have better tear resistance than thermoplastic jackets
Water Resistance	✓	✓	✓	All three products are designed to meet UL & CSA water resistance requirements for outdoor cords
Sunlight Resistance	✓	✓	✓	All three products are formulated to have UV stability
UL Listing (Indoor & Outdoor) and CSA	✓	✓	✓	Only rubber compounds can be used on SOOW products
MSHA Approval	✓	✓	✓	Thermoset rubber will not deform after exposure to open flame

General Cable

General Cable Wire Wizard℠

CAROL® BRAND

Carol Cord ★ Made in USA

General Cable

Ampacity: Choosing Cable When the Heat Is On

BY SAM FRIEDMAN, DIRECTOR, TECHNICAL SERVICES — CAROL® BRAND CORD PRODUCTS — GENERAL CABLE

Thanks to the dedication and ingenuity of cable engineers around the world, there are cables available for an almost infinite number of applications. Welding cable, extension cords, stage lighting cable, landscape lighting wire, diesel locomotive cable, major appliance cord — you name the energy transmission need, and I'll name the applicable product. Whether your project faces environmental extremes, necessitates considerable flexibility, or simply requires unfailing reliability and longevity, it's essential that your quest for the optimal cable begin with identifying its optimal ampacity.

Ampacity is the maximum current an insulated conductor can safely carry without exceeding its insulation and jacket temperature limitations — or in plain terms, it's a cable's electric current-carrying capacity. Most power cable is sized according to its ampacity, a fact that underscores the importance of first considering amperage needs when selecting portable power cable. By doing so, you'll avoid serious safety hazards, equipment damage and production downtime caused by overcurrent — i.e., too much current flowing through a conductor — which is a significant threat to under-amped cable. Excessive current can cause overheating, insulation damage and fire/shock hazards that, in turn, can harm equipment through heat buildup and produce cable faults that lead to lost productivity. Therefore, it is essential to start every project with the correct cable and then have every installation reviewed and carried out by a trained electrical professional.

There are several systems of codes and standards that can help identify the correct ampacity for your power cable needs. Developed to provide direction for both trained professionals and end users, these codes set the foundation for the design and inspection of electrical installations. First, there is the National Electric Code (NEC or NFPA 70), which catalogs the requirements for safe electrical installations and represents the primary document for guidance in the United States. There are also regulations set forth by the Insulated Cable Engineers Association (ICEA) and the Institute of Electrical and Electronics Engineers (IEEE) — both of which address ampacity standards for power cables. Because there are so many diverse electrical specialties, be sure to select a professional who has expertise in your particular application and its specific code requirements.

For the purpose of this discussion, let's focus on the standards established by the National Electric Code. It's amazing how many sections of the NEC deal with wire, depending on the user's particular application. It is essential for project safety that you study the portion of the code that concentrates on your intended environment and use.

As I mentioned earlier, temperature plays an important role in determining cable ampacity. For purposes of design rating, the ambient temperature is set at the maximum expected ambient temperature. In the NEC, the values in the ampacity tables are based on 30°C ambient. In order to determine ampacities at ambient temperatures other than 30°C, the code has included correction factors for these other temperatures in the ampacity tables in Article 310.

Cable ampacity of a single conductor is calculated based on the size of the electrified conductor, the established ambient temperature and the temperature rating of the insulation and jacket compounds. An increase in temperature rating of the compounds and/or an increase in conductor size will increase cable ampacity. Conversely, an increase in ambient temperature will decrease ampacity.

However, the number of current-carrying conductors found in a cable also affects ampacity. When a group of cables are bunched closely together, the NEC requires a derating of the ampacity for each individual cable. This is because tightly gathered cables can create a significant buildup of heat, which could rise above the rated temperature of the compounds used. This bunching effect also hinders heat dissipation, further increasing the risk of heat-related cable damage. Refer to NEC Table 310.15(B)(2)(a) for specifics about ampacity derating based on number of cables used in cable, conduit or raceway.

It is important to remember that heat degrades most ordinary insulating materials, and this decay directly affects cable ampacity — yet another reason to take current-carrying capacity into account when selecting a cable. By doing so, you confirm that the conductor's insulating material and jacket can handle the heat load caused by electrical current flow and eliminate the possibility of exposing cables to temperatures higher than they are designed to manage.

The NEC also permits ampacities to be calculated. However, this should only be attempted under engineering supervision and when the parameters of the cable and installation are known. Article 310.15(C) provides the method for doing this calculation.

There are some specific cabling applications for which the NEC does not set ampacity guidelines, including mining cable and utility cable. For example, most ampacity ratings for mining cable come from ICEA standard tables, which assume an ambient temperature of 40°C vs. 30°C. Because of its many specialized applications, the ampacity ratings for most power generation and energy transmission/distribution utility cables are specified by use — such as direct-buried cable, suspended cable (e.g., transmission lines) and in-duct cable. These particular installations also require specific engineering calculations that incorporate factors like temperature, wind speeds and sunlight exposure. Understandably, such highly specialized setups require not only unique ampacity guidelines but also engineering supervision and the seasoned judgment of a trained electrical professional.

So, the next time you're in the market for a cable solution, start your search by first establishing the project's ampacity requirements. By doing so, you can avoid dangerous heat buildup, prevent equipment damage and ensure the long-term safety of your cable selection. But don't worry, you don't have to go it alone! The codes and standards established for your particular application can provide invaluable guidance throughout your product search and final installation. If your project falls into one of the specialized setups addressed in a unique code section, please consider having your cable installation carried out under engineering supervision.

Put simply, safety depends on selecting the right cable. By paying attention to the current-carrying capacity of your chosen cable, you'll help maximize the life of your cable and contribute to the well-being of anyone who comes into contact — be it directly or indirectly — with your installation. Now that's a hot idea!

Still need help? Carol's Wire Wizards are ready with first-class customer support, printed catalog materials and detailed product specifications. Please give us a call at 1.800.243.8020, send us an e-mail at info@generalcable.com or visit www.generalcable.com.

General Cable Wire Wizard℠

General Cable

CAROL® BRAND

Index By Wire Type

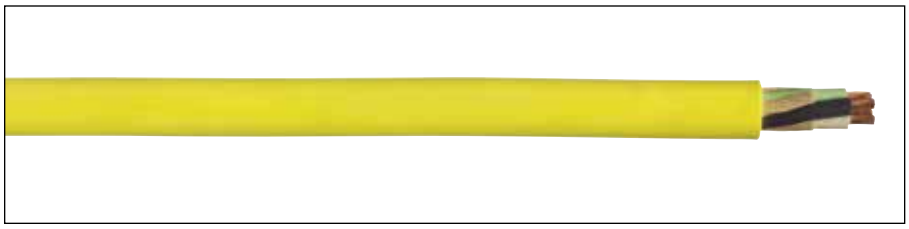
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Wire and Cable Abbreviations

E	Thermoplastic Elastomer (TPE)
J	Junior (300 V)
O	Oil-Resistant
P	Parallel
S	Service (600 V)
T	Thermoplastic/Vinyl
W	Weather Approved (water-, moisture-, damp-, sunlight-resistant)

EPDM	Ethylene-propylene-diene monomer rubber.
HPN	Two-conductor, neoprene-insulated heater cord. Parallel construction. For use in high temperature locations.
S	Extra-hard-usage, rubber-insulated portable cord. Stranded copper conductors with separator and individual rubber insulation. Two or more color-coded conductors cabled with filler, wrapped with separator and rubber jacketed overall. 600 V.
SJ	Hard-usage, rubber-insulated pendant or portable cord. Same construction as Type S, but 300 V. Jacket thickness different.
SJEOW	Hard-usage thermoplastic or rubber-insulated conductors and oil-resistant thermoplastic outer jacket. All-elastomer construction. 300 V, 90˚C to 105˚C. Weather-resistant. Meets UL specifications.
SJEW	Hard-usage thermoplastic or rubber-insulated conductors and overall thermoplastic jacket. All elastomer construction. 300 V, 90˚C to 105˚C. Weather-resistant. Meets UL specifications.
SJO	Same as SJ, but Carolprene®, oil-resistant compound outer jacket. Can also be made water-resistant. 300 V, 60˚C.
SJOO	Same as SJO but inner conductor insulation as well as the outer jacket is oil-resistant.
SJOOW	Same as SJOO but also water- and weather-resistant.
SJT	Hard-usage thermoplastic or rubber-insulated conductors with overall thermoplastic jacket. 300 V, 60˚C to 105˚C.
SJTO	Same as SJT, but oil-resistant thermoplastic outer jacket. 60˚C.
SJTW	Extra-hard-usage thermoplastic conductors and overall thermoplastic jacket. 300 V, 60˚C to 105˚C. Weather-resistant for outdoor use.
SO	Extra-hard-usage cord, same construction as Type S, except oil-resistant Carolprene® jacket. 600 V, 60˚C to 90˚C.
SOO	Same as SO, but inner conductor insulation as well as the outer jacket is oil-resistant.
SOOW	Same as SOO, but also weather-, water- and sunlight-(UV) resistant.
SP-1	All-rubber, parallel-jacketed, two-conductor light-duty cord for pendant or portable use in damp locations. 300 V.
SP-2	Same as SP-1, but heavier construction, with or without third conductor for grounding purposes. 300 V.
SPT-1	Same as SP-1, except all-thermoplastic. 300 V. With or without third conductor for grounding.
SPT-2	Same as SP-2, except all-thermoplastic. 300 V. With or without third conductor for grounding.
SPT-3	Same as SP-3, except all-thermoplastic. 300 V. With or without third conductor for grounding.
SRD	Portable range or dryer cable. Three or four rubber-insulated conductors with rubber or neoprene jacket, flat or round construction. 300 V, 60°C rated.
SRDT	Same as SRD, except all-thermoplastic with a maximum temperature of 90˚C.
ST	Extra-hard-usage cord, jacketed, same as Type S except all-plastic construction. 600 V, 60˚C to 105˚C.
STO	Same as ST, but with oil-resistant thermoplastic outer jacket. 600 V, 60˚C.
STW	Extra-hard-usage cord, jacketed. 600 V, 60˚C to 105˚C. Weather- and water-resistant for outdoor use.
SV	Vacuum cleaner cord, two- or three-conductor, rubber insulated. Overall rubber jacket. For light-duty in damp locations. 300 V, 60˚C.
SVO	Same as SV, except oil-resistant Carolprene® jacket. 300 V, 60˚C.
SVT	Same as SV, except all-plastic construction. With or without third conductor for grounding purposes only. 300 V, 60˚C to 90˚C.
XLPE	Crosslinked polyethylene.

Rubber Cord 2



Thermoset rubber cord products have evolved over the last 50 years from simple and unsophisticated to a product line where specialized, technologically advanced products are in demand for exacting commercial and industrial applications.

No longer are rubber cord products used only in applications where flexibility is needed; today typical applications require cord to perform well in environments of extreme heat and cold and on job sites and factory floors where resistance to oil, chemicals and abrasion is mandatory.

General Cable's role, as the producer of the premiere Carol® Brand rubber cord products, is to ensure that new product development, product innovation and quality not only keep pace with industry requirements but also set the trends.

Our rubber cord products carry a full range of listings and certifications with Underwriters Laboratories, Inc. and the Canadian Standard Association. In addition, many products meet or exceed the requirements of OSHA, MSHA and other relevant industry standards.

Carol Brand is simply the most accepted in the industry, having proven itself on the job time after time. Our rubber cord line is the most comprehensive in the industry, ensuring that the proper Carol product can always be specified.

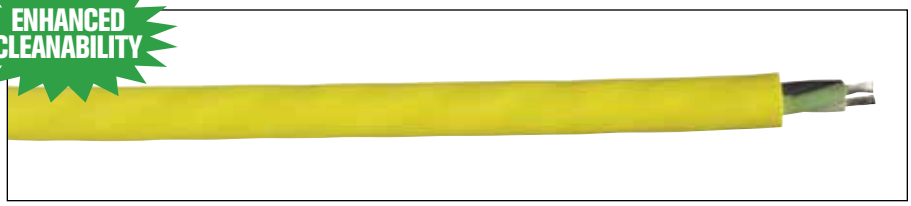
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Super Vu-Tron® Supreme Types SJOOW/SOOW with GenClean™

105°C, 300 and 600 Volt, UL/CSA Portable Cord

Featuring GenClean™ Jacket

ENHANCED CLEANABILITY



Product Construction:

Conductors:
- 18 through 10 AWG fully annealed stranded tinned copper

Insulation:
- Premium-grade, color-coded, oil-resistant 105°C EPDM
- Color code: See chart below

Jacket:
- Super Vu-Tron® Supreme, yellow, with GenClean™ technology
- Temperature range: –50°C to +105°C UL/CSA
- Voltage rating: 300 volts Type SJOOW 600 volts Type SOOW

Jacket Marking:
- SUPER VU-TRON® SUPREME SJOOW - CAROL SUPER VU-TRON® SUPREME FEATURING GENCLEAN™ JACKET (SIZE) (mm^2) 105°C (UL) WATER RESISTANT SJOOW CSA (-50°C) FT1 --- P-07-KA120015-MSHA 300 VOLT ROHS MADE IN USA
- SUPER VU-TRON® SUPREME SOOW - CAROL SUPER VU-TRON® SUPREME FEATURING GENCLEAN™ JACKET (SIZE) (mm^2) 105°C (UL) WATER RESISTANT SOOW CSA (-50°C) FT1 --- P-07-KA120015-MSHA 600 VOLT ROHS MADE IN USA

Target Applications/Markets:
- Food/beverage manufacturing
- Marine manufacturing
- Manufactured structures
- Severe environments
- Dockside power
- Health care

Features:
- Cleanable rubber jacket
- Excellent flexibility in cold temperatures
- Lasts longer in flex applications (extra-flexible Class M stranding)
- Integral Flexfill®
- Enhanced cleanability
- Reduced scuffing
- Ozone-, sunlight (UV)- and weather-resistant
- UL Listed and CSA Certified for indoor and outdoor use
- Water-resistant*
- Safety-colored, with high-visibility yellow jacket
- High heat and flame resistance
- Resistant to sunlight, oils, acids and chemicals
- Excellent abrasion and cut resistance
- Tinned copper conductors — corrosion/oxidation-resistant

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- OSHA Acceptable
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), 1000' (304.8 m)
- Other put-ups available on special order

*Suitable for immersion in water if properly sealed and terminated.

TYPE SJOOW – 300 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	STRAND O.D.	NOM. INS. THICKNESS		JACKET NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	COPPER WT. LBS/M'	STD. CTN.
					INCHES	mm	INCHES	mm				
GC601	2	18	41/34	.048"	0.030	0.76	0.310	7.87	10	56	10	1000'
GC602	3	18	41/34	.048"	0.030	0.76	0.320	8.13	10	66	15	1000'
GC603	4	18	41/34	.048"	0.030	0.76	0.345	8.76	7	79	21	250'
GC604	2	16	65/34	.057"	0.030	0.76	0.315	8.00	13	62	16	1000'
GC605	3	16	65/34	.057"	0.030	0.76	0.335	8.51	13	77	24	250'
GC606	4	16	65/34	.057"	0.030	0.76	0.370	9.40	10	98	32	250'
GC607	2	14	105/34	.077"	0.030	0.76	0.370	9.40	18	75	24	250'
GC608	3	14	105/34	.077"	0.030	0.76	0.375	9.53	18	99	36	250'
GC609	4	14	105/34	.077"	0.030	0.76	0.405	10.29	15	122	48	250'

TYPE SOOW – 600 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOM. INS. THICKNESS		JACKET NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	COPPER WT. LBS/M'	STD. CTN.
				INCHES	mm	INCHES	mm				
GC631*	2	18	41/34	0.030	0.76	0.365	9.27	10	75	10	250'
GC632	3	18	41/34	0.030	0.76	0.375	9.53	10	84	15	250'
GC633*	4	18	41/34	0.030	0.76	0.400	10.16	7	110	21	250'
GC634	2	16	65/34	0.030	0.76	0.370	9.40	13	80	16	250'
GC635	3	16	65/34	0.030	0.76	0.395	10.03	13	96	24	250'
GC636	4	16	65/34	0.030	0.76	0.425	10.80	10	118	32	250'
GC621	5	16	65/34	0.030	0.76	0.515	13.08	8	166	40	250'
GC637*	2	14	105/34	0.045	1.14	0.510	12.95	18	153	24	250'
GC638	3	14	105/34	0.045	1.14	0.525	13.34	18	164	36	250'
GC639	4	14	105/34	0.045	1.14	0.575	14.61	15	204	48	250'
GC622*	5	14	105/34	0.045	1.14	0.675	17.15	12	279	60	250'
GC641*	2	12	168/34	0.045	1.14	0.590	14.99	25	198	38	250'
GC642	3	12	168/34	0.045	1.14	0.600	15.24	25	224	57	250'
GC643	4	12	168/34	0.045	1.14	0.650	16.51	20	270	76	250'
GC623*	5	12	168/34	0.045	1.14	0.730	18.54	16	308	96	250'
GC645	3	10	259/34	0.045	1.14	0.660	16.76	30	295	99	250'
GC646	4	10	259/34	0.045	1.14	0.710	18.03	25	365	132	250'
GC624*	5	10	259/34	0.045	1.14	0.770	19.56	20	422	168	250'

TOP PERFORMANCE IN THE TOUGHEST ENVIRONMENTS

Volume change (%) of SUPER VU-TRON® SUPREME after 28 days at room temperature in the following materials			
ACETIC ACID (30%)	+19.00	LINSEED OIL	+1.04
AMMONIA HYDROXIDE	+3.12	LUBE OIL	-1.82
ASTM 3 OIL	+0.26	MILK	+4.16
BEER	+4.42	NITRIC ACID (10%)	+7.29
BLEACH WATER	+2.60	SAE 30 OIL	-1.30
BUTYL ALCOHOL	-1.82	SKYDROL 500	+17.10
CORN OIL	0.00	SODIUM HYDROXIDE	+10.90
FORMALDEHYDE	+3.38	SULFURIC ACID (10%)	+2.34
GLYCOL (ANTI-FREEZE)	-2.60	TOLUENE	+30.20
HYDROCHLORIC ACID (20%)	+10.60	UNLEADED GAS	+22.10
JP-4	+10.90	WATER	+2.86
KEROSENE	+10.60		

* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

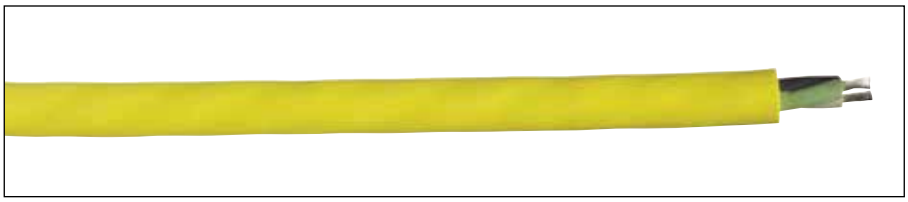
COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green/Yellow
4	Black, White, Red, Green/Yellow
5	Black, White, Red, Green/Yellow, Orange

General Cable Made in U.S.A. RoHS Compliant Directive 2011/65/EU MSHA Mine Safety and Health Administration OSHA Acceptable Occupational Safety and Health Administration Certified Canadian Standard Association UL LISTED CAROL BRAND

Super Vu-Tron® Supreme Types SJOOW/SOOW

105°C, 300 and 600 Volt, UL/CSA Portable Cord



TYPE SJOOW – 300 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	STRAND O.D.	NOM. INS. THICKNESS		JACKET NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	COPPER WT. LBS/M'	STD. CTN.
					INCHES	mm	INCHES	mm				
02601	2	18	41/34	.048"	0.030	0.76	0.310	7.87	10	56	10	1000'
02602	3	18	41/34	.048"	0.030	0.76	0.320	8.13	10	66	15	1000'
02603	4	18	41/34	.048"	0.030	0.76	0.345	8.76	7	79	20	250'
02604	2	16	65/34	.057"	0.030	0.76	0.315	8.00	13	62	16	1000'
02605	3	16	65/34	.057"	0.030	0.76	0.335	8.51	13	77	24	250'
02606	4	16	65/34	.057"	0.030	0.76	0.370	9.40	10	98	32	250'
02607	2	14	105/34	.077"	0.030	0.76	0.370	9.40	18	75	24	250'
02608	3	14	105/34	.077"	0.030	0.76	0.375	9.53	18	99	36	250'
02609	4	14	105/34	.077"	0.030	0.76	0.405	10.29	15	122	48	250'

TYPE SOOW – 600 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOM. INS. THICKNESS		JACKET NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	COPPER WT. LBS/M'	STD. CTN.
				INCHES	mm	INCHES	mm				
02631*	2	18	41/34	0.030	0.76	0.365	9.27	10	75	10	250'
02632	3	18	41/34	0.030	0.76	0.375	9.53	10	84	15	250'
02633*	4	18	41/34	0.030	0.76	0.400	10.16	7	110	21	250'
02634	2	16	65/34	0.030	0.76	0.370	9.40	13	80	16	250'
02635	3	16	65/34	0.030	0.76	0.395	10.03	13	96	24	250'
02636	4	16	65/34	0.030	0.76	0.425	10.80	10	118	32	250'
02621	5	16	65/34	0.030	0.76	0.515	13.08	8	166	40	250'
02637*	2	14	105/34	0.045	1.14	0.510	12.95	18	153	24	250'
02638	3	14	105/34	0.045	1.14	0.525	13.34	18	164	36	250'
02639	4	14	105/34	0.045	1.14	0.575	14.61	15	204	48	250'
02622*	5	14	105/34	0.045	1.14	0.675	17.15	12	279	60	250'
02641*	2	12	168/34	0.045	1.14	0.590	14.99	25	198	38	250'
02642	3	12	168/34	0.045	1.14	0.600	15.24	25	224	57	250'
02643	4	12	168/34	0.045	1.14	0.650	16.51	20	270	76	250'
02623*	5	12	168/34	0.045	1.14	0.730	18.54	16	308	96	250'
02645	3	10	259/34	0.045	1.14	0.660	16.76	30	295	99	250'
02646	4	10	259/34	0.045	1.14	0.710	18.03	25	365	132	250'
02624*	5	10	259/34	0.045	1.14	0.770	19.56	20	422	168	250'

* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

TOP PERFORMANCE IN THE TOUGHEST ENVIRONMENTS

Volume change (%) of SUPER VU-TRON® SUPREME after 28 days at room temperature in the following materials			
ACETIC ACID (30%)	+19.00	LINSEED OIL	+1.04
AMMONIA HYDROXIDE	+3.12	LUBE OIL	-1.82
ASTM 3 OIL	+0.26	MILK	+4.16
BEER	+4.42	NITRIC ACID (10%)	+7.29
BLEACH WATER	+2.60	SAE 30 OIL	-1.30
BUTYL ALCOHOL	-1.82	SKYDROL 500	+17.10
CORN OIL	0.00	SODIUM HYDROXIDE	+10.90
FORMALDEHYDE	+3.38	SULFURIC ACID (10%)	+2.34
GLYCOL (ANTI-FREEZE)	-2.60	TOLUENE	+30.20
HYDROCHLORIC ACID (20%)	+10.60	UNLEADED GAS	+22.10
JP-4	+10.90	WATER	+2.86
KEROSENE	+10.60		

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green/Yellow
4	Black, White, Red, Green/Yellow
5	Black, White, Red, Green/Yellow, Orange

Product Construction:

Conductors:
- 18 through 10 AWG fully annealed stranded tinned copper

Insulation:
- Premium-grade, color-coded, oil-resistant 105°C EPDM
- Color code: See chart below

Jacket:
- Super Vu-Tron® Supreme, yellow
- Temperature range: –50°C to +105°C UL/CSA
- Voltage rating: 300 volts Type SJOOW 600 volts Type SOOW

Jacket Marking:
- SUPER VU-TRON® SUPREME SJOOW - CAROL SUPER VU-TRON® SUPREME (SIZE) (mm^2) 105°C (UL) WATER RESISTANT SJOOW CSA (-50°C) FT1 --- P-07-KA120015-MSHA 300 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)
- SUPER VU-TRON® SUPREME SOOW - CAROL SUPER VU-TRON® SUPREME (SIZE) (mm^2) 105°C (UL) WATER RESISTANT SOOW CSA (-50°C) FT1 --- P-07-KA120015-MSHA 600 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
- Machine tools
- Power tools
- Dockside power applications
- Motor leads
- Portable machinery
- Cranes
- Submersible pumps
- Where water immersion is required
- Severe environment OEM/MRO applications

Features:
- Excellent flexibility in cold temperatures
- Lasts longer in flex applications (extra-flexible Class M stranding)
- Integral Flexfill®
- Ozone-, sunlight (UV)- and weather-resistant
- UL Listed and CSA Certified for indoor and outdoor use
- Water-resistant*
- Safety-colored, with high-visibility yellow jacket
- High heat and flame resistance
- Resistant to sunlight, oils, acids and chemicals
- Excellent abrasion and cut resistance
- TRU-Mark® sequential footage marking
- Tinned copper conductors — corrosion/oxidation-resistant

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- OSHA Acceptable
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), 1000' (304.8 m)
- Other put-ups available on special order

*Suitable for immersion in water if properly sealed and terminated.

CAROL BRAND · UL LISTED · CSA Certified Canadian Standard Association · OSHA Acceptable Occupational Safety and Health Administration · MSHA Mine Safety and Health Administration · RoHS Compliant Directive 2011/65/EU · Made in U.S.A. · General Cable

Super Vu-Tron® III Types SJOOW/SOOW

105°C, 300 and 600 Volt, UL/CSA Portable Cord

Product Construction:

Conductors:
- 18 through 10 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded, oil-resistant 105°C EPDM
- Color code: See chart below

Jacket:
- Super Vu-Tron® III, yellow
- Temperature range: –50°C to +105°C UL/CSA
- Voltage rating: 300 volts Type SJOOW 600 volts Type SOOW

Jacket Marking:
- SUPER VU-TRON® III SJOOW - CAROL SUPER VU-TRON® III (SIZE) (mm^2) 105°C (UL) WATER RESISTANT SJOOW CSA (-50°C) FT1 --- P-07-KA120015-MSHA 300 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)
- SUPER VU-TRON® III SOOW - CAROL SUPER VU-TRON® III (SIZE) (mm^2) 105°C (UL) WATER RESISTANT SOOW CSA (-50°C) FT1 --- P-07-KA120015-MSHA 600 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
- Machine tools
- Power tools
- Dockside power applications
- Motor leads
- Portable machinery
- Cranes
- Submersible pumps

Features:
- Excellent flexibility in cold temperatures
- Last longer in flex applications
- Integral Flexfill®
- Ozone-, sunlight (UV)- and weather-resistant
- UL Listed and CSA Certified for indoor and outdoor use
- Water-resistant*
- Safety-colored
- High heat and flame resistance
- Resistant to oils, acids and chemicals
- Excellent abrasion and cut resistance
- TRU-Mark® sequential footage marking

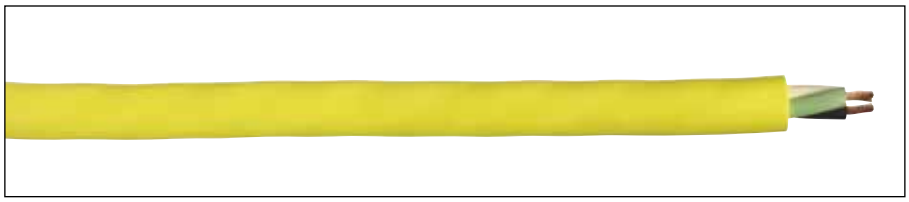
Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), 1000' (304.8 m)
- Other put-ups available on special order

*Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green
5	Black, White, Red, Green, Orange



TYPE SJOOW – 300 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M1(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
02001*	2	18	41/34	0.030	0.76	0.310	8.00	10	56	1000'
02002*	3	18	41/34	0.030	0.76	0.320	8.12	10	65	1000'
02003*	4	18	41/34	0.030	0.76	0.345	8.76	7	80	250'
02004*	2	16	65/34	0.030	0.76	0.315	8.00	13	68	1000'
02005*	3	16	65/34	0.030	0.76	0.335	8.51	13	80	250'
02006*	4	16	65/34	0.030	0.76	0.370	9.40	10	95	250'
02007*	2	14	41/30	0.030	0.76	0.370	9.40	18	90	250'
02008*	3	14	41/30	0.030	0.76	0.375	9.52	18	110	250'
02009*	4	14	41/30	0.030	0.76	0.405	10.29	15	130	250'

TYPE SOOW – 600 VOLT – UL/CSA

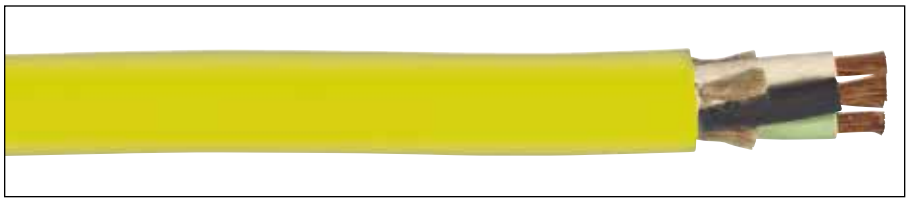
CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M1(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
02031*	2	18	41/34	0.030	0.76	0.365	9.27	10	75	250'
02032*	3	18	41/34	0.030	0.76	0.375	9.53	10	80	250'
02033*	4	18	41/34	0.030	0.76	0.400	10.16	7	110	250'
02034*	2	16	65/34	0.030	0.76	0.370	9.40	13	75	250'
02035*	3	16	65/34	0.030	0.76	0.395	10.80	13	100	250'
02036*	4	16	65/34	0.030	0.76	0.425	10.80	10	120	250'
02021*	5	16	65/34	0.030	0.76	0.515	13.08	8	150	250'
02037*	2	14	41/30	0.045	1.14	0.510	12.95	18	155	250'
02038*	3	14	41/30	0.045	1.14	0.525	13.34	18	165	250'
02039*	4	14	41/30	0.045	1.14	0.575	14.61	15	215	250'
02022*	5	14	41/30	0.045	1.14	0.675	17.15	12	285	250'
02041*	2	12	65/30	0.045	1.14	0.590	14.99	25	200	250'
02042*	3	12	65/30	0.045	1.14	0.600	15.24	25	250	250'
02043*	4	12	65/30	0.045	1.14	0.650	16.51	20	280	250'
02023*	5	12	65/30	0.045	1.14	0.730	18.54	16	315	250'
02045*	3	10	104/30	0.045	1.14	0.660	16.76	30	320	250'
02046*	4	10	104/30	0.045	1.14	0.710	18.03	25	375	250'
02024*	5	10	104/30	0.045	1.14	0.770	19.56	20	432	250'

* Non-stock item available by special order; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

General Cable Made in U.S.A. RoHS Compliant Directive 2011/65/EU MSHA Mine Safety and Health Administration OSHA Acceptable Occupational Safety and Health Administration Certified Canadian Standard Association UL LISTED CAROL BRAND

Carolprene® Jacketed Types SOOW/SJOOW

90°C, 300 and 600 Volt, UL/CSA Portable Cord



YELLOW HIGH-VISIBILITY – TYPE SJOOW – 300 VOLT – 90°C – UL/CSA

CATALOG NUMBER	NO. OF COND	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
01411	3	18	16/30	0.030	0.76	0.305	7.75	10	63	1000'
01444	4	18	16/30	0.030	0.76	0.330	8.38	7	76	250'
01442	3	16	26/30	0.030	0.76	0.330	8.38	13	76	250'
01443	4	16	26/30	0.030	0.76	0.365	9.27	10	95	250'
01460	3	14	41/30	0.030	0.76	0.370	9.40	18	106	250'
01464	4	14	41/30	0.030	0.76	0.410	10.41	15	121	250'
01480	3	12	65/30	0.030	0.76	0.430	10.92	25	146	250'
01481	4	12	65/30	0.030	0.76	0.475	12.07	20	185	250'
01483	3	10	104/30	0.045	1.14	0.580	14.73	30	242	250'
01484	4	10	104/30	0.045	1.14	0.655	16.64	25	304	250'

YELLOW HIGH-VISIBILITY – TYPE SOOW – 600 VOLT – 90°C – UL/CSA

CATALOG NUMBER	NO. OF COND	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
02469	3	18	16/30	0.030	0.76	0.365	9.27	10	84	250'
02470	4	18	16/30	0.030	0.76	0.390	9.91	7	101	250'
02465	3	16	26/30	0.030	0.76	0.390	9.91	13	103	250'
02466	4	16	26/30	0.030	0.76	0.420	10.67	10	119	250'
02462	3	14	41/30	0.045	1.14	0.535	13.59	18	172	250'
02468	4	14	41/30	0.045	1.14	0.575	14.61	15	208	250'
02425	3	12	65/30	0.045	1.14	0.595	15.11	25	229	250'
02426	4	12	65/30	0.045	1.14	0.650	16.51	20	280	250'
02428	3	10	104/30	0.045	1.14	0.660	16.76	30	295	250'
02427	4	10	104/30	0.045	1.14	0.715	18.16	25	353	250'

Cord furnished with UL and CSA labels.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

Product Construction:

Conductors:
- 18 through 10 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below

Jacket:
- Yellow Carolprene®
- Temperature range: -40°C to +90°C

Jacket Marking:
- CAROL (SIZE) (mm^2) 90°C (UL) WATER RESISTANT SJOOW CSA (-40°C) FT2 P-7K-123033 MSHA 300 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)
- CAROL (SIZE) (mm^2) 90°C (UL) WATER RESISTANT SOOW CSA (-40°C) FT2 P-7K-123033 MSHA 600 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
- Portable tools and equipment
- Portable appliances
- Small motors and associated machinery
- Food processing plants and equipment
- Marinas/docks
- Shipyards
- OEM/MRO
- OSHA VPP safety
- Construction site power
- Industrial plants
- Mining

Features:
- Excellent resistance to oil and moisture
- Good tensile strength, elongation and aging characteristics
- High flexibility
- Excellent abrasion resistance
- Water-resistant*
- UL Listed and CSA Certified for indoor and outdoor use
- Ozone-, sunlight (UV)- and weather-resistant
- TRU-Mark® sequential footage marking

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- RoHS Compliant

Packaging:
- 250' (76.2 m), 1000' (304.8 m)
- Other put-ups available on special order

* Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
3	Black, White, Green
4	Black, White, Red, Green

Carolprene® Jacketed Type SOOW

90ºC, 600 Volt, UL/CSA Portable Cord

Product Construction:

Conductors:
- 18 through 2 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90ºC EPDM
- Color code: See chart below

Jacket:
- Carolprene®, black
- Temperature range: -40ºC to +90ºC

Jacket Marking:
- CAROL (SIZE) (mm^2) 90°C (UL) WATER RESISTANT SOOW CSA (-40°C) FT2 P-7K-123033 MSHA 600 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
- Portable tools and equipment
- Portable appliances
- Small motors and associated machinery

Features:
- Excellent resistance to oil and moisture
- Good tensile strength, elongation and aging characteristics
- High flexibility
- Excellent abrasion resistance
- Water-resistant*
- UL Listed and CSA Certified for indoor and outdoor use
- Ozone-, sunlight (UV)- and weather-resistant
- TRU-Mark® sequential footage marking

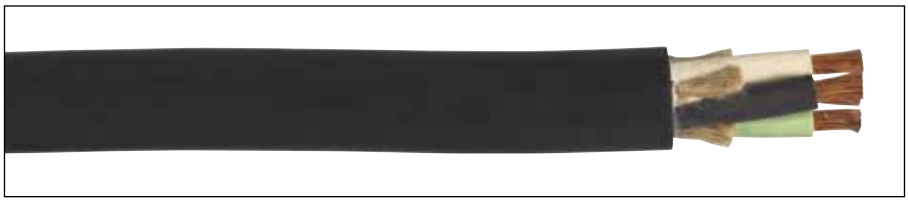
Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), 1000' (304.8 m)
- Other put-ups available on special order

*Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green
5	Black, White, Red, Green, Orange



TYPE SOOW – 600 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
02763	2	18	16/30	0.030	0.76	0.345	8.76	10	65	250'
02769	3	18	16/30	0.030	0.76	0.365	9.27	10	80	250'
02770	4	18	16/30	0.030	0.76	0.390	9.91	7	94	250'
02722	2	16	26/30	0.030	0.76	0.370	9.40	13	77	250'
02765	3	16	26/30	0.030	0.76	0.390	9.91	13	94	250'
02766	4	16	26/30	0.030	0.76	0.420	10.67	10	114	250'
02723	2	14	41/30	0.045	1.14	0.510	12.95	18	154	250'
02762	3	14	41/30	0.045	1.14	0.535	13.59	18	171	250'
02768	4	14	41/30	0.045	1.14	0.575	14.61	15	209	250'
02724	2	12	65/30	0.045	1.14	0.570	14.48	25	168	250'
02725	3	12	65/30	0.045	1.14	0.595	15.11	25	223	250'
02726	4	12	65/30	0.045	1.14	0.650	16.51	20	276	250'
02767	2	10	104/30	0.045	1.14	0.620	15.75	30	230	250'
02728	3	10	104/30	0.045	1.14	0.660	16.76	30	289	250'
02727	4	10	104/30	0.045	1.14	0.715	18.16	25	351	250'
16063	3	8	133/29	0.060	1.52	0.840	21.33	40	450	250'
16064	4	8	133/29	0.060	1.52	0.945	24.00	35	580	250'
16065	5	8	133/29	0.060	1.52	1.030	26.16	28	700	250'
16073	3	6	133/27	0.060	1.52	0.980	24.89	55	637	250'
16074	4	6	133/27	0.060	1.52	1.080	27.43	45	830	250'
16075	5	6	133/27	0.060	1.52	1.200	30.48	36	1015	250'
16083	3	4	133/25	0.060	1.52	1.140	28.96	70	926	250'
16084	4	4	133/25	0.060	1.52	1.260	32.00	60	1145	250'
16085	5	4	133/25	0.060	1.52	1.365	34.67	48	1419	250'
16093	3	2	133/23	0.060	1.52	1.330	33.78	95	1367	250'
16094	4	2	133/23	0.060	1.52	1.460	37.08	80	1699	250'
16095*	5	2	133/23	0.060	1.52	1.580	40.13	64	2066	250'

Cord furnished with UL and CSA labels.
* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

General Cable

Made in U.S.A.

RoHS Compliant Directive 2011/65/EU

MSHA Mine Safety and Health Administration

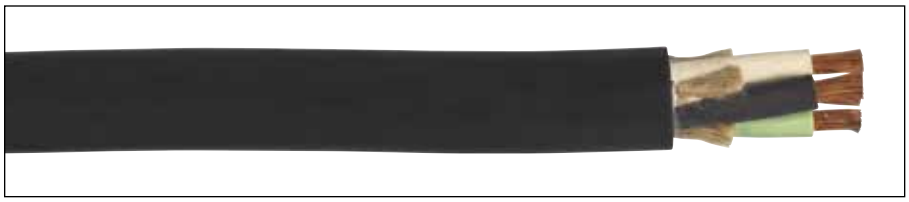
Certified Canadian Standard Association

UL LISTED

CAROL BRAND

Carolprene® with 17 FREE® Jacketed Type SOOW

105°C, 600 Volt, UL/c(UL) Portable Cord



TYPE SOOW – 600 VOLT – UL/c(UL)

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
HF763*	2	18	16/30	0.030	0.76	0.345	8.76	10	61	250'
HF769*	3	18	16/30	0.030	0.76	0.365	9.27	10	76	250'
HF770*	4	18	16/30	0.030	0.76	0.390	9.91	7	89	250'
HF722*	2	16	26/30	0.030	0.76	0.370	9.40	13	73	250'
HF765*	3	16	26/30	0.030	0.76	0.390	9.91	13	89	250'
HF766*	4	16	26/30	0.030	0.76	0.420	10.67	10	109	250'
HF723*	2	14	41/30	0.045	1.14	0.510	12.95	18	146	250'
HF762*	3	14	41/30	0.045	1.14	0.535	13.59	18	163	250'
HF768*	4	14	41/30	0.045	1.14	0.575	14.61	15	200	250'
HF724*	2	12	65/30	0.045	1.14	0.570	14.48	25	158	250'
HF725*	3	12	65/30	0.045	1.14	0.595	15.11	25	213	250'
HF726*	4	12	65/30	0.045	1.14	0.650	16.51	20	265	250'
HF767*	2	10	104/30	0.045	1.14	0.620	15.75	30	218	250'
HF728*	3	10	104/30	0.045	1.14	0.660	16.76	30	277	250'
HF727*	4	10	104/30	0.045	1.14	0.715	18.16	25	338	250'
HF063*	3	8	133/29	0.060	1.52	0.840	21.34	40	432	250'
HF064*	4	8	133/29	0.060	1.52	0.945	24.00	35	557	250'
HF065*	5	8	133/29	0.060	1.52	1.030	26.16	28	675	250'
HF073*	3	6	133/27	0.060	1.52	0.980	24.89	55	613	250'
HF074*	4	6	133/27	0.060	1.52	1.080	27.43	45	800	250'
HF075*	5	6	133/27	0.060	1.52	1.200	30.48	36	979	250'
HF083*	3	4	133/25	0.060	1.52	1.140	28.96	70	893	250'
HF084*	4	4	133/25	0.060	1.52	1.260	32.00	60	1106	250'
HF085*	5	4	133/25	0.060	1.52	1.365	34.67	48	1375	250'
HF093*	3	2	133/23	0.060	1.52	1.330	33.78	95	1322	250'
HF094*	4	2	133/23	0.060	1.52	1.460	37.08	80	1649	250'
HF095*	5	2	133/23	0.060	1.52	1.580	40.13	64	2010	250'

Cord furnished with UL and c(UL) labels.
* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

Product Construction:

Conductors:
- 18 through 2 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 105°C 17 FREE® EPDM
- Color code: See chart below

Jacket:
- Carolprene®, black, 17 FREE®
- Temperature range: -40°C to +105°C

Jacket Marking:
- CAROL (SIZE) (mm²) 105°C (UL) WATER RESISTANT SOOW WITH 17 FREE (-40°C) FT2 c(UL) 600 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

Applications
- Portable tools and equipment
- Portable appliances
- Small motors and associated machinery

Features
- No halogens
- More environmentally friendly
- Oil-resistant
- Good tensile strength, elongation and aging characteristics
- High flexibility
- Excellent abrasion resistance
- Water-resistant*
- UL Listed for indoor and outdoor use
- Ozone-, sunlight (UV)- and weather-resistant
- TRU-Mark® sequential footage marking

Industry Approvals
- UL/c(UL) Flexible Cord - UL 62/CSA 22.2 No. 49
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), 1000' (304.8 m)
- Other put-ups available on special order

* Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green
5	Black, White, Red, Green, Orange

Going Green with General Cable
General Cable has accelerated its environmental commitment, addressing its green alternative approach by identifying greener opportunities and promoting green cabling solutions wherever feasible. This includes promoting our existing green products, partnering with key customers in their green endeavors, identifying and providing for green product gaps, and participating as a member of the United States Green Building Council (USGBC) and collaborative ventures such as the Green Suppliers Network (GSN).

CAROL BRAND UL LISTED c UL LISTED RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Carolprene® Jacketed Type SJOOW

90ºC, 300 Volt, UL/CSA Portable Cord

NOW WITH TRU-Mark® Footage Marking System PRECISION

Product Construction:

Conductors:
- 18 through 10 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below

Jacket:
- Carolprene®, black
- Temperature range: -40°C to +90°C

Jacket Marking:
- CAROL (SIZE) (mm²) 90°C (UL) WATER RESISTANT SJOOW CSA (-40°C) FT2 P-7K-123033 MSHA 300 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

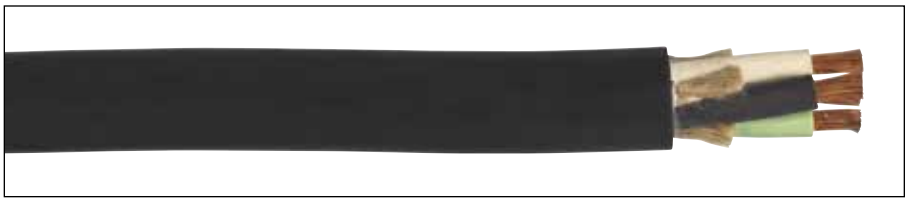
Applications:
- Portable tools and equipment
- Portable appliances
- Small motors and associated machinery

Features:
- Excellent resistance to oil and moisture
- Good tensile strength, elongation and aging characteristics
- High flexibility
- Excellent abrasion resistance
- Water-resistant*
- UL Listed and CSA Certified for indoor and outdoor use
- Ozone-, sunlight (UV)- and weather-resistant
- TRU-Mark® sequential footage marking

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), 1000' (304.8 m)
- Other put-ups available on special order

*Suitable for immersion in water if properly sealed and terminated.



TYPE SJOOW – 300 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
01310	2	18	16/30	0.030	0.76	0.285	7.24	10	46	1000'
01311	3	18	16/30	0.030	0.76	0.305	7.75	10	60	1000'
01344	4	18	16/30	0.030	0.76	0.330	8.38	7	72	250'
01312	2	16	26/30	0.030	0.76	0.310	7.87	13	56	1000'
01342	3	16	26/30	0.030	0.76	0.330	8.38	13	72	250'
01343	4	16	26/30	0.030	0.76	0.365	9.27	10	89	250'
01358	2	14	41/30	0.030	0.76	0.340	8.64	18	75	250'
01360	3	14	41/30	0.030	0.76	0.370	9.40	18	100	250'
01364	4	14	41/30	0.030	0.76	0.410	10.41	15	128	250'
01379	2	12	65/30	0.030	0.76	0.410	10.41	25	108	250'
01380	3	12	65/30	0.030	0.76	0.430	10.92	25	136	250'
01381	4	12	65/30	0.030	0.76	0.475	12.07	20	177	250'
01382*	2	10	104/30	0.045	1.14	0.560	14.22	30	190	250'
01383	3	10	104/30	0.045	1.14	0.580	14.73	30	236	250'
01384	4	10	104/30	0.045	1.14	0.655	16.64	25	296	250'

Cord furnished with UL and CSA labels.
* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green

General Cable

Made in U.S.A.

RoHS Compliant Directive 2011/65/EU

MSHA Mine Safety and Health Administration

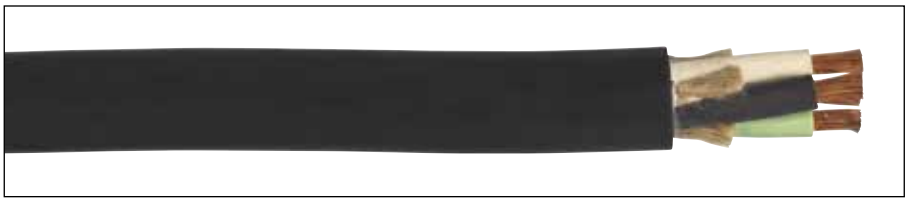
Certified Canadian Standard Association

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CAROL BRAND

Carolprene® with 17 FREE® Jacketed Type SJOOW

105°C, 300 Volt, UL/c(UL) Portable Cord



TYPE SJOOW – 300 VOLT – UL/c(UL)

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
HF310*	2	18	16/30	0.030	0.76	0.285	7.24	10	44	1000'
HF311*	3	18	16/30	0.030	0.76	0.305	7.75	10	58	1000'
HF344*	4	18	16/30	0.030	0.76	0.330	8.38	7	70	250'
HF312*	2	16	26/30	0.030	0.76	0.310	7.87	13	54	250'
HF342*	3	16	26/30	0.030	0.76	0.330	8.38	13	70	250'
HF343*	4	16	26/30	0.030	0.76	0.365	9.27	10	87	250'
HF358*	2	14	41/30	0.030	0.76	0.340	8.64	18	73	250'
HF360*	3	14	41/30	0.030	0.76	0.370	9.40	18	97	250'
HF364*	4	14	41/30	0.030	0.76	0.410	10.41	15	125	250'
HF379*	2	12	65/30	0.030	0.76	0.410	10.41	25	104	250'
HF380*	3	12	65/30	0.030	0.76	0.430	10.92	25	132	250'
HF381*	4	12	65/30	0.030	0.76	0.475	12.07	20	172	250'
HF382*	2	10	104/30	0.045	1.14	0.560	14.22	30	183	250'
HF383*	3	10	104/30	0.045	1.14	0.580	14.73	30	229	250'
HF384*	4	10	104/30	0.045	1.14	0.655	16.64	25	288	250'

Cord furnished with UL and c(UL) labels.
* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

Product Construction:

Conductors:
- 18 through 10 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 105°C 17 FREE® EPDM
- Color code: See chart below

Jacket:
- Carolprene®, black, 17 FREE®
- Temperature range: -40°C to +105°C

Jacket Marking:
- CAROL (SIZE) (mm²) 105°C (UL) WATER RESISTANT SJOOW WITH 17 FREE (-40°C) FT2 c(UL) 300 VOLT ROHS MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
- Portable tools and equipment
- Portable appliances
- Small motors and associated machinery

Features:
- No halogens
- More environmentally friendly
- Oil-resistant
- Good tensile strength, elongation and aging characteristics
- High flexibility
- Excellent abrasion resistance
- Water-resistant*
- UL Listed for indoor and outdoor use
- Ozone-, sunlight (UV)- and weather-resistant
- TRU-Mark® sequential footage marking

Industry Approvals:
- UL/c(UL) Flexible Cord - UL 62/CSA 22.2 No. 49
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), 1000' (304.8 m)
- Other put-ups available on special order

* Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green

Going Green with General Cable
General Cable has accelerated its environmental commitment, addressing its green alternative approach by identifying greener opportunities and promoting green cabling solutions wherever feasible. This includes promoting our existing green products, partnering with key customers in their green endeavors, identifying and providing for green product gaps, and participating as a member of the United States Green Building Council (USGBC) and collaborative ventures such as the Green Suppliers Network (GSN).

CAROL BRAND UL LISTED c UL LISTED RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Carolprene® Jacketed Type SOOW

90ºC, 600 Volt, Non-UL Portable Cord

Product Construction:

Conductors:
- 8 through 2 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below

Jacket:
- Carolprene®, black
- Temperature range: -40°C to +90°C

Jacket Marking:
- CAROL (SIZE) TYPE SOOW 90°C P-7K-123033 MSHA 600 VOLT ROHS MADE IN USA

Applications:
- Portable tools and equipment
- Temporary and portable power
- Motors and associated machinery

Features:
- Excellent resistance to oil and moisture
- Good tensile strength, elongation and aging characteristics
- High flexibility
- Excellent abrasion resistance
- Ozone-, sunlight (UV)- and weather-resistant
- Water-resistant*

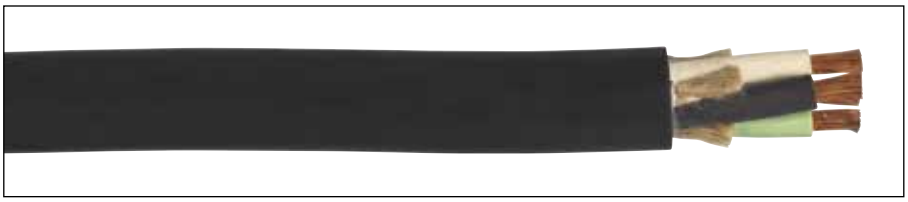
Industry Approvals:
- MSHA Approved
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), 1000' (304.8 m)
- Other put-ups available on special order

*Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green
5	Black, White, Red, Green, Orange



TYPE SOOW, NON-UL – 600 VOLT

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
01811*	2	8	65/26	0.050	1.27	0.660	16.76	40	278	250'
01812	3	8	65/26	0.050	1.27	0.695	17.65	40	343	250'
01827	4	8	65/26	0.050	1.27	0.760	19.30	35	442	250'
98267	5	8	65/26	0.050	1.27	0.840	21.34	28	542	250'
01825	3	6	101/26	0.050	1.27	0.790	20.07	55	482	250'
01824	4	6	101/26	0.050	1.27	0.865	21.97	45	599	250'
98270	5	6	101/26	0.050	1.27	0.945	24.00	36	750	250'
01823*	2	4	119/25	0.050	1.27	0.870	22.09	70	515	250'
01822	3	4	119/25	0.050	1.27	0.925	23.49	70	683	250'
01821	4	4	119/25	0.050	1.27	1.015	25.78	60	851	250'
98463	5	4	119/25	0.050	1.27	1.115	28.32	48	1039	250'
01819	3	2	133/.0211	0.055	1.40	1.085	27.56	95	1003	250'
01818	4	2	133/.0211	0.055	1.40	1.170	29.72	80	1248	250'
98187	5	2	133/.0211	0.055	1.40	1.390	35.31	64	1684	250'

* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

General Cable

Made in U.S.A.

RoHS Compliant Directive 2011/65/EU

MSHA Mine Safety and Health Administration

CAROL® BRAND

Super Vu-Tron® Type SO

90°C, 600 Volt



TYPE SO, NON-UL – 600 VOLT

CATALOG NUMBER	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)
			INCHES	mm	INCHES	mm		
77493*	18	16/30	0.030	0.76	0.180	4.57	10	19
77483*	16	26/30	0.030	0.76	0.200	5.08	13	25
77473*	14	41/30	0.045	1.14	0.240	6.09	18	40
77463*	12	65/30	0.045	1.14	0.265	6.60	25	50
77453*(1)	10	104/30	0.045	1.14	0.305	7.75	30	75

† Ampacities based on NEC Table 400.5(A)(1).
* Non-stock item; minimum quantity purchase required.
(S)Actual shipping weight may vary.
(1) Only 10 AWG construction is MSHA Approved.

Product Construction:

Conductors:
- 18 through 10 AWG stranded bare copper

Insulation:
- Premium-grade 90°C EPDM

Jacket:
- Super Vu-Tron®, black
- Temperature range: -40°C to +90°C

Jacket Marking:
- (SIZE) TYPE SO 600 VOLT CAROL SUPER VU-TRON® 90°C P-123-MSHA(1) (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
- Portable tools and equipment
- Portable appliances
- Small motors and associated machinery
- Flexible power leads

Features:
- Excellent resistance to oil and moisture
- Good tensile strength, elongation and aging characteristics
- High flexibility
- Excellent abrasion resistance
- Ozone-, sunlight (UV)- and weather-resistant
- TRU-Mark® sequential footage marking

Industry Approvals:
- MSHA Approved(1)
- RoHS Compliant

Packaging:
- Lengths cut to order

CAROL BRAND® MSHA Mine Safety and Health Administration RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Type SJ

60°C, 300 Volt, UL/CSA Portable Cord

Product Construction:

Conductors:
- 18 through 10 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded EPDM
- Color code: See chart below

Jacket:
- Rubber, black
- Temperature range: -40°C to +60°C

Jacket Marking:
- CAROL (SIZE) (mm^2) TYPE SJ 60°C (UL) --- CSA TYPE SJ-FT2 300 VOLT ROHS MADE IN USA

Applications:
- Portable tools and equipment
- Portable appliances
- Small motors and associated machinery

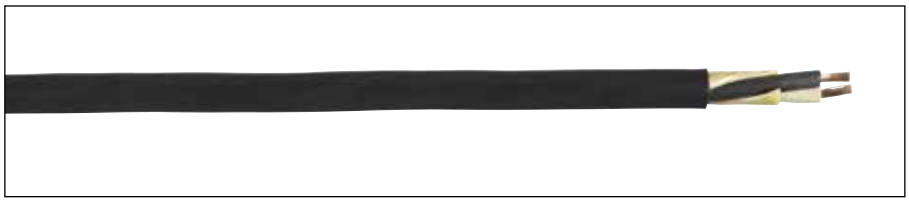
Features:
- Good flexibility in low temperatures
- Suitable for use in conditions where the cord is not subject to acid, grease, oil or solvents

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- RoHS Compliant

Packaging:
- 250' (76.2 m)
- Other put-ups available on special order

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green



TYPE SJ – 300 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
01302*	2	18	16/30	0.030	0.76	0.285	7.24	10	50	1000'
01303*	3	18	16/30	0.030	0.76	0.305	7.75	10	63	1000'
01304*	4	18	16/30	0.030	0.76	0.330	8.38	7	76	250'
01305*	2	16	26/30	0.030	0.76	0.315	8.00	13	62	1000'
01306*	3	16	26/30	0.030	0.76	0.330	8.38	13	76	250'
01307*	4	16	26/30	0.030	0.76	0.365	9.27	10	97	250'
01361*	2	14	41/30	0.030	0.76	0.340	8.64	18	79	250'
01362*	3	14	41/30	0.030	0.76	0.370	9.40	18	106	250'
01366*	4	14	41/30	0.030	0.76	0.415	10.54	15	135	250'
01368*	2	12	65/30	0.030	0.76	0.410	10.41	25	117	250'
01369*	3	12	65/30	0.030	0.76	0.430	10.92	25	145	250'
01370*	4	12	65/30	0.030	0.76	0.470	11.94	20	182	250'
01376*	2	10	104/30	0.045	1.14	0.550	13.97	30	193	250'
01377*	3	10	104/30	0.045	1.14	0.580	14.73	30	243	250'
01378*	4	10	104/30	0.045	1.14	0.655	16.64	25	318	250'

* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

Carolprene® Type SVO

90ºC, 300 Volt, UL/CSA Portable Cord



TYPE SVO – 300 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
13002	2	18	41/34	0.015	0.38	0.225	5.72	10	34	1000'
13003	3	18	41/34	0.015	0.38	0.235	5.97	10	40	1000'

† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S)Actual shipping weight may vary.

Product Construction:

Conductors:
- 18 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90ºC EPDM
- Color code: See chart below

Jacket:
- Carolprene®, black
- Temperature range: -20ºC to +90ºC

Jacket Marking:
- CAROL (SIZE) (mm²) TYPE SVO 90°C (UL) --- CSA TYPE SVO FT2 300 VOLT ROHS MADE IN USA

Applications:
- Vacuum cleaners
- Light-duty equipment
- Office equipment

Features:
- Maintains flexibility in cold temperatures
- Resistant to oil and moisture
- Good tensile strength, elongation and aging characteristics
- Excellent flex life
- Ozone-, sunlight (UV)- and weather-resistant

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- RoHS Compliant

Packaging:
- 250' (76.2 m)
- Other sizes and put-ups available on special order
- 4C cables available as UL recognized AWM as special order

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green

Super Vu-Tron® Multi-Conductor Type SOOW

90°C, 600 Volt, UL/CSA Portable Cord

Product Construction:

Conductors:
- 18 and 16 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below

Jacket:
- Super Vu-Tron® 90°C, black
- Temperature range: -40°C to +90°C

Jacket Marking:
- CAROL SUPER VU-TRON® (SIZE) (mm^2) 90°C (UL) WATER RESISTANT SOOW CSA (-40°C) FT2 P-7K-123033 MSHA 600 VOLT ROHS MADE IN USA

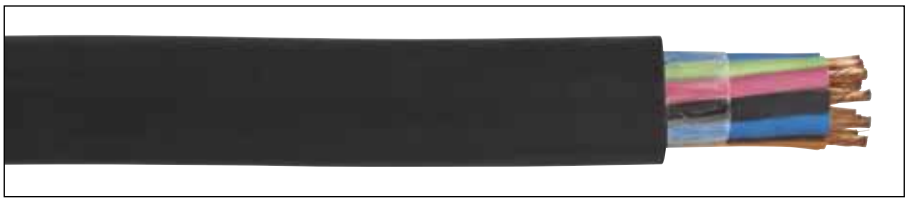
Applications:
- Control circuits
- Tools
- Heavy industrial, processing and construction equipment

Features:
- Extra-flexible stranding
- Abrasion-resistant
- Resists oils and solvents
- Flame-resistant
- Ozone-resistant
- 90°C rated conductors and jacket
- Water-resistant*
- UL Listed and CSA Certified for indoor and outdoor use
- Ozone-, sunlight (UV)- and weather-resistant

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- RoHS Compliant

Packaging:
- 5- through 8-conductor available on 250' (76.2 m), 500' (152.4 m), and 1000' (304.8 m) reels
- 9+ cond. available on long-length reels
- Other put-ups available on special order

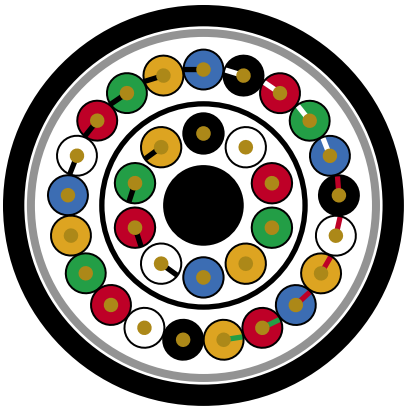
*Suitable for immersion in water if properly sealed and terminated.



TYPE S00W – 600 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)
				INCHES	mm	INCHES	mm		
09805	5	18	16/30	0.030	0.76	0.465	11.81	5.6	131
09806	6	18	16/30	0.030	0.76	0.495	12.57	5.6	142
09807	7	18	16/30	0.030	0.76	0.520	13.21	5.6	161
09808	8	18	16/30	0.030	0.76	0.530	13.46	4.9	173
09810	10	18	16/30	0.030	0.76	0.595	15.11	4.9	221
09812	12	18	16/30	0.030	0.76	0.600	15.24	3.5	235
09814	14	18	16/30	0.030	0.76	0.630	16.00	3.5	262
09816	16	18	16/30	0.030	0.76	0.700	17.78	3.5	306
09818*	18	18	16/30	0.030	0.76	0.760	19.30	3.5	341
09820	20	18	16/30	0.030	0.76	0.795	20.19	3.5	377
09822*	22	18	16/30	0.030	0.76	0.805	20.45	3.1	400
09824	24	18	16/30	0.030	0.76	0.850	21.59	3.1	453
09827*	27	18	16/30	0.030	0.76	0.865	21.97	3.1	475
09830*	30	18	16/30	0.030	0.76	0.915	23.24	3.1	524
09605	5	16	26/30	0.030	0.76	0.495	12.57	8.0	152
09606	6	16	26/30	0.030	0.76	0.520	13.21	8.0	184
09607	7	16	26/30	0.030	0.76	0.540	13.72	8.0	210
09608	8	16	26/30	0.030	0.76	0.575	14.61	7.0	228
09609	9	16	26/30	0.030	0.76	0.600	15.24	7.0	255
09610	10	16	26/30	0.030	0.76	0.620	15.75	5.0	260
09612	12	16	26/30	0.030	0.76	0.660	16.76	5.0	319
09614	14	16	26/30	0.030	0.76	0.730	18.54	5.0	343
09616	16	16	26/30	0.030	0.76	0.740	18.80	5.0	367
09618*	18	16	26/30	0.030	0.76	0.770	19.56	5.0	405
09620	20	16	26/30	0.030	0.76	0.810	20.57	5.0	444
09622*	22	16	26/30	0.030	0.76	0.900	22.86	4.5	510
09624	24	16	26/30	0.030	0.76	0.925	23.50	4.5	547
09626*	26	16	26/30	0.030	0.76	0.965	24.51	4.5	611
09630	30	16	26/30	0.030	0.76	1.010	25.65	4.5	685

† Values shown are for current-carrying conductors. A grounding conductor, or one which carries only the unbalance current from other conductors, is NOT counted in determining current carrying capacity. Ampacities based on NEC Table 400.5(A)(1).
* Non-stock item; minimum quantity purchase required.
(S)Actual shipping weight may vary.



COLOR CODE CHART

NO. OF COND.	COLOR	TRACER	NO. OF COND.	COLOR	TRACER	NO. OF COND.	COLOR	TRACER
1	Black	–	**8**	Red	Black	**15**	Blue	White
2	White	–	**9**	Green	Black	**16**	Black	Red
3	Red	–	**10**	Orange	Black	**17**	White	Red
4	Green	–	**11**	Blue	Black	**18**	Orange	Red
5	Orange	–	**12**	Black	White	**19**	Blue	Red
6	Blue	–	**13**	Red	White	**20**	Red	Green
7	White	Black	**14**	Green	White	**21**	Orange	Green

Note: Colors repeat after 21 conductors.

General Cable

Made in U.S.A. RoHS Compliant Directive 2011/65/EU MSHA Mine Safety and Health Administration CSA Certified Canadian Standard Association UL LISTED CAROL BRAND

Super Vu-Tron® Multi-Conductor Type SOOW

90°C, 600 Volt, UL/CSA Portable Cord

Product Construction:

Conductors:
- 14 through 10 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below

Jacket:
- Super Vu-Tron® 90°C, black
- Temperature range: -40°C to +90°C

Jacket Marking:
- CAROL SUPER VU-TRON® (SIZE) (mm^2) 90°C (UL) WATER RESISTANT SOOW CSA (-40°C) FT2 P-7K-123033 MSHA 600 VOLT ROHS MADE IN USA

Applications:
- Control circuits
- Tools
- Heavy industrial, processing and construction equipment

Features:
- Extra-flexible stranding
- Abrasion-resistant
- Resists oils and solvents
- Flame-resistant
- Ozone-resistant
- 90°C rated conductors and jacket
- Water-resistant*
- UL Listed and CSA Certified for indoor and outdoor use
- Ozone-, sunlight (UV)- and weather-resistant

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- RoHS Compliant

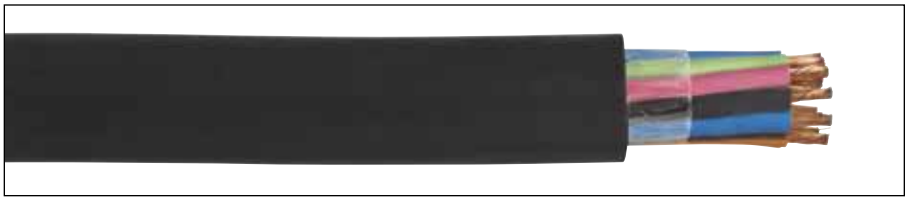
Packaging:
- 5- through 8-conductor available on 250' (76.2 m), 500' (152.4 m), and 1000' (304.8 m) reels
- 9+ cond. available on long-length reels
- Other put-ups available on special order

*Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF COND.	COLOR	TRACER	NO. OF COND.	COLOR	TRACER
1	Black	–	12	Black	White
2	White	–	13	Red	White
3	Red	–	14	Green	White
4	Green	–	15	Blue	White
5	Orange	–	16	Black	Red
6	Blue	–	17	White	Red
7	White	Black	18	Orange	Red
8	Red	Black	19	Blue	Red
9	Green	Black	20	Red	Green
10	Orange	Black	21	Orange	Green
11	Blue	Black			

Note: Colors repeat after 21 conductors. Refer to page 21 for color diagram.



TYPE S00W – 600 VOLT – UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)
				INCHES	mm	INCHES	mm		
09405	5	14	41/30	0.045	1.14	0.645	16.26	12.0	266
09406	6	14	41/30	0.045	1.14	0.710	18.03	12.0	313
09407	7	14	41/30	0.045	1.14	0.755	19.18	12.0	326
09408	8	14	41/30	0.045	1.14	0.810	20.57	10.5	366
09409*	9	14	41/30	0.045	1.14	0.860	21.84	10.5	419
09410	10	14	41/30	0.045	1.14	0.875	22.23	10.5	436
09412	12	14	41/30	0.045	1.14	0.900	22.86	7.5	516
09414	14	14	41/30	0.045	1.14	1.000	25.40	7.5	597
09416	16	14	41/30	0.045	1.14	1.030	26.16	7.5	658
09418*	18	14	41/30	0.045	1.14	1.100	27.94	7.5	720
09420	20	14	41/30	0.045	1.14	1.155	29.34	7.5	799
09424	24	14	41/30	0.045	1.14	1.260	32.00	6.7	998
09428*	28	14	41/30	0.045	1.14	1.330	33.78	6.7	1080
09430*	30	14	41/30	0.045	1.14	1.335	33.97	6.0	1146
09205	5	12	65/30	0.045	1.14	0.715	18.16	16.0	326
09206	6	12	65/30	0.045	1.14	0.740	18.80	16.0	362
09207	7	12	65/30	0.045	1.14	0.790	20.07	16.0	415
09208	8	12	65/30	0.045	1.14	0.825	20.96	14.0	464
09209	9	12	65/30	0.045	1.14	0.900	22.86	14.0	510
09210	10	12	65/30	0.045	1.14	0.950	24.13	14.0	602
09212	12	12	65/30	0.045	1.14	1.010	25.65	10.0	662
09214	14	12	65/30	0.045	1.14	1.020	25.91	10.0	724
09216	16	12	65/30	0.045	1.14	1.135	28.83	10.0	869
09218*	18	12	65/30	0.045	1.14	1.175	29.85	10.0	912
09220	20	12	65/30	0.045	1.14	1.175	29.84	10.0	977
09224	24	12	65/30	0.045	1.14	1.360	34.54	9.0	1236
09226	26	12	65/30	0.045	1.14	1.380	35.05	9.0	1309
09227*	27	12	65/30	0.045	1.14	1.390	35.30	9.0	1335
09228*	28	12	65/30	0.045	1.14	1.455	36.95	9.0	1375
09230	30	12	65/30	0.045	1.14	1.455	36.96	9.0	1512
09005	5	10	104/30	0.045	1.14	0.770	19.56	20.0	423
09006	6	10	104/30	0.045	1.14	0.875	22.23	20.0	508
09007	7	10	104/30	0.045	1.14	0.900	22.86	20.0	549
09008*	8	10	104/30	0.045	1.14	0.935	23.75	17.5	625
09010	10	10	104/30	0.045	1.14	1.020	25.91	17.5	755
09012	12	10	104/30	0.045	1.14	1.070	27.18	12.5	867
09016*	16	10	104/30	0.045	1.14	1.230	31.24	12.5	1142
09020*	20	10	104/30	0.045	1.14	1.325	33.66	12.5	1445

† Values shown are for current-carrying conductors. A grounding conductor, or one which carries only the unbalance current from other conductors, is NOT counted in determining current carrying capacity. Ampacities based on NEC Table 400.5(A)(1).

* Non-stock item; minimum quantity purchase required.

(S)Actual shipping weight may vary.

CAROL BRAND® UL® LISTED CSA Certified Canadian Standard Association MSHA Mine Safety and Health Administration RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Plastic Cord 3



Thermoplastic cord products have evolved into a product line where specialized, technologically advanced products are required to meet today's commercial and industrial applications.

No longer are plastic cord products used only in applications where oil resistance is needed; today typical applications require cord to perform well in environments of extreme heat and cold and on job sites and factory floors where resistance to oil, chemicals and abrasion is mandatory.

General Cable's role, as the producer of the premiere Carol® Brand plastic cord products, is to ensure that new product development, product innovation and quality not only keep pace with industry requirements but also set the trends.

Our plastic cord products carry a full range of listings and certifications with Underwriters Laboratories, Inc. and the Canadian Standard Association. In addition, many products meet or exceed the requirements of OSHA, MSHA and other relevant industry standards.

Carol is simply the most accepted brand in the industry, having proven itself on the job time after time. Our plastic cord line is the most comprehensive in the industry, ensuring that the proper Carol product can always be specified.

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Carol® Ultra Flex® Types SJEOOW/SEOOW

105°C, 300 and 600 Volt, UL/c(UL) Portable Cord



CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. PKG.
				INCHES	mm	INCHES	mm			
UL TYPE SJEOOW, c(UL) TYPE SJTOOW-TPE — 300 VOLT										
89002	2	18	16/30	0.030	0.76	0.293	7.44	10	45	250'
89003	3	18	16/30	0.030	0.76	0.310	7.87	10	55	250'
89004	4	18	16/30	0.030	0.76	0.340	8.64	7	65	250'
89012	2	16	26/30	0.030	0.76	0.319	8.10	13	55	250'
89013	3	16	26/30	0.030	0.76	0.338	8.59	13	70	250'
89014	4	16	26/30	0.030	0.76	0.372	9.45	10	85	250'
89022	2	14	41/30	0.030	0.76	0.351	8.92	18	75	250'
89023	3	14	41/30	0.030	0.76	0.372	9.45	18	90	250'
89024	4	14	41/30	0.030	0.76	0.410	10.41	15	115	250'
89032	2	12	65/30	0.030	0.76	0.419	10.64	25	90	250'
89033	3	12	65/30	0.030	0.76	0.443	11.25	25	130	250'
89034	4	12	65/30	0.030	0.76	0.486	12.34	20	170	250'
89042*	2	10	104/30	0.045	1.14	0.555	14.10	30	170	250'
89043*	3	10	104/30	0.045	1.14	0.587	14.91	30	210	250'
89044*	4	10	104/30	0.045	1.14	0.644	16.36	25	275	250'
UL TYPE SEOOW, c(UL) TYPE STOOW-TPE — 600 VOLT										
89052	2	18	16/30	0.030	0.76	0.355	9.02	10	55	250'
89053	3	18	16/30	0.030	0.76	0.372	9.45	10	70	250'
89054	4	18	16/30	0.030	0.76	0.402	10.21	7	85	250'
89062	2	16	26/30	0.030	0.76	0.381	9.68	13	75	250'
89063	3	16	26/30	0.030	0.76	0.400	10.16	13	85	250'
89064	4	16	26/30	0.030	0.76	0.434	11.02	10	105	250'
89065	5	16	26/30	0.030	0.76	0.511	12.98	8	120	250'
89072	2	14	41/30	0.045	1.14	0.515	13.08	18	140	250'
89073	3	14	41/30	0.045	1.14	0.541	13.74	18	150	250'
89074	4	14	41/30	0.045	1.14	0.589	14.96	15	185	250'
89075	5	14	41/30	0.045	1.14	0.669	16.99	12	230	250'
89082	2	12	65/30	0.045	1.14	0.585	14.86	25	175	250'
89083	3	12	65/30	0.045	1.14	0.614	15.60	25	195	250'
89084	4	12	65/30	0.045	1.14	0.665	16.89	20	245	250'
89085	5	12	65/30	0.045	1.14	0.718	18.24	16	295	250'
89092	2	10	104/30	0.045	1.14	0.629	15.98	30	220	250'
89093	3	10	104/30	0.045	1.14	0.661	16.79	30	260	250'
89094	4	10	104/30	0.045	1.14	0.718	18.24	25	305	250'
89095	5	10	104/30	0.045	1.14	0.777	19.74	20	385	250'
89883	3	8	133/29	0.060	1.52	0.868	22.05	40	415	250'
89884	4	8	133/29	0.060	1.52	0.971	24.66	35	545	250'
89663	3	6	133/27	0.060	1.52	1.000	25.40	55	585	250'
89664	4	6	133/27	0.060	1.52	1.110	28.19	45	750	250'

† Ampacities based on 90°C conductor and 30°C ambient temperature per Table 400.5(A)(1) of the National Electrical Code®.
* Non-stock item; minimum quantity purchase required.
(S) Actual shipping weight may vary.

Product Construction:

Conductors:
- 18 through 6 AWG fully annealed stranded bare copper

Insulation:
- Thermoplastic Elastomer
- Color code: See chart below

Jacket:
- Ultra Flex® Thermoplastic Elastomer, black, white or yellow
- Temperature range: -50°C to +105°C

Jacket Marking:
- Carol® Ultra Flex® SJEOOW - CAROL® ULTRA FLEX® (SIZE) (mm²) E11368-8 WATER RESISTANT (UL) SJEOOW c(UL) SJTOOW-TPE (-50°C) 105°C 300 V FT2 P-07-KA120010-MSHA - ROHS - MADE IN USA (DATE CODE) (TRU-MARK SEQUENTIAL FOOTAGE)
- Carol® Ultra Flex® SEOOW - CAROL® ULTRA FLEX® (SIZE) (mm²) E11368-8 WATER RESISTANT (UL) SEOOW c(UL) STOOW-TPE (-50°C) 105°C 600 V FT2 P-07-KA120010-MSHA - ROHS - MADE IN USA (DATE CODE) (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:

Indoor applications for:
- Portable power tools
- Industrial and consumer lighting fixtures
- Office equipment power supplies
- Construction site power
- Industrial and floor care equipment

Features:

- Lightweight
- Oil-resistant
- Very good flexibility
- Excellent molding characteristics
- Water-resistant*
- UL Listed and c(UL) Listed for indoor or outdoor use
- TRU-Mark® sequential footage marking

Industry Approvals:

- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- MSHA Approved
- RoHS Compliant

Packaging:

- 250' (76.2 m), 1000' (304.8 m) reels
- Packaged with TRU-Mark® precision

Other AWG sizes, conductor counts and put-ups available on special order.

* Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR**
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green
5	Black, White, Red, Green, Orange

** Green conductor for grounding only.

CAROL BRAND UL LISTED c UL LISTED MSHA Mine Safety and Health Administration RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Carol® Ultra Flex® Type SEOOW

105°C, 600 Volt, Non-UL Portable Cord

Product Construction:

Conductors:
- 8 through 2 AWG fully annealed stranded bare copper

Insulation:
- Thermoplastic Elastomer
- Color code: See chart below

Jacket:
- Ultra Flex® Thermoplastic Elastomer, black, white or yellow
- Temperature range: -50°C to +105°C

Jacket Marking:
- CAROL ULTRA FLEX® (NO. OF COND) (AWG) (mm^2) WATER RESISTANT SEOOW OR STOOW-TPE (-50°C) 105°C 600 V –– FT2 P-07-KA120010-MSHA – ROHS – MADE IN USA (DATE CODE) (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
Indoor applications for:
- Portable power tools
- Industrial and consumer lighting fixtures
- Office equipment power supplies
- Construction site power
- Industrial and floor care equipment

Features:
- Lightweight
- Oil-resistant
- Very good flexibility
- Excellent molding characteristics
- Water-resistant*
- Indoor or outdoor use (8-2 AWG)
- TRU-Mark® sequential footage marking

Industry Approvals:
- MSHA Approved
- RoHS Compliant

Packaging:
- 250' (76.2 m), 1000' (304.8 m) reels
- Packaged with TRU-Mark® precision

Other AWG sizes, conductor counts and put-ups available on special order.

*Suitable for immersion in water if properly sealed and terminated.



CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WT. LBS/M'(S)	STD. PKG.
				INCHES	mm	INCHES	mm			
NON-UL TYPE SEOOW - 600 VOLT										
89803	3	8	65/26	0.050	1.27	0.712	18.08	40	320	250'/1000'
89804	4	8	65/26	0.050	1.27	0.778	19.76	35	395	250'/1000'
89603	3	6	101/26	0.050	1.27	0.810	20.57	55	440	250'/1000'
89604	4	6	101/26	0.050	1.27	0.887	22.53	45	545	250'/1000'
89403	3	4	119/25	0.050	1.27	0.935	23.75	70	655	250'/1000'
89404	4	4	119/25	0.050	1.27	1.025	26.04	60	820	250'/1000'
89203	3	2	119/0.0223	0.050	1.27	1.158	29.41	95	985	250'/1000'
89204	4	2	119/0.0223	0.050	1.27	1.260	32.00	80	1245	250'/1000'

† Ampacities based on 90°C conductor and 30°C ambient temperature per Table 400.5(A)(1) of the National Electrical Code®.

(S) Actual shipping weight may vary.

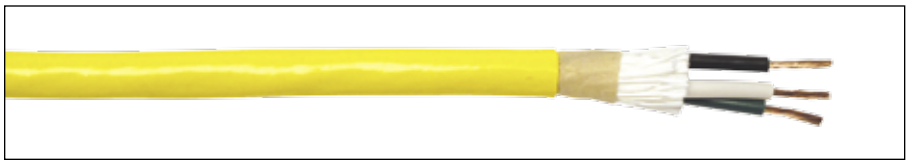
COLOR CODE CHART

NO. OF CONDUCTORS	COLOR**
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green

** Green conductor for grounding only.

Types SJTOW and STOW

90°C, 300 and 600 Volt, UL/CSA Portable Cord



TYPE SJTOW — 300 VOLT — UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WEIGHT LBS/M'(S)
				INCHES	mm	INCHES	mm		
86902*	2	18	16/30	0.030	0.76	0.290	7.37	10	42
86903*	3	18	16/30	0.030	0.76	0.305	7.75	10	54
86904*	4	18	16/30	0.030	0.76	0.335	8.51	7	65
86912*	2	16	26/30	0.030	0.76	0.315	8.00	13	57
86913	3	16	26/30	0.030	0.76	0.330	8.38	13	70
86914*	4	16	26/30	0.030	0.76	0.365	9.27	10	86
86922*	2	14	41/30	0.030	0.76	0.345	8.76	18	67
86923	3	14	41/30	0.030	0.76	0.365	9.27	18	92
86924	4	14	41/30	0.030	0.76	0.415	10.54	15	114
86932*	2	12	65/30	0.030	0.76	0.410	10.44	25	95
86933	3	12	65/30	0.030	0.76	0.430	10.92	25	132
86934*	4	12	65/30	0.030	0.76	0.485	12.32	20	167

TYPE STOW — 600 VOLT — UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WEIGHT LBS/M'(S)
				INCHES	mm	INCHES	mm		
86952*	2	18	16/30	0.030	0.76	0.350	8.89	10	60
86953	3	18	16/30	0.030	0.76	0.365	9.27	10	72
86954*	4	18	16/30	0.030	0.76	0.395	10.03	7	85
86962*	2	16	26/30	0.030	0.76	0.375	9.58	13	76
86963	3	16	26/30	0.030	0.76	0.395	10.08	13	90
86964	4	16	26/30	0.030	0.76	0.425	10.80	10	107
86972*	2	14	41/30	0.045	1.14	0.505	12.83	18	120
86973	3	14	41/30	0.045	1.14	0.535	13.59	18	156
86974	4	14	41/30	0.045	1.14	0.585	14.86	15	184
86982*	2	12	65/30	0.045	1.14	0.585	14.86	25	165
86983	3	12	65/30	0.045	1.14	0.615	15.62	25	208
86984*	4	12	65/30	0.045	1.14	0.665	16.89	20	254

* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S) Actual shipping weight may vary.

Product Construction:

Conductors:
- 18 through 12 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded PVC
- Color code: See chart below

Jacket:
- Polyvinylchloride (PVC), gray or yellow
- Temperature range: -40°C to +90°C
- Voltage rating:
  300 volts Type SJTOW
  600 volts Type STOW

Jacket Marking:
- CAROL SJTOW -
  CAROL (SIZE) (mm²) 90°C (UL) E11368-8
  WATER RESISTANT SJTOW CSA LL69381
  (-40°C) FT2 ROHS MADE IN USA 300 V
- CAROL STOW -
  CAROL (SIZE) (mm²) 90°C (UL) E11368-8
  WATER RESISTANT STOW CSA LL69381
  (-40°C) FT2 ROHS MADE IN USA 600 V

Applications:
- Portable tools
- Motors
- Floor maintenance equipment
- Hospital equipment
- Sound equipment
- Washing machines
- Portable lights
- Lamps and similar equipment

Features:
- Oil- and water-resistant* jacket
- Resists:
  – Oils
  – Water
  – Acids
  – Alkalies
- Ozone-, sunlight (UV)- and weather-resistant
- UL Listed and CSA Certified for indoor and outdoor use

Industry Approvals:
- UL Flexible Cord - UL 62
- CSA Flexible Cord - C22.2-49
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), and 1000' (304.8 m)
- Other sizes and put-ups available on special order

* Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Red, General Cable

CAROL BRAND UL LISTED CSA RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Type SVT

60°C, 300 Volt, UL/CSA Portable Cord

Product Construction:

Conductors:
- 18 AWG annealed stranded bare copper

Insulation:
- Premium-grade, color-coded PVC
- Color code: See chart below

Jacket:
- Polyvinylchloride (PVC)
- Colors available: black, white, gray
- Temperature range: -20°C to +60°C
- Ribbed jacket

Jacket Marking:
- (SIZE) (mm^2) 60°C SVT (UL) E# --- CSA LL# FT2 ROHS MADE IN USA 300 V

Applications:
- Vacuum cleaners
- Food mixers
- Office equipment

Features:
- Resists:
  - Acids
  - Alkalies
  - Ozone

Industry Approvals:
- UL Listed
- CSA Certified
- RoHS Compliant

Packaging:
- 250' (76.2 m)
- Other sizes and put-ups available on special order

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green



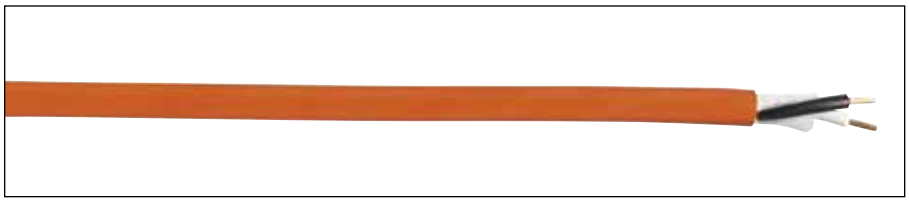
TYPE SVT — 300 VOLT — UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WEIGHT LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
86002	2	18	41/34	0.015	0.38	0.235	5.97	10	35	1000'
86003	3	18	41/34	0.015	0.38	0.240	6.10	10	40	1000'

† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S) Actual shipping weight may vary.

Type SJT

60°C, 300 Volt, UL/CSA Portable Cord



TYPE SJT — 300 VOLT — UL

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WEIGHT LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
86012*	2	18	16/30	0.030	0.76	0.285	7.24	10	45	1000'
86013	3	18	16/30	0.030	0.76	0.305	7.75	10	55	1000'
86022	2	16	26/30	0.030	0.76	0.315	8.00	13	50	1000'
86023	3	16	26/30	0.030	0.76	0.335	8.51	13	70	250'
86333	3	14	41/30	0.030	0.76	0.365	9.27	18	85	250'
86343	3	12	65/30	0.030	0.76	0.440	11.18	25	130	250'

* Non-stock item; minimum quantity purchase required.
** 600 Volt Type ST also available on special order.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S) Actual shipping weight may vary.

Product Construction:

Conductors:
- 18 through 12 AWG annealed stranded bare copper

Insulation:
- Premium-grade, color-coded PVC
- Color code: See chart below

Jacket:
- Polyvinylchloride (PVC)
  18 and 16 AWG - black only
  14 and 12 AWG - orange only
- Temperature range: -20°C to +60°C

Jacket Marking:
- (NO. COND) (SIZE) (mm^2) 60°C SJT E# (UL) --- CSA LL# FT2 ROHS MADE IN USA 300 V

Applications:
- Portable tools
- Motors
- Portable lights
- Lamps

Features:
- Resists:
  - Acids
  - Alkalies
  - Ozone

Industry Approvals:
- UL Listed
- CSA Certified
- RoHS Compliant

Packaging:
- 250' (76.2 m)
- Other sizes and put-ups available on special order

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green

Type SJT

105°C, 300 Volt, UL/CSA Portable Cord

Product Construction:

Conductors:
- 18 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded PVC
- Color code: See chart below

Jacket:
- Polyvinylchloride (PVC), white
- Temperature range: -20°C to +105°C

Jacket Marking:
- (SIZE) (mm^2) 105°C SJT E# (UL) --- CSA LL# FT2 ROHS MADE IN USA 300 V

Applications:
- For use in most hospital equipment

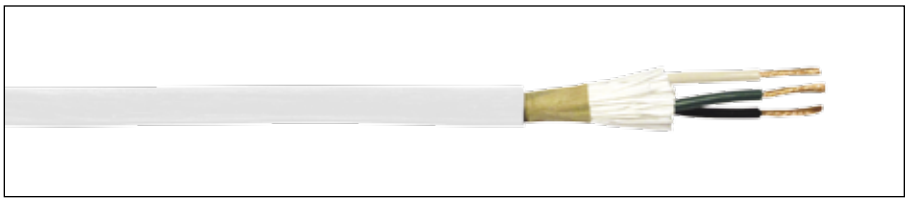
Features:
- Resists:
  - Acids
  - Alkalies
  - Ozone

Industry Approvals:
- UL Listed
- CSA Certified
- RoHS Compliant

Packaging:
- 250' (76.2 m)
- Other sizes and put-ups available on special order

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green



TYPE SJT — 300 VOLT — UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WEIGHT LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
86112*	2	18	16/30	0.030	0.76	0.285	7.24	10	45	1000'
86113	3	18	16/30	0.030	0.76	0.310	7.87	10	55	1000'

* Non-stock item; minimum quantity purchase required.
† Green conductor for grounding only. Ampacities based on NEC Table 400.5(A)(1).
(S) Actual shipping weight may vary.

Bus Drop Cable

60°C, 600 Volt, UL Listed



BUS DROP CABLE — 600 VOLT — UL

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS†	APPROX. NET WEIGHT LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
03714	3	14	19	0.030	0.76	0.400	10.16	15	120	250'
03712	3	12	19	0.030	0.76	0.425	10.80	20	150	250'
03710	3	10	19	0.030	0.76	0.485	12.32	25	225	250'
03708	3	8	19	0.045	1.14	0.625	15.88	35	370	250'
03706	3	6	19	0.060	1.52	0.770	19.56	45	600	250'
03704	3	4	19	0.060	1.52	0.950	24.13	60	751	250'
03702	3	2	133	0.060	1.52	1.145	29.08	80	1097	250'

† Ampacities based on NEC Table 400.5(A)(1).
(S) Actual shipping weight may vary.

Product Construction:

Conductors:
- 14 through 2 AWG annealed stranded bare copper per ASTM B8

Insulation:
- Premium-grade, color-coded Polyvinylchloride (PVC)
- Color code: black, white, red

Jacket:
- Polyvinylchloride (PVC) jacket, gray
- Temperature range: -20°C to +60°C

Jacket Marking:
- (SIZE) BUS DROP CABLE 600 V E# (UL)

Applications:
- As branches from busways per NEC
- Connection of stationary equipment to facilitate relocation of equipment

Features:
- One uninsulated ground conductor per interstice (3 ground conductors total)
- Resistant to oils, lubricants, water, acids, alkalies, ozone and abrasion

Industry Approvals:
- UL Listed
- RoHS Compliant

Packaging:
- 250' reel (76.2 m) as standard
- 500' (152.4 m) and 1000' (304.8 m) reels also available
- Other put-ups available on special order

CAROL BRAND UL LISTED RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Thermostat Wire

105ºC, 150 Volt, UL Type CL2

Product Construction:

Conductors:
- 20 and 18 AWG annealed solid bare copper per ASTM B3

Insulation:
- Premium-grade, color-coded PVC
- Color code: See chart below

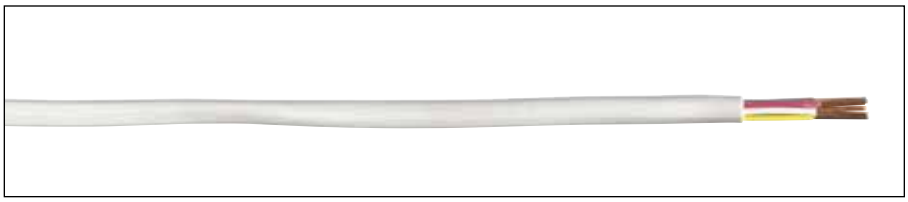
Jacket:
- Polyvinylchloride (PVC), white or brown
- Temperature range: -20ºC to +105ºC

Jacket Marking:
- CAROL AWG TYPE CL2 E# (UL) 105ºC SUNLIGHT RESISTANT - MADE IN USA

Applications:
- Thermostat control
- Heating and air conditioning installations
- Touch-plate systems
- Burglar alarms
- Intercom systems
- Door bells
- Annunciator and bell systems
- Remote control units
- Signal systems
- Other low-voltage installations

Industry Approvals:
- UL Listed Type CL2
- RoHS Compliant

Packaging:
- 4- through 10-conductor available on 250' (76.2 m) spools
- 2- and 3-conductor available on 500' (152.4 m) spools
- Other put-ups available on special order



20 AWG THERMOSTAT WIRE — 150 VOLT — UL TYPE CL2

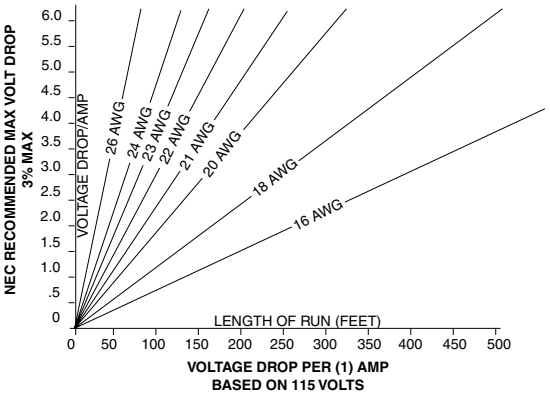
CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		APPROX. NET WEIGHT LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm		
05482	2	20	Solid	0.008	0.203	0.126	3.20	11	1000'
05483	3	20	Solid	0.008	0.203	0.133	3.38	16	1000'
05484	4	20	Solid	0.008	0.203	0.142	3.61	19	500'
05485	5	20	Solid	0.008	0.203	0.160	4.06	24	500'
05486	6	20	Solid	0.008	0.203	0.175	4.45	27	500'
05487	7	20	Solid	0.008	0.203	0.175	4.45	31	500'
05488	8	20	Solid	0.008	0.203	0.189	4.80	35	500'
05489*	9	20	Solid	0.008	0.203	0.204	5.18	40	500'
05481*	10	20	Solid	0.008	0.203	0.222	5.64	45	250'

18 AWG THERMOSTAT WIRE — 150 VOLT — UL TYPE CL2

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		APPROX. NET WEIGHT LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm		
05582	2	18	Solid	0.008	0.203	0.142	3.61	16	1000'
05583	3	18	Solid	0.008	0.203	0.150	3.81	22	1000'
05584	4	18	Solid	0.008	0.203	0.165	4.19	28	500'
05585	5	18	Solid	0.008	0.203	0.181	4.60	36	500'
05586	6	18	Solid	0.008	0.203	0.208	5.28	42	500'
05587	7	18	Solid	0.008	0.203	0.208	5.28	48	500'
05588	8	18	Solid	0.008	0.203	0.225	5.72	54	500'
05589*	9	18	Solid	0.008	0.203	0.243	6.17	61	500'
05581	10	18	Solid	0.008	0.203	0.264	6.71	69	250'

(S) Actual shipping weight may vary.

APPROXIMATE VOLTAGE DROP/AMP AT 68ºF



COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	White, Red
3	White, Red, Green
4	White, Red, Green, Blue
5	White, Red, Green, Blue, Yellow
6	White, Red, Green, Blue, Yellow, Brown
7	White, Red, Green, Blue, Yellow, Brown, Orange
8	White, Red, Green, Blue, Yellow, Brown, Orange, Black
9	White, Red, Green, Blue, Yellow, Brown, Orange, Black, Purple
10	White, Red, Green, Blue, Yellow, Brown, Orange, Black, Purple, Gray

General Cable

Made in U.S.A.

RoHS Compliant Directive 2011/65/EU

UL LISTED

CAROL BRAND

Thermostat Wire

60°C, 30 Volt, CSA Type LVT



18 AWG THERMOSTAT WIRE — 30 VOLT — CSA TYPE LVT

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		APPROX. NET WEIGHT LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm		
05092	2	18	Solid	0.016	0.41	0.210	5.33	25	2000'
05093*	3	18	Solid	0.016	0.41	0.220	5.59	33	500'
05094	4	18	Solid	0.016	0.41	0.242	6.15	41	1000'
05095	5	18	Solid	0.016	0.41	0.262	6.65	50	1000'
05096*	6	18	Solid	0.016	0.41	0.280	7.11	60	1000'
05097*	7	18	Solid	0.016	0.41	0.285	7.24	65	1000'
05098	8	18	Solid	0.016	0.41	0.304	7.75	74	1000'
05099*	9	18	Solid	0.016	0.41	0.328	8.33	83	1000'
05091*	10	18	Solid	0.016	0.41	0.360	9.14	92	250'

* Non-stock item; minimum quantity purchase required.
(S) Actual shipping weight may vary.

Product Construction:

Conductors:
- 18 AWG annealed solid bare copper per ASTM B3

Insulation:
- Premium-grade, color-coded PVC
- Color code: See chart below

Jacket:
- Polyvinylchloride (PVC), brown
- Temperature range: -20°C to +60°C

Jacket Marking:
- CAROL (SIZE) CSA LL# TYPE LVT FT4

Applications:
- Thermostat control
- Heating and air conditioning installations
- Touch-plate systems
- Burglar alarms
- Intercom systems
- Door bells
- Annunciator and bell systems
- Remote control units
- Signal systems
- Other low-voltage installations

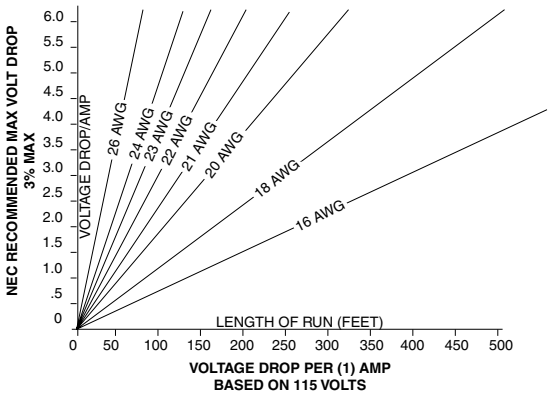
Industry Approvals:
- CSA Type LVT
- RoHS Compliant

Packaging:
- 4- through 10-conductor available on 250' (76.2 m) spools
- 2- and 3-conductor available on 500' (152.4 m) spools
- Other put-ups available on special order

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	White, Red
3	White, Red, Green
4	White, Red, Green, Blue
5	White, Red, Green, Blue, Yellow
6	White, Red, Green, Blue, Yellow, Brown
7	White, Red, Green, Blue, Yellow, Brown, Orange
8	White, Red, Green, Blue, Yellow, Brown, Orange, Black
9	White, Red, Green, Blue, Yellow, Brown, Orange, Black, Purple
10	White, Red, Green, Blue, Yellow, Brown, Orange, Black, Purple, Gray

APPROXIMATE VOLTAGE DROP/AMP AT 68°F



Thermostat Wire, Unjacketed

60ºC, Low-Voltage and Intercom Cable

Product Construction:

Conductors:
- 20 AWG annealed solid bare copper per ASTM B3

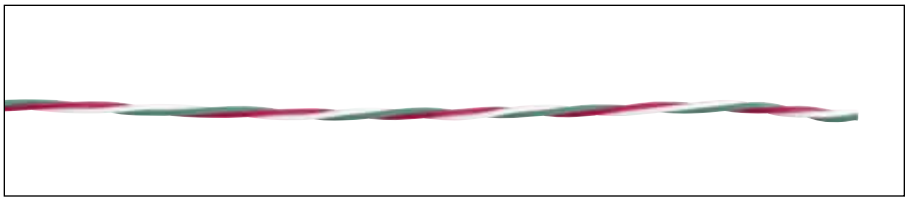
Insulation:
- Premium-grade, color-coded PVC
- Temperature range: -20ºC to +60ºC
- Color code: See chart below

Jacket:
- This product is unjacketed

Applications:
- Thermostat control
- Heating and air conditioning installations
- Touch-plate systems
- Burglar alarms
- Intercom systems
- Door bells
- Annunciator and bell systems
- Remote control units
- Signal systems
- Other low-voltage installations

Packaging:
- 4- through 8-conductor available on 250' (76.2 m) spools
- 2- and 3-conductor available on 500' (152.4 m) spools
- Other put-ups available on special order

Industry Approvals:
- RoHS Compliant



20 AWG — TWISTED CONDUCTORS — NO JACKET

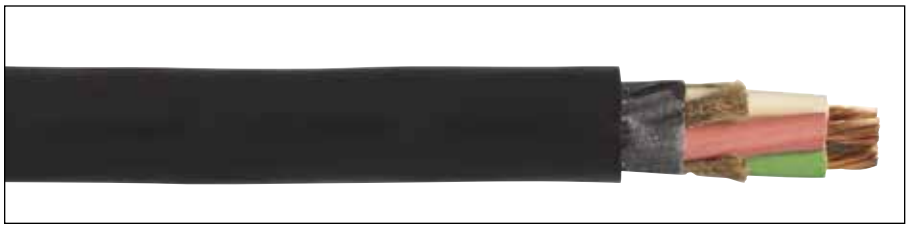
CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		APPROX. NET WEIGHT LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm		
05782	2	20	Solid	0.008	0.203	0.096	2.44	7.5	4000'
05783	3	20	Solid	0.008	0.203	0.104	2.64	11.0	2000'
05784*	4	20	Solid	0.008	0.203	0.116	2.95	15.0	2000'
05785*	5	20	Solid	0.008	0.203	0.130	3.30	18.5	1000'
05786*	6	20	Solid	0.008	0.203	0.144	3.66	22.0	1000'
05788*	8	20	Solid	0.008	0.203	0.159	4.04	30.0	1000'

* Non-stock item; minimum quantity purchase required.
(S) Actual shipping weight may vary.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
2	White, Red
3	White, Red, Green
4	White, Red, Green, Blue
5	White, Red, Green, Blue, Yellow
6	White, Red, Green, Blue, Yellow, Brown
8	White, Red, Green, Blue, Yellow, Brown, Orange, Black

Industrial Cord 4



No longer are industrial cord products used only in coal mines and industrial plants; today typical applications include providing temporary power to job sites, as well as flexible power leads for installation in conduit.

General Cable's role, as the producer of the premiere Carol® Brand industrial cord products, is to ensure that new product development, product innovation and quality not only keep pace with industry requirements but also set the trends.

Our industrial cord products carry a full range of listings and certifications with Underwriters Laboratories, Inc. and the Canadian Standard Association. In addition, many products meet or exceed the requirements of UL, CSA, OSHA, MSHA, ICEA and other relevant industry standards.

Carol is simply the most accepted brand in the industry, having proven itself on the job time after time. Our industrial cord line is the most comprehensive in the industry, ensuring that the proper Carol product can always be specified.

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Super Vu-Tron® Canadian Type G-GC Round 38

Carol® Double Jacket Drill Cord 39

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Super Vu-Tron® Single Conductor

90ºC (UL), Type W, 2000 Volt and Types RHH/RHW 600 Volt Portable Power Cable

Product Construction:

Conductor:
- 8 AWG through 500 kcmil fully annealed stranded bare copper

Insulation:
- Premium-grade 90ºC EPDM

Jacket:
- Super Vu-Tron® 90ºC, black
- Temperature range: -40°C to +90°C
- Voltage rating:
  600 volts Type RHH/RHW
  2000 volts Type W
- An open polyester braid reinforcement is applied between the insulation and jacket for mechanical strength

Jacket Marking:
- 8-1 AWG: CAROL SUPER VU-TRON® TYPE W PORTABLE POWER CABLE (UL) DRY 90°C WET 75°C 2000 V SUNLIGHT RESISTANT P-7K-123049-MSHA (SIZE) TYPE RHH OR RHW (UL) 600 V MADE IN USA
- 1/0-500 kcmil: CAROL SUPER VU-TRON® TYPE W PORTABLE POWER CABLE (UL) DRY 90°C WET 75°C 2000 V SUNLIGHT RESISTANT P-7K-123049-MSHA (SIZE) TYPE RHH OR RHW (UL) 600 V FOR CT USE --- CSA TYPE W (-40°C) 2 KV FT5 MADE IN USA

Applications:
- Portable power systems
- Entertainment industry activities such as theatre, television, night clubs, motion pictures, mobile communication vans, spotlights and sound systems
- Other similar applications that would require permanent or temporary power
- Permanent wiring of 600 volt power supplies, hoists, cranes and other applications where flexible power leads must be installed in conduit or raceways

Features:
- Water-resistant*
- Sunlight-resistant
- Designed to withstand severe environmental conditions
- Withstands exposure to oil, acids, alkalies, heat, flame, moisture and chemicals
- Meets or exceeds flame test requirements of MSHA and UL

Industry Approvals:
- UL Type W
- UL Type RHH or RHW
- MSHA Approved
- RoHS Compliant

Packaging:
- Lengths cut to order

*Suitable for immersion in water if properly sealed and terminated.



TYPE W 2000 VOLT (UL) AND TYPE RHH/RHW 600 VOLT (UL)

CATALOG NUMBER	NO. OF COND.	AWG OR kcmil	COND. STRAND	NOMINAL COND. O.D.		NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS		APPROX. NET WT. LBS/ M[1(S)]
				INCHES	mm	INCHES	mm	INCHES	mm	(1)	(2)	
83008*	1	8	133	0.160	4.06	0.060	1.52	0.470	11.94	55	80	145
83006	1	6	259	0.198	5.03	0.060	1.52	0.545	13.84	75	105	205
83004	1	4	259	0.245	6.22	0.060	1.52	0.595	15.11	95	140	270
83002	1	2	259	0.294	7.47	0.060	1.52	0.670	17.02	130	190	380
83001	1	1	259	0.346	8.79	0.080	2.03	0.730	18.54	150	220	465
83010	1	1/0†	259	0.384	9.75	0.080	2.03	0.790	20.07	170	260	550
83020	1	2/0†	259	0.441	11.20	0.080	2.03	0.865	21.97	195	300	675
83030	1	3/0†	259	0.482	12.24	0.080	2.03	0.910	23.11	225	350	790
83040	1	4/0†	259	0.555	14.10	0.080	2.03	0.960	24.38	260	405	940
83250	1	250†	627	0.615	15.62	0.105	2.67	1.045	26.54	290	455	1125
83350	1	350†	855	0.725	18.42	0.105	2.67	1.145	29.08	350	570	1465
83500	1	500†	1235	0.880	22.35	0.105	2.67	1.315	33.40	430	700	2010

* Non-stock item; minimum quantity purchase required.

(1) Ampacities based on 90°C conductor and 30°C ambient temperature based on Table 310.15(B)(16) in the National Electrical Code® for RHH/RHW with not more than three current-carrying conductors in raceway, cable or earth.

(2) Ampacities based on 90°C conductor and 30°C ambient temperature based on Table 310.15(B)(17) and Table 400.5(A)(2) in the National Electrical Code® for single-conductor cables.

(S) Actual shipping weight may vary.

† Designated for CT use.

General Cable

Made in U.S.A.

RoHS Compliant Directive 2011/65/EU

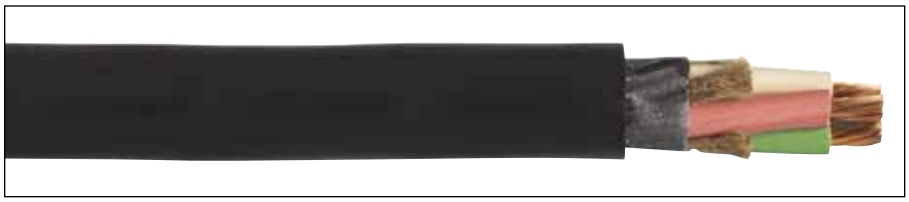
MSHA Mine Safety and Health Administration

UL LISTED

CAROL BRAND

Super Vu-Tron® Multi-Conductor Type W Round

90°C (UL), Type W, 2000 Volt Portable Power Cable



CATALOG NUMBER	NO. OF COND.	AWG OR kcmil	COND. STRAND	NOMINAL COND. O.D.		NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS(1)	APPROX. NET WT. LBS/M'(S)
				INCHES	mm	INCHES	mm	INCHES	mm		
2 CONDUCTOR – TYPE W – 2000 VOLT											
81312	2	8	133	0.160	4.06	0.060	1.52	0.770	19.56	74	325
81622	2	6	259	0.198	5.03	0.060	1.52	0.910	23.11	99	470
81642	2	4	259	0.245	6.22	0.060	1.52	1.020	25.91	130	620
81662	2	2	259	0.297	7.54	0.080	2.03	1.210	30.73	174	935
81372*	2	1	259	0.353	8.97	0.080	2.03	1.370	34.80	202	1305
81382*	2	1/0	259	0.385	9.78	0.080	2.03	1.435	36.45	234	1555
81392*	2	2/0	259	0.442	11.23	0.080	2.03	1.555	39.50	271	1860
81402*	2	3/0	259	0.480	12.19	0.080	2.03	1.670	42.42	313	2230
81412*	2	4/0	259	0.555	14.10	0.080	2.03	1.815	46.10	361	2655
3 CONDUCTOR – TYPE W – 2000 VOLT											
81313	3	8	133	0.160	4.06	0.060	1.52	0.945	24.00	74	470
81623	3	6	259	0.198	5.03	0.060	1.52	1.020	25.91	99	625
81643	3	4	259	0.245	6.22	0.060	1.52	1.135	28.83	130	810
81663	3	2	259	0.297	7.54	0.080	2.03	1.345	34.16	174	1190
81373*	3	1	259	0.353	8.97	0.080	2.03	1.455	36.96	202	1655
81383	3	1/0	259	0.385	9.78	0.080	2.03	1.585	40.26	234	1965
81393	3	2/0	259	0.442	11.23	0.080	2.03	1.675	42.55	271	2350
81403*	3	3/0	259	0.480	12.19	0.080	2.03	1.815	46.10	313	2890
81413*	3	4/0	259	0.555	14.10	0.080	2.03	1.950	49.53	361	3285
81423*	3	250	627	0.615	15.62	0.095	2.41	2.390	60.71	402	5070
81443*	3	350	855	0.725	18.42	0.095	2.41	2.680	68.07	495	6570
81473*	3	500	1235	0.880	22.35	0.095	2.41	3.030	76.96	613	8700
4 CONDUCTOR – TYPE W – 2000 VOLT											
81314	4	8	133	0.160	4.06	0.060	1.52	0.980	24.89	65	615
81624	4	6	259	0.198	5.03	0.060	1.52	1.070	27.18	87	800
81644	4	4	259	0.245	6.22	0.060	1.52	1.210	30.73	114	1040
81664	4	2	259	0.297	7.54	0.080	2.03	1.435	36.45	152	1580
81374	4	1	259	0.353	8.97	0.080	2.03	1.595	40.51	177	2045
81384	4	1/0	259	0.385	9.78	0.080	2.03	1.705	43.31	205	2430
81394	4	2/0	259	0.442	11.23	0.080	2.03	1.845	46.86	237	2950
81404	4	3/0	259	0.480	12.19	0.080	2.03	1.965	49.91	274	3430
81414	4	4/0	259	0.555	14.10	0.080	2.03	2.145	54.48	316	3885
5 CONDUCTOR – TYPE W – 2000 VOLT											
81315	5	8	133	0.160	4.06	0.060	1.52	1.030	26.16	52	650
81625	5	6	259	0.198	5.03	0.060	1.52	1.170	29.72	69	915
81645	5	4	259	0.245	6.22	0.060	1.52	1.360	34.54	91	1320
81665	5	2	259	0.297	7.54	0.080	2.03	1.595	40.51	121	1925
81375*	5	1	259	0.353	8.97	0.080	2.03	1.820	46.23	141	2675
81385	5	1/0	259	0.385	9.78	0.080	2.03	1.900	48.26	164	2885
81395*	5	2/0	259	0.442	11.23	0.080	2.03	2.060	52.32	189	3630
81405*	5	3/0	259	0.480	12.19	0.080	2.03	2.260	57.40	219	4900
81415*	5	4/0	259	0.555	14.10	0.080	2.03	2.460	62.48	252	5980

(1) Ampacities based on 90°C conductor and 30°C ambient temperature per Table 400.5(A)(2) of the National Electrical Code®.
* Non-stock item; minimum quantity purchase required.
** Green conductor for grounding only.
(S) Actual shipping weight may vary.

Product Construction:

Conductor:
- 8 AWG through 500 kcmil fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below

Jacket:
- Super Vu-Tron® 90°C, black
- Temperature range: -40°C to +90°C

Jacket Marking:
- SIZES SMALLER THAN 2-1/4" – CAROL SUPER VU-TRON® (SIZE) TYPE W PORTABLE POWER CABLE (UL) 2000 V DRY 90°C WET 75°C SUN RES P-7K-123049-MSHA---CSA TYPE W (-40°C) 2 KV FT5 MADE IN USA
- SIZES 2-1/4" AND LARGER – (SIZE) TYPE W CAROL SUPER VU-TRON® 90°C DRY AND WATER RESISTANT 75°C 2000 V SUN RES (UL) P-7K-123049 MSHA LR27161 MADE IN USA

Applications:
- Industrial and light- to medium-duty mining applications
- Heavy-duty service as power supply cable
- AC systems (grounded and ungrounded)
- Mobile and portable electrical equipment
- Motor and battery leads
- 2-conductor cables—use on DC or AC single-phase systems where grounding is not required
- 3-conductor cables—use on AC systems where no grounding is required or on DC systems with one conductor for grounding
- 4-conductor cables—use on two- or three-phase AC systems with one conductor used for grounding
- 5-conductor cables—use in applications where separating the system neutral from the frame ground is required

Features:
- Withstands severe environmental conditions
- Suitable for immersion in water*
- Indent-printed for easy identification
- Withstands exposure to oil, acids, alkalies, heat, moisture and most chemicals
- Rope lay stranding for maximum flex life
- Excellent impact resistance
- Cable core bound for superior flexibility and toughness
- Sunlight-resistant

Industry Approvals:
- CSA Type W
- MSHA Approved
- UL Type W
- RoHS Compliant

Packaging:
- Lengths cut to order

* Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR**
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green
5	Black, White, Red, Green, Orange

CAROL BRAND · UL LISTED · CSA Certified Canadian Standard Association · MSHA Mine Safety and Health Administration · RoHS Compliant Directive 2011/65/EU · Made in U.S.A. · General Cable

Super Vu-Tron® Type G and Type G-GC Round

90°C (UL), 2000 Volt Portable Power Cable

Product Construction:

Conductor:
- 8 AWG through 500 kcmil fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below
- Insulated grounds and ground checks

Jacket:
- Super Vu-Tron® 90°C, black
- Temperature range: -40°C to +90°C

Jacket Marking:
- TYPE G-GC (4/0 AND SMALLER) – CAROL SUPER VU-TRON® SIZE (mm²) TYPE G-GC PORTABLE POWER CABLE (UL) 2000 V DRY 90°C WET 75°C SUN RES P-7K-123049-MSHA --- CSA TYPE G-CG (-40°C) 2 KV FT5 MADE IN USA
- TYPE G-GC (LARGER THAN 4/0) - (SIZE) TYPE G-GC CAROL SUPER VU-TRON® 90°C DRY AND WATER RESISTANT 75°C 2000 V SUN RES (UL) P-7K-123049 MSHA LR27161 MADE IN USA
- TYPE G - CAROL SUPER VU-TRON® SIZE (mm²) TYPE G PORTABLE POWER CABLE (UL) 600/2000 V DRY 90°C WET 75°C SUN RES P-7K-123049 MHSA --- CSA TYPE G (-40°C) 2 KV FT5 MADE IN USA

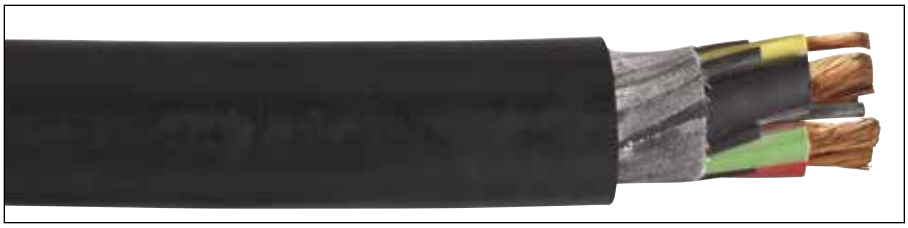
Applications:
- Industrial and light- to medium-duty mining applications
- Heavy-duty service as power supply cable
- Mobile and portable electrical equipment
- 3- and 4-conductor—use on three-phase AC systems where grounding is required

Features:
- Excellent impact and abrasion resistance
- Withstands exposure to oil, acids, alkalies, heat, moisture and most chemicals
- Suitable for immersion in water*
- Indent-printed for easy identification
- Rope lay stranding for maximum flex life
- Cable core bound for superior flexibility and toughness
- Non-wicking rubber fillers (G-GC)
- Canadian color code available upon request
- Sunlight-resistant

Industry Approvals:
- UL Type G, G-GC
- CSA
- MSHA Approved
- RoHS Compliant

Packaging:
- Lengths cut to order

*Suitable for immersion in water if properly sealed and terminated.



3 CONDUCTOR – TYPE G-GC – 2000 VOLT

CATALOG NUMBER	NO. OF COND.	AWG OR kcmil	COND. STRAND	NOMINAL COND. O.D. INCHES	NOMINAL COND. O.D. mm	YELLOW GROUND CHECK AWG SIZE	GREEN GROUND COND. AWG SIZE	NOMINAL INS. THICKNESS INCHES	NOMINAL INS. THICKNESS mm	NOMINAL O.D. INCHES	NOMINAL O.D. mm	CURR. AMPS(1)	APPROX. NET WT. LBS/M*(S)
82313	3	8	133	0.160	4.06	10	2#10	0.060	1.52	0.965	24.51	65	600
82623	3	6	259	0.198	5.03	10	2#10	0.060	1.52	1.025	26.04	87	770
82643	3	4	259	0.245	6.22	10	2#8	0.060	1.52	1.130	28.70	114	1015
82663	3	2	259	0.297	7.54	8	2#7	0.080	2.03	1.345	34.16	152	1480
82373	3	1	259	0.353	8.97	8	2#6	0.080	2.03	1.455	36.96	177	1795
82383	3	1/0	259	0.385	9.78	8	2#5	0.080	2.03	1.585	40.26	205	2245
82393	3	2/0	259	0.442	11.23	8	2#4	0.080	2.03	1.675	42.55	237	2570
82403	3	3/0	259	0.480	12.19	8	2#3	0.080	2.03	1.810	45.97	274	3230
82413	3	4/0	259	0.555	14.10	8	2#2	0.080	2.03	1.950	49.53	316	3700
82423(2)*	3	250	627	0.615	15.62	8	2#2	0.095	2.41	2.390	60.71	352	6060
82443(2)*	3	350	855	0.725	18.42	8	2#1/0	0.095	2.41	2.680	68.07	433	7400
82473(2)*	3	500	1235	0.880	22.35	8	2#2/0	0.095	2.41	3.030	76.96	536	10100

4 CONDUCTOR – TYPE G – 600/2000 VOLT

CATALOG NUMBER	NO. OF COND.	AWG OR kcmil	COND. STRAND	NOMINAL COND. O.D. INCHES	NOMINAL COND. O.D. mm	GREEN COND. AWG SIZE	NOMINAL INS. THICKNESS INCHES	NOMINAL INS. THICKNESS mm	NOMINAL O.D. INCHES	NOMINAL O.D. mm	CURRENT AMPS(1)	APPROX. NET WT. LBS/M*(S)
82314	4	8	133	0.160	4.06	4#12	0.060	1.52	1.045	26.54	52	690
82624	4	6	259	0.198	5.03	4#12	0.060	1.52	1.125	28.58	70	880
82644	4	4	259	0.245	6.22	4#10	0.060	1.52	1.225	31.12	91	1160
82664	4	2	259	0.297	7.54	4#9	0.080	2.03	1.435	36.45	122	1720
82374*	4	1	259	0.353	8.97	4#8	0.080	2.03	1.590	40.39	142	2200
82384	4	1/0	259	0.385	9.78	4#7	0.080	2.03	1.730	43.94	164	2705
82394	4	2/0	259	0.442	11.23	4#6	0.080	2.03	1.855	47.12	190	3190
82404	4	3/0	259	0.480	12.19	4#5	0.080	2.03	2.040	51.82	219	4005
82414	4	4/0	259	0.555	14.10	4#4	0.080	2.03	2.145	54.48	253	4560

(1) Ampacities based on 90°C conductor and 30°C ambient temperature per Table 400.5(A)(2) of the National Electrical Code®.
(2) UL Listed and CSA Certified.
* Non-stock item; minimum quantity purchase required.
(S) Actual shipping weight may vary.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
3	Black, White, Red
4	Black, White, Red, Orange

General Cable

Made in U.S.A.

RoHS Compliant Directive 2011/65/EU

MSHA Mine Safety and Health Administration

Certified Canadian Standard Association

UL LISTED

CAROL BRAND

Super Vu-Tron® Canadian Type G-GC Round

90°C, 2000 Volt Portable Power Cable



3 CONDUCTOR – TYPE G-GC – 2000 VOLT

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL COND. O.D.		YELLOW GROUND CHECK AWG SIZE	GROUND COND. AWG SIZE	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURR. AMPS(1)	APPROX. NET WT. LBS/ M'(S)
				INCHES	mm			INCHES	mm	INCHES	mm		
83103	3	8	133	0.160	4.06	10	2#10	0.060	1.52	0.945	24.00	65	827
83113	3	6	259	0.198	5.03	10	2#10	0.060	1.52	1.025	26.04	87	770
83123	3	4	259	0.245	6.22	10	2#8	0.060	1.52	1.140	28.96	114	1015
83133	3	2	259	0.297	7.54	8	2#6	0.080	2.03	1.345	34.16	152	1480
83143	3	1	259	0.353	8.97	8	2#6	0.080	2.03	1.455	36.96	177	1795
83153	3	1/0	259	0.385	9.78	8	2#4	0.080	2.03	1.585	40.26	205	2245
83163	3	2/0	259	0.442	11.23	8	2#4	0.080	2.03	1.685	42.80	237	2570
83183	3	4/0	259	0.555	14.10	8	2#2	0.080	2.03	1.975	50.17	316	3700

(1) Ampacity rating based on CEC/CSA.
(S) Actual shipping weight may vary.

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR
3	Black, Red, Blue

Product Construction:

Conductor:
- 6 AWG through 4/0 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below
- Insulated yellow ground check

Jacket:
- Super Vu-Tron® 90°C, black
- Temperature range: -40°C to +90°C

Jacket Marking:
- CAROL SUPER VU-TRON® SIZE (mm^2) TYPE G-GC 2 KV 90°C (-40°C) FT5 CSA LR92874 P-7K-123049-MSHA MADE IN USA

Applications:
- Industrial and light- to medium-duty mining applications
- Heavy-duty service as power supply cable
- Mobile and portable electrical equipment
- 3- and 4-conductor—use on three-phase AC systems where grounding is required

Features:
- Excellent impact and abrasion resistance
- Withstands exposure to oil, acids, alkalies, heat, moisture and most chemicals
- Indent-printed for easy identification
- Rope lay stranding for maximum flex life
- Cable core bound for superior flexibility and toughness
- Non-wicking rubber fillers (GGC)
- Canadian color code
- Sunlight-resistant

Industry Approvals:
- CSA Flexible Cord - C22.2-96
- MSHA Approved
- RoHS Compliant

Packaging:
- Lengths cut to order

CAROL BRAND® CSA Certified Canadian Standard Association MSHA Mine Safety and Health Administration RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Carol® Double Jacket Drill Cord

90°C, 600 Volt, MSHA Approved Remote Control & Drill Cord

Product Construction:

Conductors:
- 14 through 10 AWG fully annealed stranded bare copper
- ASTM B3/B174

Insulation
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below

Jacket
- 90°C, black, CPE or neoprene
- Temperature range: -40°C to +90°C
- An open polyester braid reinforcement is applied between layers for mechanical strength

Jacket Marking
- CPE jacket -
  CAROL (SIZE & NO. OF CONDS.) DOUBLE JACKET REMOTE CONTROL AND DRILL CORD 600 V 90°C P-07-KA110003-MSHA MADE IN USA
- Neoprene jacket -
  CAROL (SIZE & NO. OF CONDS.) NEOPRENE DOUBLE JACKET REMOTE CONTROL AND DRILL CORD 600 V 90°C P-07-KA110006-MSHA MADE IN USA



Applications:
- Industrial and light- to medium-duty mining applications
- Heavy-duty service as power supply cable
- AC systems (grounded and ungrounded)
- Heavy-duty and long service life applications
- Mobile and portable electrical equipment
- Motor and battery leads
- Wet or dry locations in underground mines in accordance with Schedule 26 of the U.S. Bureau of Mines
- 3-conductor cables – use on AC systems where no grounding is required or on DC systems with one conductor for grounding
- 4-conductor cables – use on two- or three-phase AC systems with one conductor used for grounding
- 5-conductor cables – use in applications where separating the system neutral from the frame ground is required

Features:
- Withstands severe environmental conditions
- Indent-printed for easy identification
- Withstands exposure to oil, acids, alkalies, heat, moisture and most chemicals
- Flexible stranding
- Excellent impact, crush and tear resistance
- Sunlight-resistant
- Reinforced jacket for increased durability
- TRU-Mark® sequential footage marking

Industry Approvals:
- RoHS Compliant
- Passes MSHA Flame Test
- Additional rating available upon request
- Other sizes and numbers of conductors available upon request

Applicable Standards:
- ICEA S-75-381

Packaging:
- Lengths cut to order

COLOR CODE CHART

NO. OF CONDUCTORS	COLOR**
2	Black, White
3	Black, White, Green
4	Black, White, Red, Green
5	Black, White, Red, Green, Orange
6	Black, White, Red, Green, Orange, Blue

** Green conductor for grounding only.

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL COND. O.D.		NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS(1)	APPROX. NET WT. LBS/M'(S)
				INCHES	mm	INCHES	mm	INCHES	mm		
CPE JACKET											
02861	2	14	41/30	0.072	1.96	0.045	1.14	0.640	16.26	18	210
02862	3	14	41/30	0.072	1.96	0.045	1.14	0.670	17.02	18	240
02868	4	14	41/30	0.072	1.96	0.045	1.14	0.715	18.16	15	285
02835	5	14	41/30	0.072	1.96	0.045	1.14	0.785	19.94	12	345
02845	5	12	65/30	0.096	2.44	0.045	1.14	0.840	21.34	16	405
02806	6	12	65/30	0.096	2.44	0.045	1.14	0.890	22.61	16	470
02855	5	10	104/30	0.117	2.97	0.045	1.14	0.895	22.73	20	495
NEOPRENE JACKET											
02961*	2	14	41/30	0.072	1.96	0.045	1.14	0.640	16.26	18	220
02962*	3	14	41/30	0.072	1.96	0.045	1.14	0.670	17.02	18	260
02968*	4	14	41/30	0.072	1.96	0.045	1.14	0.715	18.16	15	300
02935*	5	14	41/30	0.072	1.96	0.045	1.14	0.785	19.94	12	365
02945*	5	12	65/30	0.096	2.44	0.045	1.14	0.840	21.34	16	425
02906*	6	12	65/30	0.096	2.44	0.045	1.14	0.890	22.61	16	490
02955*	5	10	104/30	0.117	2.97	0.045	1.14	0.895	22.73	20	515

* Non-stock item; minimum quantity purchase required.

(1) Ampacities based on 90°C conductor and 30°C ambient temperature per NEC Table 400.5(A)(1) of the National Electrical Code®.

(S) Actual shipping weight may vary.

General Cable

Made in U.S.A.

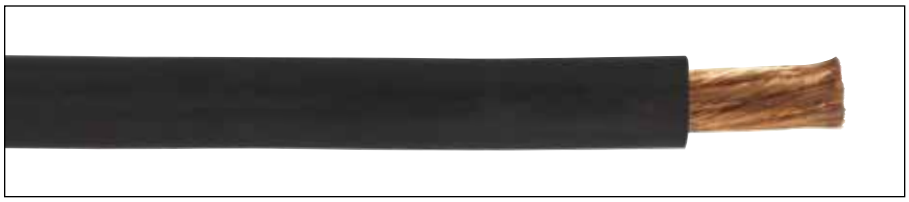
RoHS Compliant Directive 2011/65/EU

MSHA Mine Safety and Health Administration

CAROL BRAND

Carolprene® 105°C Welding Cable

105°C, 600 Volt, MSHA Approved



CAROLPRENE® 105°C WELDING CABLE – 600 VOLT – 30 AWG STRANDING

CATALOG NUMBER	AWG SIZE	NOMINAL STRAND	NOMINAL O.D.		APPROX. NET WT. LBS/M'(S)	STD. CTN.
			INCHES	mm		
01758*	6	259/30	0.420	10.67	140	1000'
01757*	4	416/30	0.475	12.07	200	1000'
01756*	2	655/30	0.520	13.21	280	1000'
01755*	1	827/30	0.575	14.61	350	1000'
01754*	1/0	1042/30	0.600	15.24	415	1000'
01753*	2/0	1316/30	0.645	16.38	510	1000'
01752*	3/0	1660/30	0.715	18.16	620	1000'
01751*	4/0	2062/30	0.765	19.43	760	1000'

* Non-stock item; minimum quantity required.
(S) Actual shipping weight may vary.

Product Construction:

Conductors:
- 6 AWG through 4/0 AWG fully annealed stranded bare copper

Jacket:
- Carolprene® 105°C, black
- Temperature range: -50°C to +105°C

Jacket Marking:
- CAROLPRENE (SIZE) AWG 105°C WELDING CABLE 600 VOLT P-07-KA1000015-MSHA MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
- Secondary voltage resistance welding leads in heavy duty or mining applications
- Power supply applications not exceeding 600 volts AC
- Sizes 1/0 and larger for permanent wiring in conduit or tray of 600 V power supplies, hoists, cranes or other applications where flexible power leads must be installed in conduit, raceways or trays

Features:
- Sunlight-resistant
- Designed to withstand severe environmental conditions
- Withstands exposure to oil, acids, alkalies, heat, flame, moisture and chemicals
- Meets or exceeds flame test requirements of MSHA
- TRU-Mark® marking system and indent printed MSHA number

Industry Approvals:
- MSHA Approved
- RoHS Compliant

Packaging:
- 250' (76.2 m), 1000' (304.8 m) reels
- Other put-ups available on special order

WELDING CABLE AMPACITIES SINGLE CONDUCTOR

Required Cable Sizes: For Welding Cable Application

	length in feet for total circuit for secondary voltages only – do not use this table for 600 Volt in-line applications						
AMPS	100'	150'	200'	250'	300'	350'	400'
100	4	4	2	2	1	1/0	1/0
150	4	2	1	1/0	2/0	3/0	3/0
200	2	1	1/0	2/0	3/0	4/0	4/0
250	1	1/0	2/0	3/0	4/0		
300	1/0	2/0	3/0	4/0			
350	1/0	3/0	4/0				
400	2/0	3/0					
450	2/0	4/0					
500	3/0	4/0					
550	3/0	4/0					
600	4/0						

REQUIRED CABLE SIZES SHOWN IN AWG NUMBERS

The total circuit length includes both welding and ground leads (based on 4-volt drop) 60% duty cycle.

These values for current-carrying capacity are based on a copper temperature of 60°C (140°F), an ambient temperature of 40°C (104°F) and yield load factors from approximately 32% for the No. 2 AWG cable to approximately 23% for the No. 3/0 AWG cable, and higher for the smaller sizes. The sizes of cables generally used range from No. 2 AWG to No. 3/0 AWG. In actual service, the load factor may be much higher than indicated without overheating the cable, as the ambient temperature will generally be substantially lower than 40°C.

Suggested Ampacities For 600 Volt In-Line Applications

AWG	AMPERES	AWG	AMPERES
4/0	405	1	220
3/0	350	2	190
2/0	300	4	140
1/0	260	6	105

Ampacities for portable cable in accordance with NEC Table 400.5(A)(2).
May not be suitable for all installations per National Electrical Code®.

CAROL BRAND

MSHA Mine Safety and Health Administration

RoHS Compliant Directive 2011/65/EU

Made in U.S.A.

General Cable

Carolprene® 90°C Welding Cable

600 Volt

RED NOW A STOCK ITEM

NOW WITH TRU-Mark® Footage Marking System PRECISION

Product Construction:

Conductor:
- 6 AWG through 500 kcmil fully annealed stranded bare copper Class K

Jacket:
- Premium-grade 90°C EPDM, black or red
- Temperature range: -40°C to +90°C

Jacket Marking:
- CAROLPRENE (SIZE) WELDING CABLE 600 VOLT MADE IN USA (TRU-MARK SEQUENTIAL FOOTAGE)

Applications:
- Secondary voltage resistance welding leads
- Power supply applications not exceeding 600 volts AC

Features:
- Good flexibility
- Abrasion-resistant
- Good color retention
- TRU-Mark® sequential footage marking

Packaging:
- 250' (76.2 m), 500' (152.4 m), and 1000' (304.8 m) reels
- MCM sizes cut to length
- Other put-ups available on special order

Industry Approvals:
- RoHS Compliant

Suggested Ampacities For 600 Volt In-Line Applications

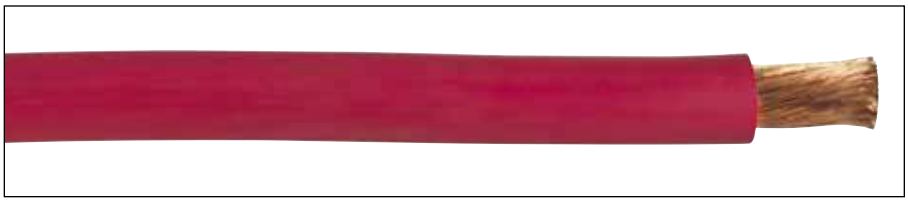
AWG OR kcmil	AMPERES	AWG	AMPERES
500 kcmil	695	1/0	190
350 kcmil	552	1	160
250 kcmil	445	2	140
4/0	310	4	100
3/0	265	6	75
2/0	223		

Ampacities for portable cable, continuous-duty (ambient temperature of 40°C).
May not be suitable for all installations per National Electrical Code®.

Ordering Part Number Example

01771.38.03

4/0 500' put-up in red
.03 for red jacket



CAROLPRENE® WELDING CABLE – 600 VOLT – CLASS K – 30 AWG STRANDING

CATALOG NUMBER	AWG OR kcmil	CONDUCTOR STRAND	NOMINAL O.D.		APPROX. NET WT. LBS/M'(S)	STD. CTN.
			INCHES	mm		
01778	6	259/30	0.380	9.65	135	250'
01777	4	406/30	0.400	10.16	172	250'
01776	2	646/30	0.465	11.81	260	250'
01775	1	812/30	0.495	12.57	317	250'
01774	1/0	1025/30	0.560	14.22	400	250'
01773	2/0	1274/30	0.615	15.62	487	250'
01772	3/0	1613/30	0.670	17.02	605	250'
01771	4/0	2029/30	0.750	19.05	827	250'
99142*	250 kcmil	2496/30	0.830	21.08	976	250'
99432*	350 kcmil	3441/30	0.960	24.38	1338	250'
99202*	500 kcmil	5054/30	1.200	30.48	1995	250'

(S) Actual shipping weight may vary.
* Non-stock item; minimum quantity required.

WELDING CABLE AMPACITIES SINGLE CONDUCTOR

Required Cable Sizes: For Welding Cable Application

	length in feet for total circuit for secondary voltages only – do not use this table for 600 Volt in-line applications						
AMPS	100'	150'	200'	250'	300'	350'	400'
100	4	4	2	2	1	1/0	1/0
150	4	2	1	1/0	2/0	3/0	3/0
200	2	1	1/0	2/0	3/0	4/0	4/0
250	1	1/0	2/0	3/0	4/0		
300	1/0	2/0	3/0	4/0			
350	1/0	3/0	4/0				
400	2/0	3/0					
450	2/0	4/0					
500	3/0	4/0					
550	3/0	4/0					
600	4/0						

REQUIRED CABLE SIZES SHOWN IN AWG NUMBERS

The total circuit length includes both welding and ground leads (based on 4-volt drop) 60% duty cycle.

These values for current-carrying capacity are based on a copper temperature of 60°C (140°F), an ambient temperature of 40°C (104°F) and yield load factors from approximately 32% for the No. 2 AWG cable to approximately 23% for the No. 3/0 AWG cable, and higher for the smaller sizes. The sizes of cables generally used range from No. 2 AWG to No. 3/0 AWG. In actual service, the load factor may be much higher than indicated without overheating the cable, as the ambient temperature will generally be substantially lower than 40°C.

General Cable

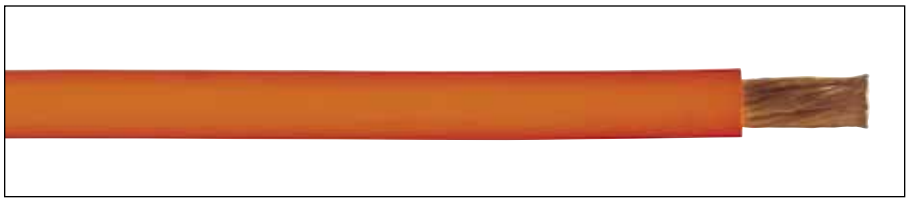
Made in U.S.A.

RoHS Compliant Directive 2011/65/EU

CAROL BRAND

Super Vu-Tron® Welding Cable

90°C, 600 Volt, UL/CSA, Types RHH/RHW



SUPER VU-TRON® WELDING CABLE—UL/CSA—CLASS M—34 AWG STRANDING

CATALOG NUMBER	AWG SIZE	CONDUCTOR STRAND	NOMINAL O.D.		APPROX. NET WT. LBS/M'(S)	STD. CTN.
			INCHES	mm		
01768*	6	660/34	0.370	9.40	125	250'
01767*	4	1045/34	0.425	10.80	191	250'
01766	2	1634/34	0.475	12.07	259	250'
01765	1	2090/34	0.530	13.46	331	250'
01764†	1/0	2597/34	0.575	14.61	401	250'
01763†	2/0	3300/34	0.630	16.00	511	250'
01762†	3/0	4214/34	0.700	17.78	615	250'
01761†	4/0	5225/34	0.800	20.32	844	250'

* Not MSHA Approved.
(S) Actual shipping weight may vary.
† Type RHH/RHW - 600 V for CT use.

Product Construction:

Conductor:
- 6 AWG through 4/0 AWG fully annealed stranded bare copper per ASTM B172 Class M

Jacket:
- Super Vu-Tron®, orange
- Temperature range: -50°C to +90°C

Jacket Marking:
- #6 - #1 AWG: CAROL SUPER VU-TRON® WELDING CABLE–EXTRA FLEXIBLE (UL) 600 VOLT (-50°C to +90°C) OIL RESISTANT P-123-141 MSHA (SIZE) --- CSA 90°C ARC WELDING CABLE FT1 MADE IN USA
- 1/0 - 4/0 AWG: CAROL SUPER VU-TRON® WELDING CABLE (SIZE) EXTRA FLEXIBLE (UL) 600 VOLT (-50°C to +90°C) OIL RESISTANT P-123-141 MSHA --- CSA 90°C ARC WELDING CABLE FT1 --- TYPE RHH OR RHW (UL) 600 V FOR CT USE MADE IN USA

Applications:
- Secondary voltage resistance welding leads
- Power supply applications not exceeding 600 volts AC
- Sizes 1/0 and larger for permanent wiring in conduit or tray of 600 V power supplies, hoists, cranes or other applications where flexible power leads must be installed in conduit, raceways or trays

Features:
- UL Listed
- CSA Certified
- Excellent flexibility to last longer in flex applications
- Abrasion-resistant
- Resists oils and solvents
- Rated -50°C for use in cold environments
- Weather-resistant
- Ozone-resistant
- Safety-colored for high visibility
- Assured longer service life, saving money in replacement costs, maintenance cost and downtime
- MSHA Approved for flame resistance
- Sunlight-resistant

Industry Approvals:
- UL Listed
- CSA Certified
- MSHA Approved
- Meets UL Vertical Flame Test per UL 854
- RoHS Compliant

Packaging:
- 250' (76.2 m), 500' (152.4 m), and 1000' (304.8 m) reels
- Other put-ups available on special order

WELDING CABLE AMPACITIES SINGLE CONDUCTOR

Required Cable Sizes: For Welding Cable Application

	length in feet for total circuit for secondary voltages only – do not use this table for 600 Volt in-line applications						
AMPS	**100'**	**150'**	**200'**	**250'**	**300'**	**350'**	**400'**
100	4	4	2	2	1	1/0	1/0
150	4	2	1	1/0	2/0	3/0	3/0
200	2	1	1/0	2/0	3/0	4/0	4/0
250	1	1/0	2/0	3/0	4/0		
300	1/0	2/0	3/0	4/0			
350	1/0	3/0	4/0				
400	2/0	3/0					
450	2/0	4/0					
500	3/0	4/0					
550	3/0	4/0					
600	4/0						

REQUIRED CABLE SIZES SHOWN IN AWG NUMBERS

The total circuit length includes both welding and ground leads (based on 4-volt drop) 60% duty cycle.

These values for current-carrying capacity are based on a copper temperature of 60°C (140°F), an ambient temperature of 40°C (104°F) and yield load factors of from approximately 32% for the No. 2 AWG cable to approximately 23% for the No. 3/0 AWG cable, and higher for the smaller sizes. The sizes of cables generally used range from No. 2 AWG to No. 3/0 AWG. In actual service, the load factor may be much higher than indicated without overheating the cable as the ambient temperature will generally be substantially lower than 40°C.

Suggested Ampacities For 600 Volt In-Line Applications

AWG	AMPERES	AWG	AMPERES
4/0	405	1	220
3/0	350	2	190
2/0	300	4	140
1/0	260	6	105

Ampacities for portable cable in accordance with NEC Table 400.5(A)(2).
May not be suitable for all installations per National Electrical Code®.

CAROL BRAND · UL LISTED · CSA Certified Canadian Standard Association · MSHA Mine Safety and Health Administration · RoHS Compliant Directive 2011/65/EU · Made in U.S.A. · General Cable

Super Vu-Tron® Entertainment Industry and Stage Lighting Cable

105ºC, 600 Volt, UL Type SC and CSA Type PPC

Product Construction:

Conductor:
- 8 AWG through 4/0 AWG fully annealed stranded bare copper per ASTM B172

Jacket:
- Super Vu-Tron® 105ºC, black
- Temperature range: -50ºC to +105ºC

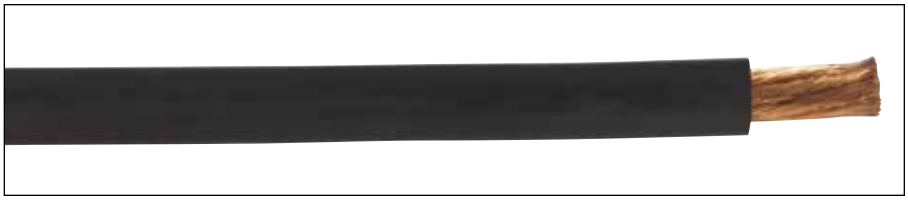
Jacket Marking:
- CAROL (SIZE) (UL) 600 VOLT TYPE SC (-50°C to +105°C) OIL RES 60°C MAX. AMPS NEC TABLE 400-5 (B) FOR 90°C OUTDOOR --- CSA TYPE PPC 105°C 600 VOLT FT5 ROHS MADE IN USA

Applications:
- Portable power systems
- Entertainment industry activities such as theater, television, night clubs, motion pictures, mobile communication vans, spotlights and sound systems
- Other similar applications that would require temporary power

Features:
- Sunlight-resistant
- Designed to withstand severe environmental conditions
- Withstands exposure to oil, acids, alkalies, heat, flame, moisture and chemicals
- Meets or exceeds flame test requirements of MSHA, CSA and UL
- Indent-printed

Industry Approvals:
- UL Listed
- CSA Certified
- RoHS Compliant

Packaging:
- Lengths cut to order



UL TYPE SC - CSA TYPE PPC - 600 VOLT

CATALOG NUMBER	AWG SIZE	NOMINAL STRAND	NOMINAL O.D.		APPROX. NET WT. LBS/M'(S)	CURRENT AMPS(1)
			INCHES	mm		
01109*	8	168/30	0.385	9.78	110	80
01108	6	259/30	0.420	10.67	152	105
01107	4	416/30	0.475	12.07	215	140
01106	2	655/30	0.520	13.21	296	190
01105	1	827/30	0.575	14.61	360	220
01104	1/0	1042/30	0.600	15.24	424	260
01103	2/0	1316/30	0.645	16.38	513	300
01102*	3/0	1660/30	0.715	18.16	644	350
01101	4/0	2062/30	0.765	19.43	824	405

(1) NEC Table 400.5(A)(2).
* Non-stock item; minimum quantity purchase required.
(S) Actual shipping weight may vary.

General Cable

Made in U.S.A.

RoHS Compliant Directive 2011/65/EU

Certified Canadian Standard Association

UL LISTED

CAROL® BRAND

Super Vu-Tron® Single Conductor Type W Extra Flex

90°C, 2000 Volt, UL Listed



TYPE W - 2000 VOLT - UL

CATALOG NUMBER	AWG OR kcmil	NOMINAL STRAND	NOMINAL COND. O.D.		NOMINAL INS. THICKNESS		NOMINAL O.D.		APPROX. NET WT. LBS/M'(S)	CURRENT AMPS(1)
			INCHES	mm	INCHES	mm	INCHES	mm		
80611*	8	168/30	0.165	4.19	0.060	1.52	0.465	11.81	133	80
80621*	6	259/30	0.198	5.03	0.060	1.52	0.545	13.84	205	105
80631*	4	416/30	0.233	5.92	0.060	1.52	0.585	14.86	264	140
80641	2	655/30	0.293	7.44	0.060	1.52	0.650	16.51	361	190
80651*	1	827/30	0.330	8.38	0.080	2.03	0.730	18.54	465	220
80661*	1/0	1042/30	0.369	9.37	0.080	2.03	0.750	19.05	521	260
80671*	2/0	1316/30	0.412	10.46	0.080	2.03	0.825	20.96	644	300
80681*	3/0	1660/30	0.490	12.45	0.080	2.03	0.910	23.11	755	350
80691	4/0	2062/30	0.530	13.46	0.080	2.03	0.960	24.38	933	405
80701*	250 kcmil	2496/30	0.606	15.39	0.105	2.67	1.020	25.91	1150	455

(1) Ampacities based on 90°C conductor and 30°C ambient temperature, based on Table 310-17 and Table 400.5(A)(2) in the National Electrical Code for single conductor cables.

* Non-stock item; minimum quantity purchase required.

(S) Actual shipping weight may vary.



COLOR CODE CHART

COLOR	COLOR CODE
Black	01
Gray	10
Red	03
Orange	04
Yellow	05
Green	06
Blue	17

ORDERING INFORMATION

Three easy steps to ordering your Super Vu-Tron Type W Extra Flex Cable:

Catalog Number	Put-Up Code	Color Code
Choose Catalog Number from Catalog Table above	Choose Put-Up Code from Packaging Information (99 for cut-to-order – please specify length needed) (41 for 1000 ft reel put-up size)	Choose Color Code from the Color Code Chart

Examples:

80691.41.01	Type W Extra Flex, 4/0 size, 1,000 ft. reel put-up, black
80691.99.17	Type W Extra Flex, 4/0 size, long-length reel put-up, blue

Make It Yours: Custom print legends available for recurring stock and special orders - ask for details

Product Construction:

Conductor:
- 8 AWG through 250 kcmil fully annealed stranded bare copper per ASTM B172

Insulation:
- Premium-grade 90°C EPDM

Jacket:
- Super Vu-Tron® 90°C, black (standard)
  Other Available Colors:
  – Gray, red, orange, yellow, green, blue
  – See color code chart
- Temperature range: -40°C to +90°C
- An open polyester braid reinforcement is applied between the insulation and jacket for mechanical strength

Jacket Marking:
- CAROL SUPER VU-TRON® TYPE W PORTABLE POWER CABLE (SIZE) 2000 V 90°C DRY AND WATER RESISTANT 75°C SUN RES (UL) P-7K-123049-MSHA---CSA TYPE W (-40°C) FT5 (TRU-MARK SEQUENTIAL FOOTAGE)
- Custom print available by special order with minimum quantity purchase

Applications:
- Portable power systems
- Entertainment industry activities such as theater, television, nightclubs, motion pictures, mobile communication vans, spotlights and sound systems
- Other similar applications that would require temporary power

Features:
- Water-resistant
- Sunlight-resistant
- Designed to withstand severe environmental conditions
- Flexible and easier to work with in cold temperatures
- Withstands exposure to oil, acids, alkalies, heat, flame, moisture and chemicals
- No “memory” effect when coiling and uncoiling for use
- Meets or exceeds flame test requirements of MSHA and UL
- TRU-Mark® sequential footage marking

Industry Approvals:
- UL Listed
- MSHA Approved
- RoHS Compliant
- CSA Certified

Packaging:
- Lengths cut to order (99 put-up code)
- 1000' reel (41 put-up code)

CAROL BRAND® UL LISTED CSA Certified Canadian Standard Association MSHA Mine Safety and Health Administration RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Diesel Locomotive Cable 2000 Volts (EPR/XL-CPE)

UL Types RHH/RHW-2 2000 V and C(UL) RW90 1000 V
Flexible, Oil-, Sunlight- and Ozone-Resistant, Flame-Retardant, -40°C to 90°C

Product Construction:

Conductor:
- 14 AWG (2.08 mm) thru 1111.1 kcmil (562 mm) Class I fully annealed flexible stranded tin coated copper per AAR 589

Insulation:
- Flame-retardant, lead-free Cross-linked Ethylene Propylene (EP) with separator tape over the conductor to facilitate stripping

Jacket:
- Black, flame-retardant, sunlight-, ozone- and oil-resistant, lead-free Cross-linked Chlorinated Polyethylene (XL-CPE)
- Colors available upon request

Print:
- GENERAL CABLE® (MFG LOCATION) DIESEL LOCOMOTIVE 2000 V P-07-KA120005-MSHA C(UL)US TYPE RHH OR RHW-2 VW-1 (SIZE) AWG/kcmil (MM²) EP FOR CT USE* SR -40°C FT4 OR RW90 EP 1000 V ROHS MONTH/YEAR OF MFG SEQUENTIAL FOOTAGE MARK

*Applicable for sizes 1/0 AWG and larger only

Applications:
- For use up to 2000 V as power cables in wind turbine generator applications per UL Subject 6140
- Diesel electric locomotives
- Mining and earth-moving equipment
- General purpose use as flexible power leads
- Flexible power leads in cable trays in sizes 1/0 AWG and larger
- Accepted for listing as flame-resistant by MSHA



Features:
- Rated 90°C wet or dry per UL 44/CSA C.22.2-38
- Flexible tinned copper stranding
- Excellent resistance to oils, gear lubricants, ozone, sunlight, heat and flame
- Designed to withstand continuous flexing

Minimum Bend Radius:
- 8X O.D. for fixed installations or mobile applications

Torsion Requirements:
- +/-180° twists per meter for 5,000 cycles at -40°C with cable weight compensated to 18 meters

Compliances:
Industry Compliances:
- Type RHH/RHW-2 per UL 44, UL File # E90494
- c(UL)US Type RW90 per CSA C.22.2-38, UL File # E90494
- National Electrical Code (NEC)
- ICEA S-95-658/NEMA WC70
- "For CT Use" on 1/0 AWG and larger in accordance with NEC®
- Accepted for listing as flame resistant by MSHA
- RoHS Compliant

Compliances (cont'd.):
Flame Test Compliances:
- UL 2556 VW-1
- IEEE 1202/CSA FT4 for sizes 1/0 AWG and larger

AC Withstand Voltage Testing requirements per UL 44:

14 - 10 AWG	6000 V
8 - 2 AWG	7500 V
1 - 4/0 AWG	9000 V
262.6 kcmil - 444 kcmil	10000 V
535.3 kcmil - 929.9 kcmil	11000 V
1111.1 kcmil	13500 V

CATALOG NUMBER	COND. SIZE AWG/ kcmil	COND. SIZE mm²	COND. STRAND	NOMINAL COND. O.D. INCHES	NOMINAL COND. O.D. mm	NOM. INS. THICKNESS INCHES	NOM. INS. THICKNESS mm	JACKET THICKNESS INCHES	JACKET THICKNESS mm	NOMINAL O.D. INCHES	NOMINAL O.D. mm	APPROX. NET WEIGHT LBS/1000 FT	APPROX. NET WEIGHT kg/km
14 AWG - 1111.1 kcmil CONDUCTORS													
5310.01014	14	2.08	19W	0.070	1.8	0.045	1.1	0.015	0.4	0.20	5.1	30	45
5310.01012	12	3.31	19W	0.088	2.2	0.045	1.1	0.015	0.4	0.22	5.6	39	58
5310.01010	10	5.26	27W	0.117	3.0	0.045	1.1	0.015	0.4	0.25	6.4	56	83
5310.01008	8	8.36	37W	0.144	3.7	0.055	1.4	0.030	0.8	0.33	8.3	87	129
5310.01006	6	13.3	61W	0.190	4.8	0.060	1.5	0.030	0.8	0.38	9.7	131	195
5310.01004	4	21.1	105W	0.262	6.7	0.060	1.5	0.030	0.8	0.46	11.7	202	301
5310.01002	2	33.6	158W	0.315	8.0	0.060	1.5	0.030	0.8	0.51	13.0	285	424
5310.01001	1	42.4	224W	0.375	9.5	0.080	2.0	0.045	1.1	0.64	16.3	417	621
5310.01110	1/0	53.5	280W	0.435	11.0	0.080	2.0	0.045	1.1	0.70	17.8	494	735
5310.01210	2/0	67.4	329W	0.465	11.8	0.080	2.0	0.045	1.1	0.73	18.5	587	874
5310.01310	3/0	85	456W	0.535	13.6	0.080	2.0	0.045	1.1	0.80	20.3	718	1069
5310.01410	4/0	107	551W	0.581	14.8	0.080	2.0	0.045	1.1	0.84	21.3	845	1258
5310.01262	262.6	133	650W	0.617	15.7	0.090	2.3	0.065	1.7	0.94	23.9	1050	1563
5310.01313	313.1	158	777W	0.671	17.0	0.090	2.3	0.065	1.7	1.00	25.3	1195	1778
5310.01373	373.7	189	925W	0.735	18.7	0.090	2.3	0.065	1.7	1.06	26.9	1384	2060
5310.01444	444.4	225	1110W	0.786	20.0	0.090	2.3	0.065	1.7	1.11	28.2	1634	2432
5310.01535	535.3	271	1332W	0.877	22.3	0.090	2.3	0.065	1.7	1.20	30.5	1925	2865
5310.01646	646.4	327	1609W	0.960	24.4	0.090	2.3	0.065	1.7	1.29	32.8	2307	3433
5310.01777	777.7	394	1924W	1.054	26.8	0.090	2.3	0.065	1.7	1.38	35.1	2728	4060
5310.01929*	929.9	475	2318W	1.230	31.2	0.090	2.3	0.065	1.7	1.56	39.6	3570	5313
5310.01111*	1111.1	562	2745W	1.328	33.7	0.115	2.9	0.095	2.4	1.77	44.9	4232	6298

* Non-stock item; minimum runs apply. Please consult Customer Service for price and delivery.

General Cable

RoHS Compliant Directive 2011/65/EU

MSHA Mine Safety and Health Administration

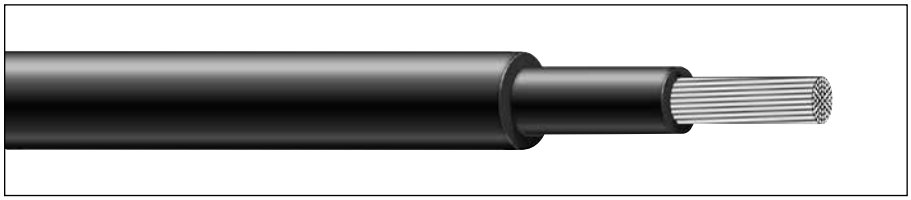
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UL LISTED

CAROL BRAND

Super Vu-Tron® DLO

EPR/CPE, Diesel Locomotive Cable
2000 V DLO, 1000 V CSA Type RW90 FT4 TC



CATALOG NUMBER	AWG/ kcmil	COND. STRAND	NOM. INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS		APPROX. NET WEIGHT**	
			INCHES	mm	INCHES	mm	30°C[1]	30°C[2]	lbs/1000ft	kg/km
1/0 AWG - 1111 kcmil CONDUCTORS										
91911	1/0	280W	0.080	2.03	0.69	17.53	260	170	515	766
91920	2/0	329W	0.080	2.03	0.73	18.54	300	195	580	863
91930	3/0	456W	0.080	2.03	0.81	20.57	350	225	770	1146
91940	4/0	551W	0.080	2.03	0.87	22.10	405	260	930	1384
91926	262.6	650W	0.095	2.41	1.00	25.40	475	298	1130	1682
91931	313.1	777W	0.095	2.41	1.06	26.92	520	328	1295	1927
91937	373.7	925W	0.095	2.41	1.10	27.94	605	364	1545	2299
91944	444.4	1110W	0.095	2.41	1.23	31.24	660	402	1820	2709
91953	535.3	1332W	0.110	2.79	1.34	34.04	735	446	2195	3267
91964	646.4	1609W	0.110	2.79	1.45	36.83	820	496	2560	3810
91977	777.7	1924W	0.110	2.79	1.50	38.10	910	563	3050	4539
91929*	929.2	2299W	0.110	2.79	1.61	40.89	1005	594	3595	5350
91811*	1111	2745W	0.125	3.18	1.75	44.45	1110	637	4250	6325

[1] Ampacities based on 90°C conductor temperature and 30°C ambient temperature and Table 12E of the Canadian Electrical Code for permanent installation in tray.

[2] Based on CEC Part 1 Table 2 for 3 conductors in raceway (conduit) and an ambient temperature of 30°C.

* Non-stock item; minimum runs apply. Please consult Customer Service for price and delivery.

**Actual shipping weight may vary.

Product Construction:

Conductor:
- 1/0 AWG through 1111 kcmil stranded tinned annealed copper per AAR 589

Insulation:
- Flame-retardant, lead-free Cross-linked Ethylene Propylene (EP) with separator tape over the conductor to facilitate stripping

Jacket:
- Black, flame-retardant, sunlight-, ozone- and oil-resistant, lead-free Cross-linked Chlorinated Polyethylene (XL-CPE)
- Colors available upon request

Jacket Marking:
- CAROL SUPER VU-TRON® (SIZE) 90°C DLO 2000 V P-102 MSHA CSA RW90 1000 V (-40°C) FT1 FT4 SR TC

Applications:
- Diesel electric locomotives
- Telecom power supply
- Oil and gas drilling rigs
- Mining and earth-moving equipment
- Shipyards
- Motor leads
- For wiring exposed to the weather
- For use in raceways including cable trays in dry, damp or wet locations in accordance with Canadian Electrical Code

Features:
- 90ºC temperature rating, wet, damp or dry
- Excellent impact and abrasion resistance
- Resists oils, acids, alkalies, heat, flame
- Flexible tinned copper stranding
- Sunlight-resistant

Compliances:
- CSA Standard C22.2 No. 38
- CSA Standard C22.2 No. 230
- CSA Standard C22.2 No. 96

Industry Compliances:
- Accepted for listing as flame-resistant by MSHA
- CSA RW90 FT4 TC
- Outdoor use

Other Compliances:
- RoHS Compliant

Packaging:
- Lengths cut to order

CAROL BRAND® SA Certified Canadian Standard Association MSHA Mine Safety and Health Administration RoHS Compliant Directive 2011/65/EU General Cable

Specialty Cord 5



In today's world, the need for specialty cord products is constantly growing. General Cable offers a full line of Carol® Brand Cord products to meet a wide range of specialized applications.

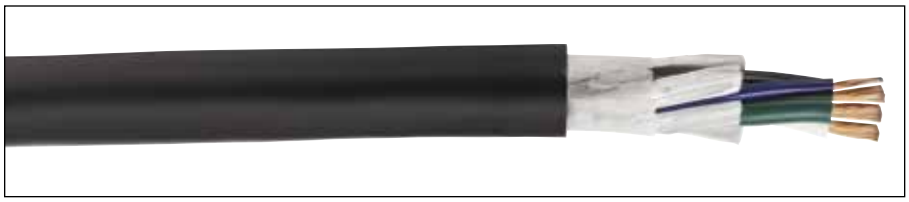
Specialty Cord includes a wide range of hook-up wire, heater cord, lamp cord and fixture wire.

Like Carol® Brand Rubber, Plastic and Industrial Cord products, these cables carry the latest regulatory listings and certifications with Underwriters Laboratories, Inc. and the Canadian Standard Association where applicable.

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CarolGrene™ Ultra Flex® Jacketed Types EVJE, EVE, EVJT and EVT

105˚C, 300 and 600 Volt, UL Electrical Vehicle Charging Cord



CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL COND. O.D.		NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS(1) (2)	APPROX. NET WT. LBS/M'(S)
				INCHES	mm	INCHES	mm	INCHES	mm		
TYPE EVJE, EVJT											
EVJE163	3	16	26/30	0.061	1.55	0.030	0.76	0.361	9.17	13	75
	1	18	16/30	0.048	1.22	0.030	0.76				
EVJE143	3	14	41/30	0.077	1.96	0.030	0.76	0.390	9.91	18	95
	1	18	16/30	0.048	1.22	0.030	0.76				
EVJE123	3	12	65/30	0.096	2.44	0.030	0.76	0.454	11.53	25	130
	1	18	16/30	0.048	1.22	0.030	0.76				
EVJT143*	3	14	41/30	0.077	1.96	0.030	0.76	0.390	9.91	18	95
	1	18	16/30	0.048	1.22	0.030	0.76				
EVJT123*	3	12	65/30	0.096	2.44	0.030	0.76	0.454	11.53	25	130
	1	18	16/30	0.048	1.22	0.030	0.76				
TYPE EVE, EVT - 600 VOLT - UL											
EVE1603	3	16	26/30	0.061	1.55	0.030	0.76	0.468	11.89	13	110
	1	18	16/30	0.048	1.22	0.030	0.76				
EVE1403	3	14	41/30	0.077	1.96	0.045	1.14	0.560	14.22	18	150
	1	18	16/30	0.048	1.22	0.030	0.76				
EVE1203	3	12	65/30	0.094	2.39	0.045	1.14	0.588	14.94	25	200
	1	18	16/30	0.048	1.22	0.030	0.76				
EVE1003	3	10	104/30	0.118	3.00	0.045	1.14	0.675	17.15	30	270
	1	18	16/30	0.048	1.22	0.030	0.76				
EVE0803	3	8	168/30	0.165	4.19	0.060	1.52	0.906	23.01	74	465
	1	18	16/30	0.048	1.22	0.030	0.76				
EVE0608	2	6	133/27	0.203	5.16	0.060	1.52	0.961	24.41	99	515
	1	8	133/29	0.160	4.06	0.060	1.52				
	1	18	16/30	0.048	1.22	0.030	0.76				
EVT1403*	3	14	41/30	0.077	1.96	0.045	1.14	0.560	14.22	18	150
	1	18	16/30	0.048	1.22	0.030	0.76				
EVT1203*	3	12	65/30	0.094	2.39	0.045	1.14	0.588	14.94	25	200
	1	18	16/30	0.048	1.22	0.030	0.76				

(1) Ampacities for 10 AWG and smaller cords based on 30˚C ambient temperature per Table 400.5(A)(1) of the National Electrical Code®. Ampacities for 8 AWG and larger cords based on 30˚C ambient temperature per Table 400.5(A)(2) of the National Electrical Code®.
(2) Green conductor for grounding only.
* Non-stock item; minimum quantity purchase required.
(S) Actual shipping weight may vary.

Product Construction:

Conductor:
- 18 through 6 AWG fully annealed stranded bare copper
- ASTM B3

Insulation:
- Premium-grade, color-coded 105˚C Thermoplastic Elastomer for types EVJE & EVE
- PVC for types EVJT & EVT
- Color code: See chart below

Jacket:
- 105˚C, black, Thermoplastic Elastomer for types EVJE & EVE
- 105˚C, black, PVC for types EVJT & EVT
- Temperature range: -50°C to +105°C - TPE
  -40°C to +105°C - PVC

Jacket Marking:
- UL Type EVE - CAROLGRENE™ ULTRA FLEX® ELECTRIC VEHICLE CABLE -- (SIZE) (mm^2) E333326-8 (UL) EVE 105°C DRY 60°C WET 600 V FT2 - ROHS - MADE IN USA
- UL Type EVJE - CAROLGRENE™ ULTRA FLEX® ELECTRIC VEHICLE CABLE -- (SIZE) (mm^2) E333326-8 (UL) EVJE c(UL) 105°C DRY 60°C WET 300 V FT2 - ROHS - MADE IN USA

Applications:
- Level 1 - 120 volt charging units
- Level 2 - 240 volt charging units
- Compatible with SAE J1772 EV plug standard
- UL 2594 and NEC 625 residential and commercial charging stations
- Ideal for charging electric vehicles (EV), neighborhood electric vehicles (NEV), battery electric vehicles (BEV), low-speed vehicles (LSV), personal electric vehicles (PEV), plug-in hybrid vehicles (PHV), and plug-in hybrid electric vehicles (PHEV)

Features:
- Superior flexibility (EVE & EVJE)
- Lightweight
- Water-resistant
- Oil-resistant jacket
- Excellent molding characteristics
- Suitable for immersion in water*
- UL Listed for outdoor use

Industry Approvals:
- UL 62 for Type EVE/EVJE/EVT/EVJT
- RoHS Compliant

Other AWG sizes, conductor counts, and put-ups available on special order.

* Suitable for immersion in water if properly sealed and terminated.

COLOR CODE CHART

CONDUCTORS	COLORS
POWER	Black, White, Green
SIGNAL	Blue

CAROLGRENE™ UltraFlex®

CAROL® BRAND UL® LISTED RoHS Compliant Directive 2011/65/EU Made in U.S.A.

General Cable

CarolGrene™ Ultra Flex® Types EVJ and EV

90°C, 300 and 600 Volt, UL Electrical Vehicle Charging Cord

Product Construction

Conductor:
- 18 through 4 AWG fully annealed stranded bare copper
- ASTM B3

Insulation:
- Premium-grade, color-coded 90°C EPDM
- Color code: See chart below

Jacket:
- Carolprene® rubber, black

Jacket Marking:
- UL Type EV - CAROLGRENE™ ELECTRIC VEHICLE (SIZE) (mm²) E333326 (UL) EV CSA 90°C DRY 60°C WET 600 V FT2 ROHS MADE IN USA
- UL Type EVJ - CAROLGRENE™ ELECTRIC VEHICLE (SIZE) (mm²) E333326 (UL) EVJ CSA 90°C DRY 60°C WET 300 V FT2 ROHS MADE IN USA

Applications:
- Level 1 - 120 volt charging units
- Level 2 - 240 volt charging units
- Compatible with SAE J1772 EV plug standard
- UL 2594 and NEC 625 residential and commercial charging stations.
- Ideal for charging electric vehicles (EV), neighborhood electric vehicles (NEV), battery electric vehicles (BEV), low-speed vehicles (LSV), personal electric vehicles (PEV), plug-in hybrid vehicles (PHV), and plug-in hybrid electric vehicles (PHEV)

Features:
- Superior flexibility in cold temperatures
- Lightweight
- Water-resistant
- Oil-resistant jacket
- 105°C rating also available
- Suitable for immersion in water*
- UL Listed for outdoor use

Industry Approvals:
- UL 62 for Type EV and EVJ
- RoHS Compliant

Other AWG sizes, conductor counts, and put-ups available on special order.

*Suitable for immersion in water if properly sealed and terminated.



CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL COND. O.D.		NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS(1) (2)	APPROX. NET WT. LBS/M'(S)
				INCHES	mm	INCHES	mm	INCHES	mm		
TYPE EVJ - 300 VOLT - UL											
EVJ163	3	16	26/30	0.061	1.55	0.030	0.76	0.360	9.14	13	85
	1	18	16/30	0.048	1.22	0.030	0.76				
EVJ143	3	14	41/30	0.072	1.83	0.030	0.76	0.390	9.91	18	110
	1	18	16/30	0.048	1.22	0.030	0.76				
EVJ123	3	12	65/30	0.094	2.39	0.030	0.76	0.455	11.56	25	155
	1	18	16/30	0.048	1.22	0.030	0.76				
TYPE EV - 600 VOLT - UL											
EV1403	3	14	41/30	0.072	1.83	0.045	1.14	0.545	13.84	18	185
	1	18	16/30	0.048	1.22	0.030	0.76				
EV1203	3	12	65/30	0.094	2.39	0.045	1.14	0.580	14.73	25	220
	1	18	16/30	0.048	1.22	0.030	0.76				
EV1003	3	10	104/30	0.117	2.97	0.045	1.14	0.630	16.00	30	275
	1	18	16/30	0.048	1.22	0.030	0.76				
EV0803	3	8	168/30	0.160	4.06	0.060	1.52	0.885	22.48	74	465
	1	18	16/30	0.048	1.22	0.030	0.76				
EV0608*	2	6	133/27	0.203	5.16	0.060	1.52	0.985	25.02	99	570
	1	8	133/29	0.160	4.06	0.060	1.52				
	1	18	16/30	0.048	1.22	0.030	0.76				
EV0406	2	4	133/25	0.242	6.15	0.060	1.52	1.080	27.43	130	777
	1	6	133/27	0.203	5.16	0.060	1.52				
	1	18	16/30	0.048	1.22	0.030	0.76				

(1) Ampacities for 10 AWG and smaller cords based on 30°C ambient temperature per Table 400.5(A)(1) of the National Electrical Code®. Ampacities for 8 AWG and larger cords based on 30°C ambient temperature per Table 400.5(A)(2) of the National Electrical Code®.
(2) Green conductor for grounding only.
* Non-stock item; minimum quantity purchase required.
(S) Actual shipping weight may vary.

COLOR CODE CHART

CONDUCTORS	COLORS
POWER	Black, White, Green
SIGNAL	Blue

CAROLGRENE™ UltraFlex®

General Cable

Made in U.S.A. RoHS Compliant Directive 2011/65/EU UL LISTED CAROL BRAND

Heater Cord Type HPN

90ºC, 300 Volt, UL/CSA Portable Cord



TYPE HPN - 300 VOLT - UL/CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		CURRENT AMPS*	APPROX. NET WT. LBS/M'(S)	STD. CTN.
				INCHES	mm	INCHES	mm			
25202	2	18	41/34	0.045	0.76	0.145 X 0.285	3.68 X 7.24	10	31	1000'
25212	2	16	65/34	0.045	1.14	0.155 X 0.300	3.94 X 7.62	15	38	1000'

(S) Actual shipping weight may vary.

* Ampacities based on NEC Table 400.5(A)(1).

Product Construction:

Conductor:

- 18 through 16 AWG fully annealed stranded bare copper

Insulation/Jacket:

- Carolprene®, black
- Temperature range: -20ºC to +90ºC

Jacket Marking:

- CAROL 2/C (SIZE) (mm²) TYPE HPN (UL) E-11368 HEATER CORD 90°C CSA FT2 LL-9993 - CPE 300 VOLT MADE IN USA

Applications:

- Portable heaters
- Toasters
- Irons
- Soldering irons
- Paint removers
- Other heat-related applications for industrial, commercial and home use

Features:

- Heat-resistant
- Oil-resistant

Industry Approvals:

- UL Listed
- CSA Certified

Packaging:

- 250' (76.2 m) spools
- Other put-ups available on special order

Hook-Up Wire UL Types MTW, TFF, AWM and CSA TEW

90ºC, 600 Volt, MTW, TFF, 105ºC, 1000 Volt, AWM, 600 Volt TEW

Product Construction:

Conductor:
- 18 through 8 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded PVC
- Temperature range:
  MTW: -40ºC to +90ºC
  AWM: -40ºC to +105ºC
  TEW: -30ºC to +105ºC
- Color code: See chart below

Jacket Marking:
- 18 and 16 AWG:
  CAROL (SIZE) 600 V E# MTW (UL) OR TFF OR 1000 V AWM VW-1 --- CSA TEW 105˚C FT1 ROHS MADE IN USA
- 14 through 8 AWG:
  CAROL (SIZE) 600 V E# MTW (UL) OR 1000 V AWM VW-1 --- CSA TEW 105˚C FT1 ROHS MADE IN USA

Applications:
- Motor and transformer lead
- External wiring of machinery

Features:
- Outstanding oil, flame and moisture resistance
- Extra-flexible

Industry Approvals:
- UL Type MTW/AWM
- CSA TEW
- Passes VW-1 Vertical Flame Test
- OSHA Acceptable
- AWM Style 1015 – 18-8 AWG
- AWM Style 1335 – 18-10 AWG
- AWM Style 1336 – 8 AWG
- AWM Style 1032
- RoHS Compliant

Packaging:
- 18 and 16 AWG:
  500' (152.4 m) spools
  2500' (762 m) spools
- 14 through 10 AWG:
  500' (152.4 m) spools
  2500' (762 m) reels
- 8 AWG: 500' (152.4 m) reels
- Other put-ups available on special order

COLOR CODE CHART

STOCK COLORS	ORDERING SUFFIX	STOCK COLORS	ORDERING SUFFIX
Black	01	Orange	04
White	02	Brown	08
Red	03	Purple	19
Blue	07	Gray	10
Green	06	Pink	13
Yellow	05		



UL TYPE MTW, AWM, TFF, CSA TYPE TEW - 600 VOLT

CATALOG NUMBER	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		STOCK COLORS	APPROX. NET WT. LBS/M'(S)
			INCHES	mm	INCHES	mm		
76502	18	16/30	0.031	0.79	0.110	2.79	1-12	10
76512	16	26/30	0.031	0.79	0.123	3.12	1-12	14
76812	14	19/.0147	0.031	0.79	0.136	3.45	1-12	20
76822	12	19/.0185	0.031	0.79	0.155	3.94	1-7	28
76832	10	19/.0234	0.031	0.79	0.176	4.47	1-5	42
76843	8	19/.0295	0.045	1.14	0.242	6.15	1-5	72

(S) Actual shipping weight may vary.

General Cable Made in U.S.A. RoHS Compliant Directive 2011/65/EU Passes UL VW-1 Flame Test Underwriters Laboratories, Inc. Certified Canadian Standard Association UL LISTED CAROL BRAND

Heavy Wall UL Types MTW, AWM, NEC Type THW and CSA TEW

90°C, 600 Volt



AWM, MTW, THW - 600 VOLT - UL

CATALOG NUMBER	AWG SIZE	COND. STRAND	NOMINAL INS. THICKNESS		NOMINAL O.D.		APPROX. NET WT. LBS/M'(S)
			INCHES	mm	INCHES	mm	
76954	6	19/.0372	0.064	1.63	0.315	8.00	110
76994	4	19/.0469	0.065	1.65	0.365	9.27	150

(S) Actual shipping weight may vary.

Product Construction:

Conductor:
- 6 and 4 AWG fully annealed stranded bare copper

Insulation:
- Premium-grade, color-coded PVC, black
- Temperature range:
  MTW: -40°C to +90°C
  AWM: -40°C to +105°C
  TEW: -30°C to +105°C

Jacket Marking:
- CAROL (SIZE) 600 V E# MTW OR THW (UL) OR 1000 V AWM VW-1 --- CSA TEW 105°C FT1 ROHS MADE IN USA

Applications:
- Motor and transformer lead
- External wiring of machinery

Features:
- Outstanding oil, flame and moisture resistance
- Extra-flexible

Industry Approvals:
- UL Type AWM
- UL and NMTBA Type MTW
- NEC Type THW
- CSA TEW
- Passes UL VW-1 Vertical Flame Test
- RoHS Compliant

Packaging:
- 500' (152.4 m) reels
- Other put-ups available on special order

Lamp Cord Type SPT

60ºC, 300 Volt, UL/CSA

Product Construction:

Conductor:
- 18 and 16 AWG fully annealed bare or tinned copper

Insulation:
- Premium-grade, color-coded PVC
- Temperature range: -20ºC to +60ºC
- Color code: See chart below

Jacket Marking:
- E# (UL) (NO. COND) (SIZE) (mm²) SPT-1 (or STP-2) 60°C FT2 300 VOLT CSA LL69381 RoHS

Applications:
- Small appliances
- Lamps
- Radios
- Jukeboxes

Industry Approvals:
- UL Listed
- CSA Certified
- RoHS Compliant

Packaging:
- 250' (76.2 m) spools
- Other put-ups available on special order

JACKET COLOR CODE CHART

A	Black or White or Brown
B	Clear Silver (tinned copper)
C	Clear Gold
D	Clear



TYPE SPT-1

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOM. INSULATION THICKNESS		NOMINAL O.D.		CURRENT AMPS(1)	APPROX. NET WEIGHT LBS/M(S)	JACKET COLOR CHART
				INCHES	mm	INCHES	mm			
02301	2	18	41/34	0.030	0.76	0.107 X 0.210	2.72 X 5.330	10	22	A
02304	2	18	41/34	0.030	0.76	0.107 X 0.210	2.72 X 5.330	10	22	D
02305	2	18	41/34	0.030	0.76	0.107 X 0.210	2.72 X 5.330	10	22	C
02306	2	18	41/34	0.030	0.76	0.107 X 0.210	2.72 X 5.330	10	22	B

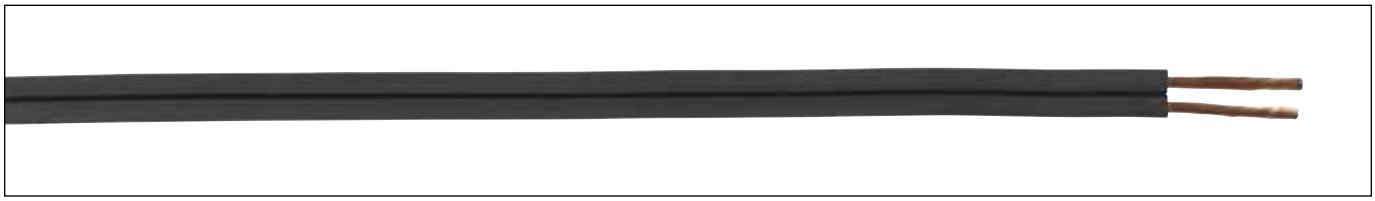
TYPE SPT-2

CATALOG NUMBER	NO. OF COND.	AWG SIZE	COND. STRAND	NOM. INSULATION THICKNESS		NOMINAL O.D.		CURRENT AMPS(1)	APPROX. NET WEIGHT LBS/M(S)	JACKET COLOR CHART
				INCHES	mm	INCHES	mm			
02303	2	16	65/34	0.045	1.14	0.155 X 0.295	3.94 X 7.490	13	37	A

(1) Ampacities based on NEC Table 400.5(A)(1).
(S) Actual shipping weight may vary.

Low-Voltage Landscape Lighting Wire

60ºC, 150 Volt, UL; 60ºC, 30 Volt, CSA



LOW-VOLTAGE LANDSCAPE LIGHTING WIRE - 150 VOLT - UL; 30 VOLT - CSA

CATALOG NUMBER	NO. OF COND.	AWG SIZE	NOM. INS. THICKNESS		NOMINAL O.D.		POWER RATING[1]			APPROX. NET WT. LBS/M'[S]
			INCHES	mm	INCHES	mm	VOLTS	AMPS	WATTS	
02309	2	16	0.045	1.14	0.155 X 0.296	3.94 X 7.52	150	13	1950	35
02310	2	14	0.045	1.14	0.170 X 0.354	4.32 X 8.99	150	18	2700	45
02311	2	12	0.045	1.14	0.190 X 0.385	4.83 X 9.78	150	25	3750	62
02312	2	10	0.045	1.14	0.200 X 0.400	5.08 X 10.16	150	30	4500	90
02313	2	8	0.060	1.52	0.270 X 0.550	6.86 X 13.97	150	55	8250	175

[1] Amps and watts are offered ONLY as a guide to the end user.
[S] Actual shipping weight may vary.

Product Construction:

Conductor:
- 8 through 16 AWG fully annealed stranded bare copper per ASTM B3

Insulation:
- Premium-grade PVC, black
- Duplex parallel design for easy tear-down during installation
- Polarity ridge on one leg for positive circuit identification
- Temperature range: -20°C to +60°C

Jacket Marking:
- CAROL (SIZE) UNDERGROUND LOW ENERGY CIRCUIT CABLE SUNLIGHT RESISTANT FOR LOW VOLTAGE OUTDOOR LIGHTING E# (UL) -- CSA LL# LVLL 30 V FT1

Applications:
- Low-voltage landscape lighting
- Low-voltage security lighting

Industry Approvals:
- UL Listed underground low-energy circuit cable
- UL Listed for outdoor applications
- UL Listed for direct burial applications
- CSA Approved
- RoHS Compliant

Packaging:
- 500' (513.4 m) spools
- Other put-ups available on special order

CAROL BRAND UL LISTED Certified Canadian Standard Association RoHS Compliant Directive 2011/65/EU Made in U.S.A. General Cable

Low-Voltage Sprinkler Wire

60ºC, 30 Volt, UL



LOW-VOLTAGE SPRINKLER WIRE - 30 VOLT - UL

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FEET)	POWER RATING[1]			APPROX. NET WT. LBS/M'[S]
				VOLTS	AMPS	WATTS	
23804	4	18	500	30	5.6	168	18
23805	5	18	500	30	5.6	168	22
23807	7	18	500	30	4.9	147	31
23810	10	18	500	30	3.5	105	44

[1] Amps and watts are offered ONLY as a guide to the end user.
[S] Actual shipping weight may vary.

Product Construction:

Conductor:
- 18 AWG fully annealed solid bare copper per ASTM B3

Insulation:
- Premium-grade, color-coded PVC
- Premium-grade PE jacket, black
- Nylon rip cord to facilitate jacket removal
- Temperature range: -20°C to +60°C
- Color code: See chart below

Jacket Marking:
- CAROL (SIZE) 30 V SPRINKLER SYSTEMS WIRE - DIRECT BURIAL E54567 (UL)

Applications:
- Low-voltage golf course satellite sprinkler control
- Residential sprinkler solenoid control

Industry Approvals:
- UL Listed under a UL Miscellaneous Wire file
- UL Listed for outdoors applications
- UL Listed for direct burial applications
- RoHS Compliant

Packaging:
- 500' reels
- Other put-ups available on special order

COLOR CODE CHART

1	Black	**4**	Green	**7**	Blue	**10**	Purple
2	White	**5**	Orange	**8**	Brown		
3	Red	**6**	Yellow	**9**	Gray		

Made in U.S.A. RoHS Compliant Directive 2011/65/EU UL LISTED

Outdoor Extension Cords 6



General Cable, under the Carol® Brand name, offers a complete line of high-quality Outdoor Extension Cords designed to provide the best electrical performance for your application.

Carol's FrogHide® Ultra Flex® extension cords are the most flexible, durable rubber outdoor cords on the market with a name you won't forget. FrogHide cords are molecularly bonded to the caps and connectors, with heavy-duty strain reliefs built in for lasting strength, even in rough applications. Plus, they are resistant to water, oil, ozone and chemicals. FrogHide cords feature an exclusive personal identification system, so you can claim them as your own. They are easy to spot on the job, thanks to the bold, bright green color. FrogHide extension cords come with a limited lifetime warranty.

Lifetime Plus® Super Flex® extension cords have a connector end that lights up to indicate the power is on. Twice as flexible as other extension cords, the high- visibility yellow cord resists moisture and will not crack in arctic cold or melt in desert heat. The super-tough jacket provides extra resistance to cracking and abrasion. Lifetime Plus extension cords remain flexible to -50˚C.

The Carol line of All Weather extension cords and High Visibility All Weather extension cords are designed for excellent performance, even in freezing temperatures. These blue outdoor cords remain flexible to -50˚C.

Safety Orange® general-purpose outdoor extension cords and Powr-Centers® are basic necessities for every household tool box. The familiar orange jacket provides excellent visibility for improved safety on the job.

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CAROL BRAND®

General Cable

FrogHide® Ultra Flex® Extension Cords

3-Conductor Grounded • Type SJOW • -40°C to 90°C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
06425.63.06	3	14	25	Green	125	15	1875	10	3.0	30	079407064250
06450.63.06	3	14	50	Green	125	15	1875	6	6.0	36	079407064502
06400.63.06	3	14	100	Green	125	13	1625	4	11.4	46	079407064007
06225.61.06	3	12	25	Green	125	15	1875	6	4.3	26	079407062256
06250.61.06	3	12	50	Green	125	15	1875	4	7.9	32	079407062508
06200.61.06	3	12	100	Green	125	15	1875	2	15.9	32	079407062003

Product Description:

Carol® Brand FrogHide® Ultra Flex® extension cords are the most flexible, durable rubber outdoor cords on the market with a name you won't forget. FrogHide cords are bonded to the caps and connectors with heavy-duty strain reliefs built in for lasting strength, even in rough applications. Plus, they are resistant to water, oil, ozone and chemicals. FrogHide cords feature an exclusive personal identification system, so you can claim them as your own. They are easy to spot on the job, thanks to the bold, bright green color. FrogHide extension cords come with a limited lifetime warranty.

Product Warranty:

Carol® Brand FrogHide® Ultra Flex®
Limited Lifetime Warranty

This product is covered by a limited lifetime warranty against manufacturing defects. If you are not satisfied with this cord, return it with the original packaging to General Cable, 4 Tesseneer Drive, Highland Heights, KY 41076 for evaluation. This warranty does not cover damage to the cord from long-term use, abuse or from failure to follow electrical codes, laws and regulations relating to building or construction, including Article 590 of the National Electrical Code®. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

Product Construction:

Conductor:
- 14 AWG or 12 AWG stranded bare copper

Insulation:
- Premium-grade, color-coded 90°C EPDM

Jacket:
- CPE; green
- Temperature range: -40°C to 90°C
- Voltage rating: 300 volts

NEMA Configuration:
- 5-15P/5-15R

Applications:
- Chain saws
- Wet/dry vacs
- Orbital sanders
- Other outdoor equipment

Features:
- New technology molecularly bonds cap and connector
- Ultra-flexible
- Heavy-duty strain relief
- Personal identification system
- Resistant to water, oil, ozone and chemicals
- Limited lifetime warranty
- 3-conductor grounded

Industry Approvals:
- UL Listed
- OSHA Acceptable

General Cable

OSHA Acceptable Occupational Safety and Health Administration

UL LISTED

CAROL BRAND

Lifetime Plus® Super Flex® Lighted Extension Cords

3-Conductor Grounded • Type SJTW • -50ºC to 60˚C • 300 Volts

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	TYPE	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
						VOLTS	AMPS	WATTS				
03387.63.05	3	16	25	Yellow	SJTW	125	13	1625	12	1.7	20	079407033874
03390.63.05	3	14	25	Yellow	SJTW	125	15	1875	12	2.5	30	079407033904
03391.63.05	3	14	50	Yellow	SJTW	125	15	1875	6	4.7	28	079407033911
03392.63.05	3	14	100	Yellow	SJTW	125	13	1625	4	9.2	37	079407033928
03397.61.05	3	12	25	Yellow	SJTW	125	15	1875	6	3.7	22	079407033973
03398.61.05	3	12	50	Yellow	SJTW	125	15	1875	4	7.0	28	079407033980
03399.61.05	3	12	100	Yellow	SJTW	125	15	1875	2	13.1	26	079407033997
03350.63.05	3	12	2	Yellow	SJTW	125	15	1875	6	1.0	6	079407033508
03351.61.05	3	12	25	Yellow	SJTW	125	15	1875	6	4.2	25	079407416592
03352.61.05	3	12	50	Yellow	SJTW	125	15	1875	4	7.5	30	079407416608
03353.61.05	3	12	100	Yellow	SJTW	125	15	1875	2	13.6	27	079407416615



Product Description:

Lifetime Plus® Super Flex® extension cords have a connector end that lights up to indicate the power is on. Twice as flexible as other extension cords, the high-visibility yellow cord resists moisture and will not crack in arctic cold or melt in desert heat. The super-tough jacket provides extra resistance to cracking and abrasion. The Lifetime Plus extension cords have a limited lifetime warranty and remain flexible to -40˚C.

Product Construction:

Conductor:
- 16 AWG, 14 AWG or 12 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; yellow
- Temperature range: -40˚C to 60˚C
- Voltage rating: 300 volts

NEMA Configuration:
- 5-15P/5-15R

Applications:
- Chain saws
- Wet/dry vacs
- Orbital sanders
- Other outdoor equipment

Features:
- Lights up with power
- Super-flexible
- Weather- and water-resistant
- Limited lifetime warranty
- 3-conductor grounded

Industry Approvals:
- UL Listed
- OSHA Acceptable

CAROL BRAND UL LISTED OSHA Acceptable Occupational Safety and Health Administration

General Cable

Safety Orange® Extension Cords

3-Conductor Grounded • Type SJTW • -40ºC to 60˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
03318.63.04	3	16	10	Orange	125	13	1625	24	0.8	19	079407033188
03327.63.04	3	16	25	Orange	125	13	1625	24	1.8	43	079407033270
03354.63.04	3	16	50	Orange	125	13	1625	12	3.4	40	079407033546
03302.63.04	3	16	100	Orange	125	10	1250	4	6.6	26	079407033027
03328.63.04	3	14	25	Orange	125	15	1875	6	2.4	14	079407033287
03356.63.04	3	14	50	Orange	125	15	1875	4	4.6	18	079407033560
03304.63.04	3	14	100	Orange	125	13	1625	2	9.0	18	079407033041
06826.63.04	3	12	25	Orange	125	15	1875	4	3.4	14	079407068265
06853.63.04	3	12	50	Orange	125	15	1875	2	6.6	13	079407068531
06801.63.04	3	12	100	Orange	125	15	1875	2	13.0	26	079407068012

Product Construction:

Conductor:
- 16 AWG through 12 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; orange
- Temperature range: -40˚C to 60˚C
- Voltage rating: 300 volts

NEMA Configuration:
- 5-15P/5-15R

Applications:
- General use indoor/outdoor cord
- Vacuum cleaners
- Floor polishers
- Sanders
- Other power equipment

Features:
- Indoor/outdoor use
- 3-conductor grounded

Industry Approvals:
- UL Listed
- OSHA Acceptable

General Cable

OSHA Acceptable Occupational Safety and Health Administration

UL LISTED

CAROL BRAND

Outdoor Powr-Center® Extension Cords

3-Conductor Grounded • Types STW, SJEOOW and SJTW • -40°C to 60°C • 300 and 600 Volts

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
STW-600 V											
00594.63.04	3	12	2	Orange	125	15	1875	6	1.0	6	079407005949
00596.61.04	3	12	50	Orange	125	15	1875	2	11.1	22	079407005963
00597.61.04	3	12	100	Orange	125	15	1875	2	21.7	43	079407005970
SJTW-300 V											
00690.63.04	3	14	10	Orange	125	15	1875	12	1.2	15	079407006908
00691.63.04	3	14	25	Orange	125	15	1875	6	2.6	16	079407006915
00692.63.04	3	14	50	Orange	125	15	1875	4	4.7	19	079407006922
00694.63.04	3	12	10	Orange	125	15	1875	12	1.8	22	079407006946
00696.63.04	3	12	50	Orange	125	15	1875	2	7.0	14	079407006960
00697.63.04	3	12	100	Orange	125	15	1875	2	13.4	27	079407006977
ALL WEATHER HIGH VISIBILITY SJEOOW-300 V											
00790.63.07	3	14	10	Blue	125	15	1875	12	1.3	16	079407007905
00791.63.07	3	14	25	Blue	125	15	1875	6	2.7	16	079407007912
00792.63.07	3	14	50	Blue	125	15	1875	4	4.8	19	079407007929
00793.63.07	3	14	100	Blue	125	13	1625	2	9.0	18	079407007936
00787.63.05	3	12	50	Yellow	125	15	1875	2	6.5	13	079407007875
00788.63.05	3	12	100	Yellow	125	15	1875	2	13.0	26	079407007882



Product Construction:

Conductor:
- 14 AWG or 12 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; orange, TPE; blue or yellow
- Temperature range: -40°C to 60°C
- Voltage rating: 300 and 600 volts

NEMA Configuration:
- 5-15P/5-15R

Applications:
- General use indoor/outdoor cord
- Chain saws
- Wet/dry vacs
- Orbital sanders
- Other power equipment

Features:
- Indoor/outdoor use
- 3 grounded outlets

Industry Approvals:
- UL Listed
- OSHA Acceptable

CAROL BRAND UL LISTED OSHA Acceptable Occupational Safety and Health Administration

General Cable

All Weather Extension Cords

3-Conductor Grounded • Type SJEOOW • -50˚C to 105˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
03654.63.07	3	16	25	Blue	125	13	1625	4	1.8	7	079407036547
03655.63.07	3	16	50	Blue	125	13	1625	4	3.2	13	079407036554
03660.63.07	3	14	25	Blue	125	15	1875	4	2.2	9	079407036608
03661.63.07	3	14	50	Blue	125	15	1875	4	4.3	17	079407036615
03662.63.07	3	14	100	Blue	125	13	1625	2	8.0	16	079407036622
03667.63.07	3	12	50	Blue	125	15	1875	2	6.5	13	079407036677
03668.63.07	3	12	100	Blue	125	15	1875	2	12.5	25	079407036684

Product Description:

The Carol® line of All Weather Extension Cords are designed for excellent performance, even in freezing temperatures. The blue outdoor cords remain flexible and resist cracking to -50˚C.

Product Construction:

Conductor:
- 16 AWG through 12 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- TPE; blue
- Temperature range: -50˚C to 105˚C
- Voltage rating: 300 volts

NEMA Configuration:
- 5-15P/5-15R

Applications:

- Snow blowers
- Engine heaters
- Battery chargers
- Other outdoor equipment

Features:

- Flexible from -50˚C to 105˚C
- For harsh weather conditions
- 3-conductor grounded

Industry Approvals:

- UL Listed
- OSHA Acceptable

High Visibility All Weather Extension Cords

3-Conductor Grounded • Type SJEOOW • -50˚C to 105˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
03685.61.05	3	10	50	Yellow	125	15	1875	2	12.5	25	079407036851
03686.61.05	3	10	100	Yellow	125	15	1875	2	24.5	49	079407036868

Product Construction:

Conductor:
- 10 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded premium PVC

Jacket:
- TPE; yellow
- Temperature range: -50˚C to 105˚C
- Voltage rating: 300 volts

NEMA Configuration:
- 5-15P/5-15R

Applications:

- Heavy construction equipment
- Air compressors
- Circular saws
- Generators

Industry Approvals:

- UL Listed
- OSHA Acceptable

General Cable

OSHA Acceptable Occupational Safety and Health Administration

UL LISTED

CAROL BRAND

Application-Specific Extension Cords 7



General Cable offers a complete line of Power Supply Replacement Cords for use with power tools and household appliances. The three-conductor cords have either right angle or straight caps with a variety of plug configurations. The free ends are conveniently slit for ease of connection.

Carol® Brand Range Cords and Dryer Cords are available in three-wire and four-wire constructions, with an assortment of plug configurations. They are designed to accommodate virtually any household oven/range or clothes dryer.

Carol offers a wide assortment of Major Appliance Extension Cords with a variety of plug and cap configurations for use with air conditioners, refrigerators, freezers, microwave ovens, dehumidifiers and other large household appliances.

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Pro Flex® Rubber Extension Cords

3-Conductor Grounded • Type SJ • 60˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS					
06610.63.01	3	16	10	Black	125	13	1625	5-15P/5-15R	24	0.7	17	079407066100
06625.63.01	3	16	25	Black	125	13	1625	5-15P/5-15R	24	1.7	40	079407066254
06911.63.01	3	14	25	Black	125	15	1875	5-15P/5-15R	6	2.3	14	079407069118

Product Construction:

Conductor:
- 16 AWG through 14 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded EPDM

Jacket:
- CPE; black
- Temperature: 60˚C
- Voltage rating: 300 volts

Applications:
- Floor polishers
- Sanders

Features:
- General use indoor cord
- 3-conductor grounded

Industry Approvals:
- UL Listed
- OSHA Acceptable for indoor use

Coiled Power Tool Extension Cords and Power Supply Cords

2 and 3 Conductor • Type SJT • 60˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS					
06014.60.04	3	16	10	Orange	125	13	1625	5-15P/5-15R	10	1.1	11	079407060146
02551.70.01	3	16	12	Black	125	15	1875	5-15P	10	1.1	11	079407025510

Product Construction:

Conductor:
- 16 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; orange or black
- Voltage rating: 300 volts

Applications:
- Workshop and tool bench use

Features:
- Coiled cord expands from 3' to 10' or 12'
- Right-angle plug helps prevent the cord from being pulled from the socket

Features (cont'd.):
- 06014.60.04 and 02551.70.01 are 3-conductor grounded

Industry Approvals:
- UL Listed
- OSHA Acceptable

Power Supply Replacement Cords with Switch

3-Conductor Grounded • Type SJ • 60˚C • 300 Volts

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	SWITCH SPEED	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS						
02332.70.01	3	16	10	Black	125	10	1250	5-15P	1 Speed (On/Off)	25	0.9	22	079407023325
02333.70.01	4	16	10	Black	125	10	1250	5-15P	2 Speed (On/High/Low)	25	0.9	22	079407023332



Product Construction:

Conductor:
- 16 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded EPDM

Jacket:
- CPE; black

Applications:
- For replacement use
- For fan replacements

Features:
- Switch
- Straight plug
- Conductor stripped 5/8"
- Jacket removed 2"

Industry Approvals:
- UL Listed
- CSA

General Cable

UL LISTED CAROL BRAND

Power Supply Replacement Cords

3-Conductor Grounded • Types SJ, SJOW and SJOOW • 60˚C • 300 Volts

CATALOG NUMBER	CORD TYPE	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PLUG CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
						VOLTS	AMPS	WATTS						
02685.70.01	SJOOW	3	18	8	Black	125	10	1250	5-15P	Straight	25	0.6	14	079407026852
02686.70.01	SJOW	3	16	8	Black	125	13	1625	5-15P	Straight	35	0.7	24	079407026869
04932.70.01	SJ	3	16	12	Black	125	13	1625	5-15P	Straight	50	0.8	40	079407049325
04929.70.01	SJ	3	16	9	Black	125	13	1625	5-15P	Straight	50	0.6	30	079407049295
04926.70.01	SJ	3	16	6	Black	125	13	1625	5-15P	Straight	50	0.6	28	079407049264



Product Construction:

Conductor:
- 18 AWG or 16 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded EPDM

Jacket:
- CPE; black

Applications:
- For replacement use

Features:
- For replacement use
- Straight plug

Industry Approvals:
- UL Listed
- CSA

Power Supply Replacement Cords

2 and 3 Conductor • Types SJT and ST • 60˚C • 300 Volts and 600 Volts

CATALOG NUMBER	CORD TYPE	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PLUG CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
						VOLTS	AMPS	WATTS						
300 Volt														
02523.73.01	SJT	3	18	3	Black	125	10	1250	5-15P	Straight	50	0.2	12	079407025237
01364.70.01	SJT	3	18	8'2"	Black	125	10	1250	5-15P	Straight	50	0.5	25	079407213641
02052.70.01	SJT	3	18	12	Black	125	10	1250	5-15P	Straight	50	0.7	36	079407020522
02524.73.01	SJT	3	16	3	Black	125	13	1625	5-15P	Straight	50	0.3	14	079407025244
02547.70.01	SJT	3	16	6	Black	125	13	1625	5-15P	Straight	25	0.5	13	079407018444
01513.70.01	SJT	3	16	8'2"	Black	125	13	1625	5-15P	Straight	45	0.7	32	079407315130
04949.60.10	SJT	3	16	9	Gray	125	13	1625	5-15P	Straight	50	0.7	35	079407049493
01614.70.01	SJT	3	16	12	Black	125	13	1625	5-15P	Straight	50	0.9	44	079407016143
01278.70.01	SJT	2	16	8	Black	125	13	1625	1-15P	Straight	30	0.5	14	079407012787
01950.70.01	SJT	3	14	8	Black	125	15	1875	5-15P	Straight	50	0.8	41	079407019502
600 Volt														
01951.70.01	ST	3	12	8	Black	125	15	1875	5-15P	Straight	25	1.8	45	079407719518



With Switch	CORD TYPE	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PLUG CONFIG.	SWITCH SPEED	PKG. PER CTN.	WT./UNIT LBS	WT./CTN. LBS	UPC CODE
						VOLTS	AMPS	WATTS							
01732.70.01	SJT	3	18	8	Black	125	10	1250	5-15P	Straight	1 Speed (On/Off)	25	0.7	18	079407017324
02053.70.01	SJT	3	18	12	Black	125	10	1250	5-15P	Straight	1 Speed (On/Off)	15	0.8	12	079407020539

With Strain Relief	CORD TYPE	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PLUG CONFIG.	STRAIN RELIEF	PKG. PER CTN.	WT./UNIT LBS	WT./CTN. LBS	UPC CODE
						VOLTS	AMPS	WATTS							
02548.70.01	SJT	3	16	6	Black	125	13	1625	5-15P	Straight	7" From Free End	25	0.5	13	079407025480

With Receptacle Only	CORD TYPE	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	RECEPTACLE CONFIG.	PKG. PER CTN.	WT./UNIT LBS	WT./CTN. LBS	UPC CODE
						VOLTS	AMPS	WATTS						
04530.73.01	SJT	3	16	3	Black	125	13	1625	5-15R	Straight	50	0.2	9	079407045303

Product Construction:

Conductor:
- 18 AWG through 12 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; black or gray

Applications:
- For replacement use

Features:
- Straight plug
- Conductor stripped 5/8"
- Jacket removed 1 1/2"

Industry Approvals:
- UL Listed
- CSA

CAROL BRAND

UL LISTED

CSA Certified Canadian Standard Association

General Cable

Range Cords

Type SRDT • 50 Amps • 60˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS					
05604.63.10	3	2#6 & 1#8	4	Gray	250	50	12500	10-50P	12	1.8	22	079407056040
05606.63.10	3	2#6 & 1#8	6	Gray	250	50	12500	10-50P	12	2.6	31	079407056064
00604.63.01	4	2#6 & 2#8	4	Black	250	50	12500	14-50P	12	2.2	27	079407006045
00606.63.01	4	2#6 & 2#8	6	Black	250	50	12500	14-50P	6	3.2	19	079407006069

Product Construction:

Conductor:
- 8 AWG through 6 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade PVC; black or gray

Applications:
- Ranges in homes built prior to 1997 (3-conductor)
- Ranges in homes built after 1997 (4-conductor)

Features:
- Right-angle cap
- Eyelet ends for safer hookups
- Strain-relief clamp protects cord from damage caused by pulling or stretching

Industry Approvals:
- UL Listed

Dryer Cords

Type SRDT • 30 Amps • 60˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS					
05654.63.10	3	3#10	4	Gray	250	30	7500	10-30P	12	1.2	14	079407056545
05656.63.10	3	3#10	6	Gray	250	30	7500	10-30P	12	1.5	18	079407056569
01004.63.01	4	4#10	4	Black	250	30	7500	14-30P	12	1.5	18	079407010042
01006.63.01	4	4#10	6	Black	250	30	7500	14-30P	6	2.1	12	079407010066

Product Construction:

Conductor:
- 10 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; black or gray

Applications:
- Dryers in homes built prior to 1997 (3-conductor)
- Dryers in homes built after 1997 (4-conductor)

Features:
- Right-angle cap
- Eyelet ends for safer hookups

Features (cont'd):
- Strain-relief clamp protects cord from damage caused by pulling or stretching

Industry Approvals:
- UL Listed
- Meets revised 1997 NEC requirements

Air Conditioner Replacement Cords

3-Conductor Grounded • Type SPT-3 • 60˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PLUG CONFIG.	NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS						
04194.60.17	3	14	3	Beige	125	15	1875	Straight	5-15P	24	0.3	8	079407041947
04195.60.17	3	14	6	Beige	125	15	1875	Straight	5-15P	24	0.6	15	079407041657
04199.60.17	3	12	6	Beige	250	20	5000	Right Angle	6-20P	24	0.9	22	079407041992

Product Construction:

Conductor:
- 12 AWG and 14 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; beige

Applications:
- For replacement use with air conditioners

Features:
- Conductor stripped 5/8"
- Free end slit 1 1/2"

Industry Approvals:
- UL Listed

General Cable

UL LISTED CAROL BRAND

Major Appliance Cords

3-Conductor Grounded • Type SPT-3 • 15 and 20 Amps • 60˚C • 300 Volts

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS					
00436.63.17	3	14	6	Beige	125	15	1875	5-15P/5-15R	24	0.6	15	079407004362
00439.63.17	3	14	9	Beige	125	15	1875	5-15P/5-15R	24	0.9	21	079407004393
00442.63.17	3	14	12	Beige	125	15	1875	5-15P/5-15R	12	1.2	14	079407004423
00762.63.17	3	12	9	Beige	250	20	5000	6-20P/6-20R	24	1.4	34	079407007622
00772.63.17	3	12	9	Beige	125	20	2500	5-20P/5-20R	24	1.4	34	079407007721

Product Construction:

Conductor:
- 12 and 14 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade PVC; beige

Applications:
- Air conditioners
- Refrigerators
- Freezers
- Microwaves
- Dehumidifiers

Features:
- Molded right-angle plug

Industry Approvals:
- UL Listed



Power Supply Replacement Cords

3-Conductor Grounded • Types SPT-1 and SPT-3 • 60˚C • 300 Volts

CATALOG NUMBER	CORD TYPE	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PLUG CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
						VOLTS	AMPS	WATTS						
02050.70.10	SPT-1	3	18	8	Gray	125	10	1250	5-15P	Straight	50	0.4	21	079407020508
02522.73.01	SPT-3	3	16	6	Black	125	13	1625	5-15P	Straight	25	0.6	14	079407025220
04106.73.10	SPT-3	3	16	6	Gray	125	13	1625	5-15P	Right Angle	50	0.4	22	079407041060
04103.73.10	SPT-3	3	16	3	Gray	125	13	1625	5-15P	Right Angle	100	0.3	26	079407041039
04806.73.10	SPT-3	3	16	6	Gray	125	13	1625	5-15P	Straight	50	0.4	19	079407048069
04803.73.10	SPT-3	3	16	3	Gray	125	13	1625	5-15P	Straight	100	0.3	27	079407048038

Product Construction:

Conductor:
- 18 AWG and 16 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; black, gray or beige

Applications:
- For replacement use

Features:
- Conductor stripped 5/8”
- Free end slit 1 1/2”

Industry Approvals:
- UL Listed



CAROL BRAND UL LISTED

General Cable

Plug-it® Extension Cord Accessories 8



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The Plug-it® Fluorescent Light turns your extension cord into a light. The portable light has no permanent cord attached, providing easy storage when not in use. Ideal for contractors and do-it-yourselfers alike, the impact-resistant Plug-it® Fluorescent Light has a 13-watt bulb that runs cool to the touch when in operation. A cord-locking screw secures extension cords and resists disconnection when in use.

Also available in the Plug-it® series are adapters, Powr-Reels™ and the GFCI.

- The Plug-it® Powr-Center® Adapter features three outlets in a “T” configuration, adapting a single extension cord for more uses.
- The Plug-it® Ground Fault Circuit Interrupter (GFCI) and Surge Protector Plug connects to any standard extension cord. This handy pocket-size adapter detects power leaks and cuts off electricity in less than a second to prevent electric shock. It is designed for use anywhere ground fault protection is desired, including job sites, workshops, garages, kitchens, bathrooms or outdoor outlets, and features convenient test and reset buttons.

Plug-it® Fluorescent Utility Light

Cordless • Cool-Running • Impact-Resistant

CATALOG NUMBER	MAXIMUM BULB SIZE (WATTS)	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
07505.73.05	13	8	1.3	10	079407075058



Product Description:

The impact-resistant Plug-it® Fluorescent Light has a 13-watt bulb that runs cool to the touch when in operation. A cord-locking screw secures the extension cord and resists disconnection when in use.

Product Construction:

Body:
- PVC; yellow

Lens:
- Clear butyrate

Bulb:
- PLS 13-watt fluorescent

Applications:

- Temporary lighting
- For general use only
- Not for use in hazardous locations

Features:

- Turns an extension cord into a light
- Connects to 3-conductor grounded extension cord
- Cool-running 13-watt fluorescent bulb
- Rubberized hood
- Impact-resistant body and lens
- Swivel hook
- Locking screw system assures secure cord connections

Industry Approvals:

- UL Listed

Plug-it® Powr-Center® Adapter

"T" Configuration—Adapt extension cords for different uses

Product Construction:

Body:
- PVC; beige

Applications:

- Adapts a single extension cord for multiple uses

Features:

- 3 convenient outlets

CATALOG NUMBER	VOLTS	AMPS	WATTS	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE	COLOR
04781.96.17	125	15	1875	5	0.6	3	079407047819	Beige

Industry Approvals:

- UL Listed



Powr-Reel™ with 3 Outlets

3-Conductor Grounded • Type SJO • 90˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
44623.61.05	3	16	25	Yellow	125	10	1250	4	2.7	11	079407446230

Product Construction:

Conductor:
- 16 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded 90˚C EPDM

Jacket:
- CPE; yellow
- Voltage rating: 300 volts

Applications:
- Shop tools

Features:
- Tangle-Proof® instant cord storage
- Sturdy metal reel case
- Rubber cord
- 3 grounded outlets
- Cord locks in place; pull on cord to engage retractable reel

Industry Approvals:
- UL Listed
- OSHA Acceptable

Plug-it® Ground Fault Circuit Interrupter (GFCI) and Surge Protector Plug



CATALOG NUMBER	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
	VOLTS	AMPS	WATTS				
D7524.13.05	125	15	1875	6	0.3	2	079407075249

Product Description:
The Plug-it® Ground Fault Circuit Interrupter and Surge Protector Plug detects power leaks and cuts off electricity in less than one second to prevent electric shock.

Product Construction:

Body:
- PVC; yellow

Applications:
- Use anywhere GFCI protection is desired: job sites, kitchens, bathrooms, garages and workshops

Features:
- Detects power leaks and cuts electricity off in less than a second to prevent electric shock
- Test and reset buttons
- Use with any standard extension cord
- Use indoor or outdoor
- Protects electrical circuitry from voltage fluctuations
- Maximum clamping voltage - 790 volts
- MOV - 80 joules

Industry Approvals:
- UL Listed
- OSHA Acceptable

Specialty Extension Cords and Lighting 9



Carol® Brand Specialty Extension Cord Products are uniquely designed for specific uses by contractors, do-it-yourselfers and homeowners alike.

The Shock Safe® 3-outlet Powr-Center® has a built-in ground fault circuit interrupter (GFCI) for detecting power leaks. Featuring weather-resistant test and reset buttons, the GFCI cuts off electricity to prevent electric shock.

Carol offers 3-outlet Powr-Centers® for use when multiple outlets are needed indoors. The three-conductor cords are designed specifically for household, office or workshop use.

Carol offers three-conductor standard Utility Lights with plastic or metal guards. Our Brooder Lamp and Clamp Lights are also available to meet your lighting needs.

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Shock Safe® Ground Fault Circuit Interrupter (GFCI) Powr-Center®

3 Conductor • Type SJTW • -40ºC to 60˚C • 300 Volts



POWR-CENTER® WITH 3 OUTLETS

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
04000.63.05	3	12	2	Yellow	125	15	1875	6	1.3	8	079407040001

Product Description:

The Shock Safe® 3-outlet Powr-Center® has a built-in GFCI for detecting power leaks. Featuring weather-resistant test and reset buttons, the GFCI cuts off electricity to prevent electric shock.

Product Construction:

Conductor:
- 12 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; yellow
- Temperature range: -40˚C to 60˚C
- Voltage rating: 300 volts

Applications:

- Power tools
- Appliances

Features:

- Integral GFCI detects power leaks and cuts off electricity to prevent electric shock
- Test and reset buttons
- 3-conductor grounded

Industry Approvals:

- UL Listed
- OSHA Acceptable

Household Powr-Centers®

3-Conductor Grounded • Types SPT-3 and SJT • 60˚C • 300 Volts



CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
TYPE SPT-3											
00655.63.04	3	14	3	Orange	125	15	1875	10	0.6	6	079407006557
TYPE SJT											
00565.63.17	3	16	9	Beige	125	13	1625	12	0.7	8	079407005659

Product Construction:

Conductor:
- 16 AWG or 14 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; orange or beige
- Voltage rating: 300 volts

Applications:

- Clocks
- Lamps
- Holiday lighting
- Other household appliances

Features:

- 3 grounded outlets

Industry Approvals:

- UL Listed

Plastic Guard Utility Light

3-Conductor Grounded • Type SJT • 300 Volts

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS				
04497.60.05	3	16	50	Yellow	125	13	1650	6	3.5	21	079407044979

Product Construction:

Conductor:
- 16 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; yellow
- Voltage rating: 300 volts

Applications:
- Temporary lighting
- For general use only
- Not for use in hazardous locations

Features:
- Side outlet
- On/off switch
- 75-watt bulb maximum
- Swivel hook
- Polypropylene guard

Industry Approvals:
- UL Listed
- OSHA Acceptable for general use



Metal Guard Utility Light

3-Conductor Grounded • Type SJT • 300 Volts

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING			NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	AMPS	WATTS					
04455.60.05	3	16	25	Yellow	125	13	1650	15-15P	12	1.8	22	079407044559
04457.60.05	3	16	50	Yellow	125	13	1650	15-15P	6	3.5	21	079407044573

Product Construction:

Conductor:
- 16 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; yellow
- Voltage rating: 300 volts

Applications:
- Temporary lighting
- For general use only
- Not for use in hazardous locations

Features:
- Side outlet
- Metal hook
- On/off switch
- 75-watt bulb maximum
- 3-conductor grounded

Industry Approvals:
- UL Listed
- OSHA Acceptable for general use



CAROL BRAND UL LISTED

General Cable

Brooder and Heat Lamp

2-Conductor Polarized • Type SJTW • 105˚C • 300 Volts • Non-UL

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING		NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	WATTS					
04127.60.01	2	18	8	Black	125	250	1-15P	12	1.0	12	079407041275



Product Construction:

Conductor:
- 18 AWG stranded bare copper per ASTM B174

Insulation:
- Premium-grade, color-coded PVC

Jacket:
- PVC; black
- Voltage rating: 300 volts

Applications:
- Temporary lighting
- Egg hatching

Features:
- 10 1/2" bell shade
- Porcelain socket
- Hanging clamp
- Swivel clamp with protective vinyl sleeve
- Protective bulb guard
- 250-watt bulb maximum

Clamp Light

2-Conductor Polarized • Type SPT-2 • 105˚C • 300 Volts

CATALOG NUMBER	NO. OF COND.	AWG SIZE	LENGTH OF CORD (FT)	COLOR OF JACKET	POWER RATING		NEMA CONFIG.	PKG. PER CTN.	WT./ UNIT LBS	WT./ CTN. LBS	UPC CODE
					VOLTS	WATTS					
04170.60.02	2	18	6	White	125	150	1-15P	12	0.8	10	079407041701



Product Construction:

Conductor:
- 18 AWG stranded bare copper per ASTM B174

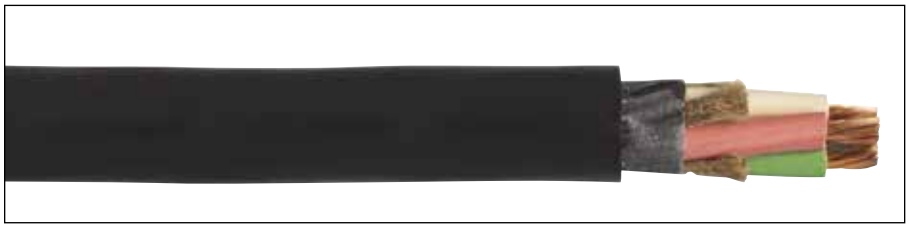
Insulation:
- Premium-grade PVC; white
- Voltage rating: 300 volts

Applications:
- Temporary lighting

Features:
- 8 1/2" bell shade
- Clamp with protective vinyl sleeve
- Adjustable ball joint
- Switch socket

Industry Approvals:
- UL Listed

General Information 10



As a helpful aid to our customers, this general information section provides useful wire and cable definitions that can assist the designer or application specialist in determining the best cord product specification.

Understanding and using proper wire and cable terminology gains additional importance, given the global application and use of cord and cordset products.

Quick-reference unit conversion and temperature conversion charts included in this section provide you with an understanding of the worldwide applications of our cord products.

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Glossary

AAR: Association of American Railroads.

AC: Alternating Current (a.c.). Current in which the charge-flow periodically reverses and is represented by: $I = I_{\circ} \cos (2 f + \phi)$ where, I is the current, $I_{\circ}$ is the amplitude, f the frequency, ϕ the phase angle.

ALS: A type of cable consisting of insulated conductors enclosed in a continuous, closely fitting aluminum tube.

ANSI: Abbreviation for American National Standards Institute.

ASME: Abbreviation for American Society of Mechanical Engineers.

ASTA: United Kingdom approval agency.

ASTM: Abbreviation for the American Society for Testing and Materials, a non-profit industry-wide organization which publishes standards, methods of test, recommended practices, definitions and other related material.

AWM: UL designation for appliance wiring material.

Abrasion Resistance: Ability of a wire, cable or material to resist surface wear.

Accelerated Aging: A test that attempts to duplicate long-time environmental aging in comparatively short time spans.

Accelerator: A chemical additive which hastens a chemical reaction under specific conditions.

Adhesive-Bonded: Cables bonded by adding an adhesive coating to the surface of the cable components, then joining and curing the adhesive to form a cable. See *Bonded Cables.*

Admittance: The measure of the ease with which an alternative current flows in a circuit. The reciprocal of impedance.

Aerial Cable: A cable suspended in the air on poles or other overhead structure.

Aging: The change in properties of a material with time under specific conditions.

Air Core Cable: A cable in which the interstices in the cable core are not filled with a moisture barrier.

Alligator Clip: A mechanical device shaped like alligator jaws used as a temporary connection on the end of interconnections wire.

Alloy: A metal formed by combining two or more different metals to obtain desirable properties.

Aluminum-Steel Conductor: A composite conductor made up of a combination of aluminum and steel wires.

Ambient Temperature: The temperature of a medium (gas or liquid) surrounding an object.

American Wire Gauge (AWG): The standard system used for designating wire diameter. The lower the AWG number, the larger the diameter. Also called the Brown and Sharpe (B&S) Wire Gauge.

Ampacity: See *Current Carrying Capacity.*

Ampere's Law: The magnetic intensity at any point near a current carrying conductor can be computed on the assumption that each infinitesimal length of the conductor produces at the point of an infinitesimal magnetic density. The resulting magnetic intensity at the point is the vector sum of the contributions of all the elements of the conductor.

Ampere: The unit of current. One ampere is the current flowing through one ohm of resistance at one volt potential.

Analog: Transmission data densities by continuously variable quantities.

Anneal: Relief of mechanical stress through heat and gradual cooling. Annealing copper renders it less brittle.

Annular Conductor: A number of wires stranded in three reversed concentric layers around a core.

Anti-Oxidant: A substance which prevents or slows down oxidation of material exposed to air.

Appliance Wire and Cable: A classification covering insulated wire and cable for internal wiring of appliances and equipment.

Arc Resistance: The time required for an arc to establish a conductive path in a material.

Armored Cable: A cable provided with a wrapping of metal for mechanical protection.

Attenuation: Power loss in an electrical system. In cables, generally expressed in db per unit length, usually 100 ft.

Audio Frequency: The range of frequencies audible to the human ear. Usually 20-20,000 Hz.

B & S Gauge: The same as American Wire Gauge (AWG).

BCF: Abbreviation for billion conductor feet. A quantity derived by multiplying the number of conductors in a cable by the amount of cable. Usually used to indicate plant capacity or an annual requirement.

Band Marking: A continuous circumferential band applied to a conductor at regular intervals for identification.

Band Width: The frequency range of electrical signals transmitted.

Banded Cable: Two or more cables banded together by stainless steel strapping.

Barrel-Packed: Method of coiling into a fiber drum for shipment.

Belt: Number of layers of insulation on a conductor, or number of layers of jacket on a cable.

Belted-Type Cable: Multiple conductor cable having a layer of insulation over the assembled insulated conductors.

Bend Radius: The radius of the bend (usually designated as a multiple of product diameter) at which a wire product can safely be bent without significantly affecting its ability to function.

Bifilar: A winding made non-inductive by winding together (as one wire) two wires carrying current in opposite directions.

Bimetallic Wire: A wire formed of two different metals joined together (not alloyed). It can include wire with a steel core clad wire, or plated or coated wire.

Binder: A spirally served tape or thread used for holding assembled cable components in place awaiting subsequent manufacturing operations.

Binding Post: A device for clamping or holding electrical conductors in a rigid position.

Bond Strength: Amount of adhesion between bonded surfaces, e.g., in cemented ribbon cable.

Glossary

Bondable Wire: An insulated wire treated to facilitate adherence to materials such as potting compounds. Also, magnet wires used in making coils when bonding the turns together is desired.

Bonded Cable: Cable consisting of pre-insulated conductors or multiconductor components laid-in parallel and bonded into a flat cable. See *Adhesive-Bonded.*

Bonded Construction: An insulation construction in which the glass braid and nylon jacket are bonded together.

Booster: A device inserted into a line (or cable) to increase the voltage.

Boot: (1) Protective covering over a cable wire, or connector in addition to the normal jacketing or insulation. (2) A form placed around wire termination of a multiple-contact connector to contain the liquid potting compound before it hardens.

Braid: A fibrous or metallic group of filaments interwoven in cylindrical form to form a covering over one or more wires.

Braid Angle: The smaller of the two angles formed by the shielding strand and in the axis of the cable being shielded.

Braid Carrier: A spool or bobbin on a braid which holds one group of strands or filaments consisting of a specific number of ends. The carrier revolves during braiding operations.

Braid Ends: The number of strands used to make up one carrier. The strands are wound side by side on the carrier bobbin and lie parallel in the finished braid.

Braiding Machine: Machine used to apply braids to wire and cable and to produce braided sleeving and braids for tying or lacing purposes. Braiding machines are identified by the number of carriers.

Breakdown (Puncture): A disruptive discharge through the insulation.

Breakdown Voltage: The voltage at which the insulation between two conductors breaks down.

Breakout: The point at which a conductor or group of conductors breaks out from a multiconductor cable to complete circuits at various points along the main cable.

British Standard Wire Gauge: A modification of the Birmingham Wire Gauge and the legal standard of Great Britain for all wires. Also known as Standard Wire Gauge (SWG), New British Standard (NBS), English Legal Standard and Imperial Wire Guide.

Building Wire: Wire used for light and power, 600 volts or less, usually not exposed to outdoor environment.

Bunched Stranding: A group of strands twisted together in a random manner and the same direction without regard to geometric arrangement of specific strands.

Buncher: A machine that twists wires together in random arrangement.

Bundle: (fiber optic) A number of fibers grouped together, usually carrying a common signal.

Buried Cable: A cable installed directly in the earth without use of underground conduit. Also called Direct Burial Cable.

Bus: Wire used to connect two terminals inside of an electrical unit.

Bushing: A mechanical device used as a lining for an opening to prevent abrasion to wire and cable.

Butt: Joining of two conductors end-to-end, with no overlap and with the axes in line.

Butt Splice: A splice wherein two wires from opposite ends butt against each other, or against a stop, in the center of a splice.

Butt Wrap: Tape wrapped around an object or conductor in an edge-to-edge condition.

Byte: Typically a group of eight binary digits.

C-SJ: Same as SJ except extra-flexible conductor.

C-SJO: Same as SJO except extra-flexible conductor.

CATV: Acronym for Community Antenna Television.

CCTV: Acronym for Closed-Circuit Television.

CEBEC: Belgium Approval Agency; Comite Electrotechnique Belge Service de la Marque.

CE Code, CEC: Canadian Electrical Code.

CEE: Consortium for Energy Efficiency.

CENELEC: European Standards Agency; European Committee for Electrotechnical Norms.

CSA: Abbreviation for Canadian Standards Association, a non-profit independent organization which operates a listing service for electrical and electronic materials and equipment. The Canadian counterpart of the Underwriters Laboratories.

CV: Abbreviation for continuous vulcanization.

Cable: A stranded conductor with or without insulation and other coverings (single-conductor cable) or a combination of conductors (multiple-conductor cable). In fiber optics, a jacketed fiber or jacketed bundle in a form which can be terminated.

Cable Assembly: Typically, the cable and associated connectors; ready to install.

Cable Clamp: A device used to give mechanical support to the wire bundle or cable at the rear of a plug or receptacle.

Cable Clamp Adapter: A mechanical adapter that attaches to the rear of a plug or receptacle to allow the attachment of a cable clamp.

Cable Core: The portion of an insulated cable lying under a protective covering.

Cable Core Binder: A wrapping of tapes or cords around the conductors of a multiple-conductor cable used to hold them together.

Cable Filler: The material used in multiple-conductor cables to occupy the interslices formed by the assembly of the insulated conductors, thus forming a cable core.

Cable Sheath: The protective covering applied to cables.

Cable Vulcanizer: Compression molding machine used to repair cable jacketing that has had a part removed for splicing, for adding connectors or other devices or for replacing damaged sections.

Cabling: Twisting together two or more insulated conductors by machine to form a cable. In fiber optics, a method by which a group or bundle of fibers is mechanically assembled.

Cabling Factor: Used in the formula for calculating the diameter of an unshielded, unjacketed cable. D=Kd, where D is the cable diameter, K is the factor and d is the diameter of one insulated conductor.

Capacitance: The ratio of the electrostatic charge on a conductor to the potential difference between the conductors required to maintain that charge.

Glossary

Capacitance, Direct: The capacitance measured from one conductor to another conductor through a single insulating layer.

Capacitance, Mutual: The capacitance between two conductors (typically of a pair) with all other conductors, including shield, short circuited to ground.

Carrier: The woven element of a braid consisting of one or more ends (strands) which creates the interlaced effect. Also, a spindle, spool, tube or bobbin (on a braiding machine) containing yarn or wire, employed as a braid.

CBO: Rubber-insulated Brewery Cord.

Certificate of Compliance (C of C): A written statement; normally generated by a Quality Control Department, which states that the product being shipped meets customer's specifications.

Certified Test Report (CTR): A report reflecting actual test data on the cable shipped. Tests are normally conducted by the Quality Control Department, and show that the product being shipped meets the required test specifications.

Characteristic Impedance: The impedance that when connected to the output terminals of a transmission line, of any length, makes the line appear indefinitely long.

Chlorinated Polyethylene (CPE): Rubbery polymer used for insulation and jacketing of wire and cable. Manufactured by Dow Chemical under the trade name Tyrin.

Chlorosulfonated Polyethylene (CSPE): A rubbery polymer used for insulations and jackets. Manufactured by E.I. DuPont under the trade name of Hypalon.

Cigarette Wrap: Tape insulation wrapped longitudinally instead of spirally over a conductor.

Circuit: A complete path over which electrons can flow from the negative terminals of a voltage source through parts and wires to the positive terminals of the same voltage source.

Circuit Sizes: A popular term for building wire sizes 14 through 10 AWG.

Circular Mil: The area of a circle one mil (.001") in diameter; 7.854x10 7 sq. in. Used in expressing wire cross sectional area.

Cladding: Method of applying a layer of metal over another metal whereby the junction of the two metals is continuously welded. In fiber optics, a sheathing intimately in contact with the core of a higher refractive index material which serves to provide optical insulation and protection to the reflection interface.

Closed End Splice: An insulated splice in which two or more wires overlap and enter the splice from the same end of the barrel.

Coaxial Cable: A cable consisting of two cylindrical conductors with a common axis, separated by a dielectric.

Coaxial Connector: A connector that has a coaxial construction and is used with coaxial cable.

Coil Effect: The inductive effect exhibited by a spiral-wrapped shield, especially above audio frequencies.

Cold Flow: Permanent deformation of the insulation due to mechanical force of pressure (not due to heat softening).

Color Code: A color system for wire or circuit identification by use of solid colors, tracers braids, surface printing, etc.

Common Axis Cabling: In multiple cable constructions, a twisting of all conductors about a "common axis" to result in smaller-diameter constructions. Tends to result in greater susceptance to electromagnetic and electrostatic interference.

Compact Conductor: Stranded conductor rolled to deform the round wires to fill the normal interstices between the wires in a strand.

Composite (Clad) Wire: A wire having a core of one metal with a fused outer shell of different metals.

Composite Conductor: Two or more strands of different metals assembled and operated in parallel.

Compound: An insulating or jacketing material made by mixing two or more ingredients.

Compression Cable: A pipe type cable in which the pressure medium is separated from the insulation by a membrane or sheath.

Concentric: A central core surrounded by one or more layers of helically wound strands in a fixed round geometric arrangement.

Concentric Strand: A strand that consists of a central wire or core surrounded by one or more layers of spirally laid wires.

Concentric-Lay Cable: A concentric-lay conductor, or a multiple-conductor cable composed of a central core surrounded by one or more layers of helically laid insulated conductors.

Concentricity: The measurement of the location of the center of the conductor with respect to the geometric center of the circular insulation.

Conductance: The ability of a conductor to carry an electric charge. The ratio of the current flow to the potential difference causing the flow. The reciprocal of resistance.

Conductivity: The capacity of a material to carry electrical current—usually expressed as a percentage of copper conductivity (copper being one hundred percent).

Conductor: A wire (or combination of wires not insulated from one another) suitable for carrying electric current.

Conduit: A tube or trough in which insulated wires and cables are run.

Connector: A device used to provide rapid connect/disconnect service for electrical cable and wire terminations.

Contact: The part of a connector which actually carries the electrical current and is touched together or separated to control the flow.

Contact Inspection Hole: A hole in the cylindrical rear portion of contact used to check the depth to which a wire has been inserted.

Contact Size: The largest size wire which can be used with the specific contact. Also, the diameter of the engagement end of the pin.

Continuity Check: A test to determine whether electrical current flows continuously throughout the length of a single wire or individual wires in a cable.

Continuous Vulcanization: Simultaneous extrusion and vulcanization of rubber-like wire coating materials.

Glossary

Contrahelical: Cable spiraling in an opposite direction than the preceding layer within a wire or cable.

Control Cable: A multiconductor cable made for operation in control of signal circuits.

Controlled Impedance Cable: Package of two or more insulated conductors where impedance measurements between respective conductors are kept essentially constant throughout the entire length.

Copolymer: A compound resulting from the polymerization of two different monomers.

Copper-Clad: Steel with a coating of copper welded to it before drawing as opposed to copper-plated. Synonymous with Copperweld.

Copperweld: The trade name of Flexo Wire Division (Copperweld Steel Corp.) for their copper-clad steel conductors.

Cord: A small, flexible insulated cable.

Cord Set: Portable cords fitted with a wiring device at one or both ends.

Core: In cables, a component or assembly of components over which other materials are applied, such as additional components, shield, sheath or armor. In fiber optics, the transparent glass or plastic section with a high refractive index through which the light travels by internal reflections.

Corona: A discharge due to ionization of air around a conductor due to a potential gradient exceeding a certain critical value.

Corona Resistance: The time that the insulation will withstand a specified level of field-intensified ionization that does not result in the immediate complete breakdown of the insulation.

Corrosion: The destruction of the surface of a metal by chemical reaction.

Coverage: The calculated percentage which defines the completeness with which a metal braid covers the underlying surface. The higher percentage of coverage, the greater the protection against external interference.

Covering: Textile braid or jacket of rubber, plastics or other materials applied over wire and cables to provide mechanical protection and identification.

Crazing: The minute cracks on the surface of plastic materials.

Creep: The dimensional change with time of a material under load.

Creepage: The conduction of electricity across the surface of a dielectric.

Creepage Path: The path across the surface of a dielectric between two conductors.

Creepage Surface: An insulating surface which provides physical separation as a form of insulation between two electrical conductors of different potential.

Crimp: Act of compressing a connector barrel around a cable in order to make an electrical connection.

Crimp Termination: Connection in which a metal sleeve is secured to a conductor by mechanically crimping the sleeve with pliers, presses, or automated crimping machines.

Cross-linked: Inter-molecular bonds between long-chain thermoplastic polymers by chemical or electron bombardment means. The properties of the resulting thermosetting material are usually improved.

Crosstalk: Undesired electrical currents in conductors caused by electromagnetic or electrostatic coupling from other conductors or from external sources. Also, leakage of optical power from one optical conductor to another.

Cure: To change the physical properties of a material by chemical reaction.

Curing Cycle: The time, temperature and pressure required for curing.

Curl: The degree to which a wire tends to form a circle after removal from a spool. An indication of the ability of the wire to be wrapped around posts in long runs.

Current: The rate of transfer of electricity. Practical unit is the ampere which represents the transfer of one coulomb per second. In a simple circuit, current (I) produced by a cell or electromotive force (E) when there is an external resistance (R) and internal resistance (r) is:

$$I = \frac{E}{R + r}$$

Current-Carrying Capacity: The maximum current an insulated conductor can safely carry without exceeding its insulation and jacket temperature limitations.

Cut-Through Resistance: The ability of a material to withstand mechanical pressure usually a sharp edge or small radius, without separation.

Cycle: The complete sequence including reversal of the flow of an alternating electric current.

D.C.: Abbreviation for Direct Current.

DEMKO: Approval agency of Denmark.

DRT: Plastic range and dryer cord (CSA).

Decibel (db): A unit to express differences of power level. Used to express power gain in amplifiers or power loss in passive circuits or cables.

Delay Line: A cable made to provide very low velocity of propagation with long electrical delay for transmitted signals.

Depth of Crimp: Thickness of the crimped portion of a connector measured between two opposite points on the crimped surface.

Derating Factor: A factor used to reduce the current-carrying capacity of a wire when used in environments other than that for which the value was established.

Dielectric: An insulating medium which intervenes between two conductors and permits electrostatic attraction and repulsion to take place across it.

Dielectric Breakdown: The voltage required to cause an electrical failure or breakthrough of the insulation.

Dielectric Constant (K): The ratio of the capacitance of a condenser with dielectric between the electrodes to the capacitance when air is between the electrodes. Also called Permittivity and Specific Inductive Capacity.

Dielectric Loss: Power dissipated in an insulating medium as the result of the friction caused by molecular motion when an AC electric field is applied.

Dielectric Strength: The voltage which an insulation can withstand before breakdown occurs. Usually expressed as a voltage gradient (such as volts per mil).

Dielectric Test: A test in which a voltage higher than the rated voltage is applied for a specified time to determine the adequacy of the insulation under normal conditions.

Glossary

Digital: Transmission data representative by discrete characters.

Dip Coating: An insulating coating applied to the conductor by passing the conductor through an applicator containing liquid insulating medium.

Direct Burial Cable: A cable installed directly in the earth.

Direct Capacitance: The capacitance measured directly from conductor to conductor through a single insulating layer.

Direct Current: An electric current which flows in only one direction.

Direct Current Resistance (DCR): The resistance offered by any circuit to the flow of direct current.

Direction of Lay: The lateral direction in which the strands of a conductor run over the top of the cable conductor as they recede from an observer looking along the axis of the conductor or cable. Also applies to twisted cable.

Discrete Wiring: Wire or wires having distinct identity and purpose.

Disruptive Discharge: A sudden, large increase in current through an insulation medium due to the complete failure of the medium under the electrostatic stress.

Disturbed Conductor: A conductor that receives energy generated by the field of another conductor or an external source, such as a transformer.

Drain Wire: In a cable, the uninsulated wire laid over the component or components and used as a ground connection.

Draw Feed Stock: Rod or wire that is subsequently drawn to a smaller size.

Drawing: In wire manufacture, pulling the metal through a die or series of dies to reduce diameter to a specified size.

Dual Coaxial Cable: Two individually insulated conductors laid parallel or twisted and placed within an overall shield and sheath.

Duct: An underground or overhead tube for carrying electrical conductors.

Duplex: Two-way data transmission on a four-wire transmission line.

Duplex Cable: A cable composed of two insulated single-conductor cables twisted together.

Duplex Parallel: Typically used in the thermo-couple industry to denote two parallel conductors of dissimilar metals insulated in parallel without twist and jacketed. Commonly applied to thermo-couple grades and extension wires.

Durometer: A measure of hardness.

E: Symbol for voltage. Usually used to represent direct voltage or the effective (root-mean-square) value of an alternating voltage.

EFTS: Abbreviation for Electronic Funds Transfer System.

EIA: Abbreviation for Electronic Industries Association.

EMI: Abbreviation for electromagnetic interference.

EPDM: Ethylene-propylene-diene monomer rubber.

EPR: Ethylene-propylene rubber.

ESTA: Australian approval agency, Electricity Trust of South Australia.

ETPC: Abbreviation for electrolytic tough pitch copper. It has a minimum conductivity of 99.9%.

Eccetricity: Like concentricity, a measure of the center of a conductor's location with respect to the circular cross-section of the insulation. Expressed as a percentage of displacement of one circle within the other.

Eddy Current: Circulating currents induced in conducting materials by varying magnetic fields.

Elastomer: A rubber or rubber-like material which will stretch repeatedly to 200 percent or more and return rapidly and with force to its approximate original shape.

Electro-Tinned: Electrolytic process of tinning wire using pure tin.

Electrode: A conductor through which a current enters or leaves a nonmetallic conductor.

Electromagnetic Coupling: Energy transfer by means of a varying magnetic field.

Electromagnetic Field: A rapidly moving electric field and its associated moving magnetic field.

Electromagnetic Induction: The production of a voltage in a coil due to a change in the number of magnetic lines of force (flux linkages) passing through the coil.

Electromotive Force (e.m.f.): Pressure or voltage. The force which causes current to flow in a circuit.

Electronic Wire and Cable: A length of conductive or semiconductive material used in an electronic application.

Elongation: The fractional increase in the length of a material stressed in tension.

Embossing: A marker identification by means of thermal indentation leaving raised lettering on the sheath material of cable.

Emergency Overload: Load which occurs when larger-than-normal currents are carried through a cable or wire over a certain period of time.

Enameled Wire: A conductor with a baked-on enamel film insulation. In addition to magnet wire, enameled insulation is used on thermocouple-type wires and other wires.

Ends: In braiding, the number of essentially parallel wires of threads on a carrier.

Energize: To apply rated voltage to a circuit or device in order to activate it.

Equilay: More than one layer of helically laid wires with the direction of lay reversed for successive layers, but with the length of lay the same for each layer.

Etched Wire: A process applied to fluoroplastic wire in which the wire is passed through a sodium bath to create a rough surface to allow epoxy resin to bond the fluoroplastic.

External Interference: The effects of electrical waves or fields which cause sounds other than the desired signal; static.

External Wiring: Electronic wiring which interconnects subsystems within the system.

Extruded Cable: Cable with conductors which are uniformly insulated and formed by applying a homogeneous insulation material in a continuous extrusion process.

Extrusion: Method of continuously forcing plastic, rubber or elastomer material through an orifice to apply insulation or jacketing over a conductor or cable core.

FAA: Federal Aeronautics Administration.

Glossary

FEP: Fluorinated ethylene propylene.

FI: Approval agency of Finland; Electrical Inspectorate.

FR-1: A flammability rating established by Underwriters Laboratories for wires and cables that pass a specially designed vertical flame test.

Farad: A unit of electrical capacity.

Fatigue Resistance: Resistance to metal crystallization which leads to conductors or wires breaking from flexing.

Feed-Through Insulators: Insulators that carry a metal conductor through the chassis while preventing the 'hot' lead from shorting to the ground chassis.

Feedthrough: (1) A conductor that connects patterns on opposite sides of a PCB. Also called Interfacial Connection. (2) A connector or terminal block, usually having double- ended terminals which permit simple distribution and bussing of electrical circuits.

Ferrule: A short tube used to make solderless connections to shielded or coaxial cable.

Fiber: A thread or threadlike structure. Also, a single discrete element used to transmit optical (light wave) information.

Fiber Optics: A lightwave or optical communications system in which electrical information is converted to light energy transmitted to another location through optical fibers and is there converted back into electrical information.

Fiber Tubing: A loose, crush-resistant cylinder applied over individual fibers to provide mechanical protection.

Field: An area of influence around a magnet or electric charge.

Field Coil: A suitable insulated winding to be mounted on a field pole to magnetize it.

Figure 8 Cable: An aerial cable configuration in which the conductors and the steel strand which supports the cable are integrally jacketed. A cross-section of the finished cable approximates the figure "eight."

Filament: Fiber characterized by extreme length.

Filled Cable: A telephone cable construction in which the cable core is filled with a material that will prevent moisture from entering or passing through the cable.

Filler: (1) A material used in multiconductor cables to occupy large interstices formed by the assembled conductors. (2) An inert substance added to a compound to improve properties or decrease cost.

Film: A thin, plastic sheet.

Fine Stranded Wire: Stranded wire with component strands of 36 AWG or smaller.

Flame Resistance: The ability of a material not to propagate flame once the heat source is removable.

Flammability: The measure of the material's ability to support combustion.

Flashover: A disruptive discharge around or over the surface of a solid or liquid insulator.

Flat Braid: A woven braid of tinned copper strands rolled flat at time of manufacture to a specified width.

Flat Cable: A cable with two smooth or corrugated, but essentially flat, surfaces.

Flat Conductor: A wire having a rectangular cross-section as opposed to a round or square conductor.

Flat Conductor Cable: A cable with a plurality of flat conductors.

Flex Life: The measurement of the ability of a conductor or cable to withstand repeated bending.

Flexibility: The ease with which a cable may be bent.

Flexible: That quality of a cable or cable component which allows for bending under the influence of outside force, as opposed to limpness which is bending due to the cable's own weight.

Floating: Referring to a circuit which has no connection to ground.

Flux: (1) The lines of force which make up an electrostatic field. (2) The rate of flow of energy across or through a surface. (3) A substance used to promote or facilitate fusion.

Foamed Plastics: Insulations having a cellular structure.

Foil: A thin, continuous sheet of metal.

Free Connector: A connector for attachment to the free end of a wire or cable.

Funnel Entry: Flared or widened entrance to a terminal or connector wire barrel.

Fuse Wire: Wire made from an alloy that melts at a relatively low temperature.

Fused Coating: A metallic coating which has been melted and solidified, forming a metallurgical bond to the base material.

Fused Conductors: Individual strands of heavy tinned copper wire stranded together and then bonded together by induction heating.

Fused Spiral Tape: A PTFE insulated hookup wire. The spiral-wrapped conductor is passed through a sintering oven where overlaps are fused together.

GTO: Gast tube sign and oil-burner ignition cable. 5,000V-15,000V.

Galvanometer: An instrument for detecting or measuring small electrical current.

Gas-Filled Cable: A self-contained pressure cable in which the pressure medium is an inert gas having access to the insulation.

Gauge: A term used to denote the physical size of a wire.

Gimmick: A short length of wire soldered onto a circuit component and used as a small adjustable capacitor.

Ground: A conductive connection between an electrical circuit and the earth or other large conducting body to serve as an earth, thus making a complete electrical circuit.

Ground Conductor: A conductor in a transmission cable or line that is grounded.

Ground Insulation: The insulation used between a winding and the magnetic core or other structural parts, usually at ground potential.

Ground Loop: The generation of undesirable current flow within a ground conductor, owing to the circulation currents which originate from a second source of voltage.

Ground Plane: Expanded copper mesh which is laminated into some flat cable constructions as a shield.

Ground Potential: Zero potential with respect to the ground or earth.

HPN: Two-conductor, neoprene-insulated heater cord. Parallel construction. For use in damp locations.

Glossary

HSJ: Same as type HS but with #18, #16 and #14 conductors and differing thickness of jacket.

Hard-Drawn Copper Wire: Copper wire that has not been annealed after drawing.

Harness: An arrangement of wires and cables, usually with many breakouts, which have been tied together or pulled into a rubber or plastic sheath, used to interconnect an electric circuit.

Hash Mark Stripe: A non-continuous helical stripe applied to a conductor for identification.

Heat Distortion: Distortion of flow of a material or configuration due to the application of heat.

Heat Seal: Method of sealing a tape-wrap jacket by means of thermal fusion.

Heater Cord: Flexible stranded copper conductor, cotton-wrapped with rubber insulation and asbestos roving.

Helical Stripe: A continuous, colored, spiral stripe applied to a conductor for circuit identification.

Helix: Spiral winding.

Henry: The unit of inductance.

Hertz (Hz): A term replacing cycles-per-second as an indication of frequency.

Heterogeneous Insulation: A cable insulating system composed of two or more layers of different insulating materials.

Hi-Pot: A test designed to determine the highest voltage that can be applied to a conductor without breaking through the insulation.

High-Temperature Wire and Cable: Electrical wire and cables having thermal operating characteristics of 150°C and higher.

High Voltage: Generally, a wire or cable with an operating voltage of over 600 volts.

Holding Strength: Ability of a connector to remain assembled to a cable when under tension.

Homogeneous Insulation: A complete cable insulation structure whose components cannot be identified as layers of different materials.

Hook-Up Wire: A wire used for low-current, low-voltage (under 1000 volts) applications within enclosed electronic equipment.

Hot Stamping: Method of alpha numerical coding. Identification markings are made by pressing heated type and marking foil into softened insulation surfaces.

Hot Tin Dip: A process of passing bare wire through a bath of molten tin to provide a coating.

HS: 600 V-rated rubber-insulated heater cord.

HSJ: 300 V-rated rubber-insulated heater cord.

Hybrid Cable: Multi-conductor cable containing two or more types of components.

Hygroscopic: Capable of absorbing moisture from the air.

Hypalon: DuPont's trade name for their chlorosulfonated polyethylene, an ozone-resistant synthetic rubber.

ICEA: Abbreviation for Insulated Cable Engineers Association.

IEC: European Standardization agency, International Electrotechnical Commission.

IEEE: Abbreviation for Institute of Electrical and Electronics Engineers.

Ignition Cable: Cable designed for Automotive Ignition Systems.

ISA: Instrument Society of America.

Impedance: The total opposition that a circuit offers to the flow of alternating current or any other varying current at a particular frequency. It is a combination of resistance R and reactance X, measured in ohms.

Impedance Matching: Connecting cables and devices together which have the same impedance value in ohms.

Impulse: A surge of unidirectional polarity.

Impulse Strength: The voltage breakdown of insulation under voltage surges on the order of microseconds in duration.

Impulse Test: An insulation test in which the voltage applied is an impulse voltage of specified wave shape.

Inductance: The property of a circuit or circuit element that opposes a change in current flow, thus causing current changes to lag behind voltage changes. It is measured in henrys.

Inductive Coupling: Crosstalk resulting from the action of the electromagnetic field of one conductor on the other.

Insertion Tool: A small, hand-held tool used to insert contacts into a connector.

Insulated Wire: A conductor of electricity covered with a non-conducting material.

Insulating Joint: A device which mechanically couples and electrically insulates the sheath and armor of contiguous lengths of cable.

Insulation: A material having high resistance to the flow of electric current. Often called a dielectric in radio frequency cable.

Insulation Adhesion: The degree of tightness of the insulation over the base conductor measured in terms of force required to remove a specified length of insulation from the wire.

Insulation Crimp: The area of a terminal, splice or contact that has been formed around the insulation of the wire.

Insulation Grip: Extended cylinders at the rear of crimp-type contacts designed to accept the bared wire and a small length of its insulation.

Insulation Piercing: A method of crimping whereby lances cut the insulation of the wires and enter into the strands to make electrical contact.

Insulation Resistance: The ratio of the applied voltage to the total current between two electrodes in contact with a specific insulation, usually expressed in megohms-M feet.

Insulation System: All of the insulation materials used to insulate a particular electrical or electronic product.

Integral Belt: A layer of insulation or semi-conductive material applied by extrusion over two or more insulated, twisted or parallel conductors to form a round, smooth diameter.

Glossary

Interconnecting Cable: The wiring between modules, between units or the larger portions of a system.

Interconnecting Wire: The physical wiring between components (outside a module), between modules, between units or between larger portions of a system or systems.

Interconnection: Mechanically joining devices together to complete an electrical circuit.

Interface: The two surfaces on the contact side of both halves of a multiple-contact connector which face each other when the connector is assembled.

Internal Wiring: Electronic wiring which interconnects components, usually within a sealed subsystem.

Interstices: Voids or valleys between individual strands in a conductor or between insulated conductors in a multiconductor cable.

Ionization Voltage (Corona Level): The minimum value of falling rms voltage which sustains electrical discharge within the vacuous or gas-filled spaces in the cable construction or insulation.

Irradiation: In insulations, the exposure of the material to high-energy emissions for the purpose of favorably altering the molecular structure.

JAN Specification: Joint Army-Navy specification (replaced by current Military Specifications).

Jack: A plug-in type terminal widely used in electronic apparatus for temporary connections.

Jacket: A rubber or synthetic covering applied over primary insulation, braids, shields, cable components or over the cable itself. In fiber optics, a covering, frequently plastic, over a fiber bundle of fibers, or cable which protects against the environment.

Jumper: A short length of conductor used to make a temporary connection between terminals, around a break in a circuit or around an instrument.

Junction: A point in a circuit where two or more wires are connected.

kcmil: One thousand circular mils (MCM)

KEMA KEUR: Approval agency of the Netherlands.

KV: Kilovolt (1000 volts).

KVA: Kilovolt ampere.

KW: Kilowatt.

Kilo: A numerical prefix denoting 1000 (10^3).

Kynar: Pennwalt trade name for polyvinylidene fluoride. Typically used as insulation for wire wrap wire.

Lacing and Harnessing: A method of grouping wires by securing them in bundles of designated patterns.

Lacquer: A liquid resin or compound applied to textile braid to prevent fraying, moisture absorption, etc.

Laminated Tape: A tape consisting of two or more layers of different materials bonded together.

Lay: The length measured along the axis of a wire or cable required for a single strand (in stranded wire) or conductor (in cable) to make one complete turn about the axis of the conductor or cable.

Layer: Consecutive turns of a coil lying in a single plane.

Leaching and Non-Leaching: In a leaching wire, the plasticizer will migrate when exposed to heat. A non-leaching wire will retain its plasticizer under extreme temperature conditions and remain flexible after baking.

Lead: A wire, with or without terminals, that connects two points in a circuit.

Lead-Cured: A cable that is cured or vulcanized in a metallic lead mold.

Lead Dress: The placement or routing of wire and component leads in an electrical circuit.

Lead-in: The conductor or conductors that connect the antenna proper to electronic equipment.

Leakage Current: The undesirable flow of current through or over the surface of an insulation.

Life Cycle: A test to determine the length of time before failure in a controlled, usually accelerated, environment.

Limits of Error: The maximum deviation (in degrees of percent) of a thermocouple or thermocouple extension wire from standard emf-temperature to be measured.

Limpness: The ability of a cable to lay flat or conform to a surface.

Line Balance: The degree to which the conductors of a cable are alike in their electrical characteristics with respect to each other, to other conductors and to ground.

Line Drop: A voltage loss occurring between any two points in a transmission line due to the resonance reactance or leakage of the line.

Line Loss: The total of the various energy losses occurring in a transmission line.

Line Voltage: Voltage existing in a cable or circuit.

Local Area Network (LAN): A baseband or broadband interactive bi-directional communication systems for information exchange on a common transmission line.

Longitudinal Shield: A tape shield, flat or corrugated, applied longitudinally with the axis of the core being shielded.

Longitudinal Wrap: Tape applied longitudinally with the axis of the core being covered.

Loop Resistance: The total resistance of two conductors measured round trip from one end. Commonly used term in the thermocouple industry.

Looping-in: Wiring method which avoids tee joints by carrying the conductor or cable to and from the point to be supplied.

Loss: Energy dissipated without accomplishing useful work.

Loss Factor: The product of the dissipation and dielectric constant of an insulating material.

Lossy Line: A cable having large attenuation per unit of length.

Low-Loss Dielectric: An insulating material that has a relatively low dielectric loss, such as polyethylene or Teflon.

Low-Noise Cable: Cable configuration specially constructed to eliminate spurious electrical disturbances caused by capacitance changes or self-generated noise induced by either physical abuse or adjacent circuitry.

Low Tension: Low voltage, as applied to ignition cable.

Lug: Termination, usually crimped or soldered to the conductor, with provision for screwing on to the terminal.

Glossary

MATV: Acronym for Master Antenna Television System—a combination of components providing multiple television receiver operations from one antenna or group of antennas normally on a single building.

MCM: One thousand circular mils.

MHz: Megahertz.

MTW: Thermoplastic insulated machine tool wire.

Magnet Wire: Insulated wire intended for use in windings on motor, transformer and other coils for electromagnetic devices.

Magnetic Field: The region within which a body or current experiences magnetic force.

Magnetic Flux: The rate of flow of magnetic energy across or through a surface (real or imaginary).

Magnetic Noise: Caused by change in current level, e.g., ac powerline (creates magnetic field around the cable); this magnetic field causes the magnetic noise.

Marker Tape: A tape laid parallel to the conductors under the sheath in a cable, imprinted with the manufacturer's name and the specification to which the cable is made.

Meg or Mega: A numerical prefix denoting 1,000,000 (10^6).

Megarad: A unit for measuring radiation dosage.

Messenger: Supporting member, usually a high-strength steel wire, used to suspend aerial cable. The messenger may be an integral part of the cable, or exterior to it (lashed messenger).

Mft: A popular abbreviation for 1000 ft.

Mho: The unit of conductivity. The reciprocal of an ohm.

Micro: A numerical prefix denoting one-millionth (10^{-6}).

Microfarad: One-millionth of a farad, commonly abbreviated μF.

Micromicrofarad: One-millionth of a microfarad (uuf, uufd, mmf, mmfd, $\mu\mu$F are common abbreviations.)

Microwave: A short (usually less than 30 cm) electrical wave.

Mil: A unit used in measuring diameter of a wire or thickness of insulation over a conductor. One-one thousandth of an inch (.001").

Mineral Insulated: Cable and thermocouple wire consisting of one or more conductors surrounded by magnesium oxide insulation and enclosed in a liquid- and gas-tight metallic sheathing.

Miniature Wire: Insulated conductors of approximately 20-34 AWG.

Mining Cable: A flame-retardant cable specially constructed to withstand severe physical abuse for underground use in mines or tunnels.

Mis-Match: A termination having a different impedance than that for which a circuit or cable is designed.

Mode: One of the components of a general configuration of a propagating wave font.

Modem: Device which places and receives data signals over a common carrier's communication facility.

Modulus of Elasticity: The ratio of stress to strain in an elastic material.

Moisture Absorption: The amount of moisture, in percentage, that a material will absorb under specified conditions.

Moisture Resistance: The ability of a material to resist absorbing moisture from the air or when immersed in water.

Molded Plug: A connector molded on either end of a cord or cable.

Monomer: The basic chemical unit used in building a polymer.

Motor Lead Wire: Wire which connects to the fragile magnet wire found in coils, transformers and stator or field windings.

Multiconductor: More than one conductor within a single cable complex.

Multiple-Conductor Cable: A combination of two or more conductors cabled together and insulated from one another and from sheath or armor where used.

Multiple-Conductor Concentric Cable: An insulated central conductor with one or more tubular stranded conductors laid over it concentrically and insulated from one another.

Multiplexing: Simultaneous transmission of two or more messages over the same cable pair.

Mutual Capacitance: Capacitance between two conductors when all other conductors, including ground, are connected together and then regarded as an ignored ground.

Mylar®: DuPont trademark for polyester film.

NEMA: National Electrical Manufacturers Association.

NEMKO: Approval agency of Norway.

NFPA: Abbreviation for National Fire Protection Association. Administrative Sponsor of the National Electrical Code® (ANSI Standards Committee CI).

National Electrical Code®: A set of regulations governing construction and installation of electrical wiring and apparatus in the United States, established by the American National Board of Fire Underwriters.

National Electrical Code® Article 725: The NEC Article which covers remote control signal and communication power limited circuits that are not an integral part of the device or appliance.

National Electrical Code® Article 760: The NEC Article which covers the fire and burglar alarms installation of wire and equipment operating at 600 Volts or less.

National Electrical Code® Article 800: The NEC Article which covers telephone, telegraph as well as outside wiring for fire and burglar alarms.

NEC Type CL2: A Class 2 power-limited type cable for general use applications within a building under NEC Article 725, this type design is "Listed" by UL. These cables meet a 70,000 BTU flame test.

NEC Type CL2P: A Class 2 power-limited cable which is suitable for use in plenums in accordance with NEC Article 725. The cable meets the requirements of UL 910 the Steiner Tunnel test which classifies fire and smoke characteristics. The cable is "Listed" by UL.

NEC Type CL2R: A Class 2 power-limited cable which is suitable for use in riser shafts in accordance with NEC Article 725. These cables meet the UL 1666 flame test and are "Listed" by UL.

Glossary

NEC Type CL2X: A Class 2 power-limited cable which is suitable for restricted applications (sic . . . less than 0.25" in diameter in residences, exposed lengths less than 10-ft.) or else in raceways under NEC Article 725. These cables meet a VW-1 flame test and are "Listed" by UL.

NEC Type CM: A general application communications cable, Listed by UL, for use within buildings under NEC Article 800. It meets the requirements of the 70,000 BTU flame test.

NEC Type FPL: A general application fire-protection cable for use within buildings in accordance with NEC Article 760. These cables are Listed by UL and meet the 70,000 BTU flame test.

Neoprene: A synthetic rubber with good resistance to oil, chemical and flame. Also called polychloroprene.

Non-Contaminating: Type of PVC jacket material whose plasticizer will not migrate into the dielectric of a coaxial cable and thus avoids contaminating and destroying the dielectric.

Nylon: Thermoplastic with good chemical and abrasion resistance.

OSHA: Abbreviation for Occupational Safety and Health Act. Specifically the Williams-Steiger law passed in 1970 covering all factors relating to safety in places of employment.

OVE: Approval agency in Austria; Oesterreichischer Verband fur Elektrotechnik (Austrian Electrotechnical Association).

Off Center: Conductor displaced within the cross-section of its insulation.

Offgassing: Percentage of a specified gas released during the combustion of insulation or jacketing material.

Ohm: A unit of electrical resistance.

Oil Aging: Cable aged in an accelerated manner by placement in an oil bath and heated to a pre-set temperature for a stated time.

Oil-Filled Cable: A self-contained pressure cable in which the pressure medium is low viscosity oil having access to the insulation.

Open Cell: Foamed or cellular material with cells which are generally interconnected.

Oscillatory Surge: A surge which includes both positive and negative polarity values.

Outgassing: The dissipation of gas from a dielectric evidencing decomposition.

Overall Diameter: Finished diameter over wire or cable.

Overcoat Conductor: A stranded conductor made from individual strands of tin-coated wire stranded together, and then given an overall tin coat.

Overlap: The amount the trailing edge laps over the leading edge of a spiral tape wrap.

Oxygen Index: Percentage of oxygen necessary to support combustion in a gas mixture.

Ozone: Reactive form of oxygen, typically found around electrical discharges and present in the atmosphere in small quantities.

PCB: Printed Circuit Board.

PIC: A general term for any type of plastic-insulated telephone cable.

PLSJ: All-rubber, parallel-jacketed, two-conductor, light-duty cord for pendent or portable use in damp locations. 300V.

PLT: Same as PLSJ, except thermoplastic insulation.

POSJ: All-rubber, parallel light-duty rip-cord for use on lamps and small appliances. 300V, 60°C.

POT: Thermoplastic, parallel, light-duty rip-cord. 300V, 60°C to 105°C.

PTFE: Abbreviation for Polytetrafluoroethylene.

Packing Fraction: (fiber optic) The ratio of active cross-sectional area of fiber core, or cores, to the total end surface of the fiber, or fiber bundle.

Pair: Two insulated wires of a single circuit associated together; also known as a "balance" transmission line.

Parallel Pair: A duplex construction of two insulated conductors laid parallel and then covered overall with a braid or jacket.

Parallel Stripe: A stripe applied longitudinally on a wire or cable parallel to the axis of the conductor.

Patch Cable: A cable with plugs or terminals on each end of the conductors to temporarily connect circuits of equipment together.

Patch Cord: Braid covered with plugs or terminals on each end to connect jacks or blocks in switchboards or programming systems.

Pay-Off: The process of feeding a cable or wire from a bobbin, reel or other package.

Percentage Conductivity: Conductivity of a material expressed as a percentage of that of copper.

Periodicity: The uniformly spaced variations in the insulation diameter of a transmission cable that result in reflections of a signal, when its wavelength or a multiple thereof is equal to the distance between two diameter variations.

Permittivity: See *Dielectric Constant.*

Pick: Distance between two adjacent crossover points of braid filaments. The measurement in picks per inch indicates the degree of coverage.

Pico: A numerical prefix denoting one-millionth of one-millionth (10^{-12}).

Picofarad: One-millionth of one-millionth of a farad. A micromicrofarad or picofarad (abbreviation pf). (See *μμF*).

Pigtail Wire: Fine-stranded, extra-flexible, rope- lay lead wire attached to a shield for terminating purposes.

Pitch Diameter: Diameter of a circle passing through the center of the conductors in any layer of a multiconductor cable.

Pitch: In flat cable, the nominal distance between the index edges of two adjacent conductors.

Plain Conductor: A conductor consisting of only one metal.

Plain Weave: A weave used on woven cables. Threads between the wires act as binders and give the cable lateral stiffness and linear flexibility. Also called Standard and Square Weave.

Planetary Cabler: A cabler capable of laying down any number of shielded overbraided or jacketed singles, pairs, called groups, or any combination of them in sequence.

Planetary Twister: A twisting machine whose payoff spools are mounted in rotating cradles that hold the axis of the spool in a fixed direction as the spools are revolved so the wire will not kink as it is twisted.

Plastic Deformation: Change in dimensions under load that is not recovered when the load is removed.

Plasticizer: A chemical agent added to plastics to make them softer and more pliable.

Glossary

Plenum: The air return path of a central air handling system, either ductwork or open space over a suspended ceiling.

Plenum Cable: Cable approved by a recognized agency such as UL for installation in plenums without the need for conduit.

Plug: The part of the two mating halves of a connector which is movable when not fastened to the other mating half.

Ply: The number of individual strands or filaments twisted together to form a single thread.

Point-to-Point Wiring: An interconnecting technique wherein the connections between components are made by wires routed between connecting points.

Polarization: The orientation of a flat cable or a rectangular connector.

Polychloroprene: Chemical name for neoprene.

Polyester: Polyethylene terephthalate extensively as a moisture resistant cable core wrap.

Polyethylene: A thermoplastic material having excellent electrical properties.

Polyhalocarbon: A general name for polymers containing halogen atoms. The halogens are fluorine, chlorine, bromine and iodine.

Polymer: A material of high molecular weight formed by the chemical union of monomers.

Polyolefin: Any of the polymers and copolymers of the ethylene family of hydrocarbons.

Polypropylene: A thermoplastic similar to polyethylene but stiffer and having higher softening point (temperature); excellent electrical properties.

Polyurethane: Class of polymers known for good abrasion and solvent resistance (may be applied in solid or cellular form).

Polyvinyl Chloride: A general-purpose thermoplastic widely used for wire and cable insulations and jackets.

Porosity: Multiple voids in an insulation cross-section.

Potting: The sealing of a cable termination or other component with a liquid which thermosets into an elastomer.

Power Cables: Cables of various sizes construction and insulation, single- or multi-conductor, designed to distribute primary power to various types of equipment.

Power Factor: The ratio of resistance to impedance. The ratio of the actual power of an alternating current to apparent power. Mathematically the cosine of the angle between the voltage applied and the current resulting.

Pre-Bond: Stranded wire which has been fused, topcoat-tinned, or overcoat-tinned.

Primary Insulation: The first layer of non-conductive material applied over a conductor whose prime function is to act as electrical insulation.

Primary: The transformer winding which receives the energy from a supply circuit.

Printed Wiring: A printed circuit intended to provide point-to-point electrical connections.

Programming: Ability to select various circuit patterns by interconnecting appropriate contacts on one side of a connector plug or panel.

Propagation Delay: Time delay between input and output of signal.

Propagation Time: Time required for a wave to travel between two points on a transmission line.

Proximity Effect: Nonuniform current distribution over the cross-section of a conductor caused by the variation of the current in a neighboring conductor.

Pulling Eye: A device used to pull cable into or from a duct.

Pulse: Energy which changes abruptly from an intensity to another. May be light energy or electrical energy.

Pulse Cable: A type of coaxial cable constructed to transmit repeated high- voltage pulses without degradation.

Quad: A series of four separately insulated conductors, generally twisted together in pairs. Also, a series-parallel combination of transistors with increased reliability because failure of one transistor will not disable the entire circuit.

Quadders: Three-bay machines which can twist four wires together and cable braided and shielded wires with varying lay lengths.

Rated Voltage: The maximum voltage at which an electrical component can be operated for extended periods without undue degradation or safety hazard.

R-F: Radio-frequency.

REA: Abbreviation for Rural Electrification Administration.

RG/U: General utility-grade military coaxial cable.

Random Winding: A winding in rotating equipment wherein the wires do not lie in an even pattern.

Reactance: The opposition offered to the flow of alternating current by inductance or capacitance of a compound or circuit.

Red Plaque: A powdery, brown-red growth found on silvercoated copper conductors and shield braids.

Redraw: The consecutive drawing of wire through a series of dies to reach a desired wire size.

Reducing Joint: A joint between two lengths of cable where the conductors are not the same size.

Reel: A revolvable flanged device made of wood metal, used for winding flexible metal wire or cable.

Reflection Loss: The part of a signal which is lost due to reflection of power at a line discontinuity.

Reinforced Sheath: The outermost covering of a cable that has cable sheath constructed in layers with the addition of a reinforcing material, usually a braided fiber, molded in place between layers.

Remanence: The magnetic induction that remains in a magnetic circuit after the removal of an applied magnetomotive force.

Resistance: A measure of the difficulty in moving electrical current through a medium when voltage is applied. It is measured in ohms.

Resistive Conductor: A conductor with high electric resistance.

Restriction on Hazardous Substances (RoHS): The European Commission's Directive 2002/95/EC, adopted January 27, 2003, also known as "RoHS," which restricts the use of certain hazardous substances in electrical and electronic equipment.

Retractile Cord: A cord having specially treated insulation or jacket so that it will retract.

Return Wire: A ground wire or the negative wire in a direct-current circuit.

Glossary

Ribbon Cable: A flat cable of individually insulated conductors lying parallel and held together by means of adhesive or woven textile yarn.

Ridge Marker: One or more ridges running laterally along the outer surface of a plastic-insulated wire for purposes of identification.

Rigid Bay: Cabling equipment that maintains component sequence, and can produce cables with distinct layers.

Rigid Coaxial Cable: Nonflexible coaxial cable, usually a metal tube-armored coaxial cable.

Ring Tongue: A solderless terminal that connects wire to a stud.

Ringing Out: Locating or identifying specific conductive paths by passing current through selected conductors.

Rip-Cord: Two or more insulated conductors in a parallel configuration which may be separated to leave the insulation of each conductor intact.

Rope Concentric: A group of standard conductors assembled in a concentric manner.

Rope Lay Conductor: A conductor composed of a central core surrounded by one or more layers of helically laid groups of wires.

Rope Unilay: A group of stranded conductors assembled in a unilay manner.

Round Wire Shields: Shields constructed from bare, tinned or silver-plated copper wire that include braided, spiral and reverse spiral.

Rubber (Wire Insulation): Term used to describe wire insulations made of thermosetting elastomers, occur naturally or may be made synthetically.

Rulan: DuPont's trade name for their flame-retardant polyethylene insulating material.

S: Heavy-duty, rubber-insulated portable cord. Stranded copper conductors with separator and individual rubber insulation. Two or more color-coded conductors cabled with filler wrapped with separator and rubber jacketed overall. 600V.

SAE: Society of Automotive Engineers.

SANZ: Standards Association of New Zealand.

SBR: Copolymer of styrene and butadiene. Most commonly used type of synthetic rubber.

Secondary Insulation: A nonconductive material that protects the conductor against abrasion and provides a second electrical barrier.

Segmental Conductor: A stranded conductor consisting of three or more stranded conducting elements, each element having approximately the shape of the sector of a circle, assembled to give a substantially circular cross-section.

Selenium Cure: Process used to cure neoprene and rubber-jacketed wires and cables.

Self-Extinguishing: Characteristic of a material whose flame is extinguished after the igniting flame source is removed.

Semi-Conducting Jacket: A jacket having a sufficiently low resistance so that its outer surface can be kept at substantially ground potential.

Semi-Rigid: A cable containing a flexible inner core and a relatively inflexible sheathing.

Semi-Solid: An insulation cross-section having a partially open space between the conductor and the insulation perimeter.

SEMKO: Approval agency for Sweden.

Separator: A layer of insulating material which is placed between a conductor and its dielectric, between a cable jacket and the components it covers or between various components of a multiple-conductor cable.

Serve: A filament or group of filaments such as fibers or wires, wound around a central core.

Serving: A wrapping applied over the core of a cable or over a wire.

Sheath: The outer covering or jacket of a multi-conductor cable.

Shield Coverage: Amount of outer cable covered by the shielding material.

Shield Effectiveness: The ability of a shield to screen out undesirable signals.

Shield: In cables, a metallic layer placed around a conductor or group of conductors to prevent electrostatic or electromagnetic interference between the enclosed wires or external fields.

Shielded Line: A transmission line whose elements confine propagated radio waves to an essentially finite space inside a tabular conducting surface called the sheath, thus preventing the line from radiating radio waves.

Shielded-Type Cable: A cable in which the surface of the insulation is at ground potential.

Shunt Wire: A conductor joining two parts of an electric circuit to divert part of the current.

Signal: A current used to convey information, either digital, analog, audio or video.

Silicone: A material made from silicon and oxygen. Can be in thermosetting elastomer or liquid form. The thermosetting elastomer form is noted for high heat resistance.

Silicone Treating: A silicone liquid treatment applied to insulated conductors to allow for easy jacket stripping.

Single-Faced Tape: Fabric tape finished on one side with a rubber or synthetic compound.

Sizing: Applying a material to a surface to fill pores.

SJ: Junior hard-service, rubber-insulated pendant or portable cord. Same construction as type S, but 300V. Jacket thickness different.

SJO: Same as SJ, but Carolprene®, oil-resistant compound outer jacket. Can also be made "water-resistant." 300V, 60°C.

SJT: Junior hard-service thermoplastic or rubber- insulated conductors with overall thermoplastic jacket. 300V, 60°C to 105°C.

SJTO: Same as SJT but oil-resistant thermoplastic outer jacket. 60°C.

SJOO: Same as SJO with oil-resistant insulation.

SJOOW: Same as SJOO with the added UL + CSA Approval for outdoor use and water resistance.

Skeleton Braid: Widely separated braid of fiber copper, or steel, used to hold core together, for reinforcing jacket or for shielding.

Skin Tape: Filled tape coated on one or both sides with a thin film of uncured rubber or synthetic compound to produce a coating suitable for vulcanization.

Skin Effect: The tendency of alternating current as its frequency increases, to travel only on the surface of a conductor.

Glossary

Sleeve: A braided, knifed or woven tube used over wires or components as insulation tubing. Also called sleeving.

Solid Conductor: A conductor consisting of a single wire.

SO: Hard-service cord, same construction as type S except oil-resistant Carolprene® jacket. 600V, 60˚ to 90˚C

SOO: Same as SO with oil-resistant insulation.

SOOW: Same as SOO with the added UL + CSA Approval for outdoor use and water resistance.

SOW: Same as SO with the added UL and CSA approval for outdoor use and water resistance.

SP-1: All-rubber, parallel-jacketed two-conductor light-duty cord for pendant or portable use in damp locations. 300V.

SP-2: Same as SP-1, but heavier construction, with or without third conductor for grounding purposes. 300V.

SP-3: Same as SP-2 but heavier construction for refrigerators or room air conditioners. 300V.

SPT-1: Same as SP-1, except all-thermoplastic. 300V. With or without third conductor for grounding.

SPT-2: Same as SP-2 except all-thermoplastic. 300V. With or without third conductor for grounding.

SPT-3: Same as SP-3, except all-thermoplastic. 300V. With or without third conductor for grounding.

Span: In flat conductors, distance between the reference edge of the first and the last conductor. In round conductors, distance between centers of the first and last conductors.

Spark Test: A test designed to locate pin-holes in the insulation of a wire or cable by application of a voltage for a very short period of time while the wire is being drawn through the electrode field.

Specific Gravity: The ratio of the density (mass per unit volume) of a material to that of water.

Spiral Shield: A metallic shield of fine-stranded wires applied spirally rather than braided.

Spiral Stripe: A color-coding stripe applied helically to the surface of an insulated wire or cable.

Spiral Wrap: The helical wrap of a tape or thread over a core.

Splice: A connection of two or more conductors or cables to provide good mechanical strength as well as good conductivity.

SRD: Portable range or dryer cable. Three or four rubber-insulated conductors with rubber or neoprene jacket, flat or round construction. 300V, 60°C.

SRDT: Same as SRD, except all-thermoplastic with a maximum temperature of 90°C.

ST: Hard-service cord, jacketed, same as type S except all-plastic construction. 600 V, 60°C to 105°C.

Standing Wave Ratio: In a transmission line, waveguide or analogous system, a figure of merit used to express the efficiency of the system in transmitting power.

Stay Cord: A component of a cable used to anchor the cable ends at their points of termination and to keep any pull of the cable from being transferred to the electrical connections.

STO: Same as ST but with oil-resistant thermoplastic outer jacket. 600 V, 60°C.

Strand: One of the wires of any stranded conductor.

Strand Lay: The distance of advance of one strand of a spirally stranded conductor, in one turn, measured axially.

Stranded Conductor: A conductor composed of groups of wires twisted together.

Strap: Square- or rectangular-section bare conductor manufactured and used in coil form.

Strip: To remove insulation from a cable.

Structural Return Loss: Backward-reflected energies from uneven parts of the cable structure are termed structural return loss.

Surface Resistivity: The resistance of a material between two opposite sides of a unit square of its surface. It is usually expressed in ohms.

SV: Vacuum cleaner cord two- or three-conductor rubber-insulated. Overall rubber jacket. For light duty in damp locations. 300 V, 60°C.

SVO: Same as SV except Carolprene jacket, 300 V, 60°C.

SVT: Same as SV except all-plastic construction. With or without third conductor for grounding purposes only. 300 V, 60°C to 90°C.

Sweep Test: A test given to check attenuation by oscilloscope, as in coaxial cable.

TEW: Canadian Standard Association type appliance wires. Solid or stranded single-conductor, plastic-insulated. 600 V, 105°C.

TF: Fixture wire, thermoplastic-covered solid or 7- strands. 60°C.

TFE: Teflon® (tetrafluoroethylene).

TFF: Same as TF but flexible stranding. 60°C.

THHN: 90°C, 600 V nylon jacketed building wire.

THW: Thermoplastic vinyl-insulated building wire. Flame-retardant, moisture- and heat-resistant. 75°C. Dry and wet locations.

THWN: Same as THW but with nylon jacket overall. 75°C.

TW: Thermoplastic vinyl-jacketed building wire, moisture-resistant 60°C.

Take-Up: The process of accumulating wire or cable onto a reel, bobbin or some other type of pack. Also, the device for pulling wire or cable through a piece of equipment or machine.

Tank Test: A voltage dielectric test in which the test sample is submerged in water and voltage is applied between the conductor and water as ground.

Tape: A relatively narrow woven or cut strip of fabric, paper or film material.

Tape Cable: A form of multiple-conductor consisting of parallel metal strips imbedded in insulating material.

Tape Wrap: A spirally applied tape over an insulated or uninsulated wire.

Taped Insulation: Insulation of helically wound tapes applied over a conductor or over an assembled group of insulated conductors.

Taping: Process of insulating continuous-length, large-diameter wires with tape of nonextrudable materials.

Tear Strength: The force required to initiate or continue a tear in a material under specified conditions.

Glossary

Teflon®: DuPont's trade name for fluorocarbon resins. FEP, PFA and TFE are typical materials.

Tefzel: DuPont's trade name for a fluorocarbon material typically used as a wire wrap insulation.

Telemetry Cable: Cable used for transmission of information from instruments to the peripheral recording equipment.

Temperature Rating: The maximum temperature at which an insulating material may be used in continuous operation without loss of its basic properties.

Tensile Strength: The pull stress required to break a given specimen.

Tension Member: A member included in a fiber cable to add tensile strength.

Terminals: Metal wire termination devices designed to handle one or more conductors, and to be attached to a board bus or block with mechanical fasteners or clipped on.

Test Lead: A flexible, insulated lead wire used for making tests, connecting instruments to a circuit temporarily or for making temporary electrical connections.

Textile Braid: Any braid made from threads of cotton, silk or synthetic fibers.

Thermal Aging: Exposure to a thermal condition or programmed series of conditions for predescribed periods of time.

Thermocouple Lead Wire: An insulated pair of wires used from the couple to a junction box.

Thermoplastic: A material which softens when heated and becomes firm on cooling.

Thermoset: A material which hardens or sets when heat is applied, and which, once set cannot be resoftened by heating. The application of heat is called "curing."

Three-Phase Current: Current delivered through three wires, with each wire serving as a return for the other two.

Three-Phase Three-Wire System: An alternating current supply system comprising three conductors over which three-phase power is sent.

Three-Wire System: A d-c or single-phase a-c system comprising three conductors, one of which is maintained at a potential midway between the potential of the other two.

Tin Overcoat (TOC): Tinned copper wire stranded, then coated with pure tin.

Tinsel Wire: A low-voltage stranded wire with each strand a very thin conductor ribbon spirally wrapped around a textile yarn.

Topcoat: Bare (untinned) copper wire, stranded then coated with pure tin.

Tracer: A means of identifying polarity.

Transmission: Transfer of electric energy from one location to another through conductors or by radiation or induction fields.

Transmission Cable: Two or more transmission lines. See *Transmission Line.*

Transmission Line: A signal-carrying circuit with controlled electrical characteristics used to transmit high-frequency or narrow-pulse signals.

Transmission Loss: The decrease or loss in power during transmission of energy from one point to another. Usually expressed in decibels.

Transposition: Interchanging the relative positions of wires to neutralize the effects of induction to or from other circuits or, to minimize interference pickup by the lead-in during reception.

Tray: A cable tray system is an assembly of units or sections, and ancillary filings, made of noncombustible materials used to support cables. Cable tray systems include ladders troughs channels, solid bosom trays and similar structures.

Tray Cable: A factory-assembled multi-conductor or multipair control cable approved under the National Electrical Code for installation in trays.

Triaxial: A three-conductor cable with one conductor in the center, a second circular conductor shield concentric with the first, and third circular conductor shield insulated from and concentric with the first and second, usually with insulation, and over a braid or impervious sheath overall.

Triboelectric Noise: Noise generated in a shielded cable due to variations in capacitance between shielding and conductor as the cable is flexed.

Triple Cable: A cable composed of three insulated single conductors and one bare conductor all twisted together. It may or may not have a common covering of binding.

True Concentric: A cable in which each successive layer has a reversed direction of lay from the preceding layer.

Tubing: A tube of extruded nonsupported plastic material.

Twin Cable: A pair of insulated conductors twisted, sheathed or held together mechanically and not identifiable from each other in a common covering.

Twin Coaxial: A configuration containing two separate complete coaxial cables laid parallel or twisted around each other in one complex.

Twin Line: A transmission line which has a solid insulating material, in which the two conductors are placed in parallel to each other.

Twinner: A device for twisting together two conductors.

Twisted Pairs: A cable composed of two small insulated conductors twisted together without a common covering.

UF: Thermoplastic underground feeder and branch circuit cable.

UHF: Abbreviation for ultra high frequency, 300 to 3,000 MHz.

UL: Underwriters Laboratories, Inc.

UTE: Approval agency for France; Union Technique de l'Electricite.

Unbalanced Line: A transmission line in which voltages on the two conductors are unequal with respect to ground.

Unidirectional Concentric Stranding: A stranding where each successive layer has a different lay length, thereby retaining a circular form without migration of strands from one layer to another.

Unidirectional Stranding: A term denoting that in a stranded conductor, all layers have the same direction of lay.

Unilay Strand: A conductor constructed with a central core surrounded by more than one layer of helically-laid wires, with all layers having a common length and direction of lay.

VDE: German approval agency.

VHF: Abbreviation for very high frequency, 30 to 300 MHz.

VSWR: Abbreviation for volume standing wave ratio.

Glossary

VW-1: A flammability rating established by Underwriters Laboratories for wires and cables that pass a specially designed vertical flame test (formerly designated FR-1-).

Velocity of Propagation: The speed of an electrical signal down a length of cable compared to speed in free space expressed as a percent. It is the reciprocal of the square root of the dielectric constant of the cable insulation.

Volt: A unit of electromotive force.

Voltage: The term most often used in place of electromotive force, potential difference or voltage drop to designate the electric pressure that exists between two points and is capable of producing a current when a closed circuit is connected between two points.

Voltage Drop: A term used to express the amount of voltage loss in a conductor of given size and length drawing a given current.

Voltage Rating: The highest voltage that may be continuously applied to a wire in conformance with standards or specifications.

Voltage Standing Wave Ration (VSWR): The ratio of the maximum effective voltage to the minimum effective voltage measured along the length of a mis-matched radio frequency transmission line.

Volume Resistivity (Specific Insulation Resistance): The electrical resistance between opposite faces of a 1 cm cube of insulating material commonly expressed in ohms/centimeter.

Vulcanization: A chemical reaction in which the physical properties of an elastomer are changed by reacting it with sulfur or other cross-linking agents.

Wall Thickness: The thickness of the applied insulation or jacket.

Water Absorption: A test to determine the water absorbed by a material after a given immersion period.

Waterblocked Cable: A cable constructed with no internal voids in order to allow no longitudinal water passage under a given pressure.

Watt: A unit of electric power.

Wave Length: The distance, measured in the direction of propagation, of a repetitive electrical pulse or waveform between two successive points that are characterized by the same phase of vibration.

Wicking: The longitudinal flow of a liquid in a wire or cable due to capillary action.

Wire: A conductor, either bare or insulated.

Wire Gauge: A system of numerical designation of wire sizes.

Wire Nut: A closed-end splice that is screwed on instead of crimped.

Wire Wrapped Connection: A solderless connection made by wrapping bare wire around a square or rectangular terminal with a power or hand tool.

Wire Wrapping Tools: Portable electric tools and automatic stationary machines used to make solderless wrapped connections of wires to terminals.

Wire and Cable Marker: Device for identification marking of wire and cable.

Wire and Cable Tying, Clamping and Harnessing Devices: Tying faces lacing cords and flexible sleevings which are use for wire and cable bundling, harnessing and holding. Other devices include plastic ties or clamps, spiral-cut plastic tubing and plastic U-shaped trays or ducts.

Wire and Lead Cutters: Tools for cutting range from plier-type cutters to semiautomatic or fully automatic machines integrated with other wire processing operations such as stripping, forming and terminating.

Wrapper: An insulating barrier applied as a sheet or tape wrapped around a co~l periphery.

XLPE: Crosslinked polyethylene.

Yield Strength: The minimum stress at which a material will start to physically deform without increase in load.

Zytel: DuPont's trade name for nylon resins.

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Unit Conversion Factors

Unit Conversion Factors

UNIT	X CONSTANT	= UNIT	UNIT	X CONSTANT	= UNIT
BTU	778.0	foot-pound (ft-lb)	gallons	3.785332	liters (l)
BTU	1054.8	joules	gallons	0.13368	cubic foot (ft^3)
BTU	0.293	watt-hours (w-hr)	gallons	231.0	cubic inch (in^3)
centimeters (cm)	0.032808	feet (ft)	gallons	3785.332	cubic centimeter (cm^3)
centimeters (cm)	0.3937	inches (in)	grams (g)	15.432	grains
centimeters (cm)	0.00001	kilometers (km)	gram/centimeter^3 (gm/cm^3)	0.0361275	pounds/in^3 (lb/in^3)
centimeters (cm)	0.010	meters (m)	horsepower (hp)	33000.0	ft-lb/min
centimeters (cm)	10.0	millimeters (mm)	horsepower (hp)	550.0	ft-lb/sec
circular mils	0.00064516	circular millimeters	horsepower (hp)	745.7	watts (w)
circular mils	0.0000007854	inches^2 (in^2)	inch (in)	0.027178	yards (yd)
circular mils	0.00050671	square millimeters (mm^2)	inch (in)	0.083333	feet (ft)
circular mils	0.7854	$mils^2$	inch (in)	0.00002540	kilometer (km)
cubic centimeter (cm^3)	0.000035314	cubic foot (ft^3)	inch (in)	0.025400	meter (m)
cubic centimeter (cm^3)	0.061023	cubic inch (in^3)	inch (in)	2.54000514	centimeter (cm)
cubic centimeter (cm^3)	0.000001	cubic meter (m^3)	inch (in)	25.4000514	millimeter (mm)
cubic centimeter (cm^3)	0.0026417	gallons	inch (in)	1000.0	mils
cubic foot (ft^3)	1728.0	cubic inch (in^3)	joules	0.000948	BTU
cubic foot (ft^3)	28317.016	cubic centimeter (cm^3)	joules	10^7	ergs
cubic inch (in^3)	0.00057870	cubic feet (ft^3)	liters (l)	61.0250	cubic inch (in^3)
cubic inch (in^3)	0.000016387	cubic meter (m^3)	meters (m)	1.093611	yards (yd)
cubic inch (in^3)	16.387162	cubic centimeter (cm^3)	meters (m)	3.2808333	feet (ft)
cubic meter (m^3)	1000000.0	centimeter (cm)	meters (m)	39.37	inch (in)
cubic meter (m^3)	35.314456	cubic foot (ft^3)	meters (m)	100.0	centimeter (cm)
cubic meter (m^3)	264.17	gallons	miles	1760.0	yards (yd)
feet (ft)	0.00018939	miles	miles	5280.0	feet (ft)
feet (ft)	0.33333	yards (yd)	miles	1.6093	kilometer (km)
feet (ft)	12	inches (in)	millimeters (mm)	0.0032808	feet (ft)
feet (ft)	0.00030480	kilometers (km)	millimeters (mm)	0.03937	inch (in)
feet (ft)	0.30480	meters (m)	millimeters (mm)	0.001	meters (m)
feet (ft)	30.480	centimeters (cm)	millimeters (mm)	0.01	centimeters (cm)
feet (ft)	304.80	millimeters (mm)	millimeters (mm)	39.3701	mils
feet/pound (ft/lb)	0.00067197	meters/grams (m/g)	millimeters (mm)	1000.0	microns (u)
foot-pound (ft-lb)	0.001285	BTU	watts (w)	44.25	ft-lb/minute
foot-pound (ft-lb)	1.356	joules	watts (w)	0.737562	ft-lb/sec
foot-pound (ft-lb)	0.1383	kilogram/meter (kg/m)	watts (w)	0.001341	horsepower (hp)
			watt-hours (w-hr)	3.41266	BTU

Temperature Conversion Chart

To use this chart, find your known temperature (˚F or ˚C) in the shaded column. If the known temperature is in ˚C and you wish to know its value in ˚F, move to the adjacent right-hand column. If the known temperature is in ˚F and you wish to know its value in ˚C, move to the adjacent left-hand column.

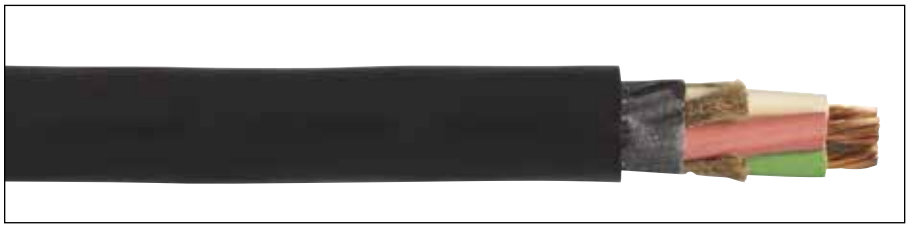
Temperature Conversion Formulas	
°C =	$\frac{5}{9}$ (°F - 32)
°F =	($\frac{9}{5}$ x °C) + 32

°C	KNOWN TEMP	°F	°C	KNOWN TEMP	°F	°C	KNOWN TEMP	°F	°C	KNOWN TEMP	°F	°C	KNOWN TEMP	°F
-45.0	**-49.0**	-56.2	-17.2	**1.0**	33.8	10.6	**51.0**	123.8	38.3	**101.0**	213.8	66.1	**151.0**	303.8
-44.4	**-48.0**	-54.4	-16.7	**2.0**	35.6	11.1	**52.0**	125.6	38.9	**102.0**	215.6	66.7	**152.0**	305.6
-43.9	**-47.0**	-52.6	-16.1	**3.0**	37.4	11.7	**53.0**	127.4	39.4	**103.0**	217.4	67.2	**153.0**	307.4
-43.3	**-46.0**	-50.8	-15.6	**4.0**	39.2	12.2	**54.0**	129.2	40.0	**104.0**	219.2	67.8	**154.0**	309.2
-42.8	**-45.0**	-49.0	-15.0	**5.0**	41.0	12.8	**55.0**	131.0	40.6	**105.0**	221.0	68.3	**155.0**	311.0
-42.2	**-44.0**	-47.2	-14.4	**6.0**	42.8	13.3	**56.0**	132.8	41.1	**106.0**	222.8	68.9	**156.0**	312.8
-41.7	**-43.0**	-45.4	-13.9	**7.0**	44.6	13.9	**57.0**	134.6	41.7	**107.0**	224.6	69.4	**157.0**	314.6
-41.1	**-42.0**	-43.6	-13.3	**8.0**	46.4	14.4	**58.0**	136.4	42.2	**108.0**	226.4	70.0	**158.0**	316.4
-40.6	**-41.0**	-41.8	-12.8	**9.0**	48.2	15.0	**59.0**	138.2	42.8	**109.0**	228.2	70.6	**159.0**	318.2
-40.0	**-40.0**	-40.0	-12.2	**10.0**	50.0	15.6	**60.0**	140.0	43.3	**110.0**	230.0	71.1	**160.0**	320.0
-39.4	**-39.0**	-38.2	-11.7	**11.0**	51.8	16.1	**61.0**	141.8	43.9	**111.0**	231.8	71.7	**161.0**	321.8
-38.9	**-38.0**	-36.4	-11.1	**12.0**	53.6	16.7	**62.0**	143.6	44.4	**112.0**	233.6	72.2	**162.0**	323.6
-38.3	**-37.0**	-34.6	-10.6	**13.0**	55.4	17.2	**63.0**	145.4	45.0	**113.0**	235.4	72.8	**163.0**	325.4
-37.8	**-36.0**	-32.8	-10.0	**14.0**	57.2	17.8	**64.0**	147.2	45.6	**114.0**	237.2	73.3	**164.0**	327.2
-37.2	**-35.0**	-31.0	-9.4	**15.0**	59.0	18.3	**65.0**	149.0	46.1	**115.0**	239.0	73.9	**165.0**	329.0
-36.7	**-34.0**	-29.2	-8.9	**16.0**	60.8	18.9	**66.0**	150.8	46.7	**116.0**	240.8	74.4	**166.0**	330.8
-36.1	**-33.0**	-27.4	-8.3	**17.0**	62.6	19.4	**67.0**	152.6	47.2	**117.0**	242.6	75.0	**167.0**	332.6
-35.6	**-32.0**	-25.6	-7.8	**18.0**	64.4	20.0	**68.0**	154.4	47.8	**118.0**	244.4	75.6	**168.0**	334.4
-35.0	**-31.0**	-23.8	-7.2	**19.0**	66.2	20.6	**69.0**	156.2	48.3	**119.0**	246.2	76.1	**169.0**	336.2
-34.4	**-30.0**	-22.0	-6.7	**20.0**	68.0	21.1	**70.0**	158.0	48.9	**120.0**	248.0	76.7	**170.0**	338.0
-33.9	**-29.0**	-20.2	-6.1	**21.0**	69.8	21.7	**71.0**	159.8	49.4	**121.0**	249.8	77.2	**171.0**	339.8
-33.3	**-28.0**	-18.4	-5.6	**22.0**	71.6	22.2	**72.0**	161.6	50.0	**122.0**	251.6	77.8	**172.0**	341.6
-32.8	**-27.0**	-16.6	-5.0	**23.0**	73.4	22.8	**73.0**	163.4	50.6	**123.0**	253.4	78.3	**173.0**	343.4
-32.2	**-26.0**	-14.8	-4.4	**24.0**	75.2	23.3	**74.0**	165.2	51.1	**124.0**	255.2	78.9	**174.0**	345.2
-31.7	**-25.0**	-13.0	-3.9	**25.0**	77.0	23.9	**75.0**	167.0	51.7	**125.0**	257.0	79.4	**175.0**	347.0
-31.1	**-24.0**	-11.2	-3.3	**26.0**	78.8	24.4	**76.0**	168.8	52.2	**126.0**	258.8	80.0	**176.0**	348.8
-30.6	**-23.0**	-9.4	-2.8	**27.0**	80.6	25.0	**77.0**	170.6	52.8	**127.0**	260.6	80.6	**177.0**	350.6
-30.0	**-22.0**	-7.6	-2.2	**28.0**	82.4	25.6	**78.0**	172.4	53.3	**128.0**	262.4	81.1	**178.0**	352.4
-29.4	**-21.0**	-5.8	-1.7	**29.0**	84.2	26.1	**79.0**	174.2	53.9	**129.0**	264.2	81.7	**179.0**	354.2
-28.9	**-20.0**	-4.0	-1.1	**30.0**	86.0	26.7	**80.0**	176.0	54.4	**130.0**	266.0	82.2	**180.0**	356.0
-28.3	**-19.0**	-2.2	-0.6	**31.0**	87.8	27.2	**81.0**	177.8	55.0	**131.0**	256.8	82.8	**181.0**	357.8
-27.8	**-18.0**	-0.4	0.0	**32.0**	89.6	27.8	**82.0**	179.6	55.6	**132.0**	269.6	83.3	**182.0**	359.6
-27.2	**-17.0**	1.4	0.6	**33.0**	91.4	28.3	**83.0**	181.4	56.1	**133.0**	271.4	83.9	**183.0**	361.4
-26.7	**-16.0**	3.2	1.1	**34.0**	93.2	28.9	**84.0**	183.2	56.7	**134.0**	273.2	84.4	**184.0**	363.2
-26.1	**-15.0**	5.0	1.7	**35.0**	95.0	29.4	**85.0**	185.0	57.2	**135.0**	275.0	85.0	**185.0**	365.0
-25.6	**-14.0**	6.8	2.2	**36.0**	96.8	30.0	**86.0**	186.8	57.8	**136.0**	276.8	85.6	**186.0**	366.8
-25.0	**-13.0**	8.6	2.8	**37.0**	98.6	30.6	**87.0**	188.6	58.3	**137.0**	278.6	86.1	**187.0**	368.6
-24.4	**-12.0**	10.4	3.3	**38.0**	100.4	31.1	**88.0**	190.4	58.9	**138.0**	280.4	86.7	**188.0**	370.4
-23.9	**-11.0**	12.2	3.9	**39.0**	102.2	31.7	**89.0**	192.2	59.4	**139.0**	282.2	87.2	**189.0**	372.2
-23.3	**-10.0**	14.0	4.4	**40.0**	104.0	32.2	**90.0**	194.0	60.0	**140.0**	284.0	87.8	**190.0**	374.0
-22.8	**-9.0**	15.8	5.0	**41.0**	105.8	32.8	**91.0**	195.8	60.6	**141.0**	285.8	88.3	**191.0**	375.8
-22.2	**-8.0**	17.6	5.6	**42.0**	107.6	33.3	**92.0**	197.6	61.1	**142.0**	287.6	88.9	**192.0**	377.6
-21.7	**-7.0**	19.4	6.1	**43.0**	109.4	33.9	**93.0**	199.4	61.7	**143.0**	289.4	89.4	**193.0**	379.4
-21.1	**-6.0**	21.2	6.7	**44.0**	111.2	34.4	**94.0**	201.2	62.2	**144.0**	291.2	90.0	**194.0**	381.2
-20.6	**-5.0**	23.0	7.2	**45.0**	113.0	35.0	**95.0**	203.0	62.8	**145.0**	293.0	90.6	**195.0**	383.0
-20.0	**-4.0**	24.8	7.8	**46.0**	114.8	35.6	**96.0**	204.8	63.3	**146.0**	294.8	91.1	**196.0**	384.8
-19.4	**-3.0**	26.6	8.3	**47.0**	116.6	36.1	**97.0**	206.6	63.9	**147.0**	296.6	91.7	**197.0**	386.6
-18.9	**-2.0**	28.4	8.9	**48.0**	118.4	36.7	**98.0**	208.4	64.4	**148.0**	289.4	92.2	**198.0**	388.4
-18.3	**-1.0**	30.2	9.4	**49.0**	120.2	37.2	**99.0**	210.2	65.0	**149.0**	300.2	92.8	**199.0**	390.2
-17.8	**0.0**	32.0	10.0	**50.0**	122.0	37.8	**100.0**	212.0	65.6	**150.0**	302.0	93.3	**200.0**	392.0

General Cable

CAROL BRAND

Cord Technical Information 11



As applications become more intricate, specifying wire and cable products to meet commercial, industrial and specialty requirements has become more time-consuming and complex.

Today's designers, installers and contractors must be aware not only of general power transmission types but also of the myriad of materials available to meet specific environmental and electrical performance criteria.

This technical section is presented to aid in the selection of cord products to best suit specific designs and applications.

For technical issues and questions, please contact your local General Cable distributor, your retailer or your Inside Sales Representative.

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AWG to Metric Conversion Chart

SIZE (AWG)	mm^2	SIZE (AWG)	mm^2
18	0.82	1/0	53.5
16	1.31	2/0	64.4
14	2.08	3/0	85.0
12	3.31	4/0	107.0
10	5.26	250	127.0
9	6.63	300	152.0
8	8.37	350	177.0
6	13.30	500	253.0
4	21.15	600	304.0
2	33.62	750	380.0
1	42.40	1000	507.0

Common Wire Conductor Stranding

STRANDING CLASS	14–2 AWG	1–4/0 AWG	250 MCM – 500 MCM
B	7 STR	19 STR	37 STR
C	19 STR	37 STR	61 STR
D	37 STR	61 STR	91 STR
G	49 STR	133 STR	259 STR
H	133 STR	259 STR	427 STR
I	All sizes use 24 AWG wires		
K	All sizes use 30 AWG wires		
M	All sizes use 34 AWG wires		

Bend Radius Calculation per ICEA

Bend Radius = 6 x nominal OD (typically in inches)

Applies to the following cable types:

SJ	G-GC
SO	Welding
W	Stage Lighting & Entertainment
G	

Class K Copper Stranding

Size	Rope-Lay with Bunch Stranding		Bunch Stranding		Weight
AWG or kcmil	Nominal Number of 30 AWG Wires	Strand Construction	Nominal Number of 30 AWG Wires	Approx. O.D. (inches)	lbs./1000 ft.
1,000	10,101	37 x 7 x 39	10,101	1.419	3,270
900	9,065	37 x 7 x 35	9,065	1.323	2,935
800	7,980	19 x 7 x 60	7,980	1.305	2,585
750	7,581	19 x 7 x 57	7,581	1.276	2,455
700	6,916	19 x 7 x 52	6,916	1.207	2,240
650	6,517	19 x 7 x 49	6,517	1.166	2,110
600	5,985	19 x 7 x 45	5,985	1.125	1,940
550	5,453	19 x 7 x 41	5,453	1.056	1,765
500	5,054	19 x 7 x 38	5,054	0.988	1,635
450	4,522	19 x 7 x 34	4,522	0.933	1,465
400	3,990	19 x 7 x 30	3,990	0.878	1,290
350	3,458	19 x 7 x 26	3,458	0.809	1,120
300	2,989	7 x 7 x 61	2,989	0.768	960
250	2,499	7 x 7 x 51	2,499	0.682	802
4/0	2,107	7 x 7 x 43	2,107	0.627	676
3/0	1,666	7 x 7 x 34	1,666	0.533	535
2/0	1,323	7 x 7 x 27	1,323	0.470	425
1/0	1,064	19 x 56	1,064	0.451	338
1	836	19 x 44	836	0.397	266
2	665	19 x 35	665	0.338	211
3	532	19 x 28	532	0.304	169
4	420	7 x 60	420	0.272	132
5	336	7 x 48	336	0.235	106
6	266	7 x 38	266	0.202	84
7	210	7 x 30	210	0.179	66
8	168	7 x 24	168	0.157	53
9	133	7 x 19	133	0.146	42
10	–	–	104	0.126	32.5
12	–	–	65	0.101	20.3
14	–	–	41	0.078	12.8
16	–	–	26	0.060	8.0
18	–	–	16	0.048	5.0
20	–	–	10	0.038	3.2

Sources: ASTM B172 Specification for Rope-Lay-Stranded Copper Conductors Having Bunch-Stranded Members and ICEA S-68-516 (NEMA WC8).

Class M Copper Stranding

Size	Rope-Lay with Bunch Stranding		Bunch Stranding		Weight
AWG or kcmil	Nominal Number of 34 AWG Wires	Strand Construction	Nominal Number of 34 AWG Wires	Approx. O.D. (inches)	lbs./1000 ft.
1,000	25,193	61 x 7 x 59	25,193	1.404	3,240
900	22,631	61 x 7 x 53	22,631	1.331	2,910
800	20,069	61 x 7 x 47	20,069	1.256	2,580
750	18,788	61 x 7 x 44	18,788	1.207	2,415
700	17,507	61 x 7 x 41	17,507	1.183	2,250
650	16,226	61 x 7 x 38	16,226	1.133	2,085
600	14,945	61 x 7 x 35	14,945	1.084	1,920
550	13,664	61 x 7 x 32	13,664	1.035	1,755
500	12,691	37 x 7 x 49	12,691	0.997	1,630
450	11,396	37 x 7 x 44	11,396	0.940	1,465
400	10,101	37 x 7 x 39	10,101	0.901	1,300
350	8,806	37 x 7 x 34	8,806	0.825	1,130
300	7,581	19 x 7 x 57	7,581	0.768	975
250	6,384	19 x 7 x 48	6,384	0.713	821
4/0	5,320	19 x 7 x 40	5,320	0.645	684
3/0	4,256	19 x 7 x 32	4,256	0.576	547
2/0	3,325	19 x 7 x 25	3,325	0.508	427
1/0	2,646	7 x 7 x 54	2,646	0.423	337
1	2,107	7 x 7 x 43	2,107	0.376	268
2	1,666	7 x 7 x 34	1,666	0.337	212
3	1,323	7 x 7 x 27	1,323	0.305	169
4	1,064	19 x 56	1,064	0.269	134
5	836	19 x 44	836	0.240	105
6	665	19 x 35	665	0.215	84
7	532	19 x 28	532	0.196	67
8	420	7 x 60	420	0.162	53
9	336	7 x 48	336	0.146	42
10	259	7 x 37	259	0.126	32.5
12	168	7 x 24	168	0.101	21.0
14	–	–	104	0.078	12.8
16	–	–	65	0.060	8.0
18	–	–	41	0.048	5.0
20	–	–	26	0.038	3.2

Sources: ASTM B172 Specification for Rope-Lay-Stranded Copper Conductors Having Bunch-Stranded Members and ICEA S-68-516 (NEMA WC8).

Installation — Training and Bending Limitations

Physical Limitations Training and Bending

Overview

Training is the positioning of cable when it is not under tension. Bending is the positioning of cable when it is under tension. When installing cable, the object is to limit the mechanical forces so that the cable's physical and electrical characteristics are maintained for the expected service life. Bends in conductors, multiconductor cables or assemblies of conductors shall be made so that the cable will not be damaged.

A nonshielded cable can tolerate a sharper bend than a shielded cable. This is especially true for cables having helically applied metallic shielding tapes which, when bent too sharply, can separate or buckle and cut into the insulation. Remember that offsets are bends.

The problem is compounded by the fact that most tapes are under jackets that conceal such damage. The extruded polymers used for insulation shields have sufficient conductivity and coverage initially to pass acceptance testing, then fail prematurely due to corona at the shield/insulation interface.

Minimum Bending Radius in Accordance with National Electric Code

Voltage	Conductors	Shielding	Cable Types	Minimum Bending Radius as a Multiple of Conductor/Assembly Diameter		
600 V	Single	Nonshielded	All	5X		
601-2000 V			All	8X		
600 V or 2000 V	Multiconductor or Multiplexed	Nonshielded	TC or TC-ER	1 in. (25 mm) or less	Over 1 in. to 2 in. (>25 mm to 50 mm)	Over 2 in. (>50 mm)
				4X	5X	6X
			MC[1]	7X		
		Shielded	All	12X		
			TC or TC-ER	12X		
			MC	12X/7X[1]		

[1] Per 330.24B Interlocked-Type Armor or Corrugated Sheath.

Cord Product Coding System

Cord Packaging and Color Codes

Example: **02725.41.01**

Product Number

Packaging Code Identification Numbers

CODE	PACKAGING	CODE	PACKAGING
15/R5	250' Spool	**41**	1000' Reel
18/R8	500' Spool	**43**	2000' Reel
21	1000' Spool	**44**	2500' Reel
24	2500' Spool	**46**	5000' Reel
35	250' Reel	**85**	250' Coil
38	500' Reel	**99**	LL Reel
40	LL Reel	**XX**	Shorts

Jacket Color Code Identification Numbers

CODE	COLOR	CODE	COLOR
01	Black	**07**	Blue
02	White	**08**	Brown
03	Red	**10**	Gray
04	Orange	**13**	Pink
05	Yellow	**19**	Purple
06	Green	**77**	Light Blue

Voltage Drop Calculations

To Find Volts Lost:

1. Multiply current (amperes) by the distance (feet in one conductor) by the figure in the table below for the type of system and wire used.
2. Place a decimal in front of the last six figures.
3. The result is number of volts lost.

Note: For AC 3 Phase Current Voltage Drop obtained is phase-to-phase.

WIRE SIZE	POWER FACTOR %	AC SINGLE PHASE	AC THREE PHASE	DC	WIRE SIZE	POWER FACTOR %	AC SINGLE PHASE	AC THREE PHASE	DC
14 AWG	100	5880	5090	5880	**3/0 AWG**	100	149	129	144
	90	5360	4640			90	179	155	
	80	4790	4150			80	181	156	
	70	4230	3660			70	177	153	
	60	3650	3160			60	171	148	
12 AWG	100	3690	3190	3690	**4/0 AWG**	100	121	104	114
	90	3380	2930			90	152	131	
	80	3030	2620			80	156	135	
	70	2680	2320			70	155	134	
	60	2320	2010			60	151	131	
10 AWG	100	2320	2010	2820	**250 kcmil**	100	102	89	97
	90	2150	1861			90	136	117	
	80	1935	1675			80	143	123	
	70	1718	1487			70	143	124	
	60	1497	1296			60	141	122	
8 AWG	100	1462	1265	1462	**300 kcmil**	100	86	75	81
	90	1373	1189			90	121	104	
	80	1248	1081			80	128	111	
	70	1117	969			70	131	113	
	60	981	849			60	130	113	
6 AWG	100	918	795	918	**350 kcmil**	100	74	64	69
	90	882	764			90	109	95	
	80	812	703			80	118	102	
	70	734	636			70	122	105	
	60	653	565			60	122	106	
4 AWG	100	578	501	578	**400 kcmil**	100	66	57	60
	90	571	494			90	101	88	
	80	533	462			80	111	96	
	70	489	423			70	115	99	
	60	440	381			60	116	101	
2 AWG	100	367	318	363	**500 kcmil**	100	54	47	48
	90	379	328			90	89	78	
	80	361	313			80	99	86	
	70	337	292			70	105	91	
	60	309	268			60	108	93	
1 AWG	100	291	252	288	**600 kcmil**	100	47	41	40
	90	311	269			90	83	72	
	80	299	259			80	93	81	
	70	284	246			70	99	86	
	60	264	229			60	103	89	
1/0 AWG	100	233	202	229	**750 kcmil**	100	39	34	32
	90	257	222			90	75	65	
	80	252	218			80	86	75	
	70	241	209			70	93	81	
	60	227	106			60	97	84	
2/0 AWG	100	187	162	181	**1000 kcmil**	100	31	27	24
	90	213	184			90	67	58	
	80	212	183			80	79	68	
	70	206	178			70	86	75	
	60	196	169			60	91	78	

Insulation and Jacket Properties

TYPICAL PROPERTIES OF COMMON INSULATING MATERIALS

PARAMETER	PVC	PE	PP	XLPE	NYLON	EPDM	TFE	BUTYL RUBBER	SILICONE RUBBER	TPR
Specific Gravity	1.37	0.92	0.89	0.93-1.18	1.09	1.43	2.17	1.40	1.60	1.16-1.20
Dielectric Constant										
(a) 60 Hz	6.0	2.26	2.6	3.0	4.6	3.4	2.1	4.1	3.3	2.8
(b) 1000 Hz	5.0	2.25		3.0	4.5	3.4	2.1	4.0	3.1	2.8
Dielectric Strength, v/mil										
(a) 0.010" wall	1800	2100	850	-	1000	700	2000	700	600	625
(b) 0.040" wall	800	1050	450	700	470	500	950	500	400	
Tensile Strength, PSI x 1000	1.5-3.8	1.4-2.4	2.9-4.5	1.8-2.5	8.8-11.9	0.8-1.2	2.0-6.0	0.5-1.5	0.6-1.2	2.3
Service Temp. Range, °C	-55/+105	-90/+90	-40/+105	-55/+105	-55/+105	-55/+105	-90/+260	-40/+90	-80/+200	-55/+90
Elongation, %	200-375	350-550	700	250-400	150-380	250-450	200-500	200-400	125-400	500
Water Absorption, % in 24 hr	<0.75	<0.02	<0.02	<0.01	2.5	<0.1	<0.01	<1.0	<1.0	<0.6
Flame Resistance	Self-Extinguishing	Support Flame	Support Flame	Slow Flame	Self-Extinguishing	Supports Flame	Non-Flammable	Slow Burning	Slow (Non-Cond. Ash)	Flammable
Ozone Resistance	Excellent	Good	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Excellent
Flexibility	Good	Good	Good	Good-Fair	Good-Fair	Excellent	Good	Excellent	Excellent	Excellent
Abrasion Resistance	Good	Good	Fair	Excellent	Excellent	Fair	Excellent	Poor	Poor	Good-Fair
Acid Resistance	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Excellent
Base Resistance	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Good	Excellent
Hydraulic Fluid Resistance	Good-Fair	Fair-Poor	Fair	Good-Fair	Good-Fair	Good-Fair	Excellent	Poor	Fair-Poor	Poor
Organic Solvent Resistance	Fair-Poor	Poor	Fair	Fair	Good-Fair	Fair-Poor	Excellent	Good-Fair	Poor	Poor

NOTE: The above is representative of performance. For specific compound performance, consult factory.

TYPICAL PROPERTIES OF COMMON JACKETING MATERIALS

PARAMETER	PVC	PE	NYLON	CPE	TFE	SILICONE RUBBER	NEOPRENE	POLY-URETHANE	TPR
Specific Gravity	1.37	0.92	1.09	1.46	2.17	1.24	1.52	1.3	1.16-1.20
Tensile Strength, PSI x 1000	1.5-3.8	1.4-2.4	8.8-119	1.2-2.0	2.0-6.0	0.6-1.2	1.5-2.5	>3.5	2.3
Elongation, %	200-375	350-550	150-380	300-500	200-500	125-400	300-500	540-700	500
Service Temp. Range,°C	-55/+105	-80/+75	-55/+105	-50/+105	-90/+200	-80/+200	-65/+90	-65/+75	-55/+90
Ozone Resistance	Excellent	Good	Good	Excellent	Excellent	Excellent	Excellent	Good	Excellent
Weatherability	Good-Fair	Excellent-Good	Fair-Poor	Excellent	Excellent	Excellent	Good	Good	Excellent
Flame Resistance	Self-Extinguishing	Supports Flame	Flammable	Self-Extinguishing	Non-Flammable	Slow-Burn (Non-Cond. Ash)	Self-Extinguishing	Slow-Burn	Flammable
Flexibility	Good	Good	Good-Fair	Excellent	Good	Excellent	Excellent	Excellent	Excellent
Abrasion Resistance	Good	Good	Excellent	Good	Excellent	Poor	Excellent	Excellent	Good-Fair
Acid Resistance	Excellent	Excellent	Poor	Good	Excellent	Poor	Good	Fair	Excellent
Base Resistance	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Good	Fair	Excellent
Hydraulic Fluid Resistance	Good-Fair	Fair-Poor	Good-Fair	Good	Excellent	Fair-Poor	Good	Poor	Good
Organic Solvent Resistance	Fair-Poor	Poor	Good-Fair	Good	Excellent	Poor	Good	Poor	Poor
Resistance to Tearing	Good	Good	Excellent	Good	Good	Fair	Good	Excellent	Good-Fair

NOTE: The above is representative of performance. For specific compound performance, consult factory.

Government and Military Wire and Cable Specifications

J-C-90: Flexible cord and fixture wire.
J-C-96: Neoprene jacketed telephone wire.
J-C-580: Flexible cord and fixture wire.
J-C-0741: Rubber and/or neoprene welding cable.
MIL-C-17: Coaxial cable – polyethylene and Teflon dielectric.
MIL-C-915, MIL-C-2194: Shipboard cable.
MIL-C-1486: 10 conductor WM-46/U only.
MIL-C-3078: Cable, electric, insulated low tension single conductor.
MIL-C-3432: 300 volt and 600 volt rubber insulated power and control cable.
MIL-C-3458: Cables, telephone.
MIL-C-3702: Cable, power electrical, ignition, high tension.
MIL-C-3849: Tinsel cord. Light duty low voltage flexible cord for switchboards, microphones, telephones, etc.
MIL-C-3883: Cord electrical (audio frequency).
MIL-C-3884: Conductor electrical (short lay).
MIL-C-4839: KEL-F insulated cable, WF-15/U.
MIL-C-4866: RG-62 B/U cable.
MIL-C-4921A (ASG): Single conductor 8 AWG 5,000 volt cable with butyl compound insulation and polychloroprene. For airport lighting.
MIL-C-5136: Cable, power, electric, polychloroprene sheathed, buna compound insulated.
MIL-C-5767: Low temperature rubber portable cords.
MIL-C-6166: Cord, headset-microphone CX1301/AR.
MIL-C-7078: 600 volt aircraft cable.
MIL-C-8721 (ASG): Cable, ignition high tension, aircraft quality.
MIL-C-8721: Miniature coaxial cables with Teflon TFE cores.
MIL-C-8817 (ASG): Cable ignition, high tension, aircraft quality.
MIL-C-9360: RG 134/U cable
MIL-C-10065: Cables, special purpose electrical (multi-pair) audio frequency.
MIL-C-10369: Cable, telephone field, for rapid payout.
MIL-C-10392: Cables, special purpose, electric (miniature).
MIL-C-10581: Cables telephone, cable assemblies, telephone, coil assembly, telephone loading
MIL-C-11060: Cables, twisted pair, internal hook-up, unshielded and shielded.
MIL-C-11097: Cable, telephone (Wire W-50-A).
MIL-C-11311: Telephone cable types WD-31/U and WT-24/U.
MIL-C-11440: Cable, power electrical.
MIL-C-12064: Low temperature power cable and cords for Arctic service.
MIL-C-12423: Cable, telephone WD-33 U.
MIL-C-12881: Cables, telephone, switchboard (cable and cable assemblies).
MIL-C-12992: Cable assembly, power, electrical (Cord CX-227 TVQ- 1).
MIL-C-13066: Cable, telephone (submarine No. 19 AWG and No. 22 AWG).
MIL-C-13077: Cable, special purpose, electrical.
MIL-C-13486: Cables, special purpose electrical: low tension, heavy duty, single CDR & multiconductor shielded arid unshielded
MIL-C-13777: Multi-conductor missile ground support cable.
MIL-C-13892: Cable, telephone (flexible).
MIL-C-14189: Cable, power electrical, 3000 volt, for field use.
MIL-C-15325: Cable, tow, electric (three conductor).
MIL-C-15479: Cables, power, electrical, submarine, Navy Standard Harbor Defense.
MIL-C-18959: Cable power, electrical, portable neoprene jacketed 600 volt.
MIL-C-18961: Cable, special purpose, electrical and wire, electrical, shot
MIL-C-18962: Cable, power, electrical, direct burial, neoprene jacketed 600 volt.
MIL-C-19381 (Ships): Cables, special purpose, electrical nuclear plant.
MIL-C-19547: Cables, electrical, special purpose, shore use.
MIL-C-19638: Cables, power electric, submarine, Navy Harbor Defense.
MIL-C-19654: Cable, telephone, submarine.
MIL-C-19787: Cable, electric, torpedo, 65 conductor (torpedo control, electric setting).
MIL-C-19883: Cables, special purpose, electric, for remote control radar set AN/FPN-28.
MIL-C-21069: Cable, electrical, shield, 600 volt (non-flexing service).
MIL-C-22667: Cable, special purpose, buoyant, electrical (submarine use).
MIL-C-23020: Coaxial cable for use inside submarines (water blocked).
MIL-C-23206: Cable, special purpose, electrical. Silicone rubber, water blocked.
MIL-C-23437: Cable, electrical, shielded pairs.
MIL-C-24145 (Ships): Cable, electrical special purpose for shipboard use (water blocked and non-water blocked). Formerly BuShip 660 L.
MIL-C-24640: Cable, electrical, lightweight for shipboard use.
MIL-C-24643: Cable and cord, electrical, low-smoke for shipboard use.
MIL-C-25115: RG-62 C/U.
MIL-C-25509: RG-115 A U
MIL-C-26468 (USAF): Cables, guided missile, ground installation, general requirements for.
MIL-C-27072: Multi-conductor ground support cable.
MIL-C-27212: Cable, power, electrical, airport lighting control.
MIL-C-27500: Shielded and unshielded aircraft and missile cables.
MIL-C-36359 (USAF): Power cable of two voltage range for airport lighting 8 AWG (3,000-5,OOOV) CCLP insulated.
MIL-C-55021: Cables, twisted pairs and triples, internal hook-up, shielded and unshielded.
MIL-C-55036: Cable, telephone, WM130##/6.
MIL-E-9085 (USAF): Electrical cord, WM-85/u.
MIL-E-9088 (USAF): Electrical cord, WF-15/u.
MIL-R-833 (USAF): RF cable, RG12/u.
MIL-STD-122: Color code for chassis wiring for electronic equipment.
MIL-STD-681: Identification coding and application of hook-up wire.
MIL-W-76: General purpose hook-up wire. Vinyl insulated types LW, MW and HW.
MIL-W-438: Wire ignition electric power.
MIL-C-442: Thermoplastic or rubber jacketed two conductor parallel rip cord.
MIL-W-583: Wire, magnet, electrical.
MIL-W-3093: Wire, insulated, W-121, W-122, W-123, WD15/u, WD-16, WF-9/u, WT-3/u (distributing, frame wires).
MIL-W-3104: Wire, insulated No. 20 AWG, extra flexible.
MIL-W-3975: Wire, electrical (tinsel).
MIL-W-3861: Wire, electrical (bare copper).
MIL-W-5086: 600 volt aircraft wire (copper conductors).
MIL-W-5088: Installation of wiring and wiring devices in aircraft.
MIL-W-5274: Spec for aircraft wire, Type I 600V, Type II 600V, Type 111 300 rating
MIL-W-5845: Wire, electrical, iron and constantan, thermocouple.
MIL-W-5846: Wire, electrical, chromel and alumel, thermocouple.
MIL-W-5908: Wire, electrical, copper and constantan, thermocouple.
MIL-W-6370: Wire, electrical, insulated antenna.
MIL-W-7072: 600 volt aircraft wiring (aluminum conductors).
MIL-W-7500: Wire, electrical, WS-31-U.
MIL-W-8160: Installation of wire in guided missiles.
MIL-W-877: 600 volt silicone rubber insulated aircraft wire.
MIL-W-12349: KEL-F insulated hook-up wire.
MIL-W-12410: General purpose hook-up wire similar to MIL-W-76.
MIL-W-12995: Wire, electrical (W-29 and W-120).
MIL-W-13075: Wire, electrical
MIL-W-13169: Wire, electrical (for instrument test leads).
MIL-W-13241: Wire, electrical.
MIL-W-16400: General specification for electronic equipment, Naval ship and shore.
MIL-W-16878: Electronic hook-up wire. Includes vinyl (Types B, C, and D), Teflon (Types ET, E, EE, KT, K and KK) and polyethylene (Type J).
MIL-W-17211 (Ships): Wire, electrical, radio antenna 7/12, 7/14, 7/16, 7/18, 7/20, 7/22.
MIL-W-19150: Wire, insulated, hard drawn copper.
MIL-W-19583 (Navy): Wire, electrical, magnet, high temperature, film insulated.
MIL-W-21306: Wire, electrical twisted pair, color coded switchboard.
MIL-W-22759: Teflon and Tefzel insulated airframe wire.
MIL-W-25038: Wire, electrical, high temperature and fire-resistant aircraft.
MIL-W-27300: Teflon insulated 600 volt aircraft wire.
MIL-W-81044: Irradiated wire for aircraft and hook-up.
MIL-W-81381: Wire, electric polyamide insulated copper and copper alloy (Kapton H-film).
MIL-W-81822: Solid conductor, wire wrap insulated and uninsulated.
NAS-702: General purpose PVC insulated hook-up wire.
NAS-703: High temperature general purpose Teflon TFE insulated wire. Similar to Types E and EE of MIL-W-16878.

Cordset Technical Information 12



General Cable takes pride in offering high-quality cordsets to our customers that provide reliable service year after year in the most rugged uses and application conditions. From our innovative **Plug-it®** line of cordset products and extension cord accessories to the ultimate extension cord in the industry – **FrogHide®** – we sell the products that power you forward.

Handy information and technical data in this section will help in the correct selection and matching of our cordset products to your application. For difficult applications or more detailed technical questions, please contact your local General Cable distributor, your retailer, or your Inside Sales Representative.

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Extension Cord Facts	101
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Ground Fault Circuit Interrupters (GFCI)	104
NEMA Receptacle and Plug Chart	105-106

Extension Cord Facts

What does AWG mean?

AWG means American Wire Gauge. It designates the size of the copper wire. The standard sizes for extension cords are 16 AWG, 14 AWG, 12 AWG and 10 AWG. The smaller the AWG number, the larger the size of the copper wire and wattage rating.

What do the amp and watt ratings mean?

Never plug more than the specific number of watts into a cord. For example, could you plug a 150-watt lamp, a 60-watt lamp and a 10-amp appliance into an extension cord rated 13 amps/1625 watts?

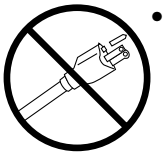
Use the Amp to Watt Conversion Table to determine the total number of watts to be used (150 watts + 60 watts + 1250 watts = 1460 watts). Therefore, it is safe to use the 13-amp/1625-watt extension cord.

Always look for the Underwriters Laboratory label which is permanently attached or molded into the cord. Read the label for instructions and electrical ratings.

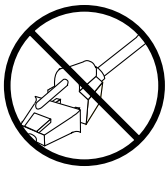
Amps To Watts (@ 125 V) Conversion Table		
0	=	0
1	=	125
2	=	250
3	=	375
4	=	500
5	=	625
6	=	750
7	=	875
8	=	1000
9	=	1125
10	=	1250
11	=	1375
12	=	1500
13	=	1625
14	=	1750
15	=	1875

How to use an extension cord properly.

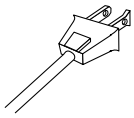
- Be sure the cord you have selected meets the intended use. Never use a cord outdoors that is not marked for outdoors.
- Inspect cord thoroughly before each use. Do not use if damaged.



- Do not remove, bend or modify any metal prongs or pins of plug.
- Look for the number of watts on appliances to be plugged into cord.
- Refer to UL Label on cord for specific wattage.
- Do not connect a three-prong plug into a two-hole cord.



- Do not plug more than the specified number of watts into a cord.
- Make sure appliance is off before connecting cord to outlet.



- A polarized plug has one blade wider than the other.
- Fully insert plug into outlet.
- Do not use excessive force to make connections.
- Do not run cords through doorways, holes in ceilings, walls or floors.
- Do not use an extension cord when wet.



- Keep extension cords away from water.
- Keep children and pets away from extension cords.



- Avoid overheating. Uncoil cord and do not cover it with any other material.
- Do not plug one extension cord into another.
- Do not drive, drag or place objects over extension cord.
- Always grasp plug when removing it from cord or outlet.
- Do not unplug by pulling on cord.



- Always store extension cords indoors.

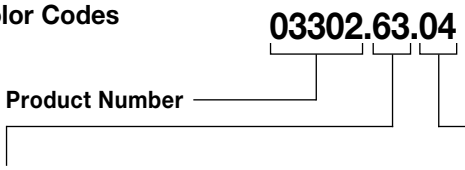


- Do not walk on cord.
- Always unplug cord when not in use.
- Always look for the Underwriters Laboratory (UL) label which is permanently attached or molded into the cord. Read the label for instructions and electrical ratings.

Cordset Product Coding System

Cordset Packaging and Color Codes

Example:



Packaging Code Identification Numbers

CODE	PACKAGING	CODE	PACKAGING
13	Clamshell	70	Bulk (with tie)
60	Cuff	73	Bulk (without tie)
61	Box	96	Card
63	Sleeve		

Jacket Color Code Identification Numbers

CODE	COLOR	CODE	COLOR
00	No color	06	Green
01	Black	07	Blue
02	White	08	Brown
03	Red	10	Gray
04	Orange	17	Beige
05	Yellow		

Surface Printed Legend

Our extension cords have surface-printed jackets to provide a means of identifying and distinguishing between different types of extension cords.

Example: 16/3 SJTW OUTDOOR E-XXXXX (UL)

- 16/3 — Gauge & Conductor
- SJTW — Jacket Compound
- OUTDOOR — Application
- E-XXXXX — UL Identification #
- (UL) — UL Listed

Inner Wire Color Code Chart

NO. OF CONDUCTORS	COLOR
2	Black, White
3	Black, White, Green
4	Black, White, Green, Red

Understanding Wire Gauge

- Gauge refers to the size of the wire
- The thinner the wire, the higher the gauge number
- The thicker the wire, the lower the gauge number



- The lower the gauge, the more electrical current (amps) the wire can carry
- The lower the gauge, the longer distance the wire can be run from an electrical source

How to Select the Right Extension Cord

1. Look up the amp rating on the power tool or appliance.
2. Determine the maximum distance the tool or appliance will be from the electrical outlet.
3. Use the Extension Cord Selector chart below to identify the proper gauge.

Extension Cord Selector

EQUIPMENT	AMP RATING
Circular Saw	12-15
Power Drill	3-7
Hedge Trimmer	2-3
Weed Trimmer	2-4
Chain Saw	7-12
Leaf Blower	6-12
Bug Killer	1-2
Lawn Mower	6-12

Extension Cord Selector

MAXIMUM DISTANCES	UP TO 10 AMPS	UP TO 15 AMPS
0' to 25'	16 Gauge	14 Gauge
25' to 50'	16 Gauge	14 Gauge
50' to 75'	16 Gauge	12 Gauge
75' to 100'	16 Gauge	12 Gauge

Extension Cord Performance Guide

	FROGHIDE® ULTRA FLEX® RUBBER	LIFETIME PLUS® SUPER FLEX®	ALL WEATHER BLUE	SAFETY ORANGE®
Low-Temp Flex	Excellent	Good	Good	Fair
Room-Temp Flex	Excellent	Very Good	Very Good	Good
Oil Resistance	Excellent	Very Good	Very Good	Fair
Cap/Cord Bonding	Excellent	Very Good	Very Good	Good
Abrasion Resistance	Excellent	Very Good	Very Good	Very Good
Chemical Resistance	Excellent	Very Good	Very Good	Very Good
Heat Softening	Excellent	Fair	Fair	Fair
Water Resistance	Excellent	Excellent	Excellent	Excellent
Flame Resistance	Excellent	Very Good	Very Good	Very Good

Ground Fault Circuit Interrupters (GFCI)

What is the GFCI?

The GFCI is a fast-acting circuit interrupter that senses small current imbalances.

These small imbalances in the circuit are caused by current leakage to ground and, in a fraction of a second, the GFCI shuts off the electricity. The GFCI continually matches the amount of current going to an electrical device against the amount of current returning from the device along the normal path. Whenever the amount "going" differs from the amount "returning" by approximately 5 milliamps, the GFCI interrupts the electrical power within as little as 1/40 of a second.

What are OSHA's Electrical Standards for Construction?

GFCIs can be used successfully to reduce electrical hazards on construction sites...

Tripping of GFCIs - interruption of current flow - is sometimes caused by wet connectors and tools. It is a good practice to limit exposure of connectors and tools to excessive moisture by using watertight or sealable connectors. Providing more GFCIs or shorter circuits can prevent tripping caused by the cumulative leakage from several tools or by leakages from extremely long circuits.

To help cope with the electrical hazards at construction sites...

The Occupational Safety and Health Administration (OSHA) issued a revision of OSHA safety and health regulation, 29 Code of Federal Regulations Part 1926, Subpart K (Electrical Standards of Construction). This revision was published in the federal Register and contains the requirements for the GFCI and the assured equipment grounding conductor program.

What are the Employer's Responsibilities on a Construction Site?

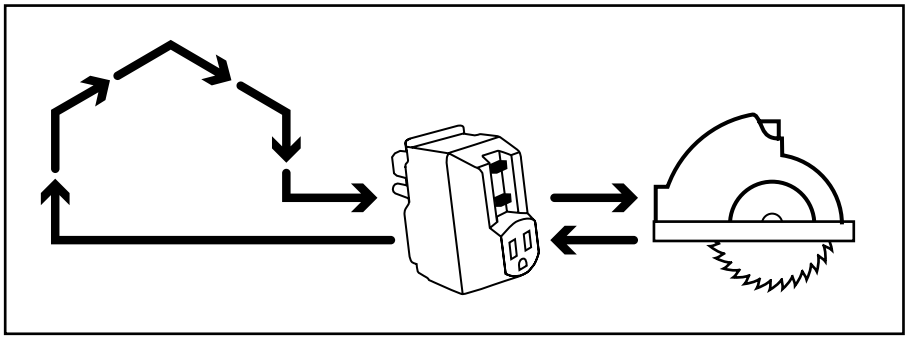
OSHA ground-fault protection rules and regulations have been determined necessary and appropriate for employee safety and health.

Therefore, it is the employer's responsibility to provide either...

- Ground-fault circuit interrupters on construction sites for receptacle outlets in use and not a part of the permanent wiring of the building or structure.
- A scheduled and recorded assured equipment grounding conductor program on construction sites, covering all cordsets, receptacles that are not part of the permanent wiring of the building or structure, and equipment connected by cord and plug that are for use or used by employees.

It is also the employer's responsibility to provide approved ground fault circuit interrupters for a 120-volt, single-phase, 15- and 20-ampere receptacle outlets on construction sites that are not part of the permanent wiring of the building or structure, and that are in use by employees. Receptacles on the ends of extension cords are not part of the permanent wiring and, therefore must be protected by GFCIs whether or not the extension cord is plugged into permanent wiring.

Effective management of worker safety and health protection is a decisive factor in reducing the extent and severity of work-related injuries and illnesses and their related costs. An effective program includes provisions for the systematic identification, evaluation and prevention or control of general workplace hazards, specific job hazards and potential hazards that may arise from foreseeable conditions. An effective program will include management commitment and employee involvement, work site analysis, hazard prevention and control, training and the proper equipment.



NEMA Receptacle and Plug Chart

	VOLTAGE	LINE NO.	15 AMPERE		20 AMPERE	
			RECEPTACLE	PLUG	RECEPTACLE	PLUG
2 Pole 2 Wire	125 V	1	1-15R 	1-15P 		
	250 V	2	2-15R 	2-15P 	2-20R 	2-20P 
2 Pole 3 Wire Grounding	125 V	5	5-15R 	5-15P 	5-20R 	5-20P 
	250 V	6	6-15R 	6-15P 	6-20R 	6-20P 
	277 V	7	7-15R 	7-15P 	7-20R 	7-20P 
3 Pole 3 Wire	125/250 V	10			10-20R 	10-20P 
	3 ϕ Δ 250 V	11	11-15R 	11-15P 	11-20R 	11-20P 
3 Pole 4 Wire Grounding	125/250 V	14	14-15R 	14-15P 	14-20R 	14-20P 
	3 ϕ Δ 250 V	15	15-15R 	15-15P 	15-20P 	15-20P 
4 Pole 4 Wire	3 ϕ Y 120/208 V	18	18-15R 	18-15P 	18-20R 	18-20P 

NEMA Receptacle and Plug Chart

	VOLTAGE	LINE NO.	30 AMPERE RECEPTACLE	30 AMPERE PLUG	50 AMPERE RECEPTACLE	50 AMPERE PLUG	60 AMPERE RECEPTACLE	60 AMPERE PLUG
2 Pole 2 Wire	125 V	1						
	250 V	2	2-30R 	2-30P 				
2 Pole 3 Wire Grounding	125 V	5	5-20R 	5-30P 	5-50R 	5-50P 		
	250 V	6	6-30R 	6-30P 	6-50R 	6-50P 		
	277 V	7	7-30R 	7-30P 	7-50R 	7-50P 		
3 Pole 3 Wire	125/250 V	10	10-30R 	10-30P 	10-50R 	10-50P 		
	3 ϕ Δ 250 V	11	11-30R 	11-30P 	11-50R 	11-50P 		
3 Pole 4 Wire Grounding	125/250 V	14	14-30R 	14-30P 	14-50R 	14-50P 	14-60R 	14-60P 
	3 ϕ Δ 250 V	15	15-30R 	15-30P 	15-50R 	15-50P 	15-60R 	15-60P 
4 Pole 4 Wire	3 ϕ Y 120/208 V	18	18-30R 	18-30P 	18-50R 	18-50P 	18-60R 	18-60P 

LOCKING-TYPE PLUGS AND RECEPTACLES

VOLTAGE	LINE NO.	15 AMPERE RECEPTACLE	15 AMPERE PLUG	20 AMPERE RECEPTACLE	20 AMPERE PLUG	30 AMPERE RECEPTACLE	30 AMPERE PLUG
125 V	L-1	L1-15R 	L1-15P 				
250 V	L-2			L2-20R 	L2-20P 		
125 V	L-5	L5-15R 	L5-15P 	L5-20R 	L5-20P 	L5-30R 	L5-30P 
250 V	L-6	L6-15R 	L6-15P 	L6-20R 	L6-20P 	L6-30R 	L6-30P 
277 V, A.C.	L-7	L7-15R 	L7-15P 	L7-20R 	L7-20P 	L7-30R 	L7-30P 
480 V	L-8			L8-20R 	L8-20P 	L8-30R 	L8-30P 
600 V	L-9			L9-20P 	L9-20P 	L9-30R 	L9-30P 

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General Cable

Who says you can't have it all?



At General Cable, we are dedicated to providing you with a full range of in-stock quality wire and cable at competitive prices, expert service and support, and innovative programs that provide hassle-free delivery—whenever and wherever it's needed. We are your all-in supplier for:

- **Carol® Brand Portable Cord, Industrial Cord & Cordset Products (Super Vu-Tron® Supreme featuring GenClean™)**
- **Carol® Brand Electronics Products (EXZEL® & Electronic Classics)**
- **General Cable Armored, Instrumentation Power & Control and Automation Cables (CCW®, FREP®, GenFree®, SunGen®, TC Flex™, VNTC®)**
- **Gen*SPEED*® Brand, Carol® Brand and Helix/Hi-Temp® Cat 6 and Cat 5e Products**
- **General Cable Copper Building Wire & PV Wire**
- **STABILOY® Brand and PDIC® Brand Aluminum Alloy Feeder, Service Entrance & Armored Cables**
- **General Cable Military, Mining, Nuclear, OGP and Rail & Transit Cables**

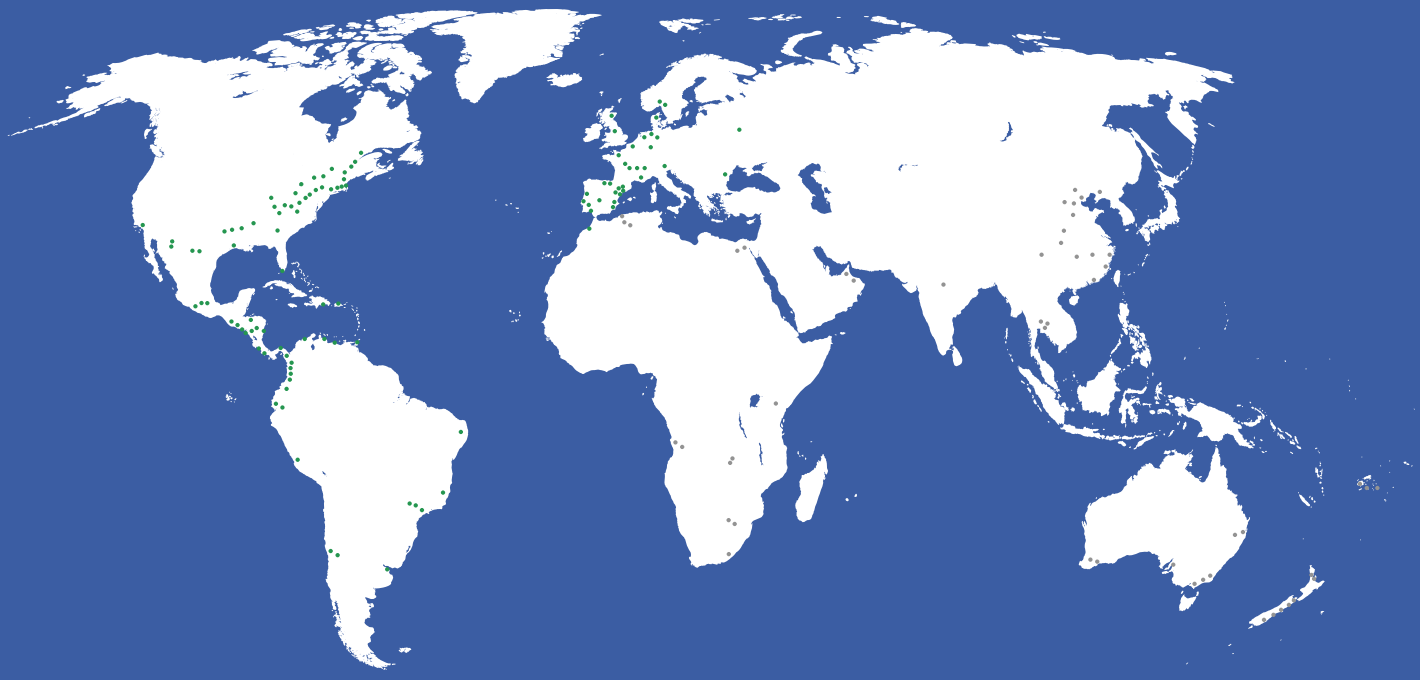
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CONNECTING THE WORLD

Global Reach



General Cable, a leading wire and cable innovator for over 170 years, serves customers through a network of 38 manufacturing facilities in our core markets and has worldwide sales representation and distribution. The Company is dedicated to the production of high-quality aluminum, copper and fiber optic wire and cable and systems solutions for the energy, construction, industrial, specialty and communications sectors. In addition to our strong brand recognition and strengths in technology and manufacturing, General Cable is also competitive in such areas as distribution and logistics, marketing, sales and customer service. This combination enables General Cable to better serve its customers as they expand into new geographic markets.

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Form No. CAR-0084-R0115
46207

OILFIELD ARRESTORS

Rapid Response, High Current Delta Arrestors™ For Industrial Use Help Prevent Voltage Surge and Lightning Damage to Motors and Control Equipment.

600 SERIES SPECIFICATIONS

Type of design	Silicon Oxide Varistor
Maximum current	100,000 amps
Maximum energy	3000 joules
Maximum number of surges	Unlimited
Response time one milliamp test	5 nanoseconds
Response time to clamp 10,000 amps	10 nanoseconds
Response time to clamp 50,000 amps	25 nanoseconds
Leak current at double the rated voltage	none
Leads	36" #12 THHN
Case material	PVC
Locknut and Washer furnished	



NIPPLE
½" Thread

CASE DIMENSIONS: 4½" High
2¼" Diameter

SIMPLE INSTALLATION

Fasten the arrestor to the service entrance equipment. Connect the black wires to the lines below the main disconnect. Connect the white wire to the grounded neutral bus.

LA 603 for 440-600 Volt 3 Phase 3 or 4 Wire Service

LA 602 for 440-600 Volt Single Phase 3 Wire Service

LA 601 for 440-600 Volt Single Phase 2 Wire Service

Conduction Characteristics

8 X 20 microsecond wave shape
ANSI IEEE NEMA STANDARD

Discharge Current	5000 A	10000 A	20000 A	40000 A	60000 A	80000 A	100000 A
Clamping Voltage	450 V	920 V	1040 V	1500 V	2300 V	4000 V	5000 V
	Unlimited Operations					One Operation	

DELTA LIGHTNING ARRESTORS,™ INC.

P. O. BOX 750
BIG SPRING, TEXAS 79721

Product Data Sheet

9001SKR9R

Non-Illuminated Pushbutton Operator, Push - Maintained; Pull - Maintained



List Price	$86.00 USD
Availability	**Stock Item: This item is normally stocked in our distribution facility.**

Technical Characteristics

Approvals	UL Listed File Number E42259 CCN NKCR - CSA Certified File Number LR25490 Class 321103 - CE Marked
Bezel Material	Plastic
Button/Cap Color	Red
Enclosure Rating	NEMA 4/4X/13; IP65
Head Type	Round
Mounting Type	Panel
Mounting Position	All
Number of Operators	1
Operator Type	Push - Maintained; Pull - Maintained
Size	30mm
Type	SK

Shipping and Ordering

Category	21429 - Push Buttons, Corrosion Resistant, Type SK & SKY
Discount Schedule	CP1
Article Number	785901546610
Package Quantity	1
Weight	0.13 lbs.
Availability Code	Stock Item: This item is normally stocked in our distribution facility.
Returnability	Y

As standards, specifications, and designs change from time to time, please ask for confirmation of the information given in this document.

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The GE push button offering includes a complete line of control units and stations in both full size (30 mm) push buttons and in smaller size (22 mm) devices which are designed to be used in numerous types of industrial applications.

The CR104P full-size, heavy-duty oiltight and watertight line is complete with a variety of accessories and enclosures. These push buttons are especially adapted to heavy duty service in almost any application including those where water and oil coolant is present. All units are suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those applications. Standard contact blocks are supplied with IP 10 back-of-hand protection to comply with UL 508 Section 39A requirements for door mounted devices.

GE's C-2000 22mm Global Push Buttons are designed to be applied in just about any application worldwide. C-2000 push buttons conform to all major world standards and are UL listed and CSA Certified. All devices except the double push button are rated for NEMA 1, 3, 3R, 3S, 4, 4X, 12, 13, and IP66 when mounted in a suitable enclosure. C-2000 push buttons are manufactured in an ISO 9000 facility, assuring you that these products comply with quality standards that are recognized worldwide. Pre-engraved nameplates are available in French, Spanish, Italian, German, and English. The C-2000 push button line is globally available under the same product numbers, packaging, and markings anywhere in the world.

An entire listing of CR2943 and CR2941 standard-duty push button control stations is available, suitable for NEMA Type 1, 4, 4X, and 7 and 9 applications.



Reference Publications

See Publication Index, Section 17.

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons (CR104P)

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~~**Heavy-Duty 22.5 mm Watertight/Oiltight Push Buttons (C-2000)**~~

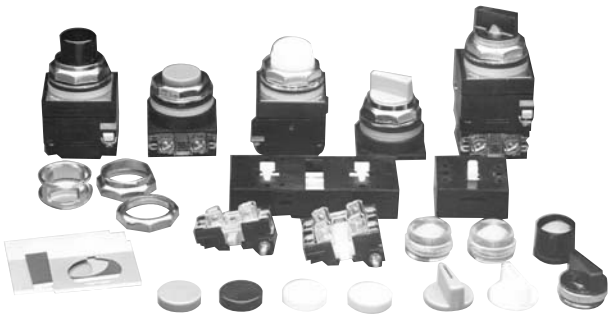
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Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Push Buttons
600 Volts Maximum AC/DC
10 Amperes Continuous



30.5 mm Heavy-Duty Push Buttons

Description

Standard and illuminated push buttons and selector switches are available as both key and conventional operators. The CR104P line also includes push-to-test and standard pilot lights, mush-room-head push buttons, joysticks, and push-pull and push-push operators.

Chrome-plated octagonal mounting rings project an attractive, high-quality appearance. Positive feel selector switches offer a quality touch in all illuminated and non-illuminated, maintained and spring return units.

Application

Especially adapted to machine-tool service or any application where oil or coolant is present. The convenient one-hole mount-ing makes this line suitable for general-purpose use in equipment of all kinds where panel mounting is possible. This line is ideal for applications where oil-tightness, water-tightness and long life are essential.

All units are suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. The exception is CR104PTP units, which are suitable for Type 1, 12, and 13 applications only. Although not needed on all Type 4X applications, protective caps provide improved resistance to some corrosive materials. They are not required by UL.

Features

—Ease of Assembly: One-screw contact block mounting. Octagonal ring provides ease in front panel mounting and enclosure applications.
—Greater Torque: Due to the eight-sided ring design, greater torque can be developed during assembly and installation to provide oil-tightness.
—Stocking Inventories Reduced: Forms may be furnished as complete units or as components, allowing building-block construction from a minimum of stock. The latter may provide faster service.
—Color Coded: Colored knobs and caps are available in kit forms for easy field conversion.

Product Number Selection Instructions

Selection of CR104P push buttons from the following pages is done in one of two ways: (1) one-step selection and pricing, in which items are selected from a single table and (2) step-by-step selection and pricing, in which you follow a sequence of steps to build the product number and list price for the product(s) you need. In either case, follow the instructions provided and order by complete product number.
Example: CR104PBG91B1 at **$34.20, GO-10P1**. Product numbers and prices do not include nameplates, which must be ordered separately from pages 9-40 and 9-41.

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Push Buttons
Lamp Selection
600 Volts Maximum AC/DC
10 Amperes Continuous

Lamp Selection

Incandescent, neon, and light emitting diode (LED) lamps are available for use in indicating lights, illuminated push buttons, and illuminated selector switches. Incandescent lamps have traditionally been the most frequently used, but it is wise to review the characteristics of the different types of lamps and select the one that is most appropriate for the application. Although the incandescent lamp offers the lowest initial cost, the LED is usually the most economical over the long term, due to its long life, resistance to shock and vibration, and lower power consumption. Benefits of LEDs include:

Resistance to Shock and Vibration—Since LEDs are sold state, they are completely impervious to the problems associated with shock and vibration that can significantly reduce the life of incandescent lamps by mechanically breaking the filament. The high inrush currents at startup associated with incandescents also act to significantly reduce the life of lamps used in frequent on-off applications.

Longer Life—The LEDs used with CR104P push buttons have a service life of 100,000 hours (11 years) compared to 20,000 hours (28 months) for the neon lamps, and 2,000 hours (3 months) for the standard incandescent lamps.

Reduced Power Consumption—The LEDs used for the CR104P push buttons consume between 10% and 52% less power than the equivalent incandescent lamp. The table below shows the power consumption of each type.

Lower Operating Temperature— Because of the lower power consumption and greater efficiency of LEDs, they operate much cooler than incandescent lamps. Thus, in applications where heat in the enclosure could be a problem, LED lamps are a better choice. Incandescent bulbs are recommended for light-duty applications and panels not subject to shock and vibration. Neon lamps offer a middle ground, at a cost and performance between the LED and the incandescent, but can have problems associated with flicker induced by noise and frequency. LED lamps offer the best overall performance for the long term.

Lamp Comparison

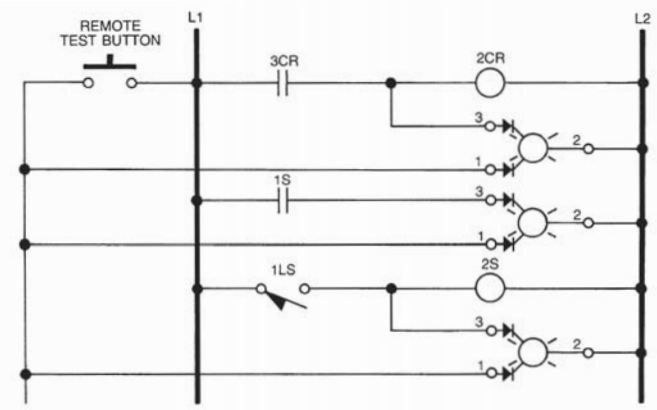
Bulb Type	Lifespan (Hours)	Shock & Vibration Immunity	Operating Temperature	Power Consumption	Brightness
LED	**100,000**	**High**	Medium	Medium	Medium
Incandescent	2,000	Low	High	High	**High**
Neon	20,000	Medium	**Low**	**Low**	Low

Potentiometers

Resistance	100 ohms ± 10% (list resistance by product number)
End Resistance	4 ohms maximum
Dielectric Strength	1000 Vac
2 Watts Maximum at 70°C	

Dual Input Illuminated Push Buttons (also called Remote Test Lights)

Dual input illuminated push buttons and indicating lights allow a number of lights to be tested from a single test button without operating the control circuit. A dual input illuminated push button without contacts becomes a remote test indicating light.



Typical wiring diagram for remote test of lights using dual input "Remote Test" Lights.

Power Consumption

Type	Volts AC/DC	Incandescent CR104P	Watts	LED CR104P	Watts	Neon CR104P	Watts
Full Voltage/ Transformer	6 (20,000 hours)	XA16	.95	XA36*	0.54	—	—
	12 (15,000 hours)	XA12	1.12	XA32*	0.72	—	—
	24 (2,500 hours)	XA14	1.12	XA34*	0.72	—	—
	120 (telephone slide)	XA52	3	—	—	—	—
	130 (miniature bayonet)	XA54	2.6	XA38*	1.2	XA19	0.077
Resistor	240	XA52	3	—	—	—	—
	120	XA15	3	—	—	—	—
Cluster Lights	12	XA22	.96	—	—	—	—
	24	XA24	1.12	—	—	—	—
	6	XA26	1.2	—	—	—	—

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Standard
Non-Illuminated
600 Volts Maximum AC/DC
10 Amperes Continuous

Common Forms

One-step selection and pricing of common assembled forms.

Units are supplied factory-assembled when ordered with contact blocks.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

Flush Button - Momentary Operator

Contact Configuration	Color	Product Number	List Price GO-10P1
None (Operator Only)	Black	CR104PBG00B1	**$16.20**
None (Operator Only)	Red	CR104PBG00R1	**$16.20**
None (Operator Only)	Green	CR104PBG00G1	**$16.20**
None (Operator Only)	1 Each: Red, Green, Yellow, Black	CR104PBG00U1[1]	**$16.20**
None (Operator Only)	1 Each: Brown, Blue, Orange, White	CR104PBG00V1[1]	**$16.20**
None (Operator Only)	Other	CR104PBG00*1[2]	**$15.90**
1NO-1NC	Black	CR104PBG91B1	**$34.20**
1NO-1NC	Red	CR104PBG91R1	**$34.20**
1NO-1NC	Green	CR104PBG91G1	**$34.20**
1NO-1NC	1 Each: Red, Green, Yellow, Black	CR104PBG91U1[1]	**$34.20**
1NO-1NC	1 Each: Brown, Blue, Orange, White	CR104PBG91V1[1]	**$34.20**
1NO-1NC	Other	CR104PBG91*1[2]	**$33.90**
2NO-2NC	Black	CR104PBG92B1	**$52.20**
2NO-2NC	Red	CR104PBG92R1	**$52.20**
2NO-2NC	Green	CR104PBG92G1	**$52.20**
2NO-2NC	1 Each: Red, Green, Yellow, Black	CR104PBG92U1[1]	**$52.20**
2NO-2NC	1 Each: Brown, Blue, Orange, White	CR104PBG92V1[1]	**$52.20**
2NO-2NC	Other	CR104PBG92*1[2]	**$51.90**
1NO	Black	CR104PBG10B1	**$25.20**
1NO	Red	CR104PBG10R1	**$25.20**
1NO	Green	CR104PBG10G1	**$25.20**
1NO	1 Each: Red, Green, Yellow, Black	CR104PBG10U1[1]	**$25.20**
1NO	1 Each: Brown, Blue, Orange, White	CR104PBG10V1[1]	**$25.20**
1NO	Other	CR104PBG10*1[2]	**$24.90**
1NC	Black	CR104PBG01B1	**$25.20**
1NC	Red	CR104PBG01R1	**$25.20**
1NC	Green	CR104PBG01G1	**$25.20**
1NC	1 Each: Red, Green, Yellow, Black	CR104PBG01U1[1]	**$25.20**
1NC	1 Each: Brown, Blue, Orange, White	CR104PBG01V1[1]	**$25.20**
1NC	Other	CR104PBG01*1[2]	**$24.90**

[1]Supplied with 4 caps: Unassembled.

[2]To order assembled units with a different color, substitute the letter below in place of the * in product number and add required adder to the list price.



Flush Button

Cap Colors Available*

Color	Insert in place of asterisk (*)	List Price Adder, GO-10P1 Push Buttons
Yellow	E	**$0.30**
Blue	L	**$0.30**
Orange	M	**$0.30**
Brown	N	**$0.30**
White	W	**$0.30**
No Cap	A	**$0.00**

Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Standard
Non-Illuminated
600 Volts Maximum AC/DC
10 Amperes Continuous

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

Extended Button - Momentary Operator

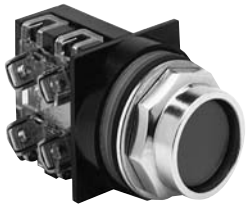
Contact Configuration	Color	Product Number	List Price GO-10P1
None (Operator Only)	Black	CR104PBG00B2	**$16.20**
None (Operator Only)	Red	CR104PBG00R2	**$16.20**
None (Operator Only)	Green	CR104PBG00G2	**$16.20**
None (Operator Only)	1 Each: Red, Green, Yellow, Black	CR104PBG00U2[1]	**$16.20**
None (Operator Only)	1 Each: Brown, Blue, Orange, White	CR104PBG00V2[1]	**$16.20**
None (Operator Only)	Other	CR104PBG00*2[2]	**$15.90**
1NO-1NC	Black	CR104PBG91B2	**$34.20**
1NO-1NC	Red	CR104PBG91R2	**$34.20**
1NO-1NC	Green	CR104PBG91G2	**$34.20**
1NO-1NC	1 Each: Red, Green, Yellow, Black	CR104PBG91U2[1]	**$34.20**
1NO-1NC	1 Each: Brown, Blue, Orange, White	CR104PBG91V2[1]	**$34.20**
1NO-1NC	Other	CR104PBG91*2[2]	**$33.90**
2NO-2NC	Black	CR104PBG92B2	**$52.20**
2NO-2NC	Red	CR104PBG92R2	**$52.20**
2NO-2NC	Green	CR104PBG92G2	**$52.20**
2NO-2NC	1 Each: Red, Green, Yellow, Black	CR104PBG92U2[1]	**$52.20**
2NO-2NC	1 Each: Brown, Blue, Orange, White	CR104PBG92V2[1]	**$52.20**
2NO-2NC	Other	CR104PBG92*2[2]	**$51.90**
1NO	Black	CR104PBG10B2	**$25.20**
1NO	Red	CR104PBG10R2	**$25.20**
1NO	Green	CR104PBG10G2	**$25.20**
1NO	1 Each: Red, Green, Yellow, Black	CR104PBG10U2[1]	**$25.20**
1NO	1 Each: Brown, Blue, Orange, White	CR104PBG10V2[1]	**$25.20**
1NO	Other	CR104PBG10*2[2]	**$24.90**
1NC	Black	CR104PBG01B2	**$25.20**
1NC	Red	CR104PBG01R2	**$25.20**
1NC	Green	CR104PBG01G2	**$25.20**
1NC	1 Each: Red, Green, Yellow, Black	CR104PBG01U2[1]	**$25.20**
1NC	1 Each: Brown, Blue, Orange, White	CR104PBG01V2[1]	**$25.20**
1NC	Other	CR104PBG01*2[2]	**$24.90**



Extended Button

Recessed Button - Momentary Operator

Contact Configuration	Color	Product Number	List Price GO-10P1
None (Operator Only)	Black	CR104PBG00B3	**$16.20**
None (Operator Only)	Red	CR104PBG00R3	**$16.20**
None (Operator Only)	Green	CR104PBG00G3	**$16.20**
None (Operator Only)	1 Each: Red, Green, Yellow, Black	CR104PBG00U3[1]	**$16.20**
None (Operator Only)	1 Each: Brown, Blue, Orange, White	CR104PBG00V3[1]	**$16.20**
None (Operator Only)	Other	CR104PBG00*3[2]	**$15.90**
1NO-1NC	Black	CR104PBG91B3	**$34.20**
1NO-1NC	Red	CR104PBG91R3	**$34.20**
1NO-1NC	Green	CR104PBG91G3	**$34.20**
1NO-1NC	1 Each: Red, Green, Yellow, Black	CR104PBG91U3[1]	**$34.20**
1NO-1NC	1 Each: Brown, Blue, Orange, White	CR104PBG91V3[1]	**$34.20**
1NO-1NC	Other	CR104PBG91*3[2]	**$33.90**
2NO-2NC	Black	CR104PBG92B3	**$52.20**
2NO-2NC	Red	CR104PBG92R3	**$52.20**
2NO-2NC	Green	CR104PBG92G3	**$52.20**
2NO-2NC	1 Each: Red, Green, Yellow, Black	CR104PBG92U3[1]	**$52.20**
2NO-2NC	1 Each: Brown, Blue, Orange, White	CR104PBG92V3[1]	**$52.20**
2NO-2NC	Other	CR104PBG92*3[2]	**$51.90**
1NO	Black	CR104PBG10B3	**$25.20**
1NO	Red	CR104PBG10R3	**$25.20**
1NO	Green	CR104PBG10G3	**$25.20**
1NO	1 Each: Red, Green, Yellow, Black	CR104PBG10U3[1]	**$25.20**
1NO	1 Each: Brown, Blue, Orange, White	CR104PBG10V3[1]	**$25.20**
1NO	Other	CR104PBG10*3[2]	**$24.90**
1NC	Black	CR104PBG01B3	**$25.20**
1NC	Red	CR104PBG01R3	**$25.20**
1NC	Green	CR104PBG01G3	**$25.20**
1NC	1 Each: Red, Green, Yellow, Black	CR104PBG01U3[1]	**$25.20**
1NC	1 Each: Brown, Blue, Orange, White	CR104PBG01V3[1]	**$25.20**
1NC	Other	CR104PBG01*3[2]	**$24.90**



Recessed Button

[1]Supplied with 4 caps: Unassembled.

[2]To order assembled units with a different color, substitute the letter below in place of the * in product number and add required adder to the list price.

Cap Colors Available*

Color	Insert in place of asterisk (*)	List Price Adder, GO-10P1 Push Buttons
Yellow	E	**$0.30**
Blue	L	**$0.30**
Orange	M	**$0.30**
Brown	N	**$0.30**
White	W	**$0.30**
No Cap	A	**$0.00**

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Standard
Illuminated
600 Volts Maximum AC/DC
10 Amperes Continuous

Suitable for use in NEMA Types 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

Extended Button without Guard - Momentary Operator

Power Supply Type	Supply Voltage	Lamp Type[1]	Contact Configuration	Product Number[2]	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*1S2	**$82.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*1S3	**$82.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*1S4	**$82.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*1S5	**$82.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBL11*1S6	**$70.20**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	1NO-1NC	CR104PBL11*1S7	**$70.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	1NO-1NC	CR104PBL11*1S8	**$70.20**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NO-1NC	CR104PBL11*1S2	**$70.20**
Dual Input[3]	120V Dual Input	Incand., 130V	1NO-1NC	CR104PBL91*1H2	**$100.20**
Full Voltage	6 VAC/DC	LED, 6V	1NO-1NC	CR104PBL11*1L6	**$88.20**
Full Voltage	12 VAC/DC	LED, 12V	1NO-1NC	CR104PBL11*1L7	**$88.20**
Full Voltage	24 VAC/DC	LED, 24V	1NO-1NC	CR104PBL11*1L8	**$88.20**
Full Voltage	120 VAC/DC	LED, 120V	1NO-1NC	CR104PBL11*1L2	**$88.20**



Extended without Guard

Extended Button with Guard - Momentary Operator

Power Supply Type	Supply Voltage	Lamp Type[1]	Contact Configuration	Product Number[2]	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*3S2	**$88.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*3S3	**$88.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*3S4	**$88.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*3S5	**$88.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBL11*3S6	**$76.20**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	1NO-1NC	CR104PBL11*3S7	**$76.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	1NO-1NC	CR104PBL11*3S8	**$76.20**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NO-1NC	CR104PBL11*3S2	**$76.20**
Dual Input[3]	120V Dual Input	Incand., 130V	1NO-1NC	CR104PBL11*3H2	**$106.20**
Full Voltage	6 VAC/DC	LED, 6 V	1NO-1NC	CR104PBL11*3L6	**$94.20**
Full Voltage	12 VAC/DC	LED, 12 V	1NO-1NC	CR104PBL11*3L7	**$94.20**
Full Voltage	24 VAC/DC	LED, 24 V	1NO-1NC	CR104PBL11*3L8	**$94.20**
Full Voltage	120 VAC/DC	LED, 120 V	1NO-1NC	CR104PBL11*3L2	**$94.20**



Extended with Guard

[1]All lamps miniature bayonet bases.

[2]Replace asterisk (*) in product number with letter from chart below.

[3]See page 9-3 for dual input wiring diagram.

Push-Push Maintained Operator

The push-push operated units are 2-position, maintained contact push buttons. They are assembled, ready for installation, except for the required nameplate which must be ordered as a separate item. Two single-circuit contact blocks are the maximum number that can be installed on the operator. All normally open contacts must be the early closing type.

Power Supply Type	Voltage (60/50 Hz)	Lamp Type[1]	Contact Configuration[3]	Color	Product Number[4]	List Price GO-10P1
Transformer	120 V	Incand., 6V, #755	1NC-1NO	Red	CR104PBT11R1B2	**$100.20**
Transformer	120 V	Incand., 6V, #755	1NC-1NO	Green	CR104PBT11G1B2	**$100.20**
Transformer	120 V	Incand., 6V, #755	1NC-1NO	Yellow	CR104PBT11E1B2	**$100.20**
Transformer	120 V	Incand., 6V, #755	1NC-1NO	Blue	CR104PBT11L1B2	**$100.20**
Transformer	120 V	Incand., 6V, #755	1NC-1NO	Amber	CR104PBT11M1B2	**$100.20**
Transformer	120 V	Incand., 6V, #755	1NC-1NO	Clear	CR104PBT11C1B2	**$100.20**
Transformer	120 V	Incand., 6V, #755	1NC-1NO	White	CR104PBT11W1B2	**$100.20**



Push-Push, Illuminated Push Button

[4]Supplied with one NO (early closing) and one NC single circuit contact blocks.
Product number and price do not include nameplate. Nameplates must be ordered as separate item from pages 9-40 to 9-41. Resistor-type illuminated push button units are available. Contact your nearest GE Consumer & Industrial Rep.

Lens Colors Available*

Color	Insert in place of asterisk (*)
No Lens Cap	A[5]
Clear[6]	C
Yellow	E
Green	G
Blue	L
Amber	M
Red	R
White	W

[5]Subtract **$4.20**.

[6]Not available as LED.

Lamps: See pages 9-35
Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Mushroom-Head
Non-Illuminated
600 Volts Maximum AC/DC
10 Amperes Continuous

One-step selection and pricing of common assembled forms.

Units are supplied factory-assembled when ordered with contact blocks, except 2 3/8" diameter mushroom-head, which is unattached.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

1 3/8" Diameter - Momentary Operator

Contact Configuration	Color	Product Number	List Price GO-10P1
None (Operator Only)	Black	CR104PBM00B5	$34.20
None (Operator Only)	Red	CR104PBM00R5	$34.20
None (Operator Only)	Other	CR104PBM00*5[1]	$28.20
1NO-1NC	Black	CR104PBM91B5	$52.20
1NO-1NC	Red	CR104PBM91R5	$52.20
1NO-1NC	Other	CR104PBM91*5[1]	$46.20
2NO-2NC	Black	CR104PBM92B5	$70.20
2NO-2NC	Red	CR104PBM92R5	$70.20
2NO-2NC	Other	CR104PBM92*5[1]	$64.20
1NO	Black	CR104PBM10B5	$43.20
1NO	Red	CR104PBM10R5	$43.20
1NO	Other	CR104PBM10*5[1]	$37.20
1NC	Black	CR104PBM01B5	$43.20
1NC	Red	CR104PBM01R5	$43.20
1NC	Other	CR104PBM01*5[1]	$37.20



1 3/8" Mushroom Head



2 3/8" Mushroom Head

2 3/8" Diameter - Momentary Operator

Contact Configuration	Color	Product Number	List Price GO-10P1
None (Operator Only)	Black	CR104PBM00B6	$34.20
None (Operator Only)	Red	CR104PBM00R6	$34.20
None (Operator Only)	Other	CR104PBM00*6[1]	$28.20
1NO-1NC	Black	CR104PBM91B6	$52.20
1NO-1NC	Red	CR104PBM91R6	$52.20
1NO-1NC	Other	CR104PBM91*6[1]	$46.20
2NO-2NC	Black	CR104PBM92B6	$70.20
2NO-2NC	Red	CR104PBM92R6	$70.20
2NO-2NC	Other	CR104PBM92*6[1]	$64.20
1NO	Black	CR104PBM10B6	$43.20
1NO	Red	CR104PBM10R6	$43.20
1NO	Other	CR104PBM10*6[1]	$37.20
1NC	Black	CR104PBM01B6	$43.20
1NC	Red	CR104PBM01R6	$43.20
1NC	Other	CR104PBM01*6[1]	$37.20

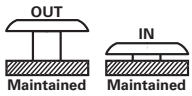


Push-to-Latch, Turn-to-Release

1 3/8" Diameter Push-to-latch, turn-to-release

Contact Configuration	Color	Product Number	List Price GO-10P1
None (Operator Only)	Red	CR104PTR20A0R	$52.20
1NO-1NC	Red	CR104PTR20A0R91	$70.20
2NO-2NC	Red	CR104PTR20A0R92	$88.20
1NO	Red	CR104PTR20A0R1	$61.20
1NC	Red	CR104PTR20A0R01	$61.20

[1]To order assembled units with a different color, substitute the letter below in place of the * in product number and add required adder to the list price.



2 Position Maintained

NC X O
NO O X

Push-Pull Maintained Operator

Contact Configuration	Color	Operation	Product Number	List Price GO-10P1
1NO-1NC	Red	2 Position Maintained	CR104PBM01R5C	$61.20
1NC-1NC late breaking	Red	3 Position, Momentary Push, Momentary Pull	CR104PBM0LR5D	$61.20
1NC-1NC late breaking	Red	3 Position, Maintained Push, Momentary Pull	CR104PBM0LR5E	$61.20



Momentary Push - Momentary Pull

NC X X O
NC X O O

Cap Colors Available*

Color	Insert in place of asterisk (*)	List Price Adder, GO-10P1 Mushroom Heads
Yellow	E	$6.00
Green	G	$6.00
No Cap	A	$0.00



Maintained Push - Momentary Pull

NC X X O
NC X O O

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Mushroom-Head
600 Volts Maximum AC/DC
10 Amperes Continuous

Suitable for use in NEMA Types 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications.

1 3/8" Diameter Illuminated - Momentary Operator

Power Supply Type	Supply Voltage	Lamp Type[1]	Contact Configuration	Product Number[2]	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*5S2	**$96.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*5S3	**$96.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*5S4	**$96.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*5S5	**$96.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBL11*5S6	**$84.20**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	1NO-1NC	CR104PBL11*5S7	**$84.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	1NO-1NC	CR104PBL11*5S8	**$84.20**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NO-1NC	CR104PBL11*5S2	**$84.20**
Full Voltage	6 VAC/DC	LED, 6V	1NO-1NC	CR104PBL11*5L6	**$102.20**
Full Voltage	12 VAC/DC	LED, 12V	1NO-1NC	CR104PBL11*5L7	**$102.20**
Full Voltage	24 VAC/DC	LED, 24V	1NO-1NC	CR104PBL11*5L8	**$102.20**
Full Voltage	120 VAC/DC	LED, 120V	1NO-1NC	CR104PBL11*5L2	**$102.20**



Illuminated Mushroom-Head Push Button

1 5/8" Diameter Illuminated - Momentary Operator

Power Supply Type	Supply Voltage	Lamp Type[1]	Contact Configuration	Product Number[2, 3]	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*7S2	**$96.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*7S3	**$96.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*7S4	**$96.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*7S5	**$96.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBL11*7S6	**$84.20**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	1NO-1NC	CR104PBL11*7S7	**$84.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	1NO-1NC	CR104PBL11*7S8	**$84.20**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NO-1NC	CR104PBL11*7S2	**$84.20**
Full Voltage	6 VAC/DC	LED, 6V	1NO-1NC	CR104PBL11*7L6	**$102.20**
Full Voltage	12 VAC/DC	LED, 12V	1NO-1NC	CR104PBL11*7L7	**$102.20**
Full Voltage	24 VAC/DC	LED, 24V	1NO-1NC	CR104PBL11*7L8	**$102.20**
Full Voltage	120 VAC/DC	LED, 120V	1NO-1NC	CR104PBL11*7L2	**$102.20**

[1]All lamps miniature bayonet bases.

[2]Replace asterisk (*) in product number with letter from chart below.

[3]1 5/8" mushroom-head push buttons are special order—nonstock.

Lens Colors Available*

Color	Insert in place of asterisk (*)
No Lens Cap	A[4]
Clear[5]	C
Yellow	E
Green	G
Blue	L
Amber	M
Red	R
White	W

[4]Subtract **$4.20**.

[5]Not available as LED.

Lamps: See pages 9-35
Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Key Operated
600 Volts Maximum AC/DC
10 Amperes Continuous

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item. Four single-circuit or four double-circuit contact blocks are maximum number that can be assembled to cylinder lock operators.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will provide improved corrosion resistance.

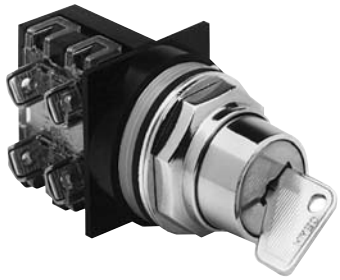
Operator Alone

Position Type	Release Type	Product Number	List Price GO-10P1
Lock in Depressed and Free Positions	-	CR104PBK00A1J	**$52.20**
Lock Only in Free Position	-	CR104PBK00A1K	**$52.20**
Lock Only in Depressed Position	-	CR104PBK00A1L	**$52.20**
-	Push-To-Latch, Key Operate To Reset	CR104PBK00A1M	**$52.20**

Select contact blocks from page 9-34.

Assembled Operator

Position Type	Release Type	Contact Configuration	Product Number	List Price GO-10P1
Lock in Depressed and Free Positions	-	1NO-1NC	CR104PBK91A1J	**$70.20**
Lock Only in Free Position	-	1NO-1NC	CR104PBK91A1K	**$70.20**
Lock Only in Depressed Position	-	1NO-1NC	CR104PBK91A1L	**$70.20**
-	Push-To-Latch, Key Operate To Reset	1NO-1NC	CR104PBK91A1M	**$70.20**



Key Operated Push Button

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Special Function
Non-Illuminated
600 Volts Maximum AC/DC
10 Amperes Continuous

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item. Four single-circuit or four double-circuit contact blocks are maximum number that can be assembled to cylinder lock operators.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will provide improved corrosion resistance.

Push-Push

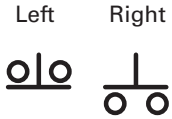
The push-push operated units are 2-position, maintained contact push buttons. They are assembled, ready for installation, except for the required nameplate which must be ordered as a separate item. Two single-circuit contact blocks are the maximum number that can be installed on the operator. All normally open contacts must be the early closing type.

Contact Configuration[1]	Color	Product Number	List Price GO-10P1
1NC-1NO	Black	CR104PBG11B1B	**$52.20**
1NC-1NO	Red	CR104PBG11R1B	**$52.20**
1NC-1NO	Green	CR104PBG11G1B	**$52.20**
1NC-1NO	Yellow	CR104PBG11E1B	**$52.20**
1NC-1NO	Blue	CR104PBG11L1B	**$52.20**
1NC-1NO	Orange	CR104PBG11M1B	**$52.20**
1NC-1NO	Brown	CR104PBG11N1B	**$52.20**
1NC-1NO	White	CR104PBG11W1B	**$52.20**

[1]Supplied with one NO (early make) and one NC single-circuit contact block.



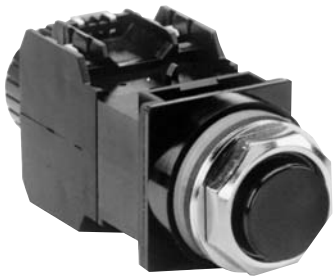
Push-Push, Non-Illuminated Push Button



Contact Configuration

Time-Delay (Adjustable 0.5-30 Seconds)

Contact Configuration	Color	Product Number	List Price GO-10P1
1NO-1NC	Black	CR104PBG99B1	**$106.20**
1NO-1NC	Red	CR104PBG99R1	**$106.20**
1NO-1NC	Green	CR104PBG99G1	**$106.20**
1NO-1NC	No Cap	CR104PBG99A1	**$105.90**
1NO-1NC	Yellow	CR104PBG99E1	**$106.20**
1NO-1NC	Blue	CR104PBG99L1	**$106.20**
1NO-1NC	Orange	CR104PBG99M1	**$106.20**
1NO-1NC	Brown	CR104PBG99N1	**$106.20**
1NO-1NC	White	CR104PBG99W1	**$106.20**



Time-Delay Push Button

Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Special Function
Non-Illuminated
Push-Turn
600 Volts Maximum AC/DC
10 Amperes Continuous

Suitable for use in NEMA Types 1, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Push-Turn Unit

2-Position

Contact State				
Push Position	Turn Position		Product Number[1]	List Price GO-10P1
Free			CR104PTP26E0*92	$70.20
Depressed				
Free			CR104PTP26D0*92	$70.20
Depressed				
Free			CR104PTP21B0*91	$52.20
Depressed				
Free			CR104PTP22B0*91	$52.20
Depressed				
Free			CR104PTP22B0*92	$70.20
Depressed				
Free			CR104PTP22D0*92	$70.20
Depressed				
Free			CR104PTP21C0*92	$70.20
Depressed				
Free			CR104PTP23C0*92	$70.20
Depressed				
Free			CR104PTP23B0*92	$70.20
Depressed				
Free			CR104PTP24C0*92	$70.20
Depressed				
Free			CR104PTP24E3*92	$70.20
Depressed				
Free			CR104PTP25B3*92	$70.20
Depressed				

3-Position

Contact State					
Push Position	Turn Position			Product Number[1]	List Price GO-10P1
Free				CR104PTP31E0*92	$70.20
Depressed					
Free				CR104PTP31E2*92	$70.20
Depressed					
Free				CR104PTP34E6*91	$52.20
Depressed					
Free				CR104PTP32F2*92	$70.20
Depressed					
Free				CR104PTP33G2*92	$70.20
Depressed					

[1]Replace asterisk (*) in product number with letter from chart below.

Cap Colors Available*

Color	Insert in place of asterisk (*)
Black	B
Red	R
Green	G
Yellow	E

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Special Function
Illuminated
600 Volts Maximum AC/DC
10 Amperes Continuous

Suitable for use in NEMA Types 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance. Not available for CR104PBT devices.

2-Position Maintained 1 3/8" diameter

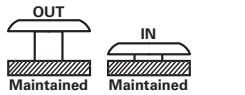
Power Supply Type	Supply Voltage	Lamp Type[1]	Contact Configuration	Product Number[2]	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*5C2	**$100.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*5C3	**$100.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*5C4	**$100.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBT11*5C5	**$100.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	1NO-1NC	CR104PBL11*5C6	**$88.20**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	1NO-1NC	CR104PBL11*5C7	**$88.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	1NO-1NC	CR104PBL11*5C8	**$88.20**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NO-1NC	CR104PBL11*5C2	**$88.20**
Resistor	120V 50/60 Hz	Incand., 60V	1NO-1NC	CR104PBR11*5C2	**$88.20**
Resistor	240V 50/60 Hz	Incand., 130V	1NO-1NC	CR104PBR11*5C3	**$88.20**
Full Voltage	6 VAC/DC	LED, 6V	1NO-1NC	CR104PBL11*5P6	**$106.20**
Full Voltage	12 VAC/DC	LED, 12V	1NO-1NC	CR104PBL11*5P7	**$106.20**
Full Voltage	24 VAC/DC	LED, 24V	1NO-1NC	CR104PBL11*5P8	**$106.20**
Full Voltage	120 VAC/DC	LED, 120V	1NO-1NC	CR104PBL11*5P2	**$106.20**



Push-Pull Illuminated Push Button

Push-Pull 3-Position Momentary Push-Momentary Pull

Power Supply Type	Supply Voltage	Lamp Type[1]	Contact Configuration	Color	Product Number	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBT0LR5D2	**$100.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBT0LR5D3	**$100.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBT0LR5D4	**$100.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBT0LR5D5	**$100.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBL0LR5D6	**$88.20**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	1NC-1NC late breaking	Red Lens	CR104PBL0LR5D7	**$88.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	1NC-1NC late breaking	Red Lens	CR104PBL0LR5D8	**$88.20**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5D2	**$88.20**
Resistor	120V 50/60 Hz	Incand., 60V	1NC-1NC late breaking	Red Lens	CR104PBR0LR5D2	**$88.20**
Resistor	240V 50/60 Hz	Incand., 130V	1NC-1NC late breaking	Red Lens	CR104PBR0LR5D3	**$88.20**
Full Voltage	6 VAC/DC	LED, 6V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5K6	**$106.20**
Full Voltage	12 VAC/DC	LED, 12V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5K7	**$106.20**
Full Voltage	24 VAC/DC	LED, 24V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5K8	**$106.20**
Full Voltage	120 VAC/DC	LED, 120V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5K2	**$106.20**



2 Position Maintained

NC X O
NO O X

Push-Pull 3-Position Maintained Push-Momentary Pull

Power Supply Type	Supply Voltage	Lamp Type[1]	Contact Configuration	Color	Product Number	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBT0LR5E2	**$100.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBT0LR5E3	**$100.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBT0LR5E4	**$100.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBT0LR5E5	**$100.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	1NC-1NC late breaking	Red Lens	CR104PBL0LR5E6	**$88.20**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	1NC-1NC late breaking	Red Lens	CR104PBL0LR5E7	**$88.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	1NC-1NC late breaking	Red Lens	CR104PBL0LR5E8	**$88.20**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5E2	**$88.20**
Resistor	120V 50/60 Hz	Incand., 60V	1NC-1NC late breaking	Red Lens	CR104PBR0LR5E2	**$88.20**
Resistor	240V 50/60 Hz	Incand., 130V	1NC-1NC late breaking	Red Lens	CR104PBR0LR5E3	**$88.20**
Full Voltage	6 VAC/DC	LED, 6V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5M6	**$106.20**
Full Voltage	12 VAC/DC	LED, 12V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5M7	**$106.20**
Full Voltage	24 VAC/DC	LED, 24V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5M8	**$106.20**
Full Voltage	120 VAC/DC	LED, 120V	1NC-1NC late breaking	Red Lens	CR104PBL0LR5M2	**$106.20**



Momentary Push - Momentary Pull

[3]NC X X O
NC X O O



Maintained Push - Momentary Pull

[3]NC X X O
NC X O O

[1]All lamps miniature bayonet bases.

[2]Replace asterisk (*) in product number with letter from chart to right.

[3]Normally closed, late-breaking contacts.

Lens Colors Available*

Color	Insert in place of asterisk (*)
No Lens Cap	A[4]
Clear[5]	C
Yellow	E
Green	G
Blue	L
Amber	M
Red	R
White	W

[4]Subtract **$4.20**.

[5]Not available as LED.

Lamps: See pages 9-35
Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Protected Mushroom-Head
600 Volts Max. AC/DC
10 Amperes Continuous

CR104PTY protected mushroom-head push buttons are designed specifically for rugged industrial applications and hazardous duty environments, including food and beverage, mining, construction, timber, pulp/paper, and automotive/trucking industries. They also are ideal for such E-stop applications as fuel stations and airport baggage handling equipment.

In addition to providing unsurpassed vibration and impact resistance, CR104PTY protected mushroom-head push buttons allow operation with heavy gloves, provide illuminated lens visibility from all angles, and permit mounting of four double-circuit contact blocks. The bright chrome operator is available in two- or three-position forms. It can be used with other CR104P operators or as a stand-alone unit.

Suitable for use in NEMA Types 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



All Forms

Step-by-step selection and pricing of all forms.

									❶	❷		❸	❹		
Product Number	C	R	1	0	4	P	T	Y							= Complete Product No.
Price									+	+		+			**+ $ Total List Price, GO-10P1**

(Photocopying this blank form will allow for its repeated use.)

❶ Select Operator

Select the operator. Transfer the product number digit to the box marked ❶ in the product number line and the price to the box marked ❶ in the price line at the bottom of next page. **Note your operator's product number digit for use in later selection steps.**

Version	Product No. Digit	List Price Adder, GO-10P1
2-Position Push-Pull Maintained[1]	2	**$43.00**
3-Position Momentary Push-Pull[1]	4	**$43.00**
3-Position Momentary Pull, Maintained Push[1]	5	**$43.00**

[1] See page 9-14 for contact type/position

❷ Select Service Voltage

Select service voltage. Transfer the product number digit to the box marked ❷ in the product number line and the price to the box marked ❷ in the price line at the bottom of next page.

Service Voltage	Product No. Digit	List Price Adder, GO-10P1
Nonilluminated	09	**$0.00** (NC)
No lamp[2]	10	**$18.00**
120V	11	**$21.00**
6-8V	12	**$21.00**
12V	13	**$21.00**
18V	14	**$21.00**
24V	15	**$21.00**

[2] Basic line version—no set voltage and no lamp. Use LED listed on page 9-35 when longer bulb life is required. LED must match lens color.

❸ Select Cap/Lens Color

Select cap/lens color. Transfer the product number digit to the box marked ❸ in the product number line and the price to the box marked ❸ in the price line at the bottom of next page.

Cap/Lens Color	Product No. Digit	List Price Adder, GO-10P1
No Cap	1	**$0.00** (NC)
Black	2	**$6.00**
Red	3	**$6.00**
Orange	4	**$6.00**
Yellow	5	**$6.00**
Green	6	**$6.00**
Blue	7	**$6.00**
White	8	**$6.00**

❹ Select Contact Block

Select contact block. Transfer the product number digit to the box marked ❹ in the product number line and the price to the box marked ❹ in the price line at the bottom of this page.

Contact Block	Product No. Digits	List Price Adder, GO-10P1
No contact block	00	**$0.00** (NC)
1 Normally Closed (NC)	01	**$9.00**
2NC	02	**$18.00**
1 Normally Open (NO)	10	**$9.00**
1NO-1NC	11	**$18.00**
2NO	20	**$18.00**
2NO-2NC	22	**$36.00**

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Protected Mushroom-Head
600 Volts Max. AC/DC
10 Amperes Continuous

2-Position



Contact Block	Maintained Pulled Out	Maintained Push In
NC	X	0
NO	0	X

3-Position



Contact Block	Contact Position	Momentary Pull Out	Maintained Center	Momentary Push In
NC	Left	X	0	0
NO	Left	0	0	X
NC	Right	X	X	0
NOEM	Left	0	X	X

NOEM—Normally Open Early Make
NOTE: All other combinations are invalid.

Heavy-Duty 30.5 mm Watertight/Oiltight Pilot Devices

CR104P

600 Volts Max. AC/DC
10 Amperes Continuous

Suitable for use in NEMA Types 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rates for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

Standard Indicating Lights

Power Supply Type	Supply Voltage	Lamp Type	Product Number[1]	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	CR104PLG32*	**$64.20**
Transformer	200-208V 60 Hz	Incand., 6V, #755	CR104PLG3A*	**$64.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	CR104PLG33*	**$64.20**
Transformer	277V 60 Hz	Incand., 6V, #755	CR104PLG3B*	**$64.20**
Transformer	347V 60 Hz	Incand., 6V, #755	CR104PLG3C*	**$64.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	CR104PLG34*	**$64.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	CR104PLG35*	**$64.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	CR104PLG16*	**$52.50**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	CR104PLG17*	**$52.50**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	CR104PLG18*	**$52.50**
Full Voltage	120V 50/60 Hz	Incand., 130V	CR104PLG22*	**$52.50**
Resistor	120V 50/60 Hz	Incand., 60V	CR104PLG42*	**$52.50**
Resistor	240V 50/60 Hz	Incand., 130V	CR104PLG43*	**$52.50**
Transformer	120V 50/60 Hz	LED, 6V	CR104PLG92*	**$82.20**
Transformer	200-208V 60 Hz	LED, 6V	CR104PLG9A*	**$82.20**
Transformer	240V 50/60 Hz	LED, 6V	CR104PLG93*	**$82.20**
Transformer	277V 60 Hz	LED, 6V	CR104PLG9B*	**$82.20**
Transformer	347V 60 Hz	LED, 6V	CR104PLG9C*	**$82.20**
Transformer	480V 50/60 Hz	LED, 6V	CR104PLG94*	**$82.20**
Transformer	600V 50/60 Hz	LED, 6V	CR104PLG95*	**$82.20**
Full Voltage	6 VAC/DC	LED, 6V	CR104PLG86*	**$70.20**
Full Voltage	12 VAC/DC	LED, 12V	CR104PLG87*	**$70.20**
Full Voltage	24 VAC/DC	LED, 24V	CR104PLG88*	**$70.20**
Full Voltage	120 VAC/DC	LED, 120V	CR104PLG82*	**$70.20**
Transformer, Flashing	120V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLG62*	**$67.20**
Transformer, Flashing	200-208V 60 Hz	Incand., 6V, #267 Flasher	CR104PLG6A*	**$67.20**
Transformer, Flashing	240V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLG63*	**$67.20**
Transformer, Flashing	277V 60 Hz	Incand., 6V, #267 Flasher	CR104PLG6B*	**$67.20**
Transformer, Flashing	347V 60 Hz	Incand., 6V, #267 Flasher	CR104PLG6C*	**$67.20**
Transformer, Flashing	480V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLG64*	**$67.20**
Transformer, Flashing	600V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLG65*	**$67.20**
Full Voltage, Flashing	6V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLG56*	**$70.20**
Full Voltage	120V	Neon, 120V, #NE51H-R	CR104PLG72*	**$55.20**



Standard

Push to Test Indicating Lights

Power Supply Type	Supply Voltage	Lamp Type	Product Number[1]	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	CR104PLT32*	**$82.20**
Transformer	200-208V 60 Hz	Incand., 6V, #755	CR104PLT3A*	**$82.20**
Transformer	240V 50/60 Hz	Incand., 6V, #755	CR104PLT33*	**$82.20**
Transformer	277V 60 Hz	Incand., 6V, #755	CR104PLT3B*	**$82.20**
Transformer	347V 60 Hz	Incand., 6V, #755	CR104PLT3C*	**$82.20**
Transformer	480V 50/60 Hz	Incand., 6V, #755	CR104PLT34*	**$82.20**
Transformer	600V 50/60 Hz	Incand., 6V, #755	CR104PLT35*	**$82.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #755	CR104PLT16*	**$70.20**
Full Voltage	12V 50/60 Hz	Incand., 12V, #756	CR104PLT17*	**$70.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #1819	CR104PLT18*	**$70.20**
Full Voltage	120V 50/60 Hz	Incand., 130V	CR104PLT22*	**$70.20**
Resistor	120V 50/60 Hz	Incand., 60V	CR104PLT42*	**$70.20**
Resistor	240V 50/60 Hz	Incand., 130V	CR104PLT43*	**$70.20**
Transformer	120V 50/60 Hz	LED, 6V	CR104PLT92*	**$100.20**
Transformer	200-208V 60 Hz	LED, 6V	CR104PLT9A*	**$100.20**
Transformer	240V 50/60 Hz	LED, 6V	CR104PLT93*	**$100.20**
Transformer	277V 60 Hz	LED, 6V	CR104PLT9B*	**$100.20**
Transformer	347V 60 Hz	LED, 6V	CR104PLT9C*	**$100.20**
Transformer	480V 50/60 Hz	LED, 6V	CR104PLT94*	**$100.20**
Transformer	600V 50/60 Hz	LED, 6V	CR104PLT95*	**$100.20**
Full Voltage	6 VAC/DC	LED, 6V	CR104PLT86*	**$88.20**
Full Voltage	12 VAC/DC	LED, 12V	CR104PLT87*	**$88.20**
Full Voltage	24 VAC/DC	LED, 24V	CR104PLT88*	**$88.20**
Full Voltage	120 VAC/DC	LED, 120V	CR104PLT82*	**$88.20**
Transformer, Flashing	120V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLT62*	**$85.20**
Transformer, Flashing	200-208V 60 Hz	Incand., 6V, #267 Flasher	CR104PLT6A*	**$85.20**
Transformer, Flashing	240V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLT63*	**$85.20**
Transformer, Flashing	277V 60 Hz	Incand., 6V, #267 Flasher	CR104PLT6B*	**$85.20**
Transformer, Flashing	347V 60 Hz	Incand., 6V, #267 Flasher	CR104PLT6C*	**$85.20**
Transformer, Flashing	480V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLT64*	**$85.20**
Transformer, Flashing	600V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLT65*	**$85.20**
Full Voltage, Flashing	6V 50/60 Hz	Incand., 6V, #267 Flasher	CR104PLT56*	**$88.20**
Full Voltage	120V	Neon, 120V, #NE51H-R	CR104PLT72*	**$73.20**

[1]Replace asterisk (*) in product number with letter from table on right.



Push-to-Test

Lens Colors Available*

Color	Insert in place of asterisk (*)
No Lens	A[2,3,4]
Clear[4]	C[3]
Yellow	E[4]
Green	G[4]
Blue	L[4]
Amber	M
Red	R
White	W

[2]Subtract **$4.20** from list price with no lens.
[3]Not suitable for use with LED.
[4]Not suitable for use with NEON light.

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

600 Volts Max. AC/DC
10 Amperes Continuous

Suitable for use in NEMA Types 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

Cluster-Type (Steady Light, Miniature Bayonet Lamp Socket)

Power Supply Type	Supply Voltage	Lamp Type	Cluster Type	Product Number	List Price GO-10P1
Full Voltage	6V 50/60 Hz	Incand., 6V, #176B	2-Lamp	CR104PLB16W	**$112.20**
Full Voltage	12V 50/60Hz	Incand., 12V, #373	2-Lamp	CR104PLB17W	**$112.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #399	2-Lamp	CR104PLB18W	**$112.20**
Full Voltage	6V 50/60 Hz	Incand., 6V, #176B	4-Lamp	CR104PLQ16W	**$238.20**
Full Voltage	12V 50/60Hz	Incand., 12V, #373	4-Lamp	CR104PLQ17W	**$238.20**
Full Voltage	24V 50/60 Hz	Incand., 24V, #399	4-Lamp	CR104PLQ18W	**$238.20**

All cluster lights shipped with one boot of each of the following colors—yellow, green, blue, and red. Bulb extractor available, CR104MG128 at List Price, GO-10P1, **$6.00.**



Cluster Lights

Accessories

Cluster lights provide either two or four separate light signals in the same space as one full-size indicating light. Colored boots can provide color distinction to each lamp. Applications should not energize more than two lamps continuously.

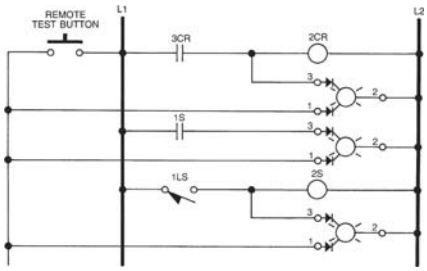
Accessory Type	Color	Package Quantity	Product Number	List Price GO-10P1
Lens and Divider (2 Lamp Cluster)	White		CR104PXL02W	**$5.70**
Lens and Divider (4 Lamp Cluster)	White		CR104PXL04W	**$5.70**
Cluster-Type Pilot Light Boots	Yellow	4	CR104PXL08E	**$0.37**
Cluster-Type Pilot Light Boots	Green	4	CR104PXL08G	**$0.37**
Cluster-Type Pilot Light Boots	Blue	4	CR104PXL08L	**$0.37**
Cluster-Type Pilot Light Boots	Red	4	CR104PXL08R	**$0.37**
Cluster-Type Pilot Light Boots	1 Each: Yellow, Green, Blue, Red	Four, 1 each color	CR104PXL08T	**$1.50 per package**

Remote Test Lights (Dual Input Illuminated Push Buttons)

Dual input illuminated push buttons and indicating lights allow a number of lights to be tested from a single test button without operating the control circuit. A dual input illuminated push button without contacts is a remote test indicating light.

Power Supply Type	Supply Voltage	Lamp Type	Contacts	Product Number[1]	List Price GO-10P1
Full Voltage	120V 50/60 Hz	Incand., 120V, #90MB	with	CR104PBL91*1H2	**$100.20**
Full Voltage	120V 50/60 Hz	Incand., 120V, #90MB	without	CR104PBL00*1H2	**$82.20**

[1]Replace asterisk (*) in product number with letter from table below.



Typical wiring diagram for remote test of lights using dual input "remote test" lights.

Lens Colors Available*

Color	Insert in place of asterisk (*)
No Lens	A[2,3,4]
Clear[4]	C[3]
Yellow	E[4]
Green	G[4]
Blue	L[4]
Amber	M
Red	R
White	W

[2]Subtract **$4.20** from list price with no lens.
[3]Not suitable for use with LED.
[4]Not suitable for use with NEON light.

Lamps: See pages 9-35
Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

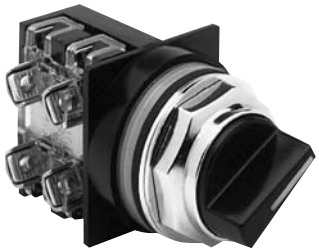
CR104P

Knob Operated
Non-Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

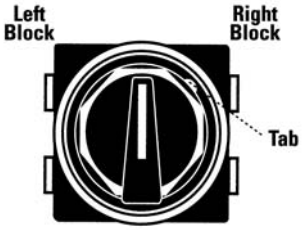
Units are supplied factory-assembled when ordered with contact block.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Knob-Operated Selector Switch



Contacts viewed from front of panel.

2-Position - Black Knob[1]

Release Type	2 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Maintained	1	None	CR104PSG21B	**$22.20**
Maintained	1	1NO-1NC	CR104PSG21B91	**$40.20**
Maintained	1	2NO-2NC	CR104PSG21B92	**$58.20**
Spring Return L ➔ C	2	None	CR104PSG12B	**$34.20**
Spring Return L ➔ C	2	1NO-1NC	CR104PSG12B91	**$52.20**
Spring Return L ➔ C	2	2NO-2NC	CR104PSG12B92	**$70.20**
Spring Return R ➔ C	3	None	CR104PSG63B	**$34.20**
Spring Return R ➔ C	3	1NO-1NC	CR104PSG63B91	**$52.20**
Spring Return R ➔ C	3	2NO-2NC	CR104PSG63B92	**$70.20**

[1]To order knob in a color other than black, replace the "B" in listed Product Numbers with E (Yellow), G (Green), L (Blue), or R (Red).

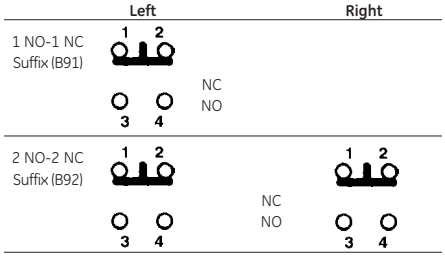
2-Position Selector Switches - Non-Illuminated

Operator Position				Cam #1 Type of Contact Block	Cam #1 Mounting Location Left/Right	Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #3 Type of Contact Block	Cam #3 Mounting Location Left/Right
Contact State	O	–	X	NO	L or R	–		–	
	X	–	O	NC	L or R	–		–	
	X	O	–	–		NO	L or R	–	
	O	X	–	–		NC	L or R	–	
	–	O	X	–		–		NO	L or R
	–	X	O	–		–		NC	L or R

– : This position is nonexistent or is a "pass through".
In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel



Numbers and letters are molded into blocks at terminals.

3-Position - Black Knob[1] - Maintained

Release Type	3 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Maintained	4	None	CR104PSG34B	**$22.20**
Maintained	4	1NO-1NC	CR104PSG34B91	**$40.20**
Maintained	4	2NO-2NC	CR104PSG34B92	**$58.20**
Maintained	2	None	CR104PSG32B	**$22.20**
Maintained	2	1NO-1NC	CR104PSG32B91	**$40.20**
Maintained	2	2NO-2NC	CR104PSG32B92	**$58.20**
Maintained	3	None	CR104PSG33B	**$22.20**
Maintained	3	1NO-1NC	CR104PSG33B91	**$40.20**
Maintained	3	2NO-2NC	CR104PSG33B92	**$58.20**
Maintained	5	None	CR104PSG35B	**$22.20**
Maintained	5	2NO-2NC	CR104PSG35B92	**$58.20**
Maintained	6	None	CR104PSG36B	**$22.20**
Maintained	6	2NO-2NC	CR104PSG36B92	**$58.20**

3-Position - Black Knob[1] - Spring Return L➔C

Release Type	3 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Spring Return L ➔ C	4	None	CR104PSG74B	**$34.20**
Spring Return L ➔ C	4	1NO-1NC	CR104PSG74B91	**$52.20**
Spring Return L ➔ C	4	2NO-2NC	CR104PSG74B92	**$70.20**
Spring Return L ➔ C	2	None	CR104PSG72B	**$34.20**
Spring Return L ➔ C	2	1NO-1NC	CR104PSG72B91	**$52.20**
Spring Return L ➔ C	2	2NO-2NC	CR104PSG72B92	**$70.20**
Spring Return L ➔ C	3	None	CR104PSG73B	**$34.20**
Spring Return L ➔ C	3	1NO-1NC	CR104PSG73B91	**$52.20**
Spring Return L ➔ C	3	2NO-2NC	CR104PSG73B92	**$70.20**
Spring Return L ➔ C	5	None	CR104PSG75B	**$34.20**
Spring Return L ➔ C	5	2NO-2NC	CR104PSG75B92	**$70.20**
Spring Return L ➔ C	6	None	CR104PSG76B	**$34.20**
Spring Return L ➔ C	6	2NO-2NC	CR104PSG76B92	**$70.20**

[1]To order knob in a color other than black, replace the "B" in listed Product Numbers with E (Yellow), G (Green), L (Blue), or R (Red).

3-Position Selector Switches - Non-Illuminated

Operator Position				Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #3 Type of Contact Block	Cam #3 Mounting Location Left/Right	Cam #5 Type of Contact Block	Cam #5 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	NO	L or R	–	–	NO	L or R	NO	L or R	NO	Left
	O	X	O	–	–	NC	L or R	NC	L or R	NC	Right	–	–
	X	O	O	NC	L or R	NO	L or R	–	–	NC	Left	NO	Right
	X	X	O	–	–	–	–	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–	–	–	NC	Right

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

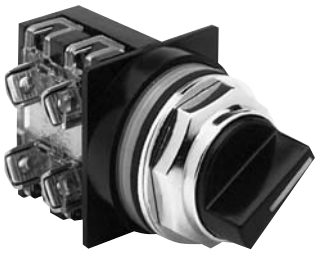
CR104P

Knob Operated
Non-Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

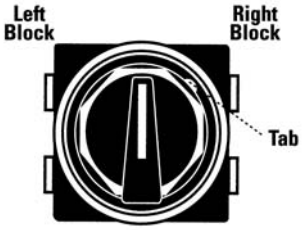
Units are supplied factory-assembled when ordered with contact block.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications., when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Knob-Operated Selector Switch



Contacts viewed from front of panel.

3-Position - Black Knob[1] - Spring Return C←R

Release Type	3 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Spring Return C ← R	4	None	CR104PSG84B	**$34.20**
Spring Return C ← R	4	1NO-1NC	CR104PSG84B91	**$52.20**
Spring Return C ← R	4	2NO-2NC	CR104PSG84B92	**$70.20**
Spring Return C ← R	2	None	CR104PSG82B	**$34.20**
Spring Return C ← R	2	1NO-1NC	CR104PSG82B91	**$52.20**
Spring Return C ← R	2	2NO-2NC	CR104PSG82B92	**$70.20**
Spring Return C ← R	3	None	CR104PSG83B	**$34.20**
Spring Return C ← R	3	1NO-1NC	CR104PSG83B91	**$52.20**
Spring Return C ← R	3	2NO-2NC	CR104PSG83B92	**$70.20**
Spring Return C ← R	5	None	CR104PSG85B	**$34.20**
Spring Return C ← R	5	2NO-2NC	CR104PSG85B92	**$70.20**
Spring Return C ← R	6	None	CR104PSG86B	**$34.20**
Spring Return C ← R	6	2NO-2NC	CR104PSG86B92	**$70.20**

3-Position - Black Knob[1] - Spring Return L→C←R

Release Type	3 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Spring Return L → C ← R	4	None	CR104PSG94B	**$34.20**
Spring Return L → C ← R	4	1NO-1NC	CR104PSG94B91	**$52.20**
Spring Return L → C ← R	4	2NO-2NC	CR104PSG94B92	**$70.20**
Spring Return L → C ← R	2	None	CR104PSG92B	**$34.20**
Spring Return L → C ← R	2	1NO-1NC	CR104PSG92B91	**$52.20**
Spring Return L → C ← R	2	2NO-2NC	CR104PSG92B92	**$70.20**
Spring Return L → C ← R	3	None	CR104PSG93B	**$34.20**
Spring Return L → C ← R	3	1NO-1NC	CR104PSG93B91	**$52.20**
Spring Return L → C ← R	3	2NO-2NC	CR104PSG93B92	**$70.20**
Spring Return L → C ← R	5	None	CR104PSG95B	**$34.20**
Spring Return L → C ← R	5	2NO-2NC	CR104PSG95B92	**$70.20**
Spring Return L → C ← R	6	None	CR104PSG96B	**$34.20**
Spring Return L → C ← R	6	2NO-2NC	CR104PSG96B92	**$70.20**

[1]To order knob in a color other than black, replace the "B" in listed Product Numbers with E (Yellow), G (Green), L (Blue), or R (Red).

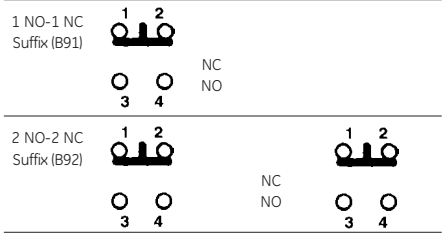
3-Position Selector Switches - Non-Illuminated

Operator Position				Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #3 Type of Contact Block	Cam #3 Mounting Location Left/Right	Cam #5 Type of Contact Block	Cam #5 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	NO	L or R	–	–	NO	L or R	NO	L or R	NO	Left
	O	X	O	–	–	NC	L or R	NC	L or R	NC	Right	–	–
	X	O	O	NC	L or R	NO	L or R	–	–	NC	Left	NO	Right
	X	X	O	–	–	–	–	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–	–	–	NC	Right

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel



Numbers and letters are molded into blocks at terminals.

4-Position - Black Knob[1]

Release Type	4 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Maintained	7	None	CR104PSG47B[2]	**$22.20**
Maintained	7	2NO-2NC	CR104PSG47B92[2]	**$58.20**

[1]To order knob in a color other than black, replace the "B" in listed Product Numbers with E (Yellow), G (Green), L (Blue), or R (Red).

[2]Two double-circuit contact blocks, mounted side-by-side, is standard arrangement. No more than two contact blocks, single and/or double, may be used with this operator.

4-Position Selector Switch - Non-Illuminated

Operator Position					Cam #7 Type of Contact Block	Cam #7 Mounting Location Left-Right
Contact State	X	O	O	O	NC	Left
	O	O	X	O	NO	Left
	O	O	O	X	NC	Right
	O	X	O	O	NO	Right

Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

Lever Operated
Non-Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

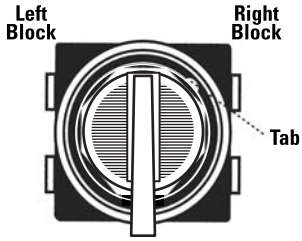
Units are supplied factory-assembled when ordered with contact block.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Lever-Operated Selector Switch



Contacts viewed from front of panel.

2-Position Chrome[1]

Release Type	2 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Maintained	1	None	CR104PSM21	**$22.20**
Maintained	1	1NO-1NC	CR104PSM21A91	**$40.20**
Maintained	1	2NO-2NC	CR104PSM21A92	**$58.20**
Spring Return L ➔ C	2	None	CR104PSM12	**$34.20**
Spring Return L ➔ C	2	1NO-1NC	CR104PSM12A91	**$52.20**
Spring Return L ➔ C	2	2NO-2NC	CR104PSM12A92	**$70.20**
Spring Return R ➔ C	3	None	CR104PSM63	**$34.20**
Spring Return R ➔ C	3	1NO-1NC	CR104PSM63A91	**$52.20**
Spring Return R ➔ C	3	2NO-2NC	CR104PSM63A92	**$70.20**

[1]To order black wing lever, replace "A" in Product Number with "B" before 91 or 92 contact digits. **Example**: the Product Number for a maintained, 1NO-1NC operator with black wing lever is CR104PSM21**B**91.

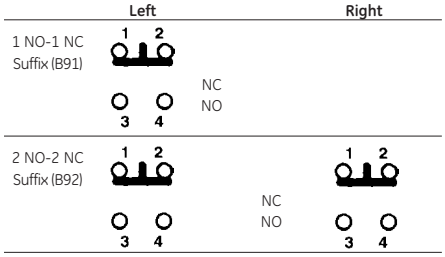
2-Position Selector Switches - Non-Illuminated

Operator Position				Cam #1		Cam #2		Cam #3	
				Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right
Contact State	O	–	X	NO	L or R	–		–	
	X	–	O	NC	L or R	–		–	
	X	O	–	–		NO	L or R	–	
	O	X	–	–		NC	L or R	–	
	–	O	X	–		–		NO	L or R
	–	X	O	–		–		NC	L or R

– : This position is nonexistent or is a "pass through".
In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel



Numbers and letters are molded into blocks at terminals.

3-Position Chrome[1] - Maintained

Release Type	3 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Maintained	4	None	CR104PSM34	**$22.20**
Maintained	4	1NO-1NC	CR104PSM34A91	**$40.20**
Maintained	4	2NO-2NC	CR104PSM34A92	**$58.20**
Maintained	2	None	CR104PSM32	**$22.20**
Maintained	2	1NO-1NC	CR104PSM32A91	**$40.20**
Maintained	2	2NO-2NC	CR104PSM32A92	**$58.20**
Maintained	3	None	CR104PSM33	**$22.20**
Maintained	3	1NO-1NC	CR104PSM33A91	**$40.20**
Maintained	3	2NO-2NC	CR104PSM33A92	**$58.20**
Maintained	5	None	CR104PSM35	**$22.20**
Maintained	5	2NO-2NC	CR104PSM35A92	**$58.20**
Maintained	6	None	CR104PSM36	**$22.20**
Maintained	6	2NO-2NC	CR104PSM36A92	**$58.20**

3-Position Chrome[1] - Spring Return L➔C

Release Type	3 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Spring Return L ➔ C	4	None	CR104PSM74	**$34.20**
Spring Return L ➔ C	4	1NO-1NC	CR104PSM74A91	**$52.20**
Spring Return L ➔ C	4	2NO-2NC	CR104PSM74A92	**$70.20**
Spring Return L ➔ C	2	None	CR104PSM72	**$34.20**
Spring Return L ➔ C	2	1NO-1NC	CR104PSM72A91	**$52.20**
Spring Return L ➔ C	2	2NO-2NC	CR104PSM72A92	**$70.20**
Spring Return L ➔ C	3	None	CR104PSM73	**$34.20**
Spring Return L ➔ C	3	1NO-1NC	CR104PSM73A91	**$52.20**
Spring Return L ➔ C	3	2NO-2NC	CR104PSM73A92	**$70.20**
Spring Return L ➔ C	5	None	CR104PSM75	**$34.20**
Spring Return L ➔ C	5	2NO-2NC	CR104PSM75A92	**$70.20**
Spring Return L ➔ C	6	None	CR104PSM76	**$34.20**
Spring Return L ➔ C	6	2NO-2NC	CR104PSM76A92	**$70.20**

[1]To order black wing lever, replace "A" in Product Number with "B" before 91 or 92 contact digits. **Example**: the Product Number for a maintained, 1NO-1NC operator with black wing lever is CR104PSM32**B**91.

3-Position Selector Switches - Non-Illuminated

Operator Position				Cam #4		Cam #2		Cam #3		Cam #5		Cam #6	
				Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right
Contact State	O	O	X	NO	L or R	–	–	NO	L or R	NO	L or R	NO	Left
	O	X	O	–	–	NC	L or R	NC	L or R	NC	Right	–	–
	X	O	O	NC	L or R	NO	L or R	–	–	NC	Left	NO	Right
	X	X	O	–	–	–	–	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–	–	–	NC	Right

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

Lever Operated
Non-Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

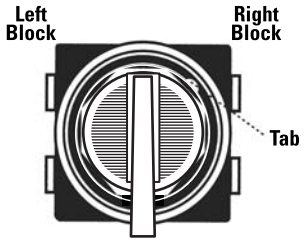
Units are supplied factory-assembled when ordered with contact block.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Lever-Operated Selector Switch



Contacts viewed from front of panel.

3-Position Chrome[1] - Spring Return C←R

Release Type	3 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Spring Return C ← R	4	None	CR104PSM84	**$34.20**
Spring Return C ← R	4	1NO-1NC	CR104PSM84A91	**$52.20**
Spring Return C ← R	4	2NO-2NC	CR104PSM84A92	**$70.20**
Spring Return C ← R	2	None	CR104PSM82	**$34.20**
Spring Return C ← R	2	1NO-1NC	CR104PSM82A91	**$52.20**
Spring Return C ← R	2	2NO-2NC	CR104PSM82A92	**$70.20**
Spring Return C ← R	3	None	CR104PSM83	**$34.20**
Spring Return C ← R	3	1NO-1NC	CR104PSM83A91	**$52.20**
Spring Return C ← R	3	2NO-2NC	CR104PSM83A92	**$70.20**
Spring Return C ← R	5	None	CR104PSM85	**$34.20**
Spring Return C ← R	5	2NO-2NC	CR104PSM85A92	**$70.20**
Spring Return C ← R	6	None	CR104PSM86	**$34.20**

3-Position Chrome[1] - Spring Return L→C←R

Release Type	3 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Spring Return C ← R	6	2NO-2NC	CR104PSM86A92	**$70.20**
Spring Return L → C ← R	4	None	CR104PSM94	**$34.20**
Spring Return L → C ← R	4	1NO-1NC	CR104PSM94A91	**$52.20**
Spring Return L → C ← R	4	2NO-2NC	CR104PSM94A92	**$70.20**
Spring Return L → C ← R	2	None	CR104PSM92	**$34.20**
Spring Return L → C ← R	2	1NO-1NC	CR104PSM92A91	**$52.20**
Spring Return L → C ← R	2	2NO-2NC	CR104PSM92A92	**$70.20**
Spring Return L → C ← R	3	None	CR104PSM93	**$34.20**
Spring Return L → C ← R	3	1NO-1NC	CR104PSM93A91	**$52.20**
Spring Return L → C ← R	3	2NO-2NC	CR104PSM93A92	**$70.20**
Spring Return L → C ← R	5	None	CR104PSM95	**$34.20**
Spring Return L → C ← R	5	2NO-2NC	CR104PSM95A92	**$70.20**
Spring Return L → C ← R	6	None	CR104PSM96	**$34.20**
Spring Return L → C ← R	6	2NO-2NC	CR104PSM96A92	**$70.20**

[1]To order black wing lever, replace "A" in Product Number with "B" before 91 or 92 contact digits. **Example**: the Product Number for a maintained, 1NO-1NC operator with black wing lever is CR104PSM32**B**91.

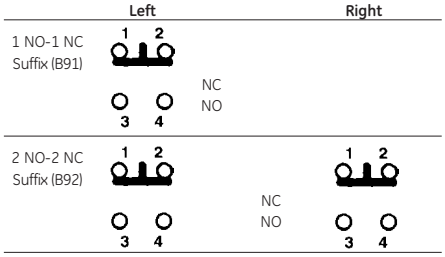
3-Position Selector Switches - Non-Illuminated

Operator Position				Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #3 Type of Contact Block	Cam #3 Mounting Location Left/Right	Cam #5 Type of Contact Block	Cam #5 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	NO	L or R	–	–	NO	L or R	NO	L or R	NO	Left
	O	X	O	–	–	NC	L or R	NC	L or R	NC	Right	–	–
	X	O	O	NC	L or R	NO	L or R	–	–	NC	Left	NO	Right
	X	X	O	–	–	–	–	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–	–	–	NC	Right

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel



Numbers and letters are molded into blocks at terminals.

4-Position Chrome[1]

Release Type	4 Position Cam Code	Contact Configuration	Product Number[1]	List Price GO-10P1
Maintained	7	None	CR104PSM47	**$22.20**
Maintained	9	2NO-2NC	CR104PSM47A92	**$58.20**

4-Position Selector Switch - Non-Illuminated

Operator Position					Cam #7 Type of Contact Block	Cam #7 Mounting Location Left-Right
Contact State	X	O	O	O	NC	Left
	O	O	X	O	NO	Left
	O	O	O	X	NC	Right
	O	X	O	O	NO	Right

Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

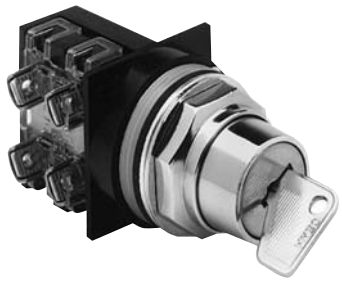
CR104P

Key Operated
Non-Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item. Two keys included with each cylinder lock.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Key Selector Switch

2-Position - Key Operated

Release Type	2 Position Cam Code	Contact Configuration	Key Removal	Product Number	List Price GO-10P1
Maintained	1	None	Left	CR104PSK21A00L	**$58.20**
Maintained	1	None	Right	CR104PSK21A00R	**$58.20**
Maintained	1	None	Left and Right	CR104PSK21A00M	**$58.20**
Maintained	1	1NO-1NC	Left	CR104PSK21A91L	**$76.20**
Maintained	1	1NO-1NC	Right	CR104PSK21A91R	**$76.20**
Maintained	1	1NO-1NC	Left and Right	CR104PSK21A91M	**$76.20**
Maintained	1	1NO-1NC	Left	CR104PSK21A91L51[1]	**$88.20**
Maintained	1	1NO-1NC	Right	CR104PSK21A91R51[1]	**$88.20**
Maintained	1	1NO-1NC	Left and Right	CR104PSK21A91M51[1]	**$88.20**
Maintained	1	2NO-2NC	Left	CR104PSK21A92L	**$94.20**
Maintained	1	2NO-2NC	Right	CR104PSK21A92R	**$94.20**
Maintained	1	2NO-2NC	Left and Right	CR104PSK21A92M	**$94.20**
Spring Return L ➔ C	2	None	Center	CR104PSK12A00C	**$70.20**
Spring Return L ➔ C	2	1NO-1NC	Center	CR104PSK12A91C	**$88.20**
Spring Return L ➔ C	2	1NO-1NC	Center	CR104PSK12A91C51[1]	**$100.20**
Spring Return L ➔ C	2	2NO-2NC	Center	CR104PSK12A92C	**$106.20**
Spring Return R ➔ C	3	None	Center	CR104PSK63A00C	**$70.20**
Spring Return R ➔ C	3	1NO-1NC	Center	CR104PSK63A91C	**$88.20**
Spring Return R ➔ C	3	1NO-1NC	Center	CR104PSK63A91C51[1]	**$100.20**
Spring Return R ➔ C	3	2NO-2NC	Center	CR104PSK63A92C	**$106.20**

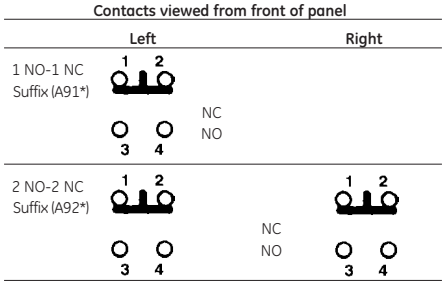
[1]CH501 keyed cylinder lock. Other listed cylinder locks are alike and use identical keys. Dissimilar locks are also available; contact nearest GE Consumer & Industrial Representative.

2-Position Selector Switches - Key Operated

Operator Position				Cam #1 Type of Contact Block	Cam #1 Mounting Location Left/Right	Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #3 Type of Contact Block	Cam #3 Mounting Location Left/Right
Contact State	O	–	X	NO	L or R	–		–	
	X	–	O	NC	L or R	–		–	
	X	O	–	–		NO	L or R	–	
	O	X	–	–		NC	L or R	–	
	–	O	X	–		–		NO	L or R
	–	X	O	–		–		NC	L or R

– : This position is nonexistent or is a "pass through".
In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms



Numbers and letters are molded into blocks at terminals.
*Key removal code.

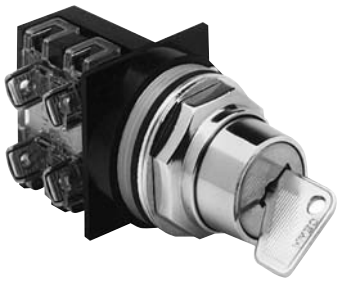
Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

Key Operated
Non-Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.
Product Number and price do not include nameplate. All nameplates must be ordered as a separate item. Two keys included with each cylinder lock.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Key Selector Switch

3-Position Maintained - Key Operated

Release Type	3 Position Cam Code	Contact Configuration	Key Removal	Product Number	List Price GO-10P1
Maintained	4	None	Left	CR104PSK34A00L	**$58.20**
Maintained	4	None	Center	CR104PSK34A00C	**$58.20**
Maintained	4	None	Right	CR104PSK34A00R	**$58.20**
Maintained	4	None	Left, Right, and Center	CR104PSK34A00W	**$58.20**
Maintained	4	1NO-1NC	Left	CR104PSK34A91L	**$76.20**
Maintained	4	1NO-1NC	Center	CR104PSK34A91C	**$76.20**
Maintained	4	1NO-1NC	Right	CR104PSK34A91R	**$76.20**
Maintained	4	1NO-1NC	Left, Right, and Center	CR104PSK34A91W	**$76.20**
Maintained	4	1NO-1NC	Left	CR104PSK34A91L51[1]	**$88.20**
Maintained	4	1NO-1NC	Center	CR104PSK34A91C51[1]	**$88.20**
Maintained	4	1NO-1NC	Right	CR104PSK34A91R51[1]	**$88.20**
Maintained	4	1NO-1NC	Left, Right, and Center	CR104PSK34A91W51[1]	**$88.20**
Maintained	4	2NO-2NC	Left	CR104PSK34A92L	**$94.20**
Maintained	4	2NO-2NC	Center	CR104PSK34A92C	**$94.20**
Maintained	4	2NO-2NC	Right	CR104PSK34A92R	**$94.20**
Maintained	4	2NO-2NC	Left, Right, and Center	CR104PSK34A92W	**$94.20**
Maintained	2	None	Left	CR104PSK32A00L	**$58.20**
Maintained	2	None	Center	CR104PSK32A00C	**$58.20**
Maintained	2	None	Right	CR104PSK32A00R	**$58.20**
Maintained	2	None	Left, Right, and Center	CR104PSK32A00W	**$58.20**
Maintained	2	1NO-1NC	Left	CR104PSK32A91L	**$76.20**
Maintained	2	1NO-1NC	Center	CR104PSK32A91C	**$76.20**
Maintained	2	1NO-1NC	Right	CR104PSK32A91R	**$76.20**
Maintained	2	1NO-1NC	Left, Right, and Center	CR104PSK32A91W	**$76.20**
Maintained	2	2NO-2NC	Left	CR104PSK32A92L	**$94.20**
Maintained	2	2NO-2NC	Center	CR104PSK32A92C	**$94.20**
Maintained	2	2NO-2NC	Right	CR104PSK32A92R	**$94.20**
Maintained	2	2NO-2NC	Left, Right, and Center	CR104PSK32A92W	**$94.20**

3-Position Maintained - Key Operated (continued)

Release Type	3 Position Cam Code	Contact Configuration	Key Removal	Product Number[1]	List Price GO-10P1
Maintained	3	None	Left	CR104PSK33A00L	**$58.20**
Maintained	3	None	Center	CR104PSK33A00C	**$58.20**
Maintained	3	None	Right	CR104PSK33A00R	**$58.20**
Maintained	3	None	Left, Right, and Center	CR104PSK33A00W	**$58.20**
Maintained	3	1NO-1NC	Left	CR104PSK33A91L	**$76.20**
Maintained	3	1NO-1NC	Center	CR104PSK33A91C	**$76.20**
Maintained	3	1NO-1NC	Right	CR104PSK33A91R	**$76.20**
Maintained	3	1NO-1NC	Left, Right, and Center	CR104PSK33A91W	**$76.20**
Maintained	3	2NO-2NC	Left	CR104PSK33A92L	**$94.20**
Maintained	3	2NO-2NC	Center	CR104PSK33A92C	**$94.20**
Maintained	3	2NO-2NC	Right	CR104PSK33A92R	**$94.20**
Maintained	3	2NO-2NC	Left, Right, and Center	CR104PSK33A92W	**$94.20**
Maintained	5	None	Left	CR104PSK35A00L	**$58.20**
Maintained	5	None	Center	CR104PSK35A00C	**$58.20**
Maintained	5	None	Right	CR104PSK35A00R	**$58.20**
Maintained	5	None	Left, Right, and Center	CR104PSK35A00W	**$58.20**
Maintained	5	2NO-2NC	Left	CR104PSK35A92L	**$94.20**
Maintained	5	2NO-2NC	Center	CR104PSK35A92C	**$94.20**
Maintained	5	2NO-2NC	Right	CR104PSK35A92R	**$94.20**
Maintained	5	2NO-2NC	Left, Right, and Center	CR104PSK35A92W	**$94.20**
Maintained	6	None	Left	CR104PSK36A00L	**$58.20**
Maintained	6	None	Center	CR104PSK36A00C	**$58.20**
Maintained	6	None	Right	CR104PSK36A00R	**$58.20**
Maintained	6	None	Left, Right, and Center	CR104PSK36A00W	**$58.20**
Maintained	6	2NO-2NC	Left	CR104PSK36A92L	**$94.20**
Maintained	6	2NO-2NC	Center	CR104PSK36A92C	**$94.20**
Maintained	6	2NO-2NC	Right	CR104PSK36A92R	**$94.20**
Maintained	6	2NO-2NC	Left, Right, and Center	CR104PSK36A92W	**$94.20**

[1]CH501 keyed cylinder lock. Other listed cylinder locks are alike and use identical keys. Dissimilar locks are also available; contact nearest GE Consumer & Industrial Representative.

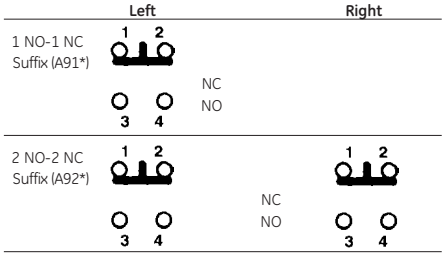
3-Position Selector Switches - Key Operated

Operator Position				Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #3 Type of Contact Block	Cam #3 Mounting Location Left/Right	Cam #5 Type of Contact Block	Cam #5 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	NO	L or R	–	–	NO	L or R	NO	L or R	NO	Left
	O	X	O	–	–	NC	L or R	NC	L or R	NC	Right	–	–
	X	O	O	NC	L or R	NO	L or R	–	–	NC	Left	NO	Right
	X	X	O	–	–	–	–	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–	–	–	NC	Right

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel



Numbers and letters are molded into blocks at terminals.
*Key removal code.

Extra Keys: See pages 9-39
Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

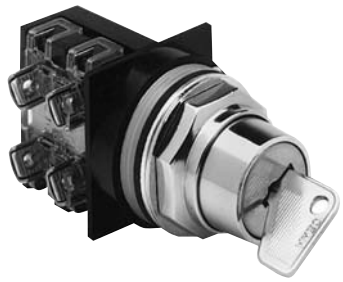
CR104P

Key Operated
Non-Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item. Two keys included with each cylinder lock.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Key Selector Switch

3-Position - Key Operated Spring Return L➔C

Release Type	3 Position Cam Code	Contact Configuration	Key Removal	Product Number	List Price GO-10P1
Spring Return L ➔ C	4	None	Center	CR104PSK74A00C	**$70.20**
Spring Return L ➔ C	4	None	Right	CR104PSK74A00R	**$70.20**
Spring Return L ➔ C	4	None	Center and Right	CR104PSK74A00Q	**$70.20**
Spring Return L ➔ C	4	1NO-1NC	Center	CR104PSK74A91C	**$88.20**
Spring Return L ➔ C	4	1NO-1NC	Right	CR104PSK74A91R	**$88.20**
Spring Return L ➔ C	4	1NO-1NC	Center and Right	CR104PSK74A91Q	**$88.20**
Spring Return L ➔ C	4	1NO-1NC	Center	CR104PSK74A91C51[1]	**$100.20**
Spring Return L ➔ C	4	2NO-2NC	Center	CR104PSK74A92C	**$106.20**
Spring Return L ➔ C	4	2NO-2NC	Right	CR104PSK74A92R	**$106.20**
Spring Return L ➔ C	4	2NO-2NC	Center and Right	CR104PSK74A92Q	**$106.20**
Spring Return L ➔ C	2	None	Center	CR104PSK72A00C	**$70.20**
Spring Return L ➔ C	2	None	Right	CR104PSK72A00R	**$70.20**
Spring Return L ➔ C	2	None	Center and Right	CR104PSK72A00Q	**$70.20**
Spring Return L ➔ C	2	1NO-1NC	Center	CR104PSK72A91C	**$88.20**
Spring Return L ➔ C	2	1NO-1NC	Right	CR104PSK72A91R	**$88.20**
Spring Return L ➔ C	2	1NO-1NC	Center and Right	CR104PSK72A91Q	**$88.20**
Spring Return L ➔ C	2	2NO-2NC	Center	CR104PSK72A92C	**$106.20**
Spring Return L ➔ C	2	2NO-2NC	Right	CR104PSK72A92R	**$106.20**
Spring Return L ➔ C	2	2NO-2NC	Center and Right	CR104PSK72A92Q	**$106.20**

[1]CH501 keyed cylinder lock. Other listed cylinder locks are alike and use identical keys. Dissimilar locks are also available; contact nearest GE Consumer & Industrial Representative.

3-Position - Key Operated Spring Return L➔C (continued)

Release Type	3 Position Cam Code	Contact Configuration	Key Removal	Product Number	List Price GO-10P1
Spring Return L ➔ C	3	None	Center	CR104PSK73A00C	**$70.20**
Spring Return L ➔ C	3	None	Right	CR104PSK73A00R	**$70.20**
Spring Return L ➔ C	3	None	Center and Right	CR104PSK73A00Q	**$70.20**
Spring Return L ➔ C	3	1NO-1NC	Center	CR104PSK73A91C	**$88.20**
Spring Return L ➔ C	3	1NO-1NC	Right	CR104PSK73A91R	**$88.20**
Spring Return L ➔ C	3	1NO-1NC	Center and Right	CR104PSK73A91Q	**$88.20**
Spring Return L ➔ C	3	2NO-2NC	Center	CR104PSK73A92C	**$106.20**
Spring Return L ➔ C	3	2NO-2NC	Right	CR104PSK73A92R	**$106.20**
Spring Return L ➔ C	3	2NO-2NC	Center and Right	CR104PSK73A92Q	**$106.20**
Spring Return L ➔ C	5	None	Center	CR104PSK75A00C	**$70.20**
Spring Return L ➔ C	5	None	Right	CR104PSK75A00R	**$70.20**
Spring Return L ➔ C	5	None	Center and Right	CR104PSK75A00Q	**$70.20**
Spring Return L ➔ C	5	2NO-2NC	Center	CR104PSK75A92C	**$70.20**
Spring Return L ➔ C	5	2NO-2NC	Right	CR104PSK75A92R	**$70.20**
Spring Return L ➔ C	5	2NO-2NC	Center and Right	CR104PSK75A92Q	**$70.20**
Spring Return L ➔ C	6	None	Center	CR104PSK76A00C	**$70.20**
Spring Return L ➔ C	6	None	Right	CR104PSK76A00R	**$70.20**
Spring Return L ➔ C	6	None	Center and Right	CR104PSK76A00Q	**$70.20**
Spring Return L ➔ C	6	2NO-2NC	Center	CR104PSK76A92C	**$106.20**
Spring Return L ➔ C	6	2NO-2NC	Right	CR104PSK76A92R	**$106.20**
Spring Return L ➔ C	6	2NO-2NC	Center and Right	CR104PSK76A92Q	**$106.20**

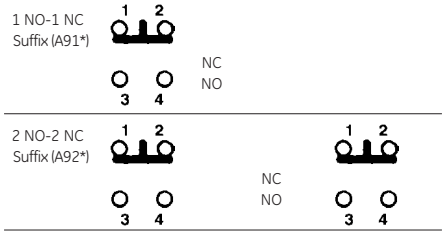
3-Position Selector Switches - Key Operated

	Operator Position			Cam #4		Cam #2		Cam #3		Cam #5		Cam #6	
				Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right	Type of Contact Block	Mounting Location Left/Right
Contact State	O	O	X	NO	L or R	–	–	NO	L or R	NO	L or R	NO	Left
	O	X	O	–	–	NC	L or R	NC	L or R	NC	Right	–	–
	X	O	O	NC	L or R	NO	L or R	–	–	NC	Left	NO	Right
	X	X	O	–	–	–	–	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–	–	–	NC	Right

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel



Numbers and letters are molded into blocks at terminals.
*Key removal code.

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

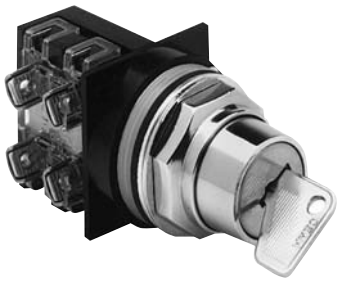
CR104P

Key Operated
Non-Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item. Two keys included with each cylinder lock.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Key Selector Switch

3-Position - Key Operated Spring Return C←R

Release Type	3 Position Cam Code	Contact Configuration	Key Removal	Product Number	List Price GO-10P1
Spring Return C ← R	4	None	Left	CR104PSK84A00L	**$70.20**
Spring Return C ← R	4	None	Center	CR104PSK84A00C	**$70.20**
Spring Return C ← R	4	None	Left and Center	CR104PSK84A00D	**$70.20**
Spring Return C ← R	4	1NO-1NC	Left	CR104PSK84A91L	**$88.20**
Spring Return C ← R	4	1NO-1NC	Center	CR104PSK84A91C	**$88.20**
Spring Return C ← R	4	1NO-1NC	Left and Center	CR104PSK84A91D	**$88.20**
Spring Return C ← R	4	1NO-1NC	Center	CR104PSK84A91C51[1]	**$100.20**
Spring Return C ← R	4	2NO-2NC	Left	CR104PSK84A92L	**$106.20**
Spring Return C ← R	4	2NO-2NC	Center	CR104PSK84A92C	**$106.20**
Spring Return C ← R	4	2NO-2NC	Left and Center	CR104PSK84A92D	**$106.20**
Spring Return C ← R	2	None	Left	CR104PSK82A00L	**$70.20**
Spring Return C ← R	2	None	Center	CR104PSK82A00C	**$70.20**
Spring Return C ← R	2	None	Left and Center	CR104PSK82A00D	**$70.20**
Spring Return C ← R	2	1NO-1NC	Left	CR104PSK82A91L	**$88.20**
Spring Return C ← R	2	1NO-1NC	Center	CR104PSK82A91C	**$88.20**
Spring Return C ← R	2	1NO-1NC	Left and Center	CR104PSK82A91D	**$88.20**
Spring Return C ← R	2	2NO-2NC	Left	CR104PSK82A92L	**$106.20**
Spring Return C ← R	2	2NO-2NC	Center	CR104PSK82A92C	**$106.20**
Spring Return C ← R	2	2NO-2NC	Left and Center	CR104PSK82A92D	**$106.20**
Spring Return C ← R	3	None	Left	CR104PSK83A00L	**$70.20**
Spring Return C ← R	3	None	Center	CR104PSK83A00C	**$70.20**
Spring Return C ← R	3	None	Left and Center	CR104PSK83A00D	**$70.20**
Spring Return C ← R	3	1NO-1NC	Left	CR104PSK83A91L	**$88.20**
Spring Return C ← R	3	1NO-1NC	Center	CR104PSK83A91C	**$88.20**
Spring Return C ← R	3	1NO-1NC	Left and Center	CR104PSK83A91D	**$88.20**
Spring Return C ← R	3	2NO-2NC	Left	CR104PSK83A92L	**$106.20**
Spring Return C ← R	3	2NO-2NC	Center	CR104PSK83A92C	**$106.20**
Spring Return C ← R	3	2NO-2NC	Left and Center	CR104PSK83A92D	**$106.20**
Spring Return C ← R	5	None	Left	CR104PSK85A00L	**$70.20**
Spring Return C ← R	5	None	Center	CR104PSK85A00C	**$70.20**
Spring Return C ← R	5	None	Left and Center	CR104PSK85A00D	**$70.20**
Spring Return C ← R	5	2NO-2NC	Left	CR104PSK85A92L	**$106.20**
Spring Return C ← R	5	2NO-2NC	Center	CR104PSK85A92C	**$106.20**
Spring Return C ← R	5	2NO-2NC	Left and Center	CR104PSK85A92D	**$106.20**
Spring Return C ← R	6	None	Left	CR104PSK86A00L	**$70.20**
Spring Return C ← R	6	None	Center	CR104PSK86A00C	**$70.20**
Spring Return C ← R	6	None	Left and Center	CR104PSK86A00D	**$70.20**
Spring Return C ← R	6	2NO-2NC	Left	CR104PSK86A92L	**$106.20**
Spring Return C ← R	6	2NO-2NC	Center	CR104PSK86A92C	**$106.20**
Spring Return C ← R	6	2NO-2NC	Left and Center	CR104PSK86A92D	**$106.20**

[1]CH501 keyed cylinder lock. Other listed cylinder locks are alike and use identical keys. Dissimilar locks are also available; contact nearest GE Consumer & Industrial Representative.

3-Position - Key Operated Spring Return L➔C←R

Release Type	3 Position Cam Code	Contact Configuration	Key Removal	Product Number	List Price GO-10P1
Spring Return L ➔ C ← R	4	None	Center	CR104PSK94A00C	**$70.20**
Spring Return L ➔ C ← R	4	1NO-1NC	Center	CR104PSK94A91C	**$88.20**
Spring Return L ➔ C ← R	4	1NO-1NC	Center	CR104PSK94A91C51[1]	**$100.20**
Spring Return L ➔ C ← R	4	2NO-2NC	Center	CR104PSK94A92C	**$106.20**
Spring Return L ➔ C ← R	2	None	Center	CR104PSK92A00C	**$70.20**
Spring Return L ➔ C ← R	2	1NO-1NC	Center	CR104PSK92A91C	**$88.20**
Spring Return L ➔ C ← R	2	2NO-2NC	Center	CR104PSK92A92C	**$106.20**
Spring Return L ➔ C ← R	3	None	Center	CR104PSK93A00C	**$70.20**
Spring Return L ➔ C ← R	3	1NO-1NC	Center	CR104PSK93A91C	**$88.20**
Spring Return L ➔ C ← R	3	2NO-2NC	Center	CR104PSK93A92C	**$106.20**
Spring Return L ➔ C ← R	5	None	Center	CR104PSK95A00C	**$70.20**
Spring Return L ➔ C ← R	5	2NO-2NC	Center	CR104PSK95A92C	**$106.20**
Spring Return L ➔ C ← R	6	None	Center	CR104PSK96A00C	**$70.20**
Spring Return L ➔ C ← R	6	2NO-2NC	Center	CR104PSK96A92C	**$106.20**

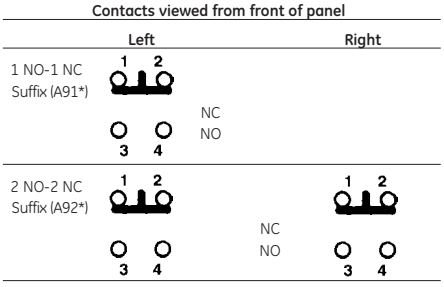
3-Position Selector Switches - Key Operated

Operator Position				Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #3 Type of Contact Block	Cam #3 Mounting Location Left/Right	Cam #5 Type of Contact Block	Cam #5 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	NO	L or R	–	–	NO	L or R	NO	L or R	NO	Left
	O	X	O	–	–	NC	L or R	NC	L or R	NC	Right	–	–
	X	O	O	NC	L or R	NO	L or R	–	–	NC	Left	NO	Right
	X	X	O	–	–	–	–	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–	–	–	NC	Right

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel



Numbers and letters are molded into blocks at terminals.
*Key removal code.

Extra Keys: See pages 9-39
Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

Knob Operated
Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.

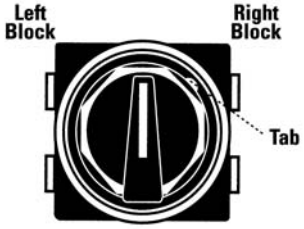
Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Resistor forms of 2-position and 3-position illuminated selector switches are available. Contact nearest GE Consumer & Industrial Representative for proper selection and pricing.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Knob Operated



Contacts viewed from front of panel.

2-Position - Maintained

2 Position Cam Code	Contact Configuration	Power Supply Type	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
1	None	Transformer	120V	Incand., 6V, #755	Red	CR104PST21R00S2	**$70.20**
1	None	Transformer	120V	Incand., 6V, #755	Green	CR104PST21G00S2	**$70.20**
1	None	Transformer	120V	Incand., 6V, #755	Yellow	CR104PST21E00S2	**$70.20**
1	None	Transformer	120V	Incand., 6V, #755	No Lens	CR104PST21A00S2[1]	**$66.00**
1	1NO-1NC	Transformer	120V	Incand., 6V, #755	Red	CR104PST21R11S2	**$88.20**
1	1NO-1NC	Transformer	120V	Incand., 6V, #755	Green	CR104PST21G11S2	**$88.20**
1	1NO-1NC	Transformer	120V	Incand., 6V, #755	Yellow	CR104PST21E11S2	**$88.20**
1	1NO-1NC	Transformer	120V	Incand., 6V, #755	No Lens	CR104PST21A11S2[1]	**$84.00**
1	None	Transformer	240V	Incand., 6V, #755	Red	CR104PST21R00S3	**$70.20**
1	None	Transformer	240V	Incand., 6V, #755	Green	CR104PST21G00S3	**$70.20**
1	None	Transformer	240V	Incand., 6V, #755	Yellow	CR104PST21E00S3	**$70.20**
1	None	Transformer	240V	Incand., 6V, #755	No Lens	CR104PST21A00S3[1]	**$66.00**
1	1NO-1NC	Transformer	240V	Incand., 6V, #755	Red	CR104PST21R11S3	**$88.20**
1	1NO-1NC	Transformer	240V	Incand., 6V, #755	Green	CR104PST21G11S3	**$88.20**
1	1NO-1NC	Transformer	240V	Incand., 6V, #755	Yellow	CR104PST21E11S3	**$88.20**
1	1NO-1NC	Transformer	240V	Incand., 6V, #755	No Lens	CR104PST21A11S3[1]	**$84.00**
1	None	Full Voltage	6V	Incand., 6V, #755	Red	CR104PSL21R00S6	**$58.20**
1	None	Full Voltage	6V	Incand., 6V, #755	Green	CR104PSL21G00S6	**$58.20**
1	None	Full Voltage	6V	Incand., 6V, #755	Yellow	CR104PSL21E00S6	**$58.20**
1	None	Full Voltage	6V	Incand., 6V, #755	No Lens	CR104PSL21A00S6[1]	**$54.00**
1	1NO-1NC	Full Voltage	6V	Incand., 6V, #755	Red	CR104PSL21R11S6	**$76.20**
1	1NO-1NC	Full Voltage	6V	Incand., 6V, #755	Green	CR104PSL21G11S6	**$76.20**
1	1NO-1NC	Full Voltage	6V	Incand., 6V, #755	Yellow	CR104PSL21E11S6	**$76.20**
1	1NO-1NC	Full Voltage	6V	Incand., 6V, #755	No Lens	CR104PSL21A11S6[1]	**$72.00**
1	None	Full Voltage	24V	Incand., 24V, #1819	Red	CR104PSL21R00S8	**$58.20**
1	None	Full Voltage	24V	Incand., 24V, #1819	Green	CR104PSL21G00S8	**$58.20**
1	None	Full Voltage	24V	Incand., 24V, #1819	Yellow	CR104PSL21E00S8	**$58.20**
1	None	Full Voltage	24V	Incand., 24V, #1819	No Lens	CR104PSL21A00S8[1]	**$54.00**
1	1NO-1NC	Full Voltage	24V	Incand., 24V, #1819	Red	CR104PSL21R11S8	**$76.20**
1	1NO-1NC	Full Voltage	24V	Incand., 24V, #1819	Green	CR104PSL21G11S8	**$76.20**
1	1NO-1NC	Full Voltage	24V	Incand., 24V, #1819	Yellow	CR104PSL21E11S8	**$76.20**
1	1NO-1NC	Full Voltage	24V	Incand., 24V, #1819	No Lens	CR104PSL21A11S8[1]	**$72.00**
1	None	Full Voltage	120V	Incand., 130V	Red	CR104PSL21R00S2	**$58.20**
1	None	Full Voltage	120V	Incand., 130V	Green	CR104PSL21G00S2	**$58.20**
1	None	Full Voltage	120V	Incand., 130V	Yellow	CR104PSL21E00S2	**$58.20**
1	None	Full Voltage	120V	Incand., 130V	No Lens	CR104PSL21A00S2[1]	**$54.00**
1	1NO-1NC	Full Voltage	120V	Incand., 130V	Red	CR104PSL21R11S2	**$76.20**
1	1NO-1NC	Full Voltage	120V	Incand., 130V	Green	CR104PSL21G11S2	**$76.20**
1	1NO-1NC	Full Voltage	120V	Incand., 130V	Yellow	CR104PSL21E11S2	**$76.20**
1	1NO-1NC	Full Voltage	120V	Incand., 130V	No Lens	CR104PSL21A11S2[1]	**$72.00**

[1]Select required lens from page 9-36 and order as separate item. To order assembled units with lens colors not listed above, substitute the following letters in place of "A" in Product Number: L (Blue), M (Amber), W (White), or C (Clear). Price is same as for units with lenses of listed colors.

[2]All lamps miniature bayonet base.

2-Position Selector Switches - Illuminated

Operator Position				Cam #1 Type of Contact Block	Cam #1 Mounting Location Left/Right
Contact State	O	–	X	NO	Right
	X	–	O	NC	Left

– : This position is a "pass through".
In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel

	Left	Right
1 NO-1 NC Suffix (11S*)	1 2	3 4

Numbers and letters are molded into blocks at terminals.
*Voltage digit.

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

Knob Operated
Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.

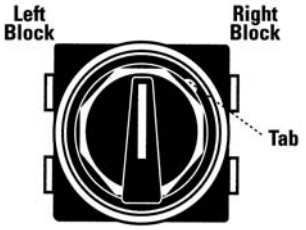
Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Resistor forms of 2-position and 3-position illuminated selector switches are available. Contact nearest GE Consumer & Industrial Representative for proper selection and pricing.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Transformer



Contacts viewed from front of panel.

3-Position Maintained Transformer Type

3 Position Cam Code	Contact Configuration	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
4	None	120V	Incand., 6V, #755	Red	CR104PST34R00S2	**$70.20**
4	None	120V	Incand., 6V, #755	Green	CR104PST34G00S2	**$70.20**
4	None	120V	Incand., 6V, #755	Yellow	CR104PST34E00S2	**$70.20**
4	None	120V	Incand., 6V, #755	No Lens	CR104PST34A00S2[1]	**$66.00**
4	1NO-1NC	120V	Incand., 6V, #755	Red	CR104PST34R11S2	**$88.20**
4	1NO-1NC	120V	Incand., 6V, #755	Green	CR104PST34G11S2	**$88.20**
4	1NO-1NC	120V	Incand., 6V, #755	Yellow	CR104PST34E11S2	**$88.20**
4	1NO-1NC	120V	Incand., 6V, #755	No Lens	CR104PST34A11S2[1]	**$84.00**
4	None	240V	Incand., 6V, #755	Red	CR104PST34R00S3	**$70.20**
4	None	240V	Incand., 6V, #755	Green	CR104PST34G00S3	**$70.20**
4	None	240V	Incand., 6V, #755	Yellow	CR104PST34E00S3	**$70.20**
4	None	240V	Incand., 6V, #755	No Lens	CR104PST34A00S3[1]	**$66.00**
4	1NO-1NC	240V	Incand., 6V, #755	Red	CR104PST34R11S3	**$88.20**
4	1NO-1NC	240V	Incand., 6V, #755	Green	CR104PST34G11S3	**$88.20**
4	1NO-1NC	240V	Incand., 6V, #755	Yellow	CR104PST34E11S3	**$88.20**
4	1NO-1NC	240V	Incand., 6V, #755	No Lens	CR104PST34A11S3[1]	**$84.00**
2	None	120V	Incand., 6V, #755	Red	CR104PST32R00S2	**$70.20**
2	None	120V	Incand., 6V, #755	Green	CR104PST32G00S2	**$70.20**
2	None	120V	Incand., 6V, #755	Yellow	CR104PST32E00S2	**$70.20**
2	None	120V	Incand., 6V, #755	No Lens	CR104PST32A00S2[1]	**$66.00**
2	1NO-1NC	120V	Incand., 6V, #755	Red	CR104PST32R11S2	**$88.20**
2	1NO-1NC	120V	Incand., 6V, #755	Green	CR104PST32G11S2	**$88.20**
2	1NO-1NC	120V	Incand., 6V, #755	Yellow	CR104PST32E11S2	**$88.20**
2	1NO-1NC	120V	Incand., 6V, #755	No Lens	CR104PST32A11S2[1]	**$84.00**
2	None	240V	Incand., 6V, #755	Red	CR104PST32R00S3	**$70.20**
2	None	240V	Incand., 6V, #755	Green	CR104PST32G00S3	**$70.20**
2	None	240V	Incand., 6V, #755	Yellow	CR104PST32E00S3	**$70.20**
2	None	240V	Incand., 6V, #755	No Lens	CR104PST32A00S3[1]	**$66.00**
2	1NO-1NC	240V	Incand., 6V, #755	Red	CR104PST32R11S3	**$88.20**
2	1NO-1NC	240V	Incand., 6V, #755	Green	CR104PST32G11S3	**$88.20**
2	1NO-1NC	240V	Incand., 6V, #755	Yellow	CR104PST32E11S3	**$88.20**
2	1NO-1NC	240V	Incand., 6V, #755	No Lens	CR104PST32A11S3[1]	**$84.00**

3-Position Maintained Transformer Type (continued)

3 Position Cam Code	Contact Configuration	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
6	None	120V	Incand., 6V, #755	Red	CR104PST36R00S2	**$70.20**
6	None	120V	Incand., 6V, #755	Green	CR104PST36G00S2	**$70.20**
6	None	120V	Incand., 6V, #755	Yellow	CR104PST36E00S2	**$70.20**
6	None	120V	Incand., 6V, #755	No Lens	CR104PST36A00S2[1]	**$66.00**
6	1NO-1NC	120V	Incand., 6V, #755	Red	CR104PST36R11S2	**$88.20**
6	1NO-1NC	120V	Incand., 6V, #755	Green	CR104PST36G11S2	**$88.20**
6	1NO-1NC	120V	Incand., 6V, #755	Yellow	CR104PST36E11S2	**$88.20**
6	1NO-1NC	120V	Incand., 6V, #755	No Lens	CR104PST36A11S2[1]	**$84.00**
6	None	240V	Incand., 6V, #755	Red	CR104PST36R00S3	**$70.20**
6	None	240V	Incand., 6V, #755	Green	CR104PST36G00S3	**$70.20**
6	None	240V	Incand., 6V, #755	Yellow	CR104PST36E00S3	**$70.20**
6	None	240V	Incand., 6V, #755	No Lens	CR104PST36A00S3[1]	**$66.00**
6	1NO-1NC	240V	Incand., 6V, #755	Red	CR104PST36R11S3	**$88.20**
6	1NO-1NC	240V	Incand., 6V, #755	Green	CR104PST36G11S3	**$88.20**
6	1NO-1NC	240V	Incand., 6V, #755	Yellow	CR104PST36E11S3	**$88.20**
6	1NO-1NC	240V	Incand., 6V, #755	No Lens	CR104PST36A11S3[1]	**$84.00**

[1]Select required lens from page 9-36 and order as separate item. To order assembled units with lens colors not listed above, substitute the following letters in place of "A" in Product Number: L (Blue), M (Amber), W (White), or C (Clear). Price is same as for units with lenses of listed colors.

[2]All lamps miniature bayonet base.

3-Position Selector Switches - Illuminated

Operator Position				Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	–	–	NO	Right	–	–
	O	X	O	NC	Left	–	–	–	–
	X	O	O	NO	Right	NC	Left	NO	Right
	X	X	O	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel

	Left	Right
1 NO-1 NC Suffix (11S*)	1 2	3 4

Numbers and letters are molded into blocks at terminals.
*Voltage digit.

Lamps: See pages 9-35
Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

Knob Operated
Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Resistor forms of 2-position and 3-position illuminated selector switches are available. Contact nearest GE Consumer & Industrial Representative for proper selection and pricing.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

3-Position Maintained Full Voltage Type

3 Position Cam Code	Contact Configuration	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
4	None	6V	Incand., 6V, #755	Red	CR104PSL34R00S6	**$58.20**
4	None	6V	Incand., 6V, #755	Green	CR104PSL34G00S6	**$58.20**
4	None	6V	Incand., 6V, #755	Yellow	CR104PSL34E00S6	**$58.20**
4	None	6V	Incand., 6V, #755	No Lens	CR104PSL34A00S6[1]	**$54.00**
4	1NO-1NC	6V	Incand., 6V, #755	Red	CR104PSL34R11S6	**$76.20**
4	1NO-1NC	6V	Incand., 6V, #755	Green	CR104PSL34G11S6	**$76.20**
4	1NO-1NC	6V	Incand., 6V, #755	Yellow	CR104PSL34E11S6	**$76.20**
4	1NO-1NC	6V	Incand., 6V, #755	No Lens	CR104PSL34A11S6[1]	**$72.00**
4	None	24V	Incand., 24V, #1819	Red	CR104PSL34R00S8	**$58.20**
4	None	24V	Incand., 24V, #1819	Green	CR104PSL34G00S8	**$58.20**
4	None	24V	Incand., 24V, #1819	Yellow	CR104PSL34E00S8	**$58.20**
4	None	24V	Incand., 24V, #1819	No Lens	CR104PSL34A00S8[1]	**$54.00**
4	1NO-1NC	24V	Incand., 24V, #1819	Red	CR104PSL34R11S8	**$76.20**
4	1NO-1NC	24V	Incand., 24V, #1819	Green	CR104PSL34G11S8	**$76.20**
4	1NO-1NC	24V	Incand., 24V, #1819	Yellow	CR104PSL34E11S8	**$76.20**
4	1NO-1NC	24V	Incand., 24V, #1819	No Lens	CR104PSL34A11S8[1]	**$72.00**
4	None	120V	Incand., 130V	Red	CR104PSL34R00S2	**$58.20**
4	None	120V	Incand., 130V	Green	CR104PSL34G00S2	**$58.20**
4	None	120V	Incand., 130V	Yellow	CR104PSL34E00S2	**$58.20**
4	None	120V	Incand., 130V	No Lens	CR104PSL34A00S2[1]	**$54.00**
4	1NO-1NC	120V	Incand., 130V	Red	CR104PSL34R11S2	**$76.20**
4	1NO-1NC	120V	Incand., 130V	Green	CR104PSL34G11S2	**$76.20**
4	1NO-1NC	120V	Incand., 130V	Yellow	CR104PSL34E11S2	**$76.20**
4	1NO-1NC	120V	Incand., 130V	No Lens	CR104PSL34A11S2[1]	**$72.00**
2	None	6V	Incand., 6V, #755	Red	CR104PSL32R00S6	**$58.20**
2	None	6V	Incand., 6V, #755	Green	CR104PSL32G00S6	**$58.20**
2	None	6V	Incand., 6V, #755	Yellow	CR104PSL32E00S6	**$58.20**
2	None	6V	Incand., 6V, #755	No Lens	CR104PSL32A00S6[1]	**$54.00**
2	1NO-1NC	6V	Incand., 6V, #755	Red	CR104PSL32R11S6	**$76.20**
2	1NO-1NC	6V	Incand., 6V, #755	Green	CR104PSL32G11S6	**$76.20**
2	1NO-1NC	6V	Incand., 6V, #755	Yellow	CR104PSL32E11S6	**$76.20**
2	1NO-1NC	6V	Incand., 6V, #755	No Lens	CR104PSL32A11S6[1]	**$72.00**
2	None	24V	Incand., 24V, #1819	Red	CR104PSL32R00S8	**$58.20**
2	None	24V	Incand., 24V, #1819	Green	CR104PSL32G00S8	**$58.20**
2	None	24V	Incand., 24V, #1819	Yellow	CR104PSL32E00S8	**$58.20**
2	None	24V	Incand., 24V, #1819	No Lens	CR104PSL32A00S8[1]	**$54.00**

3-Position Maintained Full Voltage Type (continued)

3 Position Cam Code	Contact Configuration	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
2	1NO-1NC	24V	Incand., 24V, #1819	Red	CR104PSL32R11S8	**$76.20**
2	1NO-1NC	24V	Incand., 24V, #1819	Green	CR104PSL32G11S8	**$76.20**
2	1NO-1NC	24V	Incand., 24V, #1819	Yellow	CR104PSL32E11S8	**$76.20**
2	1NO-1NC	24V	Incand., 24V, #1819	No Lens	CR104PSL32A11S8[1]	**$72.00**
2	None	120V	Incand., 130V	Red	CR104PSL32R00S2	**$58.20**
2	None	120V	Incand., 130V	Green	CR104PSL32G00S2	**$58.20**
2	None	120V	Incand., 130V	Yellow	CR104PSL32E00S2	**$58.20**
2	None	120V	Incand., 130V	No Lens	CR104PSL32A00S2[1]	**$54.00**
2	1NO-1NC	120V	Incand., 130V	Red	CR104PSL32R11S2	**$76.20**
2	1NO-1NC	120V	Incand., 130V	Green	CR104PSL32G11S2	**$76.20**
2	1NO-1NC	120V	Incand., 130V	Yellow	CR104PSL32E11S2	**$76.20**
2	1NO-1NC	120V	Incand., 130V	No Lens	CR104PSL32A11S2[1]	**$72.00**
6	None	6V	Incand., 6V, #755	Red	CR104PSL36R00S6	**$58.20**
6	None	6V	Incand., 6V, #755	Green	CR104PSL36G00S6	**$58.20**
6	None	6V	Incand., 6V, #755	Yellow	CR104PSL36E00S6	**$58.20**
6	None	6V	Incand., 6V, #755	No Lens	CR104PSL36A00S6[1]	**$54.00**
6	1NO-1NC	6V	Incand., 6V, #755	Red	CR104PSL36R11S6	**$76.20**
6	1NO-1NC	6V	Incand., 6V, #755	Green	CR104PSL36G11S6	**$76.20**
6	1NO-1NC	6V	Incand., 6V, #755	Yellow	CR104PSL36E11S6	**$76.20**
6	1NO-1NC	6V	Incand., 6V, #755	No Lens	CR104PSL36A11S6[1]	**$72.00**
6	None	24V	Incand., 24V, #1819	Red	CR104PSL36R00S8	**$58.20**
6	None	24V	Incand., 24V, #1819	Green	CR104PSL36G00S8	**$58.20**
6	None	24V	Incand., 24V, #1819	Yellow	CR104PSL36E00S8	**$58.20**
6	None	24V	Incand., 24V, #1819	No Lens	CR104PSL36A00S8[1]	**$54.00**
6	1NO-1NC	24V	Incand., 24V, #1819	Red	CR104PSL36R11S8	**$76.20**
6	1NO-1NC	24V	Incand., 24V, #1819	Green	CR104PSL36G11S8	**$76.20**
6	1NO-1NC	24V	Incand., 24V, #1819	Yellow	CR104PSL36E11S8	**$76.20**
6	1NO-1NC	24V	Incand., 24V, #1819	No Lens	CR104PSL36A11S8[1]	**$72.00**
6	None	120V	Incand., 130V	Red	CR104PSL36R00S2	**$58.20**
6	None	120V	Incand., 130V	Green	CR104PSL36G00S2	**$58.20**
6	None	120V	Incand., 130V	Yellow	CR104PSL36E00S2	**$58.20**
6	None	120V	Incand., 130V	No Lens	CR104PSL36A00S2[1]	**$54.00**
6	1NO-1NC	120V	Incand., 130V	Red	CR104PSL36R11S2	**$76.20**
6	1NO-1NC	120V	Incand., 130V	Green	CR104PSL36G11S2	**$76.20**
6	1NO-1NC	120V	Incand., 130V	Yellow	CR104PSL36E11S2	**$76.20**
6	1NO-1NC	120V	Incand., 130V	No Lens	CR104PSL36A11S2[1]	**$72.00**

[1]Select required lens from page 9-36 and order as separate item. To order assembled units with lens colors not listed above, substitute the following letters in place of "A" in Product Number: L (Blue), M (Amber), W (White), or C (Clear). Price is same as for units with lenses of listed colors.

[2]All lamps miniature bayonet base.

3-Position Selector Switches - Illuminated

Operator Position				Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	–	–	NO	Right	–	–
	O	X	O	NC	Left	–	–	–	–
	X	O	O	NO	Right	NC	Left	NO	Right
	X	X	O	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel

	Left	Right
1 NO-1 NC Suffix (11S*)		

Numbers and letters are molded into blocks at terminals.
*Voltage digit.

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

Knob Operated
Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.

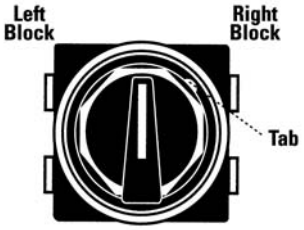
Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Resistor forms of 2-position and 3-position illuminated selector switches are available. Contact nearest GE Consumer & Industrial Representative for proper selection and pricing.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Transformer



Contacts viewed from front of panel.

3-Position Spring Return L→C←R Transformer Type

3 Position Cam Code	Contact Configuration	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
4	None	120V	Incand., 6V, #755	Red	CR104PST94R00S2	**$82.20**
4	None	120V	Incand., 6V, #755	Green	CR104PST94G00S2	**$82.20**
4	None	120V	Incand., 6V, #755	Yellow	CR104PST94E00S2	**$82.20**
4	None	120V	Incand., 6V, #755	No Lens	CR104PST94A00S2[1]	**$78.00**
4	1NO-1NC	120V	Incand., 6V, #755	Red	CR104PST94R11S2	**$100.20**
4	1NO-1NC	120V	Incand., 6V, #755	Green	CR104PST94G11S2	**$100.20**
4	1NO-1NC	120V	Incand., 6V, #755	Yellow	CR104PST94E11S2	**$100.20**
4	1NO-1NC	120V	Incand., 6V, #755	No Lens	CR104PST94A11S2	**$96.00**
4	None	240V	Incand., 6V, #755	Red	CR104PST94R00S3	**$82.20**
4	None	240V	Incand., 6V, #755	Green	CR104PST94G00S3	**$82.20**
4	None	240V	Incand., 6V, #755	Yellow	CR104PST94E00S3	**$82.20**
4	None	240V	Incand., 6V, #755	No Lens	CR104PST94A00S3[1]	**$78.00**
4	1NO-1NC	240V	Incand., 6V, #755	Red	CR104PST94R11S3	**$100.20**
4	1NO-1NC	240V	Incand., 6V, #755	Green	CR104PST94G11S3	**$100.20**
4	1NO-1NC	240V	Incand., 6V, #755	Yellow	CR104PST94E11S3	**$100.20**
4	1NO-1NC	240V	Incand., 6V, #755	No Lens	CR104PST94A11S3[1]	**$96.00**
2	None	120V	Incand., 6V, #755	Red	CR104PST92R00S2	**$82.20**
2	None	120V	Incand., 6V, #755	Green	CR104PST92G00S2	**$82.20**
2	None	120V	Incand., 6V, #755	Yellow	CR104PST92E00S2	**$82.20**
2	None	120V	Incand., 6V, #755	No Lens	CR104PST92A00S2[1]	**$78.00**
2	1NO-1NC	120V	Incand., 6V, #755	Red	CR104PST92R11S2	**$100.20**
2	1NO-1NC	120V	Incand., 6V, #755	Green	CR104PST92G11S2	**$100.20**
2	1NO-1NC	120V	Incand., 6V, #755	Yellow	CR104PST92E11S2	**$100.20**
2	1NO-1NC	120V	Incand., 6V, #755	No Lens	CR104PST92A11S2[1]	**$96.00**
2	None	240V	Incand., 6V, #755	Red	CR104PST92R00S3	**$82.20**
2	None	240V	Incand., 6V, #755	Green	CR104PST92G00S3	**$82.20**
2	None	240V	Incand., 6V, #755	Yellow	CR104PST92E00S3	**$82.20**
2	None	240V	Incand., 6V, #755	No Lens	CR104PST92A00S3[1]	**$78.00**
2	1NO-1NC	240V	Incand., 6V, #755	Red	CR104PST92R11S3	**$100.20**
2	1NO-1NC	240V	Incand., 6V, #755	Green	CR104PST92G11S3	**$100.20**
2	1NO-1NC	240V	Incand., 6V, #755	Yellow	CR104PST92E11S3	**$100.20**
2	1NO-1NC	240V	Incand., 6V, #755	No Lens	CR104PST92A11S3[1]	**$96.00**

3-Position Spring Return L→C←R Transformer Type (continued)

3 Position Cam Code	Contact Configuration	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
6	None	120V	Incand., 6V, #755	Red	CR104PST96R00S2	**$82.20**
6	None	120V	Incand., 6V, #755	Green	CR104PST96G00S2	**$82.20**
6	None	120V	Incand., 6V, #755	Yellow	CR104PST96E00S2	**$82.20**
6	None	120V	Incand., 6V, #755	No Lens	CR104PST96A00S2[1]	**$78.00**
6	1NO-1NC	120V	Incand., 6V, #755	Red	CR104PST96R11S2	**$100.20**
6	1NO-1NC	120V	Incand., 6V, #755	Green	CR104PST96G11S2	**$100.20**
6	1NO-1NC	120V	Incand., 6V, #755	Yellow	CR104PST96E11S2	**$100.20**
6	1NO-1NC	120V	Incand., 6V, #755	No Lens	CR104PST96A11S2[1]	**$96.00**
6	None	240V	Incand., 6V, #755	Red	CR104PST96R00S3	**$82.20**
6	None	240V	Incand., 6V, #755	Green	CR104PST96G00S3	**$82.20**
6	None	240V	Incand., 6V, #755	Yellow	CR104PST96E00S3	**$82.20**
6	None	240V	Incand., 6V, #755	No Lens	CR104PST96A00S3[1]	**$78.00**
6	1NO-1NC	240V	Incand., 6V, #755	Red	CR104PST96R11S3	**$100.20**
6	1NO-1NC	240V	Incand., 6V, #755	Green	CR104PST96G11S3	**$100.20**
6	1NO-1NC	240V	Incand., 6V, #755	Yellow	CR104PST96E11S3	**$100.20**
6	1NO-1NC	240V	Incand., 6V, #755	No Lens	CR104PST96A11S3[1]	**$96.00**

[1]Select required lens from page 9-36 and order as separate item. To order assembled units with lens colors not listed above, substitute the following letters in place of "A" in Product Number: L (Blue), M (Amber), W (White), or C (Clear). Price is same as for units with lenses of listed colors.

[2]All lamps miniature bayonet base.

3-Position Selector Switches - Illuminated

Operator Position				Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	–	–	NO	Right	–	–
	O	X	O	NC	Left	–	–	–	–
	X	O	O	NO	Right	NC	Left	NO	Right
	X	X	O	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel

	Left	Right
1 NO-1 NC Suffix (11S*)		

Numbers and letters are molded into blocks at terminals.
*Voltage digit.

Lamps: See pages 9-35
Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Drilling Plans and Dimensions: See page 9-57
Product Number Selection Instructions: See pages 9-2

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

Knob Operated
Illuminated
600 Volts Max. AC/DC
10 Amperes Continuous

Units are supplied factory-assembled when ordered with contact blocks.

Product Number and price do not include nameplate. All nameplates must be ordered as a separate item.

Resistor forms of 2-position and 3-position illuminated selector switches are available. Contact nearest GE Consumer & Industrial Representative for proper selection and pricing.

Suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications, when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

3-Position Spring Return L→C←R Full Voltage Type

3 Position Cam Code	Contact Configuration	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
4	None	6V	Incand., 6V, #755	Red	CR104PSL94R00S6	**$70.20**
4	None	6V	Incand., 6V, #755	Green	CR104PSL94G00S6	**$70.20**
4	None	6V	Incand., 6V, #755	Yellow	CR104PSL94E00S6	**$70.20**
4	None	6V	Incand., 6V, #755	No Lens	CR104PSL94A00S6[1]	**$66.00**
4	1NO-1NC	6V	Incand., 6V, #755	Red	CR104PSL94R11S6	**$88.20**
4	1NO-1NC	6V	Incand., 6V, #755	Green	CR104PSL94G11S6	**$88.20**
4	1NO-1NC	6V	Incand., 6V, #755	Yellow	CR104PSL94E11S6	**$88.20**
4	1NO-1NC	6V	Incand., 6V, #755	No Lens	CR104PSL94A11S6[1]	**$84.00**
4	None	24V	Incand., 24V, #1819	Red	CR104PSL94R00S8	**$70.20**
4	None	24V	Incand., 24V, #1819	Green	CR104PSL94G00S8	**$70.20**
4	None	24V	Incand., 24V, #1819	Yellow	CR104PSL94E00S8	**$70.20**
4	None	24V	Incand., 24V, #1819	No Lens	CR104PSL94A00S8[1]	**$66.00**
4	1NO-1NC	24V	Incand., 24V, #1819	Red	CR104PSL94R11S8	**$88.20**
4	1NO-1NC	24V	Incand., 24V, #1819	Green	CR104PSL94G11S8	**$88.20**
4	1NO-1NC	24V	Incand., 24V, #1819	Yellow	CR104PSL94E11S8	**$88.20**
4	1NO-1NC	24V	Incand., 24V, #1819	No Lens	CR104PSL94A11S8[1]	**$84.00**
4	None	120V	Incand., 130V	Red	CR104PSL94R00S2	**$70.20**
4	None	120V	Incand., 130V	Green	CR104PSL94G00S2	**$70.20**
4	None	120V	Incand., 130V	Yellow	CR104PSL94E00S2	**$70.20**
4	None	120V	Incand., 130V	No Lens	CR104PSL94A00S2[1]	**$66.00**
4	1NO-1NC	120V	Incand., 130V	Red	CR104PSL94R11S2	**$88.20**
4	1NO-1NC	120V	Incand., 130V	Green	CR104PSL94G11S2	**$88.20**
4	1NO-1NC	120V	Incand., 130V	Yellow	CR104PSL94E11S2	**$88.20**
4	1NO-1NC	120V	Incand., 130V	No Lens	CR104PSL94A11S2[1]	**$84.00**
2	None	6V	Incand., 6V, #755	Red	CR104PSL92R00S6	**$70.20**
2	None	6V	Incand., 6V, #755	Green	CR104PSL92G00S6	**$70.20**
2	None	6V	Incand., 6V, #755	Yellow	CR104PSL92E00S6	**$70.20**
2	None	6V	Incand., 6V, #755	No Lens	CR104PSL92A00S6[1]	**$66.00**
2	1NO-1NC	6V	Incand., 6V, #755	Red	CR104PSL92R11S6	**$88.20**
2	1NO-1NC	6V	Incand., 6V, #755	Green	CR104PSL92G11S6	**$88.20**
2	1NO-1NC	6V	Incand., 6V, #755	Yellow	CR104PSL92E11S6	**$88.20**
2	1NO-1NC	6V	Incand., 6V, #755	No Lens	CR104PSL92A11S6[1]	**$84.00**
2	None	24V	Incand., 24V, #1819	Red	CR104PSL92R00S8	**$70.20**
2	None	24V	Incand., 24V, #1819	Green	CR104PSL92G00S8	**$70.20**
2	None	24V	Incand., 24V, #1819	Yellow	CR104PSL92E00S8	**$70.20**
2	None	24V	Incand., 24V, #1819	No Lens	CR104PSL92A00S8[1]	**$66.00**
2	1NO-1NC	24V	Incand., 24V, #1819	Red	CR104PSL92R11S8	**$88.20**
2	1NO-1NC	24V	Incand., 24V, #1819	Green	CR104PSL92G11S8	**$88.20**
2	1NO-1NC	24V	Incand., 24V, #1819	Yellow	CR104PSL92E11S8	**$88.20**
2	1NO-1NC	24V	Incand., 24V, #1819	No Lens	CR104PSL92A11S8[1]	**$84.00**

3-Position Spring Return L→C←R Full Voltage Type (continued)

3 Position Cam Code	Contact Configuration	Input Voltage	Lamp Type[2]	Color	Product Number	List Price GO-10P1
2	None	120V	Incand., 130V	Red	CR104PSL92R00S2	**$70.20**
2	None	120V	Incand., 130V	Green	CR104PSL92G00S2	**$70.20**
2	None	120V	Incand., 130V	Yellow	CR104PSL92E00S2	**$70.20**
2	None	120V	Incand., 130V	No Lens	CR104PSL92A00S2[1]	**$66.00**
2	1NO-1NC	120V	Incand., 130V	Red	CR104PSL92R11S2	**$88.20**
2	1NO-1NC	120V	Incand., 130V	Green	CR104PSL92G11S2	**$88.20**
2	1NO-1NC	120V	Incand., 130V	Yellow	CR104PSL92E11S2	**$88.20**
2	1NO-1NC	120V	Incand., 130V	No Lens	CR104PSL92A11S2[1]	**$84.00**
6	None	6V	Incand., 6V, #755	Red	CR104PSL96R00S6	**$70.20**
6	None	6V	Incand., 6V, #755	Green	CR104PSL96G00S6	**$70.20**
6	None	6V	Incand., 6V, #755	Yellow	CR104PSL96E00S6	**$70.20**
6	None	6V	Incand., 6V, #755	No Lens	CR104PSL96A00S6[1]	**$66.00**
6	1NO-1NC	6V	Incand., 6V, #755	Red	CR104PSL96R11S6	**$88.20**
6	1NO-1NC	6V	Incand., 6V, #755	Green	CR104PSL96G11S6	**$88.20**
6	1NO-1NC	6V	Incand., 6V, #755	Yellow	CR104PSL96E11S6	**$88.20**
6	1NO-1NC	6V	Incand., 6V, #755	No Lens	CR104PSL96A11S6[1]	**$84.00**
6	None	24V	Incand., 24V, #1819	Red	CR104PSL96R00S8	**$70.20**
6	None	24V	Incand., 24V, #1819	Green	CR104PSL96G00S8	**$70.20**
6	None	24V	Incand., 24V, #1819	Yellow	CR104PSL96E00S8	**$70.20**
6	None	24V	Incand., 24V, #1819	No Lens	CR104PSL96A00S8[1]	**$66.00**
6	1NO-1NC	24V	Incand., 24V, #1819	Red	CR104PSL96R11S8	**$88.20**
6	1NO-1NC	24V	Incand., 24V, #1819	Green	CR104PSL96G11S8	**$88.20**
6	1NO-1NC	24V	Incand., 24V, #1819	Yellow	CR104PSL96E11S8	**$88.20**
6	1NO-1NC	24V	Incand., 24V, #1819	No Lens	CR104PSL96A11S8[1]	**$84.00**
6	None	120V	Incand., 130V	Red	CR104PSL96R00S2	**$70.20**
6	None	120V	Incand., 130V	Green	CR104PSL96G00S2	**$70.20**
6	None	120V	Incand., 130V	Yellow	CR104PSL96E00S2	**$70.20**
6	None	120V	Incand., 130V	No Lens	CR104PSL96A00S2[1]	**$66.00**
6	1NO-1NC	120V	Incand., 130V	Red	CR104PSL96R11S2	**$88.20**
6	1NO-1NC	120V	Incand., 130V	Green	CR104PSL96G11S2	**$88.20**
6	1NO-1NC	120V	Incand., 130V	Yellow	CR104PSL96E11S2	**$88.20**
6	1NO-1NC	120V	Incand., 130V	No Lens	CR104PSL96A11S2[1]	**$84.00**

[1]Select required lens from page 9-36 and order as separate item. To order assembled units with lens colors not listed above, substitute the following letters in place of "A" in Product Number: L (Blue), M (Amber), W (White), or C (Clear). Price is same as for units with lenses of listed colors.

[2]All lamps miniature bayonet base.

3-Position Selector Switches - Illuminated

Operator Position				Cam #2 Type of Contact Block	Cam #2 Mounting Location Left/Right	Cam #4 Type of Contact Block	Cam #4 Mounting Location Left/Right	Cam #6 Type of Contact Block	Cam #6 Mounting Location Left/Right
Contact State	O	O	X	–	–	NO	Right	–	–
	O	X	O	NC	Left	–	–	–	–
	X	O	O	NO	Right	NC	Left	NO	Right
	X	X	O	–	–	–	–	NC	Left
	O	X	X	–	–	–	–	–	–

In the product number of a selector switch, the cam is identified by the fifth figure after the "104".
Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams - Factory Forms

Contacts viewed from front of panel

	Left	Right
1 NO-1 NC Suffix (11S*)		

Numbers and letters are molded into blocks at terminals.
*Voltage digit.

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Selector Switches

CR104P

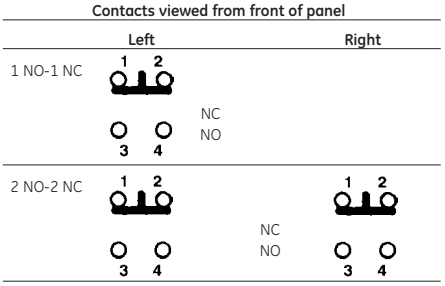
Cam Logic
600 Volts max. AC/DC
10 Amperes Continuous

2-Position Selector Switches

Operator Position				Illuminated or Nonilluminated Cam #1 Type of Contact Block	Cam #1 Mounting Location Left-Right	Nonilluminated Only Cam #2 Type of Contact Block	Cam #2 Mounting Location Left-Right	Nonilluminated Only Cam #3 Type of Contact Block	Cam #3 Mounting Location Left-Right
Contact State	O	–	X	NO	L or R	–		–	
	X	–	O	NC	L or R	–		–	
	X	O	–	–		NO	L or R	–	
	O	X	–	–		NC	L or R	–	
	–	O	–	–		–		NO	L or R
	–	X	–	–		–		NC	L or R

In the product number of a 2-position selector switch, the cam is identified by the fifth figure after the "104". Example: CR104PSG2 **1** B, the cam number is 1.

Schematic Diagrams



Numbers and letters are molded into blocks at terminals.

3-Position Selector Switches

Operator Position				Illuminated or Nonilluminated Cam #2 Type of Contact Block	Cam #2 Mounting Location Left-Right	Nonilluminated Only Cam #3 Type of Contact Block	Cam #3 Mounting Location Left-Right	Illuminated or Nonilluminated Cam #4 Type of Contact Block	Cam #4 Mounting Location Left-Right	Nonilluminated Only Cam #5 Type of Contact Block	Cam #5 Mounting Location Left-Right	Illuminated or Nonilluminated Cam #6 Type of Contact Block	Cam #6 Mounting Location Left-Right
Contact State	O	O	X	–	–	NO	L or R	NO	L or R	NO	L or R	NO	Left
	O	X	O	NC	L or R	NC	L or R	–	–	NC	Right	2-NC	L+R (IN SERIES)[1]
	X	O	O	NO	L or R	–	–	NC	L or R	NC	Left	NO	Right
	X	X	O	1-NO+1-NC	in parallel[1]	–	–	–	–	–	–	NC	Left
	O	X	X	–	–	1-NO+1-NC	in parallel[1]	–	–	–	–	NC	Right
	X	O	X	–	–	–	–	1-NO+1-NC	in parallel[1]	NO+NC	Right Left in parallel[1]	2 NO	in parallel[1]

4-Position Selector Switch

Operator Position					Non-Illuminated Only Cam #7 Type of Contact Block	Cam #7 Mounting Location Left-Right	Field Wired
Contact State	X	O	O	O	NC	Left	–
	O	O	X	O	NO	Left	–
	O	O	O	X	NC	Right	–
	O	X	O	O	NO	Right	–
	O	O	X	X	NO	Left	2-in parallel
					NC	Right	
	O	X	O	X	NO	Right	2-in parallel
					NC	Right	
	O	X	X	O	NO	Left	2-in parallel
					NO	Right	
	X	O	O	X	NC	Left	2-in parallel
					NC	Right	
	X	O	X	O	NO	Left	2-in parallel
					NC	Left	
	O	X	X	X	NO	Left	3-in parallel
					NO	Right	
					NC	Right	
	X	X	X	O	NO	Left	3-in parallel
					NC	Left	
					NO	Right	
	X	X	O	X	NC	Left	3-in parallel
					NO	Right	
					NC	Right	
	X	O	X	X	NO	Left	3-in parallel
					NC	Left	
					NC	Right	

X = Contact is closed.

O = Contact is open.

NO = Normally open contact.

NC = Normally closed contact.

– = This position is nonexistent or is a "pass-through" position with no detent to stop or hold the knob there.

[1]Field wired.

In the product number of a 3-position non-illuminated selector switch the fifth figure after the "104" is the cam code number.
Example: In CR104PSG3 **2** B91, the cam number is 2.

Note that an "open" position for an NO contact may **not** be a closed position for an NC contact at the same location and knob position. The cam may depress the contact plunger only halfway in that position.

Changing cams on operators is not recommended: but, changing contact blocks on operators per above chart may meet a special need.
Example: To provide both X O O and O X O operation, simply add a single-circuit NO contact block (L or R) to a CR104PSG3 **2** B01.

Heavy-Duty 30.5 mm Watertight/Oiltight Special Operators

CR104P

Joysticks
600 Volts max. AC/DC
10 Amperes Continuous

Suitable for use in NEMA Types 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance. Boot is nitride rubber, check for application suitability. For optional silicone boot, contact factory for availability. Nine-position selector switch contact rating is 10 Amperes at 125/150 Volts ac. Terminals are solder or quick connect type.

3-Position



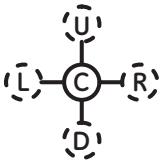
Position	Contact Block Left	Contact Block Right
R	X O	O X
C	–	–
L	O X	X O

Release Type	Product Number	List Price GO-10P1
Maintained	CR104PJJ31	**$142.20**
Momentary	CR104PJB31	**$142.20**
Maintained with mechanical interlock in center position	CR104PJJ31B	**$148.20**
Momentary with mechanical interlock in center position	CR104PJB31B	**$148.20**



Momentary

5-Position



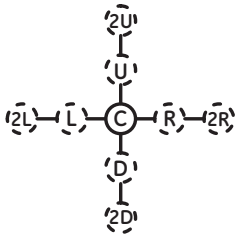
Position	Contact Block Left	Contact Block Right
U	X O	– –
R	– –	O X
C	– –	– –
D	O X	– –
L	– –	X O

Release Type	Product Number	List Price GO-10P1
Maintained	CR104PJC53	**$166.20**
Momentary	CR104PJD53	**$166.20**
Maintained with mechanical interlock in center position	CR104PJC53B	**$172.20**
Momentary with mechanical interlock in center position	CR104PJD53B	**$172.20**



Maintained

9-Position

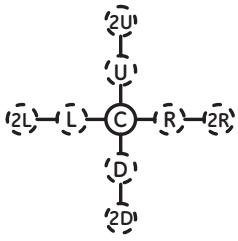


Pos.	Contact Block 1	2	3	4	5	6	7	8
2U	O X	O X	X O	X O	X O	X O	X O	X O
U	X O	O X	X O	X O	X O	X O	X O	X O
2R	X O	X O	X O	X O	O X	X O	X O	X O
R	X O	X O	X O	X O	X O	O X	X O	X O
C	X O	X O	X O	X O	X O	X O	X O	X O
D	X O	X O	O X	X O	X O	X O	X O	X O
2D	X O	X O	O X	O X	X O	X O	X O	X O
L	X O	X O	X O	X O	X O	X O	O X	X O
2L	X O	X O	X O	X O	X O	X O	O X	O X

Release Type	Product Number	List Price GO-10P1
Maintained	CR104PJL96	**$304.20**
Momentary	CR104PJM96	**$304.20**
Maintained with mechanical interlock in center position	CR104PJL96B	**$310.20**
Momentary with mechanical interlock in center position	CR104PJM96B	**$310.20**



Mechanical Interlock



Pos.	Contact Block 1	2	3	4	5	6	7	8
2U	O X	O X	X O	X O	X O	X O	X O	X O
U	X O	O X	X O	X O	X O	X O	X O	X O
2R	X O	X O	X O	X O	O X	X O	X O	X O
R	X O	X O	X O	X O	X O	O X	X O	X O
C	X O	X O	X O	X O	X O	X O	X O	X O
D	X O	X O	O X	X O	X O	X O	X O	X O
2D	X O	X O	X O	O X	X O	X O	X O	X O
L	X O	X O	X O	X O	X O	X O	O X	X O
2L	X O	X O	X O	X O	X O	X O	X O	O X

Release Type	Product Number	List Price GO-10P1
Maintained	CR104PJL97	**$304.20**
Momentary	CR104PJM97	**$304.20**
Maintained with mechanical interlock in center position	CR104PJL97B	**$310.20**
Momentary with mechanical interlock in center position	CR104PJM97B	**$310.20**



9-Position

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Special Operators

CR104P

Potentiometer Operators
600 Volts max. AC/DC
10 Amperes Continuous

Potentiometer operators are designed for 2-watt potentiometers with shafts 2" long and .25" in diameter. Potentiometers offered here fit that description and also are available as Clinostat model 380C1.

Suitable for use in NEMA Types 1, 3, 3R, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.

Potentiometer Operators

Ohms	Product Number	List Price GO-10P1
None (Operator Only)	CR104PXP	**$70.20**

Assembled Potentiometer Operators

Ohms	Product Number	List Price GO-10P1
100 Ohms	CR104PXP01	**$118.20**
250 Ohms	CR104PXP02	**$118.20**
500 Ohms	CR104PXP03	**$118.20**
1,000 Ohms	CR104PXP04	**$118.20**
2,500 Ohms	CR104PXP05	**$118.20**
5,000 Ohms	CR104PXP06	**$118.20**
10,000 Ohms	CR104PXP07	**$118.20**
25,000 Ohms	CR104PXP08	**$118.20**
50,000 Ohms	CR104PXP09	**$118.20**
100,000 Ohms	CR104PXP10	**$118.20**
250,000 Ohms	CR104PXP11	**$118.20**
500,000 Ohms	CR104PXP12	**$118.20**
1 million Ohms	CR104PXP13	**$118.20**
2.5 million Ohms	CR104PXP14	**$118.20**
5 million Ohms	CR104PXP15	**$118.20**



Potentiometer Operator

CR104P

Contact Blocks
600 Volts max. AC/DC
10 Amperes Continuous

Description

The basic contact block features one normally open/one normally closed (1NO-1NC) contact with a white plunger. There are two types of standard single contact blocks. One contains 1NC contact with a red plunger; the other contains 1NO contact with a green plunger.

Application

Gold flashed contacts are recommended for nonarcing, low-level loads (below 48 volts). All standard forms of the CR104P contact blocks are available with gold flashed contacts

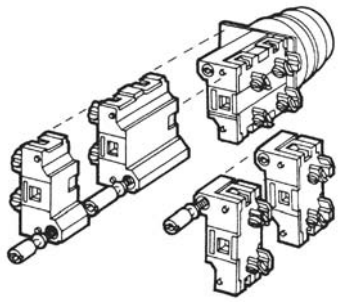
Logic reed contact blocks are specially suited for operations using low voltage levels (24 volts or below) typically available from programmable logic controls or computer systems. They are ideal for use in hostile environments at voltages up to 120 Vac.

Installing and Adding Blocks

A single captive screw, coupled with mating projections and recesses, connects each contact block to the operator or to another contact block, and it provides resistance to shock and vibration. These internally threaded screws make mounting to other blocks possible, allowing assembly of side-by-side and piggyback contact blocks. Depending on the capacity of the operator unit, it is possible to obtain a maximum of eight circuits (four on each side).

Connections

The terminal screws, equipped with captive saddle clamps, are mounted in offset positions to allow easy accessibility, even when installed with minimum center distance. You need only to strip the wire, place it under the saddle clamp, and tighten it to provide a positive, reliable connection. Standard and gold flashed contact blocks are supplied with IP10 back-of-hand protection to comply with UL508 Section 39A requirement for door mounted devices. Contact blocks are also available with IP20 finger safe protection.



Connections

Maximum Contacts

Operator	Single Current Blocks	Single Current Contacts	Double Circuit Blocks	Double Circuit Contacts
Non-illuminated selector switches (excluding 4-position)	6	6	6	12
Combination (push-turn)	6	6	6	12
Non-illuminated momentary push buttons (incl. mushroom-head)	8	8	4	8
Illuminated momentary push buttons	4	4	2	4
Push-to-latch/turn-to-release mushroom-head push buttons	4	4	4	8
Key push buttons	4	4	4	8
Illuminated selector switches	4	4	2	4
3-position & 5-position joysticks	4	4	4	8
Push-pull illuminated mushroom-head push buttons	2	2	2	4
Push-pull non-illuminated mushroom-head push buttons	2	2	2	4
Non-illuminated 4-position selector switches	—	—	2	4
Push-push illuminated push buttons	2	2	—	—

CR104P

Contact Blocks
600 Volts max. AC/DC
10 Amperes Continuous

Suitable for use in NEMA Types 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA Type 4X applications, protective caps will improve corrosion resistance.



Single-Circuit with Finger-Safe Terminals

Standard

Contact Configuration	Operating Plunger Color	Protection	Product Number	List Price GO-10P1
1NO-1NC	White	IP10 Back-of-Hand	CR104PXC91	**$18.00**
1NO	Green	IP10 Back-of-Hand	CR104PXC1	**$9.00**
1NC	Red	IP10 Back-of-Hand	CR104PXC01	**$9.00**
1NO (early close)	White	IP10 Back-of-Hand	CR104PXC10E[1]	**$9.00**
1NC (late open)	White	IP10 Back-of-Hand	CR104PXC01L[1]	**$9.00**
1NO	Green	IP20 Finger	CR104PXC1F	**$12.00**
1NC	Red	IP20 Finger	CR104PXC01F	**$12.00**
1NO (early close)	White	IP20 Finger	CR104PXC10EF	**$12.00**
1NC (late open)	White	IP20 Finger	CR104PXC01LF	**$12.00**

[1]Overlapping contacts can be achieved by combining CR104PXC10E , EF and CR104PXC01L, LF.

Gold Flashed

Contact Configuration	Operating Plunger Color	Protection	Product Number	List Price GO-10P1
1NO-1NC	White	IP10 Back-of-Hand	CR104PXC91G	**$36.00**
1NO	Green	IP10 Back-of-Hand	CR104PXC10G	**$18.00**
1NC	Red	IP10 Back-of-Hand	CR104PXC01G	**$18.00**
1NO (early close)	White	IP10 Back-of-Hand	CR104PXC10EG[2]	**$18.00**
1NC (late open)	White	IP10 Back-of-Hand	CR104PXC01LG[2]	**$18.00**
1NO	Green	IP20 Finger	CR104PXC10GF	**$21.00**
1NC	Red	IP20 Finger	CR104PXC01GF	**$21.00**
1NO (early close)	White	IP20 Finger	CR104PXC10EGF[2]	**$21.00**
1NC (late open)	White	IP20 Finger	CR104PXC01LGF[2]	**$21.00**

[2]Overlapping contacts can be achieved by combining CR104PXC10EG , EGF and CR104PXC01LG, LGF.



Single Circuit Contact Block

Reed Switch

Contact Configuration	Product Number[3]	List Price GO-10P1
1NO	CR104PXC10R	**$18.00**
1NC	CR104PXC01R	**$18.00**

[3]Sold as components only. Suitable for Class I, Group A,B,C and D, Div. 2, Class II Hazardous Locations; Groups F and G Hazardous Locations when installed in a NEMA Type 4 or 12 enclosure.

IP10 Guards For Contact Blocks

For Use With	Product Number[4]	List Price GO-10P1
1NO	CR104PXG117	**$0.50**
1NC	CR104PXG118	**$0.50**
1NO-1NC	CR104PXG119	**$0.75**

[4]Minimum order quantity is 10; package quantity is 10; multiple quantities is 10.



Double Circuit Contact Block

IP20 Guards For Contact Blocks

For Use With	Product Number	List Price GO-10P1
1NO	CR104PXG17	**$3.00**
1NC	CR104PXG18	**$3.00**
1NO-1NC	CR104PXG19	**$6.00**

Contact Ratings: Standard Blocks–AC Ratings, NEMA A600 Heavy Pilot Duty

Maximum Voltage	Continuous Current Amperes	AC Make Voltamperes @ 60/50 Hz[1]	AC Break Voltamperes @ 60/50 Hz[5]
600 VAC/DC	10	7200	720

[5]Maximum make and break currents are 60 and 6 amperes respectively for voltages of 120 and below.

Contact Ratings: Standard Blocks–DC Ratings, NEMA P600 Heavy Pilot Duty

Maximum Make or Break Amperes @ 125 VDC	Maximum Make or Break Amperes @ 250 VDC	Maximum Make 0r Break Amperes @ 600 VDC
1.1	0.55	0.2



Reed Switch Contact Block

Contact Ratings: Reed Switch Blocks

AC Operating Voltage	AC Maximum Continuous Current	AC Resistive VA	DC Operating Voltage	DC Maximum Continuous Current	DC Resistive Watts
2-120 VAC	.001-.15A	8 VA maximum	2-30 VDC	.001-.15A	4.5 Watts maximum

Nameplates: See pages 9-40 to 9-41
Technical Data: See pages 9-56 to 9-57
Product Number Selection Instructions: See pages 9-2

Lamps

Bulb Type	Voltage	Lamp Type	Description	Product Number	List Price GO-10P1
Incandescent with bayonet base	6V	No. 755 Lamp	Transformers and Full-voltage	CR104PXA16	**$3.00**
Incandescent with bayonet base	12V	No. 756 Lamp	Full-voltage	CR104PXA12	**$3.00**
Incandescent with bayonet base	24V	No. 1819 Lamp	Full-voltage	CR104PXA14	**$3.00**
Incandescent with bayonet base	130V		Full-voltage	CR104PXA54	**$3.00**
Incandescent with telephone slide base	120V	No. 120PSB Lamp	Full-voltage, 240 V Resistor	CR104PXA52[1]	**$3.00**
Incandescent with bayonet base	60V	No. 1835 Lamp	120V Resistor	CR104PXA15	**$3.00**
Incandescent Flasher with bayonet base	6V	No. 267 Lamp	Full-voltage	CR104PXA16F	**$6.00**
Incandescent with screw base	6V	No. 1768 Lamp	Cluster light	CR104PXA26	**$3.00**
Incandescent with screw base	12V	No. 373 Lamp	Cluster light	CR104PXA22	**$3.00**
Incandescent with screw base	24V	No. 399 Lamp	Cluster light	CR104PXA24	**$3.00**
Neon with bayonet base	120V	No. NE51H-R Lamp		CR104PXA19	**$3.00**



Lamps

Lamps

Bulb Type	Voltage	Lamp Type	Product Number	List Price GO-10GC
LED with bayonet base	6 VAC/DC	Flat Top; replaces No. 755 Lamp	080BA9S6L*	**$18.00**
LED with bayonet base	12 VAC/DC	Flat Top	080BA9S12L*	**$18.00**
LED with bayonet base	24 VAC/DC	Flat Top	080BA9S24L*	**$18.00**
LED with bayonet base	48 VAC/DC	Flat Top	080BA9S48L*	**$18.00**
LED with bayonet base	120 VAC/DC	Flat Top	080BA9S120L*	**$18.00**

*Insert LED color from table.

LED Colors

Colors	Red	Green	Yellow	Orange	White	Blue
*Color code	R	V	G	A	B	L

[1]For replacement only **(GO-11GS).**

Mushroom-Head Caps

Mushroom-Head Cap Diameter	Depth (max. projection front of panel)	Color	Illumination	For Use With	Product Number	List Price GO-10P1
1-3/8" (34.9 mm)	1.10" (27.9 mm)	Black	Non-Illuminated	Standard operators	CR104PXM03B	**$6.00**
1-3/8" (34.9 mm)	1.10" (27.9 mm)	Red	Non-Illuminated	Standard operators	CR104PXM03R	**$6.00**
1-3/8" (34.9 mm)	1.10" (27.9 mm)	Yellow	Non-Illuminated	Standard operators	CR104PXM03E	**$6.00**
1-3/8" (34.9 mm)	1.10" (27.9 mm)	Green	Non-Illuminated	Standard operators	CR104PXM03G	**$6.00**
1-3/8" (34.9 mm)	1.10" (27.9 mm)	Red	Non-Illuminated	Push-turn operators	CR104PXM04R	**$6.00**
2-3/8" (60.3 mm)	1.10" (27.9 mm)	Black	Non-Illuminated	Standard operators	CR104PXM06B	**$6.00**
2-3/8" (60.3 mm)	1.10" (27.9 mm)	Red	Non-Illuminated	Standard operators	CR104PXM06R	**$6.00**
2-3/8" (60.3 mm)	1.10" (27.9 mm)	Yellow	Non-Illuminated	Standard operators	CR104PXM06E	**$6.00**
2-3/8" (60.3 mm)	1.10" (27.9 mm)	Green	Non-Illuminated	Standard operators	CR104PXM06G	**$6.00**
1 3/8" (34.9 mm)	1.20" (30.5 mm)	Red	Illuminated	Standard operators	CR104PXL06R	**$4.20**
1 3/8" (34.9 mm)	1.20" (30.5 mm)	Yellow	Illuminated	Standard operators	CR104PXL06E	**$4.20**
1 3/8" (34.9 mm)	1.20" (30.5 mm)	Green	Illuminated	Standard operators	CR104PXL06G	**$4.20**
1 3/8" (34.9 mm)	1.20" (30.5 mm)	Blue	Illuminated	Standard operators	CR104PXL06L	**$4.20**
1 3/8" (34.9 mm)	1.20" (30.5 mm)	Amber	Illuminated	Standard operators	CR104PXL06M	**$4.20**
1 3/8" (34.9 mm)	1.20" (30.5 mm)	White	Illuminated	Standard operators	CR104PXL06W	**$4.20**
1 3/8" (34.9 mm)	1.20" (30.5 mm)	Clear	Illuminated	Standard operators	CR104PXL06C	**$4.20**
2 3/8" (60.3 mm)	1.20" (30.5 mm)	Red	Non-Illuminated	Key operated	CR104PXM08R	**$6.00**
1.58" (40.1 mm)	1.58" (40.1 mm)	Black	Non-Illuminated	CR104PTY protected operators	CR104PTYZ152	**$6.00**
1.58" (40.1 mm)	1.58" (40.1 mm)	Red	Illuminated, Non-Illuminated	CR104PTY protected operators	CR104PTYZ153	**$6.00**
1.58" (40.1 mm)	1.58" (40.1 mm)	Orange	Illuminated, Non-Illuminated	CR104PTY protected operators	CR104PTYZ154	**$6.00**
1.58" (40.1 mm)	1.58" (40.1 mm)	Yellow	Illuminated, Non-Illuminated	CR104PTY protected operators	CR104PTYZ155	**$6.00**
1.58" (40.1 mm)	1.58" (40.1 mm)	Green	Illuminated, Non-Illuminated	CR104PTY protected operators	CR104PTYZ156	**$6.00**
1.58" (40.1 mm)	1.58" (40.1 mm)	Blue	Illuminated, Non-Illuminated	CR104PTY protected operators	CR104PTYZ157	**$6.00**
1.58" (40.1 mm)	1.58" (40.1 mm)	White	Illuminated, Non-Illuminated	CR104PTY protected operators	CR104PTYZ158	**$6.00**



CR104PXM03* Mushroom-Head, 1 3/8" dia.



CR104PXM06* Mushroom-Head, 2 3/8" dia.



CR104PXL06*
Mushroom-Head, 1 3/8" dia., Illuminated



CR104XM08R
2 3/8" dia., for Key-Operated Push Buttons



CR104PTZ15* Replacement heads for protected Mushroom-Heads

Heavy-Duty 30.5 mm Watertight/Oiltight Accessories

CR104P

Accessories, Components and Kits
600 Volts max. AC/DC
10 Amperes Continuous



CR104PXM02* Non-Illuminated Knob



CR104PXL03* Illuminated Knob



CR104PXL05* Push Button Lens



CR104PXL01* Standard Pilot Light Lens



CR104PXL07* Push-to-Test Pilot Light Lens



CR104XL02* Cluster Type Lens and Divider

Selector Switch Knobs

Depth (max. projection front of panel)	Color	Illumination	Product Number	List Price GO-10P1
1.16" (29.5 mm)	Black	Non-Illuminated	CR104PXM02B	**$.75**
1.16" (29.5 mm)	Red	Non-Illuminated	CR104PXM02R	**$.75**
1.16" (29.5 mm)	Yellow	Non-Illuminated	CR104PXM02E	**$.75**
1.16" (29.5 mm)	Green	Non-Illuminated	CR104PXM02G	**$.75**
1.16" (29.5 mm)	Blue	Non-Illuminated	CR104PXM02L	**$.75**
1.11" (28.2 mm)	Red	Illuminated	CR104PXL03R	**$4.20**
1.11" (28.2 mm)	Yellow	Illuminated	CR104PXL03E	**$4.20**
1.11" (28.2 mm)	Green	Illuminated	CR104PXL03G	**$4.20**
1.11" (28.2 mm)	Blue	Illuminated	CR104PXL03L	**$4.20**
1.11" (28.2 mm)	Amber	Illuminated	CR104PXL03M	**$4.20**
1.11" (28.2 mm)	White	Illuminated	CR104PXL03W	**$4.20**
1.11" (28.2 mm)	Clear	Illuminated	CR104PXL03C	**$4.20**

Lenses

Depth (max. projection front of panel)	Color	Illumination	For use with	Product Number	List Price GO-10P1
1.20" (30.5 mm)	Red	Illuminated	Push Buttons	CR104PXL05R	**$4.20**
1.20" (30.5 mm)	Yellow	Illuminated	Push Buttons	CR104PXL05E	**$4.20**
1.20" (30.5 mm)	Green	Illuminated	Push Buttons	CR104PXL05G	**$4.20**
1.20" (30.5 mm)	Blue	Illuminated	Push Buttons	CR104PXL05L	**$4.20**
1.20" (30.5 mm)	Amber	Illuminated	Push Buttons	CR104PXL05M	**$4.20**
1.20" (30.5 mm)	White	Illuminated	Push Buttons	CR104PXL05W	**$4.20**
1.20" (30.5 mm)	Clear	Illuminated	Push Buttons	CR104PXL05C	**$4.20**
0.92" (23.4 mm)	Red		Standard Pilot Lights	CR104PXL01R	**$4.20**
0.92" (23.4 mm)	Yellow		Standard Pilot Lights	CR104PXL01E	**$4.20**
0.92" (23.4 mm)	Green		Standard Pilot Lights	CR104PXL01G	**$4.20**
0.92" (23.4 mm)	Blue		Standard Pilot Lights	CR104PXL01L	**$4.20**
0.92" (23.4 mm)	Amber		Standard Pilot Lights	CR104PXL01M	**$4.20**
0.92" (23.4 mm)	White		Standard Pilot Lights	CR104PXL01W	**$4.20**
0.92" (23.4 mm)	Clear		Standard Pilot Lights	CR104PXL01C	**$4.20**
1.20" (30.5 mm)	Red		Push-to-test Pilot Lights	CR104PXL07R	**$4.20**
1.20" (30.5 mm)	Yellow		Push-to-test Pilot Lights	CR104PXL07E	**$4.20**
1.20" (30.5 mm)	Green		Push-to-test Pilot Lights	CR104PXL07G	**$4.20**
1.20" (30.5 mm)	Blue		Push-to-test Pilot Lights	CR104PXL07L	**$4.20**
1.20" (30.5 mm)	Amber		Push-to-test Pilot Lights	CR104PXL07M	**$4.20**
1.20" (30.5 mm)	White		Push-to-test Pilot Lights	CR104PXL07W	**$4.20**
1.20" (30.5 mm)	Clear		Push-to-test Pilot Lights	CR104PXL07C	**$4.20**

Lens and Divider

Color	For use with	Product Number	List Price GO-10P1
White	Cluster Type Pilot Lights	CR104PXL02W	**$5.70**
White	Cluster Type Pilot Lights	CR104PXL04W	**$5.70**

CR104P

Accessories, Components and Kits
600 Volts max. AC/DC
10 Amperes Continuous

Protective Caps

Description	Protective Caps Material	Color	Package Quantity	Product Number	List Price GO-10P1
Lever for combination (push/turn) units				CR104PXM07	**$6.00**
Protective cap for standard push button	Neoprene rubber	Black		CR104PXB01B[1]	**$12.00**
Protective cap for standard push button	Neoprene rubber	Red		CR104PXB01R[1]	**$12.00**
Protective cap for standard push button	Neoprene rubber	Yellow		CR104PXB01E[1]	**$12.00**
Protective cap for standard push button	Neoprene rubber	Green		CR104PXB01G[1]	**$12.00**
Protective cap for standard push button	Silicone	Transparent		CR104PXB01C[1]	**$12.00**
Protective cap for illuminated push button or push-to-test pilot light	Silicone	Transparent		CR104PXB02C[1]	**$18.00**
Protective cap for knob-operated selector switches	Neoprene rubber with transparent actuator	Black		CR104PXB03C[1]	**$12.00**
Protective cap for lever-operated selector switches	Neoprene rubber	Black		CR104PXB04B[1]	**$12.00**
Painted plug for unused mounting hole				CR104PXG103[2]	**$6.00**
Chrome plated plug for unused mounting hole				CR104PXG113[3]	**$6.00**
Color cap kits for standard push buttons		1 Each: Red, Green, Yellow, Black	Pkg. of 4	CR104PXM01U	**$1.50 per package**
Color cap kits for standard push buttons		1 Each: Brown, Blue, Orange, White	Pkg. of 4	CR104PXM01V	**$1.50 per package**
Color cap kits for standard push buttons		Black	Pkg. of 10	CR104PXM01B[4]	**$.30**
Color cap kits for standard push buttons		Red	Pkg. of 10	CR104PXM01R[4]	**$.30**
Color cap kits for standard push buttons		Yellow	Pkg. of 10	CR104PXM01E[4]	**$.30**
Color cap kits for standard push buttons		Green	Pkg. of 10	CR104PXM01G[4]	**$.30**
Color cap kits for standard push buttons		White	Pkg. of 10	CR104PXM01W[4]	**$.30**
Color cap kits for standard push buttons		Blue	Pkg. of 10	CR104PXM01L[4]	**$.30**
Color cap kits for standard push buttons		Orange	Pkg. of 10	CR104PXM01M[4]	**$.30**
Color cap kits for standard push buttons		Clear	Pkg. of 10	CR104PXM01C[4]	**$.30**
Color cap kits for standard push buttons		Brown	Pkg. of 10	CR104PXM01N[4]	**$.30**

[1]Replaces octagonal ring.
[2]Recommended for use on painted steel enclosures.
[3]Recommended for use on stainless steel enclosures.
[4]This price per each, packaged in quantities of 10 of one color. Must be ordered in multiples of 10.



CR104PXM07
Lever for Combination (push/turn) Units



CR104PXB01*
For Standard Push Button



CR104PXB02C For Illuminated or Push-to-Test Push Button



CR104PXB03C
For Knob-Operated Selector Switches



CR104PXB04B
For Lever-Operated Selector Switches



CR104PXG1_3
Plug for Unused Mounting Hole



CR104PXM01*
Color Cap Kits for Standard Push Buttons

CR104P

Accessories, Components and Kits
600 Volts max. AC/DC
10 Amperes Continuous

Mushroom-Head Guards

Mushroom-Head Cap Diameter	Depth (max. projection front of panel)	Product Number	List Price GO-10P1
1 3/8", OD = 1.66" (42.2 mm)	1.38" (35.1 mm)	CR104PXG14	**$24.00**
2 3/8", OD = 2.64" (67.1 mm)	1.38" (35.1 mm)	CR104PXG15	**$24.00**



CR104PXG14 Mushroom-Head Guard

Cluster-Type Pilot Light Boots

Color	Package Quantity	Product Number	List Price GO-10P1
Yellow	4	CR104PXL08E[1]	**$0.37**
Green	4	CR104PXL08G[1]	**$0.37**
Blue	4	CR104PXL08L[1]	**$0.37**
Red	4	CR104PXL08R[1]	**$0.37**
1 Each: Yellow, Green, Blue, Red	Four, 1 each color	CR104PXL08T	**$1.50 per package**

[1]This price per each, packaged in quantities of 4. Must be ordered in multiples of 4.



CR104PXL08* Cluster Light Boots

Octagonal Operator Mounting Rings

For use with	Depth (max. projection front of panel)	Description	Product Number	List Price GO-10P1
Standard Flush Push Buttons, Push-to-test Pilot Lights, Mushroom-Head Push Buttons			CR104PXG01	**$1.20**
Extended Push Buttons, Key-Operated Push Buttons, Push-to-latch/turn-to-release Push Buttons			CR104PXG02	**$1.20**
Recessed Push Buttons	0.71" (19.0 mm)		CR104PXG03	**$1.20**
Guarded Illuminated Push Buttons	1.20" (30.5 mm)		CR104PXG04	**$6.00**
Combination (push/turn) Units			CR104PXG06	**$1.80**
Non-illuminated Selector Switches, Joysticks, Potentiometer Operators			CR104PXG07	**$1.20**
Standard Pilot Lights, Illuminated Selector Switches			CR104PXG08	**$1.20**
Cluster Pilot Lights (2- and 4-lamp)			CR104PXG09	**$1.20**
Octagonal Rings		CR104P octagonal ring wrench	CR104PXG104	**$18.00**



CR104PXG01 Octagonal Mounting Ring for Standard Flush and Mushroom-Head Push Buttons, and Push to Test Pilot Lights



CR104PXG04 Octagonal Mounting Ring for Guarded Illuminated Push Buttons

Stainless Steel Flush Plate

Package Quantity	Product Number	List Price GO-10P8
1	CR2940BD201D	**$18.00**



CR104PXG07 Octagonal Mounting Ring for Non-Illuminated Selector Switches, Joysticks and Potentiometer Operators



CR104PXG104 Octagonal Ring Wrench

CR104P

Accessories, Components and Kits
600 Volts max. AC/DC
10 Amperes Continuous

Keys

Description	For use with	Product Number	List Price GO-10P1
Spare standard cylinder lock key	Key-Operated Selection Switches	CR104PXK95	**$3.60**
Spare CH501 cylinder lock key	Key-Operated Selection Switches	CR104PXK51	**$3.60**
1.5 mm hex key	Push-turn Switch Levers	CR104PXG107	**$1.50**
2.0 mm hex key	Standard Push Buttons, Push-turn Mushroom-head Push Buttons	CR104PXG108	**$1.50**
2.5 mm hex key	Potentiometer Operators, Push-turn Mushroom-head Push Buttons	CR104PXG109	**$1.50**

Display Panels

Description	Product Number	List Price GO-10P1
Assembled display panel- 4 operators	CR104PD001B	**$130.00**
Assembled display panel - 12 operators	CR104PD001A	**$300.00**

Terminals

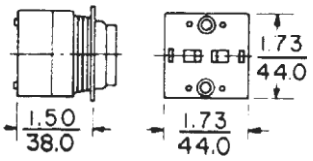
Description	Product Number	List Price GO-10P1
100 quick-connect terminals For 9-position joystick contact blocks	CR104PXG102	**$68.40**

Modification Kits

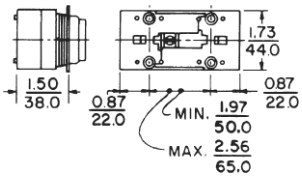
Kit Type	Description	Product Number	List Price GO-10P1
Push-on/Push-off	Converts standard momentary operator to push-on/push-off	CR104PXF11[1,2]	**$18.00**
Maintained Mechanical Latch for Two Push Buttons	Makes one standard or 1 3/8" mushroom-head push button a latch, another a release	CR104PXF21[2]	**$18.00**
Mechanical Interlock	Prevents simultaneous operation Prevents simultaneous operation	CR104PXF23[2]	**$18.00**
Push-pull	Converts momentary mushroom-head push button to push-to-latch/pull-to-release	CR104PXF12[2]	**$18.00**
Lockout Attachment	Padlockable device to hold standard flush or extended push button in depressed position	CR104PXG13	**$18.00**
Locking Cover	Padlockable clear cover for standard knob-operated selector switch	CR104PXG16	**$18.00**

[1]This kit can only be used with CR104PXC01 (NC) and/or CR104PXC10E (NO early closing contact blocks).
[2]Not for use with illuminated forms.

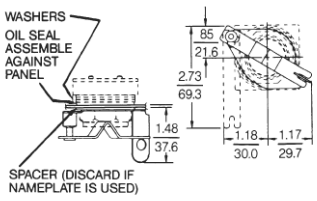
Outlines, Dimensions (in. / mm) (For Estimating Only)



CR104PXF11, CR104PXF12
Modification Kit



CR104PXF21, CR104PXF23
Modification Kit



CR104PXG13
Modification Kit



CR104PD001A Display Panel
- 12 Operators



CR104PXF11 Modification Kit
- Push on/Push off



CR104PXF21 Modification Kit -
Maintained Mech. Latch for
2 Push Buttons



CR104PXG13 Lockout Attachment



CR104PXG16 Locking Cover

Publications and Reference: See Section 17 for a complete list of additional product-related publications

CR104P

Nameplates and Legend Inserts
600 Volts max. AC/DC
10 Amperes Continuous

Nameplates–Standard Lithographed

Unless otherwise indicated, all nameplates are black and available in Sizes 1-3 only. To select size, replace asterisk (*) in product number with appropriate digit from Sizes table.

Nameplate Marking	Product Number	List Price GO-10P1
Blank (Sizes 1-5)	CR104PXN*B	$1.80
Blank (Red, sizes 1-5)	CR104PXN*R	$1.80
Blank (with round)	CR104PXN6E	$2.50
CLOSE	CR104PXN*BP006	$1.80
DECREASE	CR104PXN*BP007	$1.80
DOWN	CR104PXN*BP008	$1.80
EMERGENCY STOP (Red)	CR104PXN*RP009	$1.80
FAST	CR104PXN*BP010	$1.80
FORWARD	CR104PXN*BP011	$1.80
HIGH	CR104PXN*BP012	$1.80
IN	CR104PXN*BP013	$1.80
INCH	CR104PXN*BP014	$1.80
INCREASE	CR104PXN*BP017	$1.80
JOG	CR104PXN*BP018	$1.80
JOG FORWARD	CR104PXN*BP019	$1.80
JOG REVERSE	CR104PXN*BP020	$1.80
LEFT	CR104PXN*BP021	$1.80
LOW	CR104PXN*BP022	$1.80
LOWER	CR104PXN*BP023	$1.80
OFF	CR104PXN*BP024	$1.80
ON	CR104PXN*BP025	$1.80
OPEN	CR104PXN*BP026	$1.80
OUT	CR104PXN*BP027	$1.80
POWER ON	CR104PXN*BP084	$1.80
RAISE	CR104PXN*BP028	$1.80
RESET	CR104PXN*BP030	$1.80
RETURN	CR104PXN*BP031	$1.80
REVERSE	CR104PXN*BP032	$1.80
RIGHT	CR104PXN*BP033	$1.80
RUN	CR104PXN*BP034	$1.80
SLOW	CR104PXN*BP036	$1.80
START	CR104PXN*BP037	$1.80
START CYCLE	CR104PXN*BP038	$1.80
STOP (Red)	CR104PXN*RP040	$1.80
STOP CYCLE (Red)	CR104PXN*RP041	$1.80
TEST	CR104PXN*BP043	$1.80
UP	CR104PXN*BP047	$1.80
EMERGENCY STOP PULL TO TEST (Red)	CR104PXN*RP048	$1.80
PUSH TO STOP PULL TO START	CR104PXN*BP085	$1.80
FOR REV	CR104PXN*BP050	$1.80
HAND AUTO	CR104PXN*BP051	$1.80
HIGH LOW	CR104PXN*BP052	$1.80
JOG RUN	CR104PXN*BP053	$1.80
LEFT RIGHT	CR104PXN*BP054	$1.80
LOW HIGH	CR104PXN*BP055	$1.80
LOWER RAISE	CR104PXN*BP056	$1.80
OFF ON	CR104PXN*BP057	$1.80
OPEN CLOSE	CR104PXN*BP058	$1.80
RAISE LOWER	CR104PXN*BP059	$1.80
REV FOR	CR104PXN*BP060	$1.80
RUN JOG	CR104PXN*BP061	$1.80
SAFE RUN	CR104PXN*BP062	$1.80
SAFE STOP RUN	CR104PXN*BP063	$1.80
SLOW FAST	CR104PXN*BP064	$1.80
START JOG	CR104PXN*BP087	$1.80
START STOP	CR104PXN*BP086	$1.80
STOP START	CR104PXN*BP065	$1.80
UP DOWN	CR104PXN*BP066	$1.80
OFF COOLANT ON	CR104PXN*BP067	$1.80
AUTO OFF-HAND	CR104PXN*BP083	$1.80
FOR OFF REV	CR104PXN*BP068	$1.80
FOR STOP REV	CR104PXN*BP069	$1.80
HAND OFF AUTO	CR104PXN*BP070	$1.80
JOG OFF RUN	CR104PXN*BP071	$1.80
JOG SAFE RUN	CR104PXN*BP072	$1.80
LOW OFF HIGH	CR104PXN*BP073	$1.80
LOWER OFF RAISE	CR104PXN*BP074	$1.80
MAN OFF AUTO	CR104PXN*BP076	$1.80
OPEN OFF CLOSE	CR104PXN*BP077	$1.80
REV OFF FOR	CR104PXN*BP079	$1.80
SLOW OFF FAST	CR104PXN*BP080	$1.80
SLOW STOP FAST	CR104PXN*BP081	$1.80
POTENTIOMETER MARKINGS	CR104PXN*BP082	$1.80
OFF AUTO	CR104PXN1BP090	$1.80
ON OFF AUTO	CR104PXN1BP091	$1.80
PUSH TO STOP - TURN TO RESET (Round w/Yellow Background)	CR104PXN6EP092	$2.50
Yellow Background Emergency Stop	CR104PXN6EP009	$2.50

Sizes*

Nameplate	Dimensions (H x W, Inches)	*Product No. Digit
Standard (Size 1)	1.98 x 1.93	1
Large (Size 2)	1.98 x 2.63	2
Extra-large, automotive (Size 3)	2.40 x 2.44	3[1]
Small joystick (Size 4; available for XN*R and XN*B only)	2.32 x 2.32	4[1]
Large joystick (Size 5; available for XN*R and XN*B only)	2.92 x 2.92	5[1]

[1]These nameplates do not fit standard enclosures.



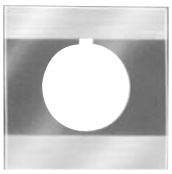
Standard (Size 1)



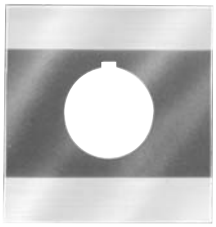
Large (Size 2)



Extra-large Automotive (Size 3)



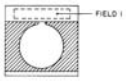
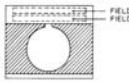
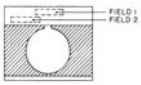
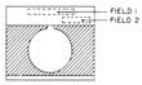
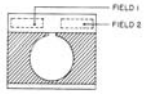
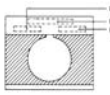
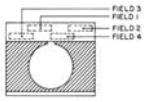
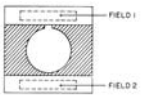
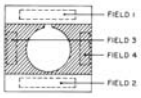
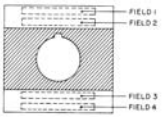
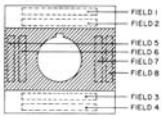
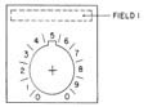
Small Joystick (Size 4; available for XN*R and XN*B only)



Large Joystick (Size 5; available for XN*R and XN*B only)

Nameplates–Nonstandard Engraved

Note limitations on number of characters per field. Specify marking desired, by field, for each nameplate ordered. To select color, replace asterisk (*) in product number with **B** for black field and letters and with **R** for red field and letters. For overall dimensions by nameplate size, see Sizes table, page 9-40.

Style	Nameplate Size	Max. Characters per Field	Product Number	List Price GO-10P1
	1	Field 1: 13	CR104PXN1*B001	**$7.80**
	2	Field 1: 16	CR104PXN2*B001	**$7.80**
	3	Field 1: 10	CR104PXN3*B001	**$7.80**
	1	Fields 1-2: 13	CR104PXN1*C001	**$7.80**
	2	Fields 1-2: 15	CR104PXN2*C001	**$7.80**
	3	Fields 1-2: 10	CR104PXN3*C001	**$7.80**
	1	Field 1: 13; Field 2: 7	CR104PXN1*D001	**$7.80**
	2	Field 1: 15; Field 2: 8	CR104PXN2*D001	**$7.80**
	3	Field 1: 10; Field 2: 5	CR104PXN3*D001	**$7.80**
	1	Field 1: 13; Field 2: 7	CR104PXN1*E001	**$7.80**
	2	Field 1: 15; Field 2: 8	CR104PXN2*E001	**$7.80**
	3	Field 1: 10; Field 2; 5	CR104PXN3*E001	**$7.80**
	1	Fields 1-2: 7	CR104PXN1*F001	**$7.80**
	2	Fields 1-2: 8	CR104PXN2*F001	**$7.80**
	3	Fields 1-2: 5	CR104PXN3*F001	**$7.80**
	1	Field 1: 13; Fields 2-3: 7	CR104PXN1*G001	**$7.80**
	2	Field 1: 15; Fields 2-3: 8	CR104PXN2*G001	**$7.80**
	3	Field 1: 10; Fields 2-3: 5	CR104PXN3*G001	**$7.80**
	1	Fields 1-4: 5	CR104PXN1*H001	**$7.80**
	2	Fields 1-4: 6	CR104PXN2*H001	**$7.80**
	3	Fields 1-4: 4	CR104PXN3*H001	**$7.80**
	4	Fields 1-2: 16	CR104PXN4*J001	**$7.80**
	4	Fields 1-2: 16; Fields 3-4: 8	CR104PXN4*K001	**$7.80**
	5	Fields 1-4: 18	CR104PXN5*L001	**$7.80**
	5	Fields 1-4: 18; Fields 5-8: 11	CR104PXN5*M001	**$7.80**
	1	Field 1: 13	CR104PXN1*N001	**$7.80**
	2	Field 1: 16	CR104PXN2*N001	**$7.80**
	3	Field 1: 10	CR104PXN3*N001	**$7.80**

Legend Inserts

Legend insert kits for standard push buttons with clear caps feature three 2-sided inserts per kit.

Product Number	List Price GO-10P1
CR104PXG101	**$1.80**

Insert	Side 1	Side 2
1		
2		
3		

Legend Inserts

Heavy-Duty 30.5 mm Watertight/Oiltight Kitted Operators

CR104P

Hot Buttons
Push Buttons
600 Volts max. AC/DC
10 Amperes Continuous

Description

Hot Buttons make it easier and faster than ever for you to get the most popular push buttons, pilot lights and selector switches. GE has taken its proven CR104P Heavy-Duty Oiltight push buttons, matched them with their logical and most often-used contacts and nameplates, and put them together. One product number, one box, one price.

Standard Flush Non-Illuminated

Contact Configuration	Marking	Color	Product Number	List Price GO-10P1
1NO	START	1 Each: Red, Green, Yellow, Black	CR104PBG10U1A1	**$27.00**
1NO	RUN	1 Each: Red, Green, Yellow, Black	CR104PBG10U1A2	**$27.00**
1NO	ON	1 Each: Red, Green, Yellow, Black	CR104PBG10U1A3	**$27.00**
1NC	STOP	1 Each: Red, Green, Yellow, Black	CR104PBG01U1A1	**$27.00**
1NC	OFF	1 Each: Red, Green, Yellow, Black	CR104PBG01U1A2	**$27.00**

Standard Extended Illuminated

Guard	Contact Configuration	Marking	Color	Voltage	Product Number	List Price GO-10P1
with Guard	1NO-1NC	START	Green	Transformer 120V	CR104PBT11G3S2A1	**$90.00**
with Guard	1NO-1NC	RUN	Green	Transformer 120V	CR104PBT11G3S2A2	**$90.00**
with Guard	1NO-1NC	ON	Green	Transformer 120V	CR104PBT11G3S2A3	**$90.00**
with Guard	1NO-1NC	STOP	Red	Transformer 120V	CR104PBT11R3S2A1	**$90.00**
with Guard	1NO-1NC	OFF	Red	Transformer 120V	CR104PBT11R3S2A2	**$90.00**

Mushroom-Head Non-Illuminated

Head Size	Contact Configuration	Marking	Color	Product Number	List Price GO-10P1
1 3/8" dia.	1NC	EMERGENCY STOP	Red	CR104PBM01R5A	**$63.00**

Special Function Non-Illuminated

Special Function Type	Contact Configuration	Marking	Color	Product Number	List Price GO-10P1
Push-Pull	1NC	PUSH TO STOP PULL TO START	Red	CR104PBM01R5CA1	**$63.00**
Push-Pull	1NC	EMERGENCY STOP	Red	CR104PBM01R5CA2	**$63.00**
Push-Turn-to-Release	1NC	EMERGENCY STOP	Red	CR104PTR20A0R01A	**$63.00**

Special Function Illuminated

Special Function Type	Contact Configuration	Marking	Color	Voltage	Product Number	List Price GO-10P1
Push-Pull	1NO-1NC	PUSH TO STOP PULL TO START	Red	Transformer 120 V	CR104PBT11R5C2A1	**$102.00**
Push-Pull	1NO-1NC	EMERGENCY STOP	Red	Transformer 120 V	CR104PBT11R5C2A2	**$102.00**



Standard Non-Illuminated Push Button



Standard Illuminated Push Button with Guard



Mushroom-Head Non-Illuminated Push Button



Mushroom-Head Non-Illuminated Push-Pull Push Button



Mushroom-Head Non-Illuminated Push-Turn-to-Release Push Button



Mushroom-Head Illuminated Push-Pull Push Button

Heavy-Duty 30.5 mm Watertight/Oiltight Kitted Operators

CR104P

Hot Buttons
600 Volts max. AC/DC
10 Amperes Continuous

Knob Selector Switches

Position Type	Marking	Contact Configuration	Product Number	List Price GO-10P1
2-Position Maintained	OFF-ON	1NO-1NC	CR104PSG21B91A	**$42.00**
3-Position Maintained	HAND-OFF-AUTO	1NO-1NC	CR104PSG34B91A	**$42.00**



2-Position Maintained Selector Switch

Standard Pilot Lights

Power Supply Type	Supply Voltage	Lamp Type	Marking	Color	Product Number	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	ON	Red	CR104PLG32RA1	**$66.00**
Full Voltage	120V 50/60 Hz	Incand., 130V	ON	Red	CR104PLG22RA1	**$54.00**
Transformer	120V 50/60 Hz	Incand., 6V, #755	OFF	Red	CR104PLG32RA2	**$66.00**
Full Voltage	120V 50/60 Hz	Incand., 130V	OFF	Red	CR104PLG22RA2	**$54.00**
Transformer	120V 50/60 Hz	Incand., 6V, #755	OFF	Green	CR104PLG32GA2	**$66.00**
Full Voltage	120V 50/60 Hz	Incand., 130V	OFF	Green	CR104PLG22GA2	**$54.00**
Transformer	120V 50/60 Hz	Incand., 6V, #755	ON	Green	CR104PLG32GA1	**$66.00**
Full Voltage	120V 50/60 Hz	Incand., 130V	ON	Green	CR104PLG22GA1	**$54.00**



3-Position Maintained Selector Switch

Push to Test Pilot Lights

Power Supply Type	Supply Voltage	Lamp Type	Contact Configuration	Marking	Color	Product Number	List Price GO-10P1
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NO-1NC	ON	Red	CR104PLT32RA	**$84.00**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NO-1NC	ON	Red	CR104PLT22RA	**$72.00**
Transformer	120V 50/60 Hz	Incand., 6V, #755	1NO-1NC	OFF	Green	CR104PLT32GA	**$84.00**
Full Voltage	120V 50/60 Hz	Incand., 130V	1NO-1NC	OFF	Green	CR104PLT22GA	**$72.00**



Standard Pilot Light

Hot Buttons Display Rack

This convenient display allows Hot Buttons to be easily selected. The display may be a freestanding counter display or may be hung on the wall. The display (28"W x 15"H x 5"D) allows the distributor to showcase Hot Buttons to the customer and makes easy selection of the desired function. The display has a clear front, which allows ready view for stock replenishment. Also included are an attractive poster and a counter literature rack with promotional leaflets.

Product Number	List Price GO-10P1
CR104PHBDISPLAY	**$200.00**



Press-to-Test Pilot Light



Hot Buttons Display Rack

Publications and Reference: See Section 17 for a complete list of additional product-related publications

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Technical Data
600 Volts Max. AC/DC
10 Amperes Continuous

General Specifications

Standards and Approvals	UL Listed—File Number E2403 C-UL-CSA Cert. LR—15492 NEMA—ICS2—1988, IEC 947.5.1, VDE 0660
Enclosure Ratings	All units are suitable for use in NEMA Type 1, 3, 3R, 4, 4X, 12, and 13 applications when mounted in enclosures rated for those same applications. For some NEMA 4X applications, protective caps will provide improved corrosion resistance.
Finger Protection at Terminals	IP2X according to IEC 529 Terminal identification per CENELEC EN 50013
Operating temperature range	–25° to +70°C, –13° to +158°F
Storage Temperature Range	–40° to +70°C, –40° to +158°F

Climate Specs

Climate Type	Temperature	Relative Humidity
Temperate	74°F (23°C)	50%
Wet	74°F (23°C)	83%
Hot Wet	104°F (40°C)	92%
Variable Wet	74° to 104°F (23° to 40°C)	83%-92%

Resistance to Shock	50g, 11ms
Frequency Range	1-100 Hz
Vibration Amplitude	1-13.2 Hz—displacement ±1mm, 13.2-100 Hz—acceleration ±0.7g
Operating Force Without Contact Blocks - Recessed	1.625 lb./f.
Operating Force Without Contact Blocks Flush	2.5 lb./f.
Operating Force With 1 NO Contact Block - Recessed	2.5 lb./f.
Operating Force With 1 NO Contact Block - Flush	2.875 lb./f.
Operating Force With 2 NO Contact Blocks - Recessed	3.5 lb./f.
Operating Force With 2 NO Contact Blocks Flush	3.5 lb./f.
Operating Force With 3 NO Contact Blocks - Recessed	4.0 lb./f.
Operating Force With 3 NO Contact Blocks Flush	4.375 lb./f.
Wire Size	22-12 AWG stranded or solid copper wire
Torque Requirements	Terminal screws: 10-14 in./lb. Contact block mounting screws: 10-14 in./lb.

Contacts

Electrical Reliability Data	With indicating light loads, tested for 5,000,000 operations at 40mA and 115 V resistive loads with no failures observed.
Thermal Current	10A per IEC 947 5-1
Insulation Voltage	Ui = 660 Vac/dc
Protection from Electrical Shock	Class 1 per IEC 536 for metal operators; Class II (double insulation) per IEC 536 for plastic operators
Insulation Category	Group C per VDE 0110
Dielectric strength	2500 V
Short-circuit protection	10A time-delay fuse gG per IEC 269.1 & 269.3
Finger Safe Terminals	Available for silver and gold single- and double-circuit contact blocks, as components and as assembled versions.
Contact Characteristics	NC: slow make, double break (positive opening) NO: slow make, double break Opposite polarity Self-cleaning below 300 volts NO and NC snap action (for use on joysticks)

Pilot Duty Ratings for Standard Contact Blocks

A600

(maximum make volt-amperes = 7200; maximum break volt-amperes = 720; PF = .25)

Volts (V)	12	24	48	60	120	240	480	600
Continuous (A)	10	10	10	10	10	10	10	10
Making (A)	60	60	60	60	60	30	15	12
Breaking (A)	10	10	10	10	6	3	1.5	1.2

P300

(maximum make or break volt-amperes = 69)

Volts (V)	12	24	48	60	125	250	300
Continuous (A)	5	5	5	5	5	5	5
Making (A)	5	5	2.8	2.3	1.1	0.55	0.46
Breaking (A)	5	5	2.8	2.3	1.1	0.55	0.46

Reed Switch Block Ratings

AC Operating Voltage	2-120 Vac
AC Maximum Continuous Current	.001-.15A
AC Resistive Watts	8 VA maximum
DC Operating Voltage	2-30 Vdc
DC Maximum Continuous Current	.001-.15A
DC Resistive Watts	4.5 VA maximum

Power Supply Resistor Values

Resistor Value @ 120 Vac/dc	750 ohms ±5%, 5 watts, 2 resistors in series
Resistor Value @ 240 Vac/dc	2700 ohms ±5%, 5 watts, 2 resistors in series

Heavy-Duty 30.5 mm Watertight/Oiltight Push Buttons

CR104P

Technical Data
600 Volts Max. AC/DC
10 Amperes Continuous

Materials List

Component	Material
Cap (non-illuminated)	Unfilled polyacetal
Cap (illuminated)	Polycarbonate
Metal housings	Chromium- or zinc-plated zinc ingot
Plastic housing	Nylon
White plunger	Unfilled polyacetal
Flange	Nylon
Grease	Good for temperatures of –42° to +204°C
Plate spacer	Polycarbonate
Locking plate	Chromium-plated zinc ingot
Locking ring	Chromium-plated zinc ingot
Hexagonal ring	Chromium-plated zinc ingot
Contact block housing	Nylon
Cam	Unfilled Polyacetal
Cam follower	Unfilled Polyacetal
Joystick protective housings	Vinyl nitrile
Terminal screw size	#6-32
Gasket	Vinyl nitrile
Contacts	Silver alloy
Push button guards	Chromium-plated zinc ingot
Wobble stick	Aluminum
Key	Brass
Protective caps	Silicon rubber
Locking attachment	Polycarbonate

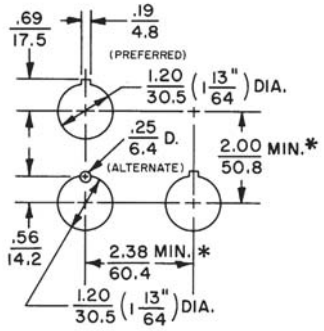
Mechanical Life Ratings

Operator	Number of Operations
Standard push buttons	3,000,000
Illuminated push buttons (including push on/push off)	1,000,000
Momentary mushroom-head push buttons	3,000,000
Maintained and push-to-latch, turn-to-release mushroom-head push buttons	500,000
Selector switches (all)	1,000,000
Joysticks	500,000
Toggle switches	500,000
Wobble switches	1,000,000
Key-operated push buttons	500,000
Selector push buttons	1,000,000
Time-delay push buttons	1,000,000

Electrical Life Ratings

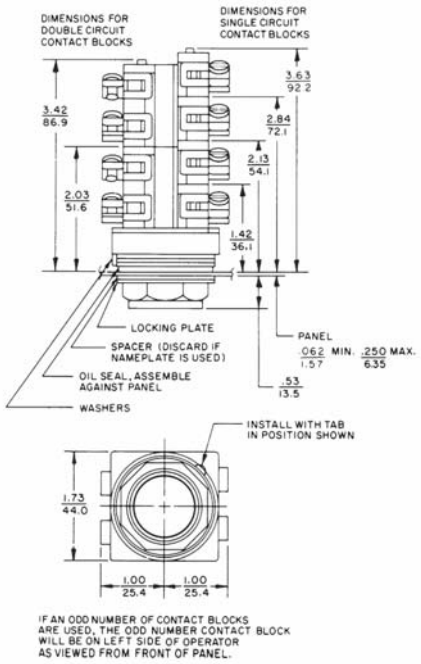
Operator	Number of Operations
Push buttons	5,000,000
Selector switches	500,000

Outlines, Dimensions ($\frac{in.}{mm}$) (For Estimating Only)



Drilling Plan Dual Dimensions

CR104P push buttons are designed for front mounting, with or without nameplates, in 1 13/64" (30.5 mm) diameter holes. Operators are provided with an octagonal ring, spacers, and gaskets to ensure an oiltight, uniform front protrusion. Acceptable Panel Thickness: 0.04 - 0.25 inches (1.02 - 6.35 mm)



Outline and Dimensions

For dimensional information on other operators, contact nearest GE Consumer & Industrial Representative. Manufacturing tolerances apply to all untoleranced dimensions.

Panel thickness (inches)	No. of washers required
.062	3
.093	2
.125	2
.188	1
.25	0

Publications and Reference: See Section 17 for a complete list of additional product-related publications

15-150A Circuit Breakers
Thermal-Magnetic Trip
E150 Line Circuit Breakers
Types TEB, TED, THED
Noninterchangeable Trip

Three Pole — Includes Cu/Al line and load lugs. For optional lugs, see page 3-117 and 3-118.

	Type TEB		Type TED				Type THED, Hi-Break	
	240 Vac		480 Vac		600 Vac		600 Vac	
Ampere Rating	Product Number	List Price GO-135B	Product Number	List Price GO-135B	Product Number	List Price GO-135B	Product Number	List Price GO-135B
10	TEB132010WL[1,3]	**$240.00**	TED134010WL[1,3]	**$377.00**	—	—	—	—
15	TEB132015WL[3]	**$240.00**	TED134015WL[3]	**$377.00**	TED136015WL[3]	**$439.00**	THED136015WL[3]	**$655.00**
20	TEB132020WL[3]	**$240.00**	TED134020WL[3]	**$377.00**	TED136020WL[3]	**$439.00**	THED136020WL[3]	**$655.00**
25	TEB132025WL[3]	**$240.00**	TED134025WL[3]	**$377.00**	TED136025WL[3]	**$439.00**	THED136025WL[3]	**$655.00**
30	TEB132030WL[3]	**$240.00**	TED134030WL[3]	**$377.00**	TED136030WL[3]	**$439.00**	THED136030WL[3]	**$655.00**
35	TEB132035WL[3]	**$240.00**	TED134035WL[3]	**$377.00**	TED136035WL[3]	**$439.00**	THED136035WL[3]	**$655.00**
40	TEB132040WL[3]	**$240.00**	TED134040WL[3]	**$377.00**	TED136040WL[3]	**$439.00**	THED136040WL[3]	**$655.00**
45	TEB132045WL[3]	**$240.00**	TED134045WL[3]	**$377.00**	TED136045WL[3]	**$439.00**	THED136045WL[3]	**$655.00**
50	TEB132050WL[3]	**$240.00**	TED134050WL[3]	**$377.00**	TED136050WL[3]	**$439.00**	THED136050WL[3]	**$655.00**
60	TEB132060WL	**$240.00**	TED134060WL	**$377.00**	TED136060WL	**$439.00**	—	—
70	TEB132070WL	**$339.00**	TED134070WL	**$445.00**	TED136070WL	**$534.00**	THED136070WL	**$742.00**
80	TEB132080WL	**$339.00**	TED134080WL	**$445.00**	TED136080WL	**$534.00**	—	—
90	TEB132090WL	**$339.00**	TED134090WL	**$445.00**	TED136090WL	**$534.00**	THED136090WL	**$742.00**
100	TEB132100WL	**$339.00**	TED134100WL	**$445.00**	TED136100WL	**$534.00**	THED136100WL	**$742.00**
110	—	—	TED134110WL	**$1198.00**	TED136110WL	**$1198.00**	THED136110WL	**$1683.00**
125	—	—	TED134125WL	**$1198.00**	TED136125WL	**$1198.00**	THED136125WL	**$1683.00**
150	—	—	TED134150WL	**$1198.00**	TED136150WL	**$1198.00**	THED136150WL	**$1683.00**
100NA	—	—	TED134YT100[2]	**$377.00**	TED136YT100[2]	**$445.00**	—	—
150NA	—	—	TED134YT150[2]	**$967.00**	TED136YT150[2]	**$967.00**	—	—

[1]Not UL listed, rated 5kA @ 120V, 240V and 480V.
[2]Includes factory-installed dummy trip.
[3]UL listed for HID (high intensity discharge).

Notes: All TEB, TED, THED breakers UL listed as HACR type except 10 ampere.
All TEB, TED, THED breakers suitable for reverse feed.
60/75°C rating through 100 amperes, 75°C rating above 100 amperes.

Accessories: See pages 3-40 to 3-46 and 3-108 to 3-120.

Add-on Current Limiter — UL Listed
100 kAIC at 480 and 600 VAC[4]

Ampere Rating	Product Number	List Price GO-135B
15	TEDL36015	**$848.00**
20	TEDL36020	**$848.00**
30	TEDL36030	**$848.00**
60	TEDL36060	**$848.00**
100	TEDL36100	**$848.00**

[4]For use with 3 Pole TED/THED only

E150 Reference Publications

TDR Operating Mechanism	GEH-2994
Shunt Trip	GEH-3416
Undervoltage Release	GEH-3417
Auxiliary Switch	GEH-3418
Three Coil Shunt Trip	GEH-3434
Mechanical Interlock	GEH-4310
TDM Operating Mechanism	GEH-4335
Bell Alarm	GEH-4576
Plug-in Mounting Base	GEH-4610
STDA Flange Handle	GEH-5314
STDA Operating Mechanism	GEH-5684
Cable Operator Mechanism	GEH-6290
Motor Operator	GEH-6500
Back Connected Studs	GEJ-3609
Padlocking Device - Standard	GEJ-5143
E150 Outline Drawing	139C3643SH1, 2, 4

Publications and Reference: See Section 22 for a complete list of additional product-related publications

GE Panelboards

CATALOGUE #	DESCRIPTION

Branch Breakers

For use in type AD 347/600v Panelboards

TED114015	15A 1P BRK, max. 10ka @ 347V
TED114020	20A 1P BRK, max. 10ka @ 347V
TED114030	30A 1P BRK, max. 10ka @ 347V
TED136015	15A 3P BRK, max. 14ka @ 600V
TED136020	20A 3P BRK, max. 14ka @ 600V
TED136030	30A 3P BRK, max. 14ka @ 600V
TED136040	40A 3P BRK, max. 14ka @ 600V
TED136050	50A 3P BRK, max. 14ka @ 600V
TED136060	60A 3P BRK, max. 14ka @ 600V
TED136070	70A 3P BRK, max. 14ka @ 600V
TED136090	90A 3P BRK, max. 14ka @ 600V
TED136100	100A 3P BRK, max. 14ka @ 600V
TED136125	125A 3P BRK, max. 14ka @ 600V
TED136150	150A 3P BRK, max. 14ka @ 600V
THED114015	15A 1P BRK, max. 18ka @ 347V
THED114020	20A 1P BRK, max. 18ka @ 347V
THED114030	30A 1P BRK, max. 18ka @ 347V
THED136015	15A 3P BRK, max. 18ka @ 600V
THED136020	20A 3P BRK, max. 18ka @ 600V
THED136030	30A 3P BRK, max. 18ka @ 600V
THED136040	40A 3P BRK, max. 18ka @ 600V
THED136050	50A 3P BRK, max. 18ka @ 600V
THED136060	60A 3P BRK, max. 18ka @ 600V
THED136070	70A 3P BRK, max. 18ka @ 600V
THED136090	90A 3P BRK, max. 18ka @ 600V
THED136100	100A 3P BRK, max. 18ka @ 600V
THED136125	125A 3P BRK, max. 18ka @ 600V
THED136150	150A 3P BRK, max. 18ka @ 600V

GE Panelboards

Panels 347/600v- 3 Phase

Main Lug

ADG – (3P4W) 347/600V			
125A			
NUMBER OF CIRCUITS	BOX	TRIM	INTERIOR
18	AB31BA	AF31 (F/S) A	ADG3181MBXAXM8
30	AB37BA	AF37 (F/S) A	ADG3301MBXAXM8
225A			
18	AB37BA	AF37 (F/S) A	ADG3182MBXAXM8
30	AB43BA	AF43 (F/S) A	ADG3302MBXAXM8
42	AB55BA	AF55 (F/S) A	ADG3422MBXAXM8
400A			
42	AB64BA	AF64 (F/S) A	ADG3424MBXAXM8

Notes: F = Flush / S = Surface

GE AD Series Breakers

AMPS	TED 10KAIC 347/600V			THED 18KAIC
	1P	2P (22KAIC)	3P	
15	TED114015	FBV26TE015RV	TED136015	Replace with THED except 2 Pole
20	TED114020	FBV26TE020RV	TED136020	
30	TED114030	FBV26TE030RV	TED136030	
40		FBV26TE040RV	TED136040	
50		FBV26TE050RV	TED136050	
60		FBV26TE060RV	TED136060	
70		FBV26TE070RV	TED136070	
90		FBV26TE090RV	TED136090	
100		FBV26TE100RV	TED136100	
125			TED136125	
150			TED136150	

Panel Filler 1x TEDFP1
Mounting Hardware for TED 3 Pole Breaker ASPTED3P
All AD & AQ panels c/w Ground Kits

Electric Heaters



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P/N 28359001 87565511

INTRODUCTION

1. Before installing the electric heater, read these instructions carefully. Failure to follow these instructions could damage the product or cause a hazardous condition.
2. Check the ratings on the heater label to assure the product is suitable for your application.

WARNING



To avoid electric shock and equipment damage, disconnect any power supplies to the enclosure before installing the electric heater. Do not energize any circuits before all internal and external electrical and mechanical clearances are checked to assure that all assembled equipment functions safely and properly.

GENERAL SAFETY INFORMATION

1. Protect the lead wires from coming in contact with sharp objects, hot surfaces, and/or chemicals.
2. If continuous operation of the heater is essential to the safe functioning of any other equipment, adequate warning devices must be installed to assure safe operation at all times.

CAUTION

Do not use these electric heaters in dusty, dirty, corrosive, or hazardous locations.

Reduce the thermostat from factory setting to a recommended setting not to exceed 75 F for most applications.

Portions of the heater can get hot. Adequate protection must be taken to protect people from potential burns and to protect other components from this heat. Always allow the heater to cool before touching it.

Thermal sensitive devices or materials may need to be located further from the heater than the minimum recommended distance.

Heaters must not be installed on wood or other combustible surfaces.

This heater must only be installed in a totally enclosed enclosure.

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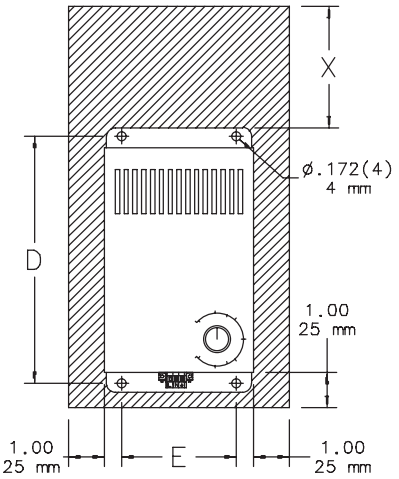
LOCATION AND MOUNTING

1. Hoffman electric heaters should be centered as low as possible in the enclosure for optimum heat distribution.
2. It is recommended that the heater be installed on a non-combustible metal panel for optimum performance. It may, however, be mounted on any metal surface.

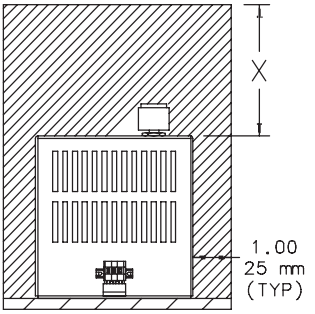
   WARNING: Heaters must not be installed on wood or other combustible surfaces.
3. The heater should be mounted in a vertical position with the terminal block at the bottom and the air outlet openings at the top as shown.
4. The recommended clearances shown by the shadowed area indicates the space that should be kept free of components for safe operation of the heater.

   WARNING: Heat sensitive components must not be placed above the heater discharge area.
5. Four 10−32 UNF, self−tapping screws are included for installation.

Vertical Surface Mounting

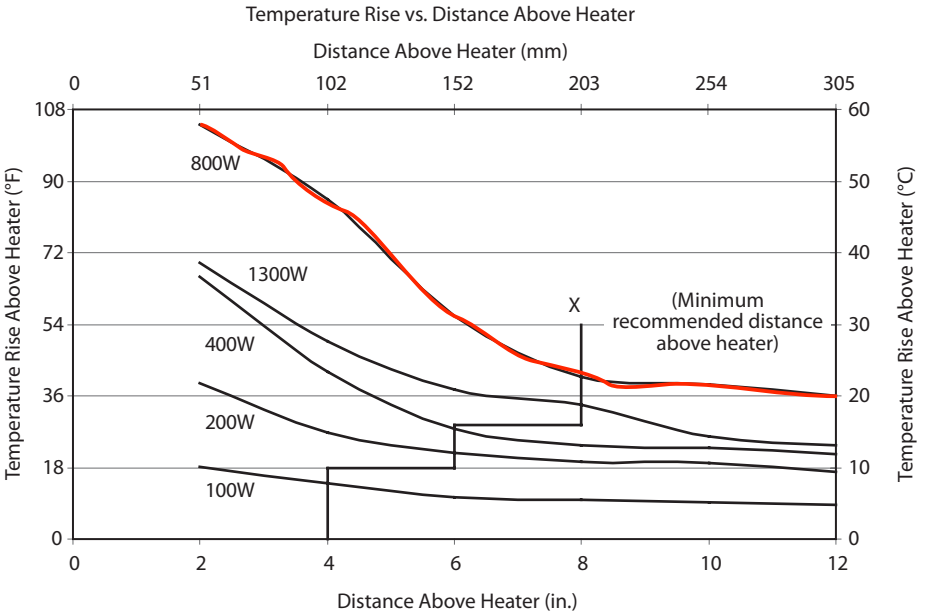


Optional Horizontal Surface Mounting



	Watts	X	D	E
DAH1001A, DAH1002A	100	4	5.00 (127 mm)	3.25 (83 mm)
DAH2001A, DAH2002A	200	6		
DAH4001B, DAH4002B	400	6	7.00 (178 mm)	3.50 (89 mm)
DAH8001B, DAH8002B	800	8		
DAH13001C, DAH13002C	1300	8		

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WIRING

Reference Wiring Illustration on page 6

1. All wiring must comply with applicable local codes and ordinances.
2. Connect the heater lead wires to the proper A.C. power source. Power source for 800 and 1300 watt heaters should be continuous.
3. The heater must be properly grounded.

NOTE: Exposed wires should not come in contact with the heater housing.

SETTING THE THERMOSTAT

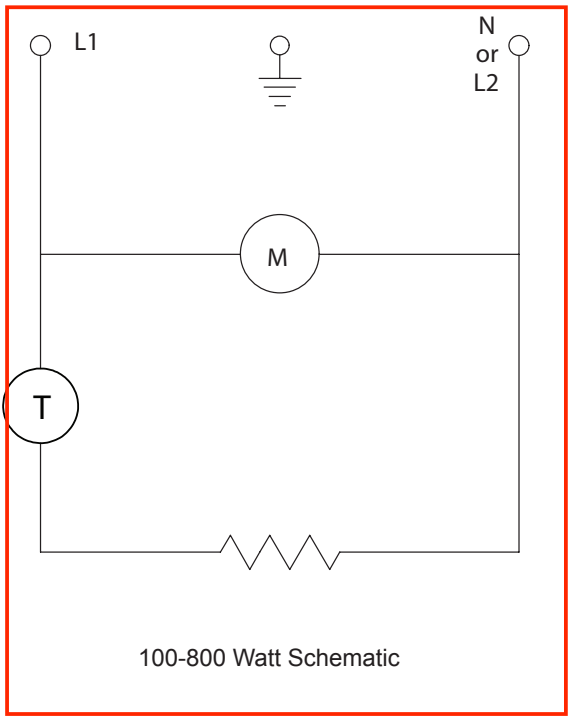
1. The heater is controlled by an adjustable thermostat. Set the thermostat to the desired temperature. It is recommended not to exceed 75 F for most applications.

MAINTENANCE

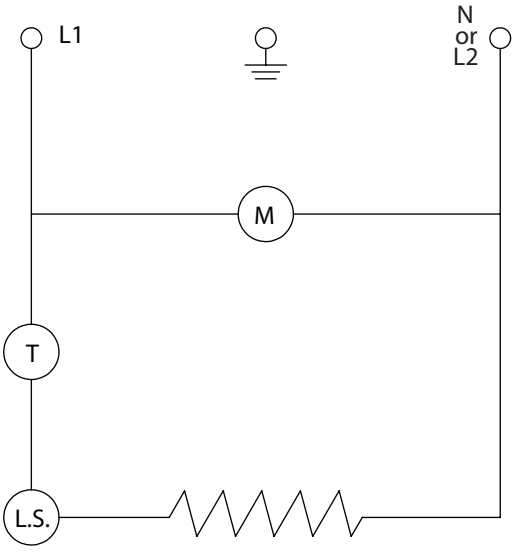
1. Always disconnect power supply before inspecting or working on the heater.
2. Generally the unit requires no maintenance since the fan bearings are permanently lubricated and sealed.

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English



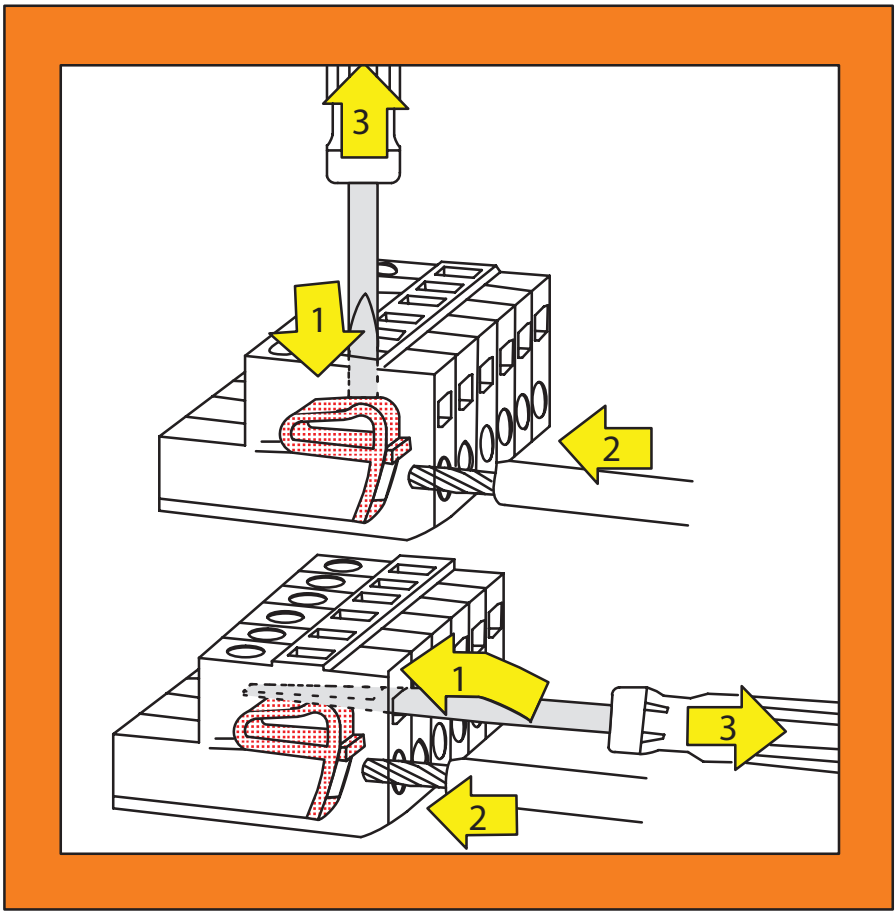
100-800 Watt Schematic



1300 Watt Schematic

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Wiring Illustration



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Notes

Notes

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ELECTRIC HEATERS



115/230 Volt
100/200 Watt



115/230 Volt
400/800 Watt



115/230 Volt
1300 Watt

INDUSTRY STANDARDS

UL 508A Component Recognized; File No. E61997

CSA Certified, CSA File No. LR42186
CE

APPLICATION

Protect mechanical, electrical and electronic equipment from low temperatures, condensation and corrosion with this thermostatically controlled, fan-driven heater that maintains a stable enclosure temperature.
Fan draws cool air from the bottom of the enclosure and passes this air across the thermostat and heating element before being released into enclosure cavity. Heated air is discharged through the top of the heater unit.

SPECIFICATIONS

- Aluminum housing
- Thermostat range adjustable from 0 F to 100 F (-18 C to 38 C)
- Four 10-32 x self-tapping screws are included with each heater
- Ball bearing fan
- Terminal strip with clamp connector that accepts both solid and stranded wire

FINISH

- Brushed aluminum

⚠ CAUTION

These electric heaters are not designed for use in dusty, dirty, corrosive, or hazardous locations. Portions of the heater can get hot. Adequate protection must be taken to protect people from potential burns, and to protect other components from this heat. Pentair Technical Products recommends this heater only be installed in a totally-enclosed metal enclosure.

DO NOT INSTALL HEATERS ON WOOD PANELS. Heat sensitive components should not be placed near the heater discharge area since this air can be quite warm. The clearance range defines the space that must be kept free of these components for proper and safe operation of the heater.

Performance Data **100 and 200 Watt Heaters**

CATALOG NUMBERS	DAH1001A	DAH1002A	DAH2001A	DAH2002A
ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**115**	**230**
Frequency (Hz)	50/60	50/60	50/60	50/60
Power Consumption (Watts)	100	100	200	200
Nominal Current (Amps)	0.98	0.49	1.89	0.95
HEATING PERFORMANCE				
Watts	**100**	**100**	**200**	**200**
UNIT CONSTRUCTION				
Weight (lb./kg)	1.6/0.73	1.6/0.73	1.6/0.73	1.6/0.73
X (in./mm)	4.00/102	4.00/102	4.00/102	4.00/102

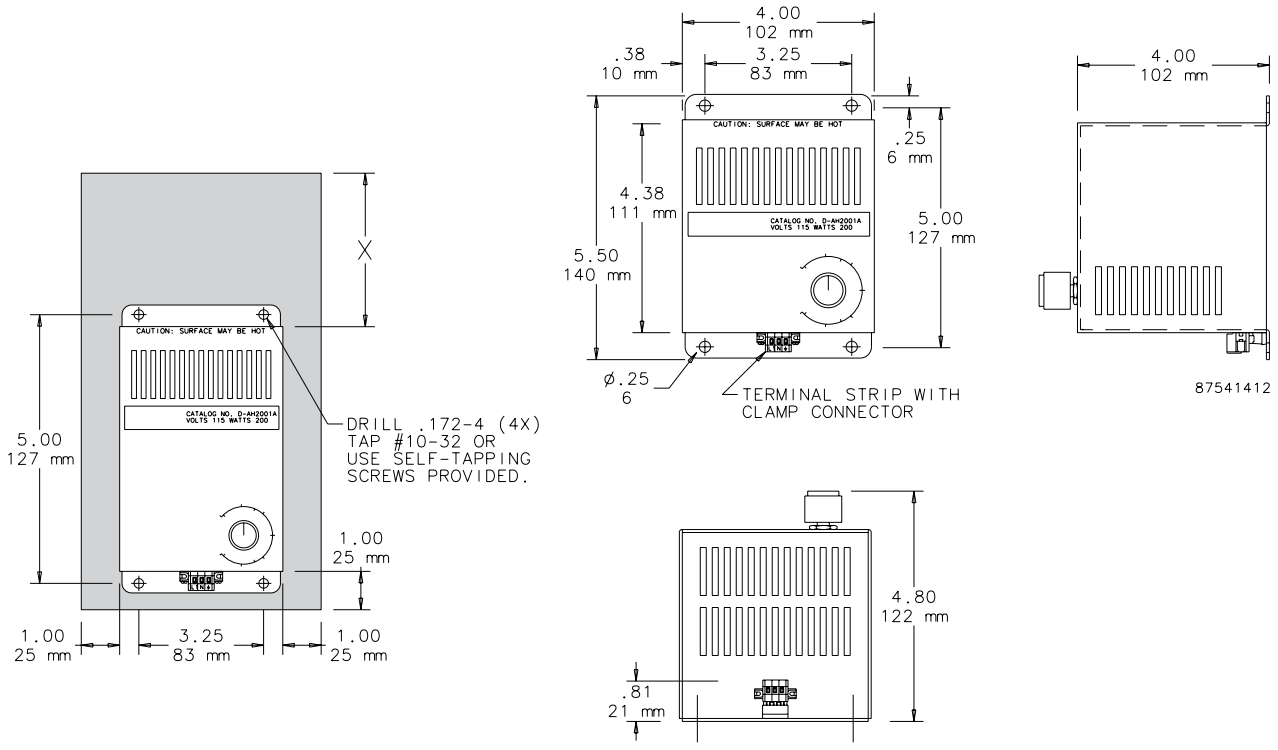
Performance Data **400 and 800 Watt Heaters**

CATALOG NUMBERS	DAH4001B	DAH4002B	DAH8001B	DAH8002B
ELECTRICAL DATA				
Rated Voltage	**115**	**230**	**115**	**230**
Frequency (Hz)	50/60	50/60	50/60	50/60
Power Consumption (Watts)	400	400	800	800
Nominal Current (Amps)	3.72	1.86	7.37	3.69
HEATING PERFORMANCE				
Watts	**400**	**400**	**800**	**800**
UNIT CONSTRUCTION				
Weight (lb./kg)	2.2/1.00	2.2/1.00	2.2/1.00	2.2/1.00
X (in./mm)	6.00/152	6.00/152	8.00/203	8.00/203

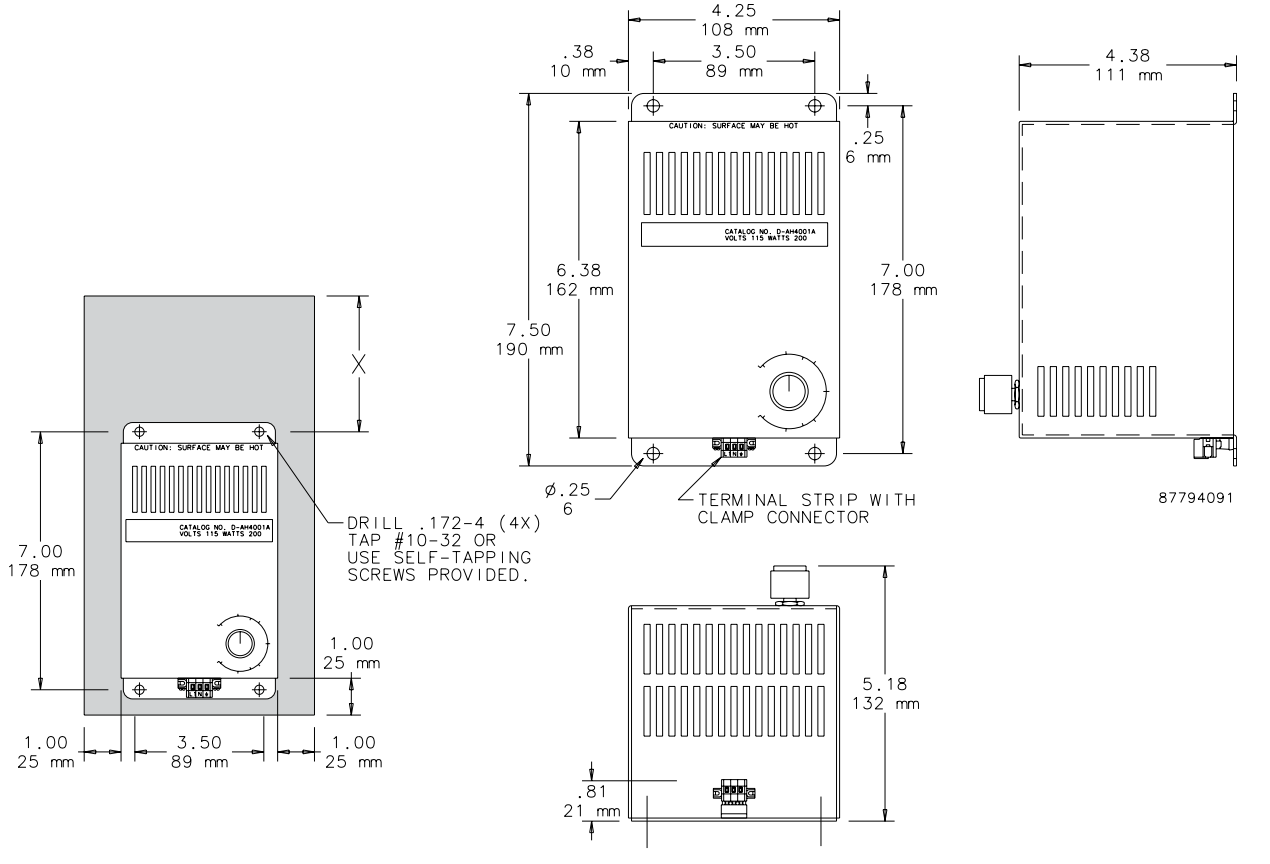
Performance Data **1300 Watt Heaters**

CATALOG NUMBERS	DAH13001C	DAH13002C
ELECTRICAL DATA		
Rated Voltage	**115**	**230**
Frequency (Hz)	50/60	50/60
Power Consumption (Watts)	1300	1300
Nominal Current (Amps)	11.5	5.7
HEATING PERFORMANCE		
Watts	**1300**	**1300**
UNIT CONSTRUCTION		
Weight (lb./kg)	3.4/1.54	3.4/1.54
X (in./mm)	8.00/203	8.00/203

Dimensions and Clearance Range Drawing for DAH1001A, -2A and DAH2001A, -2A



Dimensions and Clearance Range Drawing for DAH4001B, -2B and DAH8001B, -2B



RR Series — General Purpose Power Relays

Key features of the RR series include:

- **High reliability and long service life**
- **Available in octal (8- and 11-pin) or square (11-blade) base**
- **Options include check button for test operation, indicator light, and side flange (contact IDEC for diodes)**
- **DIN rail, surface and panel type sockets available for a wide range of mounting applications**



Specifications

Contact Material	Silver
Contact Resistance	30mΩ maximum (initial value)
Minimum Applicable Load	24V DC/10mA, 5V DC/20mA (reference value)
Operating Time	25ms maximum
Release Time	25ms maximum
Maximum Continuous Applied Voltage (AC/DC) at 20°C	110% of the rated voltage
Minimum Operating Voltage (AC/DC) at 20°C	80% of the rated voltage
Drop-Out Voltage (AC) at 20°C	30% of the rated voltage
Drop-Out Voltage (DC) at 20°C	15% of the rated voltage
Power Consumption	AC: approximately 3VA (50Hz), 2.5VA (60Hz) DC: approximately 1.5W
Insulation Resistance	100MΩ minimum (measured with 500V DC megger)
Dielectric Strength	**Pin** (RR2P, RR3PA) Between live and dead parts: 1,500V AC, 1 minute Between contact circuit and operating coil: 1,500V AC, 1 minute Between contact circuits: 1,500V AC, 1 minute (1,000V AC between NO-NC contacts)
	Blade (RR1BA, RR2BA, RR3B) Between live and dead parts: 2,000V AC, 1 minute Between contact circuit and operating coil: 2,000V AC, 1 minute Between contact circuits: 2,000V AC, 1 minute Between contacts of same polarity: 1,000V AC, 1 minute
Frequency Response	1,800 operations/hour
Temperature Rise	Coil: 85°C maximum Contact: 65°C maximum
Vibration Resistance	0 to 6G (55Hz maximum)
Shock Resistance	100N (approximately 10G)
Life Expectancy	Electrical: over 500,000 operations (120V, 50/60Hz, 10A) Mechanical: over 10,000,000 operations
Operating Temperature	–30 to +70°C
Weight	RR2P: 90g, RR3PA: 96g (approximately) RR1BA/RR2BA/RR3B: 82g (approximately)

UL Recognized
File No. E66043

CSA Certified
File No. LR35144

TÜV PRODUCT SERVICE
File No. B020813332452*
* Pin Style Only
(does not apply to blade style)

CE*
* Pin Style Only

Ordering Information

Order standard voltages for fastest delivery. Allow extra delivery time for non-standard voltages.

Basic Part No.	Coil Voltage:
RR3PA-U	**AC120V**

Part Numbers

Part Numbers: RR Series with Options

Termination	Contact Configuration	Basic Part No.	Indicator Light	Check Button	Light and Check Button	Side Flange
P, PA (pin)	DPDT	RR2P-U	RR2P-UL	RR2P-UC	RR2P-ULC	—
	3PDT	RR3PA-U	RR3PA-UL	RR3PA-UC	RR3PA-ULC	—
B, BA (blade)	SPDT	RR1BA-U	RR1BA-UL	RR1BA-UC	RR1BA-ULC	RR1BA-US
	DPDT	RR2BA-U	RR2BA-UL	RR2BA-UC	RR2BA-ULC	RR2BA-US
	3PDT	RR3B-U	RR3B-UL	RR3B-UC	RR3B-ULC	RR3B-US

1. RR1BA, RR2BA, and RR3PA are U.S. standard terminal arrangements.
2. For diode option on DC coils please consult factory.

Ratings

Coil Ratings

Rated Voltage		Rated Current ±15% at 20°C		Coil Resistance ±10% at 20°C	Inrush Current	Inductance	
		60Hz	50Hz			Energizing	De-Energizing
AC	6V	420mA	490mA	4.9Ω	720mA	0.04H	0.02H
	12V	210mA	245mA	18Ω	365mA	0.15H	0.08H
	24V	105mA	121mA	79Ω	182mA	0.57H	0.32H
	120V	20.5mA	24mA	2100Ω	35mA	15H	8.2H
	240V	10.5mA	12.1mA	8330Ω	18mA	57H	32H
DC	6V	240mA		25Ω	N/A		
	12V	120mA		100Ω			
	24V	60mA		400Ω			
	48V	30mA		1600Ω			
	110V	13mA		8460Ω			

Contact Ratings

	Resistive			Inductive			Motor Load
Voltage	Nominal	UL	CSA	Nominal	UL	CSA	UL
30V DC	10A	10A	10A	7.5A	7A	7.5A	—
110V DC	0.5A	—	—	0.3A	—	0.5A	—
120V AC	10A	10A	10A	7.5A	7.5A	7.5A	1/4 hp
240V AC	7.5A	10A	10A	5A	7A	7A	1/3 hp

Inductive load: cos ø = 0.3, L/R = 7ms.

Applicable Sockets

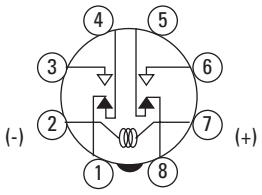
Part Numbers: Sockets

Relays	Standard DIN Rail Mount	Finger-Safe DIN Rail Mount	Panel Mount
RR2P	SR2P-05 SR2P-06	SR2P-05C	SR2P-51
RR3PA	SR3P-05 SR3P-06	SR3P-05C	SR3P-51
RR1BA RR2BA RR3B	SR3B-05	—	SR3B-51

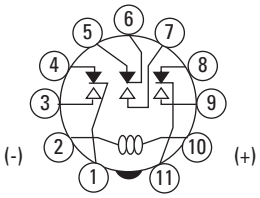
Springs & Clips (optional)	
Part Numbers	Use With Socket
SR2B-02F1	SR2P-05, -05C, -06
SR3P-01F1	SR2P-51, SR3P-51
SR3B-02F1	SR3P-05, -05C, -06 SR3B-05, -51
SR3P-01F1	SR3P-51
SR3B-02F1	SR3B-05 SR3B-51

See Section F for details on sockets. All DIN rail mount sockets listed can be mounted using DIN rail BNDN1000.

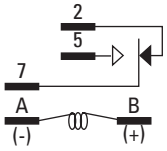
Internal Circuits



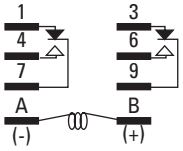
RR2P



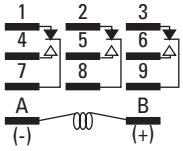
RR3PA



RR1BA



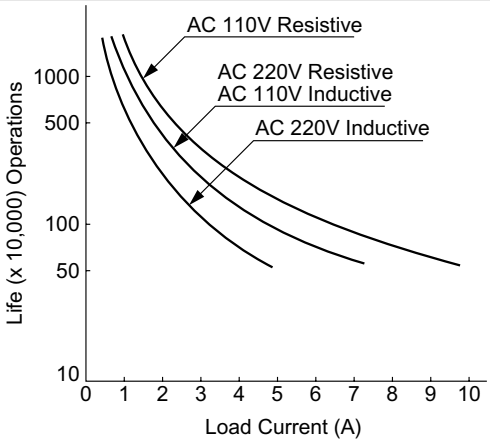
RR2BA

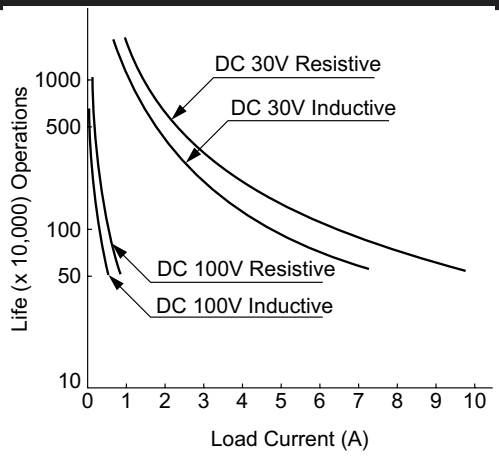


RR3B

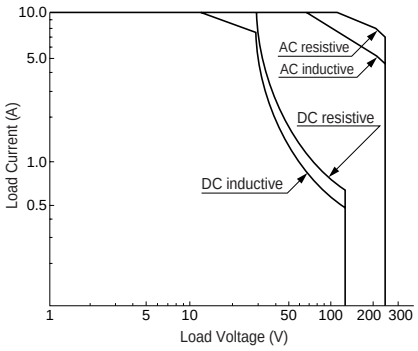
Image as viewed from bottom of relay. Refer to socket for exact wiring layout (Section F).

Electrical Life Curves



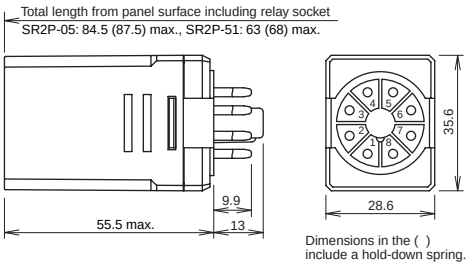


Maximum Switching Capacity

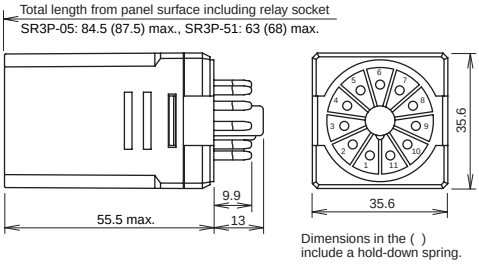


Dimensions

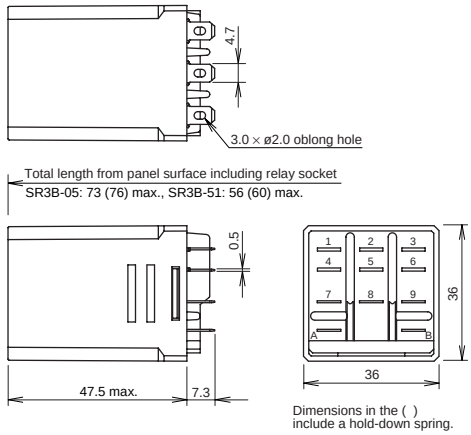
8-Pin
RR2P



11-Pin
RR3PA

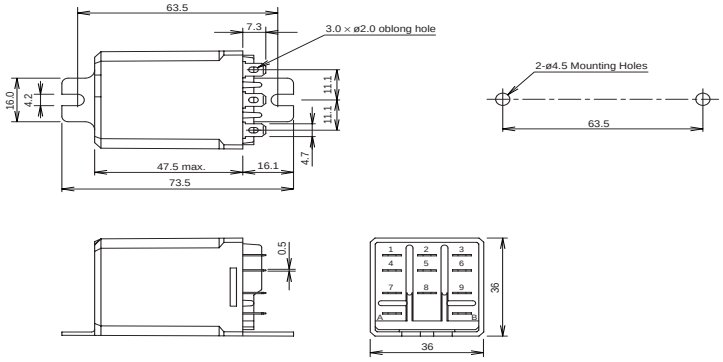


Blade
RR1BA, RR2BA, RR3B



***Note**: Dimensions in [ ] include hold-down spring.*

Side Flange
RR1BA-US, RR2BA-US, RR3B-US



All dimensions in mm.

E Relays

KOHLER. Power Systems

Automatic Transfer Switches
Standard Specific-Breaker Rated

ISO 9001 KOHLER POWER SYSTEMS NATIONALLY REGISTERED



Available Controllers

- Decision-Maker® MPAC 750
- Decision-Maker® MPAC 1200

Ratings

Model	Current	Voltage, Frequency
KSS	40–600 amps	208–600 VAC, 50/60 Hz
	800–1000 amps	208–480 VAC, 50/60 Hz

Transfer Switch Standard Features

- UL 1008 listed at 208–480 VAC file # E58962 (automatic), # E86894 (nonautomatic)
- CSA certification available
- IBC seismic certification available
- Standard-transition operation
- Silver tungsten alloy contacts on 400–600 amp models
- Solid or switched neutral
- Available with either automatic or non-automatic control (non-automatic control requires the Decision-Maker® MPAC 1200 controller)
- Available in 2, 3, or 4 pole configurations
- High withstand/closing ratings, for use with specific breakers only
- Electrically operated, mechanically held mechanism
- Double-throw, mechanically interlocked design (break-before-make power contacts)
- Enclosed arc chambers with arc chutes
- Front-accessible contacts for easy inspection
- Main shaft auxiliary position-indicating contacts (see page 3 for contact ratings)
- Standard one-year limited warranty. Extended limited warranties are available.

Available Automatic Transfer Switch Controllers

Select one of the following controllers for your automatic transfer switch.

Decision-Maker® MPAC 750 Controller



- Test pushbutton
- Exercise pushbutton
- LED indicators: Source available, transfer switch position, service required (fault), and “not in auto”
- Programmable voltage pickup and dropout settings
- Programmable time delays
- Seven day generator exerciser
- Two programmable inputs and two programmable outputs
- Modbus communication standard
- RS-485 communication standard
- Ethernet communication optional

For more information about Decision-Maker® MPAC 750 features and functions, see specification sheet G11-126.

Decision-Maker® MPAC 1200 Controller



- LCD display, 4 lines x 20 characters, backlit
- Complete programming and viewing capability at the door using the keypad and LCD display
- LED indicators: Source available, transfer switch position, service required (fault), and “not in auto”
- Programmable voltage and frequency pickup and dropout settings
- Programmable time delays
- Programmable generator exerciser
- Time-based load control
- Two programmable inputs and two programmable outputs
- Up to four I/O extension modules available
- Modbus communication standard
- RS-485 communication standard
- Ethernet communication optional

For more information about Decision-Maker® MPAC 1200 features and functions, see specification sheet G11-127.

Codes and Standards

The ATS meets or exceeds the requirements of the following specifications:

- Underwriters Laboratories UL 1008, Standard for Automatic Transfer Switches for Use in Emergency Standby Systems file #E58962 (automatic), #E86894 (nonautomatic)
- CSA C22.2 No. 178 certification available, file #LR58301
- NFPA 70, National Electrical Code
- NFPA 99, Essential Electrical Systems for Health Care Facilities
- NFPA 110, Emergency and Standby Power Systems
- IEEE Standard 446, IEEE Recommended Practice for Emergency and Standby Power Systems for Commercial and Industrial Applications
- NEMA Standard ICS 10-2005, Electromechanical AC Transfer Switch Equipment
- EN61000-4-4 Fast Transient Immunity Severity Level 4
- IEC 60947-6-1, Low Voltage Switchgear and Control Gear; Multifunction Equipment; Automatic Transfer Switching Equipment
- EN61000-4-5 Surge Immunity Class 4 (voltage sensing and programmable inputs only)
- IEC Specifications for EMI/EMC Immunity:
  - CISPR 11, Radiated Emissions
  - IEC 1000-4-2, Electrostatic Discharge
  - IEC 1000-4-3, Radiated Electromagnetic Fields
  - IEC 1000-4-4, Electrical Fast Transients (Bursts)
  - IEC 1000-4-5, Surge Voltage
  - IEC 1000-4-6, Conducted RF Disturbances
  - IEC 1000-4-8, Magnetic Fields
  - IEC 1000-4-11, Voltage Dips and Interruptions
- IEEE 472 (ANSI C37.90A) Ring Wave Test
- Seismic certification in accordance with the International Building Code is available. (Accessory kit is required for seismic certification.)
  - IBC 2000, referencing ASCE 7-98 and ICC AC-156
  - IBC 2003, referencing ASCE 7-02 and ICC AC-156
  - IBC 2006, referencing ASCE 7-05 and ICC AC-156
  - IBC 2009, referencing ASCE 7-05 and ICC AC-156
  - IBC 2012, referencing ASCE 7-10 and ICC AC-156

Application Data

Environmental Specifications	
Operating Temperature	-20°C to 70°C (-4°F to 158°F)
Storage Temperature	-40°C to 85°C (-40°F to 185°F)
Humidity	5% to 95% noncondensing

UL-Listed Solderless Screw-Type Terminals for External Power Connections				
Model	Switch Rating, Amps	Range of Wire Sizes, Copper or Aluminum*		
		Normal, Emergency, and Load	Neutral	Ground
KSS	40-150	(1) #8 to 3/0 AWG †	(3) #6 - 3/0 AWG	(3) #6 - 3/0 AWG
	200-225	(1) #6 AWG to 250 KCMIL †	(3) #4 - 600 KCMIL or (6) 1/0 - 250 KCMIL	
	260	(1) #6 AWG to 350 KCMIL †		
	400	(1) #4 AWG to 600 KCMIL † or (2) #1/0 AWG to 250 KCMIL †		
	600	(2) #2 AWG to 600 KCMIL †	(3) #4 - 600 KCMIL or (6) 1/0 - 250 KCMIL	(3) #4 - 600 KCMIL or (6) 1/0 - 250 KCMIL
	800	(2) #1/0 AWG to 750 KCMIL	(12) #2 - 600 KCMIL	
	1000	(4) #2 AWG to 600 KCMIL		

* Use 60°C minimum wire for #14 to #1 AWG. Use 75°C minimum wire for 1/0 AWG and larger.

† Use copper wire only.

Contact Ratings				
			Motor Load	
	Resistive Load	Inductive Load	NC	NO
Engine Start Contacts	2 A @ 30 VDC	N/A	N/A	N/A
Auxiliary Contacts, (40-600A) ‡	15 A @ 250 VAC	N/A	N/A	N/A
Auxiliary Contacts, (800-1000A) ‡	15 A @ 480 VAC	15 A @ 250 VAC; 6 A @ 500 VAC	5 A @ 125 VAC; 3 A @ 250 VAC; 1.5 A @ 500 VAC	2.5 A @ 125 VAC; 1.5 A @ 250 VAC; 0.75 A @ 500 VAC

‡ Auxiliary position-indicating contacts, one set Normal and one set Emergency

Weights and Dimensions

Weights and dimensions are shown for transfer switches in NEMA type 1 and type 3R enclosures, and open units. Consult the factory for open units and other enclosures.

Note: Weights and dimensions are provided for reference only and should not be used for planning installation. See your local distributor for submittal drawings.

Amps	NEMA Type	Dimensions mm (in.)			Weight kg (lb.)		
		Height	Width	Depth §	2-Pole	3-Pole	4-Pole
40-225	1, 3R	791 (31.1)	450 (17.7)	316 (12.5)	28 (62)	30 (65)	31 (68)
260-400	1, 3R	1223 (48.1)	560 (22.0)	362 (14.3)	52 (115)	56 (123)	59 (131)
600	1, 3R	1702 (67.0)	610 (24.0)	514 (20.2)	179 (395)	183 (403)	186 (410)
800	1, 3R	1932 (76.1)	864 (34.0)	515 (20.3)	N/A	226 (498)	236 (520)
1000	1, 3R	1932 (76.1)	864 (34.0)	515 (20.3)	N/A	231 (509)	241 (531)

§ Allow enough room to fully open the door for inspection and service per NEC and local codes. The NEMA type 3R enclosures have a security cover on the controller that extends 54 mm (2.1 in.) beyond the door.

Withstand and Close-On Ratings (WCR)

Ratings Summary

The transfer switch is rated for use on a circuit capable of delivering not more than the RMS symmetrical Amperes listed at the specified maximum voltage below, but no greater than the interrupting capacity of the selected circuit breaker or fuse. Circuit breakers and fuses are supplied by the customer.

Certified Withstand Current Ratings in RMS Symmetrical Amperes (480 V maximum) ¶											
	With Current-Limiting Fuses				Specific Coordinated Breaker Rating, (see the following tables)			Any Breaker Ratings **			
Switch Rating, Amps	Fuse Class	Fuse Size, Max Amps	Maximum Circuit Amps		Maximum Voltage	Maximum Circuit Amps		Maximum Voltage	Maximum Circuit Amps		Time Duration, Seconds Max.
			480 VAC	600 VAC		480 VAC	600 VAC		480 VAC	600 VAC	
40–150	J	400	200,000	200,000	600 V	30,000	22,000	600 V	10,000	10,000	0.025
200–225	J	400	200,000	N/A	600 V	30,000	22,000	600 V	10,000	10,000	
260	N/A	N/A	N/A	N/A	480 V	35,000	N/A	N/A	N/A	N/A	N/A
400	J	600	200,000	200,000	600 V	50,000	42,000	600 V	35,000	35,000	0.050
	RK5 RK1	600	100,000	N/A							
600	N/A	N/A	N/A	N/A	600 V	50,000	42,000	N/A	N/A	N/A	N/A
800	L	3000	200,000	N/A	480 V	65,000	N/A	N/A	N/A	N/A	N/A
1000	L	4000									

¶ All values are available symmetrical RMS Amperes and tested in accordance with the withstand/closing requirements of UL 1008.

** Applicable to breakers with instantaneous trip elements.

Ratings with Specific Manufacturers' Circuit Breakers

Withstand and close-on ratings (WCR) in RMS symmetrical Amperes for specific manufacturers' circuit breakers.

Switch Rating, Amps	Molded-Case Circuit Breakers				
	Voltage, Max.	WCR, Amps RMS	Manufacturer	Type	Max. Size, Amps
40 80 100 150 200 225	480	30,000	Eaton	FCL	100
				JGS, JGH, JGC, JGU, JGX, JBD, JD, HJD, JDC, LCL, LCLA	250
				LDC, CLDC, KDB, KD, HKD, KDC, LD, CLD, HLD, CHLD	400
			ITE/Siemens	CED6, HED4, HED6	125
				CFD6, FD6A, FXD6, HFD6, HFXD6, HHFD6, HHFXD6	250
				CJD6	400
			General Electric	SEL, SEP, THLC1	150
				THLC2	225
				SFH, SFL, SFP	250
				SGH, SGL, SGP, FGN, FGH, FGL, FGP	400
			Schneider	HG, HJ, HL, HR	150
				JJ, JL, JR	250
				LG, LJ, LL, LR	400
	600	22,000	Eaton	JGS, JGH, JGC, JGU, JGX, JDB, JD, HJD, JDC, LCL, LCLA	250
				LDC, CLDC, KDB, KD, HKD, KDC, LD, CLD, HLD, CHLD	400
			ITE/Siemens	CED6, HED4, HED6	125
				CFD6, FD6, FXD6, HFD6, HFXD6, HHFD6, HHFXD6	250
			General Electric	SEL, SEP, THLC1	150
				THLC2	225
				SFH, SFL, SFP	250
				SGH, SGL, SGP, FGN, FGH, FGL, FGP	400

Switch Rating, Amps	Molded-Case Circuit Breakers				
	Voltage, Max.	WCR, Amps RMS	Manufacturer	Type	Max. Size, Amps
260	480	35,000	Eaton	JGS, JGH, JGC, JGU, JGX, JDB, JD, HJD, JDC, LCL, LCLA	250
				LDC, CLDC, LD, CLD, HLD, CHLD, KDB, KD, HKD, KDC	400
			ITE/Siemens	CED6, HED4, HHED6	125
				CFD6, FD6, FXD6, HFD6, HFXD6, HHFD6, HHFXD6	250
			General Electric	SEL, SEP, THLC1	150
				THLC2	225
				SFH, SFL, SFP	250
				SGH	350
				SGH, SGL, SGP, FGN, FGH, FGL, FGP	400
			Schneider	HG, HJ, HL, HR	150
				JJ, JL, JR	250
				LG, LJ, LL, LR	400
400	480	50,000	Eaton	HJD, JDC, JGC, JGH, JGU, JGX	250
				CHLD4, CLD, HLD4, CLDC, LDC, KDC, HKD, CHMDL4, CMDL4	400
				CHLD6, HDL6, CHMDL6, CMDL6, CLDC, CLD6, LDC6, CLDC6	600
				CHMDL8, HMDL8, MDL8, CMDL8	800
			ITE/Siemens	CFD6, HFD6, HFXD6, HHFD6, HHFXD6	250
			General Electric	SFL, SFP	250
				FGL, FGP	600
			Schneider	LJ, LL, LR	600
	600	42,000	Eaton	JGU, JGX	250
				CLDC4, KDC, LDC4	400
				CLDC6, LDC6, NB Tri-Pac	600
				NB Tri-Pac	800
			ITE/Siemens	CFD6	250
				CJD6, SCLD6	400
				CLD6, HHLD6, HHLXD6, SCLD6	600
				CMD6, HMD6, HMXD6,SCMD6, SHMD6	800
			General Electric	THLC1	150
				FGL4, FGP4, THLC4, TLB4	400
				SGL, SGP, FGL6, FGP6	600
				SKL8, SKP8	800
			Schneider	JL, JR	250

Switch Rating, Amps	Molded-Case Circuit Breakers				
	Voltage, Max.	WCR, Amps RMS	Manufacturer	Type	Max. Size, Amps
600	480	50,000	Eaton	HJD, JDC, JGC, JGH, JGU, JGX	250
				CHLD4, CLD, HLD4, CLDC, LDC, KDC, HKD, CHMDL4, CMDL4	400
				CHLD6, HLD6, CHMDL6, CMDL6, CLDC6, LDC6, CLD6, CLDC	600
				CHMDL8, HMDL8, MDL8, CMDL8	800
			ITE/Siemens	CFD6, HFD6, HFXD6, HHFD6, HHFXD6	250
			General Electric	SFL, SFP	250
				FGL, FGP	600
			Schneider	LJ, LL, LR	600
	600	42,000	Eaton	JGU, JGX	250
				CLDC4, KDC, LDC4	400
				CLDC6, LDC6, NB Tri-Pac	600
				NB Tri-Pac	800
			ITE/Siemens	CFD6	250
				CJD6, SCLD6	400
				CLD6, HHLD6, HHLXD6, SCLD6	600
				CMD6, HMD6, HMXD6, SCMD6, SHMD6	800
			General Electric	THLC1	150
				FGL4, FGP4, THLC4, TLB4	400
				SGL, SGP, FGL6, FGP6	600
				SKL8, SKP8	800
			Schneider	JL, JR	250
800 1000	65,000	480	Eaton/ Cutler-Hammer	TRI-PAC NB, CHMDL, HMDL, CHND, HND, NDC, CNDC	800
				TRI-PAC NB, CNDC, NDC, CRDC, TRI-PAC PB, RDC, CHND, HND, RD. CRD	1200
			Schneider/ Square D	MJ, PJ, PL, RJ	800
				PJ, PL, RL	1000
			ITE/Siemens	CMD6, HMD6, SCMD6, SHMD6, CND6, HND6, SCND6, SHND6, CPD6	800
				CND6, HND6, SCND6, CPD6, SHND6, HPD6	1200
			General Electric	TB8, TC, THC, THP	1000
				THC, THP, TRP	1200

Transfer Switch Accessories

Accessories are available either factory-installed or as loose kits, unless otherwise noted.

❑ CSA Certification

❑ Digital Meter (with MPAC 1200 only)

- Measure and display voltage, current, frequency, and power for both sources
- Programmable visual alarms for high voltage, low voltage, and high current
- Three digital outputs
- Serial port for optional network connections
- Password-protected programming menus
- Joystick operation
- Factory-installed
- Three digital outputs
- Joystick operation

❑ Extended Limited Warranties

- 2-year basic
- 5-year basic
- 5-year comprehensive
- 10-year major components

❑ Export Packaging

❑ Heater, Anti-Condensation

- Hygrostat-controlled 120 VAC strip heater (customer-supplied voltage source required)
- 100 or 250 watts (sized for enclosure)
- Protective 15 amp circuit breaker

❑ Literature Kits

- Production literature kit (one kit is included with each transfer switch)
- Overhaul literature kit

❑ Neutral Assembly

- Available as loose kit for open units

❑ RSA III Remote Serial Annunciator

- Monitors the generator set
- Monitors Normal and Emergency source status and connection
- Monitors ATS common alarm
- Allows remote testing of the ATS

For more information, see specification sheet G6-139.

❑ Seismic Certification

- Certification depends on application and geographic location. Contact your distributor for details.
- Available for 40-1000 amp KSS models with NEMA 1, 3R, 4, 4X, and 12 enclosures

❑ Surge Protection Device (SPD)

- Surge protection reduces transient voltages to harmless levels
- Protection modes: L-L / L-N / L-G / N-G
- Replaceable phase and neutral cartridges for service
- Frequency: 50-60 Hz
- Operating Temperature Range: -40 to 176°F (-40 to 80°C)
- Remote contacts for customer-supplied status indicators:
  Contacts: 1 NO, 1 NC
  Min Load: 12VDC / 10 mA
  Max. Load: 250 VAC / 1 A
  Wire Size (max.): 16AWG
- Fuse protection: 30 amps / 600 V
- UL 1449, 3rd Edition for Type 2 applications
- IEC 61-643-1, 2nd Edition T2/11
- See additional specifications below

Additional Controller Accessories

See the controller spec sheet for more information.

❑ Accessory Modules (with MPAC 1200 only)

- Alarm Module
- External Battery Supply Module
- Input/Output Module
- High-Power Input/Output Module

❑ Controller Disconnect Switch

❑ Ethernet Communications

❑ Current Sensing Kit (with MPAC 1200 only)

❑ Line-to-Neutral Voltage Monitoring (with MPAC 1200 only)

❑ Padlockable User Interface Cover

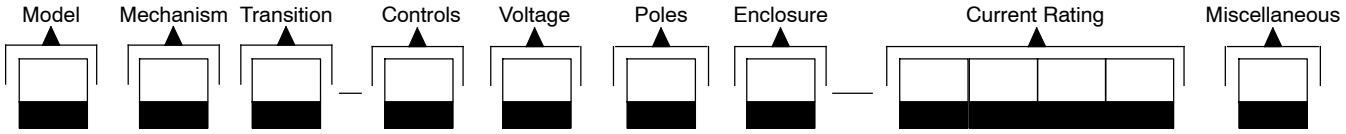
❑ Supervised Transfer Control Switch (with MPAC 1200 only)

SPD Specifications								
Nominal Voltage (V ±15%)	Max. Discharge Current (kA)	Phase	Poles	UL VPR 3rd Ed (L-N/N-G/L-G) (kV)	Limiting Voltage, (L-N/N-G/L-G) (kV)		Short Circuit Withstand Current (kA)	Maximum Continuous Operating Voltage (VAC)
					at 3kA	at 10kA		
240/120	40	Split	3	0.6 / 1.2 / 0.7	0.6 / 0.4 / 0.6	0.8 / 0.7 / 0.8	200	175 / 350
208/120	40	Wye	4	0.6 / 1.2 / 0.7	0.6 / 0.4 / 0.6	0.8 / 0.7 / 0.8	200	175 / 350
480/277	40	Wye	4	1.0 / 1.2 / 1.1	1.0 / 0.4 / 1.0	1.2 / 0.7 / 1.2	200	320 / 460
240/120	40	HLD	4	1.0 / 1.2 / 1.1	1.0 / 0.4 / 1.0	1.2 / 0.7 / 1.2	200	320 / 460
600/347	40	Wye	4	1.3 / 1.2 / 1.4	1.3 / 0.4 / 1.3	1.5 / 0.7 / 1.5	200	440 / 880

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For the nearest sales and service outlet in the
US and Canada, phone 1-800-544-2444
KOHLERPower.com

Kohler Power Systems
Asia Pacific Headquarters
7 Jurong Pier Road
Singapore 619159
Phone (65) 6264-6422, Fax (65) 6264-6455

Model Designation



Record the transfer switch model designation in the boxes. The transfer switch model designation defines characteristics and ratings as explained below.

Sample Model Designation: KSS-JCNA-0100S

Model

K: Kohler

Mechanism

S: Standard (Specific-Breaker)

Transition

S: Standard

Controller

A: Decision-Maker® MPAC 1200, Automatic
B: Decision-Maker® MPAC 1200, Non-Automatic
J: Decision-Maker® MPAC 750, Automatic

Voltage/Frequency

C: 208 Volts/60 Hz
D: 220 Volts/50 Hz
F: 240 Volts/60 Hz
G: 380 Volts/50 Hz
H: 400 Volts/50 Hz
J: 416 Volts/50 Hz
K: 440 Volts/60 Hz
M: 480 Volts/60 Hz
N: 600 Volts/60 Hz
P: 380 Volts/60 Hz
R: 220 Volts/60 Hz

Number of Poles/Wires

N: 2 Poles/3 Wires, Solid Neutral
T: 3 Poles/4 Wires, Solid Neutral
V: 4 Poles/4 Wires, Switched Neutral

Enclosure

A: NEMA 1
B: NEMA 12
C: NEMA 3R
D: NEMA 4
F: NEMA 4X
G: Open Unit

Current, Amps

0040	0200	600
0080	0225	800
0100	0260	1000
0150	0400	

Connections

S: Standard

Note: Some selections are not available for every model. Contact your Kohler distributor for availability.

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Flex 6EX EU System

Radio Control Equipment

Instruction Manual

MAGNETEK
RADIO CONTROLS

CE

191-00193-0002 R2
March 2014
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Service Information

Your New Radio System

Thank you for your purchase of Magnetek's Enrange™ Flex EX radio remote control system. Without a doubt, our Flex EX system is the ultimate solution for providing precise, undeterred, and safe control of your material.

If your product ever needs modification or service, please contact one of our representatives at the following locations:

U.S. Service Information

For questions regarding service or technical information contact:
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+1.866.624.7378

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Magnetek, Inc. has additional satellite locations for Canada and the United States. For more information, please visit http://www.magnetek.com.

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PRODUCT MANUAL SAFETY INFORMATION

Magnetek, Inc. (Magnetek) offers a broad range of radio remote control products, control products and adjustable frequency drives, and industrial braking systems for material handling applications. This manual has been prepared by Magnetek to provide information and recommendations for the installation, use, operation and service of Magnetek's material handling products and systems (Magnetek Products). Anyone who uses, operates, maintains, services, installs or owns Magnetek Products should know, understand and follow the instructions and safety recommendations in this manual for Magnetek Products.

The recommendations in this manual do not take precedence over any of the following requirements relating to cranes, hoists lifting devices or other material handling equipment which use or include Magnetek Products:

- Instructions, manuals, and safety warnings of the manufacturers of the equipment where the radio system is used,
- Plant safety rules and procedures of the employers and the owners of facilities where the Magnetek Products are being used,
- Regulations issued by the Occupational Health and Safety Administration (OSHA),
- Applicable local, state or federal codes, ordinances, standards and requirements, or
- Safety standards and practices for the industries in which Magnetek Products are used.

This manual does not include or address the specific instructions and safety warnings of these manufacturers or any of the other requirements listed above. It is the responsibility of the owners, users and operators of the Magnetek Products to know, understand and follow all of these requirements. It is the responsibility of the employer to make its employees aware of all of the above listed requirements and to make certain that all operators are properly trained. **No one should use Magnetek Products prior to becoming familiar with and being trained in these requirements and the instructions and safety recommendations in this manual**.

WARRANTY INFORMATION

For information on Magnetek's product warranties by product type, please visit www.magnetek.com.

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1. INTRODUCTION

The Flex radio remote control systems are designed for control of industrial equipment and machinery such as overhead traveling cranes, jib cranes, gantry cranes, tower cranes, electric hoists, winches, monorails, conveyor belts, mining equipment and other material handling equipment where wireless control is preferred.

Each Flex system consists of a transmitter handset and receiver unit. Other standard-equipped accessories include transmitter waist belt, spare transmitter power key, clear vinyl pouch, "AA" alkaline batteries, compass direction decal sheet and user's manual.

List of notable features include:

* **62 user-programmable channels** – Advanced synthesized RF controls with 62 built-in channels; there are no more fixed channels and fragile quartz crystals to break.

* **Automatic channel scanning receiver** – No more hassle of climbing up the crane to change receiver channels.

* **Over one million unique ID codes (20bit)** – Each and every Flex system has its own unique ID codes and serial number, never repeats.

* **Advanced controls** – The Flex system utilizes advanced microprocessor controls with 32bit CRC and Hamming Code, which provide ultra-fast, safe, precise, and error-free encoding and decoding.

* **Unique I-CHIP design** – The I-CHIP functions in a way that is very similar to SIM cards used on mobile phones, with the ability to transfer system information and settings from one transmitter to another without the hassle of resetting the spares.

* **Reliable push buttons** – The in-house designed push buttons with gold-plated contacts are rated for more than one million press cycles.

* **Low power consumption** – Requires only two "AA" Alkaline batteries for more than 100 hours of operating time between replacements.

* **Ultra-durable nylon and fiberglass composite enclosures** – Highly resistant to breakage and deformation even in the most abusive environments.

* **Full compliance** – All systems are fully compliant with the FCC Part-15 Rules, European Directives (Safety, EMC, R&TTE, Machinery), and Industry Canada Specifications (IC).

2. RADIO CONTROLLED SAFETY

WARNINGS and CAUTIONS

Throughout this document WARNING and CAUTION statements have been deliberately placed to highlight items critical to the protection of personnel and equipment.

WARNING – A warning highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in injury or death of personnel, or long term physical hazards. Warnings are highlighted as shown below:



CAUTION – A caution highlights an essential operating or maintenance procedure, practice, etc. which if not strictly observed, could result in damage to, or destruction of equipment, or loss of functional effectiveness. Cautions are highlighted as shown below:



WARNINGS and CAUTIONS SHOULD NEVER BE DISREGARDED.

The safety rules in this section are not intended to replace any rules or regulations of any applicable local, state, or federal governing organizations. Always follow your local lockout and tagout procedure when maintaining any radio equipment. The following information is intended to be used in conjunction with other rules or regulations already in existence. It is important to read all of the safety information contained in this section before installing or operating the Radio Control System.

2.1 CRITICAL INSTALLATION CONSIDERATIONS

WARNING

PRIOR TO INSTALLATION AND OPERATION OF THIS EQUIPMENT, READ AND DEVELOP AN UNDERSTANDING OF THE CONTENTS OF THIS MANUAL AND THE OPERATION MANUAL OF THE EQUIPMENT OR DEVICE TO WHICH THIS EQUIPMENT WILL BE INTERFACED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

ALL EQUIPMENT MUST HAVE A MAINLINE CONTACTOR INSTALLED AND ALL TRACKED CRANES, HOISTS, LIFTING DEVICES AND SIMILAR EQUIPMENT MUST HAVE A BRAKE INSTALLED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

AN AUDIBLE AND/OR VISUAL WARNING MEANS MUST BE PROVIDED ON ALL REMOTE CONTROLLED EQUIPMENT AS REQUIRED BY CODE, REGULATION, OR INDUSTRY STANDARD. THESE AUDIBLE AND/OR VISUAL WARNING DEVICES MUST MEET ALL GOVERNMENTAL REQUIREMENTS. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

FOLLOW YOUR LOCAL LOCKOUT TAGOUT PROCEDURE BEFORE MAINTAINING ANY REMOTE CONTROLLED EQUIPMENT. ALWAYS REMOVE ALL ELECTRICAL POWER FROM THE CRANE, HOIST, LIFTING DEVICE OR SIMILAR EQUIPMENT BEFORE ATTEMPTING ANY INSTALLATION PROCEDURES. DE-ENERGIZE AND TAGOUT ALL SOURCES OF ELECTRICAL POWER BEFORE TOUCH-TESTING ANY EQUIPMENT. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

THE DIRECT OUTPUTS OF THIS PRODUCT ARE NOT DESIGNED TO INTERFACE DIRECTLY TO TWO STATE SAFETY CRITICAL MAINTAINED FUNCTIONS, I.E., MAGNETS, VACUUM LIFTS, PUMPS, EMERGENCY EQUIPMENT, ETC. A MECHANICALLY LOCKING INTERMEDIATE RELAY SYSTEM WITH SEPARATE POWER CONSIDERATIONS MUST BE PROVIDED. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH OR DAMAGE TO EQUIPMENT.

2.2 GENERAL

Radio controlled material handling equipment operates in several directions. Cranes, hoists, lifting devices and other material handling equipment can be large, and operate at high speeds. Quite frequently, the equipment is operated in areas where people are working in close proximity to the material handling equipment. **The operator must exercise extreme caution at all times**. Workers must constantly be alert to avoid accidents. The following recommendations have been included to indicate how careful and thoughtful actions may prevent injuries, damage to equipment, or even save a life.

2.3 PERSONS AUTHORIZED TO OPERATE RADIO CONTROLLED CRANES

Only properly trained persons designated by management should be permitted to operate radio controlled equipment.

Radio controlled cranes, hoists, lifting devices and other material handling equipment should not be operated by any person who cannot read or understand signs, notices and operating instructions that pertain to the equipment.

Radio controlled equipment should not be operated by any person with insufficient eyesight or hearing or by any person who may be suffering from a disorder or illness, is taking any medication that may cause loss of equipment control, or is under the influence of alcohol or drugs.

2.4 SAFETY INFORMATION AND RECOMMENDED TRAINING FOR RADIO CONTROLLED EQUIPMENT OPERATORS

Anyone being trained to operate radio controlled equipment should possess as a minimum the following knowledge and skills before using the radio controlled equipment.

The operator should:

- have knowledge of hazards pertaining to equipment operation
- have knowledge of safety rules for radio controlled equipment
- have the ability to judge distance of moving objects
- know how to properly test prior to operation
- be trained in the safe operation of the radio transmitter as it pertains to the crane, hoist, lifting device or other material handling equipment being operated
- have knowledge of the use of equipment warning lights and alarms
- have knowledge of the proper storage space for a radio control transmitter when not in use
- be trained in transferring a radio control transmitter to another person
- be trained how and when to report unsafe or unusual operating conditions
- test the transmitter emergency stop and all warning devices prior to operation; testing should be done on each shift, without a load
- be thoroughly trained and knowledgeable in proper and safe operation of the crane, hoist, lifting device, or other material handling equipment that utilizes the radio control
- know how to keep the operator and other people clear of lifted loads and to avoid "pinch" points
- continuously watch and monitor status of lifted loads
- know and follow cable and hook inspection procedures
- know and follow the local lockout and tagout procedures when servicing radio controlled equipment
- know and follow all applicable operating and maintenance manuals, safety procedures, regulatory requirements, and industry standards and codes

The operator shall not:

- lift or move more than the rated load
- operate the material handling equipment if the direction of travel or function engaged does not agree with what is indicated on the controller
- use the crane, hoist or lifting device to lift, support or transport people
- lift or carry any loads over people
- operate the crane, hoist or lifting device unless all persons, including the operator, are and remain clear of the supported load and any potential pinch points
- operate a crane, hoist or lifting device when the device is not centered over the load
- operate a crane, hoist or lifting device if the chain or wire rope is not seated properly in the sprockets, drum or sheave
- operate any damaged or malfunctioning crane, hoist, lifting device or other material handling equipment

- change any settings or controls without authorization and proper training
- remove or obscure any warning or safety labels or tags
- leave any load unattended while lifted
- leave power on the radio controlled equipment when the equipment is not in operation
- operate any material handling equipment using a damaged controller because the unit may be unsafe
- operate manual motions with other than manual power
- operate radio controlled equipment when low battery indicator is on

WARNING

THE OPERATOR SHOULD NOT ATTEMPT TO REPAIR ANY RADIO CONTROLLER. IF ANY PRODUCT PERFORMANCE OR SAFETY CONCERNS ARE OBSERVED, THE EQUIPMENT SHOULD IMMEDIATELY BE TAKEN OUT OF SERVICE AND BE REPORTED TO THE SUPERVISOR. DAMAGED AND INOPERABLE RADIO CONTROLLER EQUIPMENT SHOULD BE RETURNED TO MAGNETEK FOR EVALUATION AND REPAIR. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

2.5 TRANSMITTER UNIT

Transmitter switches should never be mechanically blocked ON or OFF. When not in use, the operator should turn the transmitter OFF. A secure storage space should be provided for the transmitter unit, and the transmitter unit should always be placed there when not in use. This precaution will help prevent unauthorized people from operating the material handling equipment.

Spare transmitters should be stored in a secure storage space and only removed from the storage space after the current transmitter in use has been turned OFF, taken out of the service area and secured.

2.6: PRE-OPERATION TEST

At the start of each work shift, or when a new operator takes control of the crane, operators should do, as a minimum, the following steps before making lifts with any crane or hoist:

Test all warning devices.

Test all direction and speed controls.

Test the transmitter emergency stop.

2.7 BATTERIES

WARNING

KNOW AND FOLLOW PROPER BATTERY HANDLING, CHARGING AND DISPOSAL PROCEDURES. IMPROPER BATTERY PROCEDURES CAN CAUSE BATTERIES TO EXPLODE OR DO OTHER SERIOUS DAMAGE. FAILURE TO FOLLOW THIS WARNING COULD RESULT IN SERIOUS INJURY OR DEATH AND DAMAGE TO EQUIPMENT.

2.8 BATTERY HANDLING

Use only batteries approved by Magnetek for the specific product.

Do not dispose of a battery pack in fire; it may explode.

Do not attempt to open the battery pack.

Do not short circuit the battery.

For intrinsically safe environments only use specified Magnetek intrinsically safe batteries.

Keep the battery pack environment cool during charging operation and storage (i.e., not in direct sunlight or close to a heating source).

2.9 BATTERY CHARGING

For those transmitters equipped with battery chargers, please familiarize all users with the instructions of the charger before attempting to use.

Do not attempt to charge non-rechargeable battery packs.

Avoid charging partially discharged rechargeable batteries to help prolong battery cycle life.

Avoid charging the battery pack for more than 24 hours at a time.

Do not charge batteries in a hazardous environment.

Do not short the charger.

Do not attempt to charge a damaged battery.

Use only Magnetek approved chargers for the appropriate battery pack.

Do not attempt to use a battery that is leaking, swollen or corroded.

Charger units are not intended for outdoor use. Use only indoors.

2.10 BATTERY DISPOSAL

Before disposing of batteries consult local and governmental regulatory requirements for proper disposal procedure.

2.11 SPECIFIC SYSTEM WARNINGS

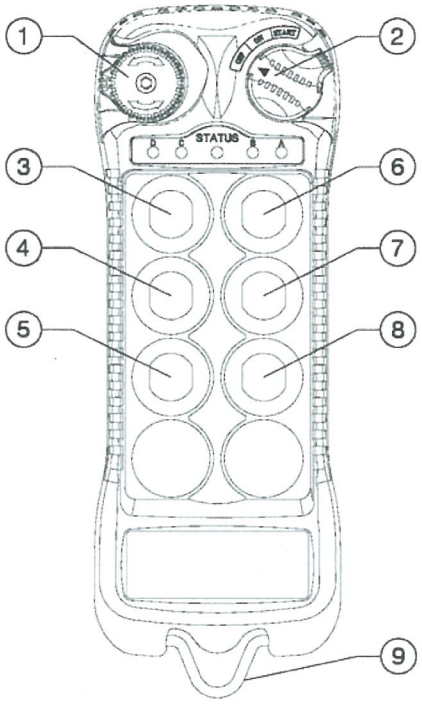
Below are some specific operating safety tips that should be strictly followed when operating a Flex 6EX System:

1. Check the Status LED on the transmitter for any signs of low battery power (refer to page 35).
2. Check the Status LED on the transmitter for any signs of irregularities (refer to page 35).
3. Make sure the system is not set to the same channel as any other Flex systems in use within a distance of 300 meters (900 feet).

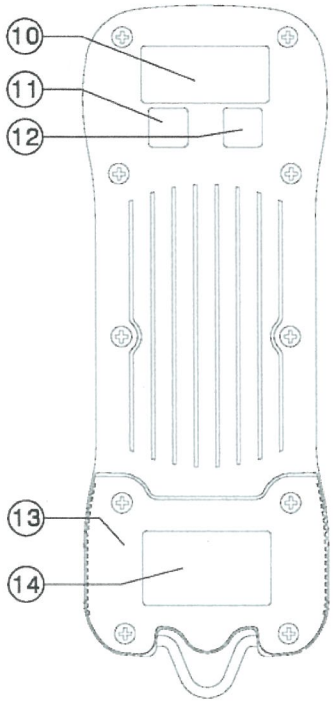
3. GENERAL SYSTEMS INFORMATION

3.1 TRANSMITTER HANDSET

3.1.1 External Illustration



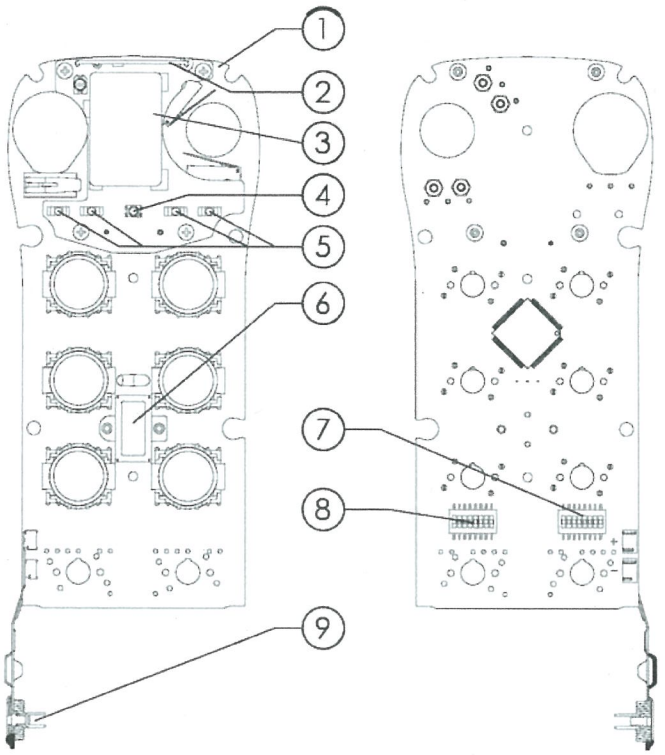
(Fig. 01)



(Fig. 02)

1. Emergency Stop Button
2. Removable Power Key Switch
3. Push Button #2
4. Push Button #4
5. Push Button #6
6. Push Button #1
7. Push Button #3
8. Push Button #5
9. Strap Ring
10. System Information
11. System Channel
12. Crane Number
13. Battery Cover
14. FCC Information

3.1.2 Internal Illustration



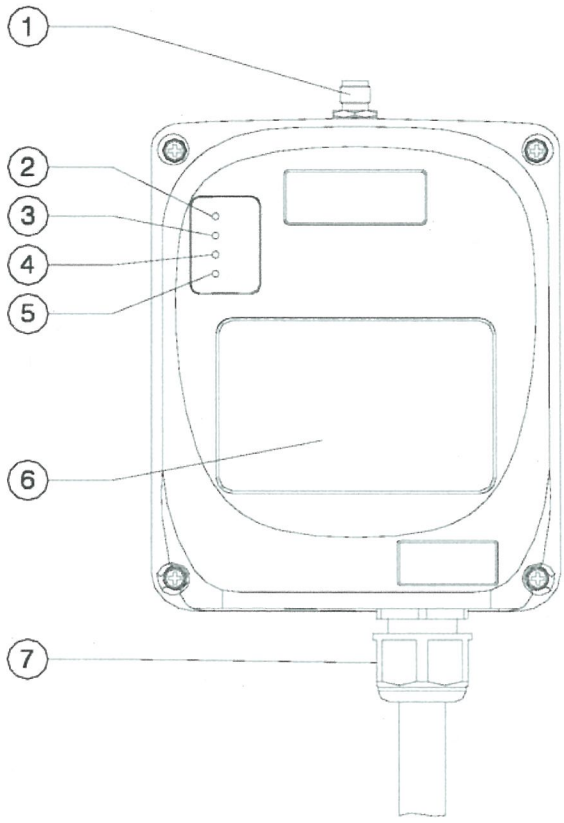
(Fig. 03)

(Fig. 04)

1. Encoder Board
2. Aerial Antenna
3. Transmitting Module
4. Status LED Display
5. Function LED Displays
6. I-CHIP
7. Function Dip-Switch
8. Channel Dip-Switch
9. Battery Contact Mechanism

3.2 RECEIVER UNIT

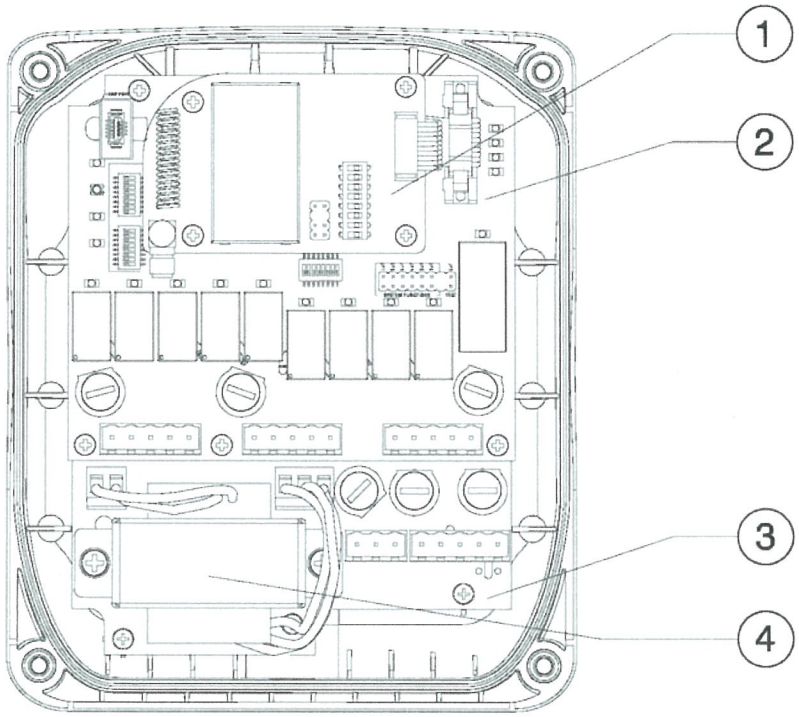
3.2.1 External Illustration



(Fig. 05)

1. External Antenna Jack (optional)
2. Power LED Display
3. Status LED Display
4. SQ LED Display
5. COM LED Display
6. Output Contact Diagram
7. Cord Grip

3.2.2 Internal Illustration



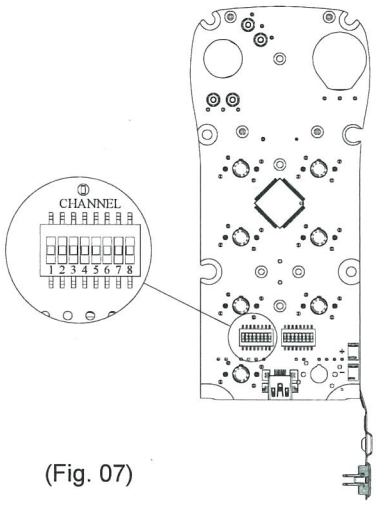
(Fig. 06)

1. Receiving Module
2. Decoder/Relay Board
3. AC Line Filter/Relay Board
4. Power Transformer

4. FUNCTION SETTINGS

4.1 TRANSMITTER HANDSET

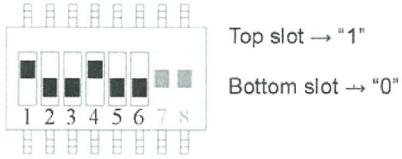
4.1.1 System Channel Settings



(Fig. 07)

Set the transmitter channel by adjusting the channel dip-switch located on the backside of the transmitter encoder board (refer to Fig. 07 above). Only the first six (6) positions are used for channel programming (refer to Fig. 08 below). The system channels table located on page 28 illustrates which dip-switch setting corresponds to which channel. Once the transmitter channel is altered, make sure to change the receiver channel as well. The channel on both the transmitter and the receiver must be identical in order for the system to work. To change the receiver channel please refer to page 20.

Example:

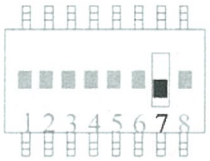


(Fig. 08)

The above dip-switch setting **"1 0 0 1 0 0"** corresponds to "channel 36" in the system channels table on page 28.

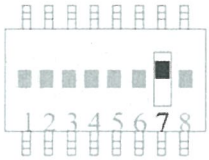
4.1.2 Continuous Transmitting Time Adjustment

(Type 1)



After the push button is released the transmitter will continue to transmit neutral signals to the receiver for up to one (1) minute. After one (1) minute the transmitter will cease transmission thus temporarily disconnecting the receiver MAIN.

(Type 2)



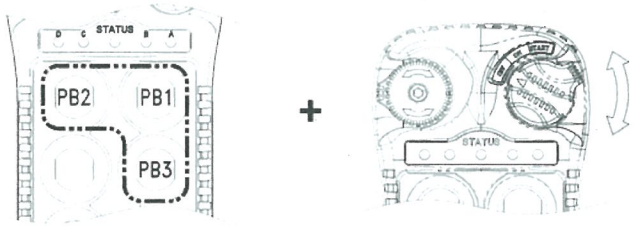
After the push button is released the transmitter will continue to transmit neutral signals to the receiver for up to three (3) minutes. After three (3) minutes the transmitter will cease transmission thus temporarily disconnecting the receiver MAIN. Please contact your local dealer if your application requires transmitting on time other than the pre-set value above.

4.1.3 Channel Change via Push Buttons

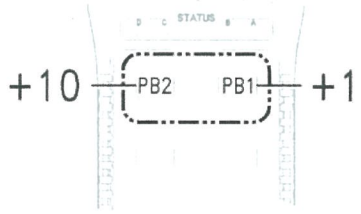
Other than CHANNEL dip-switch on the encoder board, the transmitter channel can also be changed directly on the push buttons. Please refer to the instructions below on how to change the transmitter channel via push buttons.

a. Press and hold PB1, PB2 and PB3 and rotate the power key to START position at the same time. A series of green and red blinks will appear on the Status LED showing the current channel setting. A green blink represents the tens (+10) and a red blink represents the units (+1).

Examples: 2 green blinks followed by 5 red blinks represents channel 25.
6 red blinks represents channel 06.



b. Select a new channel by pressing PB1 and PB2 on the transmitter. Press PB1 to increment the units (+1) and PB2 to increment the tens (+10).



Examples: Press PB2 two times and then PB1 four times will give you channel 24.
Press PB1 nine times with give you channel 09.

c. When finished, the newly selected channel will appear on the Status LED via series of green and red blinks again.

d. Exit the channel programming by turning off the transmitter power.

e. Make sure the receiver channel is set identical to the transmitter. Please refer to page 20 and page 23 on how to change the receiver channel.

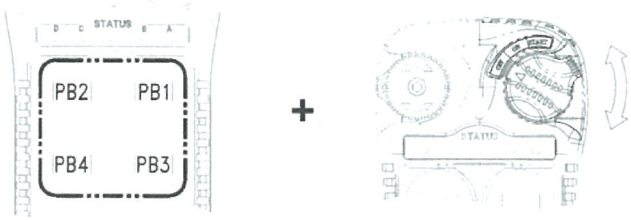
f. Please note that when the CHANNEL dip-switch inside the transmitter is changed, the priority will revert back to the new channel set on the CHANNEL dip-switch.

g. Please note that when the channel is set beyond channel 62 via PB1 and PB2 (i.e. channel 63, 68, 88, etc...), the system will recognize it as channel 62.

4.1.4 Optional 4-Digit Security Code

The 4-digit Security Code is an optional feature that can be programmed into the transmitter to allow operation only to those who know the code. If this feature is desired, set up as follows: Prior to rotating the transmitter power key-switch to START position to begin operation, you first enter a 4-digit security code in order to proceed further. When this 4-digit security code is entered correctly, a green light will appear on the Status LED. Please refer to the instruction below on how to program the 4-digit security code.

a. Release E-Stop, then press and hold PB1, PB2, PB3 and PB4 (all at once), and then rotate the power key to START position.



b. A constant orange light will appear on the Status LED telling you that you are in the security code programming mode.

c. For newly purchased system with the security code function deactivated (default setting), press PB1 four times (1111) to activate the security code function. At this time the Status LED on the transmitter will blink orange slowly, telling you that the 4 digits entered is correct. Then select your own 4-digit security code by pressing PB1, PB2, PB3 or PB4 on the transmitter (four presses randomly). At this time, fast orange blinks are displayed on the Status LED telling you to reconfirm the 4-digit security code you have just entered. A green light will appear once you have re-entered the same 4-digit security code again (programming completed). If any mistake is made during this process, or if a red light is shown on the Status LED after you have re-entered the security code (incorrect input), or even if you believe you have entered the correct code but the transmitter fails to work properly, then you must reset the transmitter power (by power-cycling the transmitter*) and then repeat steps a, b, and c again.

**NOTE: To power-cycle the transmitter, you must first remove, then reinstall the batteries. Simply turning the power switch off, then on will NOT properly clear the memory. This process must be used for any errors regarding proper transmitter operation (not just for security code settings).*

***Steps:** Press and hold PB1~PB4 and rotate power key to START position → constant orange → press PB1 four times (for new systems) or 4-digit security code → slow orange blinks → enter the new 4-digit security code → fast orange blinks → re-enter the same 4-digit security code again → green light*

d. If you wish to cancel the security code function, then repeat a, b, and c above and press PB1 four times as your new security code (security code function disabled).

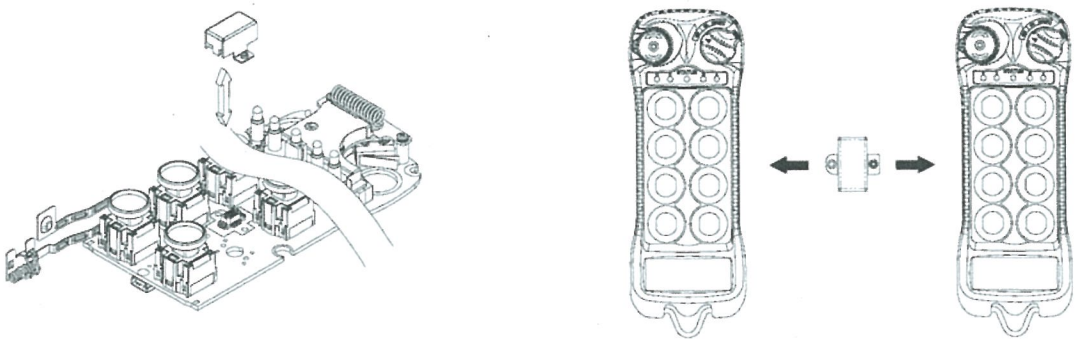
e. If you do not remember the 4-digit security code, then you must contact your dealer or distributor for further assistance.

4.1.5 I-CHIP

The I-CHIP functions in a way that is very similar to a SIM card inside a mobile phone, which stores system information such as your telephone number, account number, phone book and other settings. I-CHIP works exactly the same way, as it stores information such as system serial number/ID code, channel and push button configurations.

When replacing a transmitter handset, just take the I-CHIP out of the old transmitter and install it into the new one (refer to Fig. 09 below). For complete information transfer, make sure both the Channel and Function dip-switch is set to all "1". If both dip-switches are set to all "1", then the transmitter will operate according to the push button configurations and channel stored inside the I-CHIP. If both Channel and Function dip-switch is set to other values other than all "1", then the transmitter will operate according to the channel and push button configurations set on these two dip-switches, not the ones stored inside the I-CHIP. Every time when the settings on these two dip-switches have changed, the new settings will be stored into the I-CHIP automatically. In this case the previous channel and push button configurations stored inside the I-CHIP will be replaced by the new settings.

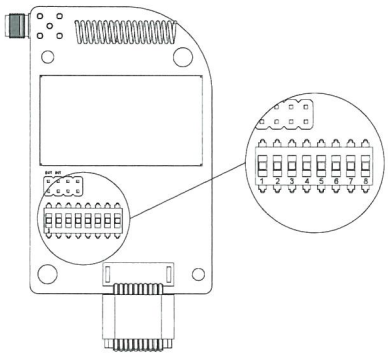
For safety purposes, the system serial number/ID code stored inside the I-CHIP can not be changed directly on the transmitter encoder board. Only channels and push button configurations can be changed directly on the encoder board via Channel and Function dip-switches. There are only two ways that you can change transmitter serial number/ID code: via I-CHIP programming port located on the decoder module inside the receiver unit, (please refer to page 27 on how to program the I-CHIP (serial number/ID code) via the receiver unit); or via an external I-CHIP programmer or duplicator unit available from the factory. Please ask your local dealers for assistance if your system requires serial number/ID code adjustments.



(Fig. 09)

4.2 RECEIVER UNIT

4.2.1 System Channel Settings

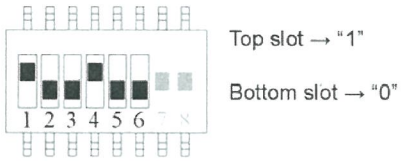


(Fig. 10)

Even though the Flex system is equipped with an automatic channel scanning mode, the user can also set the receiver channel manually. Please refer to page 33 on how automatic channel scanning receiver works.

Set the receiver channel by adjusting the channel dip-switch located on the receiver module (refer to Fig. 10 above). Only the first six (6) positions are used for channel programming (refer to Fig. 11 below). The system channels table located on page 28 illustrates which dip-switch setting corresponds to which channel. Once the receiver channel is altered, make sure to change transmitter channel as well. The channel on both transmitter and receiver must be identical in order for system to work. To change the transmitter channel please refer to page 15.

Example:



(Fig. 11)

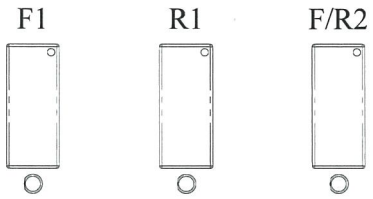
The above dip-switch setting **"1 0 0 1 0 0"** corresponds to "channel 36" in the system channels table on page 28.

4.2.2 Output Relay Configurations

4.2.2.1 Output Relay Types

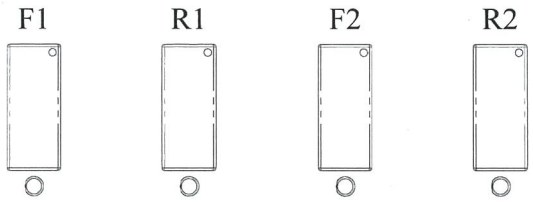
a. Three (3) output relays per motion – shared 2nd speed output relay

Output relays with Forward 1st speed (F1), Reverse 1st speed (R1) and Forward/Reverse 2nd speed (F/R2). Forward and Reverse 2nd speed (F/R2) shared the same output relay.



b. Four (4) output relays per motion – separate 1st and 2nd speed output relays

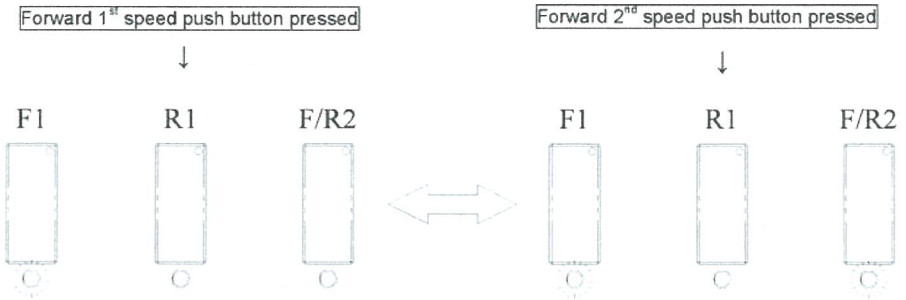
Output relays with Forward 1st speed (F1), Reverse 1st speed (R1), Forward 2nd speed (F2) and Reverse 2nd speed (R2). Forward and Reverse 2nd speed with separate output relays.



4.2.2.2 Output Relay Actions at 2nd Speed

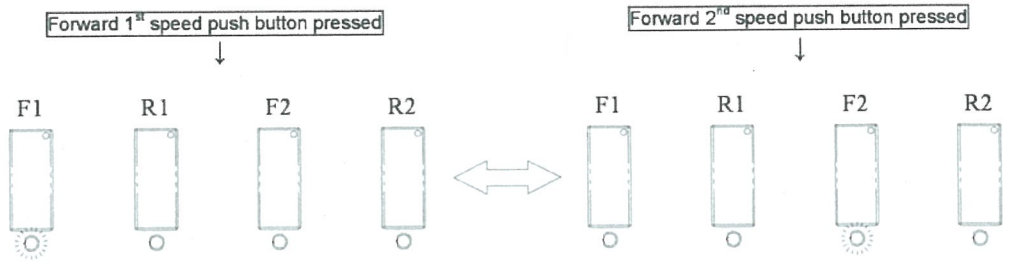
a. 3-output relays configuration with Closed/Closed contact at 2nd speed

At 2nd speed, both 1st speed (F1 or R1) and 2nd speed (F/R2) output relays are closed (refer to page 24 on how to set to this function).



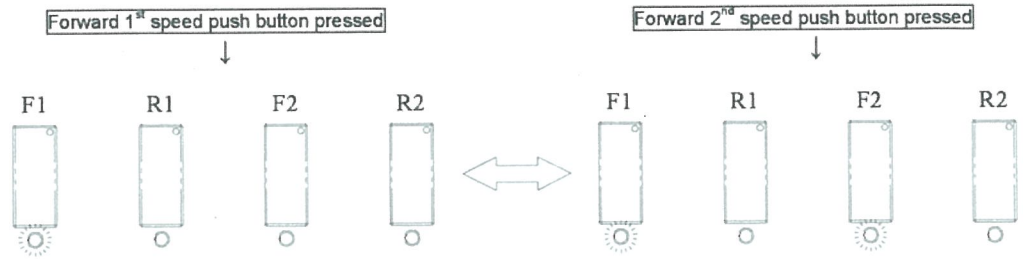
b. 4-output relays configuration with Opened/Closed contact at 2nd speed

At 2nd speed, only the 2nd speed (F2 or R2) output relay is closed (refer to page 24 on how to set to this function).



c. 4-output relays configuration with Closed/Closed contact at 2nd speed

At 2nd speed, both 1st speed (F1 or R1) and 2nd speed (F2 or R2) output relays are closed (refer to page 24 on how to set to this function).



4.2.2.3 START/AUX Function

After initiating the START function the Start position will become an auxiliary function with momentary contact. For auxiliary applications such as horns or buzzers, please connect it to the FUNC output relay (wire #5) located inside the receiver unit.

4.2.2.4 Momentary Contact

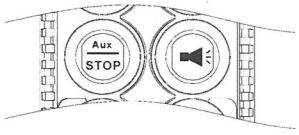
When the push button is released, the output relay that corresponds to that push button will open (refer to page 25 on how to set to this function). This type of contact is usually applied to external application such as horns or buzzers.

4.2.2.5 Toggled Contact

When the push button is released, the output relay that corresponds to that push button will remain closed (maintained contact) until next time the user presses the same push button again (refer to page 25 on how to set to this function). This type of contact is usually applied to external application such as lights.

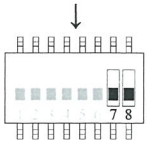
4.2.2.6 Auxiliary STOP Push Button Function

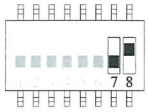
The auxiliary STOP function acts as a 2nd emergency stop button. Other than by emergency stop button and transmitter power key switch, the receiver MAIN is also deactivated when this auxiliary stop push button is pressed (refer to page 25 on how to set to this function).

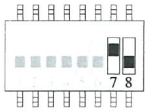


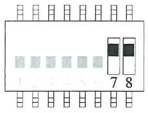
4.2.3 Receiver Auto-Scanning Settings

Receiver Channel Dip-switch

(1)  → Scans all 62 channels (manufacture preset)
For standard operation

(2)  → Single fixed channel
Auto scanning function disabled

(3)  → Scanning 2 channels only*

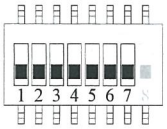
(4)  → Scanning 3 channels only

* If the first 6 dip-switch positions on the receiving module is set to Ch.01 ("000000" or "000001"), when set to 2-channel scanning (type-3 above), then the receiver will only scan Ch.01 and Ch.02.

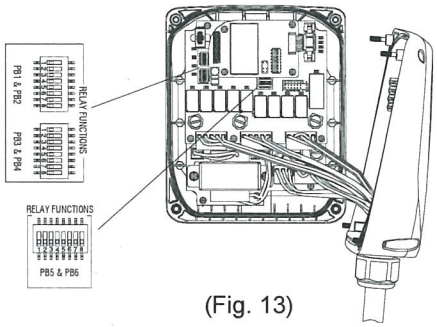
4.2.4 Dip-Switch Settings

4.2.4.1 Interlocked Functions

Interlocked means the two adjacent push buttons cannot be activated simultaneously as they will cancel each other out. Interlocked settings are usually applied to forward and reverse motions. Each dip-switch on the decoder module corresponds to one (1) motion or two (2) adjacent push buttons (refer to Fig. 12 & 13 below). Only the first seven (7) dip-switch positions are used (counting from left to right); the 8th dip-switch position (far right) is not used.



(Fig. 12)



(Fig. 13)

Manufacture preset

Dip Settings	Function Descriptions	# of Relays Used
0000000	Normal (single speed only, F2 & R2 relays not used)	2
0000001	Closed/Closed Relay Action at 2nd Speed (separate 2nd speed relay)	4
0000010	Closed/Closed Relay Action at 2nd Speed (shared 2nd speed relay)	3
0000011	Opened/Closed Relay Action at 2nd Speed (separate 2nd speed relay)	4
0001001	On + Start / Off + Start -- Prior to pressing the button you must first rotate and hold the power key switch at START position to activate On or Off relays.	2
0001010	FWD/REV toggled (latched).	2
0001011	FWD/REV toggled (latched) and affected by the E-stop command.	2

4.2.4.2 Non-Interlocked Functions

Contrary to interlocked settings, non-interlocked settings allow the two adjacent push buttons be used simultaneously. Non-interlocked settings are usually applied to a crane's auxiliary functions, such as lights, horn, 3rd speed and auxiliary stop. Each dip-switch on the decoder module corresponds to one (1) motion or two (2) adjacent push buttons (left & right push buttons).

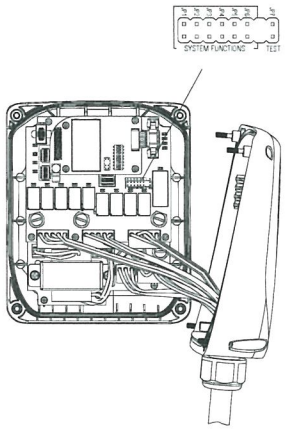
Function Code	Dip Position Setting #1	Dip Position Setting #2 - #4 (left button) & #5 - #7 (right button)	Function Description
A	1	000	Normal (momentary) contact.
B	1	001	Toggled (latching) contact.
C	1	011	Normal + Start function. For added safety, you must first rotate and hold the power key switch at "START" position and then press the intended push button at the same time to activate the output relay.
D	1	111	Auxiliary Stop.

Example #1: Left button (set to function code A) / right button (set to function code A) → **1 000 000**
Example #2: Left button (set to function code B) / right button (set to function code B) → **1 001 001**
Example #3: Left button (set to function code A) / right button (set to function code C) → **1 000 011**
Example #4: Left button (set to function code C) / right button (set to function code B) → **1 011 001**

4.2.5 Jumper Settings

Jumper settings are applied to functions such as main-disconnect time, Start function, system information (serial number/ID code) programming, and system testing. Jumpers #1 - #7 are located on the decoder/relay board between the receiving RF module and the output relays (refer to Fig.14 below).

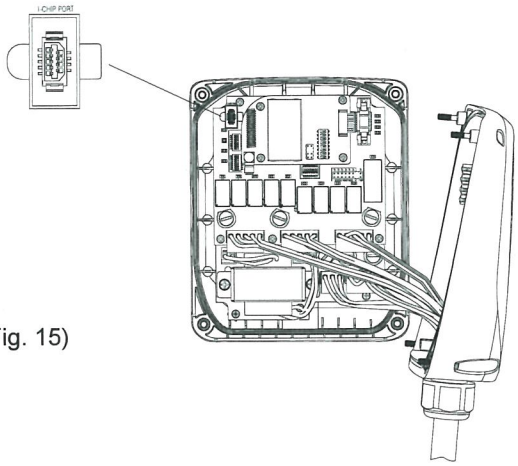
(Fig. 14)



Manufacture preset

Jumper Settings	Function
JP3 (Blank)	After 1 or 3 minutes of transmitter inactivity (MAIN deactivated), press any push button on the transmitter to reactivate the receiver MAIN.
JP3 (Inserted)	After 1 or 3 minutes of transmitter inactivity (MAIN deactivated), rotate the transmitter power key-switch to "START" position to reactivate the receiver MAIN.
JP6 (Blank)	Program system serial number/ID code and channel from decoder module to I-CHIP.
JP6 (Inserted)	Program system serial number/ID code and channel from I-CHIP to decoder module.
JP7 (Inserted)	For system test only, receiver MAIN disabled.

4.2.6 I-CHIP Programming Port



(Fig. 15)

The I-CHIP programming port, located on the decoder module (refer to Fig. 15 above) inside the receiver, is designed for the purpose of transferring a system serial number/ID code from the I-CHIP to the receiver or vice versa. If you wish to transfer system information from the receiver to the I-CHIP, just insert the I-CHIP onto the programming port (JP6 jumper not inserted), wait until the Status LED on the decoder module turned displays a constant green light (within 2 seconds), and then take the I-CHIP out of the programming port (programming completed). At this time the I-CHIP should also possess the same serial number/ID code as the receiver.

If the Status LED on the decoder module displays a constant red light after inserting the I-CHIP (programming failed), then you must reinsert the I-CHIP one more time. On the other hand, if you wish to transfer system information from I-CHIP to receiver, then you must first insert JP6 jumper prior to inserting the I-CHIP, then wait for the green light to appear on the Status LED. At this time the receiver should also possess the same system information as the I-CHIP. Please note that the receiver unit must be powered in order to proceed with the programming.

4.2.7 Fuse Ratings

FUSE #	110 - 120VAC	220 - 240VAC	380 - 400VAC	410 - 460VAC	24VAC	42 & 48VAC	12 - 24VDC
F1 - F8	5.0A (clear)	5.0A (clear)	5.0A (clear)	5.0A (clear)	5.0A (clear)	5.0A (clear)	5.0A (clear)
F9 - F10	0.5A (blue)	0.5A (blue)	0.5A (blue)	0.5A (blue)	1.0A (red)	1.0A (red)	1.0A (red)

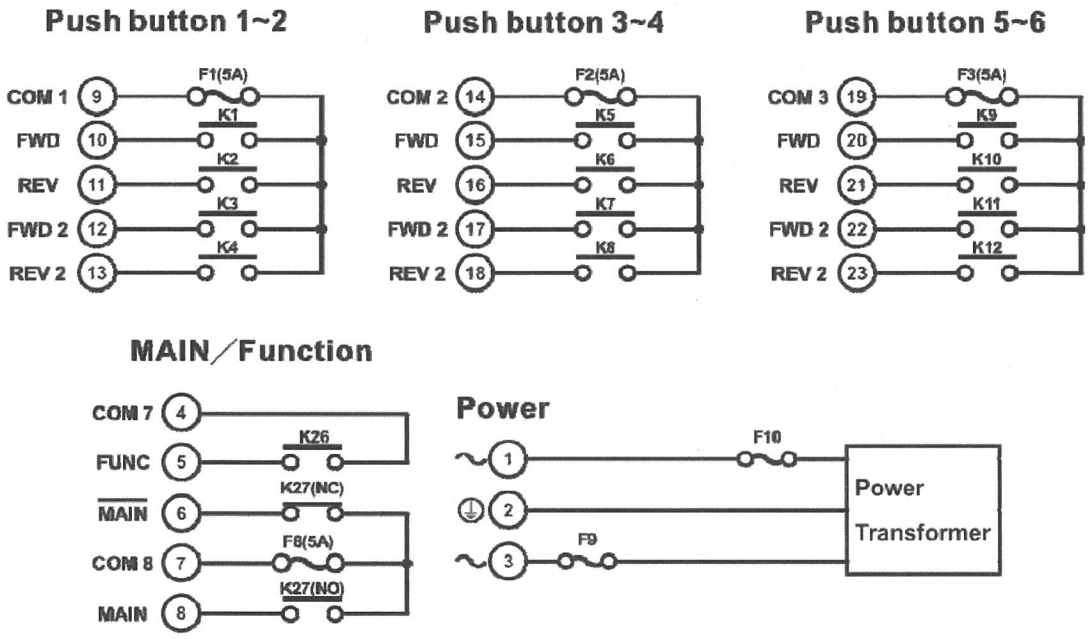
5. SYSTEM CHANNELS TABLE

Channel	Frequency	Dip-switch Setting	Channel	Frequency	Dip-switch Setting
01	433.000MHZ	000000	32	433.775MHZ	100000
01	433.000MHZ	000001	33	433.800MHZ	100001
02	433.025MHZ	000010	34	433.825MHZ	100010
03	433.050MHZ	000011	35	433.850MHZ	100011
04	433.075MHZ	000100	36	433.875MHZ	100100
05	433.100MHZ	000101	37	433.900MHZ	100101
06	433.125MHZ	000110	38	433.925MHZ	100110
07	433.150MHZ	000111	39	433.950MHZ	100111
08	433.175MHZ	001000	40	433.975MHZ	101000
09	433.200MHZ	001001	41	434.000MHZ	101001
10	433.225MHZ	001010	42	434.025MHZ	101010
11	433.250MHZ	001011	43	434.050MHZ	101011
12	433.275MHZ	001100	44	434.075MHZ	101100
13	433.300MHZ	001101	45	434.100MHZ	101101
14	433.325MHZ	001110	46	434.125MHZ	101110
15	433.350MHZ	001111	47	434.150MHZ	101111
16	433.375MHZ	010000	48	434.175MHZ	110000
17	433.400MHZ	010001	49	434.200MHZ	110001
18	433.425MHZ	010010	50	434.225MHZ	110010
19	433.450MHZ	010011	51	434.250MHZ	110011
20	433.475MHZ	010100	52	434.275MHZ	110100
21	433.500MHZ	010101	53	434.300MHZ	110101
22	433.525MHZ	010110	54	434.325MHZ	110110
23	433.550MHZ	010111	55	434.350MHZ	110111
24	433.575MHZ	011000	56	434.375MHZ	111000
25	433.600MHZ	011001	57	434.400MHZ	111001
26	433.625MHZ	011010	58	434.425MHZ	111010
27	433.650MHZ	011011	59	434.450MHZ	111011
28	433.675MHZ	011100	60	434.475MHZ	111100
29	433.700MHZ	011101	61	434.500MHZ	111101
30	433.725MHZ	011110	62	434.525MHZ	111110
31	433.750MHZ	011111	I-CHIP		111111*

* *When set to all "1" the priority goes to the channel assigned inside the I-CHIP.*

6. RECEVIER INSTALLATION

6.1 OUTPUT RELAY CONTACT DIAGRAM



* For 3-relay (shared 2nd speed) and 4-relay (separate 2nd speed) configurations please refer to page 21.

* For 4-relay closed/closed and 4-relay opened/closed relay configurations please refer to page 21.

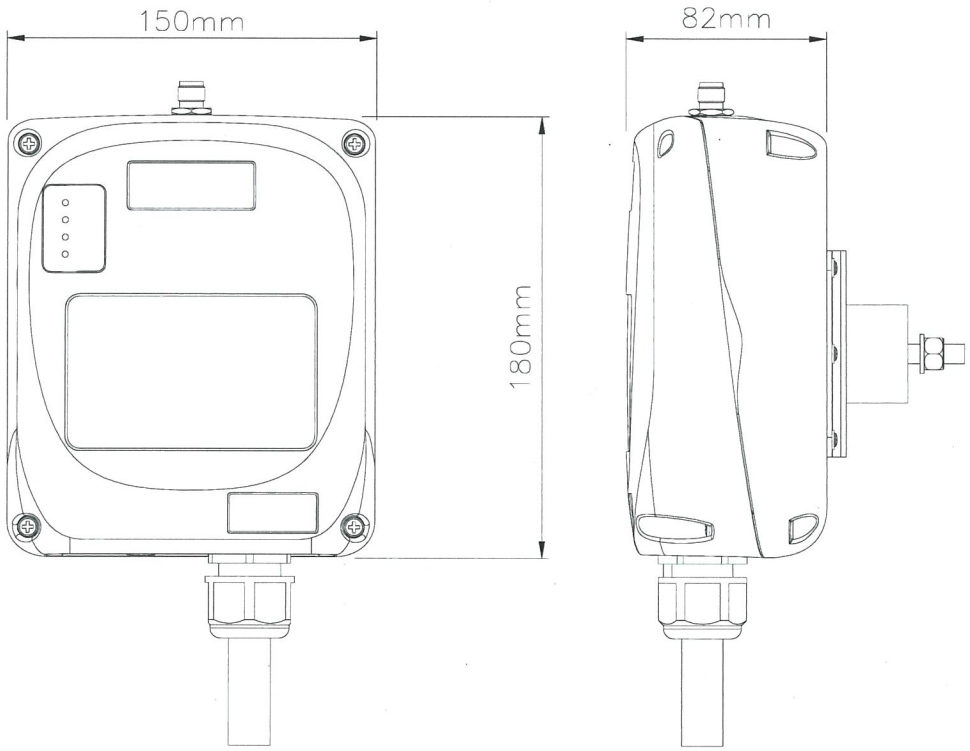
* For 12-24VDC power supply, wire #1 corresponds to the negative charge (-) and wire #3 corresponds to the positive charge (+). Wire #2 is for GROUND.

* Wire #6 is for "Normal Close" and wire #8 is for "Normal Open" MAIN output.

6.2 PRE-INSTALLATION PRECAUTIONS

1. Make sure the transmitter and receiver have identical serial number/ID codes and channels.
2. Make sure the receiver is not set to the same channel as any other systems in use in the surrounding area.
3. Make sure that the crane or equipment is working properly prior to installation.
4. Make sure the power source to the receiver is set correctly.
5. Switch off the main power source to the crane or equipment prior to installation.

6.3 STEP-BY-STEP INSTALLATION



(Fig. 16)

1. For best reception the location of the receiver should be visible to the operator at all time.

2. The location selected should not be exposed to high levels of electric noise. Mounting the receiver next to an unshielded variable frequency drive may cause minor interference. Always locate the receiver as far away from the variable frequency drive as possible.

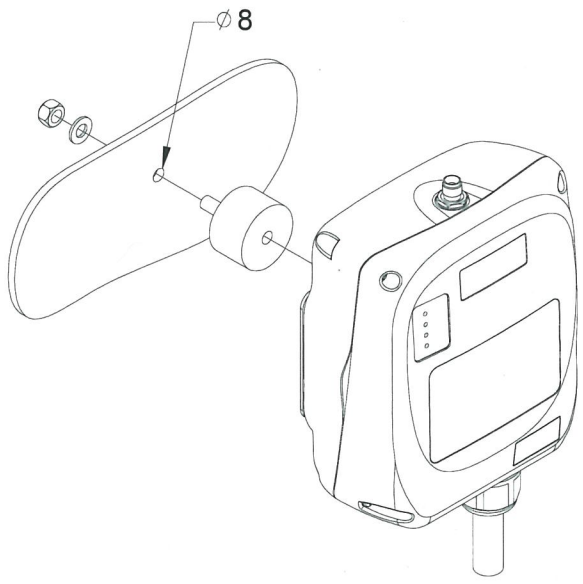
3. Ensure the selected location has adequate space to accommodate the receiver (refer to Fig. 16 on page 30).

4. For better reception, make sure the receiver is in an upright position.

5. Drill one hole (8mm in diameter) on the control panel or location where the receiver is to be installed (refer to below).

6. Make sure the bolt is tightened after installation.

7. For system wiring please refer to page 29.



6.4 SYSTEM TESTING

1. Turn on the power source to the receiver and test the MAIN relay output by pressing the red emergency stop button and observe that it properly opens and closes the mainline disconnect contactor.

2. Test the operation of each function to ensure it corresponds to the transmitter direction labels or the pendant it is replacing.

3. Test the limit switches (if any) to see if they are working properly.

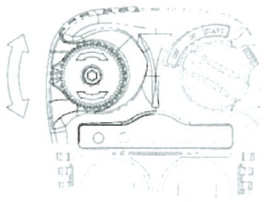
4. If your new remote control is replacing an existing pendant, make sure it is completely disconnected and placed in a safe location to prevent unwanted control commands.

7. OPERATING PROCEDURE

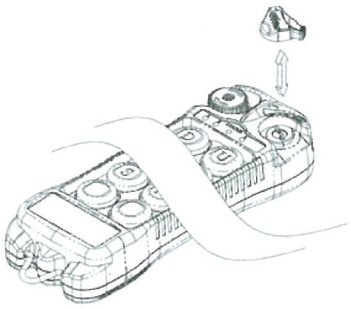
7.1 TRANSMITTER OPERATION

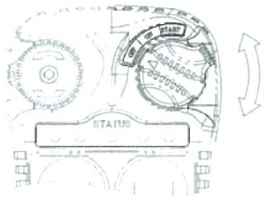
7.1.1 General Operating Procedure

a. Reset the red emergency stop button located on the top left hand side of the transmitter handset by rotating it either clockwise or counter clockwise. The red button will pop up.



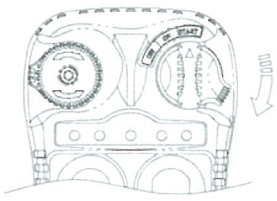
b. Turn on the transmitter power by inserting the black-colored key into the power key slot (located on the top right hand side of the transmitter handset), and rotate it clockwise to "On" position.





c. After turning on the transmitter power, check the Status LED on the transmitter handset for any sign of system irregularities (refer to "Status Light Indicators & Warnings" on page 35). If the system is normal the Status LED will light up green for two (2) seconds.

d. If there are no signs of any system irregularities, then rotate the power key-switch further to START position for up to 1.0 second to activate all transmitter push button functions and as well as the receiver MAIN. Then press any push button on the transmitter to begin operation. Pressing any push button prior to initiating the START command will result in no signal transmitted (blinking orange light).



e. In case of an emergency, pressing down the red emergency stop button will immediately disconnect the receiver MAIN and as well as the transmitter power. To resume operation, rotate the red button clockwise or counter clockwise, it will pop up. Then rotate the power key-switch to START position for up to 1.0 second to activate all transmitter push button functions and the receiver MAIN. Please note that every time when you turn the transmitter power off and back on again, or after resetting the emergency stop button, all push button functions will be locked to avoid any unintentional controls. For safety, initiating the START command after turning on the transmitter power or after resetting the emergency stop button is strictly required.

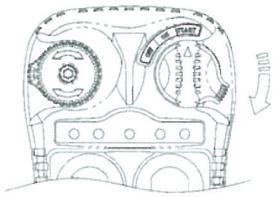
f. After 1 minute of inactivity (push button not pressed) the receiver MAIN will be disconnected temporarily. To resume operation, just press any push button on the transmitter to resume operation (depending on JP3 setting on page 26). If this 1-minute inactivity time is not sufficient for your application, you can also extend this inactivity time from 1 minute up to 3 minutes (refer to Continuous Transmitting Time Adjustment on page 16). The receiver MAIN will also be disconnected temporarily when the receiver encounters strong radio interference or when the operator is controlling the crane or equipment beyond the transmitting range.

g. To turn off the transmitter power just rotate the power key to "Off" position, it will disconnect the transmitter power and the receiver MAIN altogether.

7.1.2 Automatic Channel Scanning Operating Procedure

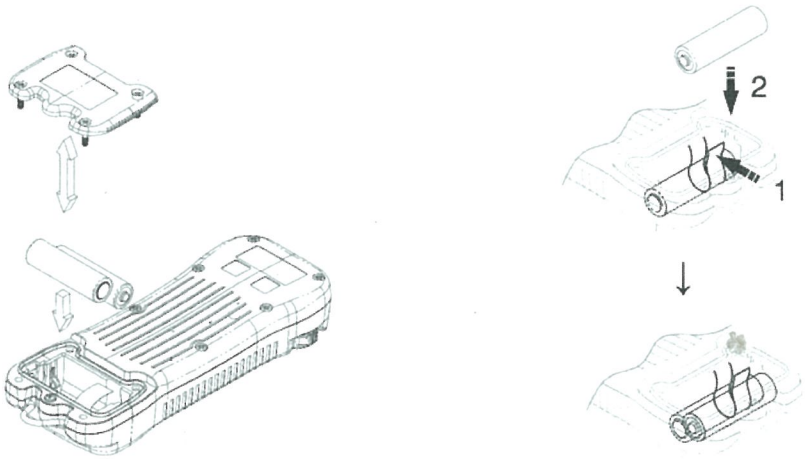
After changing the transmitter channel (refer to page 15), turn on the transmitter power and rotate the power key switch to "Start" position and hold it there for up to 1 minute. Within this 1-minute period the receiver will search (channel 01 - channel 62) and lock onto the newly selected transmitter channel automatically. Please note that in order for the receiver to switch to auto-scanning mode, prior to changing the transmitter channel, you must first deactivate the receiver MAIN by shutting off the transmitter power or press down the emergency stop button. Please refer to page 23 if you do not want the receiver to auto-scan all 62 channels.

Change Transmitter Channel →



7.1.3 Changing Transmitter Batteries

Change the transmitter batteries by unscrewing the battery cover located on the backside of the transmitter (refer to Fig. 17 below). During battery installation make sure that the blue ribbon is centered between the two batteries. After changing the batteries also make sure that all screws are tightened to avoid water, moisture, dirt, grease, or other liquid penetration.



(Fig. 17)

7.2 STATUS LIGHT INDICATORS & WARNINGS

7.2.1 Transmitter STATUS Light Indication

Type	Display Type	Indication
1	Constant red	Voltage below 1.9V at initial power on - transmitter power and receiver MAIN shuts off.
		Voltage below 1.8V during operation - transmitter power and receiver MAIN shuts off.
2	1 red blink followed by a 2-second pause	Voltage goes below 1.85V during operation - change batteries immediately.
3	2 red blinks followed by a 2-second pause	The push button is defective after turning on the transmitter power.
4	No light displayed	When a defective push button condition occurs (2 red blinks, type 3 above), find out which push button is defective by pressing all the push buttons on the transmitter one at a time. If the push button is in good working order, the LED will not light up when pressed. If the push button is defective the LED will continue to display 2 red blinks when pressed.
5	3 red blinks followed by a 2-second pause	EEPROM error.
6	4 red blinks followed by a 2-second pause	Transmitting error; system can not lock on to the designated channel.
7	Constant green for up to 2 seconds	Transmitter power on with no faults detected.
8	Blinking green	Transmission in progress.
9	Blinking orange	Transmitter push button functions locked.

7.2.2 Receiver STATUS Light Indication

Type	Display Type	Indication
1	Fast green blinks	Decoding in process
2	Slow green blinks	Decoding on standby
3	Two red blinks	Receiver MAIN jammed or defective
4	Fast red blinks	Incorrect transmitter serial number/ID code
5	Constant red	Receiver under-voltage, LV output relay activated
6	No light displayed	Decoding microprocessor is defective

7.2.3 Receiver SQ Light Indication

Type	Display Type (Red)	Indication
1	Fast blinks	Transmission received
2	Completely off	No transmission
3	Blinks intermittently	Other radio interference

7.2.4 Receiver POWER Light Indication

Type	Display Type (Red)	Indication
1	On	Power to receiver
2	Off	No power to receiver

7.2.5 Receiver COM Light Indication

Type	Display Type (Red)	Indication
1	On	Power to relay board
2	Off	No power to relay board

7.3 TROUBLE SHOOTING TIPS

Problems	Possible Reasons	Suggestions
No response when transmitter push button is pressed (Improper startup & settings)	Transmitter has low battery power	Check the transmitter battery level.
	Emergency stop button activated prior to startup	Prior to turning on the transmitter power switch make sure that the red emergency stop button is elevated.
	Transmitter push button functions locked	Initiate the Start command by rotating the power key-switch to START position.
	Incorrect system RF channel	Check to ensure that the transmitter handset and receiver unit both have the same channel.
	Incorrect system serial number/ID code	Check to ensure that the transmitter handset and receiver unit both have the same serial number/ID code.
	System out of range	Make sure that the startup procedure is initiated within 100 meters (300 feet) from the receiver location.
No response when transmitter push button is pressed (Damaged hardware)	Defective transmitting and receiving module	Check the SQ display on the face of the receiver unit. If it does not light up when push button is pressed then either the transmitting or receiving module is defective. First replace the transmitting module. If SQ display is still not lit when the push button is pressed, go ahead and replace the receiving module.
	Defective encoder board or decoder module	If still no response, then replace the transmitter encoder board. If it still doesn't work then the decoder module is defective.
No AC power to the receiver	Incorrect input voltage	Make sure the source voltage is set correctly.
	Blown fuse	Check for any blown fuses.
	Incorrect wiring	Check input voltage connection.
Outputs do not correspond to transmitter	Incorrect output connection	Check the system wiring again. Please refer to the output contact diagram inside this manual or on the receiver cover.

8. SYSTEM SPECIFICATIONS

Frequency Range	:	433 - 434 MHz
Frequency Deviation	:	12.5 KHz
Number of Channels	:	62 channels
Modulation	:	Digital Frequency Modulation based on Manchester Code, 20bit address, 32bit CRC Parity Check and Hamming Code.
Encoder & Decoder	:	Microprocessor-controlled
Transmitting Range	:	>100 Meters / 300 Feet
Frequency Control	:	Synthesized PLL (Phase Lock Loop)
Receiver Type	:	Frequency Auto Scanning
Receiver Sensitivity	:	-116dBm
Antenna Impedance	:	50 ohms
Responding Time	:	60 Milliseconds (average)
Transmitting Power	:	0.3mW
Enclosure Type	:	NEMA-4
Enclosure Rating	:	IP-66
Output Contact Rating	:	250V @ 8 Amps
Transmitter Operating Voltage	:	DC 3.0V
Receiver Power Consumption	:	11.0 VA
Receiver Supply Voltage	:	Voltage Setting / Min ~ Max 24VAC (22 ~ 26VAC) 42VAC (38 ~ 46VAC) 48VAC (43 ~ 53VAC) 110VAC (104 ~ 126VAC) 220VAC (207 ~ 253VAC) 380VAC (351 ~ 429VAC) 410VAC (400 ~ 480VAC) 12/24VDC (9 ~ 36VDC)
Operating Temperature	:	-25°C -- 75°C / -13°F -- 167°F
Transmitter Dimension	:	184mm (L) x 69mm (W) x 34mm (H)
Receiver Dimension	:	165mm (L) x 125mm (W) x 75mm (H)
Transmitter Weight	:	242g / 8.5oz
Receiver Weight	:	1.8kg / 4.0 lb (include output cable)

9. DECLARATION OF CONFORMITY

MAGNETEK

EU Declaration of Conformity Certificate

For the following equipment:

Product	: Flex Series Radio Remote Control
Multiple Listee Model No.	: Flex 4ES/EX/EM, Flex 6EX, Flex 8ES/EX/EM, Flex 12ES/EX/EM, Flex 8/12 PRO
Product Receiver Models	: CAN-2, MHR, WIC-2402, Flex 4 RX, Flex 6 RX, Flex 8R X, Flex 12 RX
Transmitter Model Serial Number	:
Receiver Model Seral Number	:
Manufacturer's Name	: Magnetek, Inc.
Manufacturer's Address	: N49 W13650 Campbell Drive
	Menomonee Falls, WI 53051 USA

The undersigned hereby declares on behalf of Magnetek, that the above-referenced products, to which this declaration relates, is in conformity with the provisions of CE Mark Directive (93/68/EEC), Machinery Safety Directive (MD) 2006/42/EC, Low Voltage Directive (LVD) 2006/95/EC, and Radio and Telecommunications Equipment Directive (R&TTE) 1999/5/EC.

The standards relevant for the evaluation of the product referenced above conformity to the directive requirements are as follows:

EN 301 489-1
EN 301 489-3
EN 300 220-3
EN 60204-1
EN 60204-32

EN 60950-1
EN 60529
EN ISO 13849-1
EN 13557

The European contact for Magnetek is:

Brian Preston
Magnetek
Unit 3, Bedford Business Centre
Mile Road
Bedford
MK42 9TW
United Kingdom

Per Annex II.B of the Machinery Directive (2006/42/EC):

The machinery, product, assembly or sub-assembly covered by this Declaration of Conformity must not be put into service until the machinery into which it is to be incorporated has been declared in conformity with the provisions of the applicable Directive(s). This statement is only necessary where the product is to be incorporated into a machine or system (e.g. a safety component).

Signature of Authorized Person:

Ben Stoller / Director - Radio Controls
For Magnetek, Inc.
Menomonee Falls, WI USA

February 20, 2014
Date of Issuance

PARAGON
Electrical Products

EC4000 SERIES

24
Hour

TRADITIONAL TIME PIECES

The EC4000 is a digital electronic 24-hour, single-channel control that manages the same ON/OFF schedule every day, but also allows days to be skipped. Available in NEMA 3R or NEMA 1 to meet the needs of any application, contractors will appreciate this series' ease of installation.



FEATURES & BENEFITS:

- Allows 16 programmable events, with 1-minute minimum ON time per day.
- User-friendly control is easy to program with just four keys and a large, easily-read digital display.
- Skip-A-Day feature enables users to skip one to seven days.
- 7-Day Carryover, unique to Paragon, protects scheduled events from power interruptions via a capacitor-more reliable than batteries.
- UL and CSA listed means quality and durability are built into every time control.
- Title 24 Certified.

WHY ▸ *Specify Paragon*

Since 1903, Paragon has been the leader in time and process control technology. As inventor of the 24-hour time switch, Paragon's heritage of patents, unparalleled quality and solutions-driven innovations have made us one of the most recognized names in time control products.

EC4000 SERIES

PARAGON Electrical Products

PHYSICAL

EC4000, EC4004
Enclosure NEMA 1 drawn steel enclosure with lockable hasp.
Weight Approximately 2 lbs. (0.9 kg)
Dimensions
Width 4-1/4" (10.8 cm), Height 7-7/8" (20.0 cm), Depth 3" (7.6 cm)
Display Size 1-3/4" x 11/16" (7 cm x 1.9 cm)

EC4000PC, EC4004PC & EC4005PC
Enclosure NEMA 3R Non-Metallic with Clear-View cover
Weight Approximately 2-1/2 lbs. (1.1 kg)
Dimensions
Width 6-9/16" (16.7 cm), Height 8-1/8" (23.1 cm), Depth 3-7/8" (9.8 cm)
Display Size 1-3/4" x 11/16" (7 cm x 1.9 cm)

ENVIRONMENTAL

Operating Temperature Range -40°F to +140°F
Operating Humidity 0-95% non-condensing
Models in NEMA 1 enclosure should be mounted indoors in an environment that is free of excessive contaminants such as oil, moisture and dirt. Models in NEMA 3R non-metallic enclosure are suitable for both indoor and outdoor use.

HOW TO SPECIFY

Installer shall furnish and install Paragon EC4000, EC4004 or EC4005 Electronic Time Control. The single-channel control shall have 24-hour capability with 16 events available. Control shall have keyboard override until overridden again or until next event is reached. Control shall provide 7 days power outage carry-over without a battery. The digital time display shall be 11/16" in height. Clock format shall be selectable, allowing a choice of 12 hour (AM/PM) or 24 hour format. An "ON" or "OFF" display will indicate the current status of the load control contacts. Wiring terminals shall have the capability to accommodate #16 to #10 AWG wire. Control shall be housed in a NEMA 1, lockable steel enclosure or a NEMA 3R lockable enclosure (with Clear-View cover) to guard against vandalism or tampering.

ELECTRICAL SPECIFICATIONS

Model No.	Contact Configuration	Voltage
EC4000/120V	SPDT	120 Vac
EC4000PC/120V-RT*	SPDT	120 Vac
EC4000PC/120V*	SPDT	120 Vac
EC4000/208-277V	SPDT	208-277 Vac
EC4000PC/208-277V*	SPDT	208-277 Vac
EC4004/120V	SPST	120 Vac
EC4004PC/120V*	SPST	120 Vac
EC4004PC/120V-RT*	SPST	120 Vac
EC4004/208-277V	SPST	208-277 Vac
EC4004PC/208-277V*	SPST	208-277 Vac
EC4004PC/208-277V-RT*	SPST	208-277 Vac
EC4005PC/120, 208-277V-RT*	DPST	120/208-240 Vac

*Supplied in a NEMA 3R non-metallic enclosure.
PC suffix designates a non-metallic enclosure with Clear-View cover.
RT designates retail packaging.

Frequency 50/60 Hz
Power Consumption 4 VA Max.
Wiring Terminals Accommodate #16 to #10 AWG wire
UL Listed, CSA Certified, and comply with FCC rules.
Power Outage Carry-Over
The program and time-of-day are maintained during a power outage for a minimum of 7 days. A built-in, special capacitor eliminates the inconvenience of battery replacement.
Output Switch Ratings

Model EC4000
Normally open contacts:
20 amp resistive (10 amp CSA) at 24-240 Vac
1 Hp (1/2 Hp CSA) at 120 Vac, 2 Hp (1 Hp CSA) at 240 Vac
5 amp tungsten at 120-240 Vac
6 amp ballast at 120-277 Vac
Normally closed contacts:
10 amp resistive at 24-240 Vac
1/4 Hp at 120 Vac, 1/2 Hp at 240 Vac
3 amp tungsten at 120-240 Vac
3 amp ballast at 120-277 Vac

Model EC4004
Normally open contacts:
30 amp resistive at 24-240 Vac (UL)
30 amp resistive at 120 Vac (CSA)
10 amp resistive at 240 Vac (CSA)
1 Hp at 120 Vac, 2 Hp at 240 Vac
5 amp tungsten at 120-240 Vac
6 amp ballast at 120-277 Vac

Model EC4005PC
Normally open contacts:
30 amp resistive at 120-277 Vac
1 Hp at 120 Vac, 3 Hp at 240 Vac
15 amp tungsten at 120-277 Vac (UL)
5 amp tungsten at 240 Vac (CSA)
20 amp ballast at 120 Vac, 10 amp at 277 Vac

TYPICAL WIRING DIAGRAMS

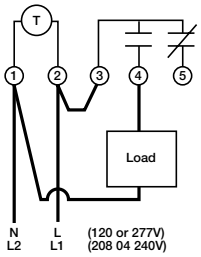


Diagram #1 – SPDT

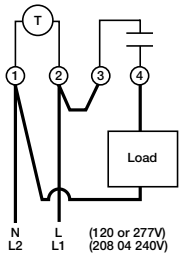


Diagram #2 – SPST

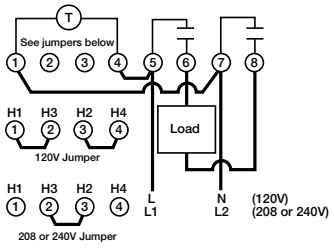


Diagram #3 – DPST

Maple Chase Company
2820 Thatcher Road
Downers Grove, Illinois 60515-4040
United States of America
Telephone +1 800 951 5526
Facsimile +1 630 963 0650

Canada
Director of Canada Sales
5785 Kennedy Road
Mississauga, Ontario L4Z 2G3
Telephone 1 905 890 5956
Facsimile 1 905 890 6098

An Invensys company

Part Number 150-1448

MaxGard® Interconnection Systems

Russellstoll Line Selections for Outdoor (and Indoor) Applications

MaxGard® **4P5W + 2 Opt.** **30 through 400A**	The widest range and toughest construction. Safety, durability and performance by design in copper-free, cast aluminum, epoxy powder-coated housings. Built to last, from 30- through 400-amp application, with a full interlock line, too. Optional 2-control contacts and more than 200 individual voltage polarization options through 600VAC/250VDC, 4P5W. O-ringed sealed pins, sleeves and interiors.

Usage

- Any application where electrical connections need protection from water and/or dust ingress to contacts or wiring compartment
- Cable-to-connector sealing and watertight device locking designs are critical
- Metal connectors are usually preferred for long service life



Typical Application Groups

Marine
- Lighting Systems
- Shore-to-Ship Power
- Welding Stations
- Power Distribution Centers
- Shipboard Power Outlets
- Barge Power Connection

Construction and Agricultural
- Generator Sets and Systems
- Portable Tools and Equipment
- Irrigation Systems Panels
- Portable Lighting and Equipment

Government Municipal and Utilities
- Portable Building Power
- Army Corps of Engineers
- Utilities Panels
- Emergency Power Systems
- Sewage Pumping Stations
- Light and Controls
- Telephone Vault Systems
- Cellular Telephone Masts

OEMs
- GenSet and Welding Systems
- Transportable Equipment

Screw Cap = NEMA 4X

Flip Lid = NEMA 3R

MaxGard® Interconnection Systems

30A–400A (30–200A Load Breaking), Maximum 600VAC/250VDC Receptacles, Inlets, Plugs, Connectors, Interlocked Receptacles, Explosion-Proof Interlocked Receptacles

Benefits

Russellstoll® builds a variety of benefits into one plug, receptacle and interlock system for your application. The MaxGard® system: **Maximum Safety, Durability** and **Performance** in electrical interconnections.

Safety

- **Waterproof construction:** Standard Neoprene O-ringed interior components provide environmental separation at the front of each device; they are watertight even when not mated (or engaged)
- **Different power supply ratings can't mix:** 24 single-rate device polarizations ensure exact voltage, frequency and phase differentiation plus a few specials, too. Available in every current range
- **Plugs stay in:** Standard delayed action pull and turn withdrawal offers all plugs an XP rating (30–100 amps). All system components use mating screw collars
- **Foreign objects stay out:** All receptacles and connectors have a gated rotating disk on the face of the interior, which engages upon insertion

Durability

- **At last — durability:** Rugged cast aluminum housings with two layers of electrostatic epoxy coating are standard, along with stainless steel hardware. Available with flap or screw covers. Interiors are molded from a tough reinforced UL94-V0 thermoset polyester
- **The best connections for life:** Pins and sleeves are made from CDA 360 and Marine-grade CDA 485 brass; 200- and 400-amp lines are silver-plated as well
- **The most power available in the most packages:** 30-, 60-, 100-, 200- and 400-amp lines in one system with cast aluminum NEMA 4X interlocks; steel 30-, 60- and 100-amp NEMA 12 interlocks or cast aluminum XP interlocks in 30-, 60- and 100-amp ranges

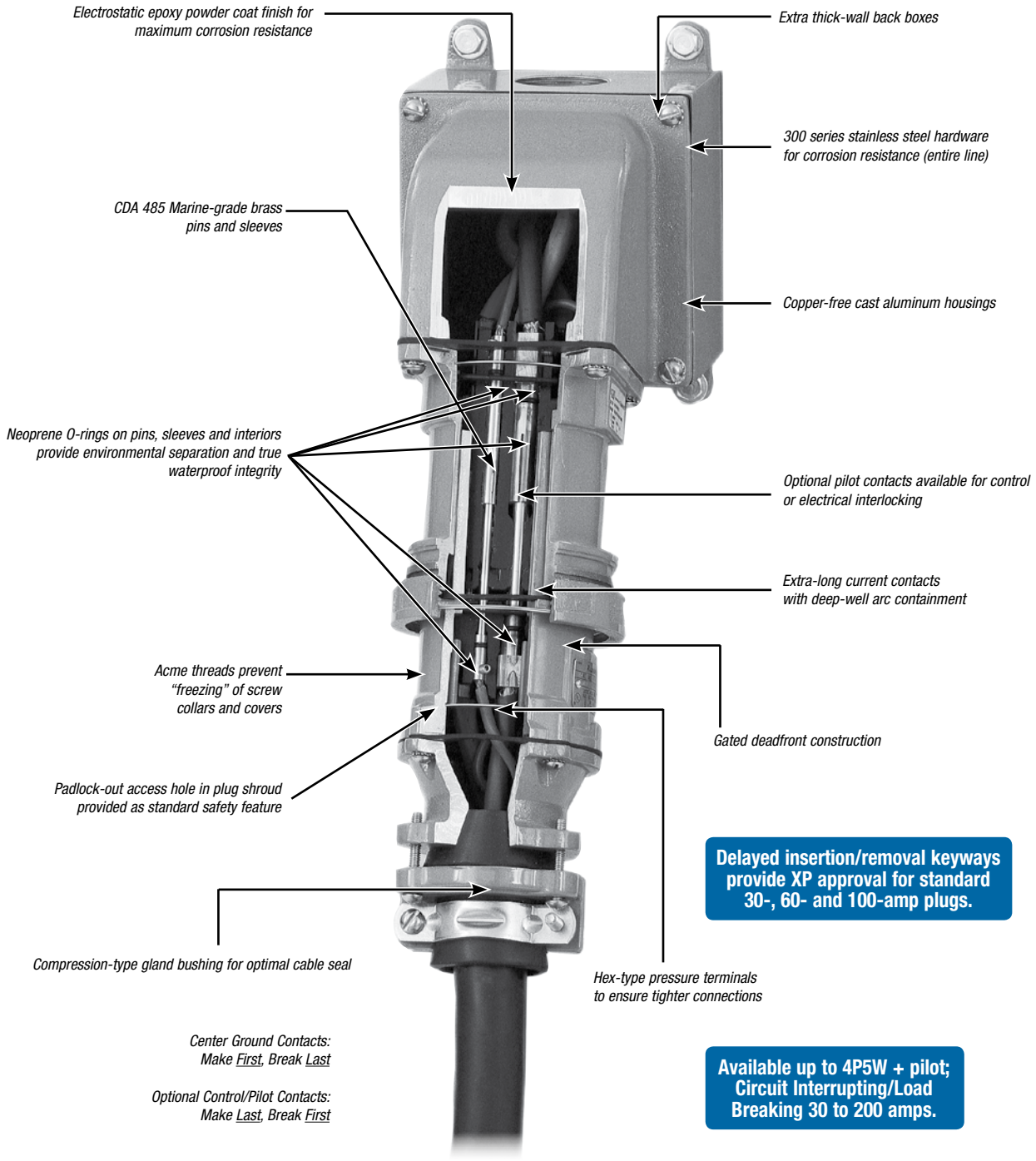
Performance

- **Any configuration you need:** Through 4-pole 5-wire configurations, all have a safety center earth ground pin design that makes first and breaks last. This feature applies to all of our plugs, connectors, receptacles, male inlets and interlock systems
- **More control available:** Two optional pilot/control pins for contactors, load monitor circuits, shunt trip or any other communication functions you need
- **Ease of assembly:** Solderless pressure-type screw terminals with hex socket heads and rear-access, take-apart housings provide quick wiring access. No interior removal required for wiring receptacles and connectors
- **More power:** 150% non-UL ratings allow extending MaxGard® installations to 600-amp custom loads, with separate disconnect service



30A–400A (30–200A Load Breaking), Maximum 600VAC/250VDC Receptacles, Inlets, Plugs, Connectors, Interlocked Receptacles, Explosion-Proof Interlocked Receptacles

Plug and Receptacle with Angle Adapter and Junction Box

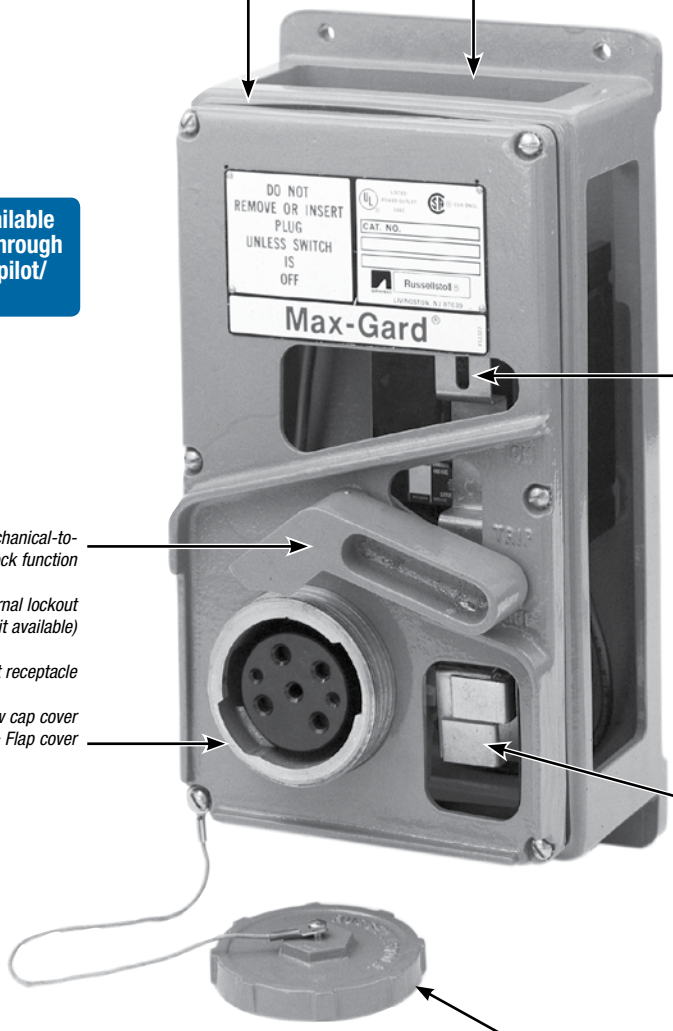


Cast Aluminum Circuit Breaker Interlocked Receptacle (Cutaway View)

Thick-wall cast copper-free aluminum housing with epoxy powder coat finish

Standard conduit openings through top or side (cutaway shown), optional sizes and locations

NEMA 4X interlocks available in 30–400-amp ranges through 4P5W, with 2 optional pilot/ control contacts.



Standard, high A/C or NA breaker switch (cutaway shown)

Options include:
- *Shunt Trip*
- *Auxiliary Switch*
- *Trip Ratings*

Heavy On/Off handle adds mechanical-to-electrical interlock function

(External lockout option kit available)

Gated, rotating deadfront receptacle

Watertight = Screw cap cover
Splashproof = Flap cover

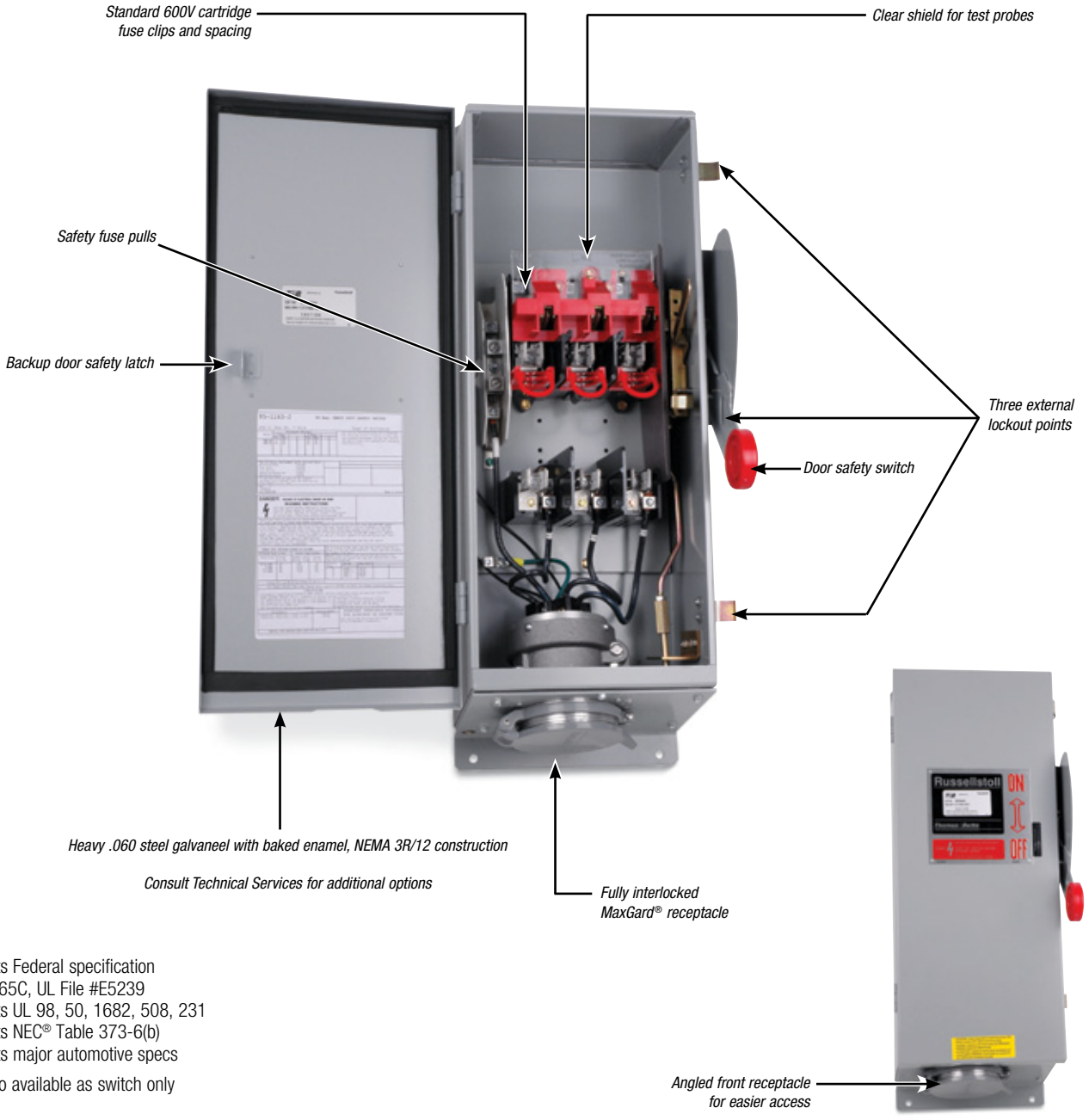
Heavy-duty sliding bar interlock mechanism (mates with plug padlock-out access hole)

Protective screw cap (flap cap also available)

30A–400A (30–200A Load Breaking), Maximum 600VAC/250VDC
Receptacles, Inlets, Plugs, Connectors, Interlocked Receptacles, Explosion-Proof Interlocked Receptacles

Fused-Disconnect Switch* Interlocked Receptacle

Available in 30-, 60- and 100-amp sizes, all polarizations through 600VAC.



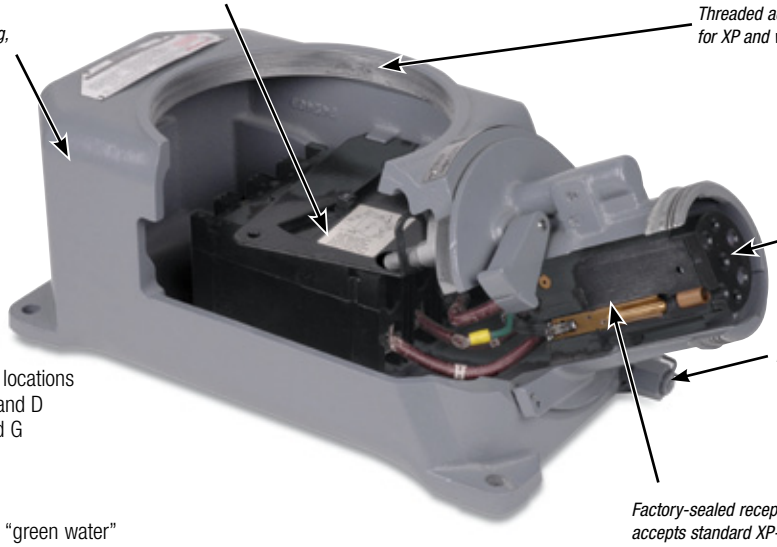
Meets Federal specification WS865C, UL File #E5239
Meets UL 98, 50, 1682, 508, 231
Meets NEC® Table 373-6(b)
Meets major automotive specs

* Also available as switch only

30A–400A (30–200A Load Breaking), Maximum 600VAC/250VDC
Receptacles, Inlets, Plugs, Connectors, Interlocked Receptacles, Explosion-Proof Interlocked Receptacles

Explosion-Proof Waterproof Circuit Breaker Interlocked Receptacle

Available in 30-, 60- and 100-amp sizes, all polarizations.

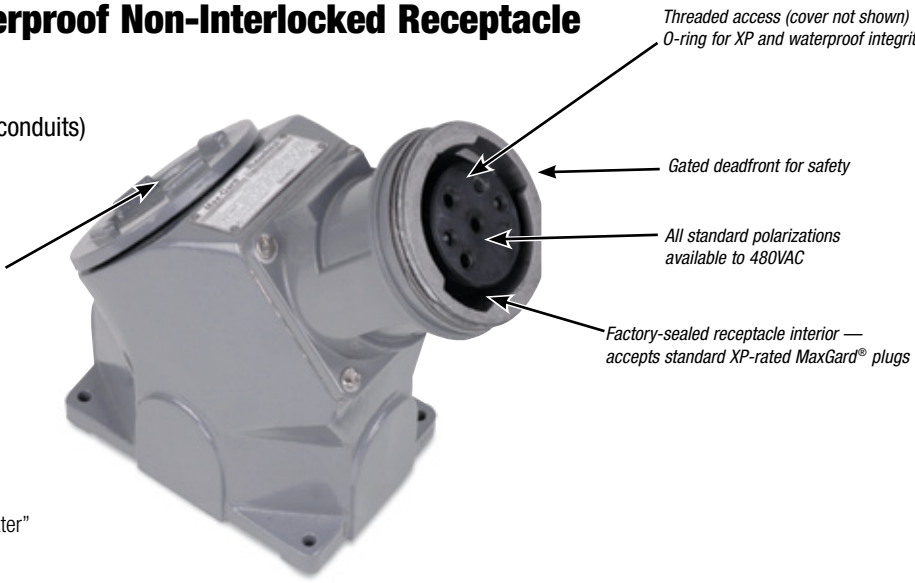


UL and CSA listed for hazardous locations
Class I, Division 1, Groups B, C and D
Class II, Division 1, Groups F and G
UL File E10919
NEMA 7, 8, 9
CSA
DOT shipboard used above deck "green water"
NEMA 4X
USCG approved

MaxGard® DBRE and DSRE series interlocks are explosion proof and waterproof (O-ring sealed), along with optional control contacts, and are fully UL Listed.

Explosion-Proof Waterproof Non-Interlocked Receptacle

- Factory-sealed interior (no filled conduits)
- Easy low-cost installation



UL and CSA Listed for hazardous locations
Class I, Division 1, C and D
Class II, Division 1, Groups F and G
UL File E10919
NEMA 7, 8, 9
CSA
DOT shipboard used above deck "green water"
NEMA 4X
USCG approved

Receptacles, Plugs and Connectors

FEATURE	RUSSELLSTOLL MAXGARD®	CROUSE-HINDS ARKTITE®**	APPLETON POWERTITE®***
Center ground contact	Yes	No	No
24 single-rated factory polarizations	Yes	No	No
Gated deadfront construction	Yes	No	No
Two optional control contacts	Yes	No	No
Marine-grade CDA485 brass pins/sleeves (200–400 amp silver-plated)	Yes	No	No
O-rings/environmental separation, full line	Yes	No	No
Available to 5-wire (4-pole, 5-wire)	Yes	30 and 60 amp only	No
Complete line epoxy powder coated — standard	Yes	No	Some

Interlocked XP Receptacles

FEATURE	RUSSELLSTOLL DBRE/DSRE SERIES	CROUSE-HINDS EPC SERIES	APPLETON EBR SERIES (WITH FB BREAKER)
Waterproof (DurORing™) O-ring sealing	Yes	No	No
Available to 5-wire (4-pole, 5-wire) through 100 amp	Yes	No	No
Gated deadfront	Yes	No	No
Center ground sleeve contact	Yes	No	No
24 single-rated factory polarizations	Yes	No	No
Class I, Div. 1, Groups B, C, D	Yes	Yes	Yes
Class II, Div. 1, Groups F and G	Yes	Yes	Yes*
Meets Coast Guard (was CG259) approvals	Yes	No	No

** Group F excepting electrically conductive dusts*

*** Crouse-Hinds and Arktite are trademarks of Cooper Industries, Inc.*

**** Appleton and Powertite are trademarks of Appleton Electric Inc.*

Receptacles, Plugs and Connectors

D	F	3	414	F	R	A	B	K

- **K**: Ø = Standard Configuration, K = 2 Control Contacts
- **B**: B = Junction Box, E = Angle Enclosure, Ø = No Box
- **A**: Ø = Without Adapter, A = Angle, S = Straight Adapter
- **R**: R = Receptacle, P = Plug
- **F**: M = Male Pins, F = Female Sleeves (contacts)
- **414**: Voltage Assignment Number — See **page H-340** (voltage selection chart)
- **3**: Amperage Rating — 3 = 30A, 6 = 60A, 1 = 100A, 2 = 200A, 4 = 400A
- **F**: F = Flap Cover, S = Screw Cover (screw collar for male plugs and male inlets)
- **D**: D = Gated Deadfront

} Ex: FP = Connector, MR = Motor Inlet

(Last 3 positions above: Ø can appear in any position — standard plugs, etc. will have a ØØØ suffix, e.g., "DS2404MPØØØ")

Interlocks (Standard or Explosion-Proof)

D	S	R	E	6	414	060	K	S

- **S**: Ø = Standard Configuration, S = Auxiliary Switch, Z = Shunt Trip
- **K**: Ø = Standard Configuration, K = 2 Control Contacts
- **060**: Breaker Rating code: (**page H-330** Breaker Rating Trip Charts) *NAO = Non-Automatic Switch
- **414**: Voltage Assignment Number (**page H-340** Voltage Selection Chart)
- **6**: Amperage Rating — 3 = 30A, 6 = 60A, 1 = 100A, 2 = 200A, 4 = 400A
- **E**: E = Explosion-Proof, F = Flap Cap (weathertight), S = Screw Cap (watertight)
- **R**: R = Receptacle
- **S**: * S = Switch, B = Circuit Breaker
- **D**: D = Gated Deadfront

** With S in position 2, positions 9, 10 and 11 must be NAO*

30 Amp Standard Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS3CC.

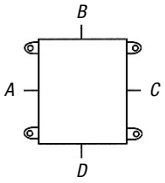
Maximum lug wire 8 AWG 7-strand or flexible, cable entrance .187" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

Outlet furnished at location "B" unless otherwise specified. 1" NPT.

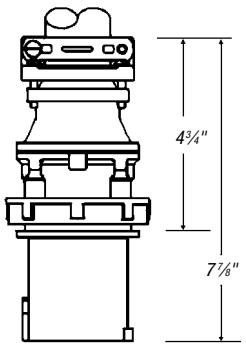


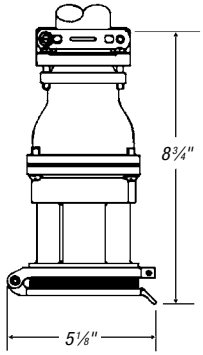
▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS3104MP00K***

*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***



Male Plug†† | Female Connector





Device Ratings and Polarizations

Maximum 600VAC or 250VDC

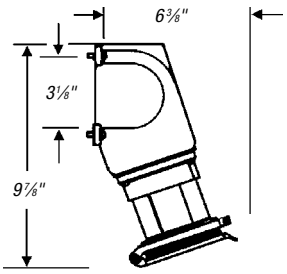
(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D.†	CAT. NO. ▼	STANDARD BUSHING I.D.†
2	3		277	DS3104MP000	⅞"	DF3104FP000	⅞"
			125	DS3107MP000		DF3107FP000	
2	3		480	DS3204MP000	⅞"	DF3204FP000	⅞"
			250	DS3207MP000		DF3207FP000	
			600	DS3214MP000		DF3214FP000	
			208	DS3216MP000		DF3216FP000	
3	4		277/480	DS3304MP000	1"	DF3304FP000	1"
			125/250	DS3307MP000		DF3307FP000	
			120/208	DS3316MP000		DF3316FP000	
3	4		3Ø 480	DS3404MP000	1"	DF3404FP000	1"
			3Ø 250	DS3407MP000		DF3407FP000	
			3Ø 600	DS3414MP000		DF3414FP000	
			3Ø 208	DS3416MP000		DF3416FP000	
			3Ø 440	DS3421MP000		DF3421FP000	
4	5		3ØY 277/480	DS3504MP000	1 3/16"	DF3504FP000	1 3/16"
			3ØY 347/600	DS3514MP000		DF3514FP000	
			3ØY 120/208	DS3516MP000		DF3516FP000	
			3ØY 250/440	DS3521MP000		DF3521FP000	

MaxGard® Interconnection Systems

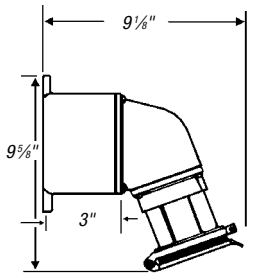


Female Receptacle with Angle Enclosure



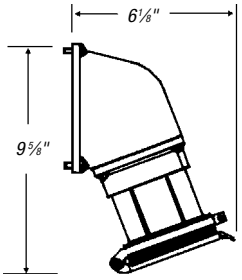


Female Receptacle with Angle Adapter** and Junction Box



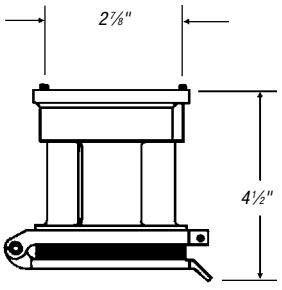


Female Receptacle with Angle Adapter**





Female Receptacle



CAT. NO.	CAT. NO.	CAT. NO.	CAT. NO.
DF3104FRØEØ	DF3104FRABØ	DF3104FRAØØ	DF3104FRØØØ
DF3107FRØEØ	DF3107FRABØ	DF3107FRAØØ	DF3107FRØØØ
DF3204FRØEØ	DF3204FRABØ	DF3204FRAØØ	DF3204FRØØØ
DF3207FRØEØ	DF3207FRABØ	DF3207FRAØØ	DF3207FRØØØ
DF3214FRØEØ	DF3214FRABØ	DF3214FRAØØ	DF3214FRØØØ
DF3216FRØEØ	DF3216FRABØ	DF3216FRAØØ	DF3216FRØØØ
DF3304FRØEØ	DF3304FRABØ	DF3304FRAØØ	DF3304FRØØØ
DF3307FRØEØ	DF3307FRABØ	DF3307FRAØØ	DF3307FRØØØ
DF3316FRØEØ	DF3316FRABØ	DF3316FRAØØ	DF3316FRØØØ
DF3404FRØEØ	DF3404FRABØ	DF3404FRAØØ	DF3404FRØØØ
DF3407FRØEØ	DF3407FRABØ	DF3407FRAØØ	DF3407FRØØØ
DF3414FRØEØ	DF3414FRABØ	DF3414FRAØØ	DF3414FRØØØ
DF3416FRØEØ	DF3416FRABØ	DF3416FRAØØ	DF3416FRØØØ
DF3421FRØEØ	DF3421MRABØ	DF3421FRAØØ	DF3421FRØØØ
DF3504FRØEØ	DF3504FRABØ	DF3504FRAØØ	DF3504FRØØØ
DF3514FRØEØ	DF3514FRABØ	DF3514FRAØØ	DF3514FRØØØ
DF3516FRØEØ	DF3516FRABØ	DF3516FRAØØ	DF3516FRØØØ
DF3521FRØEØ	DF3521FRABØ	DF3521FRAØØ	DF3521FRØØØ

30 Amp

*** Notes to Catalog Numbers**

Control Contacts (position 12)
use "K" example: DBRF3104030K0

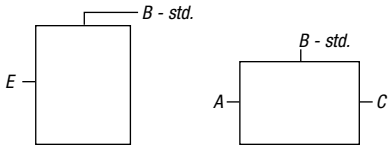
Shunt Trip Breaker (position 13)
add "Z" to above: DBRF3104030KZ

Breaker Trip Ratings (positions 9, 10, 11)
15 amp use 015 — 25 amp use 025
20 amp use 020 — 30 amp use 030

Non-Auto Sw. NAO (repl. "DBRF" with "DSRF")

Conduit Hubs: NEMA 4X
- Std. 1½" NPT-thread outlet at B (or E)
- 30 amp — Max. 2½"/64mm

Conduit Hubs: XP
- Std. 11½" -thread outlets provided at A, B or C
- 30 amp — 1.25"/32mm



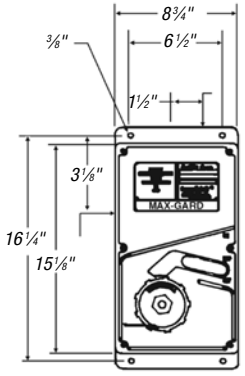
▼ ***Control contacts "K" designation.***

†† *Non-fused version available. Replace DFRF with DNRF.*

***Boldface** figures are for voltage assignment.*
*For different ratings, see **page H-340.***

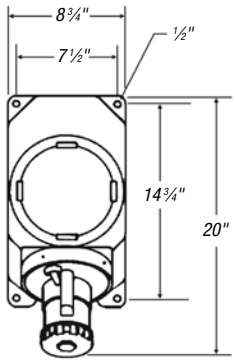


Interlocked Receptacle with Circuit Breaker NEMA 4X





Explosion-Proof Interlocked Receptacle Class I, Class II



Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. *	CAT. NO. *
2	3		277	DBRF310403000	DBRE310403000
			125	DBRF310703000	DBRE310703000
2	3		480	DBRF320403000	DBRE320403000
			250	DBRF320703000	DBRE320703000
			600	DBRF321403000	DBRE321403000
			208	DBRF321603000	DBRE321603000
3	4		277/480	DBRF330403000	DBRE330403000
			125/250	DBRF330703000	DBRE330703000
			120/208	DBRF331603000	DBRE331603000
3	4		3Ø 480	DBRF340403000	DBRE340403000
			3Ø 250	DBRF340703000	DBRE340703000
			3Ø 600	DBRF341403000	DBRE341403000
			3Ø 208	DBRF341603000	DBRE341603000
			3Ø 440	DBRF342103000	DBRE342103000
4	5		3ØY 277/480	DBRF350403000	DBRE350403000
			3ØY 347/600	DBRF351403000	DBRE351403000
			3ØY 120/208	DBRF351603000	DBRE351603000
			3ØY 250/440	DBRF352103000	DBRE352103000

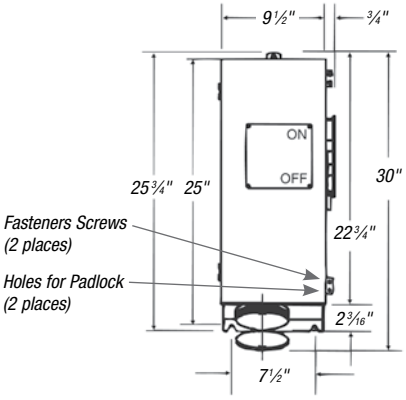
MaxGard® Interconnection Systems

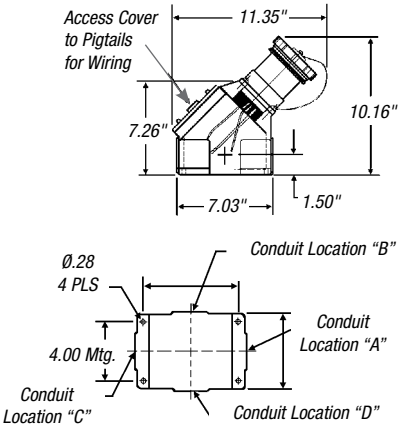


Fused†† Disconnect Interlocked Receptacle NEMA 12/3R



Explosion-Proof Non-Interlocked Receptacle





CAT. NO.	CAT. NO.
DFRF31040	DSE3104FRØ
DFRF31070	DSE3107FRØ
DFRF32040	DSE3204FRØ
DFRF32070	DSE3207FRØ
DFRF32140	DSE3214FRØ
DFRF32160	DSE3216FRØ
DFRF33040	DSE3304FRØ
DFRF33070	DSE3307FRØ
DFRF33160	DSE3316FRØ
DFRF34040	DSE3404FRØ
DFRF34070	DSE3407FRØ
DFRF34140	DSE3414FRØ
DFRF34160	DSE3416FRØ
DFRF34210	DSE3421FRØ
DFRF35040	DSE3504FRØ
DFRF35140	DSE3514FRØ
DFRF35160	DSE3516FRØ
DFRF35210	DSE3521FRØ



Application:

Dulles International Airport "People Mover."

"People Movers" are used at Dulles for shuttling passengers from check-in to mid-field terminals to board their flight. These vehicles require air conditioning and heater unit power when docked at either location for maintenance and overhaul.

Installation:

Vehicle-mounted 30-amp male inlet with mating connector and two control contacts.

MaxGard® receptacles, plugs and connectors were specified for their safety, construction and durability needed to withstand frequent reconnections. The single-rated factory polarization also ensured built-in protection against unsafe hookups. The control contacts offer monitoring capabilities for the vehicle while being overhauled. Deep insulating chambers confine and snuff out arcing when removing devices under load. Maintenance costs are minimal due to self-cleaning pin and sleeve contact design, rear-loaded interior wiring access and quick pressure-screw type wiring terminals.

30 Amp Reverse Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS3CC.

Maximum lug wire 4 AWG 7-strand or flexible, cable entrance .187" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

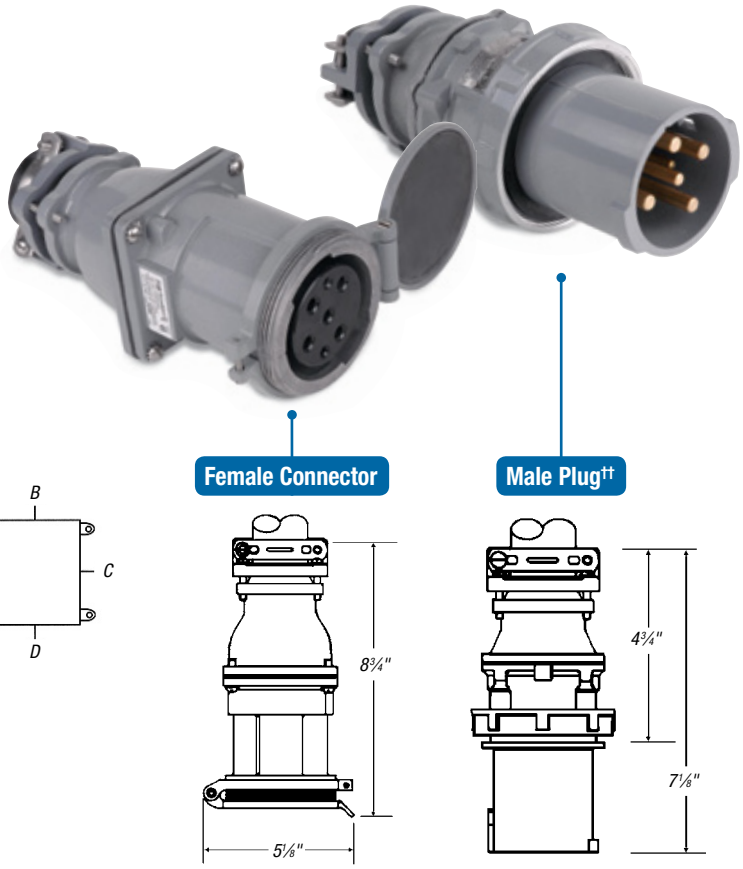
Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

Outlet furnished at location "B" unless otherwise specified. 1" NPT.

▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS3104MR00K***

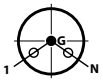
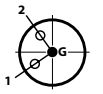
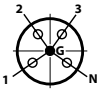
*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***



Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D.†	CAT. NO. ▼	STANDARD BUSHING I.D.†
2	3		277	DF3104FP000	⅞"	DS3104MP000	⅞"
			125	DF3107FP000		DS3107MP000	
2	3		480	DF3204FP000	⅞"	DS3204MP000	⅞"
			250	DF3207FP000		DS3207MP000	
			600	DF3214FP000		DS3214MP000	
			208	DF3216FP000		DS3216MP000	
3	4		277/480	DF3304FP000	1"	DS3304MP000	1"
			125/250	DF3307FP000		DS3307MP000	
			120/208	DF3316FP000		DS3316MP000	
3	4		3Ø 480	DF3404FP000	1"	DS3404MP000	1"
			3Ø 250	DF3407FP000		DS3407MP000	
			3Ø 600	DF3414FP000		DS3414MP000	
			3Ø 208	DF3416FP000		DS3416MP000	
			3Ø 440	DF3421FP000		DS3421MP000	
4	5		3ØY 277/480	DF3504FP000	1⅜"	DS3504MP000	1⅜"
			3ØY 347/600	DF3514FP000		DS3514MP000	
			3ØY 120/208	DF3516FP000		DS3516MP000	
			3ØY 250/440	DF3521FP000		DS3521MP000	

MaxGard® Interconnection Systems



Male Inlet with Angle Enclosure



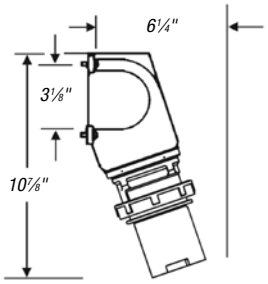
Male Inlet with Angle Adapter** and Junction Box

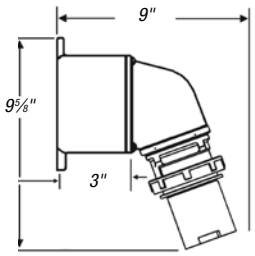


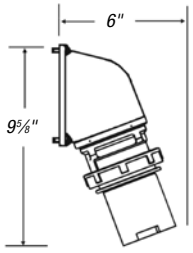
Male Inlet with Angle Adapter**

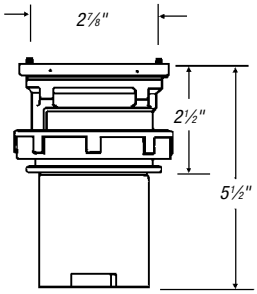


Male Inlet††









CAT. NO.	CAT. NO.	CAT. NO.	CAT. NO.
DS3104MRØEØ	DS3104MRABØ	DS3104MRA00	DS3104MRØØØ
DS3107MRØEØ	DS3107MRABØ	DS3107MRA00	DS3107MRØØØ
DS3204MRØEØ	DS3204MRABØ	DS3204MRA00	DS3204MRØØØ
DS3207MRØEØ	DS3207MRABØ	DS3207MRA00	DS3207MRØØØ
DS3214MRØEØ	DS3214MRABØ	DS3214MRA00	DS3214MRØØØ
DS3216MRØEØ	DS3216MRABØ	DS3216MRA00	DS3216MRØØØ
DS3304MRØEØ	DS3304MRABØ	DS3304MRA00	DS3304MRØØØ
DS3307MRØEØ	DS3307MRABØ	DS3307MRA00	DS3307MRØØØ
DS3316MRØEØ	DS3316MRABØ	DS3316MRA00	DS3316MRØØØ
DS3404MRØEØ	DS3404MRABØ	DS3404MRA00	DS3404MRØØØ
DS3407MRØEØ	DS3407MRABØ	DS3407MRA00	DS3407MRØØØ
DS3414MRØEØ	DS3414MRABØ	DS3414MRA00	DS3414MRØØØ
DS3416MRØEØ	DS3416MRABØ	DS3416MRA00	DS3416MRØØØ
DS3421MRØEØ	DS3421MRABØ	DS3421MRA00	DS3421MRØØØ
DS3504MRØEØ	DS3504MRABØ	DS3504MRA00	DS3504MRØØØ
DS3514MRØEØ	DS3514MRABØ	DS3514MRA00	DS3514MRØØØ
DS3516MRØEØ	DS3516MRABØ	DS3516MRA00	DS3516MRØØØ
DS3521MRØEØ	DS3521MRABØ	DS3521MRA00	DS3521MRØØØ

60 Amp Standard Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS6CC.

Maximum lug wire 4 AWG 7-strand or flexible, cable entrance .302" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

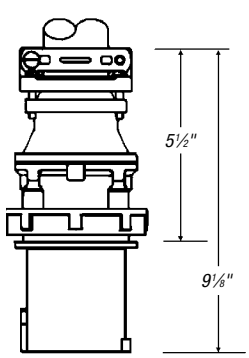
Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

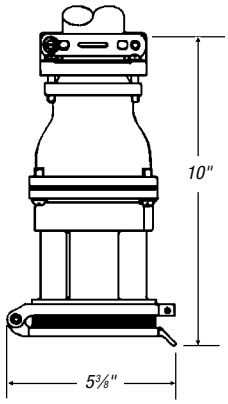
Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

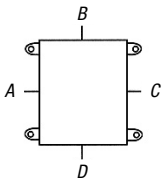
Outlet furnished at location "B" unless otherwise specified. 1½" NPT.



Male Plug†† | Female Connector







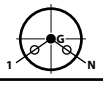
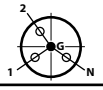
▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS6104MP00K***

*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***

Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D. †	CAT. NO. ▼	STANDARD BUSHING I.D. †
2	3		277	DS6104MP000	1¾₁₆"	DF6104FP000	1¾₁₆"
			125	DS6107MP000		DF6107FP000	
2	3		480	DS6204MP000	1¾₁₆"	DF6204FP000	1¾₁₆"
			250	DS6207MP000		DF6207FP000	
			600	DS6214MP000		DF6214FP000	
			208	DS6216MP000		DF6216FP000	
3	4		277/480	DS6304MP000	1⅝₁₆"	DF6304FP000	1⅝₁₆"
			125/250	DS6307MP000		DF6307FP000	
			120/208	DS6316MP000		DF6316FP000	
3	4		3Ø 480	DS6404MP000	1⅝₁₆"	DF6404FP000	1⅝₁₆"
			3Ø 250	DS6407MP000		DF6407FP000	
			3Ø 600	DS6414MP000		DF6414FP000	
			3Ø 208	DS6416MP000		DF6416FP000	
			3Ø 440	DS6421MP000		DF6421FP000	
4	5		3ØY 277/480	DS6504MP000	1½"	DF6504FP000	1½"
			3ØY 347/600	DS6514MP000		DF6514FP000	
			3ØY 110/208	DS6516MP000		DF6516FP000	
			3ØY 250/440	DS6521MP000		DF6521FP000	

MaxGard® Interconnection Systems



Female Receptacle with Angle Enclosure



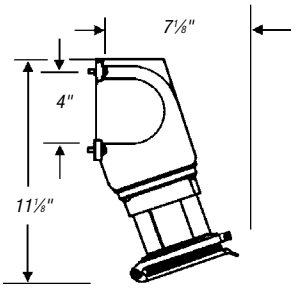
Female Receptacle with Angle Adapter** and Junction Box

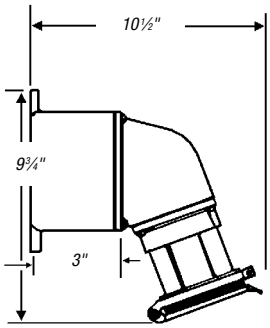


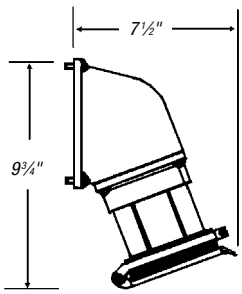
Female Receptacle with Angle Adapter**

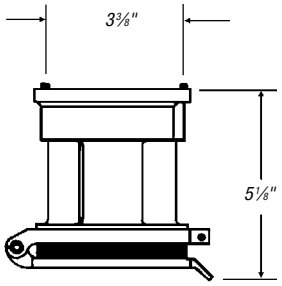


Female Receptacle









CAT. NO.	CAT. NO.	CAT. NO.	CAT. NO.
DF6104FRØEØ	DF6104FRABØ	DF6104FRAØØ	DF6104FRØØØ
DF6107FRØEØ	DF6107FRABØ	DF6107FRAØØ	DF6107FRØØØ
DF6204FRØEØ	DF6204FRABØ	DF6204FRAØØ	DF6204FRØØØ
DF6207FRØEØ	DF6207FRABØ	DF6207FRAØØ	DF6207FRØØØ
DF6214FRØEØ	DF6214FRABØ	DF6214FRAØØ	DF6214FRØØØ
DF6216FRØEØ	DF6216FRABØ	DF6216FRAØØ	DF6216FRØØØ
DF6304FRØEØ	DF6304FRABØ	DF6304FRAØØ	DF6304FRØØØ
DF6307FRØEØ	DF6307FRABØ	DF6307FRAØØ	DF6307FRØØØ
DF6316FRØEØ	DF6316FRABØ	DF6316FRAØØ	DF6316FRØØØ
DF6404FRØEØ	DF6404FRABØ	DF6404FRAØØ	DF6404FRØØØ
DF6407FRØEØ	DF6407FRABØ	DF6407FRAØØ	DF6407FRØØØ
DF6414FRØEØ	DF6414FRABØ	DF6414FRAØØ	DF6414FRØØØ
DF6416FRØEØ	DF6416FRABØ	DF6416FRAØØ	DF6416FRØØØ
DF6421FRØEØ	DF6421FRABØ	DF6421FRAØØ	DF6421FRØØØ
DF6504FRØEØ	DF6504FRABØ	DF6504FRAØØ	DF6504FRØØØ
DF6514FRØEØ	DF6514FRABØ	DF6514FRAØØ	DF6514FRØØØ
DF6516FRØEØ	DF6516FRABØ	DF6516FRAØØ	DF6516FRØØØ
DF6521FRØEØ	DF6521FRABØ	DF6521FRAØØ	DF6521FRØØØ

60 Amp

*** Notes to Catalog Numbers**

Control Contacts (position 12)
use "K" example: DBRF6104030K0

Shunt Trip Breaker (position 13)
add "Z" to above: DBRF6104030KZ

Breaker Trip Ratings (positions 9, 10, 11)

30 amp use	030
60 amp use	060
50 amp use	050

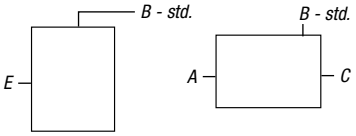
Non-Auto Sw. NAO (repl. "DBRF" with "DSRF")

Conduit Hubs: NEMA 4X

- Std. 2" NPT-thread outlet at B (or E)
- 60 amp — Max. 2½"/64mm

Conduit Hubs: XP

- Std. 11½" -thread outlets provided at A, B or C
- 60 amp — 1.50"/38mm



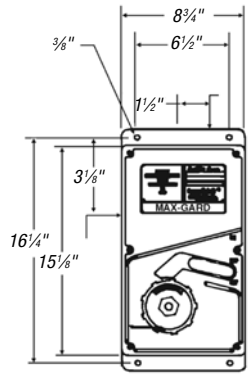
▼***Control contacts "K" designation.***

†† *Non-fused version available. Replace DFRF with DNRF.*

***Boldface** figures are for voltage assignment.*
*For different ratings, see **page H-340.***

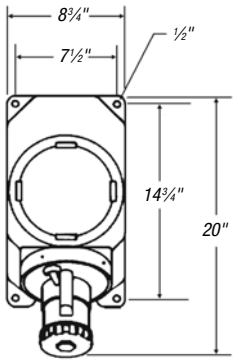


Interlocked Receptacle with Circuit Breaker NEMA 4X





Explosion-Proof Interlocked Receptacle Class I, Class II



Device Ratings and Polarizations

Maximum 600VAC or 250VDC

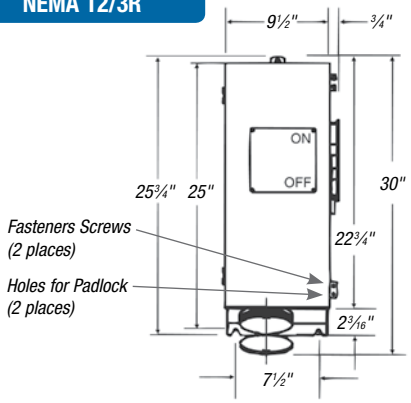
(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. *	CAT. NO. *
2	3		277	DBRF610406000	DBRE610406000
			125	DBRF610706000	DBRE610706000
2	3		480	DBRF620406000	DBRE620406000
			250	DBRF620706000	DBRE620706000
			600	DBRF621406000	DBRE621406000
			208	DBRF621606000	DBRE621606000
3	4		277/480	DBRF630406000	DBRE630406000
			125/250	DBRF630706000	DBRE630706000
			120/208	DBRF631606000	DBRE631606000
3	4		3Ø 480	DBRF640406000	DBRE640406000
			3Ø 250	DBRF640706000	DBRE640706000
			3Ø 600	DBRF641406000	DBRE641406000
			3Ø 208	DBRF641606000	DBRE641606000
			3Ø 440	DBRF642106000	DBRE642106000
4	5		3ØY 277/480	DBRF650403000	DBRE650406000
			3ØY 347/600	DBRF651406000	DBRE651406000
			3ØY 120/208	DBRF651606000	DBRE651606000
			3ØY 250/440	DBRF652106000	DBRE652106000

MaxGard® Interconnection Systems



Fused†† Disconnect Interlocked Receptacle NEMA 12/3R



CAT. NO.
DFRF61040
DFRF61070
DFRF62040
DFRF62070
DFRF62140
DFRF62160
DFRF63040
DFRF63070
DFRF63160
DFRF64040
DFRF64070
DFRF64140
DFRF64160
DFRF64210
DFRF65040
DFRF65140
DFRF65160
DFRF65210

SOLUTION 60 Amp

Convention Centers and Arenas

Power for Trade Show Exhibits and Concerts







60 Amp Reverse Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS6CC.

Maximum lug wire 4 AWG 7-strand or flexible, cable entrance .302" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

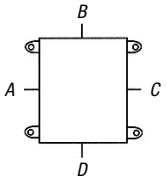
Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

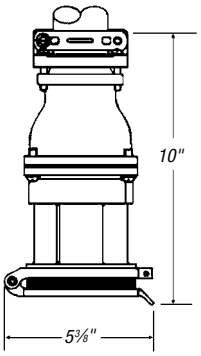
Outlet furnished at location "B" unless otherwise specified. 1½" NPT.

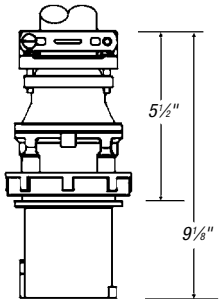


Female Connector

Male Plug††







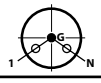
▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS3104MP00K***

*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***

Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D.†	CAT. NO. ▼	STANDARD BUSHING I.D.†
2	3		277	DF6104FP000	1¾₁₆"	DS6104MP000	1¾₁₆"
			125	DF6107FP000		DS6107MP000	
2	3		480	DF6204FP000	1¾₁₆"	DS6204MP000	1¾₁₆"
			250	DF6207FP000		DS6207MP000	
			600	DF6214FP000		DS6214MP000	
			208	DF6216FP000		DS6216MP000	
3	4		277/480	DF6304FP000	1⅝₁₆"	DS6304MP000	1⅝₁₆"
			125/250	DF6307FP000		DS6307MP000	
			120/208	DF6316FP000		DS6316MP000	
3	4		3Ø 480	DF6404FP000	1⅝₁₆"	DS6404MP000	1⅝₁₆"
			3Ø 250	DF6407FP000		DS6407MP000	
			3Ø 600	DF6414FP000		DS6414MP000	
			3Ø 208	DF6416FP000		DS6416MP000	
			3Ø 440	DF6421FP000		DS6421MP000	
4	5		3ØY 277/480	DF6504FP000	1½"	DS6504MP000	1½"
			3ØY 347/600	DF6514FP000		DS6514MP000	
			3ØY 120/208	DF6516FP000		DS6516MP000	
			3ØY 250/440	DF6521FP000		DS6521MP000	

MaxGard® Interconnection Systems



Male Inlet with Angle Enclosure



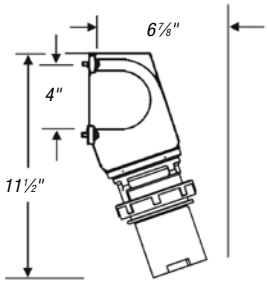
Male Inlet with Angle Adapter** and Junction Box

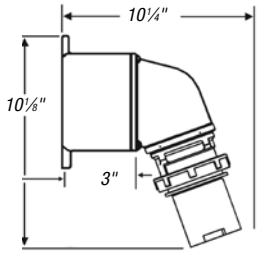


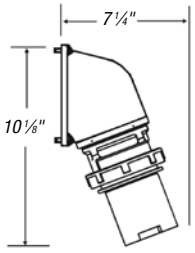
Male Inlet with Angle Adapter**

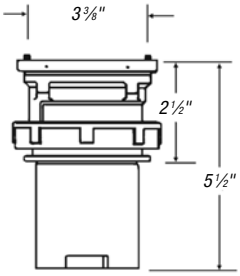


Male Inlet††









CAT. NO.	CAT. NO.	CAT. NO.	CAT. NO.
DS6104MRØEØ	DS6104MRABØ	DS6104MRAØØ	DS6104MRØØØ
DS6107MRØEØ	DS6107MRABØ	DS6107MRAØØ	DS6107MRØØØ
DS6204MRØEØ	DS6204MRABØ	DS6204MRAØØ	DS6204MRØØØ
DS6207MRØEØ	DS6207MRABØ	DS6207MRAØØ	DS6207MRØØØ
DS6214MRØEØ	DS6214MRABØ	DS6214MRAØØ	DS6214MRØØØ
DS6216MRØEØ	DS6216MRABØ	DS6216MRAØØ	DS6216MRØØØ
DS6304MRØEØ	DS6304MRABØ	DS6304MRAØØ	DS6304MRØØØ
DS6307MRØEØ	DS6307MRABØ	DS6307MRAØØ	DS6307MRØØØ
DS6316MRØEØ	DS6316MRABØ	DS6316MRAØØ	DS6316MRØØØ
DS6404MRØEØ	DS6404MRABØ	DS6404MRAØØ	DS6404MRØØØ
DS6407MRØEØ	DS6407MRABØ	DS6407MRAØØ	DS6407MRØØØ
DS6414MRØEØ	DS6414MRABØ	DS6414MRAØØ	DS6414MRØØØ
DS6416MRØEØ	DS6416MRABØ	DS6416MRAØØ	DS6416MRØØØ
DS6421MRØEØ	DS6421MRABØ	DS6421MRAØØ	DS6421MRØØØ
DS6504MRØEØ	DS6504MRABØ	DS6504MRAØØ	DS6504MRØØØ
DS6514MRØEØ	DS6514MRABØ	DS6514MRAØØ	DS6514MRØØØ
DS6516MRØEØ	DS6516MRABØ	DS6516MRAØØ	DS6516MRØØØ
DS6521MRØEØ	DS6521MRABØ	DS6521MRAØØ	DS6521MRØØØ

100 Amp Standard Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS1CC.

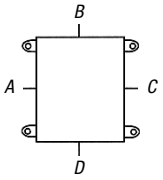
Maximum lug wire 0 AWG 19-strand or 1 AWG flexible, cable entrance .386" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

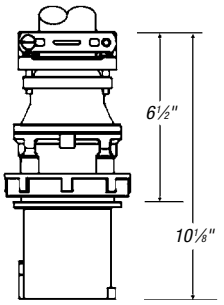
Outlet furnished at location "B" unless otherwise specified. 2" NPT.

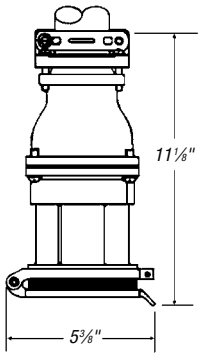




Male Plug††

Female Connector





▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS1104MP00K***

*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***

Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60HZ	CAT. NO. ▼	STANDARD BUSHING I.D. †	CAT. NO. ▼	STANDARD BUSHING I.D. †
2	3		277	DS1104MP000	1 11/16"	DF1104FP000	1 11/16"
			125	DS1107MP000		DF1107FP000	
2	3		480	DS1204MP000	1 11/16"	DF1204FP000	1 11/16"
			250	DS1207MP000		DF1207FP000	
			600	DS1214MP000		DF1214FP000	
			208	DS1216MP000		DF1216FP000	
3	4		277/480	DS1304MP000	1 13/16"	DF1304FP000	1 13/16"
			125/250	DS1307MP000		DF1307FP000	
			120/208	DS1316MP000		DF1316FP000	
3	4		3Ø 480	DS1404MP000	1 13/16"	DF1404FP000	1 13/16"
			3Ø 250	DS1407MP000		DF1407FP000	
			3Ø 600	DS1414MP000		DF1414FP000	
			3Ø 208	DS1416MP000		DF1416FP000	
			3Ø 440	DS1421MP000		DF1421FP000	
4	5		3ØY 277/480	DS1504MP000	2"	DF1504FP000	2"
			3ØY 347/600	DS1514MP000		DF1514FP000	
			3ØY 118/208	DS1516MP000		DF1516FP000	
			3ØY 250/440	DS1521MP000		DF1521FP000	

MaxGard® Interconnection Systems



Female Receptacle with Angle Enclosure



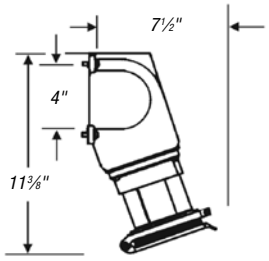
Female Receptacle with Angle Adapter** and Junction Box

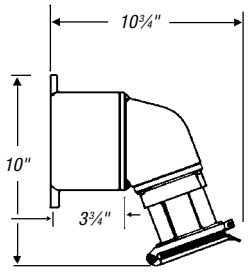


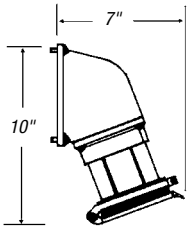
Female Receptacle with Angle Adapter**

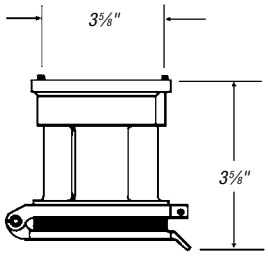


Female Receptacle









CAT. NO.	CAT. NO.	CAT. NO.	CAT. NO.
DF1104FR0E0	DF1104FRAB0	DF1104FRA00	DF1104FR000
DF1107FR0E0	DF1107FRAB0	DF1107FRA00	DF1107FR000
DF1204FR0E0	DF1204FRAB0	DF1204FRA00	DF1204FR000
DF1207FR0E0	DF1207FRAB0	DF1207FRA00	DF1207FR000
DF1214FR0E0	DF1214FRAB0	DF1214FRA00	DF1214FR000
DF1216FR0E0	DF1216FRAB0	DF1216FRA00	DF1216FR000
DF1304FR0E0	DF1304FRAB0	DF1304FRA00	DF1304FR000
DF1307FR0E0	DF1307FRAB0	DF1307FRA00	DF1307FR000
DF1316FR0E0	DF1316FRAB0	DF1316FRA00	DF1316FR000
DF1404FR0E0	DF1404FRAB0	DF1404FRA00	DF1404FR000
DF1407FR0E0	DF1407FRAB0	DF1407FRA00	DF1407FR000
DF1414FR0E0	DF1414FRAB0	DF1414FRA00	DF1414FR000
DF1416FR0E0	DF1416FRAB0	DF1416FRA00	DF1416FR000
DF1421FR0E0	DF1421FRAB0	DF1421FRA00	DF1421FR000
DF1504FR0E0	DF1504FRAB0	DF1504FRA00	DF1504FR000
DF1514FR0E0	DF1514FRAB0	DF1514FRA00	DF1514FR000
DF1516FR0E0	DF1516FRAB0	DF1516FRA00	DF1516FR000
DF1521FR0E0	DF1521FRAB0	DF1521FRA00	DF1521FR000

100 Amp

* Notes to Catalog Numbers

Control Contacts (position 12) use "K" example: DBRF1104030K0

Shunt Trip Breaker (position 13) add "Z" to above: DBRF1104030KZ

Breaker Trip Ratings (positions 9, 10, 11)
70 amp use 070 100 amp use 100
90 amp use 090

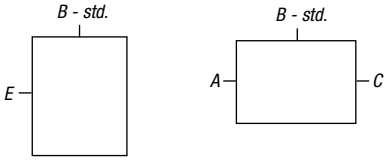
Non-Auto Sw. NAO (repl. "DBRF" with "DSRF")

Conduit Hubs: NEMA 4X

- Std. 2" NPT-thread outlet at B (or E)
- 100 amp — Max. 2½"/64mm

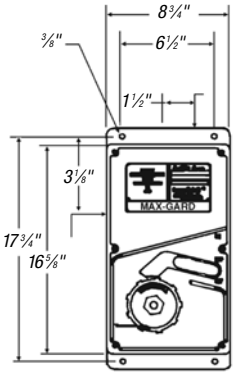
Conduit Hubs: XP

- Std. 11½" -thread outlets provided at A, B or C
- 100 amp — 2.00"/51mm





Interlocked Receptacle with Circuit Breaker NEMA 4X



†† *Non-fused version available. Replace DFRF with DNRF.*

***Boldface** figures are for voltage assignment.*
*For different ratings, see **page H-340.***

Device Ratings and Polarizations

Maximum 600VAC or 250VDC

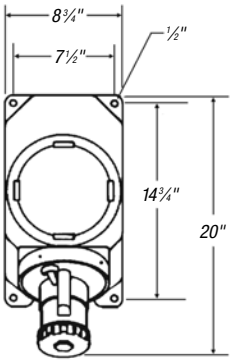
(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO.
				*
2	3		277	DBRF11041000
			125	DBRF11071000
2	3		480	DBRF12041000
			250	DBRF12071000
			600	DBRF12141000
			208	DBRF12161000
3	4		277/480	DBRF13041000
			125/250	DBRF13071000
			120/208	DBRF13161000
3	4		3Ø 480	DBRF14041000
			3Ø 250	DBRF14071000
			3Ø 600	DBRF14141000
			3Ø 208	DBRF14161000
			3Ø 440	DBRF14211000
4	5		3ØY 277/480	DBRF15041000
			3ØY 347/600	DBRF15141000
			3ØY 120/208	DBRF15161000
			3ØY 250/440	DBRF15211000

MaxGard® Interconnection Systems

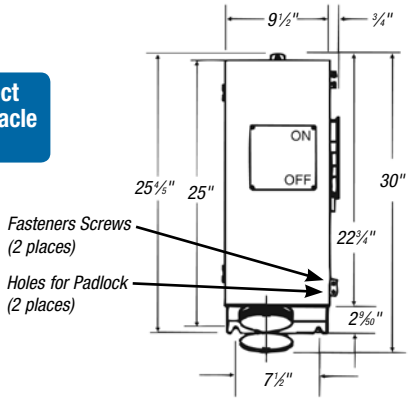


Explosion-Proof Interlocked Receptacle Class I, Class II





Fused†† Disconnect Interlocked Receptacle NEMA 12/3R



CAT. NO. *	CAT. NO.
DBRE11041000	DFRF11040
DBRE11071000	DFRF11070
DBRE12041000	DFRF12040
DBRE12071000	DFRF12070
DBRE12141000	DFRF12140
DBRE12161000	DFRF12160
DBRE13041000	DFRF13040
DBRE13071000	DFRF13070
DBRE13161000	DFRF13160
DBRE14041000	DFRF14040
DBRE14071000	DFRF14070
DBRE14141000	DFRF14140
DBRE14161000	DFRF14160
DBRE14211000	DFRF14210
DBRE15041000	DFRF15040
DBRE15141000	DFRF15140
DBRE15161000	DFRF15160
DBRE15211000	DFRF15210

100 Amp Reverse Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number **DS1**CC.

Maximum lug wire 0 AWG 19-strand or 1 AWG flexible, cable entrance .386" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

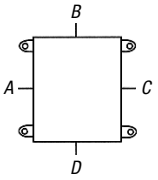
Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

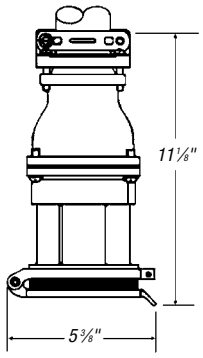
Outlet furnished at location "B" unless otherwise specified. 2" NPT.

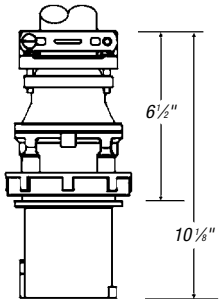


Female Connector

Male Plug††







▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS1104MR00K***

*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***

Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D. †	CAT. NO. ▼	STANDARD BUSHING I.D. †
2	3		277	**DF1104FP000**	1 11/16"	**DS1104MP000**	1 11/16"
			125	**DF1107FP000**		**DS1107MP000**	
2	3		480	**DF1204FP000**	1 11/16"	**DS1204MP000**	1 11/16"
			250	**DF1207FP000**		**DS1207MP000**	
			600	**DF1214FP000**		**DS1214MP000**	
			208	**DF1216FP000**		**DS1216MP000**	
3	4		277/480	**DF1304FP000**	1 13/16"	**DS1304MP000**	1 13/16"
			125/250	**DF1307FP000**		**DS1307MP000**	
			120/208	**DF1316FP000**		**DS1316MP000**	
3	4		3Ø 480	**DF1404FP000**	1 13/16"	**DS1404MP000**	1 13/16"
			3Ø 250	**DF1407FP000**		**DS1407MP000**	
			3Ø 600	**DF1414FP000**		**DS1414MP000**	
			3Ø 208	**DF1416FP000**		**DS1416MP000**	
			3Ø 440	**DF1421FP000**		**DS1421MP000**	
4	5		3ØY 277/480	**DF1504FP000**	2"	**DS1504MP000**	2"
			3ØY 347/600	**DF1514FP000**		**DS1514MP000**	
			3ØY 110/208	**DF1516FP000**		**DS1516MP000**	
			3ØY 250/440	**DF1521FP000**		**DS1521MP000**	

MaxGard® Interconnection Systems



Male Inlet with Angle Enclosure



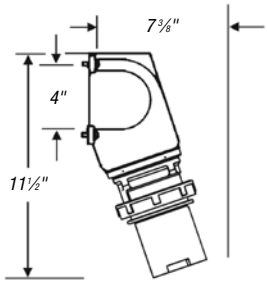
Male Inlet with Angle Adapter** and DJB3 Junction Box

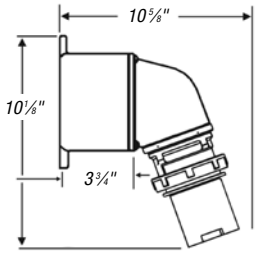


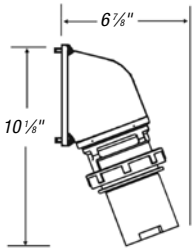
Male Inlet with Angle Adapter**

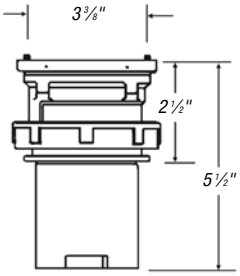


Male Inlet††









CAT. NO.	CAT. NO.	CAT. NO.	CAT. NO.
DS1104MRØEØ	DS1104MRABØ	DS1104MRA00	DS1104MR000
DS1107MRØEØ	DS1107MRABØ	DS1107MRA00	DS1107MR000
DS1204MRØEØ	DS1204MRABØ	DS1204MRA00	DS1204MR000
DS1207MRØEØ	DS1207MRABØ	DS1207MRA00	DS1207MR000
DS1214MRØEØ	DS1214MRABØ	DS1214MRA00	DS1214MR000
DS1216MRØEØ	DS1216MRABØ	DS1216MRA00	DS1216MR000
DS1304MRØEØ	DS1304MRABØ	DS1304MRA00	DS1304MR000
DS1307MRØEØ	DS1307MRABØ	DS1307MRA00	DS1307MR000
DS1316MRØEØ	DS1316MRABØ	DS1316MRA00	DS1316MR000
DS1404MRØEØ	DS1404MRABØ	DS1404MRA00	DS1404MR000
DS1407MRØEØ	DS1407MRABØ	DS1407MRA00	DS1407MR000
DS1414MRØEØ	DS1414MRABØ	DS1414MRA00	DS1414MR000
DS1416MRØEØ	DS1416MRABØ	DS1416MRA00	DS1416MR000
DS1421MRØEØ	DS1421MRABØ	DS1421MRA00	DS1421MR000
DS1504MRØEØ	DS1504MRABØ	DS1504MRA00	DS1504MR000
DS1514MRØEØ	DS1514MRABØ	DS1514MRA00	PDS1514MR000
DS1516MRØEØ	DS1516MRABØ	DS1516MRA00	DS1516MR000
DS1521MRØEØ	DS1521MRABØ	DS1521MRA00	DS1521MR000

200 Amp Standard Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS2CC.

Maximum lug wire 4/0 AWG 19-strand or flexible, cable entrance .625" diameter.

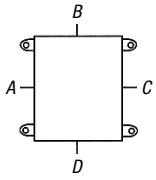
Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

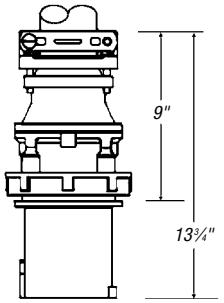
Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

Outlet furnished at location "B" unless otherwise specified. 3" NPT.

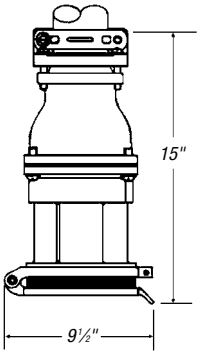




Male Plug††



Female Connector



▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS2104MP00K***

*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***

Device Ratings and Polarizations

Maximum 600VAC or 250VDC

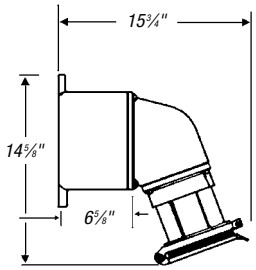
(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D.†	CAT. NO. ▼	STANDARD BUSHING I.D.†
2	3		277	DS2104MP000	2⅛"	DF2104FP000	2⅛"
			125	DS2107MP000		DF2107FP000	
2	3		480	DS2204MP000	2⅛"	DF2204FP000	2⅛"
			250	DS2207MP000		DF2207FP000	
			600	DS2214MP000		DF2214FP000	
			208	DS2216MP000		DF2216FP000	
3	4		277/480	DS2304MP000	2¼"	DF2304FP000	2¼"
			125/250	DS2307MP000		DF2307FP000	
			120/208	DS2316MP000		DF2316FP000	
3	4		3Ø 480	DS2404MP000	2¼"	DF2404FP000	2¼"
			3Ø 250	DS2407MP000		DF2407FP000	
			3Ø 600	DS2414MP000		DF2414FP000	
			3Ø 208	DS2416MP000		DF2416FP000	
			3Ø 440	DS2421MP000		DF2421FP000	
4	5		3ØY 277/480	DS2504MP000	2½"	DF2504FP000	2½"
			3ØY 347/600	DS2514MP000		DF2514FP000	
			3ØY 110/208	DS2516MP000		DF2516FP000	
			3ØY 250/440	DS2521MP000		DF2521FP000	

MaxGard® Interconnection Systems

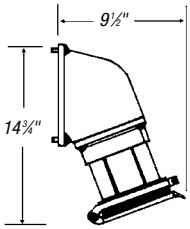


Female Receptacle with Angle Adapter** and Junction Box



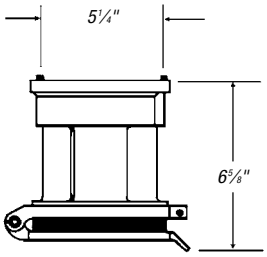


Female Receptacle with Angle Adapter**





Female Receptacle



CAT. NO.	CAT. NO.	CAT. NO.
DF2104FRABØ	DF2104FRAØØ	DF2104FRØØØ
DF2107FRABØ	DF2107FRAØØ	DF2107FRØØØ
DF2204FRABØ	DF2204FRAØØ	DF2204FRØØØ
DF2207FRABØ	DF2207FRAØØ	DF2207FRØØØ
DF2214FRABØ	DF2214FRAØØ	DF2214FRØØØ
DF2216FRABØ	DF2216FRAØØ	DF2216FRØØØ
DF2304FRABØ	DF2304FRAØØ	DF2304FRØØØ
DF2307FRABØ	DF2307FRAØØ	DF2307FRØØØ
DF2316FRABØ	DF2316FRAØØ	DF2316FRØØØ
DF2404FRABØ	DF2404FRAØØ	DF2404FRØØØ
DF2407FRABØ	DF2407FRAØØ	DF2407FRØØØ
DF2414FRABØ	DF2414FRAØØ	DF2414FRØØØ
DF2416FRABØ	DF2416FRAØØ	DF2416FRØØØ
DF2421FRABØ	DF2421FRAØØ	DF2421FRØØØ
DF2504FRABØ	DF2504FRAØØ	DF2504FRØØØ
DF2514FRABØ	DF2514FRAØØ	DF2514FRØØØ
DF2516FRABØ	DF2516FRAØØ	DF2516FRØØØ
DF2521FRABØ	DF2521FRAØØ	DF2521FRØØØ

MaxGard® Interconnection Systems

200 Amp

* Notes to Catalog Numbers

Control Contacts (position 12) use "K" example: DBRF2104200K0

Shunt Trip Breaker (position 13) add "Z" to above: DBRF2104200KZ

Breaker Trip Ratings (positions 9, 10, 11)
150 amp use 150

175 amp use 175

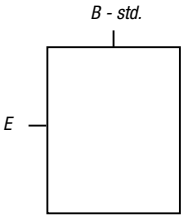
200 amp use 200

Non-Auto Sw. NAO (repl. "DBRF" with "DSRF")

Conduit Hubs: NEMA 4X

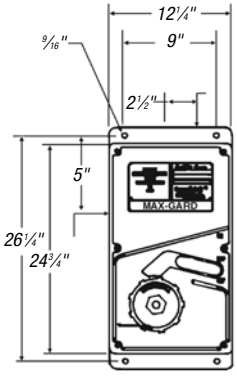
- Std. 2" NPT-thread outlet at B (or E)
- 200 amp — Max. 3 11/16 mm

Boldface figures are for voltage assignment.
For different ratings, see **page H-340**.





Interlocked Receptacle with Circuit Breaker NEMA 4X



Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO.
				*
2	3		277	DBRF21042000
			125	DBRF21072000
2	3		480	DBRF22042000
			250	DBRF22072000
			600	DBRF22142000
			208	DBRF22162000
3	4		277/480	DBRF23042000
			125/250	DBRF23072000
			120/208	DBRF23162000
3	4		3Ø 480	DBRF24042000
			3Ø 250	DBRF24072000
			3Ø 600	DBRF24142000
			3Ø 208	DBRF24162000
			3Ø 440	DBRF24212000
4	5		3ØY 277/480	DBRF25042000
			3ØY 347/600	DBRF25142000
			3ØY 120/208	DBRF25162000
			3ØY 250/440	DBRF25212000

MaxGard® Interconnection Systems

Staten Island Ferry

SOLUTION
200 Amp

200A MaxGard® inlets with disconnects





200A MaxGard® connections on ferry deck



30A and 200A MaxGard® interlocks



200A MaxGard® interlocks in parallel



200 Amp Reverse Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number **DS2**CC.

Maximum lug wire 4/0 AWG 19-strand or flexible, cable entrance .625" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

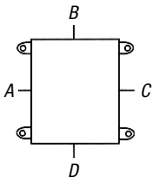
Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

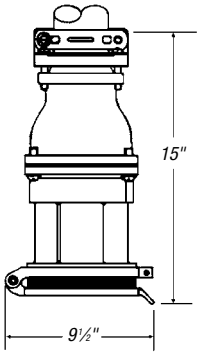
Outlet furnished at location "B" unless otherwise specified. 3" NPT.

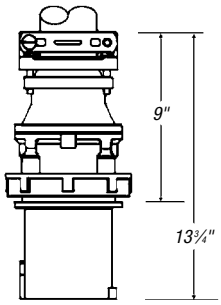


▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS2104MR00K***

*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***







Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D. †	CAT. NO. ▼	STANDARD BUSHING I.D. †
2	3		277	**DF2104FP000**	2⅛"	**DS2104MP000**	2⅛"
			125	**DF2107FP000**		**DS2107MP000**	
2	3		480	**DF2204FP000**	2⅛"	**DS2204MP000**	2⅛"
			250	**DF2207FP000**		**DS2207MP000**	
			600	**DF2214FP000**		**DS2214MP000**	
			208	**DF2216FP000**		**DS2216MP000**	
3	4		277/480	**DF2304FP000**	2¼"	**DS2304MP000**	2¼"
			125/250	**DF2307FP000**		**DS2307MP000**	
			120/208	**DF2316FP000**		**DS2316MP000**	
3	4		3Ø 480	**DF2404FP000**	2¼"	**DS2404MP000**	2¼"
			3Ø 250	**DF2407FP000**		**DS2407MP000**	
			3Ø 600	**DF2414FP000**		**DS2414MP000**	
			3Ø 208	**DF2416FP000**		**DS2416MP000**	
			3Ø 440	**DF2421FP000**		**DS2421MP000**	
4	5		3ØY 277/480	**DF2504FP000**	2½"	**DS2504MP000**	2½"
			3ØY 347/600	**DF2514FP000**		**DS2514MP000**	
			3ØY 110/208	**DF2516FP000**		**DS2516MP000**	
			3ØY 250/440	**DF2521FP000**		**DS2521MP000**	

MaxGard® Interconnection Systems



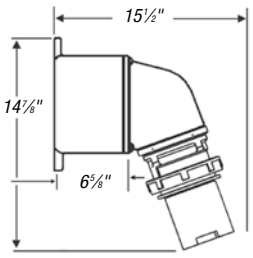
Male Inlet with Angle Enclosure

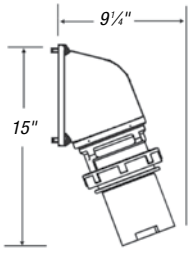


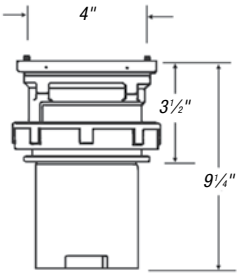
Male Inlet with Angle Adapter**



Male Inlet††







CAT. NO.	CAT. NO.	CAT. NO.
DS2104MRABØ	DS2104MRAØØ	DS2104MRØØØ
DS2107MRABØ	DS2107MRAØØ	DS2107MRØØØ
DS2204MRABØ	DS2204MRAØØ	DS2204MRØØØ
DS2207MRABØ	DS2207MRAØØ	DS2207MRØØØ
DS2214MRABØ	DS2214MRAØØ	DS2214MRØØØ
DS2216MRABØ	DS2216MRAØØ	DS2216MRØØØ
DS2304MRABØ	DS2304MRAØØ	DS2304MRØØØ
DS2307MRABØ	DS2307MRAØØ	DS2307MRØØØ
DS2316MRABØ	DS2316MRAØØ	DS2316MRØØØ
DS2404MRABØ	DS2404MRAØØ	DS2404MRØØØ
DS2407MRABØ	DS2407MRAØØ	DS2407MRØØØ
DS2414MRABØ	DS2414MRAØØ	DS2414MRØØØ
DS2416MRABØ	DS2416MRAØØ	DS2416MRØØØ
DS2421MRABØ	DS2421MRAØØ	DS2421MRØØØ
DS2504MRABØ	DS2504MRAØØ	DS2504MRØØØ
DS2514MRABØ	DS2514MRAØØ	DS2514MRØØØ
DS2516MRABØ	DS2516MRAØØ	DS2516MRØØØ
DS2521MRABØ	DS2521MRAØØ	DS2521MRØØØ

MMI Trailer



SOLUTION 200 Amp

Application:

Electrical hook-up of mobile medical imaging (MMI) trailers

Mobile medical units provide trailer-transportable blood banks, dental clinics, magnetic resonance imaging (MRI), X-ray and other diagnostic equipment to many hospitals and clinics throughout the country on a regular leased basis. Safe outdoor usage connections are required for up to 200-amp power supplies at each facility. Major specialized custom trailer manufacturers rely on the MaxGard® 200-amp interface.

Installation:

Site-mounted 200-amp receptacles with trailer-mounted plugs and connectors

When a mobile medical unit trailer is at the desired location, a heavy-duty MaxGard® 200-amp cable assembly connects the trailer with a corresponding receptacle or connector at each site, usually mounted on an outside wall. A primary safety feature is the receptacle's gated deadfront construction that ensures no exterior access to live receptacle contacts. With so many different hands involved on a daily basis, the MaxGard epoxy powder-coat finish and rugged waterproof construction provide hospital-safe long service life.

400 Amp Standard Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS4CC.

Maximum lug wire 500 kcmil 37-strand or flexible, cable entrance .937" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

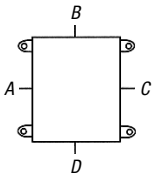
Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

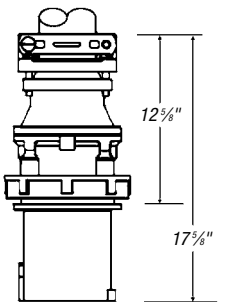
Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

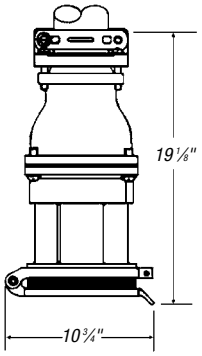
Outlet furnished at location "B" unless otherwise specified. 4" NPT.



Male Plug†† | Female Connector







▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS4104MP00K***

*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***

Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D. †	CAT. NO. ▼	STANDARD BUSHING I.D. †
2	3		277	DS4104MP000	2¾"	DF4104FP000	2¾"
			125	DS4107MP000		DF4107FP000	
2	3		480	DS4204MP000		DF4204FP000	
			250	DS4207MP000		DF4207FP000	
			600	DS4214MP000		DF4214FP000	
			208	DS4216MP000		DF4216FP000	
3	4		277/480	DS4304MP000	3"	DF4304FP000	3"
			125/250	DS4307MP000		DF4307FP000	
			120/208	DS4316MP000		DF4316FP000	
3	4		3Ø 480	DS4404MP000		DF4404FP000	
			3Ø 250	DS4407MP000		DF4407FP000	
			3Ø 600	DS4414MP000		DF4414FP000	
			3Ø 208	DS4416MP000		DF4416FP000	
			3Ø 440	DS4421MP000		DF4421FP000	
4	5		3ØY 277/480	DS4504MP000	3¼"	DF4504FP000	3¼"
			3ØY 347/600	DS4514MP000		DF4514FP000	
			3ØY 110/208	DS4516MP000		DF4516FP000	
			3ØY 250/440	DS4521MP000		DF4521FP000	

MaxGard® Interconnection Systems



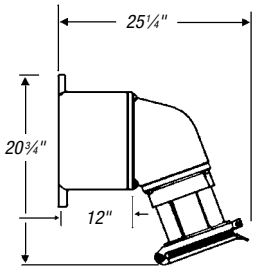
Female Receptacle with Angle Adapter and Junction Box**

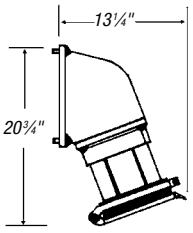


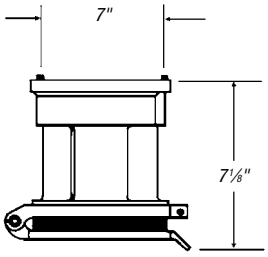
Female Receptacle with Angle Adapter**



Female Receptacle







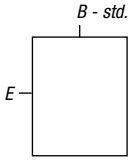
CAT. NO.	CAT. NO.	CAT. NO.
DF4104FRAB0	DF4104FRA00	DF4104FR000
DF4107FRAB0	DF4107FRA00	DF4107FR000
DF4204FRAB0	DF4204FRA00	DF4204FR000
DF4207FRAB0	DF4207FRA00	DF4207FR000
DF4214FRAB0	DF4214FRA00	DF4214FR000
DF4216FRAB0	DF4216FRA00	DF4216FR000
DF4304FRAB0	DF4304FRA00	DF4304FR000
DF4307FRAB0	DF4307FRA00	DF4307FR000
DF4316FRAB0	DF4316FRA00	DF4316FR000
DF4404FRAB0	DF4404FRA00	DF4404FR000
DF4407FRAB0	DF4407FRA00	DF4407FR000
DF4414FRAB0	DF4414FRA00	DF4414FR000
DF4416FRAB0	DF4416FRA00	XDF4416FR000
DF4421FRAB0	DF4421FRA00	DF4421FR000
DF4504FRAB0	DF4504FRA00	DF4504FR000
DF4514FRAB0	DF4514FRA00	DF4514FR000
DF4516FRAB0	DF4516FRA00	DF4516FR000
DF4521FRAB0	DF4521FRA00	DF4521FR000

400 Amp

*** Notes to Catalog Numbers**
Control Contacts (position 12)
use "K" example: DBRF4104200K0
Shunt Trip Breaker (position 13)
add "Z" to above: DBRF4104200KZ
Breaker Trip Ratings (positions 9, 10, 11)
250 amp use 250 350 amp use 350
300 amp use 300 400 amp use 400
Non-Auto Sw. NAO (repl. "DBRF" with "DSRF")

Conduit Hubs: NEMA 4X

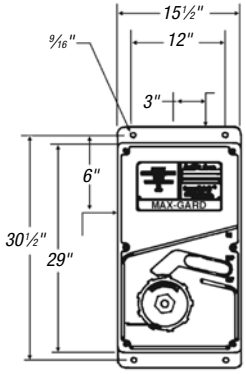
- Std. 4" NPT-thread outlet at B (or E)
- 400 amp — Max. 4" (102mm)



***Boldface** figures are for voltage assignment.*
*For different ratings, see **page H-340.***



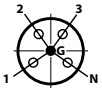
Interlocked Receptacle with Circuit Breaker NEMA 4X



Device Ratings and Polarizations

Maximum 600VAC or 250VDC

(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. *
2	3		277	DBRF41044000
			125	DBRF41074000
2	3		480	DBRF42044000
			250	DBRF42074000
			600	DBRF42144000
			208	DBRF42164000
3	4		277/480	DBRF43044000
			125/250	DBRF43074000
			120/208	DBRF43164000
3	4		3Ø 480	DBRF44044000
			3Ø 250	DBRF44074000
			3Ø 600	DBRF44144000
			3Ø 208	DBRF44164000
			3Ø 440	DBRF44214000
4	5		3ØY 125/250	DBRF45044000
			3ØY 347/600	DBRF45144000
			3ØY 120/208	DBRF45164000
			3ØY 250/440	DBRF45214000

Shore-to-ship power





SOLUTION
400 Amp

Application:

Shore power to marine vessels — sightseeing boats

When docked, marine vessels need shore power when their engines aren't running. Dockside designs need to be as safe as possible during heavy use, rough treatment and adverse weather conditions. High amperage-rated systems are installed using parallel power delivery with cross-network protection.

Installation:

400-amp male inlets and power connectors with control contacts

Watertight devices are necessary for dockside installations. MaxGard® connections go further with O-rings on both pins and interiors for environmental separation and true waterproof performance. The male inlet center ground pin feature and keyed entry design align easily, make ground first and break last, while quarter-turn insertion delayed-action removal and locking screw collars provide accidental pull-out protection. Upon connector insertion, two auxiliary control contacts complete a contactor circuit, which powers the line through a make-last-and-break-first configuration. Contactors are installed separately in an on-shore sheltered power distribution panel.

This can be wired for each contactor or for multiple connections; if one plug is removed, power is cut off.

400 Amp Reverse Service

** If receptacle is desired with a Straight Adapter instead of standard Angle Adapter, substitute "S" for the "A" in the catalog number of the Receptacle with Angle Adapter or Adapter and Box.

† Standard cable bushings shown; see **page H-334** for other sizes available at no extra cost if specified on order.

†† Always furnished with screw collar. We recommend cup cap with male plug; order catalog number DS4CC.

Maximum lug wire 500 kcmil 37-strand or flexible, cable entrance .937" diameter.

Receptacles furnished with flap cap also have screw thread to accept male collar on plug.

Catalog numbers shown are for flap cap receptacles; change "DF" to "DS" for ordering screw cap.

Boldface figures are for voltage assignment. For different ratings, see **page H-340**.

Outlet furnished at location "B" unless otherwise specified. 4" NPT.

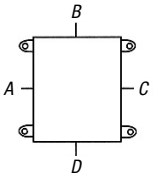
▼ ***Control contacts for plug/receptacles: Use "K" where noted. Ex: DS4104MR00K***

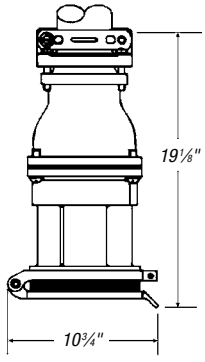
*For Adapters, Junction Boxes and Accessories, see **pages H-334–H-337.***

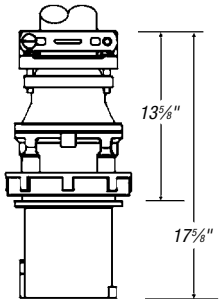


Female Connector

Male Plug††



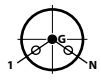
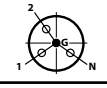
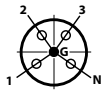




Device Ratings and Polarizations

Maximum 600VAC or 250VDC

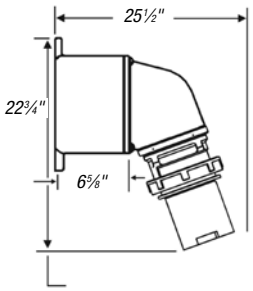
(For full polarization, see **page H-340**)

POLE	WIRE	CONDUCTOR PLACEMENT	VOLTAGE 60 HZ	CAT. NO. ▼	STANDARD BUSHING I.D.†	CAT. NO. ▼	STANDARD BUSHING I.D.†
2	3		277	DF4104FP000	2¾"	DS4104MP000	2¾"
			125	DF4107FP000		DS4107MP000	
2	3		480	DF4204FP000		DS4204MP000	
			250	DF4207FP000		DS4207MP000	
			600	DF4214FP000		DS4214MP000	
			208	DF4216FP000		DS4216MP000	
3	4		277/480	DF4304FP000	3"	DS4304MP000	3"
			125/250	DF4307FP000		DS4307MP000	
			120/208	DF4316FP000		DS4316MP000	
3	4		3Ø 480	DF4404FP000		DS4404MP000	
			3Ø 250	DF4407FP000		DS4407MP000	
			3Ø 600	DF4414FP000		DS4414MP000	
			3Ø 208	DF4416FP000		DS4416MP000	
			3Ø 440	DF4421FP000		DS4421MP000	
4	5		3ØY 277/480	DF4504FP000	3¼"	DS4504MP000	3¼"
			3ØY 347/600	DF4514FP000		DS4514MP000	
			3ØY 120/208	DF4516FP000		DS4516MP000	
			3ØY 250/440	DF4521FP000		DS4521MP000	

MaxGard® Interconnection Systems

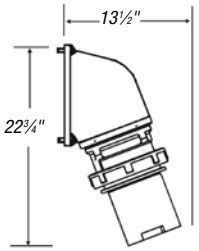


Male Inlet with Angle Adapter and Junction Box**



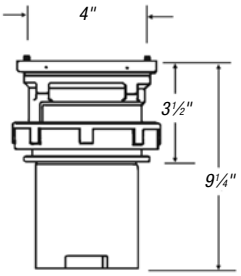


Male Inlet with Angle Adapter**





Male Inlet††



CAT. NO.	CAT. NO.	CAT. NO.
DS4104MRABØ	DS4104MRAØØ	DS4104MRØØØ
DS4107MRABØ	DS4107MRAØØ	DS4107MRØØØ
DS4204MRABØ	DS4204MRAØØ	DS4204MRØØØ
DS4207MRABØ	DS4207MRAØØ	DS4207MRØØØ
DS4214MRABØ	DS4214MRAØØ	DS4214MRØØØ
DS4216MRABØ	DS4216MRAØØ	DS4216MRØØØ
DS4304MRABØ	DS4304MRAØØ	DS4304MRØØØ
DS4307MRABØ	DS4307MRAØØ	DS4307MRØØØ
DS4316MRABØ	DS4316MRAØØ	DS4316MRØØØ
DS4404MRABØ	DS4404MRAØØ	DS4404MRØØØ
DS4407MRABØ	DS4407MRAØØ	DS4407MRØØØ
DS4414MRABØ	DS4414MRAØØ	DS4414MRØØØ
DS4416MRABØ	DS4416MRAØØ	DS4416MRØØØ
DS4421MRABØ	DS4421MRAØØ	DS4421MRØØØ
DS4504MRABØ	DS4504MRAØØ	DS4504MRØØØ
DS4514MRABØ	DS4514MRAØØ	DS4514MRØØØ
DS4516MRABØ	DS4516MRAØØ	DS4516MRØØØ
DS4521MRABØ	DS4521MRAØØ	DS4521MRØØØ

Cable Bushings for MaxGard® Plugs and Connectors

To order non-standard bushing, add cable bushing number to the end of a catalog number. The bushing is furnished at no additional cost at time of order.

Ex: DF2504FP000/DF2032.

Shaded areas show Cable Bushings provided with a strain-relief neck; larger bushings are collar style.



Size No. 3 and 6
(Identification Letter Inside Hole)



Size No. 10, 20 and 40

HOLE DIAMETER FOR CABLE	SIZE 3 30 AMP	SIZE 6 60 AMP	SIZE 10 100 AMP	SIZE 20 200 AMP	SIZE 40 400 AMP
.625"	**JG63**				
.750"	**JG64**	**JG104**			
.875"	**JG65** Std. 2P3W	**JG105**			
1.000"	**JG66** Std. 2P3W	**JG106**	**DF1020**	**DF2020**	
1.188"	**JG67** Std. 3P4W	**JG107** Std. 2P3W	**DF1022**	**DF2022**	
1.313"		**JG108** Std. 3P4W	**DF1024**	**DF2024**	
1.375"	**JG69**				
1.500"	**JG610**	**JG1010** Std. 4P5W	**DF1026**	**DF2026**	
1.625"					
1.688"		**JG1011**	**DF1027** Std. 2P3W	**DF2027**	
1.813"			**DF1029** Std. 3P4W	**DF2029**	
1.875"		**JG1013**	**DF1030**	**DF2032** Std. 2P3W	
2.000"			**DF1032** Std. 4P5W		
2.125"				**DF2034** Std. 3P4W	
2.250"				**DF2036** Std. 4P5W	
2.500"				**DF2040**	
2.625"					**DF4042**
2.750"					**DF4044**
3.000"					**DF4048** Std. 3P4W
3.250"					**DF4054** Std. 4P5W

Standard Cable Bushings

Notes: *When ordering, select bushing size slightly larger than your cable O.D. for best fit.*

Material *— Neoprene*

Adapters for Conduit and Fittings

Adapters are tapped NPT standard pipe thread to accommodate rigid conduit or standard connectors for armored and non-metallic cable or flexible conduit.



JPA Conduit Adapters

30 AMP CAT. NO.	TAPPED HOLE SIZE NPT	60 AMP CAT. NO.	TAPPED HOLE SIZE NPT	100 AMP CAT. NO.	TAPPED HOLE SIZE NPT	200 AMP CAT. NO.	TAPPED HOLE SIZE NPT	400 AMP CAT. NO.	TAPPED HOLE SIZE NPT
JPA62	¾"	**JPA104**	1¼"	**DFA14**	1¼"	**DFA25**	1½"	**DFA46**	2"
JPA63	1"	**JPA105**	1½"	**DFA15**	1½"	**DFA26**	2"	**DFA47**	2½"
JPA64	1¼"	**JPA 106**	2"	**DFA16**	2"	**DFA27**	2½"	**DFA48**	3"
JPA65	1½"	—	—	—	—	—	—	—	—

Note:

Material — cast aluminum, corrosion-resistant copper-free alloy, electrostatic epoxy coated. Furnished complete with gasket and screws.

To specify standard plugs or connectors equipped with one of the above adapters, add the catalog number of the adapter selected to the catalog number of the plug or connector. Complete list price is the list price of the device plus list price of the adapter.

Ex.: Cat. No. DS3107MP000 with adapter tapped 1" would be Cat. No. DS3107MP000/JPA63.

Replacement Flap Covers and Screw Covers

- For connectors, receptacles and interlocks

CAT. NO.	DESCRIPTION	AMPERAGE
DFC3	Flap Cover Assembly (Weathertight)	30
DFC6		60
DFC10		100
DFC20		200
DFC40		400
DSC3	Screw Cap and STS — Lanyard Assembly (Watertight)	30
DSC6		60
DSC10		100
DSC20		200
DSC40		400



DFC6



DSC6

Accessories for Receptacles

	DESCRIPTION	30 AMP CAT. NO.	60 AMP CAT. NO.	100 AMP CAT. NO.	200 AMP CAT. NO.	400 AMP CAT. NO.
	**Cup Caps** For watertight plugs/inlets. Cup caps are used where portable equipment is on a standby basis and plugs are not in use. Effectively protect insulation and contacts from excessive moisture, dirt, dust and corrosion. **Material** — Cast aluminum, corrosion-resistant copper-free alloy, electrostatic epoxy coated with steel braid cable attached.	DS3CC	DS6CC	DS1CC	DS2CC	DS4CC
	**Adapter Flush Frames — Single Gang** Provide suitable means for mounting box covers of junction box receptacles flush in a wall.	JFA6	JFA10	JFA10	JFA20	CONSULT FACTORY
	**Adapters for Conduit Box Receptacles** Adapters to fit existing boxes and for special mounting requirements can also be furnished. Consult your Thomas & Betts representative.					
	20° Vertical Angle Adapter	JAA6-AB6	JAA10	DAA10	DAA20	—
	30° Vertical Angle Adapter	—	—	—	—	DAA40
	45° Vertical Angle Adapter	JAA6-45	JAA10-45	—	—	—
	Straight Adapter	JRA6-AB6	JRA10	DRA10	DRA20	DRA40
	**Junction Box — Single Gang**	JB6-1	JB10-B150	JB10-B200	DJB20	DJB40
	**Angle Enclosure**	JE6	JE10	JE10M	—	—
	**MACK Adapter Plates** Enables mounting of MaxGard® receptacles to competitive existing back boxes. This involves removing the existing non-hazardous location receptacle from back box, inserting adapter plate and installing MaxGard® receptacle. Adapter plates are available for competitors' boxes including Hubbel, Killark, Appleton and Crouse-Hinds.	DCCA3	DCCA6	DCCA10	DCCA20	—
	**Russellstoll® Adapter Plates** Adapt MaxGard® receptacles to existing J-Line™, Angle Type and Heavy-Service Ever-Lok® back boxes.	DRCA3	DRCA6	DRCA10	—	N/A

Replacement Interiors for Receptacles, Connectors, Plugs and Male Inlets





RATING		VOLTAGE POLARIZATION	CORRESPONDING MALE INTERIOR ASSEMBLY		CORRESPONDING FEMALE INTERIOR ASSEMBLY	
			PLUG/INLET	MALE INTERIOR	CONNECTOR/RECEPTACLE	FEMALE INTERIOR
30A	2P3W	125VAC	DS3107MP000	DFPU3107	DF3107FP000	DFRU3107
	2P3W	250VAC	DS3207MP000	DFPU3207	DF3207FP000	DFRU3207
	3P4W	125/250VAC	DS3307MP000	DFPU3307	DF3307FP000	DFRU3307
	3P4W	3-ph 480VAC	DS3404MP000	DFPU3404	DF3404FP000	DFRU3404
	4P5W	277/480VAC	DS3504MP000	DFPU3504	DF3504FP000	DFRU3504
60A	2P3W	250VAC	DS6207MP000	DFPU6207	DF6207FP000	DFRU6207
	3P4W	125/250VAC	DS6307MP000	DFPU6307	DF6307FP000	DFRU6307
	3P4W	3-ph 480VAC	DS6404MP000	DFPU6404	DF6404FP000	DFRU6404
	4P5W	277/480VAC	DS6504MP000	DFPU6504	DF6504FP000	DFRU6504
100A	2P3W	250VAC	DS1207MP000	DFPU1207	DF1207FP000	DFRU1207
	3P4W	125/250VAC	DS1307MP000	DFPU1307	DF1307FP000	DFRU1307
	3P4W	3-ph 480VAC	DS1404MP000	DFPU1404	DF1404FP000	DFRU1404
	4P5W	277/480VAC	DS1504MP000	DFPU1504	DF1504FP000	DFRU1504
200A	3P4W	277/480VAC	DS2304MP000	DFPU2304	DF2304FP000	DFRU2304
	3P4W	3-ph 480VAC	DS2404MP000	DFPU2404	DF2404FP000	DFRU2404
	4P5W	277/480VAC	DS2504MP000	DFPU2504	DF2504FP000	DFRU2504
400A	3P4W	277/480VAC	DS4304MP000	DFPU4304	DF4304FP000	DFRU4304
	3P4W	3-ph 480VAC	DS4404MP000	DFPU4404	DF4404FP000	DFRU4404
	4P5W	277/480VAC	DS4504MP000	DFPU4504	DF4504FP000	DFRU4504

Note: *For other interiors not shown, use same polarization index as plug, connector, etc. Ex: DS6416MP000 plug uses DFPU6416 interior.*

Accessories for Interlocked NEMA 12/3R Receptacles

DESCRIPTION	30 AMP CAT. NO.	60 AMP CAT. NO.	100 AMP CAT. NO.	200 AMP CAT. NO.	400 AMP CAT. NO.
Fused Disconnect Interlocked Receptacle with Safety Switch 30–100A					
1 NO — 1 NC Contact	F34757	F34757	F34757	N/A	N/A
2 NO — 2 NC Contact	F34758	F34756B	N/A	N/A	N/A
Copper Body Lugs — 6 lugs per kit	F34756A	F34756B	F34756C	N/A	N/A
Type R Fuse Clips — 3 per kit	F34755A	F34755B	F34755C	N/A	N/A
Neutral Block	F34754A	F34754B	F34754B	N/A	N/A

Pin and Sleeve Plugs, Receptacles and Systems

1.0 Scope

1.1 This document covers multi-contact pin and sleeve, industrial grade, arc-quenching, circuit interrupting-rated electrical plugs, motor plugs, connectors, receptacles, mechanically interlocked receptacles and assorted accessories. Usable in dry, damp, wet, marine and/or hazardous locations for electrical power circuits. Devices are to be rated 30, 60, 100, 200 and/or 400 amperes at 600VAC, 50–400 Hz and 250VDC maximum. Devices are also rated for continuous use in temperatures from -40° C to +130° C. These devices must provide internal environmental seals for marine and extreme wet applications and can be electrically interlocked.

1.2 The devices described shall be Thomas & Betts/Russellstoll® MaxGard® catalog numbers as specified.

2.0 Product Classifications (Features)

2.1 **Gated Deadfront —** All receptacles and connectors must have a rotating disk on the face of the interior, which provides live contact isolation and environmental separation.

2.2 **Delayed Action Arc Containment —** All devices upon disconnect under load shall have provision so the arc is contained and extinguished within the insulation cavity, making it impossible to withdraw a live plug.

2.3 **Flap Cover or Screw Cover Option —** Flap cover option must provide weathertight capability by utilizing a spring actuated self-closing flap. Watertight capability shall be obtained by using a gasketed screw cap.

2.4 **Polarization —** All devices shall be factory polarized for amperage, voltage, frequency and phase; thus providing a single voltage rating, single interface system.

2.5 **Grounding —** The grounding of the device shall be accomplished through a separate center ground (earth) make-first and break-last pole on all devices for complete system grounding.

2.6 **Pole Capabilities —** All devices shall accommodate up to four power pins plus a separate center ground pin and they shall be integral with the connector bodies (five pins total).

2.7 **Interior Type —** Interiors must be male (pin type) or female (sleeve type). Pins and sleeves shall also be self-aligning and self-wiping/self-cleaning.

2.8 **Control Contacts —** All devices must have an option for two control contacts, which shall be make-last and break-first for use in electrical interlocks and/or control circuits. See table **below**.

2.9 **Conductor Terminals —** Pin and sleeve connections shall employ solderless pressure-type screw terminals and be sized to accept stranded or solid copper conductors in AWG sizes (max. O.D.s as noted). The screw terminals shall also have socket heads to ensure proper torquing of wires.

2.10 **Environmental Seals —** Each device must have an environmental seal or O-ring around all interiors and around each pin and sleeve to prevent water and contaminants from entering the wiring compartment. This provides waterproof capability, even when not mated.

2.11 **Hazardous Location —** All standard plugs 30, 60 and 100 amp shall be UL and CSA listed for hazardous location Class I Division 1, Groups C and D; Class II Division 1, Groups F and G. A hazardous location circuit breaker-protected interlock shall also be applicable to the same environments and possess all the same product features as outlined above. Enclosures shall meet NEMA 8 hazardous outdoor-duty classifications and shall meet shipboard use above deck in accordance with the Department of Transportation (USCG “Green Water”).

2.12 **Lockout Devices —** Plug connection lockout is achieved by a padlock through plug sleeve housing hole provided for this purpose. On Hazardous Location/Explosion Proof Interlock Receptacles, lockout shall additionally be achieved by separate lockout accessory available from the factory. On standard Interlocks, lockout accessory/construction is available from the factory.

Rating for Pilot/Control Contacts

Contact Rating Code Designation A-600, Table 119.1 — UL 508 Heavy Pilot Duty Load (720 VA/600VAC) Maximum

THERMAL CONTINUOUS CURRENT AMPS	MAXIMUM CURRENT AMPERE									
	120V		240V		480V		600V		MAX. VOLT AMPERE	
	Make	Break	Make	Break	Make	Break	Make	Break	Make	Break
10 (#12 AWG)	60	6	30	3	15	1.5	12	1.2	7200	720

3.0 Materials Requirements

3.1 **Housings —** Plug, motor plug, receptacles, connectors and interlock housings, associated covers and caps, screw collars, and clamp holders shall be made of copper-free cast aluminum (max. .004% copper).

3.2 **Finish —** All external surfaces except those that provide means of grounding shall be epoxy powder coated to resist corrosion.

3.3 **Hardware —** All hardware, external and springs, shall be stainless steel. Cable clamps shall be stainless steel or epoxy powder coated, copper-free cast aluminum.

3.4 **Insulators —** All device body insulators shall be molded from glass-reinforced high strength thermoset polyester, minimum of UL94V0 flammability rated.

3.5 **Contacts —** Contacts base material shall be made of a conductive copper alloy, (brass CDA485) to prevent dezincification. Accessory material of the contacts shall be made of a compatible corrosion resistant material.

3.6 **Environmental Seals —** Environmental gaskets and O-rings shall be made of Neoprene material.

4.0 Design and Construction Requirements

4.1 **Circuit Interrupting Rating —** All devices 30, 60, 100 and 200 amperes shall be tested to be interrupted at 150% of rated current. Additionally, all devices shall be designed and tested to interrupt 100% of rated current.

4.2 **Wiring —** All devices shall be wired from the rear requiring no disassembly of the pins and/or sleeves from the insulated body.

5.0 **Applicable Documents (Compliances)**

5.1 **Underwriters Laboratories (UL) —** The devices specified herein shall be listed in applicable sections of UL Standards 1010, 231, 1682 and 1686, File Nos. E2630, E57324, E68085, E123752.

5.2 **Canadian Standard Association (CSA) —** The devices specified shall be listed in the applicable sections of CSA C22.2-182.1, File Number LR14096.

5.3 **International Electro-Technical Commission (IEC) —** The 30-, 60- and 100-ampere devices specified shall have been tested and comply with IEC 309-1.

5.4 **Federal Department of Transportation —** Refrigerated National Shipboard location devices shall meet and comply with Federal Register volume 47, number 68, subpart 111.79.

5.5 **Standards —** The devices specified shall comply with Military Standards MIL-STD-105 and 1344; ASTM Standards D570 and D2565: NEMA Standard PR4-1983; and OSHA regulations when installed in accordance with the National Electrical Code (NEC®).

5.6 NEMA 250 Enclosures Standard

NEMA 1 — General Purpose for indoor use; guards against contact with equipment.

NEMA 3R — Outdoor use primarily to protect against rain, sleet, wind-blown dust and damage from external ice formation.

NEMA 4 — Indoor or outdoor use to protect against windblown dust and rain; splashing and hose-directed water.

NEMA 4X — Watertight, dust-tight corrosion-resistant for indoor or outdoor applications.

NEMA 6 — Watertight, casual/ temporary immersion.

NEMA 7 — Class I (Hazardous) for indoor use in Class I areas, per NEC®.

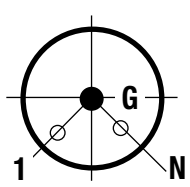
NEMA 8 — Class I (Hazardous) for indoor use in Class I, oil-immersed equipment.

NEMA 9 — Class II (Hazardous) for indoor use in Class II areas, per NEC®.

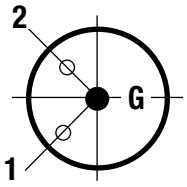
NEMA 12 — Industrial use, dust-tight for indoor use to protect against dust, falling dirt and dripping non-corrosive liquids.

NEC and National Electrical Code are registered trademarks of the National Fire Protection Association, Inc.

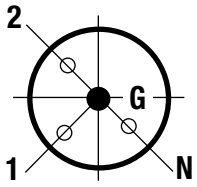
Single Polarization/Multiple Service* Assigned Voltages and Wiring Systems



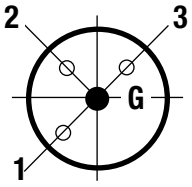
N-R1-G



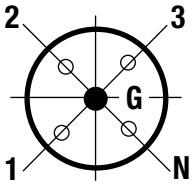
R1-S2-G



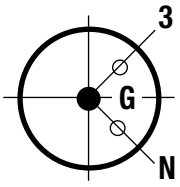
N-R1-S2-G



R1-S2-T3-G



N-R1-S2-T3-G



2P+G(DC)

VOLTAGE ASSIGN. NO.	VOLTAGE	VOLTAGE ASSIGN. NO.	VOLTAGE	VOLTAGE ASSIGN. NO.	VOLTAGE	VOLTAGE ASSIGN. NO.	VOLTAGE	VOLTAGE ASSIGN. NO.	VOLTAGE	VOLTAGE ASSIGN. NO.	VOLTAGE	INDEX
101	220V–50 Hz	**201**	380V–50 Hz	**301**	220/380V–50 Hz	**401**	380V–50 Hz	**501**	220/380V–50 Hz			01
103	127V–50 Hz	**203**	220V–50 Hz	**303**	220/127V–50 Hz	**403**	220V–50 Hz	**503**	220/127V–50 Hz			03
104	277V–60 Hz	**204**	480V–60 Hz	**304**	277/480V–60 Hz	**404**	3Ø 480V–60 Hz	**504**	3ØY 277/480V–60 Hz			04
105	250V–50 Hz	**205**	440V–50 Hz	**305**	250/440V–50 Hz	**405**	3Ø 440V–50 Hz	**505**	3Ø 250/440V–50 Hz			05
107	125V–60 Hz	**207**	250V–60 Hz	**307**	125/250V–60 Hz	**407**	3Ø 250V–60 Hz	**507**	3ØY 125/250V–60 Hz			07
108	220V–60 Hz	**208**	380V–60 Hz	**308**	220/380V–60 Hz	**408**	3Ø 380V–60 Hz	**508**	3Ø 220/380V–60 Hz			08
109	100V–60 Hz	**209**	220V–60 Hz	**309**	100/220V–60 Hz	**409**	3Ø 220V–60 Hz	**509**	3Ø 100/220V–60 Hz			09
111	115V–400 Hz	**211**	220V–400 Hz	**311**	220/115V–400 Hz	**411**	220V–400 Hz	**511**	220/115V–400 Hz			11
	—		—		—		—	**513**	230V DC	**613**	250 VDC	13
114	347V–60 Hz	**214**	600V–60 Hz	**314**	347/600V–60 Hz	**414**	3Ø 600V–60 Hz	**514**	3ØY 347/600V–60 Hz			14
115	100V–50 Hz	**215**	220V–50 Hz	**315**	100/220V–50 Hz	**415**	3Ø 220V–50 Hz	**515**	3Ø 100/220V–50 Hz			15
116	120V–60 Hz	**216**	208V–60 Hz	**316**	120/208V–60 Hz	**416**	3Ø 208V–60 Hz	**516**	3ØY 120/208V–60 Hz			16
117	120V–400 Hz	**217**	208V–400 Hz	**317**	120/208V–400 Hz	**417**	3Ø 208V–400 Hz	**517**	3Ø 120/208V–400 Hz			17
	—		—		—		208V		—	**618**	28 VDC	18
												20
	—	**221**	440V–60 Hz	**321**	250/440V–60 Hz	**421**	3Ø 440V–60 Hz	**521**	3ØY 250/440V–60 Hz			21
							250V		Reserved			22
							480V		Reserved			23
							600V		Reserved			24

MaxGard® receptacles and plugs may be furnished in any of the above voltage and phasing systems.

To order any device in a voltage and phasing not shown in the preceding catalog pages, substitute the Voltage Assignment Number in the **above** chart for that portion of the listed catalog number appearing in **boldface** type.

Example: 200 Amp Weathertight Receptacle with Flap Cover, Angle Adapter and Junction Box for 3Ø 480 volt (3-pole and ground) is DF2404FRAB0.

To change to 3Ø 208 volt, the catalog number becomes DF2416FRAB0.

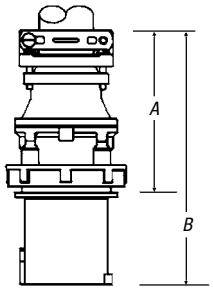
Note: *All devices may be furnished with two control contacts. Add "K" to the end of the catalog number, in place of last position Ø.*

*** Dual-Voltage or Multiple-Service Applications** (for any given polarization number) — Example: A factory installation may consist of all receptacles specified and wired at polarization "507." This is a 3ph.Y–125/250V–60 Hz supply. However, all circuit requirements "below" (507) can also be met; for instance a "207" plug will draw phasing for 250V–60 Hz operation of equipment as well, while another ".507" receptacle supplies power for a 3-phase motor installation. See chart **above**.

For non-interrupting polarizations at 45, 90, 150, 300, 600A ratings, consult Technical Services.

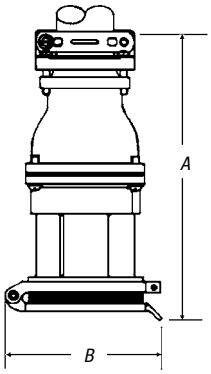
MaxGard® Interconnection Systems

Male Plug



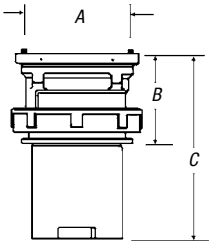
AMP	A	B
30	4¾"	7⅞"
60	5½"	9⅛"
100	6½"	10⅛"
200	9"	13¾"
400	12⅝"	17⅝"

Connector



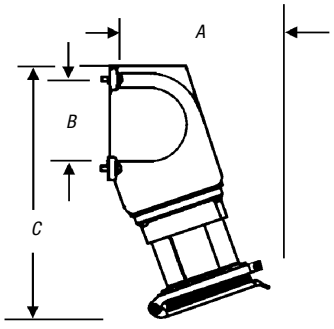
AMP	A	B
30	8¾"	5⅛"
60	10"	5⅜"
100	11⅛"	5⅜"
200	15"	9½"
400	19⅛"	10¾"

Male Inlet



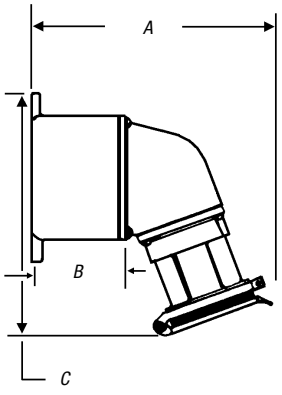
AMP	A	B	C
30	2⅞"	2½"	5½"
60	3⅜"	2½"	5½"
100	3⅜"	2½"	5½"
200	5¼"	3½"	9¼"
400	3⅜"	4⅜"	9¼"

Receptacle with Angle Enclosure



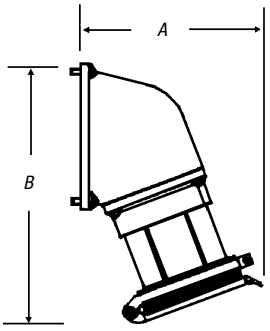
AMP	A	B	C
30	6⅜"	3⅛"	9⅞"
60	7⅛"	4"	11⅛"
100	7½"	4"	11⅜"
200	—	—	—
400	—	—	—

Receptacle with Angle Adapter and DJB Junction Box



AMP	A	B	C
30	9⅛"	3"	9⅝"
60	10½"	3"	9¾"
100	10¾"	3¾"	10"
200	15¾"	6⅝"	14⅝"
400	25¼"	12"	20¾"

Receptacle with Angle Adapter

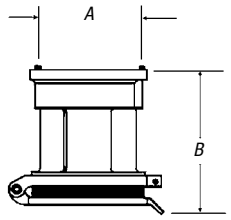


AMP	A	B
30	6⅛"	9⅝"
60	7½"	9¾"
100	7"	10"
200	9½"	14¾"
400	13¼"	20¾"

(Flap covers shown — screw covers available. On all, screw covers have nominal effect on outside dimensions.)

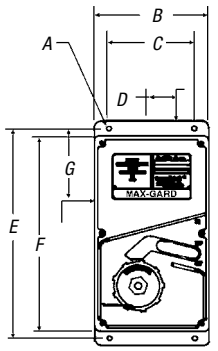
MaxGard® Interconnection Systems

Receptacle Only



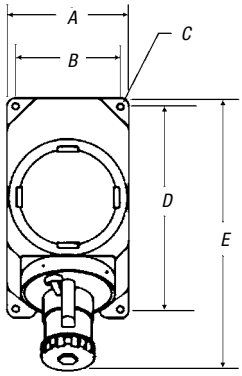
AMP	A	B
30	2⅞"	4½"
60	3⅜"	5⅛"
100	3⅜"	5⅜"
200	5¼"	6⅝"
400	7"	7⅛"

Interlocked Receptacle with Circuit Breaker NEMA 4X



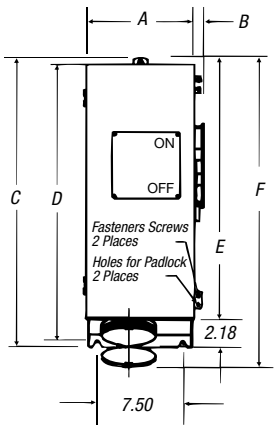
AMP	A	B	C	D	E	F	G
30	⅜"	8¾"	6½"	1½"	16¼"	15⅛"	3⅛"
60	⅜"	8¾"	6½"	1½"	16¼"	15⅛"	3⅛"
100	⅜"	8¾"	6½"	1½"	17¾"	16⅝"	3⅛"
200	9⁄16"	12¼"	9"	2½"	26¼"	24¾"	5"
400	9⁄16"	15½"	12"	3"	30½"	29"	6"

Explosion-Proof Circuit-Breaker Interlocked Receptacle



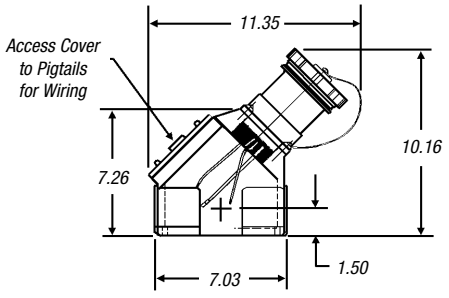
AMP	A	B	C	D	E
30	8¾"	7½"	½"	14¾"	20"
60	8¾"	7½"	½"	14¾"	20"
100	8¾"	7½"	½"	14¾"	20"
200	N/A	N/A	N/A	N/A	N/A
400	N/A	N/A	N/A	N/A	N/A

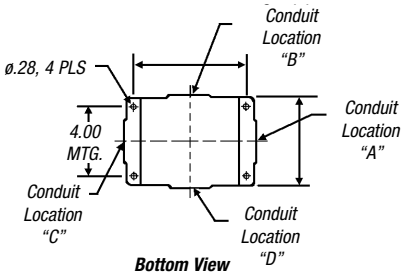
Fused Disconnect Interlocked Receptacle NEMA 3R/12



AMP	A	B	C	D	E	F
30	9½"	¾"	25¾"	25"	22¾"	30"
60	9½"	¾"	25¾"	25"	22¾"	30"
100	9½"	¾"	25¾"	25"	22¾"	30"
200	N/A	N/A	N/A	N/A	N/A	N/A
400	N/A	N/A	N/A	N/A	N/A	N/A

Explosion-Proof Non-Interlocked Receptacle





Circuit Breakers for NEMA 4X Interlocked Receptacles

High interrupt breakers may be furnished at additional cost.

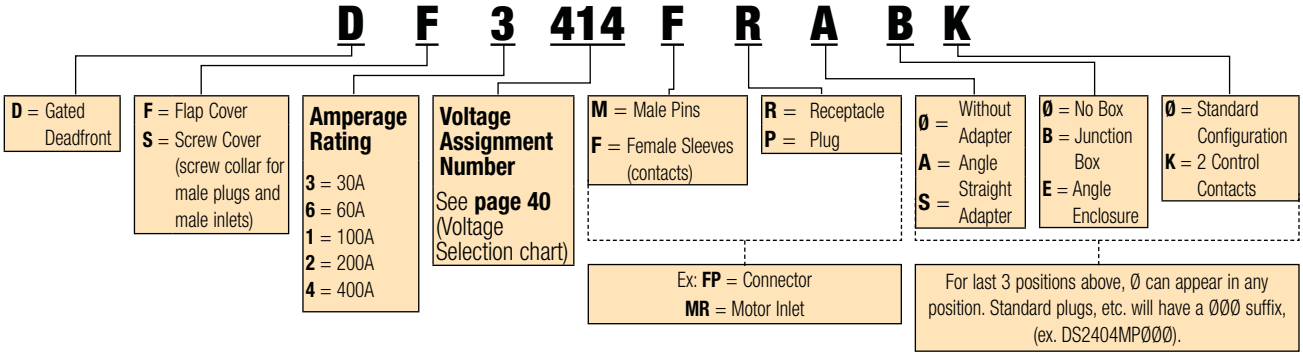
	STANDARD CIRCUIT BREAKERS		HIGH INTERRUPT CIRCUIT BREAKERS (OPTIONAL)	
INTERLOCK	MAX. VOLTS (60 Hz)	AMPERES	MAX. VOLTS (60 Hz)	AMPERES
30, 60 and 100 Amp	240 AC	20,000 Asym., 18,000 Sym.	240 AC	75,000 Asym., 65,000 Sym.
	277 AC	15,000 Asym., 14,000 Sym.	277 AC	30,000 Asym., 25,000 Sym.
	480 AC	15,000 Asym., 14,000 Sym.	600 AC	20,000 Asym., 18,000 Sym.
	600 AC	15,000 Asym., 14,000 Sym.	600 AC	20,000 Asym., 18,000 Sym.
	250 DC	10,000 Amperes	250 DC	10,000 Amperes
200 Amp	240 AC	75,000 Asym., 65,000 Sym.	N/A	
	480 AC	30,000 Asym., 25,000 Sym.		
	600 AC	20,000 Asym., 18,000 Sym.		
	250 DC	10,000 Amperes		
400 Amp	240 AC	50,000 Asym., 42,000 Sym.	240 AC	75,000 Asym., 65,000 Sym.
	277 AC	35,000 Asym., 30,000 Sym.	480 AC	40,000 Asym., 35,000 Sym.
	480 AC	25,000 Asym., 22,000 Sym.	600 AC	30,000 Asym., 25,000 Sym.
	250 DC	10,000 Amperes	250 DC	20,000 Amperes

MaxGard® Interconnection Systems

30A–400A Plugs, Connectors, Receptacles, Inlets and Interlocked Receptacles

Receptacles, Plugs and Connectors

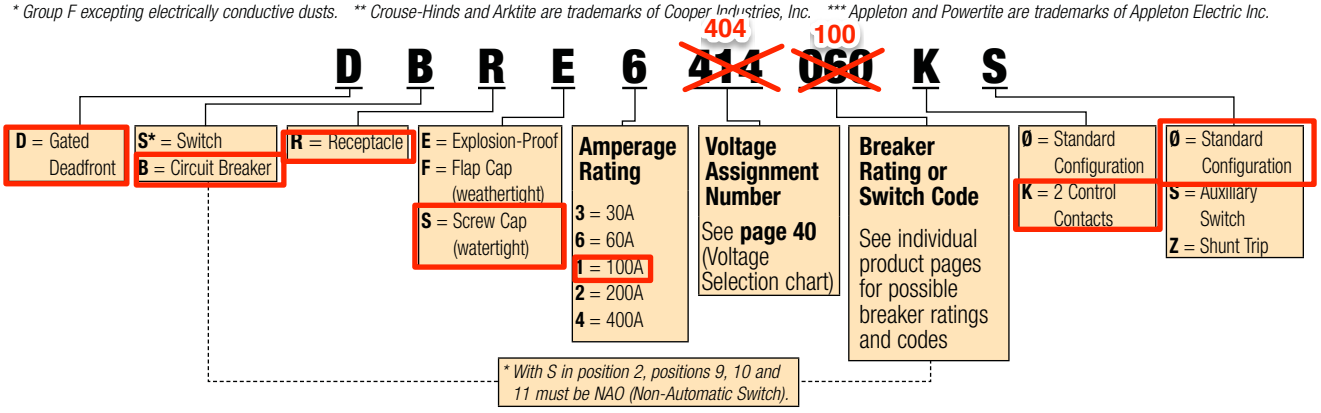
FEATURE	RUSSELLSTOLL MAXGARD®	CROUSE-HINDS ARKTITE®**	APPLETON POWERTITE®***
Center ground contact	Yes	No	No
24 single-rated factory polarizations	Yes	No	No
Gated deadfront construction	Yes	No	No
Two optional control contacts	Yes	No	No
Marine-grade CDA485 brass pins/sleeves (200–400 amp silver-plated)	Yes	No	No
O-rings/environmental separation, full line	Yes	No	No
Available to 5-wire (4-pole, 5-wire)	Yes	30 and 60 amp only	No
Complete line epoxy powder coated — standard	Yes	No	Some



Interlocked Receptacles

FEATURE	RUSSELLSTOLL DBRE/DSRE SERIES	CROUSE-HINDS EPC SERIES	APPLETON EBR SERIES (WITH FB BREAKER)
Waterproof (DurORing™) O-ring sealing	Yes	No	No
Available to 5-wire (4-pole, 5-wire) through 100 amp	Yes	No	No
Gated deadfront	Yes	No	No
Center ground sleeve contact	Yes	No	No
24 single-rated factory polarizations	Yes	No	No
Class I, Div. 1, Groups B, C, D	Yes	Yes	Yes
Class II, Div. 1, Groups F and G	Yes	Yes	Yes*
Meets Coast Guard (was CG259) approvals	Yes	No	No

** Group F excepting electrically conductive dusts.* *** Crouse-Hinds and Arktite are trademarks of Cooper Industries, Inc.* **** Appleton and Powertite are trademarks of Appleton Electric Inc.*



Description

3TF Series AC Contactors are latest products of Siemens AG in 1990's. The series products are suitable for frequency of 50/60Hz, rated insulation voltage up to 690 ~ 1000V, rated operational current up to 9A ~ 400A at rated operational voltage up to 380V under the utilization category AC - 3. 3TF Series AC Contactors are mainly used for making/breaking electric circuits at a long distance and for frequent starting/ stopping and reversing control of AC motors.They comply with IEC947, VDE0660, GB14048.

Operating Conditions

- The altitude of the site of installation does not exceed 2000 meters above sea levels.
- The ambient air temperature: -25 ~ +55°C
- Relative humidity does not exceed 50% at +40¼C and 90% at +25°C
- Atmospheric conditions: the air does not contain any explosive medium, corrosive gases and conductive dust.
- Never be shocked and vibrated obviously.
- Never be wetted by rain and snow.

Features

- For better safety, conductive part are enclosed.
- Small sizes, light weight, material of arc chute adopts unsaturated resin, with good arc resistance, never splitting.
- The arc chute is enclosed , arc-over distance is small, with a compact electric cabinet.
- Construction of main contacts system is unique, abrasion of the contacts is small, with a long electric endurance.
- The operation of the magnet has many advantages such as good reliability, little consumption, low noise and high mechanical strength.
- The contactors have higher operation frequency and control capacity.
- Auxiliary contact block may be attached to 3TF30 ~ 50 Series AC Contactors.
- SIGUT - Siemens patent terminal, ensures easy and reliable connection, strog shock resistance and perfect safety protection.

Selection and ordering data

AC operation			3TF30		3TF40		3TF31		3TF41	
Auxiliary contacts NO NC				NO - NC		NO - NC		NO - NC		NO - NC
Order No.			3TF30 00 - 0X 3TF30 10 - 0X 3TF30 01 - 0X	- - 1 - - 1	3TF40 10 - 0X 3TF40 01 - 0X 3TF40 11 - 0X 3TF40 22 - 0X 3TF40 20 - 0X 3TF40 31 - 0X	1 - - 1 1 1 2 2 2 - 3 1	3TF31 00 - 0X 3TF31 10 - 0X 3TF31 01 - 0X	- - 1 - - 1	3TF41 10 - 0X 3TF41 01 - 0X 3TF41 11 - 0X 3TF41 22 - 0X 3TF41 20 - 0X 3TF41 31 - 0X	1 - - 1 1 1 2 2 2 - 3 1
Rated insulation voltage (V)			690		690		690		690	
Rated operational current (380V)		AC - 3	9		9		12		12	
		AC - 4	3.3		3.3		4.3		4.3	
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3	230/220V	2.4		2.4		3.3		3.3	
		400/380V	4		4		5.5		5.5	
		500 V	5.5		5.5		7.5		7.5	
		690/660V	5.5		5.5		7.5		7.5	
		1000 V	- -		- -		- -		- -	
	AC - 4	400/380V	1.48/1.4		1.48/1.4		2/1.9		2/1.9	
		690/660V	2.54/2.4		2.54/2.4		3.45/3.3		3.45/3.3	
Mechanical endurance ($x10^6$)			15		15		15		15	
Electrical endurance ($x10^6$)		AC - 3	1.2		1.2		1.2		1.2	
		AC - 4	0.2		0.2		0.2		0.2	
Switching frequency (1/h)		AC - 3	1000		1000		1000		1000	
		AC - 4	250		250		250		250	
Coil voltage tolerance (AC)			(0.8~1.1)U_s							

Order No. suffixes for rated control voltages for coils 3TF3···-0X□□ 3TF4···-0X□□	Coils for 50Hz 50Hz	60Hz		Coils for 60Hz 60Hz	50Hz		Coils for 50/60Hz 50Hz/60Hz	
	24V	29V	B0	24V	20V	C1	24V	C2
	32V	38V	C0	110V	92V	G1	42V	D2
	36V	42V	G0	115V	96V	J1	110V	G2
	42V	50V	D0	120V	100V	K1	115V	J2
	48V	58V	H0	208V	173V	M1	120V	K2
	60V	72V	E0	220V	183V	N1	208V	M2
	110V	132V	F0	230V	192V	L1	220V	N2
	125/127V	150/152V	L0	240V	200V	P1	230V	L2
	220V	264V	M0	440V	367V	R1	240V	P2
	230V	277V	P0	575V	480V	S1	440V	R2
	240V	288V	U0				575V	S2
	380V	460V	Q0					
	400V	480V	V0					
	415V	500V	R0					
	500V	600V	S0					

Power consumption of coil (50Hz)	Closed (VA)	10	10	10	10
	p.f.	0.29	0.29	0.29	0.29
	Closed (VA)	68	68	68	68
	p.f.	0.82	0.82	0.82	0.82
Conventional thermal current (A)		20	20	20	20
Conventional thermal current of auxiliary contacts		10	10	10	10
Rated insulation voltage of auxiliary contacts		690	690	690	690
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	6/10	6/10	6/10	6/10
	DC - 13 110/220V	0.9/0.45	0.9/0.45	0.9/0.45	0.9/0.45
Weight (kg)		0.37	0.43	0.37	0.43

Note: 3TX4 auxiliary contact blocks for 3TF3 series, see P2/16.

Selection and ordering data

AC operation			3TF32		3TF42		3TF33		3TF43	
Auxiliary contacts NO NC				NO - NC		NO - NC		NO - NC		NO - NC
Order No.			3TF32 00 - 0X 3TF32 11 - 0X	- - 1 1	3TF42 10 - 0X 3TF42 11 - 0X 3TF42 20 - 0X 3TF42 22 - 0X	1 - 1 1 2 - 2 2	3TF33 00 - 0X 3TF33 11 - 0X	- - 1 1	3TF43 10 - 0X 3TF43 11 - 0X 3TF43 20 - 0X 3TF43 22 - 0X	1 - 1 1 2 - 2 2
Rated insulation voltage (V)			690		690		690		690	
Rated operational current (A)		AC - 3	16		16		22		22	
(380V)		AC - 4	7.7		7.7		8.5		8.5	
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3	230/220V	4		4		5.5		5.5	
		400/380V	7.5		7.5		11		11	
		500 V	9		9		11		11	
		690/660V	11		11		11		11	
		1000 V	- -		- -		- -		- -	
	AC - 4	400/380V	3.5		3.5		4		4	
		690/660V	6		6		6.6		6.6	
Mechanical endurance ($x10^6$)			15		15		15		15	
Electrical endurance ($x10^6$)		AC - 3	1.2		1.2		1.2		1.2	
		AC - 4	0.2		0.2		0.2		0.2	
Switching frequency (1/h)		AC - 3	750		750		750		750	
		AC - 4	250		250		250		250	
Coil voltage tolerance (AC)			(0.8~1.1)U_s							

Order No. suffixes for rated control voltages for coils

3TF3···-0X□□
3TF4···-0X□□

Coils for 50Hz 50Hz	60Hz		Coils for 60Hz 60Hz	50Hz		Coils for 50/60Hz	
24V	29V	B0	24V	20V	C1	24V	C2
32V	38V	C0	110V	92V	G1	42V	D2
36V	42V	G0	115V	96V	J1	110V	G2
42V	50V	D0	120V	100V	K1	115V	J2
48V	58V	H0	208V	173V	M1	120V	K2
60V	72V	E0	220V	183V	N1	208V	M2
110V	132V	F0	230V	192V	L1	220V	N2
125/127V	150/152V	L0	240V	200V	P1	230V	L2
220V	264V	M0	440V	367V	R1	240V	P2
230V	277V	P0	575V	480V	S1	440V	R2
240V	288V	U0				575V	S2
380V	460V	Q0					
400V	480V	V0					
415V	500V	R0					
500V	600V	S0					

Power consumption of coil (50Hz)	Closed (VA)	10	10	10	10
	p.f.	0.29	0.29	0.29	0.29
	Closing (VA)	68	68	68	68
	p.f.	0.82	0.82	0.82	0.82
Conventional thermal current (A)		30	30	30	30
Conventional thermal current of auxiliary contacts		10	10	10	10
Rated insulation voltage of auxiliary contacts		690	690	690	690
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	4/6	6/10	4/6	6/10
	DC - 13 110/220V	1.14/0.48	0.9/0.45	1.14/0.48	0.9/0.45
Weight (kg)		0.45	0.49	0.45	0.49

Note: 3TX4 auxiliary contact blocks for 3TF3 series, see P2/16

Selection and ordering data

AC operation			3TF34		3TF44		3TF35		3TF45	
Auxiliary contacts NO NC				NO - NC		NO - NC		NO - NC		NO - NC
Order No.			3TF34 00 - 0X 3TF34 11 - 0X	- - 1 1	3TF44 11 - 0X 3TF44 22 - 0X	1 1 2 2	3TF35 00 - 0X 3TF35 11 - 0X	- - 1 1	3TF45 11 - 0X 3TF45 22 - 0X	1 1 2 2
Rated insulation voltage (V)			690		690		690		690	
Rated operational current (A) (380V)		AC - 3	32		32		38		38	
		AC - 4	15.6		15.6		18.5		18.5	
Rated outputs of three-phase motors at 50Hz (kW)	AC - 3	230/220V	8.5		8.5		11		11	
		400/380V	15		15		18.5		18.5	
		500 V	21		21		25		25	
		690/660V	23		23		23		23	
		1000 V	- -		- -		- -		- -	
	AC - 4	400/380V	7.5		7.5		9		9	
		690/660V	13		13		15.5		15.5	
Mechanical endurance ($x10^6$)			10		10		10		10	
Electrical endurance ($x10^6$)		AC - 3	1.2		1.2		1.2		1.2	
		AC - 4	0.2		0.2		0.2		0.2	
Switching frequency (1/h)		AC - 3	750		750		600		600	
		AC - 4	250		250		200		200	
Coil voltage tolerance (AC)			$(0.8\sim1.1)U_s$							

Order No. suffixes for rated control voltages for coils

3TF3····-0X□□
3TF4····-0X□□

Coils for 50Hz 50Hz	60Hz		Coils for 60Hz 60Hz	50Hz		Coils for 50/60Hz	
24V	29V	B0	24V	20V	C1	24V	C2
32V	38V	C0	110V	92V	G1	42V	D2
36V	42V	G0	115V	96V	J1	110V	G2
42V	50V	D0	120V	100V	K1	115V	J2
48V	58V	H0	208V	173V	M1	120V	K2
60V	72V	E0	220V	183V	N1	208V	M2
110V	132V	F0	230V	192V	L1	220V	N2
125/127V	150/152V	L0	240V	200V	P1	230V	L2
220V	264V	M0	440V	367V	R1	240V	P2
230V	277V	P0	575V	480V	S1	440V	R2
240V	288V	U0				575V	S2
380V	460V	Q0					
400V	480V	V0					
415V	500V	R0					
500V	600V	S0					

Power consumption of coil (50Hz)	Closed (VA)	12.1	12.1	12.1	12.1
	p.f.	0.28	0.28	0.28	0.28
	Closing (VA)	101	101	101	101
	p.f.	0.83	0.83	0.83	0.83
Conventional thermal current (A)		55	55	55	55
Conventional thermal current of auxiliary contacts (A)		10	10	10	10
Rated insulation voltage of auxiliary contacts (V)		690	690	690	690
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	4/6	4/6	4/6	4/6
	DC - 13 110/220V	1.14/0.48	1.14/0.48	1.14/0.48	1.14/0.48
Weight (kg)		0.68	0.8	0.68	0.8

Note: 3TX4 auxiliary contact blocks for 3TF3 series, see P2/16.

Selection and ordering data

AC operation			3TF46	3TF47	3TF48	3TF49
Auxiliary contacts NO NC						
		NO - NC		NO - NC	NO - NC	NO - NC
Order No.			3TF46 22 - 0X 3TF46 44 - 0X	3TF47 22 - 0X 3TF47 44 - 0X	3TF48 22 - 0X 3TF48 44 - 0X	3TF49 22 - 0X 3TF49 44 - 0X
		NO - NC	2 2 4 4	2 2 4 4	2 2 4 4	2 2 4 4
Rated insulation voltage (V)			1000	1000	1000	1000
Rated operational current (A) (380V)		AC - 3	45	63	75	85
		AC - 4	24	28	34	42
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3	230/220V	15	18.5	22	26
		400/380V	22	30	37	45
		500 V	30	41	50	59
		690/660V	39	55	67	67
		1000 V	7-5	7-5	39	39
	AC - 4	400/380V	12.6/12	14.7/14	17.9/17	22/21
		690/660V	21.8/20.8	25.4/24.3	30.9/29.5	38/36
Mechanical endurance ($x10^6$)			10	10	10	10
Electrical endurance ($x10^6$)		AC - 3	1.2	1.2	1.2	1.2
		AC - 4	0.2	0.2	0.2	0.2
Switching frequency (1/h)		AC - 3	1200	1000	1000	850
		AC - 4	400	300	300	250
Coil voltage tolerance (AC)			$(0.8\sim1.1)U_s$			

Order No. suffixes for rated control voltages for coils

3TF46···0X□□

3TF49···0X□□

Coils for 50Hz			Coils for 60Hz			Coils for 50/60Hz	
50Hz	60Hz		60Hz	50Hz			
24V	29V	B0	24V	20V	C1	24V	C2
32V	38V	C0	110V	92V	G1	42V	D2
36V	42V	G0	115V	96V	J1	110V	G2
42V	50V	D0	120V	100V	K1	115V	J2
48V	58V	H0	208V	173V	M1	120V	K2
60V	72V	E0	220V	183V	N1	208V	M2
110V	132V	F0	230V	192V	L1	220V	N2
125/127V	150/152V	L0	240V	200V	P1	230V	L2
220V	264V	M0	440V	367V	R1	240V	P2
230V	277V	P0	575V	480V	S1	440V	R2
240V	288V	U0				575V	S2
380V	460V	Q0					
400V	480V	V0					
415V	500V	R0					
500V	600V	S0					

Power consumption of coil (50Hz)	Closed (VA)	17	17	32	32
	p.f.	0.29	0.29	0.23	0.23
	Closing (VA)	183	183	330	330
	p.f.	0.6	0.6	0.5	0.5
Conventional thermal current (A)		80	90	100	100
Conventional thermal current of auxiliary contacts (A)		10	10	10	10
Rated insulation voltage of auxiliary contacts (V)		690	690	690	690
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	4/6	4/6	4/6	4/6
	DC - 13 110/220V	1.14/0.48	1.14/0.48	1.14/0.48	1.14/0.48
Weight (kg)		1.4/1.6	1.4/1.6	2.3/2.5	2.3/2.5

Selection and ordering data

AC operation			3TF50		3TF51		3TF52		3TF53	
Auxiliary contacts NO NC				NO - NC		NO - NC		NO - NC		NO - NC
Order No.			3TF50 22 - 0X 3TF50 44 - 0X	2 2 4 4	3TF51 22 - 0X 3TF51 44 - 0X	2 2 4 4	3TF52 22 - 0X 3TF52 44 - 0X	2 2 4 4	3TF53 22 - 0X 3TF53 44 - 0X	2 2 4 4
Rated insulation voltage (V)			1000		1000		1000		1000	
Rated operational current (A)		AC - 3	110		140		170		205	
(380V)		AC - 4	54		68		75		96	
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3	230/220V	37		43		55		64	
		400/380V	55		75		90		110	
		500 V	76		98		118		145	
		690/660V	100		100		156		156	
		1000 V	65		65		90		90	
	AC - 4	400/380V	28.4/27		36/35		40/38		52/50	
		690/660V	49/46.9		63/60		69/66		90/86	
Mechanical endurance ($x10^6$)			10		10		10		10	
Electrical endurance ($x10^6$)		AC - 3	1.2		1.2		1.2		1.2	
		AC - 4	0.2		0.2		0.2		0.2	
Switching frequency (1/h)		AC - 3	1000		750		700		500	
		AC - 4	300		200		200		130	
Coil voltage tolerance (AC)			$(0.8\sim1.1)U_s$							

Order No. suffixes for rated control voltages for coils

3TF50 . . -0X□□

to

3TF53 . . -0X□□

Coils for 50Hz			Coils for 60Hz			Coils for 50/60Hz	
50Hz	60Hz		60Hz	50Hz			
24V	29V	B0	24V	20V	C1	24V	C2
32V	38V	C0	110V	92V	G1	42V	D2
36V	42V	G0	115V	96V	J1	110V	G2
42V	50V	D0	120V	100V	K1	115V	J2
48V	58V	H0	208V	173V	M1	120V	K2
60V	72V	E0	220V	183V	N1	208V	M2
110V	132V	F0	230V	192V	L1	220V	N2
125/127V	150/152V	L0	240V	200V	P1	230V	L2
220V	264V	M0	440V	367V	R1	240V	P2
230V	277V	P0	575V	480V	S1	440V	R2
240V	288V	U0				575V	S2
380V	460V	Q0					
400V	480V	V0					
415V	500V	R0					
500V	600V	S0					

Power consumption of coil (50Hz)	Closed (VA)	39	39	58	58
	p.f.	0.24	0.24	0.26	0.26
	Closing (VA)	550	550	910	910
	p.f.	0.45	0.45	0.38	0.38
Conventional thermal current (A)		160	160	210	220
Conventional thermal current of auxiliary contacts (A)		10	10	10	10
Rated insulation voltage of auxiliary contacts (V)		690	690	690	690
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	4/6	4/6	4/6	4/6
	DC - 13 110/220V	1.14/0.48	1.14/0.48	1.14/0.48	1.14/0.48
Weight (kg)		3.3/3.5	3.3/3.5	4.8/5.0	4.8/5.0

Selection and ordering data

AC operation		 3TF54		 3TF55		 3TF56		
Auxiliary contacts NO NC			 NO - NC		 NO - NC		 NO - NC	
Order No.		3TF54 22 - 0X 3TF54 44 - 0X	2 2 4 4	3TF55 22 - 0X 3TF55 44 - 0X	2 2 4 4	3TF56 22 - 0X 3TF56 44 - 0X	2 2 4 4	
Rated insulation voltage (V)		1000		1000		1000		
Rated operational current (A) (380V)	AC - 3	250		300		400		
	AC - 4	110		125		150		
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3 230/220V	78		93		125		
	AC - 3 400/380V	132		160		200		
	AC - 3 500 V	178		210		284		
	AC - 3 690/660V	235		235		375		
	AC - 3 1000 V	132		132		250		
	AC - 4 400/380V	61/58		69/66		85/81		
	AC - 4 690/660V	105/100		119/114		147/140		
Mechanical endurance ($x10^6$)		10		10		10		
Electrical endurance ($x10^6$)	AC - 3	1.2		1.2		1.2		
	AC - 4	0.2		0.2		0.2		
Switching frequency (1/h)	AC - 3	700		500		500		
	AC - 4	200		130		150		
Coil voltage tolerance (AC)		(0.8~1.1)U_s						
Order No. suffixes for rated control voltages for coils 3TF54..-0X□□ ~ 3TF56..-0X□□		Coils for 50Hz 50Hz 60Hz		Coils for 60Hz 60Hz 50Hz		Coils for 50/60Hz		
		24V 29V B0		24V 20V C1		24V C2		
		32V 38V C0		110V 92V G1		42V D2		
		36V 42V G0		115V 96V J1		110V G2		
		42V 50V D0		120V 100V K1		115V J2		
		48V 58V H0		208V 173V M1		120V K2		
		60V 72V E0		220V 183V N1		208V M2		
		110V 132V F0		230V 192V L1		220V N2		
		125/127V 150/152V L0		240V 200V P1		230V L2		
		220V 264V M0		440V 367V R1		240V P2		
		230V 277V P0		575V 480V S1		440V R2		
		240V 288V U0				575V S2		
		380V 460V Q0						
		400V 480V V0						
		415V 500V R0						
		500V 600V S0						
Power consumption of coil (50Hz)	Closed (VA)	84		84		115		
	p.f.	0.24		0.24		0.33		
	Closing (VA)	1430		1430		2450		
	p.f.	0.34		0.34		0.21		
Conventional thermal current (A)		300		300		400		
Conventional thermal current of auxiliary contacts (A)		10		10		10		
Rated insulation voltage of auxiliary contacts (V)		690		690		690		
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	4/6		4/6		4/6		
	DC - 13 110/220V	1.14/0.48		1.14/0.48		1.14/0.48		
Weight (kg)		6.2/6.4		6.2/6.4		8.5/8.7		

Selection and ordering data

DC operation			3TF30		3TF40		3TF31		3TF41	
Auxiliary contacts NO NC				NO - NC		NO - NC		NO - NC		NO - NC
Order No.			3TF30 00 - 1X 3TF30 10 - 1X 3TF30 01 - 1X	- - 1 - - 1	3TF40 10 - 1X 3TF40 01 - 1X 3TF40 11 - 1X 3TF40 20 - 1X 3TF40 22 - 1X 3TF40 31 - 1X	1 - - 1 1 1 2 - 2 2 3 1	3TF31 00 - 1X 3TF31 10 - 1X 3TF31 01 - 1X	- - 1 - - 1	3TF41 10 - 1X 3TF41 01 - 1X 3TF41 11 - 1X 3TF41 20 - 1X 3TF41 22 - 1X 3TF41 31 - 1X	1 - - 1 1 1 2 - 2 2 3 1
Rated insulation voltage (V)			690		690		690		690	
Rated operational current (A) (380V)		AC - 3	9		9		12		12	
		AC - 4	3.3		3.3		4.3		4.3	
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3	230/220V 400/380V 500 V 690/660V 1000 V	2.4 4 5.5 5.5 - -		2.4 4 5.5 5.5 - -		3.3 5.5 7.5 7.5 - -		3.3 5.5 7.5 7.5 - -	
	AC - 4	400/380V 690/660V	1.48/1.4 2.54/2.4		1.48/1.4 2.54/2.4		2/1.9 3.45/3.3		2/1.9 3.45/3.3	
Mechanical endurance ($x10^6$)			15		15		15		15	
Electrical endurance ($x10^6$)		AC - 3	1.2		1.2		1.2		1.2	
		AC - 4	0.2		0.2		0.2		0.2	
Switching frequency (1/h)		AC - 3	1000		1000		1000		1000	
		AC - 4	250		250		250		250	
Coil voltage tolerance (AC)			$(0.8\sim1.1)U_s$							
Order No. suffixes for rated control voltages for coils 3TF3····-1X□□ 3TF4····-1X□□			Rated control voltage V DC	12	21.5	24	30	36	42	48	60	110	125	180	220	230	240	250
			Order No. suffix	A4	U4	B4	C4	V4	D4	W4	E4	F4	G4	K4	M4	P4	Q4	N4
Power consumption of coil (50Hz)	Closing and Closed (W)		6.2		6.2		6.2		6.2	
Conventional thermal current (A)			20		20		20		20	
Conventional thermal current of auxiliary contacts (A)			10		10		10		10	
Rated insulation voltage of auxiliary contacts (V)			690		690		690		690	
Rated operational current of auxiliary contacts (A)		AC - 15 380/220V	6/10		6/10		6/10		6/10	
		DC - 13 110/220V	0.9/0.45		0.9/0.45		0.9/0.45		0.9/0.45	
Weight (kg)			0.58		0.64		0.58		0.64	

Note: 3TX4 auxiliary contact blocks for 3TF3 series, see P2/16.

Selection and ordering data

DC operation			3TF32		3TF42		3TF33		3TF43	
Auxiliary contacts NO NC				NO - NC		NO - NC		NO - NC		NO - NC
Order No.			3TF32 00 - 1X 3TF32 11 - 1X	- - 1 1	3TF42 10 - 1X 3TF42 11 - 1X 3TF42 20 - 1X 3TF42 22 - 1X	1 - 1 1 2 - 2 2	3TF33 00 - 1X 3TF33 11 - 1X	- - 1 1	3TF43 10 - 1X 3TF43 11 - 1X 3TF43 20 - 1X 3TF43 22 - 1X	1 - 1 1 2 - 2 2
Rated insulation voltage (V)			690		690		690		690	
Rated operational current (A) (380V)		AC - 3	16		16		22		22	
		AC - 4	7.7		7.7		8.5		8.5	
Rated outputs of three-phase motors at 50Hz (kW)	AC - 3	230/220V 400/380V 500 V 690/660V 1000 V	4 7.5 9 11 - -		4 7.5 9 11 - -		5.5 11 11 11 - -		5.5 11 11 11 - -	
	AC - 4	400/380V 690/660V	3.5 6		3.5 6		4 6.6		4 6.6	
Mechanical endurance ($x10^6$)			15		15		15		15	
Electrical endurance ($x10^6$)		AC - 3	1.2		1.2		1.2		1.2	
		AC - 4	0.2		0.2		0.2		0.2	
Switching frequency (1/h)		AC - 3	750		750		750		750	
		AC - 4	250		250		250		250	
Coil voltage tolerance (AC)			(0.8~1.1)U_s							
Order No. suffixes for rated control voltages for coils 3TF3···-1X□□ 3TF4···-1X□□			Rated control voltage	V DC 24	48	110	125	220		
			Order No. suffix	B4	W4	F4	G4	M4		
Power consumption of coil (50Hz)	Closing and Closed (W)		6.2		6.2		6.2		6.2	
Conventional thermal current (A)			30		30		30		30	
Conventional thermal current of auxiliary contacts (A)			10		10		10		10	
Rated insulation voltage of auxiliary contacts (V)			690		690		690		690	
Rated operational current of auxiliary contacts (A)		AC - 15 380/220V	4/6		6/10		4/6		6/10	
		DC - 13 110/220V	1.14/0.48		0.9/0.45		1.14/0.48		0.9/0.45	
Weight (kg)			0.70		0.66		0.70		0.66	

Note: 3TX4 auxiliary contact blocks for 3TF3 series, see P2/16.

Selection and ordering data

DC operation			3TF34		3TF44		3TF35		3TF45	
Auxiliary contacts NO NC				NO - NC		NO - NC		NO - NC		NO - NC
Order No.			3TF34 00 - 1X 3TF34 11 - 1X	- - 1 1	3TF44 11 - 1X 3TF44 22 - 1X	1 1 2 2	3TF35 00 - 1X 3TF35 11 - 1X	- - 1 1	3TF45 11 - 1X 3TF45 22 - 1X	1 1 2 2
Rated insulation voltage (V)			690		690		690		690	
Rated operational current (A) (380V)		AC - 3	32		32		38		38	
		AC - 4	15.6		15.6		18.5		18.5	
Rated outputs of three-phase motors at 50Hz (kW)	AC - 3	230/220V 400/380V 500 V 690/660V 1000 V	8.5 15 21 23 - -		8.5 15 21 23 - -		11 18.5 25 23 - -		11 18.5 25 23 - -	
	AC - 4	400/380V 690/660V	7.5 13		7.5 13		9 15.5		9 15.5	
Mechanical endurance ($x10^6$)			10		10		10		10	
Electrical endurance ($x10^6$)		AC - 3	1.2		1.2		1.2		1.2	
		AC - 4	0.2		0.2		0.2		0.2	
Switching frequency (1/h)		AC - 3	750		750		600		600	
		AC - 4	250		250		200		200	
Coil voltage tolerance (AC)			(0.8~1.1)U_s							
Order No. suffixes for rated control voltages for coils 3TF3···-1X□□ 3TF4···-1X□□			Rated control voltage: V DC 24 / 48 / 110 / 125 / 220							
			Order No. suffix B4 / W4 / F4 / G4 / M4							
Power consumption of coil (50Hz)	Closing and Closed (W)		11.7		11.7		11.7		11.7	
Conventional thermal current (A)			55		55		55		55	
Conventional thermal current of auxiliary contacts (A)			10		10		10		10	
Rated insulation voltage of auxiliary contacts (V)			690		690		690		690	
Rated operational current of auxiliary contacts (A)		AC - 15 380/220V	4/6		4/6		4/6		4/6	
		DC - 13 110/220V	1.14/0.48		1.14/0.48		1.14/0.48		1.14/0.48	
Weight (kg)			1.25		1.43		1.25		1.43	

Note: 3TX4 auxiliary contact blocks for 3TF3 series, see P2/16.

Selection and ordering data

DC operation		 3TF46		 3TF47		 3TF48		 3TF49
Auxiliary contacts NO NC			 NO - NC		 NO - NC		 NO - NC		 NO - NC
Order No.		3TF46 22 - 1X 3TF46 33 - 1X	2 2 3 3	3TF47 22 - 1X 3TF47 33 - 1X	2 2 3 3	3TF48 22 - 1X 3TF48 33 - 1X	2 2 3 3	3TF49 22 - 1X 3TF49 33 - 1X	2 2 3 3
Rated insulation voltage (V)		1000		1000		1000		1000	
Rated operational current (A) (380V)	AC - 3	45		63		75		85	
	AC - 4	24		28		34		42	
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3 230/220V 400/380V 500 V 690/660V 1000 V	15 22 30 39 7-5		18.5 30 41 55 7-5		22 37 50 67 39		26 45 59 67 39	
	AC - 4 400/380V 690/660V	12.6/12 21.8/20.8		14.7/14 25.4/24.3		17.9/17 30.9/29.5		22/21 38/36	
Mechanical endurance ($x10^6$)		3		3		3		3	
Electrical endurance ($x10^6$)	AC - 3	1.2		1.2		1.2		1.2	
	AC - 4	0.2		0.2		0.2		0.2	
Switching frequency (1/h)	AC - 3	1200		1000		1000		850	
	AC - 4	400		300		300		250	
Coil voltage tolerance (AC)		$(0.8\sim1.1)U_s$							
Order No. suffixes for rated control voltages for coils 3TF46···-1X□□ ⁞ 3TF49···-1X□□		Rated control voltage	V DC 24	48	110	125	220		
		Order No. suffix	B4	W4	F4	G4	M4		
Power consumption of coil (50Hz)	Closed (W)	2.1		2.1		2.7		2.7	
	Closing (W)	400		400		420		420	
Conventional thermal current (A)		80		90		100		100	
Conventional thermal current of auxiliary contacts (A)		10		10		10		10	
Rated insulation voltage of auxiliary contacts (V)		690		690		690		690	
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	4/6		4/6		4/6		4/6	
	DC - 13 110/220V	1.14/0.48		1.14/0.48		1.14/0.48		1.14/0.48	
Weight (kg)		1.4/1.6		1.4/1.6		2.3/2.5		2.3/2.5	

Selection and ordering data

DC operation			3TF50	3TF51	3TF52	3TF53
						
Auxiliary contacts NO NC		 NO - NC	 NO - NC	 NO - NC	 NO - NC	
Order No.			3TF50 22 - 1X 3TF50 33 - 1X	3TF51 22 - 1X 3TF51 33 - 1X	3TF52 22 - 1X 3TF52 33 - 1X	3TF53 22 - 1X 3TF53 33 - 1X
			2 2 3 3	2 2 3 3	2 2 3 3	2 2 3 3
Rated insulation voltage (V)			1000	1000	1000	1000
Rated operational current (A) (380V)	AC - 3		110	140	170	205
	AC - 4		54	68	75	96
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3	230/220V 400/380V 500 V 690/660V 1000 V	37 55 76 100 65	43 75 98 100 65	55 90 118 156 90	64 110 145 156 90
	AC - 4	400/380V 690/660V	28.4/27 49/46.9	36/35 63/60	40/38 69/66	52/50 90/86
Mechanical endurance ($x10^6$)			3	3	3	3
Electrical endurance ($x10^6$)	AC - 3		1.2	1.2	1.2	1.2
	AC - 4		0.2	0.2	0.2	0.2
Switching frequency (1/h)	AC - 3		1000	750	700	500
	AC - 4		300	200	200	130
Coil voltage tolerance (AC)			(0.8~1.1)U_s			
Order No. suffixes for rated control voltages for coils 3TF50 . . -1X□□ ~ 3TF53 . . -1X□□		Rated control voltage	V DC 24	48	110	125	220
		Order No. suffix	B4	W4	F4	G4	M4
Power consumption of coil (50Hz)	Closed (W)		2.7	2.7	11	11
	Closing (W)		500	500	876	876
Conventional thermal current (A)			160	160	210	220
Conventional thermal current of auxiliary contacts (A)			10	10	10	10
Rated insulation voltage of auxiliary contacts (V)			690	690	690	690
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V		4/6	4/6	4/6	4/6
	DC - 13 110/220V		1.14/0.48	1.14/0.48	1.14/0.48	1.14/0.48
Weight (kg)			3.3/3.5	3.3/3.5	5.4/5.6	5.4/5.6

Note: The changeover contactor of 3TF52～3TF56 DC operation contactors is included in the delivery and contained in the contactor package.

Selection and ordering data

DC operation		 3TF54		 3TF55		 3TF56		
Auxiliary contacts NO NC			 NO - NC		 NO - NC		 NO - NC	
Order No.		3TF54 22 - 1X 3TF54 33 - 1X	2 2 3 3	3TF55 22 - 1X 3TF55 33 - 1X	2 2 3 3	3TF56 22 - 1X 3TF56 33 - 1X	2 2 3 3	
Rated insulation voltage (V)		1000		1000		1000		
Rated operational current (A) (380V)	AC - 3	250		300		400		
	AC - 4	110		125		150		
Rated outputs of three-phase motors at 50Hz (KW)	AC - 3 230/220V 400/380V 500 V 690/660V 1000 V	78 132 178 235 132		93 160 210 235 132		125 200 284 375 250		
	AC - 4 400/380V 690/660V	61/58 105/100		69/66 119/114		85/81 147/140		
Mechanical endurance ($x10^6$)		3		3		3		
Electrical endurance ($x10^6$)	AC - 3	1.2		1.2		1.2		
	AC - 4	0.2		0.2		0.2		
Switching frequency (1/h)	AC - 3	700		500		500		
	AC - 4	200		130		150		
Coil voltage tolerance (AC)		(0.8~1.1)U_s						
Order No. suffixes for rated control voltages for coils 3TF54···1X□□ ~ 3TF56···1X□□		Rated control voltage	V DC 24	48	110	125	220	
		Order No. suffix	B4	W4	F4	G4	M4	
Power consumption of coil (50Hz)	Closed (W)	13.3		13.3		14		
	Closing(W)	1216		1216		1306		
Conventional thermal current (A)		300		300		400		
Conventional thermal current of auxiliary contacts (A)		10		10		10		
Rated insulation voltage of auxiliary contacts (V)		690		690		690		
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	4/6		4/6		4/6		
	DC - 13 110/220V	1.14/0.48		1.14/0.48		1.14/0.48		
Weight (kg)		6.8/7.0		6.8/7.0		9.2/9.4		

Note: The changeover contactor of 3TF52～3TF56 DC operation contactors is included in the delivery and contained in the contactor package.

Selection and ordering data

AC operation		3TB40	3TB41	3TB42	3TB43	3TB44
Auxiliary contacts NO NC		NO - NC	NO - NC	NO - NC	NO - NC	NO - NC
Order No.		3TB40 10 - 0X 1 - 3TB40 01 - 0X - 1 3TB40 22 - 0X 2 2	3TB41 10 - 0X 1 - 3TB41 01 - 0X - 1 3TB41 22 - 0X 2 2	3TB42 22 - 0X 2 2	3TB43 22 - 0X 2 2	3TB44 22 - 0X 2 2
Rated insulation voltage (V)		660	660	660	660	660
Rated operational current (A) (380V)	AC - 3	9	12	16	22	32
	AC - 4	3.3	4.3	7.7	8.5	15.6
Rated outputs of three-phase motors at 50Hz (kW)	AC - 3 230/220V	2.4	3.3	4	6.1	8.5
	AC - 3 400/380V	4	5.5	7.5	11	15
	AC - 3 500 V	5.5	7.5	10	11	21
	AC - 3 690/660V	5.5	7.5	11	11	23
	AC - 3 1000 V	- -	- -	- -	- -	- -
	AC - 4 400/380V	1.4	1.9	3.5	4	7.5
	AC - 4 690/660V	2.4	3.3	6	6.6	13
Mechanical endurance ($x10^6$)		10	10	10	10	10
Electrical endurance ($x10^6$)	AC - 3	1.0	1.0	1.0	1.0	1.0
	AC - 4	0.2	0.2	0.2	0.2	0.2
Switching frequency (1/h)	AC - 3	1000	1000	750	750	750
	AC - 4	250	250	250	250	250
Coil voltage tolerance (AC)		$(0.8\sim1.1)U_s$				

Order No. suffixes for rated control voltages for coils 3TB40..-0X□□ ~ 3TB44..-0X□□	Coils for 50Hz V AC		Coils for 50/60Hz V AC	
	24	B0	24	C2
	42	D0	42	D2
	110	F0	110	G2
	220	M0	220	N2
	240	U0	240	P2
	380	Q0		

Power consumption of coil (50Hz)						
	Closed (VA)	10	10	10	10	10
	p.f.	0.29	0.29	0.29	0.29	0.29
	Closing (VA)	68	68	68	68	69
	p.f.	0.82	0.82	0.82	0.82	0.86
Conventional thermal current (A)		20	20	30	30	45
Conventional thermal current of auxiliary contacts (A)		10	10	10	10	10
Rated insulation voltage of auxiliary contacts (V)		660	660	660	660	660
Rated operational current of auxiliary contacts (A)	AC - 15 380/220V	6/10	6/10	6/10	6/10	4/6
	DC - 13 110/220V	0.9/0.45	0.9/0.45	0.9/0.45	0.9/0.45	1.8/0.9
Weight (kg)		0.43	0.43	0.49	0.49	0.7

Spare Parts

Type	Contactor size	Contacts No NO	Contacts No NC	Order No	Illustration	Weight kg
 3TY75 61-1. Auxiliary contacts block	3TF32 11, 3TF33 11	1	1	3TX4 011 - 8A	Auxiliary contacts left	0.042
	3TF34 11, 3TF35 11	1	1	3TY7 561 - 1AA00	Auxiliary contacts left·	
	3TF44 - 3TF56	1	1	3TY7 561 - 1AA00	Auxiliary contacts left	
		1	1	3TY7 561 - 1AA00	Auxiliary contacts right	
	3TF46 - 3TF56	1	1	3TY7 561 - 1KA00	2nd auxiliary contacts left	
		1	1	3TY7 561 - 1KA00	2nd auxiliary contacts right	
 ÏßÈ¦ Coil	3TF30 - 3TF33 3TF40 - 3TF43 3TH3 - 3TH4			3TY7 403 - 0X..	Double coil from 3TF48	0.07
	3TF34 - 3TF35 3TF44 - 3TF45			3TY7 443 - 0X..		0.1
	3TF46, 3TF47			3TY7 463 - 0X..		0.12
	3TF48, 3TF49 3TF50, 3TF51 3TF52, 3TF53 3TF54, 3TF55 3TF56			3TY7 483 - 0X.. 3TY7 503 - 0X.. 3TY7 523 - 0X.. 3TY7 543 - 0X.. 3TY7 563 - 0X..		0.2 0.23 0.35 0.39 0.56
 3TX40.. - ..	3TF30 - 3TF35 3TH3					
  3TY7..0 - 0X Contact bridge Contacts	3TF44 3TF45			3TY74 40 - 0X 3TY74 50 - 0X	Three pieces of contact bridge and six pieces of contacts consists of one sets	0.1
	3TF46 3TF47			3TY74 60 - 0X 3TY74 70 - 0X		0.1
	3TF48 3TF49			3TY74 80 - 0X 3TY74 90 - 0X		0.13
	3TF50 3TF51			3TY75 00 - 0X 3TY75 10 - 0X		0.25
	3TF52 3TF53			3TY75 20 - 0X 3TY75 30 - 0X		0.3
	3TF54 3TF55			3TY75 40 - 0X 3TY75 50 - 0X		0.47
	3TF56			3TY75 60 - 0X		0.73
 3TY7..2 - 0X Arcing chamber	3TF44 3TF45			3TY74 42 - 0X 3TY74 52 - 0X	Arcing chamber	0.15
	3TF46 3TF47			3TY74 62 - 0X 3TY74 72 - 0X		0.28
	3TF48 3TF49			3TY74 82 - 0X 3TY74 92 - 0X		0.45
	3TF50 3TF51			3TY75 01 - 0X 3TY75 12 - 0X		0.75
	3TF52 3TF53			3TY75 22 - 0X 3TY75 32 - 0X		1
	3TF54 3TF55			3TY75 42 - 0X 3TY75 52 - 0X		1.3
	3TF56			3TY75 62 - 0X		1.7

Auxiliary contact blocks

When an additional auxiliary contact is needed, you can select the 3TX4 auxiliary contact block for the 3TF3 contactors only.
Up to 4 auxiliary contact blocks with 1NO or 1NC contact can be plugged onto 3TF3 contactors.

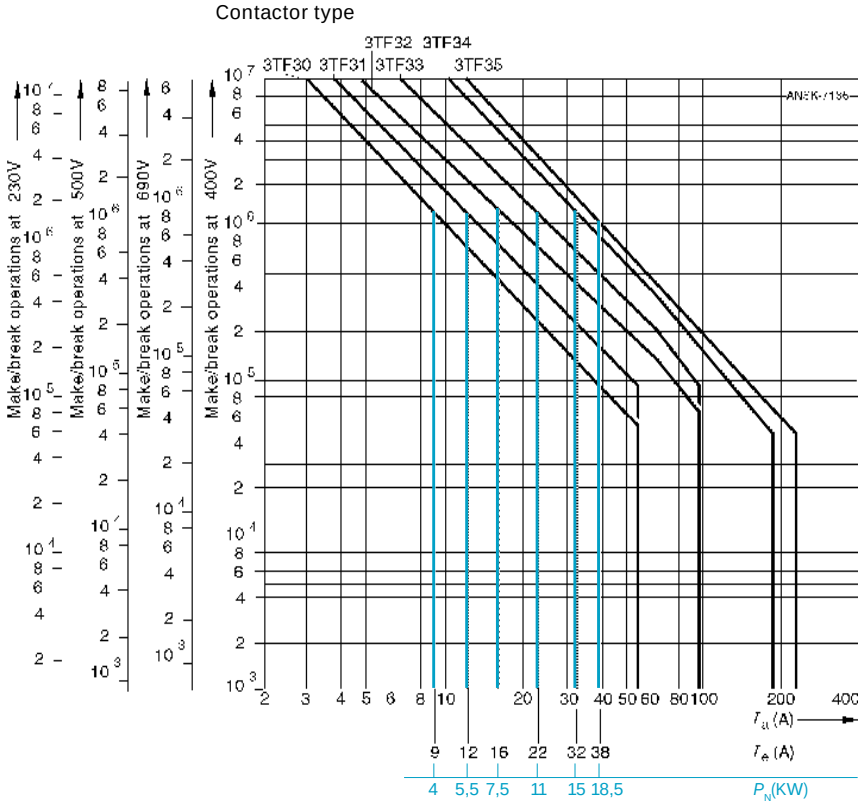
Mounting see 3TH30 mounting size figure

	Rated operational current I_e/AC - 15/AC - 14				Contacts		Order No.	Weight
	230/220V A	400/380V A	500V A	690/660V A	NO	NC		kg
 3TX4	5.6/6	3.8/4	2.5	1.8/2	1 - 1	- 1 -	3TX4 010 - 2A 3TX4 001 - 2A 3TX4 010 - 3A*	0.02

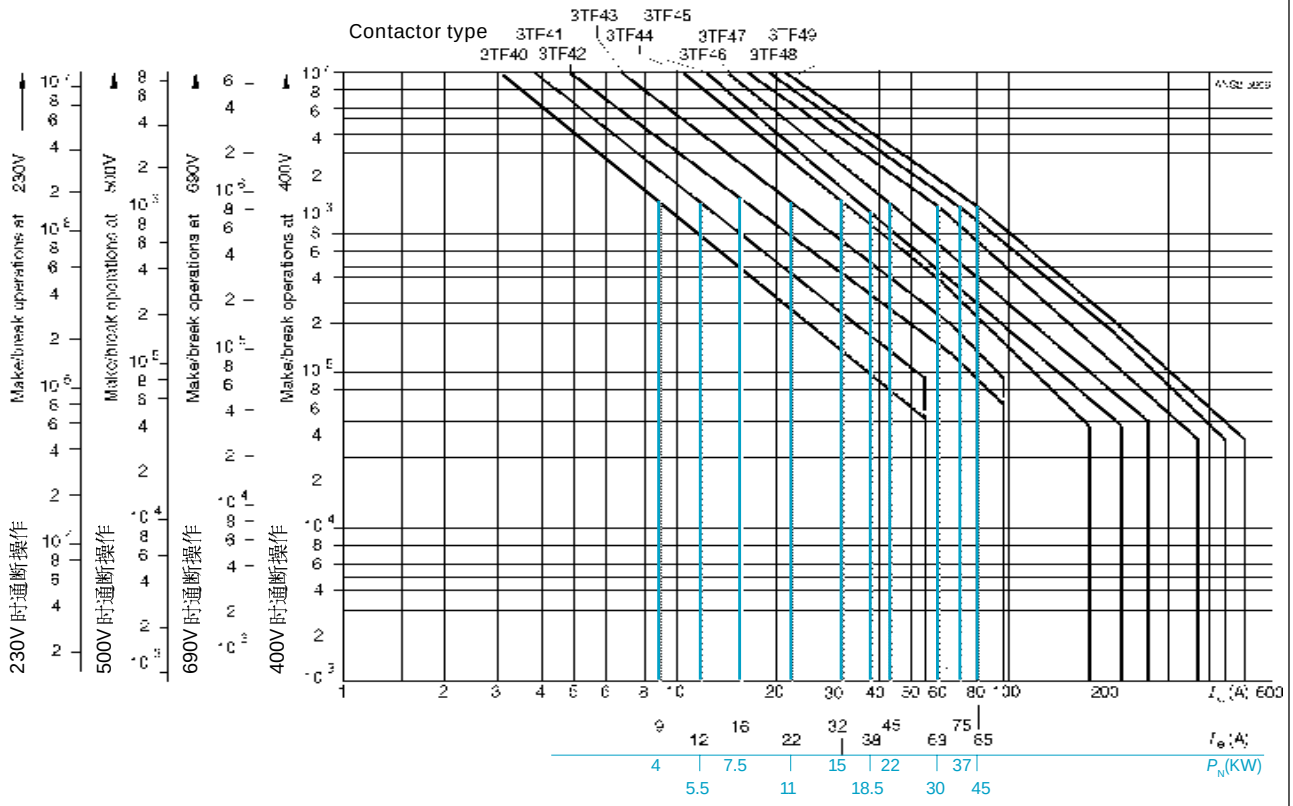
* 3TX4010 - 3A with switch position indicator

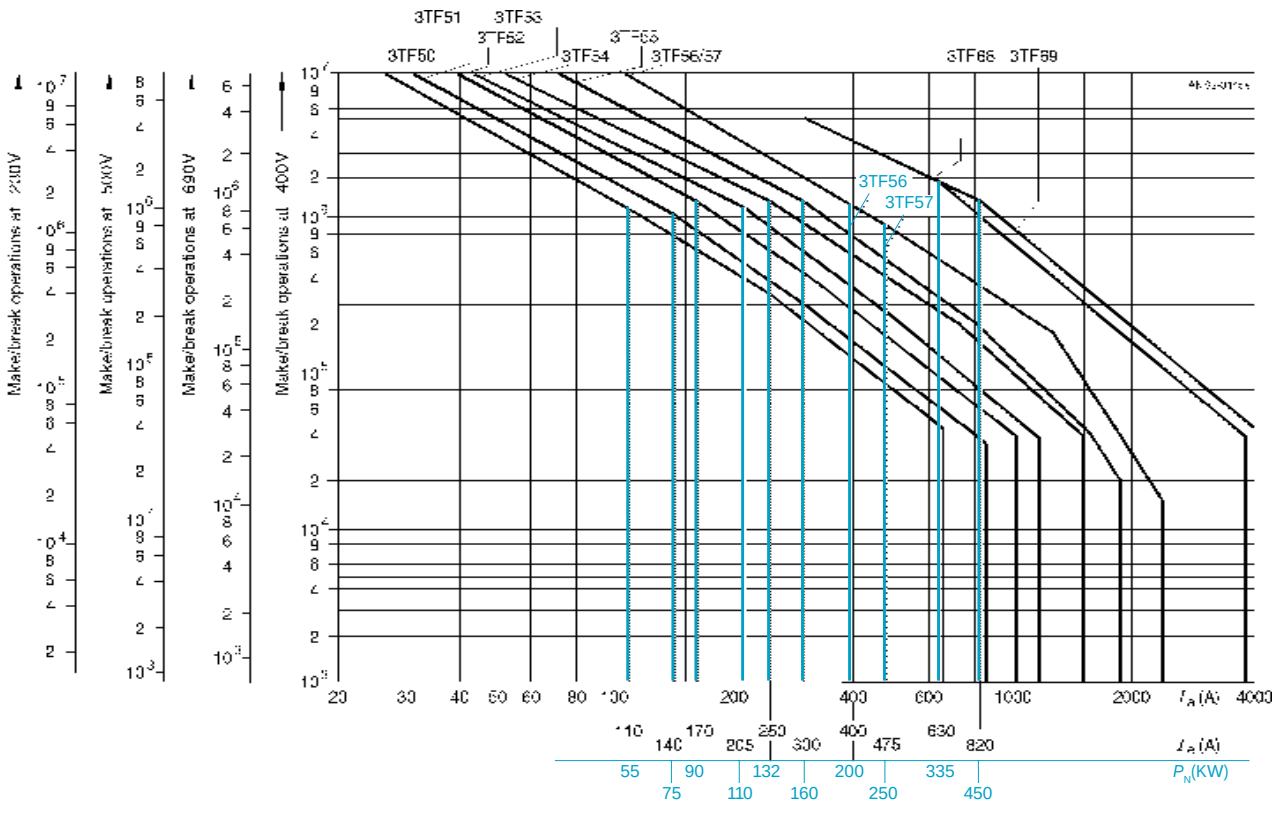
Technical data

Contact endurance of the main contacts (AC-3):



Technical data

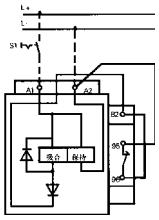




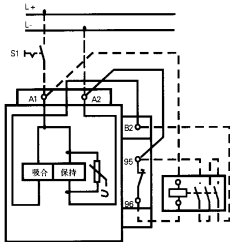
I_a: Breaking current
I_e: Rated operational current

P_N: Rated output of three-phase motors with squirrel-cage (at 400V)

DC circuit diagrams



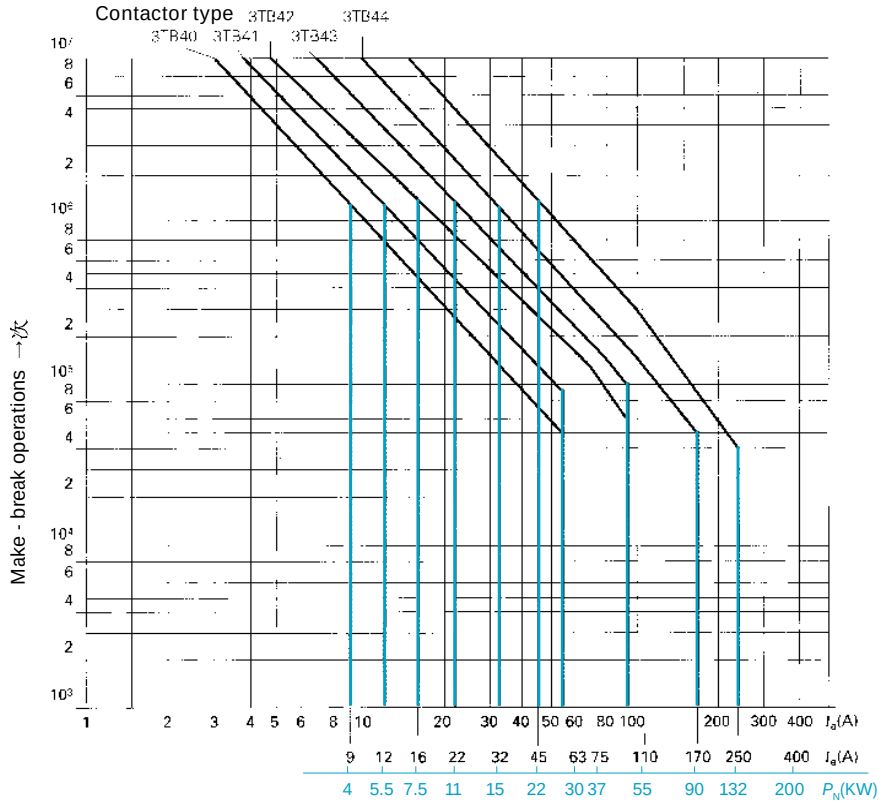
3TF46-3TF51
DC economy circuit



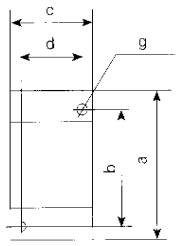
3TF52-3TF56
DC economy circuit
with changeover contactor:
3TF52～3TF55 : 3TF40
3TF56 : 3TF42

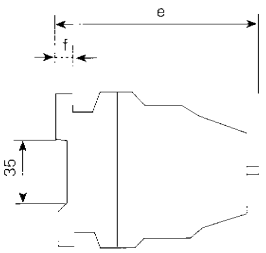
Technical data

Contact endurance of the main contacts (AC-3):



Dimension drawings



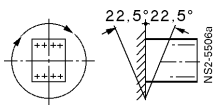


Type	a	b	c	d	e	f	g
3TB40, 3TB41	79	60	46	35	*90 106	7.5	∅5
3TB42, 3TB43	89	75	46	35	116	8	∅5
3TB44	90	75	74	50	109	8	∅5

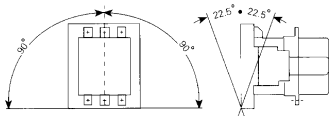
∗ Size 90 is suitable for 3TB4010, 3TB4001, 3TB4110, 3TB4101
Size 106 is suitable for 3TB4011, 3TB4022, 3TB4111, 3TB4122

Permissible Mounting Position

The contactors are designed for operation on vertical mounting surface.

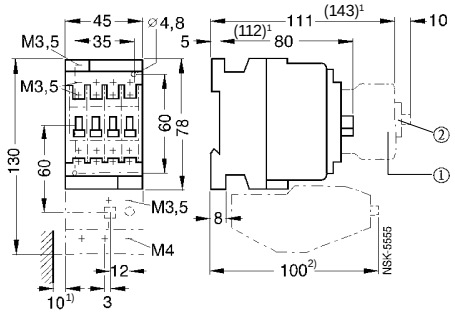


3TB40-3TB43



3TB44

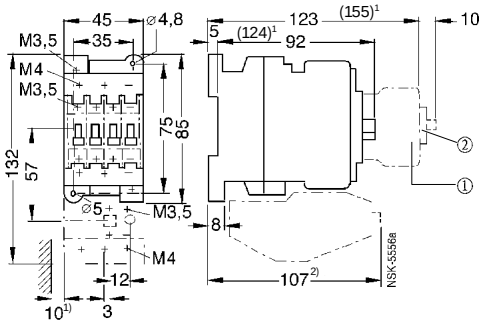
Dimension drawings



3TF30 and 3TF31, size 0

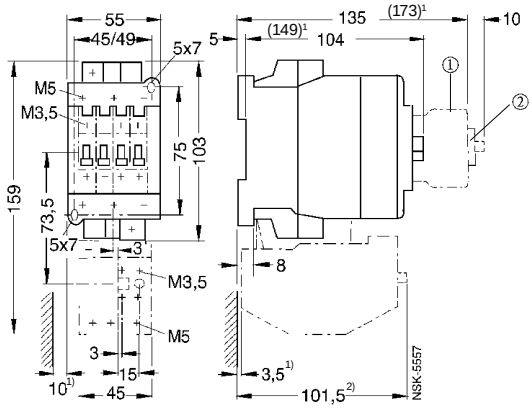
① Auxiliary contact block with position indicator
② Labelling plate

Without and with overload relay (3UA50 or 3UW10)



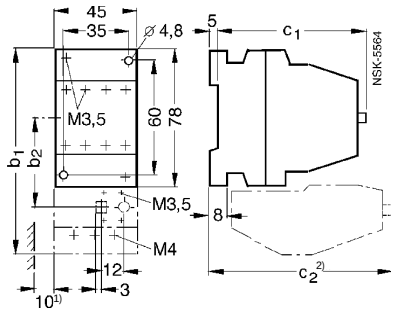
3TF32 and 3TF33, size 1

Without and with overload relay (3UA52 or 3UW13)



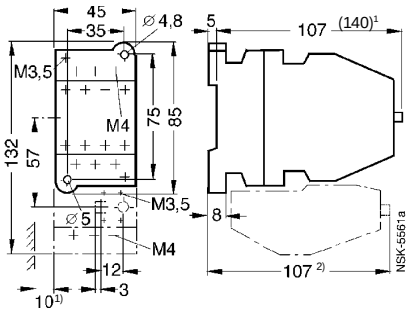
3TF34 and 3TF35, size 2

Without and with overload relay (3UA55)



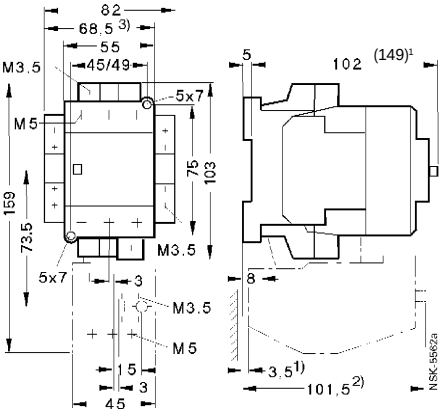
3TF40 and 3TF41, size 0

With and without 3UA50 or 3UW10 overload relay



3TF42 and 3TF43, size 1

With and without 3UA52 or 3UW13 overload relay



3TF44 and 3TF45, size 2

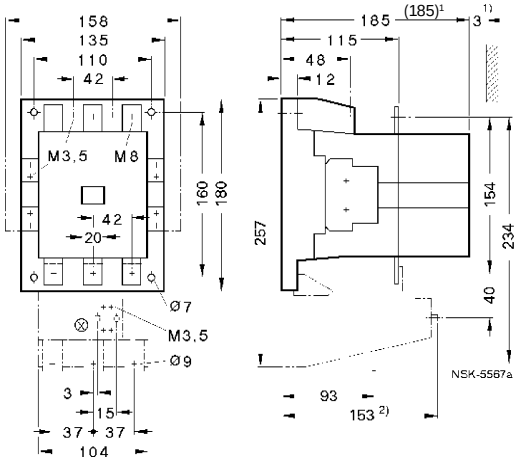
With and without 3UA55 overload relay

Contactor Type	b_1	b_2	c_1	$(c_1)^3$	c_2
1NO or 1NC	125	55	81	(115)³	108
1NO+1NC or 2NO+2NC	130	60	97	(130)³	100

( )³ DC operation

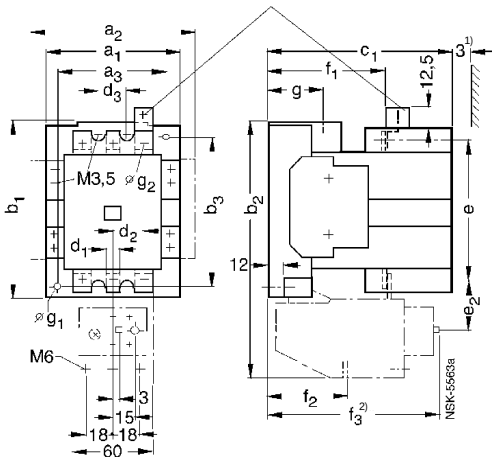
¹) Minimum clearance from the earthed parts
²) Dimension for the square OFF - button (stroke 3mm)
Dimension for the round RESET - button (stroke 2.5mm) less 2.5mm

Dimension drawings



3TF52, size 8

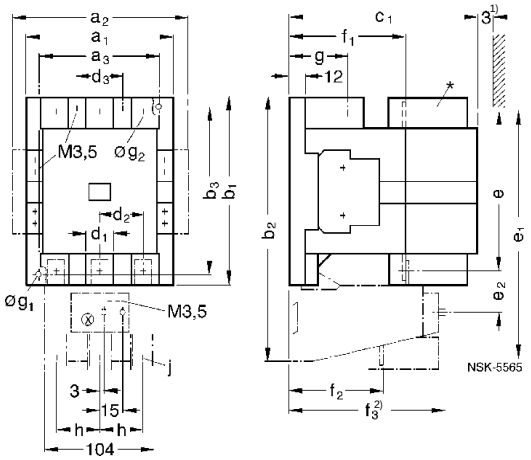
Without and with 3UA62 overload relay



3TF46 to 3TF49, size 3 and 4

With and without 3UA58 overload relay

Size	Type	a_1	a_2	a_3	b_1	b_2	b_3	c_1	$(c_1)^1$	d_1	d_2	d_3	e	e_2	f_1	f_2	f_3	g	$\varnothing g_1$	$\varnothing g_2$
3	3TF46, 3TF47	90	113	70	117	175	100	123	123	8	26.5	25	94	34	80	63	122	28	4.8	6.1(M6)
4	3TF48	100	123	80	133	194	110	140	140	8	26.5	25	107	36	89	63	122	39	5.5	6.1(M6)
4	3TF49	100	123	80	133	194	110	140	140	10.5	26.5	25	116	31.5	89	63	122	39	5.5	6.1(M6)



3TF50 and 3TF51, size 6 (box terminal with 3TF50)

With and without overload relay
3UA60 (with box terminals) for 3TF50
3UA61 (with box terminals) for 3TF51

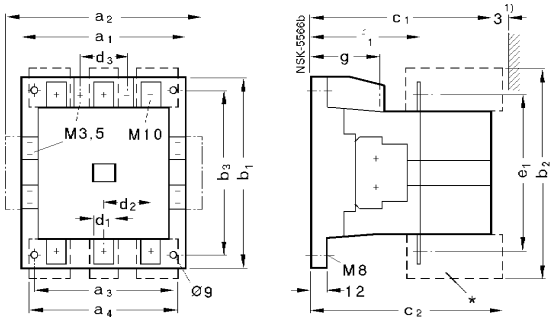
Type	h	j
3UA60	37	M6
3UA61	42	M8

* 3TF51 hasn't box terminals, Accessories

Type	a_1	a_2	a_3	b_1	b_2	b_3	c_1	$(c_1)^1$	d_1	d_2	d_3	e	e_1	e_2	f_1	f_2	f_3	g	$\varnothing g_1$	$\varnothing g_2$
3TF50	120	143	100	150	232	130	150	150	15	37	37	130	213	40	93	80	146	45	6.3	6.1(M6)
3TF51	120	143	100	150	232	130	150	150	20	42	37	139	215.5	40.5	93	80	146	45	6.3	9(M8)

( )1 DC operation

Dimension drawings



3TF53 to 3TF56, size 8~12

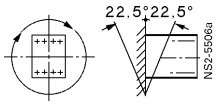
Type	a_1	a_2	a_3	b_1	b_3	c_1	$(c_1)^1$	e_1	f_1	g	d_1	d_2	$\varnothing g_1$
3TF53	135	158	110	180	160	185	185	159	115	48	25	48	7
3TF54, 3TF55	145	168	120	200	180	198	198	168	132	58	25	48	9
3TF53	160	183	130	200	180	222	222	178	150	65	25	48	9

* With box terminals (Accessories)

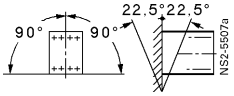
( )[1] DC operation

Permissible mounting position

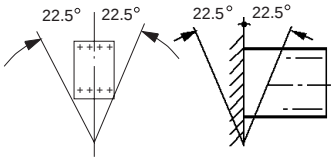
The contactors are designed for operation on vertical mounting surface.



3TF30 - 3TF33 (AC operation)
3TF40 - 3TF43 (AC operation)



3TF34 - 3TF35 (AC operation)
3TF44 - 3TF56 (AC operation)
3TF30 - 3TF33 (DC operation)
3TF40 - 3TF43 (DC solenoid system)
3TF46 - 3TF56 (DC economy circuit)



3TF34, 3TF35 (DC operation)
3TF44, 3TF45 (DC solenoid system)

Description

3TD Reversing Contactor Combinations are suitable for frequency of 50/60Hz, rated insulation voltage up to 690 ~ 1000V, rated operational current 9A ~ 400A at rated operational voltage 380V under AC - 3. They are mainly used for controlling the forward and reverse rotation. They comply with IEC947, VDE0660, GB14048.

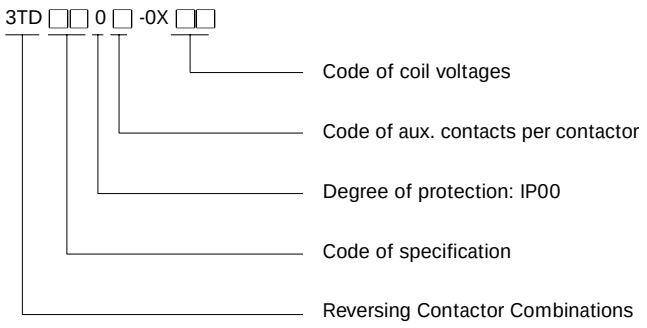
Operating Conditions

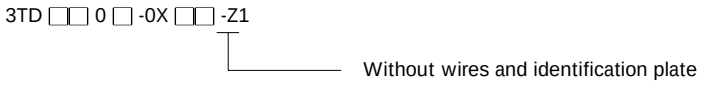
- The altitude of the site of installation does not exceed 2000 meters above sea levels.
- The ambient air temperature: -25 ~ +55°C
- Relative humidity does not exceed 50% at +40°C and 90% at +25°C
- Atmospheric conditions: the air does not contain any explosive medium, corrosive gases and conductive dust.
- Never be shocked and vibrated obviously.
- Never be wetted by rain and snow.

Features

- It is a Combinations consisting of two same type sets of 3TF AC contactors, between which one is interlocked by another through a mechanical device.
- The mechanical interlocking device does not affect the acting time of a single set of AC contactors.
- The conducting wires of the main circuit and auxiliary circuit have been connected. (The products without connection can also be suplied.)
- Compact in size, reliable in interlocking.
- The overload relays 3UA can be mounting directly on the 3TD (up to 3TD42).

Type model nomenclature





Selection and ordering data

- Mechanical endurance: 10 $\times 10^6$ operations;
- Operating time: the making time of the contacts in a contactor can not overlap the arcing time of the contacts in another contactor;
- The other technical data are same as those of 3TF, for example 3TD40, see 3TF40;
- Parameters and order specifications.

	Order No.	Auxi. contact no. per contactor		Rated operational current I_e	Rated outputs of three-phase motors AC-3					Overload Relay Type	Fuses Condination type	
		NO	NC	at AC-3, 400/380V A	230/ 220V KW	400/ 380V KW	500V KW	690/ 660V KW	1000V KW		"1" A	"2" A
	3TD40 02 - 0X ..	2	2	9	2.4	4	5.5	5.5	-	3UA50	35	25
	3TD40 02 - 0X .. - Z1	2	2									
	3TD40 01 - 0X .. - Z1	1	1									
	3TD40 00 - 0X .. - Z1	-	1									
	3TD41 02 - 0X ..	2	2	12	3.3	5.5	7.5	7.5	-		35	25
	3TD41 02 - 0X .. - Z1	2	2									
	3TD41 01 - 0X .. - Z1	1	1									
	3TD41 00 - 0X .. - Z1	-	1									
	3TD42 02 - 0X ..	2	2	16	4	7.5	9	11	-	3UA52	65	35
	3TD42 02 - 0X .. - Z1	2	2									
	3TD43 02 - 0X ..	2	2	22	5.5	11	11	11	-		65	35
	3TD43 02 - 0X .. - Z1	2	2									
	3TD44 02 - 0X ..	2	2	32	8.5	15	21	23	-	3UA55	80	63
	3TD44 02 - 0X .. - Z1	2	2									
	3TD45 02 - 0X ..	2	2	38	11	18.5	25	23	-		80	63
	3TD45 02 - 0X .. - Z1	2	2									
	3TD46 02 - 0X ..	2	2	45	15	22	30	39	-	3UA58	160	100
	3TD47 02 - 0X ..	2	2	63	18.5	30	41	55	-		160	125
	3TD48 02 - 0X ..	2	2	75	22	37	50	67	39		250	160
	3TD50 02 - 0X ..	2	2	110	37	55	76	100	55	3UA60	315	250
	3TD52 02 - 0X ..	2	2	170	55	90	118	156	90	3AU62	355	250
	3TD54 02 - 0X ..	2	2	250	78	132	178	235	132	3UA66	500	315
	3TD56 02 - 0X ..	2	2	400	125	200	284	375	150		800	500

1) The coil for AC 50/60 Hz for 3TD40 to 3TD50 contactor combinations should be used only if it is ensured that between the signal output for both directions of rotation minimum dead interval on reversing of 50ms exists.

2) Selection of the fuses in the above table is in accordance with excerpt from IEC947 - 4.
Type of co-ordination "1":
Destruction of contactor and overload relay is admissible. Contactor and/or overload relay must be replaced, if necessary.
Type of co-ordination "2":
No damage can be tolerated on the overload relay, but contact welding on the contactor is permitted, if the contacts can easily be separated.

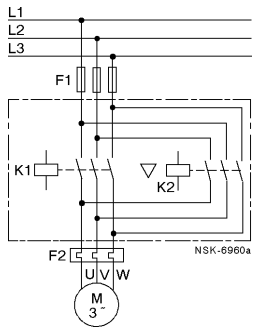
Conductor cross-section (screw terminal)

1. Main conductors
a) solid/stranded
b) finely stranded with and without end sleeve
c) finely stranded with cable lug
d) stranded with cable lug
e) connecting bars
f) stripped length
g) terminal screws
h) tightening torque
i) AWG wires

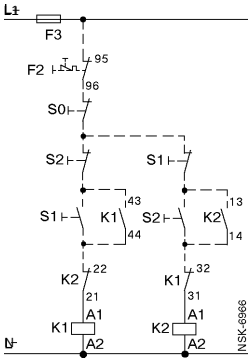
2. Auxiliary conductors
a) solid
b) finely stranded with end sleeve
c) terminal screws
d) tightening torque
e) AWG wires

	1.a) mm²	1.b) mm²	1.c) mm²	1.d) mm²	1.e) mm²	1.f) mm	1.g)	1.h) Nm/lb.in	1.i) AWG	2.a) mm²	2.b) mm²	2.c)	2.d) Nm/lbin	2.e) AWG
3TD40 3TD41	1~2.5 1 × 4	0.75~2.5	-	-		10	M3.5	0.8~1, 4/7~12	18~12	0.5~2.5	0.75~2.5	M3.5	0.8~1, 4/7~12	18~14
3TD42 3TD43	2.5~6	1.5~4	-	-	-	12	M4	1~1.5/9~13	14~10	0.5~2.5	0.75~2.5	M3.5	0.8~1, 4/7~12	18~14
3TD44 3TD45	2.5~25	2.5~16		-	-	10	M5	2.5~3/22~26.5	14~6					
3TD46 3TD47 3TD48	6~35	4~25	-	-	-	16^{+3}	-	3~4						
3TD50	25~70	25~50	-	-	-	22^{+3}	-	4~5						
3TD52	-	-	35~95	50~120	20 × 3	-	M8	10~14						
3TD54	-	-	50~240	70~240	25 × 5	-	M10	14~16.5						
3TD56	-	-	50~240	70~240	2 ×(25 × 5)	-	M10	14~16.5						

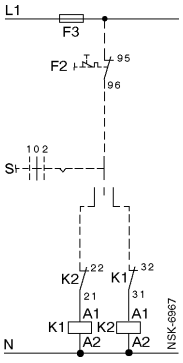
Circuit diagrams



Power circuit



Control circuit for momentary-contact control

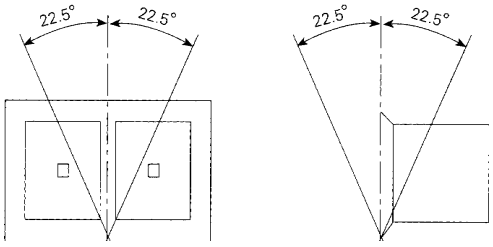


Control circuit for maintained-contact control

S0 "Off" button
S1 "On-clockwise" button
S2 "On-anti-clockwise" button
S "clockwise-Off-anti-clockwise" selector switch

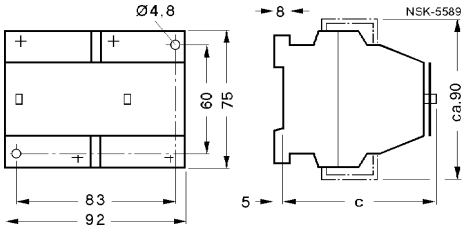
K1 Contactor for clockwise rotation
K2 Contactor for anti-clockwise rotation
F1 Fuse for power circuit
F2 Overload relay
F3 Fuse for control circuit

Permissible mounting position

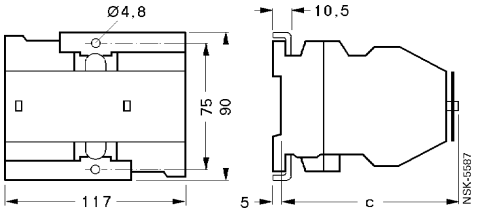


Dimension drawings

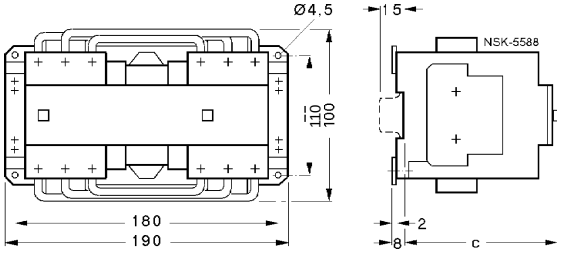
1. 3TD40, 3TD41 c=97mm/81mm



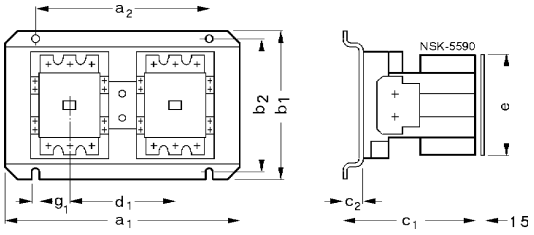
2. 3TD42, 3TD43 c=107mm



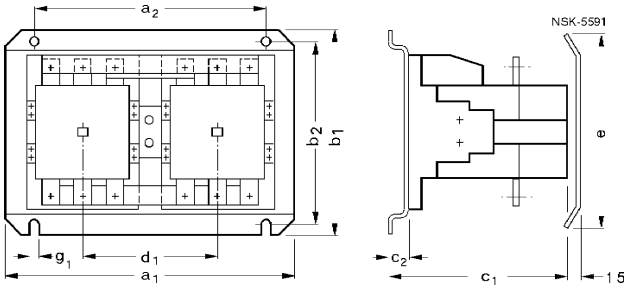
3. 3TD44, 3TD45 c=102mm



4. 3TD46 - 3TD48



5. 3TD50 - 3TD56



	a1	a2	b1	b2	b4	c1	c2	d1	e	g1
3TD46	240	180	165	145	-	141	18	117	150	7(M6)
3TD47	240	180	165	145	-	141	18	117	150	7(M6)
3TD48	260	200	175	155	-	158	18	127	160	7(M6)
3TD50	300	240	210	185	260	168	18	147	-	9(M8)
3TD52	330	270	240	215	315	203	18	162	-	9(M8)
3TD54	350	290	265	240	375	219	21	172	-	11(M10)
3TD56	380	310	265	240	385	243	21	187	-	11(M10)

Molded Case Circuit Breakers

ED 125A Frame Sentron Series

Selection

Ordering Instructions

- All ED Frame Sentron circuit breakers are supplied with load side lugs. If line side lugs are required, add "L" suffix to catalog number. Consult Siemens sales office for any addditional charge
- 50°C Calibration, 400HZ - see page 7-91. All ED frame circuit breakers may be reverse connected

Type ED2⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole 120V AC 125V DC Catalog Number	2-Pole 240V AC 125V DC 250V DC Catalog Number	3-Pole 240V AC Catalog Number
15	ED21B015④■	ED22B015	ED23B015
20	ED21B020④■	ED22B020	ED23B020
25	ED21B025■	ED22B025■	ED23B025■
30	ED21B030■	ED22B030	ED23B030
35	ED21B035■	ED22B035■	ED23B035■
40	ED21B040■	ED22B040	ED23B040
45	ED21B045■	ED22B045■	ED23B045■
50	ED21B050■	ED22B050	ED23B050
60	ED21B060■	ED22B060	ED23B060
70	ED21B070■	ED22B070	ED23B070
80	ED21B080■	ED22B080■	ED23B080
90	ED21B090■	ED22B090■	ED23B090■
100	ED21B100■	ED22B100	ED23B100

Type ED4⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole 120V AC 277V AC 125V DC Catalog Number	2-Pole 480V AC 250V DC Catalog Number	3-Pole 480V AC Catalog Number
15	ED41B015④	—	ED43B015
20	ED41B020④	ED42B020	ED43B020
25	ED41B025	ED42B025	ED43B025
30	ED41B030	ED42B030	ED43B030
35	ED41B035■	ED42B035■	ED43B035
40	ED41B040	ED42B040	ED43B040
45	ED41B045■	ED42B045■	ED43B045
50	ED41B050	ED42B050	ED43B050
60	ED41B060	ED42B060	ED43B060
70	ED41B070	ED42B070	ED43B070
80	ED41B080■	ED42B080■	ED43B080
90	ED41B090■	ED42B090■	ED43B090
100	ED41B100	ED42B100	ED43B100
110	—	ED42B110■	ED43B110
125	—	ED42B125	ED43B125

Type ED6⑤

Blue Label

Continuous Current Rating @ 40°C	1-Pole① 347V AC Catalog Number	2-Pole 600V AC 250V DC Catalog Number	3-Pole 600V AC 500V DC Catalog Number
15	ED61B015	—	ED63B015
20	ED61B020	ED62B020	ED63B020
25	ED61B025	ED62B025■	ED63B025
30	ED61B030	ED62B030	ED63B030
35	ED61B035	ED62B035■	ED63B035
40	ED61B040	ED62B040■	ED63B040
45	ED61B045■	ED62B045■	ED63B045
50	ED61B050	ED62B050■	ED63B050
60	ED61B060	—	ED63B060
70	ED61B070■	—	ED63B070
80	ED61B080	—	ED63B080
90	ED61B090	—	ED63B090
100	ED61B100■	—	ED63B100
110	—	—	ED63B110
125	—	—	ED63B125

Note: ED frame circuit breakers qualified to UL 489 Supplement SB "Naval"— See page 7-91 for additional information

■ Built to order. Allow 2–3 weeks for delivery.

①CSA Certified only (Not UL)

②For CED types and all 110–125 ampere ED frames.

③See **Note: A,** page 7-88.

④SWD rated.

⑤HACR rated.

⑥Not for use with HHED6 breakers.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
ED2, ED4, ED6, HED4, HHED6		
1	30	38
2	10	25
3	10	38
CED6		
2	5	20
3	5	30

Lugs

Ampere Rating	No. of Poles	Catalog Number	Wire Range
Aluminum Body Lugs			
All 15–25A	1, 2, 3	Line/Load **SA1E025**	#14–#10 Cu #12–#10 Al
All 30–100A	1, 2, 3	Line Side **LN1E100**	#10–1/0 Cu/Al
ED2, 4, CED6 30–60A	1	Load Side **LD1E060**	#10–#4 Cu/Al
ED2, 4, CED6 70–100A	1	Load Side **LD1E100**	#6–#1/0 Cu/Al
ED2, 4, HED4, HHED6 30–100A	2, 3	Load Side **LN1E100**	#10–1/0 Cu/Al
ED6 20-50A	2, 3	Line Side **LN1E100**	#10–1/0 Cu/Al
All 110, 125A	2, 3	Line/Load **TA1E6125**	#3–3/0 Cu #1–2/0 Al
Copper Body Lugs			
All 30–125A	1, 2, 3	Line/Load **TC1ED6150**③	#10–1/0 Cu only
Compression Lugs			
All ED, HHED, CED		**CCE125**	2/0

Enclosures (Neutral Included)⑥

Type	Catalog Number
1 (Surface)	**E2N1S** (15–100A)
1 (Flush)	**E2N1F** (15–100A)
3R	**E2N3R** (15–100A)
4–4X	**ED6SS4** (15–100A)
7–9	**EA** (15–60A)
7–9	**EB** (70–100A)
12	**E2N12** (15–100A)
1 (Surface)	**CED6N1S**②
1 (Flush)	**CED6N1F**②
3R	**CED6N3R**②
12	**CED6N12**②

Modifications page 7-91
Enclosures Section 6
Accessories pages 7-47 and 7-95 to 7-100

Molded Case Circuit Breakers

ED 125A Frame Sentron Series

Selection/Dimensions

Type HED4⑥ — Black Label

Continuous Current Rating @ 40°C	1-Pole 277V AC 125V DC	2-Pole 480V AC 250V DC	3-Pole 480V AC
	Catalog Number	Catalog Number	Catalog Number
15	HED41B015①	HED42B015	HED43B015
20	HED41B020①	HED42B020	HED43B020
25	HED41B025	HED42B025■	HED43B025
30	HED41B030	HED42B030	HED43B030
35	HED41B035■	HED42B035■	HED43B035
40	HED41B040	HED42B040	HED43B040
45	HED41B045■	HED42B045■	HED43B045
50	HED41B050■	HED42B050	HED43B050
60	HED41B060■	HED42B060■	HED43B060
70	HED41B070■	HED42B070■	HED43B070
80	HED41B080■	HED42B080■	HED43B080
90	HED41B090■	HED42B090■	HED43B090
100	HED41B100■	HED42B100■	HED43B100
110	—	HED42B110■	HED43B110
125	—	HED42B125■	HED43B125

FIGURE1 - ED, HED, HHED

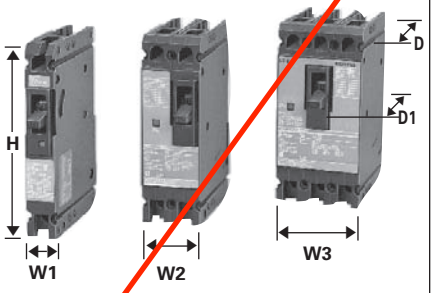
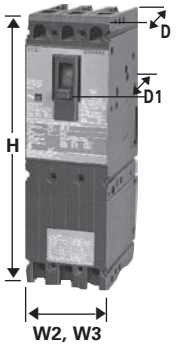


FIGURE 2 - CED (3-Pole shown)



Dimensions (in inches)

Breaker Type	W1	W2	W3	H	D	D1
Figure 1 ED2, ED4, ED6, HED4, ED6 ETI④	1	2	3	6.35	3.92	4.56
Figure 1 HHED6	—	2	3	6.53	3.92	4.56
Figure 2 CED6, CED6 ETI④	—	2	3	9.58	3.92	4.56

Fuseless Current Limiting

Type HHED6⑥ — Black Label

Type CED6⑥ — Red Label

Continuous Current Rating @ 40°C	3-Pole 600V AC	2-Pole 600V AC, 250V DC	3-Pole 600V AC, 500V DC②
	Catalog Number⑦	Catalog Number	Catalog Number
15	HHED63B015A	CED62B015	CED63B015
20	HHED63B020	CED62B020■	CED63B020
25	HHED63B025	—	—
30	HHED63B030	CED62B030■	CED63B030
35	HHED63B035	—	—
40	HHED63B040	CED62B040■	CED63B040
45	HHED63B045	—	—
50	HHED63B050	CED62B050■	CED63B050
60	—	CED62B060■	CED63B060
70	—	CED62B070■	CED63B070
80	—	CED62B080■	CED63B080
90	—	CED62B090■	CED63B090
100	—	CED62B100■	CED63B100
110	—	—	CED63B110■
125	—	CED62B125■	CED63B125

Interrupting Ratings

Breaker Type	UL 489 AIR (File #E10848) RMS Symmetrical Amperes (KA) Volts AC						Volts DC			IEC 947-2 Volts AC (50/60Hz) 220/240		380/415		500	
	120	240	277	347	480	600	125	250	500②	Icu	Ics	Icu	Ics	Icu	Ics
ED2 (1-P)	10	—	—	—	—	—	5	—	—	—	—	—	—	—	—
ED2 (2, 3-P)	—	10	—	—	—	—	—	5 (2-P)	—	—	—	—	—	—	—
ED4 (1-P)	65	—	22	—	—	—	30	—	—	—	—	—	—	—	—
ED4 (2, 3-P)	—	65	—	—	18	—	—	30 (2-P)	—	—	—	—	—	—	—
ED6 (1P)	—	—	—	30⑤	—	—	—	—	—	—	—	—	—	—	—
ED6 (2, 3-P)	—	65	—	—	25	18		—	18 (3-P)	65	17	35	9	18	5
HED4 (1-P) (15–30A)	100	—	65	—	—	—	30	—	—	—	—	—	—	—	—
HED4 (1-P) (35–100A)	100	—	25	—	—	—	30	—	—	—	—	—	—	—	—
HED4 (2, 3-P)③		100			42			30 (2-P)		—	—	—	—	—	—
HHED6 (2, 3-P)③	—	100	—	—	65	18⑦	—	—	—	—	—	—	—	—	—
CED6 (2, 3-P)	—	200	—	—	200	100	—	50 (2-P)	30 (3-P)	—	—	—	—	—	—

■ Built to order. Allow 2–3 weeks for delivery.

①SWD rated.

②When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.

③HED4 and HHED6 type circuit breakers meet the UL criteria for "current limiting" at 240V AC.

④ED6-ETI, CED6-ETI, see page 7-74 for ordering information.

⑤Single Pole 15-30A 30KA @ 347V non-UL.
35-100A 18KA @ 347V non-UL.

⑥HACR rated.

⑦HHED63B015A is rated 18KAIC at 600/347V.

Accessories for:

ED 125A Frame



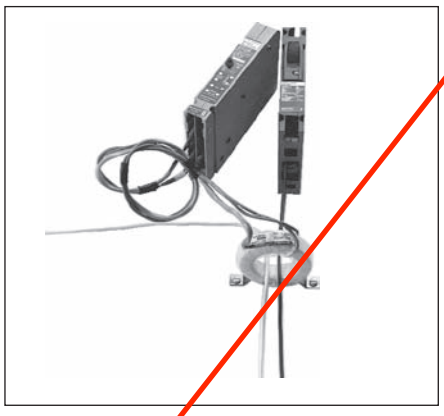
Combinations

Available only when ordered together. Only one module can be added to a breaker. Additional accessories, which always attach to the left pole, cannot be added to the combination later. Adds 1 inch pole space.

Equipment Ground Sensing

A field addable kit containing 30mA or 5 mA ground fault accessory module, current transformer with 24 inch leads, and current transformer mounting equipment. Current transformer to mount in gutter of lighting panel or any control panel. Accessory module operates from separate 120V control power source.

Both 30MA and 5MA devices are equipment protection devices only. Do not use for personnel protection.



Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch	1 Shunt Trip 1 Auxiliary Switch and 1 Alarm Switch	1 Shunt Trip and 1 Alarm Switch	1 Shunt Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
24		S17ED60	—	—	—	—
48		S18ED60	—	—	—	—
120		S01ED60	S01ED62A	S01ED62AB	S01ED62B	S01ED62AA
208		—	S02ED62A▲	S02ED62AB▲	S02ED62B▲	S02ED62AA▲
240		S03ED60	S03ED62A	S03ED62AB	S03ED62B▲	S03ED62AA▲
277		S15ED60▲	S15ED64A▲	S15ED64AB▲	S15ED64B▲	—
480		S04ED60	S04ED64A▲	S04ED64AB▲	S04ED64B▲	—
	12	S16ED60▲	S16ED62A▲	—	—	—
	24	S07ED60	S07ED62A	S07ED62AB▲	S07ED62B▲	S07ED62AA▲
	48	S09ED60▲	S09ED62A▲	S09ED62AB▲	S09ED62B▲	S09ED62AA▲
	125	S11ED60▲	S11ED62A▲	S11ED62AB▲	S11ED62B▲	S11ED62AA▲
	250	S13ED60▲	S13ED62A▲	S13ED62AB▲	S13ED62B▲	S13ED62AA▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 1 Auxiliary Switch and 1 Alarm Switch	1 Undervoltage Trip and 1 Alarm Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number	Catalog Number
120		U01ED60	U01ED62A	U01ED62AB▲	U01ED62B▲	U01ED62AA▲
208		U02ED60▲	U02ED62A▲	U02ED62AB▲	U02ED62B▲	U02ED62AA▲
240		U03ED60	U03ED62A▲	U03ED62AB▲	U03ED62B▲	U03ED62AA▲
277		U16ED60▲	U16ED64A▲	U16ED64AB▲	U16ED64B▲	—
480		U06ED60▲	U06ED64A▲	U06ED64AB▲	U06ED64B▲	—
600		U08ED60▲	—	—	—	—
	24	U13ED60	U13ED62A▲	U13ED62AB▲	U13ED62B▲	U13ED62AA▲
	48	U14ED60▲	U14ED62A▲	U14ED62AB▲	U14ED62B▲	U14ED62AA▲
	125	U10ED60▲	U10ED62A▲	U10ED62AB▲	U10ED62B▲	U10ED62AA▲
	250	U12ED60▲	U12ED62A▲	—	—	U12ED62AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Auxiliary Switch	1 Alarm Switch and 1 Auxiliary Switch	2 Auxiliary Switches	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number	Catalog Number
240	250	A01ED62	A01ED62B	A02ED62	A02ED62B
480		A01ED64	A01ED64B	—	—

Maximum Voltage		1 Auxiliary Switch	
AC	DC	Catalog Number	
	12	A01EDLV	Gold Plated Contacts—for PLC use

Alarm Switch Only

Maximum Voltage		1 Alarm Switch
AC	DC	Catalog Number
240	250	B00ED62
480		B00ED64

Ground Fault Sensing Relay Kit — Equipment Protection Only

For Use With Breaker Frame	Number of Poles	Description	Catalog Number	
			30mA	5mA
CED6, ED2, ED4 ED6, EFC, EFF, HED4, HHED6	1, 2, 3	Basic Kit	GF01ED60	GF01ED65
		Basic Kit with Normally Open Bell Alarm	GF01ED60B0	GF01ED65B0▲
		Basic Kit with Normally Closed Bell Alarm	GF01ED60BC	GF01ED65BC▲

▲ Built to order. Allow 6–8 weeks for delivery.

Molded Case Circuit Breakers

FD 250A Frame Sentron Series

Type FXD6-A①⑦

Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker – Without Lugs)

Continuous Current Rating @ 40°C	2-Pole Catalog Number	3-Pole Catalog Number
70	FXD62B070■	FXD63B070
80	FXD62B080■	FXD63B080
90	FXD62B090■	FXD63B090
100	FXD62B100	FXD63B100
110	FXD62B110■	FXD63B110
125	FXD62B125	FXD63B125
150	FXD62B150	FXD63B150
175	FXD62B175	FXD63B175
200	FXD62B200	FXD63B200
225	FXD62B225	FXD63B225
250	FXD62B250	FXD63B250

Type FD6-A⑦

Blue Label

Interchangeable Trip

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
2-Pole 600V AC, 250V DC②			
70	FD62B070■	FD62F250	FD62T070■
80	FD62B080■		FD62T080■
90	FD62B090■		FD62T090■
100	FD62B100■		FD62T100■
110	FD62B110■		FD62T110■
125	FD62B125■		FD62T125■
150	FD62B150		FD62T150
175	FD62B175■		FD62T175■
200	FD62B200		FD62T200
225	FD62B225■		FD62T225■
250	FD62B250■		FD62T250■
3-Pole 600V AC, 500V DC③			
70	FD63B070■	FD63F250	FD63T070■
80	FD63B080■		FD63T080■
90	FD63B090■		FD63T090■
100	FD63B100		FD63T100
110	FD63B110■		FD63T110■
125	FD63B125		FD63T125
150	FD63B150		FD63T150
175	FD63B175		FD63T175
200	FD63B200		FD63T200
225	FD63B225		FD63T225
250	FD63B250		FD63T250

Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)											
	UL 489 AIR (File E10848)					IEC 947-2						
	Volts AC (50/60Hz)			Volts DC		Volts AC (50/60Hz)						
	240	480	600	250	500③	220/240		380/415		500	
						Icu	Ics	Icu	Ics	Icu	Ics
FXD6-A, FD6-A	65	35	22	30 (2-P)	18 (3-P)	65	33	35	9	—	—
HFXD6⑥, HFD6⑥	100	65	25	30 (2-P)	25 (3-P)	100	50	65	33	—	—
HHFD6⑥, HHFXD6⑥	200	100	25	—	—	—	—	—	—	—	—
CFD6	200	200	100	30 (2-P)	50 (3-P)	—	—	—	—	—	—

Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
70-90	600	640	690	730	770	810	850	900
100-110	700	770	840	920	990	1060	1140	1200
125-150	800	900	1000	1100	1200	1300	1400	1500
175-200	900	1060	1210	1370	1520	1780	1930	2000
225-250	1100	1300	1500	1700	1900	2100	2300	2500

Note: FD frame qualified to UL489 supplement SB "NAVAL".
See page 7-91 for additional information.

Ordering Information

Complete Breaker Unassembled with Lugs

Prices of FD6, HFD6, and HHFD6 breakers includes frame, trip and both line and load lugs (TA1FD350A). When ordered by these catalog numbers, the customer will receive the frame, trip, and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled without Lugs

Prices of FXD6, HFXD6, HHFXD6, and CFD6 includes frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA1FD350A) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

50°C Applications see page 7-91.

400 Hz Applications see page 7-91.

Lugs For 75°C Wire⑤

Catalog Number	Wire Range
TA1FD350A	#6—350 kcmil Cu #4—350 kcmil Al
TC1FD350	#6—350 kcmil Cu
Compression Lug	
CCF250	350 kcmil Cu/Al

Enclosures

Type	Catalog Number
1	F6N1S(F)
3R	F6N3R
4-4X	FD6SS4
7-9	EC2
12	F6N12
Neutral④	N250

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Enclosures Section 6
Accessories pages 7-50 and 7-95 to 7-100

■ Built to order. Allow 2–3 weeks for delivery.

①Type FXD6-A circuit breakers are UL Listed for reverse fed applications.
②2-pole units are 3-pole width.
③When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.
④Order neutral as separate item.
⑤See **Note: A**, page 7-88.
⑥HFD6 and HHFD6 type circuit breakers meet the UL criteria for "current limiting" at 240 and 480V AC.
⑦HACR rated.

Molded Case Circuit Breakers

FD 250A Frame Sentron Series

Type HFD6, Type HFXD6②③④⑤⑥

Black Label

Interchangeable Trip

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
2-Pole 600V AC, 250V DC (3-Pole Width)			
70	HFD62B070■	HFD62F250	FD62T070■
80	HFD62B080■		FD62T080■
90	HFD62B090■		FD62T090■
100	HFD62B100■		FD62T100■
110	HFD62B110■		FD62T110■
125	HFD62B125■		FD62T125■
150	HFD62B150■		FD62T150■
175	HFD62B175■		FD62T175■
200	HFD62B200■		FD62T200■
225	HFD62B225■		FD62T225■
250	HFD62B250■		FD62T250■
3-Pole 600V AC, 500V DC①			
70	HFD63B070■	HFD63F250	FD63T070■
80	HFD63B080■		FD63T080■
90	HFD63B090■		FD63T090■
100	HFD63B100		FD63T100
110	HFD63B110■		FD63T110■
125	HFD63B125		FD63T125
150	HFD63B150		FD63T150
175	HFD63B175		FD63T175
200	HFD63B200		FD63T200
225	HFD63B225		FD63T225
250	HFD63B250		FD63T250

Type HHFD, HHFXD6②③④⑥

3-Pole 600V AC, Extra High Interrupting

70	HHFD63B070■	HHFD63F250	FD63T070■
80	HHFD63B080■		FD63T080■
90	HHFD63B090■		FD63T090■
100	HHFD63B100		FD63T100
110	HHFD63B110■		FD63T110■
125	HHFD63B125		FD63T125
150	HHFD63B150		FD63T150
175	HHFD63B175		FD63T175
200	HHFD63B200		FD63T200
225	HHFD63B225		FD63T225
250	HHFD63B250		FD63T250

Type CFD6-A③⑥

Fuseless Current Limiting

Red Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)

Continuous Current Rating @ 40°C	3-Pole 600V AC/500V DC Catalog Number
70	CFD63B070■
80	CFD63B080■
90	CFD63B090■
100	CFD63B100■
110	CFD63B110■
125	CFD63B125■
150	CFD63B150
175	CFD63B175
200	CFD63B200
225	CFD63B225
250	CFD63B250

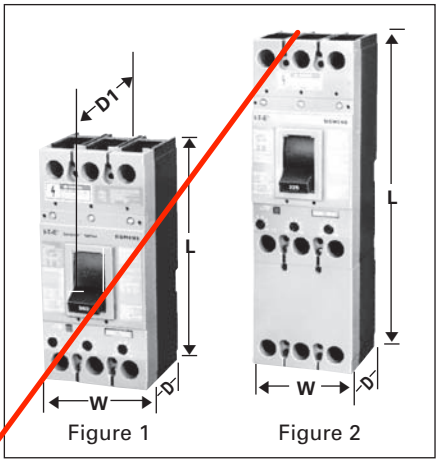


Figure 1 Figure 2

Dimensions (in inches)

Breaker Type	W	L	D	D1 (to handle)
Figure 1 FXD6-A, FD6-A, HFD6, HFXD6, HHFD6, FD6-ETI⑤	4.50	9.50	4	5.25
Figure 2 CFD6, CFD6-ETI⑤	4.50	14.25	4	5.25

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
FD6-A, HFD6, HHFD6, FXD6-A Assembled Circuit Breaker (less connectors)		
2	1	8.6
3	1	10
FD6-A, HFD6, HHFD6 Frame Only		
2	1	7.5
3	1	8.7
FD6 Trip Unit Only		
2	1	1.1
3	1	1.3
CFD6 Assembled Circuit Breaker (less terminals)		
3	1	16

■ Built to order. Allow 2–3 weeks for delivery.

① When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems.

② For non-interchangeable trip 3-pole HFD6 type circuit breaker, change prefix identifier from HFD6 to HFXD6. Price equals frame and trip prices combined, e.g. price of HFXD63B250 equals price of HFD63F250 plus price of FD63T250. Order lugs separately.

③ Type HFXD6, HHFXD6, CFD6 are UL Listed for reverse feed applications.

④ Type HFXD6, HFD6, HHFD6, HHFXD6 meet the UL criteria for "Current Limiting" at 240 VAC and 480V AC.

⑤ FXD6, ETI, CFD6, ETI — See page 7-74 for ordering information.

⑥ HACR rated.

Accessories:
for FD, FFC & FFF 250A Frames



Shunt Trip Combinations

Control Voltage		1 Shunt Trip
AC	DC	Catalog Number
24		S17FD60
120		S01FD60
240		S03FD60
277		S15FD60▲
480		S04FD60
600		S06FD60▲
	12	S16FD60▲
	24	S07FD60
	48	S09FD60▲
	125	S11FD60
	250	S13FD60▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
120		U01FD60	W01FD64
208		U02FD60▲	W02FD64▲
240		U03FD60	W03FD64▲
277		U16FD60▲	W16FD64▲
480		U06FD60▲	W06FD64▲
600		U08FD60▲	—
	24	U13FD60	W13FD64
	48	U14FD60▲	W14FD64▲
	125	U10FD60▲	W10FD64▲
	250	U12FD60▲	W12FD64▲

Auxiliary Switch Combinations

Voltage		1 Auxiliary Switch	2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number
240		A01FD62	A02FD62
480		A01FD64	A02FD64
	12	A01FDLV	Gold Plated Contacts - for PLC use

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
480	250	B00FD64	C01FD64

▲ Built to order. Allow 6–8 weeks for delivery.

①Auxiliary switch application is for 480V AC maximum.

Note: Old F-frame accessories cannot be used in new Sentron line. Likewise, new FD-frame accessories cannot be used on old F-frame circuit breakers.

Molded Case Circuit Breakers

JD 400A Frame Sentron Series

Type JXD2-A⑤

240V AC, 2-Pole 250V DC Only — Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
Continuous Current Rating @ 40°C	**2-Pole (3-Pole Width) Catalog Number**	**3-Pole Catalog Number**
200	JXD22B200■	JXD23B200
225	JXD22B225■	JXD23B225
250	JXD22B250■	JXD23B250
300	JXD22B300	JXD23B300
350	JXD22B350■	JXD23B350
400	JXD22B400	JXD23B400

Type JXD6-A①⑤

600V AC, 2-Pole 250V DC, 3-Pole 500V DC② — Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)		
200	JXD62B200■	JXD63B200
225	JXD62B225■	JXD63B225
250	JXD62B250■	JXD63B250
300	JXD62B300	JXD63B300
350	JXD62B350■	JXD63B350
400	JXD62B400	JXD63B400

Type JD6-A⑤

Blue Label

Interchangeable Trip			
Continuous Current Rating @ 40°C	**Complete Breaker Unassembled w/Lugs Catalog Number**	**Frame Only Catalog Number**	**Trip Unit Only Catalog Number**
2-Pole 600V AC, 250V DC (3-Pole Width)			
200	JD62B200■	JD62F400	JD62T200■
225	JD62B225■		JD62T225■
250	JD62B250■		JD62T250■
300	JD62B300■		JD62T300■
350	JD62B350■		JD62T350■
400	JD62B400		JD62T400
3-Pole 600V AC, 500V DC②			
200	JD63B200	JD63F400	JD63T200
225	JD63B225		JD63T225
250	JD63B250		JD63T250
300	JD63B300		JD63T300
350	JD63B350		JD63T350
400	JD63B400		JD63T400

Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (kA)											
	UL 489 AIR (File E10848)					IEC 947-2					
	Volts AC (50/60Hz)			Volts DC		Volts AC (50/60Hz)					
						220/240		380/415		500	
	240	480	600	250	500②	Icu	Ics	Icu	Ics	Icu	Ics
JXD2-A	65	—	—	30 (2-P)	—	—	—	—	—	—	—
JXD6-A, JD6-A	65	35	25	30 (2-P)	25 (3-P)	65	33	40	20	—	—
HJD6-A, HJXD6-A	100	65	35	30 (2-P)	35 (3-P)	100	50	65	33	—	—
HHJD6, HHJXD6④	200	100	50	—	—	—	—	—	—	—	—
CJD6-A	200	150	100	30 (2-P)	50 (3-P)	—	—	—	—	—	—

Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values							
	±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
200-300	1250	1430	1610	1790	1960	2140	2320	2500
350-400	2000	2290	2570	2860	3140	3430	3710	4000

■ Built to order. Allow 2–3 weeks for delivery.

①Type JXD2 and JXD6 circuit breakers are UL Listed for reverse feed applications.

②When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

③See **Note: A**, page 7-88.

④HHJD6 type circuit breakers meet the UL criteria for "current limiting" at 240 and 480V AC.

⑤HACR rated.

Note: JD frame qualified to UL489 supplement B "NAVAL." See page 7-91 for additional information.

Ordering Information

Complete Breaker Unassembled with Lugs

Prices of JD6, HJD6, and HHJD6 breakers include frame, trip and both line and load lugs (TA2J6500). When ordered by these catalog numbers, the customer will receive the frame, trip, and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled without Lugs

Prices of JXD6, HJXD6, HHJXD6, and CJD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA2J6500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

100% Rated (3-pole only)

Types JXD6 and HJXD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price.■ 100% rated JD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs TC1J6600 or TC2J6500.

50°C Applications see page 7-91.

400Hz Applications see page 7-91.

Lugs For 75°C Wire③

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2 2	#3/0-500 kcmil Cu #4/0-500 kcmil Al
TA1L6750	1 1	500-750 kcmil Al 500-600 kcmil Cu
TC1J6600	1	#3/0-600 kcmil Cu
TC2J6500	1, 2	#3/0-500 kcmil Cu
Compression Lug		
CCL600	1	500 kcmil Cu/Al

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Molded Case Circuit Breakers

JD 400A Frame Sentron Series

Type HJD6-A, HJXD6-A②④⑥

Black Label

Interchangeable Trip

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
2-Pole 600V AC, 250V DC (3-Pole Width)			
200	HJD62B200■	HJD62F400■	JD62T200■
225	HJD62B225■		JD62T225■
250	HJD62B250■		JD62T250■
300	HJD62B300■		JD62T300■
350	HJD62B350■		JD62T350■
400	HJD62B400■		JD62T400
3-Pole 600V AC, 500V DC①②⑤			
200	HJD63B200	HJD63F400	JD63T200
225	HJD63B225		JD63T225
250	HJD63B250		JD63T250
300	HJD63B300		JD63T300
350	HJD63B350		JD63T350
400	HJD63B400		JD63T400

Type HHJD6, HHJXD6②④⑥

Black Label

2-Pole 600V AC (3-Pole Width)			
200	HHJD62B200■	HHJD62F400■	JD62T200■
225	HHJD62B225■		JD62T225■
250	HHJD62B250■		JD62T250■
300	HHJD62B300■		JD62T300■
350	HHJD62B350■		JD62T350■
400	HHJD62B400■		JD62T400
3-Pole 600VAC			
200	HHJD63B200	HHJD63F400	JD63T200
225	HHJD63B225		JD63T225
250	HHJD63B250		JD63T250
300	HHJD63B300		JD63T300
350	HHJD63B350		JD63T350
400	HHJD63B400		JD63T400

Type CJD6-A ⑤⑥

Fuseless Current Limiting

Red Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)

Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC Catalog Number	3-Pole 600V AC/500V DC Catalog Number
200	For 2-pole application use outside poles of 3-pole circuit breaker	CJD63B200■
225		CJD63B225■
250		CJD63B250■
300		CJD63B300■
350		CJD63B350■
400		CJD63B400

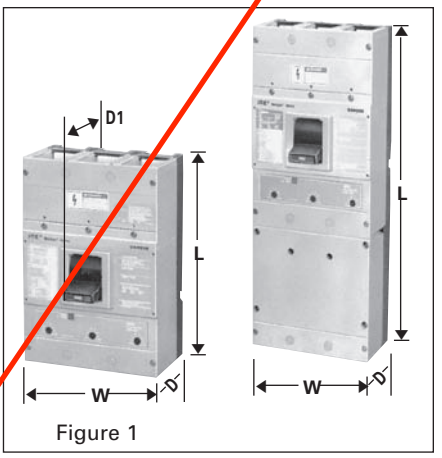


Figure 1

Dimensions (in inches)

Breaker Type	W	L	D	To Handle D1
Figure 1 JXD2-A, JXD6-A, JD6-A HJD6-A, HJXD6-A, HHJD6, HJD6, HJXD6, HHJXD6, JXD6-ETI③ SJD6, SHJD6	7.5	11	4	5.44
Figure 2 CJD6, CJD6-ETI,③ SCJD6	7.5	17.86	4	5.44

Enclosures (Except SCJD6)

Type	Catalog Number
1	J6N1
3R	J6N3R
12	J6N12
4X	LD6SS4
7, 9 (200-250A)	EC4
7, 9 (300-400A)	EE
Neutral	W60992

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
JXD2, JXD6, JD6, HJD6, HHJD6 Assembled Breaker (less terminals)		
2	1	17.5
3	1	19.5
JD6, HJD6, HHJD6 Frame Only		
2	1	14
3	1	15.5
JD6 Trip Unit Only		
2	1	3.5
3	1	4
CJD6 Complete Assembled Breaker (less terminals)		
3	1	31.5

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

2-pole units available in 3-pole construction.

① When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

② For non-interchangeable 3-pole HJD6 or HHJD6 type circuit breaker change the prefix identifier to HJXD6 or HHJXD6. Price equals price of frame plus price of trip, e.g. price of HJXD63B400 equals price of HJD63F400 plus price of JD63T400. Order lugs separately.

③ JXD6-ETI, CJD6-ETI see page 7-74 for ordering information.

④ Type HJXD6, HHJXD6 Circuit Breakers are UL listed for reverse fed applications.

⑤ CE applies to non-interchangeable type HJXD6-A only.

⑥ HACR rated.

SJD 400A Frame Digital Solid State Sentron Sensitrip III Series

Type SJD6-A

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SJD69200■	200
SJD69300■	300
SJD69400■	400
SJD69200G■	200
SJD69300G■	300
SJD69400G■	400
SJD69200NT■	200
SJD69300NT■	300
SJD69400NT■	400
SJD69200NGT■	200
SJD69300NGT■	300
SJD69400NGT■	400

Type SHJD6-A

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHJD69200■	200
SHJD69300■	300
SHJD69400■	400
SHJD69200G■	200
SHJD69300G■	300
SHJD69400G■	400
SHJD69200NT■	200
SHJD69300NT■	300
SHJD69400NT■	400
SHJD69200NGT■	200
SHJD69300NGT■	300
SHJD69400NGT■	400

Current Limiting

Type SCJD6-A

Red Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SCJD69200■	200
SCJD69300■	300
SCJD69400■	400
SCJD69200G■	200
SCJD69300G■	300
SCJD69400G■	400
SCJD69200NT■	200
SCJD69300NT■	300
SCJD69400NT■	400
SCJD69200NGT■	200
SCJD69300NGT■	300
SCJD69400NGT■	400

SJD 400A Frame – 100% Rated②

Type SJD6-A

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SJD69200H■	200
SJD69300H■	300
SJD69400H■	400
SJD69200GH■	200
SJD69300GH■	300
SJD69400GH■	400
SJD69200NTH■	200
SJD69300NTH■	300
SJD69400NTH■	400
SJD69200NGTH■	200
SJD69300NGTH■	300
SJD69400NGTH■	400

Type SHJD6-A

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHJD69200H■	200
SHJD69300H■	300
SHJD69400H■	400
SHJD69200GH■	200
SHJD69300GH■	300
SHJD69400GH■	400
SHJD69200NTH■	200
SHJD69300NTH■	300
SHJD69400NTH■	400
SHJD69200NGTH■	200
SHJD69300NGTH■	300
SHJD69400NGTH■	400

Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instantaneous Setting	Short Time Pick Up	Short Time Delay	Short Time I²t Pick Up	Ground Fault Pick Up	Ground Fault Delay
None	LI	√	√	√					
G	LIG	√	√	√				√	√
NT	LSI	√	√	√	√	√	√		
NGT	LSIG	√	√	√	√	√	√	√	√

Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SJD6-A	65	35	25
SHJD6-A	100	65	35
SCJD6-A	200	150	100

Note: "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire systems. For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

■ Built to order. Allow 2–3 weeks for delivery.

①For additional information, see **Note: A,** page 7-88.

②Refer to the NEC for proper application of 100% rated devices.

Ordering Information

Pricing information for all Digital Sentron Series SJD frames is for complete breaker only – price required lugs as separate items – lugs are suitable for 75° C wire.

SJD6 and SCJD6 are acceptable for reverse connection application.

SHJD6 are not acceptable for reverse connection application.

Shipping Weights

Breaker Type	Number per Carton	Shipping Weight (lbs)
SJD6-A	1	20
SHJD6-A	1	20
SCJD6-A	1	33

Lugs for 75° C Wire①

Catalog Number	No of Cables per Connector	Wire Range
TA2J6500	2 2	#3/0-500 kcmil Cu #4/0-500 kcmil Al
TA1L6750	1 1	500–750 kcmil Al 500–600 kcmil Cu
TC1J6600 TC2J6500 TA2J630	1 2 2	#3/0-600 kcmil Cu #3/0-500 kcmil Cu #4–#3/0-Cu/Al
Compression Lug		
CCL600	(1 pc.)	#1/0-500 kcmil Cu/Al

Neutral Transformers

Ampere Rating	Catalog Number
200	N02SJD
300	N03SJD
400	N04SJD

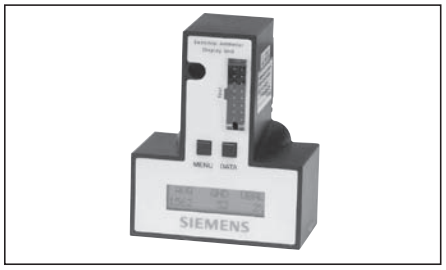
Enclosures Section 6
Accessories pages 7-54 and 7-95 to 7-100

Accessories for:

JD 400A Frame
LD 600A Frame
LMD 800A Frame
SJD 400A Frame
SLD 600A Frame



Sensitrip Ammeter



The Ammeter Display Units plug into the Sensitrip Trip Unit and displays the phase current flowing in the breaker. They are powered by the breaker's CT's with replaceable battery back-up for maintaining trip and max logs.

The SADU reads currents, current imbalance, current demand, and trip status.

Ammeter Mounting Kit

The Ammeter may also be panel or door mounted using the SADURMK18 remote mounting kit.

Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
24		S17JLD6	—
48		S18JLD6▲	—
120		S01JLD6	S01JLD62A
240		S03JLD6	S03JLD62A
277		S15JLD6▲	S15JLD64A▲
480		S04JLD6	—
	12	S16JLD6▲	S16JLD62A▲
	24	S07JLD6	S07JLD62A
	48	S09JLD6▲	S09JLD62A
	125	S11JLD6	S11JLD62A▲
	250	S13JLD6▲	S13JLD62A▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01JLD6	U01JLD62A	U01JLD62AA
208		U02JLD6▲	U02JLD62A▲	U02JLD62AA▲
240		U03JLD6	U03JLD62A▲	U03JLD62AA▲
480		U06JLD6	U06JLD64A▲	U06JLD64AA▲
	24	U13JLD6	U13JLD62A	U13JLD62AA
	48	U14JLD6▲	U14JLD62A▲	U14JLD62AA▲
	125	U10JLD6▲	U10JLD62A▲	U10JLD62AA▲
	250	U12JLD6▲	U12JLD62A▲	U12JLD62AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01JLD64	A02JLD64
—	12	A01JLDLV	A02JLDLV

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	CatalogNumber
480	250	B01JLD64	A01JLD64B	A02JLD64B

Plug-in Ammeter Display Units

Breaker Type	Description	Catalog Number
SJD, SLD	Display Unit	SADU
	Remote Mounting Kit	SADURMK18

Note: Accessory modules can only be added to right side pole of solid state SJD and SLD frame circuit breakers. No accessories can be added if mechanical interlock is used. All accessories on this page are useable on superseded JD2, JJ6, JL6, HJ6, SJL, LJ6, LL6, HL6 and SLL circuit breakers.

▲ Built to order. Allow 6–8 weeks for delivery.

Molded Case Circuit Breakers

LD 600A Frame Sentron Series

Type LXD6-A①④ — Blue Label

Non-Interchangeable Trip (Assembled Circuit Breaker without Lugs)

Continuous Current Rating @ 40°C	2-Pole (3-Pole Width) 600V AC 250V DC Catalog Number	3-Pole 600V AC 500V DC Catalog Number
450	LXD62B450■	LXD63B450
500	LXD62B500■	LXD63B500
600	LXD62B600	LXD63B600

Type LD6-A④ — Blue Label

Interchangeable Trip

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
2-Pole 600V AC, 250V DC (3-Pole Width)			
250	LD62B250■	LD62F600	JD62T250■
300	LD62B300■		JD62T300■
350	LD62B350■		JD62T350■
400	LD62B400		JD62T400
450	LD62B450■		LD62T450■
500	LD62B500■		LD62T500■
600	LD62B600		LD62T600
3-Pole 600V AC, 500V DC②			
250	LD63B250	LD63F600	JD63T250
300	LD63B300		JD63T300
350	LD63B350		JD63T350
400	LD63B400		JD63T400
450	LD63B450		LD63T450
500	LD63B500		LD63T500
600	LD63B600		LD63T600

Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA) UL 489 AIR (File E10848) Volts AC (50/60Hz) 240	480	600	Volts DC 250	500②	IEC 947-2 Volts AC (50/60Hz) 220/240 (Icu)	(Ics)	380/415 (Icu)	(Ics)	500 (Icu)	(Ics)
LD6-A, LXD6-A	65	35	25	30 (2-P)	25 (3-P)	65	33	40	20	—	—
HLD6-A, HLXD6-A	100	65	35	30 (2-P)	35 (3-P)	100	50	65	33	—	—
HHLD6, HHLXD6	200	100	50	—	—	—	—	—	—	—	—
CLD6-A	200	150	100	—	50 (3-P)	—	—	—	—	—	—

Instantaneous Adjustment Trip Range

Breaker Ampere Rating	Nominal Instantaneous Values ±20% Tolerance Low	2	3	4	5	6	7	±20% Tolerance High
250-300	1250	1430	1610	1790	1960	2140	2320	2500
350-450	2000	2290	2570	2860	3140	3430	3710	4000
500-600	3000	3430	3800	4290	4710	5140	5570	6000

■ Built to order. Allow 2–3 weeks for delivery.

①Type LXD6A circuit breakers are UL Listed for reverse fed applications.
②When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.
③See **Note: A** page 7-88.
④HACR rated.
Note: LD frame qualified to UL489 supplement SB "NAVAL". See page 7-91 for additional information.

Modifications page 7-91
Enclosures Section 6
Accessories pages 7-58 and 7-95 to 7-100

Ordering Information

Complete Breaker Unassembled with Lugs
Prices of LD6, HLD6, and HHLD6 breakers include frame, trip, and both line and load lugs (TA2J6500). When ordered by these catalog numbers, the customer will receive the frame, trip and lugs separately packaged. For applications requiring different lugs, order individual items as needed.

Complete Breaker Assembled without Lugs
Prices of LXD6, HLXD6, HHLXD6, and CLD6 include frame with non-interchangeable trip unit installed only. Order required lugs separately. For line and load lugs (TA2J6500) installed, add suffix "L" to catalog number (add 2 times list price of lugs for each pole).

100% Rated (3-pole only)
Types LXD6 and HLXD6 breakers are available with 100% ratings. To order add suffix "H" to catalog number, and 10% to list price. 100% rated LD breakers require the use of 90°C Cu cable sized at 75°C ampacity and lugs TC1J6600 or TC2J6500.

50°C Applications see page 7-91.

400Hz Applications see page 7-91.

Shipping Weights

Number of Poles	Number per Carton	Shipping Weight (lbs.)
LXD6, LD6, HLD6, HHLD6 Assembled Breaker (less terminals)		
2	1	17.5
3	1	19.5
LD6, HLD6, HHLD6 Frame Only		
2	1	14
3	1	15.5
LD6, HHLD6 Trip Unit Only		
2	1	3.5
3	1	4
CLD6 Complete Assembled Breaker (less terminals)		
3	1	31.5

Lugs For 75°C Wire③

Catalog Number	Cables per Lug	Wire Range
TA2J6500	1, 2	#3/0 500 kcmil Cu
	2	#4/0 500 kcmil Al
TC2J6500	2	#3/0-500 kcmil Cu
TA1L6750	1	500-750 kcmil Al
	1	500-600 kcmil Cu
TC1J6600	1	#3/0-600 kcmil Cu
Compression Lug		
CCL600	1	500 kcmil Cu/Al

Type HLD6-A, HLXD6-A②③⑥

Black Label

Interchangeable Trip

Continuous Current Rating @ 40°C	Complete Breaker Unassembled w/Lugs Catalog Number	Frame Only Catalog Number	Trip Unit Only Catalog Number
2-Pole 600V AC, 250V DC (3-Pole Width)			
250	HLD62B250■	HLD62F600■	JD62T250■
300	HLD62B300■		JD62T300■
350	HLD62B350■		JD62T350■
400	HLD62B400■		JD62T400
450	HLD62B450■		LD62T450■
500	HLD62B500■		LD62T500■
600	HLD62B600■		LD62T600
3-Pole 600V AC, 500V DC①⑤			
250	HLD63B250	HLD63F600	JD63T250
300	HLD63B300		JD63T300
350	HLD63B350		JD63T350
400	HLD63B400		JD63T400
450	HLD63B450		LD63T450
500	HLD63B500		LD63T500
600	HLD63B600		LD63T600

Type HHLD6, HHLXD6②③⑥

Black Label

2-Pole 600V AC (3-Pole Width)

250	HHLD62B250■	HHLD62F600■	JD62T250■
300	HHLD62B300■		JD62T300■
350	HHLD62B350■		JD62T350■
400	HHLD62B400■		JD62T400
450	HHLD62B450■		HHLD62T450■
500	HHLD62B500■		HHLD62T500■
600	HHLD62B600■		HHLD62T600■
3-Pole 600V AC			
250	HHLD63B250	HHLD63F600	JD63T250
300	HHLD63B300		JD63T300
350	HHLD63B350		JD63T350
400	HHLD63B400		JD63T400
450	HHLD63B450■		HHLD63T450■
500	HHLD63B500■		HHLD63T500■
600	HHLD63B600■		HHLD63T600■

Type CLD6-A③⑥

Fuseless Current Limiting

Red Label

Non-Interchangeable Trip (Assembled Circuit Breaker Without Lugs)

Continuous Current Rating @ 40°C	2-Pole 600V AC/250V DC Catalog Number	3-Pole 600V AC/500V DC Catalog Number
450	For 2-pole application use outside poles of 3-pole circuit breaker	CLD63B450■
500		CLD63B500
600		CLD63B600

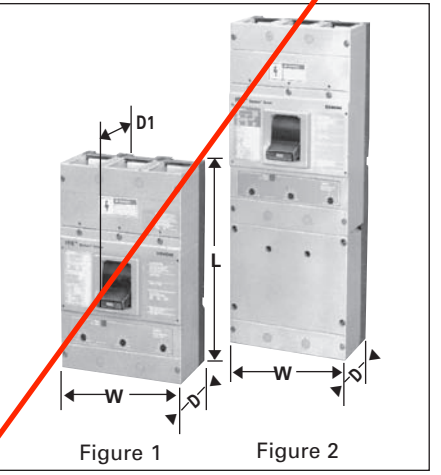


Figure 1 Figure 2

Dimensions (in inches)

Breaker Type	W	L	D	To Handle D1
Figure 1 LXD6-A, LD6-A HLD6-A HHLD6, HHLXD6, LXD6–ETI,④ SLD6, SHLD6	7.5	11	4	5.44
Figure 2 CLD6, CLD6-ETI,④ SCLD6	7.5	17.86	4	5.44

Enclosures: (except SCLD6)

Type	Catalog Number
1	LD6N1
3R	LD6N3R
12	LD6N12
4X	LD6SS4
7,9	ED6
Neutral	W60993

For inches / millimeters conversion, see Application Data section.

■ Built to order. Allow 2–3 weeks for delivery.

① When wired as shown on page 7-4, this circuit breaker is UL listed and rated for use on 500V DC ungrounded UPS systems only.

② For complete assembled 3-pole HLD6 or HHLD6 type circuit breaker change the prefix identifier HLD6 or HHLD6 to HLXD6 or HHLXD6. Price is sum of frame and trip units prices, e.g. price of HLXD63B400 is the price of HLD63F600 plus the price of LD63T600. Order the terminal connectors separately.

③ Type HLXD6, HHLXD6, & CLD6 Circuit Breakers are UL Listed for reverse feed applications.

④ LXD6-ETI, CLD6-ETI see page 7-74 for ordering information.

⑤ CE Applies to non-interchangeable type HLXD only.

⑥ HACR rated.

Molded Case Circuit Breakers

SLD 600A Frame Digital Solid State Sentron Sensitrip III Series

Selection

Type SLD6-A

Blue Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SLD69300■	300
SLD69400■	400
SLD69500■	500
SLD69600■	600
SLD69300G■	300
SLD69400G■	400
SLD69500G■	500
SLD69600G■	600
SLD69300NT■	300
SLD69400NT■	400
SLD69500NT■	500
SLD69600NT■	600
SLD69300NGT■	300
SLD69400NGT■	400
SLD69500NGT■	500
SLD69600NGT■	600

Type SHLD6-A

Black Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SHLD69300■	300
SHLD69400■	400
SHLD69500■	500
SHLD69600■	600
SHLD69300G■	300
SHLD69400G■	400
SHLD69500G■	500
SHLD69600G■	600
SHLD69300NT■	300
SHLD69400NT■	400
SHLD69500NT■	500
SHLD69600NT■	600
SHLD69300NGT■	300
SHLD69400NGT■	400
SHLD69500NGT■	500
SHLD69600NGT■	600

Current Limiting Type SCLD6-A

Red Label

3-Pole, 600V AC	
Catalog Number	Max Current Rating
SCLD69300■	300
SCLD69400■	400
SCLD69500■	500
SCLD69600■	600
SCLD69300G■	300
SCLD69400G■	400
SCLD69500G■	500
SCLD69600G■	600
SCLD69300NT■	300
SCLD69400NT■	400
SCLD69500NT■	500
SCLD69600NT■	600
SCLD69300NGT■	300
SCLD69400NGT■	400
SCLD69500NGT■	500
SCLD69600NGT■	600

Ordering Information

Pricing information for all Digital Sentron Series SLD frames is for complete breaker only – price required lugs as separate items – lugs are suitable for 75° C wire.

SLD6 and SCLD6 are suitable for reverse connection application.

SHLD6 are not suitable for reverse connection application.

Shipping Weights

Breaker Type	Number per Carton	Shipping Weight (lbs)
SLD6-A	1	20
SHLD6-A	1	20
SCLD6-A	1	33

Neutral Transformers

Ampere Rating	Catalog Number
300	N03SJD
400	N04SJD
500	N05SLD
600	N06SLD

Trip Unit Adjustable Functions

Suffix Letter Code	Trip Type	Cont Current Setting	Long Time Delay	Instan-taneous Setting	Short Time Pick Up	Short Time Delay	Short Time I^2t Pick Up	Ground Fault Pick Up	Ground Fault Delay
None	LI	√	√	√					
G	LIG	√	√	√				√	√
NT	LSI	√	√	√	√	√	√		
NGT	LSIG	√	√	√	√	√	√	√	√

Interrupting Ratings

Breaker Type	RMS Symmetrical kA UL 489 (File E10848)		
	240V AC	480V AC	600V AC
SLD6-A	65	35	25
SHLD6-A	100	65	35
SCLD6-A	200	150	100

Note: "G" suffix in catalog number denotes circuit breaker for 3-phase, 3-wire circuits. For 3-phase, 4-wire, order correct 4th wire (neutral) transformer as separate and additional item.

For ordering information and terminal connectors see page 7-55; for enclosures, see page 7-56.

100% Rated – Not available in SLD6 Frame.

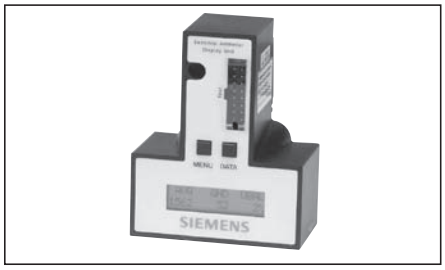
■ Built to order. Allow 2–3 weeks for delivery.

Accessories for:

JD 400A Frame
LD 600A Frame
LMD 800A Frame
SJD 400A Frame
SLD 600A Frame



Sensitrip Ammeter



The Ammeter Display Units plug into the Sensitrip Trip Unit and displays the phase current flowing in the breaker. They are powered by the breaker's CT's with replaceable battery back-up for maintaining trip and max logs.

The SADU reads currents, current imbalance, current demand, and trip status.

Ammeter Mounting Kit

The Ammeter may also be panel or door mounted using the SADURMK18 remote mounting kit.

Shunt Trip Combinations

Control Voltage		1 Shunt Trip	1 Shunt Trip and 1 Auxiliary Switch
AC	DC	Catalog Number	Catalog Number
24		S17JLD6	—
48		S18JLD6▲	—
120		S01JLD6	S01JLD62A
240		S03JLD6	S03JLD62A
277		S15JLD6▲	S15JLD64A▲
480		S04JLD6	—
	12	S16JLD6▲	S16JLD62A▲
	24	S07JLD6	S07JLD62A
	48	S09JLD6▲	S09JLD62A
	125	S11JLD6	S11JLD62A▲
	250	S13JLD6▲	S13JLD62A▲

Undervoltage Trip Combinations

Control Voltage		1 Undervoltage Trip	1 Undervoltage Trip and 1 Auxiliary Switch	1 Undervoltage Trip and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	Catalog Number
120		U01JLD6	U01JLD62A	U01JLD62AA
208		U02JLD6▲	U02JLD62A▲	U02JLD62AA▲
240		U03JLD6	U03JLD62A▲	U03JLD62AA▲
480		U06JLD6	U06JLD64A▲	U06JLD64AA▲
	24	U13JLD6	U13JLD62A	U13JLD62AA
	48	U14JLD6▲	U14JLD62A▲	U14JLD62AA▲
	125	U10JLD6▲	U10JLD62A▲	U10JLD62AA▲
	250	U12JLD6▲	U12JLD62A▲	U12JLD62AA▲

Auxiliary Switch Combinations

Maximum Voltage		1 Form C	2 Form C
AC	DC	Catalog Number	Catalog Number
480	250	A01JLD64	A02JLD64
—	12	A01JLDLV	A02JLDLV

Alarm Switch Combinations

Maximum Voltage		1 Alarm Switch	1 Alarm Switch and 1 Auxiliary Switch	1 Alarm Switch and 2 Auxiliary Switches
AC	DC	Catalog Number	Catalog Number	CatalogNumber
480	250	B01JLD64	A01JLD64B	A02JLD64B

Plug-in Ammeter Display Units

Breaker Type	Description	Catalog Number
SJD, SLD	Display Unit	SADU
	Remote Mounting Kit	SADURMK18

Note: Accessory modules can only be added to right side pole of solid state SJD and SLD frame circuit breakers. No accessories can be added if mechanical interlock is used. All accessories on this page are useable on superseded JD2, JJ6, JL6, HJ6, SJL, LJ6, LL6, HL6 and SLL circuit breakers.

▲ Built to order. Allow 6–8 weeks for delivery.

West Coast Metering

Selection and Application Guide

CIRCUIT BREAKERS
PAGE 14





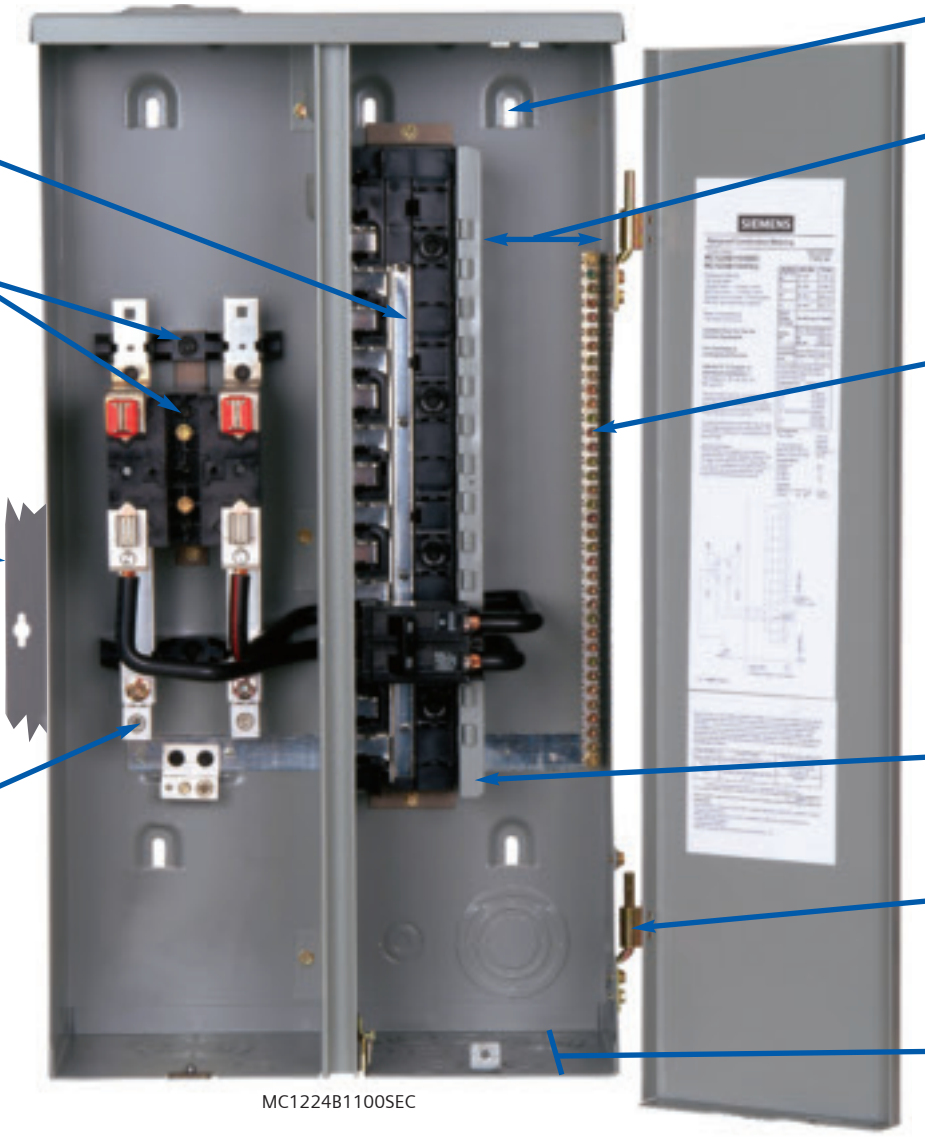
SIEMENS

Global network of innovation

Combination Meter Sockets

Overhead and Underground Feed

Features and Benefits



MC1224B1100SEC

Catalog Number Logic

Example: MC1224B1100FEC

MC	12	24	B	1	100	FEC
MC = Meter Combination MM = Meter Main	Spaces	Circuits	B = Main Breaker L = Main Lug	1 = Single Phase	Amperage	F = Semi-Flush S = Surface E = EUSERC C = OH/UG Feed (side-by-side) D = UG Feed Only (over under) M = Field Added 2nd Main W = Wide Load Center (not between the studs) SS = Test Block Bypass Socket

EUSERC Approved Meter Main and Meter Load Centers (100-225A)

Overhead and Underground Feed

FEATURES

- UL listed
- Outdoor type 3R enclosure
- Meets or exceeds EUSERC requirements
- 22,000 AIC rated
- Surface and semi–flush units available. Semi–flush rails are depth adjustable
- Side-hinged door with one screw removal
- Load wiring may exit top or bottom on flush devices
- Suitable for use only as service entrance equipment
- RX type hub provision on top endwall (surface devices), HC type hub provision on bottom endwall
- 5th jaw accessory available (ECMC5J)
- Ring type meter covers
- Contact local utility to confirm meter socket placement prior to installation
- See end of section for dimensions and wiring diagrams



MM0406L1200SEC



MC2442B1200SEC

BETWEEN STUDS CONSTRUCTION

Amps Max.	Main Breaker Catalog No.	Mounting	No. of Spaces	Max. Circuits	New Style Catalog Number	Old Style Catalog Number	Dimensions (inches) ④			K.O. Fig.
							Height	Width	Depth	
100	Q2100H	Flush	12	24	**MC1224B1100FEC**	MC1224MB1100F	26-9/16	14-1/2	7-1/2	2
100	Q2100H	Surface	12	24	**MC1224B1100SEC**	MC1224MB1100S	26-9/16	14-1/2	7-1/2	1
100	Q2100H	Flush	16	32	**MC1632B1100FEC**	–	30-9/16	14-1/2	7-1/2	2
100	Q2100H	Surface	16	32	**MC1632B1100SEC**	–	30-9/16	14-1/2	7-1/2	1
125	Q2125H	Flush	12	24	**MC1224B1125FEC**	MC1224MB1125F	26-9/16	14-1/2	7-1/2	2
125	Q2125H	Surface	12	24	**MC1224B1125SEC**	MC1224MB1125S	26-9/16	14-1/2	7-1/2	1
125	Q2125H	Flush	16	32	**MC1632B1125FEC**	MC1632MB1125F	30-9/16	14-1/2	7-1/2	2
125	Types QP	Flush	4	6	**MM0406L1125FEC** ①	MM0406ML1125F	26-9/16	14-1/2	7-1/2	2
125	and QPH	Surface	4	6	**MM406L1125SEC** ①	MM0406ML1125S	26-9/16	14-1/2	7-1/2	1
200	EQ9985	Flush	24	42	**MC2442B1200FEC**	MC2040MB1200F	40-9/16	14-1/2	7-1/2	2
200	EQ9985	Surface	24	48	**MC2442B1200SEC**	MC2040MB1200S	40-9/16	14-1/2	7-1/2	1
200	Types QN, QNH,	Flush	4	6	**MM0406L1200FEC** ①	MM0406ML1200F	30-9/16	14-1/2	7-1/2	2
200	QP and QPH	Surface	4	6	**MM0406L1200SEC** ①	MM0406ML1200S	30-9/16	14-1/2	7-1/2	1
225	EQ9986	Flush	24	42	**MC2442B1225FEC**	MC2040MB1225F	40-9/16	14-1/2	7-1/2	2
225	EQ9986	Surface	24	42	**MC2442B1225SEC**	MC2040MB1225S	40-9/16	14-1/2	7-1/2	1

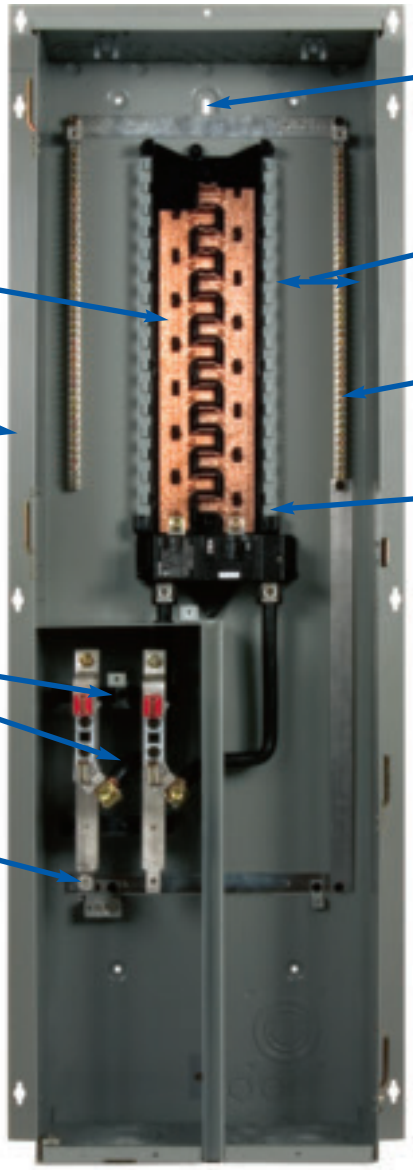
WIDE LOAD CENTER CONSTRUCTION

Amps Max.	Main Breaker Catalog No.	Mounting	No. of Spaces	Max. Circuits	New Style Catalog Number	Old Style Catalog Number	Dimensions (inches) ④			K.O. Fig.
							Height	Width②	Depth	
200	QN2200RH	Surface ③	30	40	**MC3040B1200SECW** ⑤	NA	32-1/4	21	5-1/8	3
200	QN2200RH	Surface ③	30	40	**MC4040B1200SECW** ⑤	MC4040MB1200S	32-1/4	21	5-1/8	3

① Main breaker not included.
② 21" width will not fit between typical 16" center stud construction.
③ For flush mounting, use flush rail kit FRK1.
④ Dimensions shown are representative of outside box dimensions and do not include allowances for protrusions. Dimensions are subject to change.
⑤ Meter combo has a full width load center section with a plastic basepan.

Combination Meter Sockets

Underground Feed Only
Features and Benefits



MC3042B1200FED



EUSERC Approved Meter Main and Meter Load Centers (200-225A)

Underground Feed Only

FEATURES

- UL listed
- Meets or exceeds EUSERC requirements
- 22,000 AIC rated
- Surface and semi–flush units available. Semi–flush rails are depth adjustable
- Side-hinged door with one screw removal
- Load wiring may exit top or bottom on flush mount devices
- Suitable for use only as service entrance equipment
- RX type hub provision on top endwall (surface devices), and HC type hub provision on bottom endwall
- 5th jaw accessory available (ECMC5J)
- Ring type meter covers
- Contact local utility to confirm meter socket placement prior to installation
- See end of section for dimensions and wiring diagrams



MC1212L1200SED



MC3042B1200FED

BETWEEN THE STUDS CONSTRUCTION

Main Amps	Main Breaker	No. of Spaces	No. of Circuits	Mounting	New Catalog Number	Old Style Catalog Number	Dimensions (inches) ③ Height	Width	Depth	K.O. Fig.
200	N/A	12	12	Flush	**MC1212L1200FED** ①②	MC1224MC1200F	38-3/8	14-1/2	7-1/2	4
200	N/A	12	12	Surface	**MC1212L1200SED** ①②	MC1224MB1200S	38-3/8	14-1/2	7-1/2	3
200	MBK200A	20	40	Surface	**MC2040B1200SED**	N/A	41-7/8	14-1/2	7-1/2	4
200	MBK200A	20	40	Flush	**MC2040B1200FED**	MC2040MB1200FE	41-7/8	14-1/2	7-1/2	3
200	MBK200A	30	42	Surface	**MC3042B1200SED**	N/A	48-3/8	14-1/2	7-1/2	4
200	MBK200A	30	42	Flush	**MC3042B1200FED**	N/A	48-3/8	14-1/2	7-1/2	3
225	MBK225A	30	42	Surface	**MC3042B1225SED**	N/A	48-3/8	14-1/2	7-1/2	4
225	MBK22SA	30	42	Flush	**MC3042B1225FED**	N/A	48-3/8	14-1/2	7-1/2	3

① Suitable for use as service entrance equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance branch circuit panel.
② Main breaker not included.
③ Dimensions shown are representative of outside box dimensions and do not include allowances for protrusions. Dimensions are subject to change.

EUSERC Commercial Metering
Single Sockets

SINGLE COMMERCIAL SAFETY SOCKETS

DESIGN / PERFORMANCE FEATURES
- Outdoor/Indoor – one design for either installation.
- Ring Type – meets requirements for various ring type locking provisions.
- Line and load top or bottom to meet overhead or underground requirements.

SYSTEMS / SPECIFICATIONS
- 100/200 amp maximum meter
- 120/240V AC, 1 phase 3 wire, 4 jaw
- 208Y/120V AC, 3 wire network, 5 jaw or 3 phase, 4 wire, 7 jaw
- 240V AC, 1 phase 3 wire, 3 phase 3 wire, or 3 phase 4 wire, 4, 5 or 7 jaw
- 600V AC, 1 phase 3 wire, 3 phase 3 wire, or 3 phase 4 wire, 4, 5 or 7 jaw
- 10,000 to 100,000 AIC
- EUSERC SEC #300



UAT427-XMWR

In addition to local code and National Electrical Code requirements, the serving utility may have special requirements for metering devices. Confirm meter socket acceptance prior to order placement.



MS14TB

RING TYPE RESIDENTIAL SOCKETS (NO DISCONNECT) 600V AC MAX. ①
1 PHASE 3 WIRE

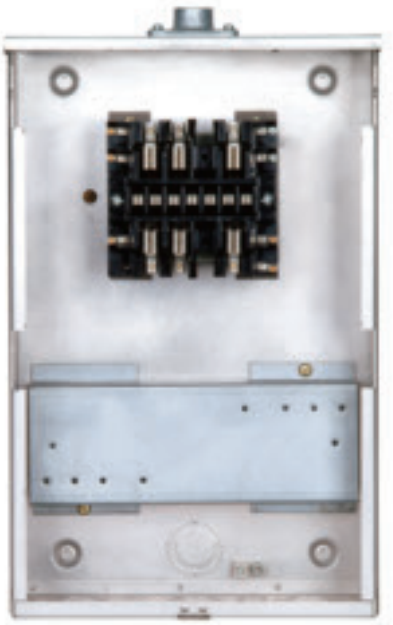
Amps Cont. Duty	Service	Catalog Number	Lugs	No. of Jaws	5th Jaw	Hub	Dimensions (inches) ②			K.O. Fig.
							Height	Width	Depth	
135	OH/UG	**SUAT121-0GWR**	#14-2/0	4	EC659-0121	RX	11.70	8.00	3.70	19
135	OH	**SUAT121-BGWR**	#14-2/0	4	EC659-0121	1-1/4" Inst.	11.70	8.00	3.70	19
135	UG	**SUAT121-PGWR**	#14-2/0	4	EC659-0121	RX	11.70	8.00	3.70	19
200	OH	**SUAT327-0GWR**	#6-350 kcmil	4	EC659-0121	RX.	14.80	8.00	4.50	20
200	OH/UG	**SUAT427-XMWR**	#6-350 kcmil	4	EC659-0121	RX.	14.80	11.00	4.50	21
200	UG	**SUAT427-PMCO**	#6-350 kcmil	5	Installed	RX.	14.80	11.00	4.50	22

RING TYPE COMMERCIAL SAFETY SOCKETS (NO DISCONNECT) 600V AC MAX., TEST BLOCK BYPASS

Amps Cont. Duty	Catalog Number	Load	Lugs	No. of Jaws	5th Jaw	Hub	Dimensions (inches) ②			K.O. Fig.
							Height	Width	Depth	
1 PHASE 3 WIRE										
100	**MS14TB**	Top & Bottom Exit	#6-2/0 box lug	4	UX001WL	RX	24.00	12.50	4.88	5
200	**MS24TB**	Top & Bottom Exit	#1/0-250 kcmil	4	UX005B	HC	30.00	14.25	6.38	6
3 PHASE 3 WIRE										
100	**MS15TB** ③	Top & Bottom Exit	#6-2/0 box lug	5	Installed	RX	24.00	12.50	4.88	5
200	**MS25TB** ④	Top & Bottom Exit	#1/0-250 kcmil	5	Installed	HC	30.00	14.25	6.38	6
3 PHASE 4 WIRE										
100	**MS17TB**	Top & Bottom Exit	#6-2/0 box lug	7	–	RX	24.00	12.50	4.88	5
200	**MS27TB**	Top & Bottom Exit	#1/0-250 kcmil	7	–	HC	30.00	14.25	6.38	6

① Sockets are UL lised for OH or UG service as indicated, but do not meet EUSERC specifications. Sealing ring included.
② Dimensions shown are representative of outside box length, width and depth, and do not include allowances for mounting bumps, endwalls, covers hubs or hardware protusions.
② Main breaker not included.
③ 5th jaw at 9 o'clock.
④ 5th jaw at 6 o'clock.

EUSERC Commercial Metering
400A CT Meter Cabinets


9387-XXXX

FEATURES
- Rated up to 600 volts
- 200A and 400A services
- Accepts bar-type CTs
- Indoor (Type 1) and outdoor (Type 3R) rated
- EUSERC approved
- 4-15 terminal available

CT MOUNTING BASES
400A MAX.

Catalog Number	Service	Max. AIC	Wire Range
RT6019A	1 phase/ 3 phase 3 wire	10	(2) NEMA Studs
RT6019HA	1 phase	50	(2) NEMA Studs
RT6067A	3 phase/	10	(2) NEMA Studs
RT6067HA	4 wire	50	(2) NEMA Studs

400A TRANSFORMER RATED
CT–METER CABINET (NO DISCONNECT)
600V AC MAX. ①

Amps Cont. Duty ③	Catalog Number	Service	No. of Jaws	Hub	Dimensions (inches) ② Height	Width	Depth	K.O. Fig.
1 PHASE 3 WIRE								
400	**RTU121814**	UG	4	–	52.00	24.00	11.00	11
400	**RTU121815**	UG	5	–	52.00	24.00	11.00	11
3 PHASE 3 WIRE								
400	**RTU121818**	UG	8	–	52.00	24.00	11.00	11
3 PHASE 3 WIRE OR 3 PHASE 4 WIRE								
400	**RTU121413** ④	OH/UG	13	RX	20.00	12.00	4.63	12
400	**RTU122015**	UG	15	–	52.00	36.00	11.00	11

① CT mounting base not included. Order from chart below.
② Dimensions shown are representative of outside box length, width and depth and do not include allowances for mounting bumps, endwalls, covers hubs or hardware protusions.
③ CT rating. Meter socket rated at 20 amps.
④ Includes test switch provision.

Transformer Rated Sockets

FEATURES
- Ring and ringless types available
- 6, 8, and 13 terminals available
- Steel or aluminum construction
- Split or solid cover options
- Test switch provision
- Prewired units available (contact local Siemens sales office)

Cover Style	Service	Dimensions (inches) Height	Width	Depth	Hub Opening	No. of Terminals	Catalog Number Aluminum	Steel
Ring-split	OH	20	12	4.5	1" hub installed	6	–	**9837-8215**
Ringless	OH/UG	20	12	4.5	RX opening	6	–	**9837-8245**
Ringless	OH/UG	20	12	4.5	RX closure plate	8	–	**9837-8405**
Ringless	OH	20	12	4.5	1" hub installed	8	–	**9837-8415**
Ringless	OH/UG	20	12	4.5	RX opening	8	–	**9837-8445**
Ringless	OH/UG	20	12	4.5	RX closure plate	13	**9837-8540**	**9837-8505**
Ringless	OH	20	12	4.5	1" hub installed	13	**9837-8514**	**9837-8515**
Ringless	OH	20	12	4.5	1.25" hub installed	13	–	**9837-8525**
Ringless	OH	20	12	4.5	1.50" hub installed	13	–	**9837-8535**
Ringless	OH/UG	20	12	4.5	RX opening	13	–	**9837-8545**

EUSERC Commercial Metering
Meter Main Combinations



MM0202F3100CESS

In addition to local code and National Electrical Code requirements, the serving utility may have special requirements for metering devices. Confirm meter socket acceptance prior to order placement.

DESIGN / PERFORMANCE FEATURES

- Outdoor/Indoor – one design for either installation.
- Ring Type – meets requirements for various ring type locking provisions.
- Test Block Bypass installed – easy servicing without interruption.
- Main Breaker field installed – adaptable to the job.
- Main T-Fuse Puller factory installed (less fuses) – adaptable to the job.

SYSTEMS / SPECIFICATIONS

- 100/200 amp maximum meter
- 120/240V AC, 1 phase 3 wire, 4 jaw
- 208Y/120V AC, 3 wire network, 5 jaw or 3 phase 4 wire, 7 jaw
- 240V AC, 1 phase 3 wire, 3 phase 3 wire, or 3 phase 4 wire , 4, 5 or 7 jaw
- 10,000 to 100,000 AIC
- EUSERC SEC #300

RING-TYPE METER MAIN COMBINATIONS (100-200A MAX.)

Test Block Bypass, 240V AC Max.

Amps Cont. Duty	Max. AIC	Tenant Main①	Circuit Breaker Prov.	Service	Jaws	Catalog Number	Service	Dimensions (inches) ② Height	Width	Depth	Wire Range AL/CU	Hub Prov.	K.O. Fig.
100	65,000	Circuit Breaker Prov.	QP, QPH, HQP	1 phase 3 wire	4	**MM0202L1100ESS**	OH	36.00	12.50	4.88	#6-2/0 Box Lug	RX	7
				3 phase 4 wire	7	**MM0202L3100ESS**	OH						7
100	100,000	T-Fuse Puller	None	1 phase 3 wire	4	**MM0202F1100ESS**	OH	36.00	12.50	4.88	#6-2/0 Box Lug	RX	7
						MM0202F1100CESS	OH/UG	24.00	20.13	4.88			9
				3 phase 4 wire	7	**MM0202F3100ESS**	OH	36.00	12.50	4.88			7
						MM0202F3100CESS	OH/UG	24.00	20.13	4.88			9
200	35,000	Circuit Breaker Prov.	QJ2, QJH2, HQJ2, HQJH2	1 phase 3 wire	4	**MM0202L1200ESS**	OH	45.00	14.25	6.38	#1/0-250 kcmil	HC	8
						MM0202L1200CESS	OH/UG	30.00	24.25	6.38			10
				3 phase 4 wire	7	**MM0202L3200CESS**	OH/UG	45.00	14.25	6.38			8
						MM0202L3200CESS	OH/UG	30.00	24.25	6.38			10
200	100,000	T-Fuse Puller	None	1 phase 3 wire	4	**MM0202F1200ESS**	OH	45.00	14.25	6.38	#1/0-250 kcmil	HC	8
						MM0202F1200CESS	OH/UG	30.00	24.25	6.38			10
				3 phase 4 wire	7	**MM0202F3200ESS**	OH	45.00	14.25	6.38			8
						MM0202F3200CESS	OH/UG	30.00	24.25	6.38			10

① Price does not include breaker or fuses.
② Dimensions shown are representative of outside box length, width and depth, and do not include allowances for mounting bumps, endwalls, covers, hubs or hardware protrusions.

EUSERC Commercial Metering
Meter Load Center Combinations



MC3040MB22SS

DESIGN / PERFORMANCE FEATURES

- Outdoor/Indoor – one design for either installation.
- Ring Type – meets requirements for various ring type locking provisions.
- Test Block Bypass installed – easy servicing without interruption.
- Main Breaker factory installed.
- Main T-Fuse Puller factory installed (less fuses).
- Compact wall-hung design reduces material and labor costs.

SYSTEMS / SPECIFICATIONS

- 100/200 amp maximum meter
- 120/240V AC, 1 phase 3 wire, 4 jaw
- 240V AC, 3 phase 4 wire, 7 jaw
- 10,000 to 100,000 AIC
- EUSERC SEC #300

In addition to local code and National Electrical Code requirements, the serving utility may have special requirements for metering devices. Confirm meter socket acceptance prior to order placement.

RING-TYPE COMMERCIAL METER LOAD CENTER COMBINATIONS (100-400A MAX.)

Test Block Bypass, 240V AC Max.

Amps Cont. Duty	Main Breaker	No. of Spaces	Max. Circuits	Service	Catalog Number	AIC Rating Std. (K)	AIC Rating Max. (K)	Dimensions (inches) ① H.	W.	D.	Wire Range AL/CU	Hub Prov.	K.O. Fig.
1 PHASE – 3 WIRE, 4 JAWS, FACTORY INSTALLED MAIN BREAKER													
100	Q2100	10	20	OH	**MC1020B1100ESS** ②	10	65	36.00	12.50	4.88	#6-2/0 box lug	RX	11
		12	24	OH/UG	**MC1224B1100CESS** ②	10	42	24.00	20.13	4.88	#6-2/0 box lug	RX	12
200	QN2200RH	24	40	OH/UG	**MC2440B1200CESS** ②	10	22	30.00	25.75	6.38	#1/0-250 kcmil	HC	13
320	QN2200RH	30	30	UG	**MC3040MB21SS** ⑤	22	22	40.07	30.25	5.94	1 set of 2 studs	HV	18
		30	40	UG	**MC3040MB22SS** ⑥	22	22	40.07	30.25	5.94	per leg	HV	18
3 PHASE – 4 WIRE, 7 JAWS, FACTORY INSTALLED T-FUSE PULLER ③													
100	T-Fuse Prov.	18	30	OH/UG	**MC1830F3100CESS** ④	100	100	26.00	24.25	4.88	#6-2/0 box lug	RX	14
200	T-Fuse Prov.	24	42	OH/UG	**MC2442F3200CESS** ④	100	100	2.00	27.25	6.38	#1/0-250 kcmil	HC	15

① Dimensions shown are representative of outside box length, width and depth, and do not include allowances for mounting bumps, endwalls, covers, hubs or hardware protrusions.
② UL listed to field change main breaker to higher AIC.
③ Price does not include uses.
④ Series rated for standard 10,000 AIC type QP branch circuit breakers.
⑤ One QN2200RH installed. Provisions for one additional subfeed QP or QPH (100 amps max.) breaker service disconnect to feed a remote load.
⑥ One QN2200RH installed. Provisions for one additional subfeed QNR or QNRH breaker type service disconnect to feed a remote load.



All-In-One Pak Metering

New and Improved!



Smaller, more compact design!
enclosures are lighter and use less wall space

Factory options!
5th jaw and horn bypass

Double barrel connectors
available for parallel feed

Stud Kits
for line compression lugs available

More secure design!
greater utility acceptance

EUSERC designs!
All ring style designs!
are EUSERC approved

Siemens Exclusive

Floating deadfront!
eliminates need for cover alignment

Siemens Exclusive

Deadfront knockouts!
eliminates need for filler plates

Siemens Exclusive

Angled circuit breaker!
for ease of installation

Centrally located neutral
minimizes neutral conductor length

Back and Bottom Exit
for load conductors

Single piece tenant cover!
easy installation

Catalog Number Logic

Example: SP6511RJB

S	P	6	5	1	1	RJB
S = Siemens	P = PAK	0 = No bussing 2 = 200 Amp 3 = 300 Amp 4 = 400 Amp 5 = 500 Amp 6 = 600 Amp	Number of Meter Sockets (2-6)	1 = Single Phase	1 = 125A Socket Rating 2 = 200A Socket Rating	R = Ringless J = 5th Jaw B = Horn Bypass

All-In-One Pak Metering
Ring Type Units


SP2211

FEATURES
- Individual split covers.
- UL Listed for 60/75°C conductors. See equipment markings for applications.
- Outdoor surface mounted enclosures field convertible to semi-flush applications.
- Top or bottom feed.
- Back and bottom branch wiring exits.
- Meets EUSERC specifications when NEMA stud kit is field added.
- 1 phase, 4 jaw sockets, 120/240V AC Max.

1 PHASE, 3 WIRE SN

Amps Cont. Duty Per Position	Bus Amps	Meter Positions Per Pak	Catalog Number	Circuit Breaker Provision	Max. AIC	Dimensions (inches) ① Height	Width	Depth	5th Jaw ② Assembly	Line Lugs Wire Range	Semi-Flush Kit Catalog Number
125	200	2	**SP2211**	QP,	65,000	37.50	13.50	6.00	GM5J	#6-300 kcmil	**SP221FK**
125	300	3	**SP3311**	QPH,	65,000	38.40	25.20	7.50	GM5J	#2-600 kcmil	**SP331FK**
125	400	4	**SP4411**	HQP	65,000	47.40	25.20	7.50	GM5J	(1) 1/0-750 kcmil	**SP441FK**
125	400	5	**SP4511**		65,000	38.40	39.20	7.50	GM5J	or	**SP4561FK**
125	400	6	**SP4611**		65,000	38.40	39.20	7.50	GM5J	(2) 1/0-250 kcmil	**SP4561FK**
125	500	4	**SP5411**		65,000	47.40	31.50	7.50	GM5J		**SP541FK**
125	600	5	**SP6511**		65,000	38.40	45.20	7.50	GM5J	(2) #2-600 kcmil	**SP6561FK**
125	600	6	**SP6611**		65,000	38.40	45.20	7.50	GM5J		**SP6561FK**
200	400	2	**SP4212**	QP QPH,	100,000	31.50	30.75	7.50	GM5J	(1) 1/0-750 kcmil	**SP422FK**
200	400	3	**SP4312**	HQP, QPP	100,000	38.44	30.75	7.50	GM5J	or	**SP432FK**
200	400	4	**SP4412**	QPHH,	100,000	47.44	30.75	7.50	GM5J	(2) 1/0-250 kcmil	**SP442FK**
200	600	4	**SP6412**	HQPP,	100,000	47.44	36.75	7.50	GM5J		**SP642FK**
200	600	5	**SP6512**	HQPPH	100,000	38.44	54.44	7.50	GM5J	(2) #2-600 kcmil	**SP6562FK**
200	600	6	**SP6612**		100,000	38.44	54.44	7.50	GM5J		**SP6562FK**

① Dimensions shown are representative of outside box length, width and depth, and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions.
② Order Catalog No. ECMMI5J for insulated 5th jaw.

All-In-One Pak Metering Accessories

Description		Catalog Number
5TH JAW KITS		
All Types	Grounded	**GM5J**
	Insulated	**ECMMI5J**
BYPASS KITS		
Slider Bypass	100 Amp	**ECMBP1U**
	200 Amp	**ECMBP2U**
Horn Bypass		**ECHBK**
COVER PLATES		
Ring Style		**ECPP**
Ringless Style		**ECP3**
SEALING RINGS		
Snap-On Type Aluminum		**SRSS**
Screw Type Stainless Steel		**SRSW**

Description	Catalog Number
FILLER PLATES	
1"	**ECOF3**
4" to 2"	**ECCP3U**
NEMA STUD KITS (Meets EUSERC Requirements)	
400 Amp Bus	**NSK400**
600 Amp Bus	**NSK600**
LUGS FOR NEMA STUD KITS	
(2) #6-350 kcmil	**SUK350TA**
(1) #2-600 kcmil	**SUK600TA**
(2) #500-1000 kcmil	**SUK1000TA**
ALTERNATE LUG KITS	
400 Amp Bus	**PLK400**
600 Amp Bus	**PLK600**

Description	Catalog Number
TYPE "HS" CONDUIT HUBS	
1"	**ECHS100**
1-1/4"	**ECHS125**
1-1/2"	**ECHS150**
2"	**ECHS200**
2-1/2"	**ECHS250**
Closure Plate	**ECHS000**
TYPE "HD" CONDUIT HUBS	
2"	**EC56854**
2-1/2"	**EC56855**
3"	**EC56856**
3-1/2"	**EC56857**
4"	**EC56858**
Closure Plate	**EC56933S**

Modular Metering
Service Entrance Modules – 1 Phase

FEATURES
- Mains available in fusible or circuit breaker style.
- 400-800A fusible mains and all tap boxes are invertible for top or bottom feed.
- 100,000A IC standard on fusible main disconnects and tap boxes.
- 65,000A IC standard for circuit breakers (100,000A IC versions available. Add suffix "U" to catalog number. Adder applies.)
- All mains fully bussed to connect with stacks on either side.
- End plates included.

SELECTION GUIDE
- Always check with the utility and local inspection authorities to verify all application requirements.
- Select fusible or circuit breaker main after determination of amps, volts, service, and AIC.
- Fusible mains and tap boxes are invertible for top or bottom feed. Breaker modules are available in dedicated top or bottom feed versions. Add suffix "BF" to circuit breaker mains for bottom feed.


WMC4

Ampere Rating	Max. Interrupting Rating	Outdoor Encl. Catalog Number	Fuse or Circuit Breaker Type	Service Feed	Line Terminal Lugs No. and Size Per Line and Neutral ②	Dimensions (inches) ① Height	Width	Depth Outdoor
1 PHASE, 3 WIRE SN, INCOMING, 120/240V AC MAX.								
CIRCUIT BREAKER MODULES ③								
400	65,000	**WMC4**	JXD6	OH	(2) #1-500 kcmil	33.00	15.09	15.00
600	65,000	**WMC6**	LXD6	OH	(2) #1-500 kcmil	37.00	15.09	15.00
800	65,000	**WMC8**	MD6	OH	(3) #1/0 400 kcmil ④	43.00	20.09	15.00
1000	65,000	**WMC10**	ND6	OH	(4) #2-500 kcmil ⑤	50.00	20.09	15.00
1200	65,000	**WMC12**	ND6	OH	(4) #2-500 kcmil ⑤	50.00	20.09	15.00
1600	65,000	**WMC16** ⑥	PD6	OH	(5) 300-600 kcmil	62.00	25.03	17.50
FUSIBLE SWITCH MODULES ⑦⑧								
200	100,000	**WMP02U** ⑨	T	OH/UG	(1) #6-250 kcmil	33.00	12.00	13.00
400	100,000	**WMS4U**	T	OH/UG	(2) #4-500 kcmil	33.50	15.00	16.00
600	100,000	**WMS6U**	T	OH/UG	(2) #4-500 kcmil	41.50	15.00	16.00
800	100,000	**WMS8U**	T	OH/UG	(3) #4-500 kcmil	41.50	15.00	16.00
1200	100,000	**WMS12U**	T	UG	(4) #250-500 kcmil	50.00	20.00	15.00
TAP BOX MODULES ⑩								
800	100,000	**WMTB80**	–	OH/UG	(3) 1/0-400 kcmil	39.00	12.00	12.00
1200	100,000	**WMTB120**	–	OH/UG	(4) 250-600 kcmil	41.00	15.00	16.00
1600	100,000	**WMTB160**	–	OH/UG	(5) 300-600 kcmil	41.75	25.00	14.00
COMBINATION FUSIBLE SWITCH & PULL BOX MODULES (MEETS EUSERC REQUIREMENTS)								
400	100,000	**WMS4UPBU**	T	UG	1 Set of 2 Studs	50.06	25.50	15.00
600	100,000	**WMS6UPBU**	T	UG	1 Set of 2 Studs	50.06	25.50	15.00
800	100,000	**WMS8UPBU**	T	UG	1 Set of 2 Studs	50.06	25.50	15.00
PULL BOX MODULES (NO THRU-BUS, INCLUDES LUG LANDINGS)								
400	65,000	**WMMB1400**	–	OH/UG	1 Set of 2 Studs	37.50	16.69	9.34
800	65,000	**WMMB1800**	–	OH/UG	1 Set of 2 Studs	45.50	19.44	12.72
1200	65,000	**WMMB11200**	–	OH/UG	1 Set of 2 Studs	47.50	25.94	12.72

① Dimensions shown are representative of outside box length, width, and depth, and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions.
② Lugs may be larger than wire range given. Wire range given is according to amount of wire bend space available.
③ Main circuit breakers are top feed. Consult sales office for bottom feed applications.
④ Lugs rated for 500 kcmil. Wire bend space limits neutral lug to 400 kcmil.
⑤ Neutral on bottom feed units will only accept (2) #1-500 kcmil.
⑥ 1200 amp maximum feed per side.
⑦ Fuses not included
⑧ Fusible switches, except 1200 amp, are top feed, invertible for bottom feed.
⑨ Fusible pull-out switch.
⑩ Coupler not included.

Modular Metering
Service Entrance Modules – 3 Phase

FEATURES
- Mains available in fusible or circuit breaker style.
- 400-800A fusible mains and all tap boxes are invertible for top or bottom feed.
- 100,000A IC standard on fusible main disconnects and tap boxes.
- 65,000A IC standard for circuit breakers (100,000A IC versions available. Add suffix "U" to catalog number. Adder applies.)
- All mains fully bussed to connect with stacks on either side.
- End plates included.

SELECTION GUIDE
- Always check with the utility and local inspection authorities to verify all application requirements.
- Select fusible or circuit breaker main after determination of amps, volts, service, and AIC.
- Fusible mains and tap boxes are invertible for top or bottom feed. Breaker modules are available in dedicated top or bottom feed versions. Add suffix "BF" to circuit breaker mains for bottom feed.


WMS44U

3 PHASE, 4 WIRE SN, INCOMING, 120/240V AC MAX.

Ampere Rating	Max. Interrupting Rating	Outdoor Encl. Catalog Number	Fuse or Circuit Breaker Type	Service Feed	Line Terminal Lugs No. and Size Per Line and Neutral ②	Dimensions (inches) ① Height	Width	Depth Outdoor
CIRCUIT BREAKER MODULES ③								
400	65,000	**WMC44**	JXD6	OH	(2) #1-500 kcmil	33.00	15.09	15.00
600	65,000	**WMC64**	LXD6	OH	(2) #1-500 kcmil	37.00	15.09	15.00
800	65,000	**WMC84**	MD6	OH	(3) #1/0 400 kcmil ④	43.00	20.09	15.00
1000	65,000	**WMC104**	ND6	OH	(4) #2-500 kcmil ⑤	50.00	20.09	15.00
1200	65,000	**WMC124**	ND6	OH	(4) #2-500 kcmil ⑤	50.00	20.09	15.00
1600	65,000	**WMC164** ⑥	PD6	OH	(5) 300-600 kcmil	62.00	25.03	17.50
FUSIBLE SWITCH MODULES ⑦⑧								
200	100,000	**WMP024U**⑨	T	OH/UG	(1) #6-250 kcmil	33.00	12.00	13.00
400	100,000	**WMMS44U**	T	OH/UG	(2) #4-500 kcmil	33.50	15.00	16.00
600	100,000	**WMMS64U**	T	OH/UG	(2) #4-500 kcmil	41.50	15.00	16.00
800	100,000	**WMMS84U**	T	OH/UG	(3) #4-500 kcmil	41.50	15.00	16.00
1200	100,000	**WMMS124U**	T	UG	(4) #250-500 kcmil	50.00	20.00	15.00
TAP BOX MODULES ⑩								
800	100,000	**WMTB84U**	–	OH/UG	(3) 1/0-400 kcmil	39.00	12.00	12.00
1200	100,000	**WMTB124U**	–	OH/UG	(4) 250-600 kcmil	41.00	15.00	16.00
1600	100,000	**WMTB164U**	–	OH/UG	(5) 300-600 kcmil	41.75	25.00	14.00
COMBINATION FUSIBLE SWITCH & PULL BOX MODULES (MEETS EUSERC REQUIREMENTS)								
400	100,000	**WMS44UPBU**	T	UG	1 Set of 2 Studs	50.06	25.50	15.00
600	100,000	**WMS64UPBU**	T	UG	1 Set of 2 Studs	50.06	25.50	15.00
800	100,000	**WMS84UPBU**	T	UG	1 Set of 2 Studs	50.06	25.50	15.00
PULL BOX MODULES (NO THRU-BUS, INCLUDES LUG LANDINGS)								
400	65,000	**WMMB3400**	–	OH/UG	1 Set of 2 Studs	37.50	16.69	9.34
800	65,000	**WMMB3800**	–	OH/UG	1 Set of 2 Studs	45.50	19.44	12.72
1200	65,000	**WMMB31200**	–	OH/UG	1 Set of 2 Studs	47.50	25.94	12.72

① Dimensions shown are representative of outside box length, width and depth, and do not include allowances for mounting bumps, endwalls, covers, hubs, or hardware protrusions.
② Lugs may be larger than wire range given. Wire range given is according to amount of wire bend space available.
③ Main circuit breakers are top feed. Consult sales office for bottom feed applications.
④ Lugs rated for 500 kcmil. Wire bend space limits neutral lug to 400 kcmil.
⑤ Neutral on bottom feed units will only accept (2) #1-500 kcmil.
⑥ 1200 amp maximum feed per side.
⑦ Fuses not included
⑧ Fusible switches, except 1200 amp, are top feed, invertible for bottom feed.
⑨ Fusible pull-out switch.
⑩ Coupler not included.

Modular Metering
Ring Type Meter Modules

FEATURES

- UL Listed for 60/75° C conductors. See equipment markings for applications.
- Individual split covers with barrel lock compatibility.
- Interconnectable with discontinued "MM" modular metering.①
- Finish is ANSI #61 light gray enamel electrodeposited on zinc-coated G90 steel.
- 200A units UL Listed for use on systems capable of delivering up to 100,000 RMS symmetrical amperes maximum short circuit current.

SERIES TESTED SYSTEMS

Specify Siemens Modular Metering Equipment in conjunction with EQ® III or Ultimate® Load Centers



WMM3U



WMM4200U



WMM34U

1 Phase, 3 Wire SN, Incoming and Outgoing, Ring Type Gangable Meter Stack

Continuous Duty Amps Per Position	Meter Positions Per Stack	Catalog Number	Breaker Provision	Maximum AIC ③	Dimensions (inches) ② Height	Width	Depth	5th Jaw Assembly ①	Horn Bypass Kit
1 PHASE 4-JAW SOCKETS, 1 PHASE-3 WIRE THRU-BUS 120/240V AC MAX.									
125	2	**WMM2U**	QP, QPH,	65,000	32.41	13.44	7.84	ECMM5J	ECHBK
	3	**WMM3U**	HQP	65,000	41.41	13.44	7.84	ECMM5J	ECHBK
	4	**WMM4U**		65,000	50.41	13.44	7.84	ECMM5J	ECHBK
	5	**WMM5U**		65,000	59.41	13.44	7.84	ECMM5J	ECHBK
	6	**WMM6U**		65,000	68.41	13.44	7.84	ECMM5J	ECHBK
200	2	**WMM2200U**	QPP, QPPH,	100,000	36.41	17.44	7.84	ECMM5J	ECHBK
	3	**WMM3200U**	HQQP, HQPPH,	100,000	47.41	17.44	7.84	ECMM5J	ECHBK
	4	**WMM4200U**	QP, QPH, HQP ④	100,000	58.41	17.44	7.84	ECMM5J	ECHBK

3 Phase, 4 Wire SN, Incoming and 1 Phase, 3 Wire SN Outgoing, Ring Type Gangable Meter Stack

Continuous Duty Amps Per Position	Meter Positions Per Stack	Catalog Number	Breaker Provision	Maximum AIC ③	Dimensions (inches) ② Height	Width	Depth	5th Jaw① Assembly	Horn Bypass Kit	Stock Phasing Phases/Socket
1 PHASE 5-JAW SOCKETS, 3 PHASE-4 WIRE THRU-BUS 208Y/240V AC ⑤										
125	3	**WMM34U**	QP, QPH,	65,000	41.41	13.44	7.84	Installed	ECHBK	1-AB, 1-BC, 1-CA
	4	**WMM44ABU**	HQP	65,000	50.41	13.44	7.84	Installed	ECHBK	2-AB, 1-BC, 1-CA
	4	**WMM44BCU**		65,000	50.41	13.44	7.84	Installed	ECHBK	2-BC, 1-AC, 1-AB
	4	**WMM44CAU**		65,000	50.41	13.44	7.84	Installed	ECHBK	2-AB, 1-BC, 1-CA
	5	**WMM54ABU**		65,000	59.41	13.44	7.84	Installed	ECHBK	1-AB, 2-BC, 2-CA
	6	**WMM64U**		65,000	68.41	13.44	7.84	Installed	ECHBK	2-AB, 2-BC, 2-CA
200	2	**WMM24AB200U**	QPP,	100,000	36.41	17.44	7.84	Installed	ECHBK	1-BC, 1-CA
	3	**WMM34200U**	QPPH,	100,000	47.41	17.44	7.84	Installed	ECHBK	1-AB, 1-BC, 1-CA
	4	**WMM44AB200U**	HQQP,	100,000	58.41	17.44	7.84	Installed	ECHBK	2-AB, 1-BC, 1-CA
	4	**WMM44BC200U**	HQPPH,	100,000	58.41	17.44	7.84	Installed	ECHBK	2-BC, 1-AC, 1-AB
	4	**WMM44CA200U**	QP, QPH,	100,000	58.41	17.44	7.84	Installed	ECHBK	2-AB, 1-BC, 1-CA
	4	**WMM54AB200U**	HQP ④	100,000	69.41	17.44	7.84	Installed	ECHBK	2-AC, 2-BC, 1-AB
	4	**WMM54BCB200U**		100,000	69.41	17.44	7.84	Installed	ECHBK	2-AC, 2-AB, 1-BC
	4	**WMM54CAB200U**		100,000	69.41	17.44	7.84	Installed	ECHBK	2-AB, 2-BC, 1-AC

① Order ECMMI5J for insulated 5th jaw.

② Dimensions shown are representative of outside box length, width and depth, and do not include allowances for mounting bumps, endwalls, covers, hubs or hardware protrusions.

③ Max. AIC determined by maximum AIC of tenant breakers. Higher ratings may be achieved thru approved series rating combinations.

④ Order filler plate ECCP3U if using standard 2" wide circuit breaker (QP).

⑤ Not for use on 3 phase, 4 wire delta systems.

Modular Metering
Commercial Meter Modules ①②③⑥

225A Maximum
1 Phase, 3 Wire SN
Incoming and Outgoing

120/240 VOLT AC
225 AMPERE, 1 PHASE SOCKET ④⑤
Use Type QP, QPH, HQP, QPP, QPPH, HQPP, HQPPH circuit breakers, 2-pole (plug-in)

Ampere Rating	No. of Meter Sckts.	Catalog Number
1200	1	W1MM1225SS
	2	W1MM2225SS
	3	W1MM3225SS
	4	W1MM4225SS

3 Phase, 4 Wire SN, Incoming
1 Phase, 3 Wire SN, Outgoing

120/208 VOLT AC
225 AMPERE, 1 PHASE SOCKET ④⑤
Use Type QP, QPH, HQP, QPP, QPPH, HQPP, HQPPH circuit breakers, 2-pole (plug-in)

Ampere Rating	No. of Meter Sckts.	Catalog Number
1200	1	W2MM1225SS
	2	W2MM2AB225SS
	2	W2MM2BC225SS
	2	W2MM2CA225SS
	3	W2MM3225SS
	4	W2MM4AB225SS
	4	W2MM4BC225SS
	4	W2MM4CA225SS

3 Phase, 4 Wire SN, Incoming
1 Phase, 3 Wire SN, Outgoing

120/208 VOLT AC
200 AMPERE, 3 PHASE SOCKET ④⑤
Use Type QJ2, QJH2, QJ2H, HQJ2H circuit breakers, 3-pole (bolt-on)

Ampere Rating	No. of Meter Sckts.	Catalog Number
1200	1	W3MM1200SS
	2	W3MM2200SS
	3	W3MM3200SS
	4	W3MM4200SS

Note: All meter modules are supplied with one hanger bracket and one single bolt joint. Lag screws for hanger bracket and mounting brackets are not included.

① When adding modular metering modules to old installation, replace metal end closure plate with plastic end closure plate. Catalog Number WMEP.
② Meter socket is plug-in lever bypass clamping jaw type except where noted.
③ 200A units UL Listed for use on systems capable of delivering up to 100,000 RMS symmetrical amperes maximum short circuit current.
④ 200A sockets are rated continuous duty.
⑤ 200A maximum breaker size.
⑥ Available July 2005.



Plug-In Circuit Breakers

Types QP, QPH, and HQP with INSTA-WIRE®, QN and QNH

1-POLE (120V AC) ①			
Continuous Current Rating @40°C	TYPE QP 10,000A IR Catalog Number	TYPE QPH 22,000A IR Catalog Number	TYPE HQP 65,000A IR Catalog Number
15	Q115 ②	Q115H ②	Q115HH ②③
20	Q120 ②	Q120H ②	Q120HH ②③
25	Q125	Q125H ③	Q125HH ③
30	Q130	Q130H	Q130HH ③
35	Q135 ③	Q135H ③	Q135HH ③
40	Q140	Q140H	Q140HH ③
45	Q145 ③	Q145H ③	Q145HH ③
50	Q150	Q150H	Q150HH ③
60	Q160	Q160H ③	Q160HH ③
70	Q170	Q170H ③	Q170HH ③
2-POLE COMMON-TRIP (120/240V AC) ①			
Continuous Current Rating @40°C	TYPE QP 10,000A IR Catalog Number	TYPE QPH 22,000A IR Catalog Number	TYPE HQP 65,000A IR Catalog Number
15	Q215	Q215H	Q215HH
20	Q220	Q220H	Q220HH
25	Q225	Q225H ③	Q225HH ③
30	Q230	Q230H	Q230HH
35	Q235	Q235H ③	Q235HH ③
40	Q240	Q240H	Q240HH ③
45	Q245	Q245H ③	Q245HH ③
50	Q250	Q250H	Q250HH
60	Q260	Q260H	Q260HH
70	Q270	Q270H	Q270HH
80	Q280	Q280H ③	–
90	Q290	Q290H	Q290HH ③
100	Q2100	Q2100H	Q2100HH
110	Q2110	Q2110H	Q2110HH ③
125	Q2125	Q2125H	Q2125HH
2-POLE COMMON-TRIP (240V AC) ①②			
Continuous Current Rating @40°C	TYPE QP 10,000A IR Catalog Number	TYPE QPH 22,000A IR Catalog Number	TYPE HQP 65,000A IR Catalog Number
15	Q215R	–	–
20	Q220R	–	–
30	Q230R	–	–
40	Q240R	–	–
50	Q250R	–	–
60	Q260R	–	–
70	Q270R	–	–
100	Q2100R ③	–	–
3-POLE COMMON-TRIP (240V AC) ①			
Continuous Current Rating @40°C	TYPE QP 10,000A IR Catalog Number	TYPE QPH 22,000A IR Catalog Number	TYPE HQP 65,000A IR Catalog Number
15	Q315	Q315H	Q315HH ③
20	Q320	Q320H	Q320HH
25	Q325	Q325H ③	–
30	Q330	Q330H	Q330HH
35	Q335	–	–
40	Q340	Q340H	Q340HH
45	Q345	–	–
50	Q350	Q350H	Q350HH
60	Q360	Q360H	Q360HH
70	Q370	Q370H	Q370HH ③
80	Q380	Q380H	Q380HH ③
90	Q390	Q390H	Q390HH ③
100	Q3100	Q3100H	Q3100HH



1-Pole
Type QP



2-Pole
Type QP



3-Pole
Type QP



Type QN



Type QNH

Type QN and QNH			
Breaker Type	Amp. Rtg.	10K AIR Catalog Number	22K AIR Catalog Number
QN 2-Pole 120/240V AC	150	QN2150	QN2150R
	175	QN2175③	QN2175R③
	200	QN2200	QN2200R
QNH 2-Pole 120/240V AC	150	QN2150H	QN2150RH
	175	QN2175H③	QN2175RH③
	200	QN2200H	QN2200RH

① HACR rated.
② UL listed for frequent switching applications (SWD). 120V AC fluorescent lighting.
③ Built to order. Allow 2-3 weeks for delivery.

Plug-In Circuit Breakers

Duplex, Triplex, Quadplex, GFCIs, AFCIs and Surge Products


Duplex


Triplex


Quadplex


1 & 2-Pole GFCIs


1-Pole AFCI


2-Pole AFCI


CB/SSA TVSS

DUPLEX CIRCUIT BREAKERS

Breaker Type	Ampere Rating	Catalog Number	Catalog Number
QT 1-Pole 10K AIC 120V AC	15-15	Q1515	Q1515NC ①
	15-20	Q1520	Q1520NC ①
	20-20	Q2020	Q2020NC ①
	20-30	Q2030	–
	15-30 ②	Q3015	–
	20-30	Q3020	–
	30-30	Q3030	Q3030NC ①

TRIPLEX CIRCUIT BREAKERS

Breaker Type	Ampere Rating: Single Pole	Ampere Rating: Common-Trip 2-Pole	Catalog Number
QT 2-Pole 10K AIC 120/240V AC Center Common Trip	15	15	Q21515CT
	15	20	Q21520CT
	15	25	Q21525CT ②
	15	30	Q21530CT
	15	35	Q21535CT ②
	15	40	Q21540CT
	15	45	Q21545CT ②
	15	50	Q21550CT
	20	20	Q22020CT
	20	25	Q22025CT ②
	20	30	Q22030CT
	20	35	Q22035CT ②
	20	40	Q22040CT
	20	45	Q22045CT ②
	20	50	Q22050CT
	30	30	Q23030CT

QUADPLEX CIRCUIT BREAKERS

Breaker Type	Ampere Rating: Inside 2-Pole	Ampere Rating: Outside 2-Pole	Catalog Number
QT 2-Pole 10K AIC 120/240V AC Common Trip	15	15	Q21515CT2
	20	20	Q22020CT2
	20	30	Q23020CT2
	20	40	Q24020CT2
	30	30	Q23030CT2
	30	40	Q24030CT2
	40	40	Q24040CT2
	50	30	Q23050CT2

GROUND FAULT CIRCUIT INTERUPTERS (Class A - 5mA)

Breaker Type	Amp. Rtg.	10K AIR Catalog Number	22K AIR Catalog Number
QPF/QPHF 1-Pole 120V AC	15	QF115①	QF115H①
	20	QF120①	QF120H①②
	25	QF125②	–
	30	QF130	QF130H
QPF/QPHF 2-Pole 120/240V AC	15	QF215	QF215H
	20	QF220	QF220H
	30	QF230	QF230H
	40	QF240	QF240H
	50	QF250	QF250H
	60	QF260	QF260H

ARC FAULT CIRCUIT INTERUPTERS (Class A - 5mA)

Breaker Type	Amp. Rtg.	10K AIR Catalog Number	22K AIR Catalog Number
QAF/QAFH 1-Pole 120V AC	15	Q115AF①	Q115AFH①②
	20	Q120AF①	Q120AFH①②
QAF/QAFH 2-Pole 120/240V AC	15	Q215AF	Q215AFH②
	20	Q220AF	Q220AFH②

SURGE PROTECTION

Breaker Type	Amp. Rtg.	10K AIR Catalog Number	Surge Type
QP①③ 1-Pole 120/240V AC	(2)15	QSA1515	Surge Arrester
	(2)20	QSA2020	Surge Arrester
QP①③ 1-Pole 120/240V AC	(2)20	QSA2020TVSS	TVSS

① UL listed for frequent switching applications (SWD). 120V AC fluorescent lighting.
② Built to order. Allow 2-3 weeks for delivery.
③ HACR rated.

Accessories

INTERCHANGEABLE HUBS	
Conduit Size (Ins. / lbs.)	**Catalog Number**
HS TYPE HUBS	
3/4	**ECHS075**
1	**ECHS100**
1-1/4	**ECHS125**
1-1/2	**ECHS150**
2	**ECHS200**
2-1/2	**ECHS250**
RX TYPE HUBS	
3/4	**EC38594**
1	**EC38596**
1-1/4	**EC38597**
1-1/2	**EC38598**
2	**EC38599**
2-1/2	**EC38600**
HC TYPE HUBS	
2	**ECHC200**
2-1/2	**ECHC250**
3	**ECHC300**
ACCESSORIES AND CLOSURE PLATES	
Adapter Plate	**ECHCRXA**
Closure Plates	
For HC Hubs	**ECHC000**
For HS Hubs	**ECHS000**
For HV Hubs	**ECHV000**
For RX Hubs	**EC38595**

SEALING RINGS (Al)	
Description	**Catalog Number**
Snap-on type	**SX001M**
Screw type	**SX001M**

BYPASS KITS	
Description	**Catalog Number**
Manual Bypass (ring style only)	**MBP1U**
Insul. 5th Jaw (ring style only)	**MBP2U**
200A Jumper (ring style only)	**JSU**
Horn Bypass Replacement	**HBPU**

COVER PLATE KITS	
Description	**Catalog Number**
Ring Style	**CPP**
Ringless Style	**CP3**

Description	**Catalog Number**
RT WIREWAY	
Termination Lugs	
(2) #6-350 kcmil	**UK350TA**
(1) #2-600 kcmil	**UK600TA**
(2) #500-1000 kcmil	**UK1000TA**

MISCELLANEOUS ACCESSORIES	
Description	**Catalog Number**
Plastic Meter Opening Cover (JA, JC)	**SX087M**
Plastic Meter Cover Ringless (JB)	**SX088M**
NEMA Stud Mechanical Lugs	
(2) #6-350 kcmil	**UK350TA**
(1) #2-600 kcmil, Al/Cu	**UK600TA**
(2) #500-1000 kcmil, Al/Cu	**UK1000TA**
Fifth Jaw	**EMC5J**
Neutral Feeder Lugs for use on INSTA-WIRE bars	
#2-1/0	**ECLK1**
#4-2/0	**ECLK2**
#1-350 kcmil	**ECLK3**

GROUND BARS (Al/Cu – except where noted)	
Description	**Catalog Number**
5 Position, #4-14 AWG Cu/Al	**ECGB5**
10 Position, #4-14 AWG Cu/Al	**ECGB10**
10 Position, #4-14 AWG Cu/Al, 1 Position #14-1/0 Cu/Al	**ECGB101**
14 Position, #4-14 AWG Cu/Al	**ECGB14**
14 Position, #4-14 AWG Cu/Al, 1 Position #14-1/0 Cu/Al	**ECGB141**
14 Position, #4-14 AWG Cu/Al, 1 Position #6-2/0 Cu/Al	**ECGB142**
20 Position, #4-14 AWG Cu/Al	**ECGB20**
20 Position, #4-14 AWG Cu/Al, 1 Position #14-1/0 Cu/Al	**ECGB201**
20 Position, #4-14 AWG Cu/Al, 1 Position #6-2/0 Cu/Al	**ECGB202**

5TH JAW KITS	
Description	**Catalog Number**
Bonded 5th Jaw	**GM5J**
Insulated 5th Jaw	**IGM5J**
For use on SP0211 only	**WSX019P**

UNIVERSAL PAK/MOD. ACCESSORIES	
Description	**Catalog Number**
Sealing Rings	
Snap-on, stainless steel	**SRSS**
Screw-on, stainless steel	**SRSW**
Snap-on, aluminum	**SRSTD**
2-pole blank Filler Plate QP 125A max. breaker	**ECP1U**
4-pole blank Filler Plate QPP 225A max. breaker	**ECP2U**
4-pole blank Filler Plate QP (2" wide) 125A breaker installed	**ECP3U**⑥
Plastic Cover Plates	
Ring Type Socket	**ECPP**
Ringless Type Socket	**ECP3**
Meter Bypass Jpr. 4&5 jaw	**ECJS**⑦
Manual Bypass Meter Skt. 125A Meter Cover	**ECMBP1U**
Manual Bypass Meter Skt. 200A Meter Cover	**ECMBP2U**

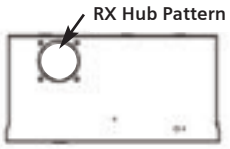
MODULAR METERING ACCESSORIES	
Description	**Catalog Number**
Single Bolt Joints	
1 Phase, 3 Wire, 1200A max.	**SBJ1**
3 Phase, 4 Wire, 1200A max.	**SBJ4**
Indoor Bussed Elbow	
1 Phase, 3 Wire, 1200A max.	**BE1**
3 Phase, 4 Wire, 1200A max.	**BE4**
Outdoor Bussed Extension	
1 Phase, 3 Wire, 1200A max.	**WMEX1U**
3 Phase, 4 Wire, 1200A max.	**WMEX4U**
5th Jaw Kit (3, 6, 9 o'clock)	**ECMM5J**①
Ins. 5th Jaw Kit (3, 6, 9 o'clock)	**ECMMI5J**①
Pass-Thru Bushing for use with Underground Pull Box	**WMMBK**②
End Closure Plate	**WMEP**③
HR Type Hubs for Service Entrance Module	
3/4"	**ECHR075**
1"	**ECHR100**
1-1/4"	**ECHR125**
1-1/2"	**ECHR150**
2"	**ECHR200**
HV Type Hubs for Service Entrance Module	
2"	**ECHV200**
2-1/2"	**ECHV250**
3"	**ECHV300**
3-1/2"	**ECHV350**
4"	**ECHV400**

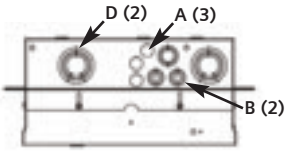
PAK METERING ACCESSORIES	
Description	**Catalog Number**
HD Type Hubs	
2"	**EC56854**④
2-1/2"	**EC56855**④
3"	**EC56856**
3-1/2"	**EC56857**
4"	**EC56858**
Closure Plate	**EC56933S**
NEMA Stud Kit for new Uni-Pak	
400A	**NSK400**
600A	**NSK600**
Parallel Lug Kit	
400A	**PLK400**
600A	**PLK600**
5th Jaw Kit	**GM5J**⑤
Insulated 5th Jaw Kit	**ECMMI5J**
NEMA Stud Kit for old Uni-Pak	
400A	**LKNS4U**
600A	**LKNS8U**

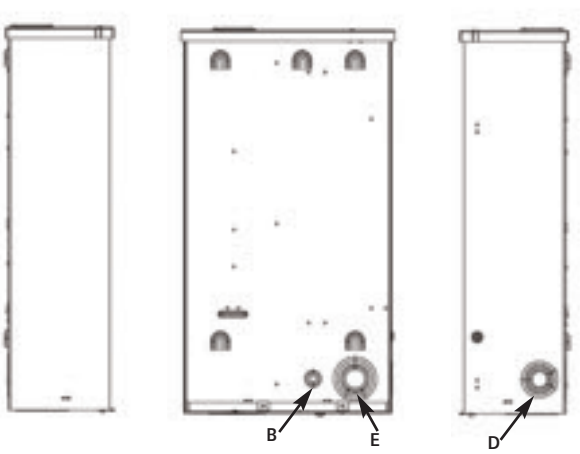
① For use on 125A and 200A sockets only.
② One pass-thru bushing supplied with each WMM8 device.
③ When adding modular metering modules to old installation, replace metal and closure plate wtih plastic end closure plate.
④ Item is a kit consisting of adaptor plate and Type RK hub.
⑤ For use on new Pak only. Use ECMM5J for old Pak.
⑥ Filler plate is not needed for new Pak.
⑦ (2) required per 1 phase meter socket. Residential type ring and ringless. 200A max. Meter cannot be installed while in use. For use with ECPP cover plate.

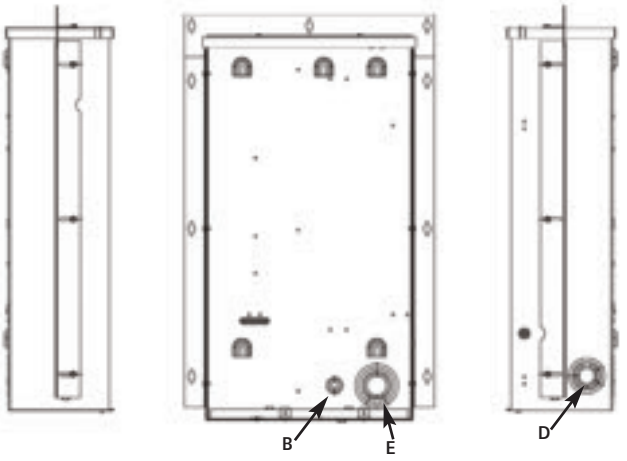
Combination Meter Sockets

Dimensions, Wiring, and Knockout Diagrams









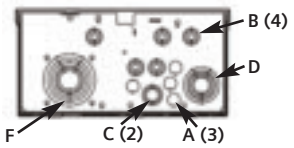


FIGURE 1

Knockout Schedule

A = 1/2”
B = 1/2”, 3/4”
C = 1/2”, 3/4”, 1”
D = 3/4”, 1”, 1-1/4”, 1-1/2”, 2”
E = 1”, 1-1/4”, 1-1/2”, 2”, 2-1/2”
F = 1-1/4”, 1-1/2”, 2”, 2-1/2”, 3”
G = 0.31 diameter Ground Wire K.O.

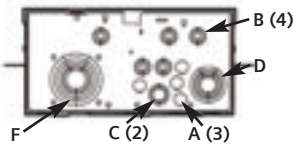
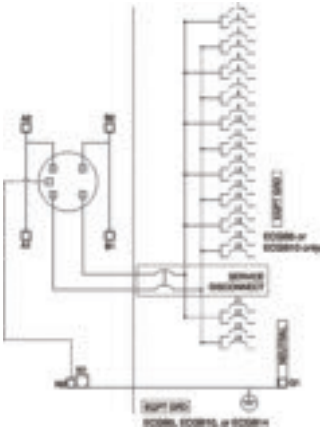
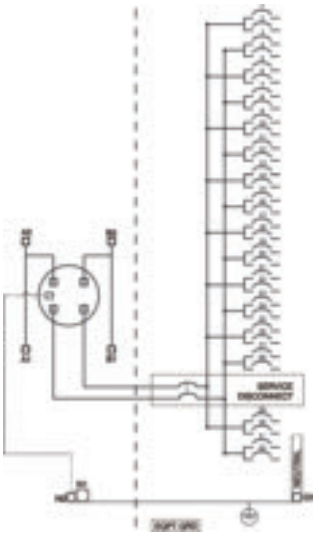


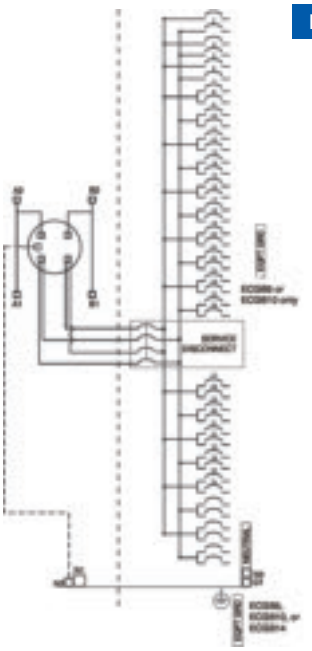
FIGURE 2



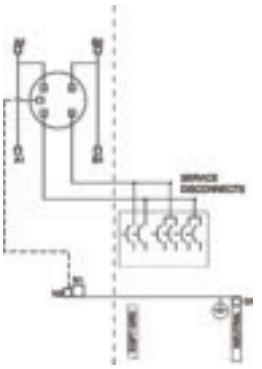
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MC1224B1100SEC
MC1224B1125FEC
MC1224B1125SEC



MC1632B1100FEC
MC1632B1100SEC
MC1632B1125FEC



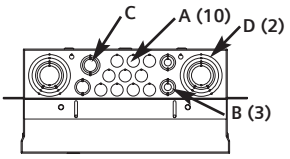
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MC2442B1200SEC
MC2442B1225FEC
MC2442B1225SEC

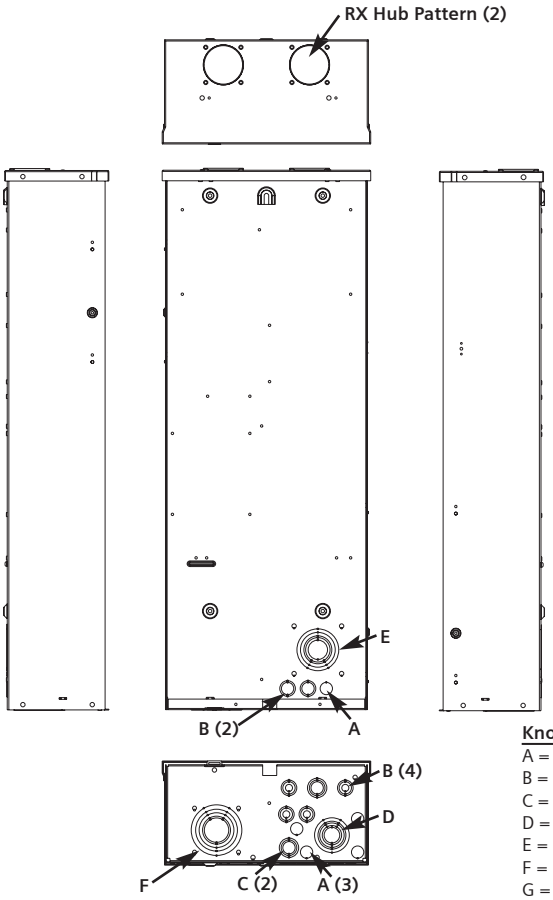


MM0406L1125FEC
MM0406L1125SEC
MM0406L1200FEC
MM0406L1200SEC

Combination Meter Sockets

Dimensions, Wiring, and Knockout Diagrams





Knockout Schedule

A = 1/2”
B = 1/2”, 3/4”
C = 1/2”, 3/4”, 1”
D = 3/4”, 1”, 1-1/4”, 1-1/2”, 2”
E = 1”, 1-1/4”, 1-1/2”, 2”, 2-1/2”
F = 1-1/4”, 1-1/2”, 2”, 2-1/2”, 3”
G = 0.31 diameter Ground Wire K.O.

FIGURE 3

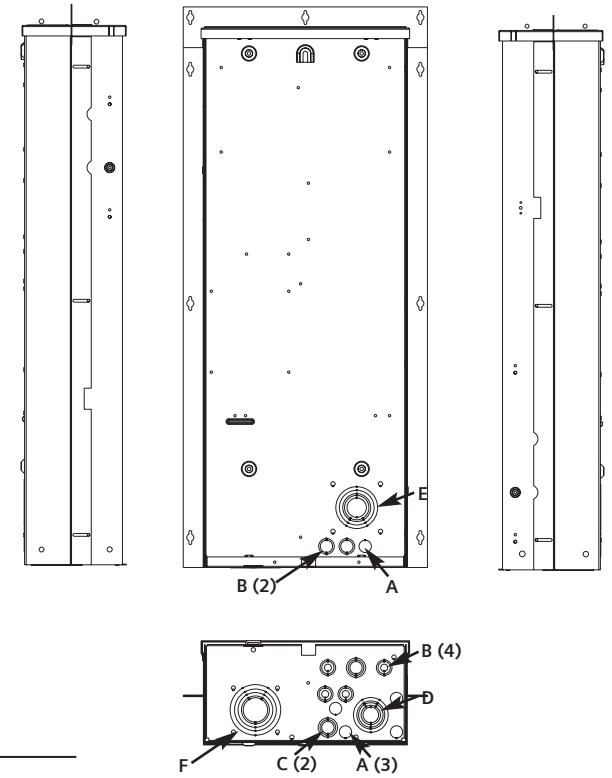
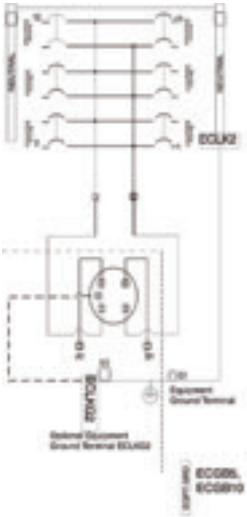
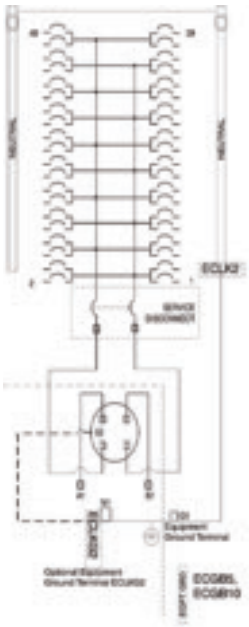


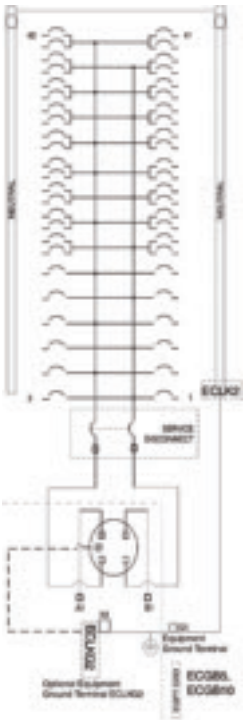
FIGURE 4



MC1212L1200FED
MC1212L1200SED

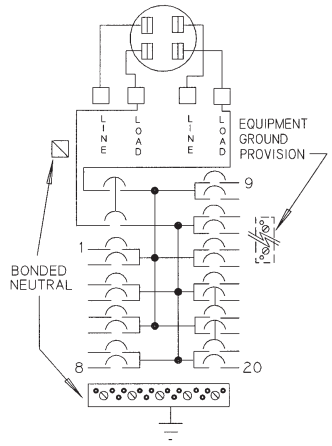


MC2040B1200FED
MC2040B1200SED

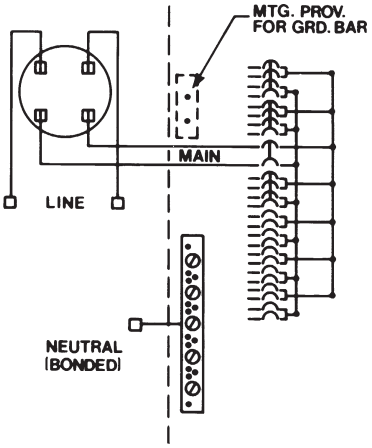


MC3042B1200FED
MC3042B1200SED
MC3042B1225FED
MC3042B1225SED

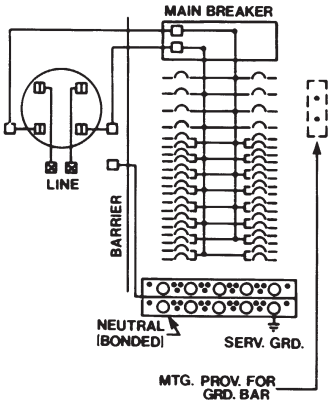
EUSERC Commercial Metering
Wiring Diagrams



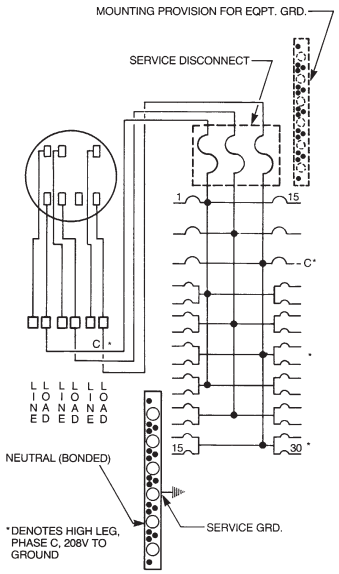
MC1020B1100ESS



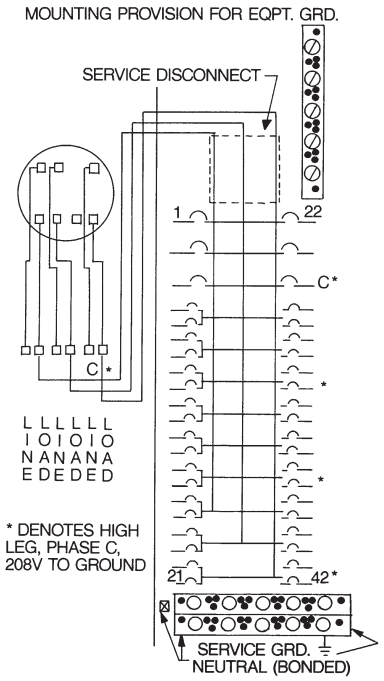
MC1224B1100CESS



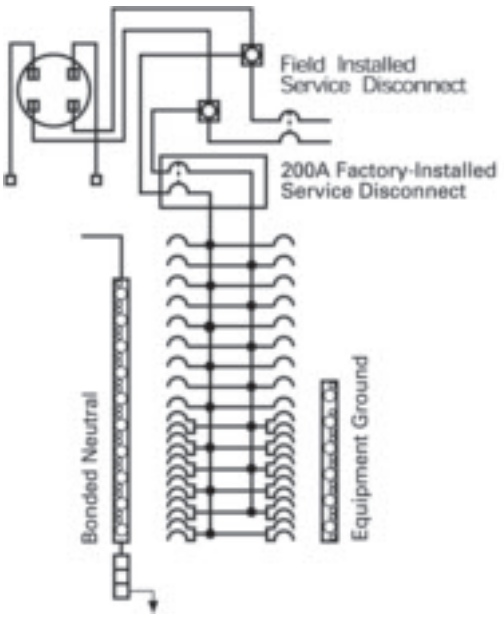
MC2440B1200CESS



MC1830F3100CESS



MC2442F3200CESS



MC3040MB21/22SS

EUSERC Commercial Metering
Dimensions and Knockout Diagrams

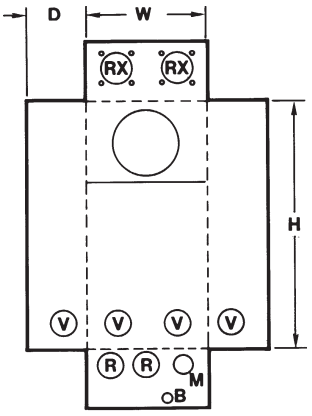


FIGURE 5

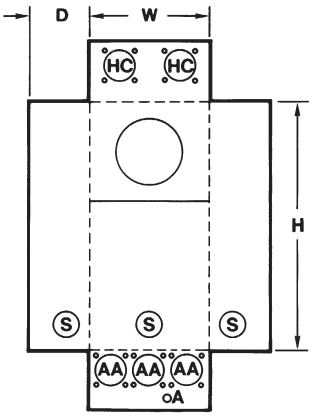


FIGURE 6

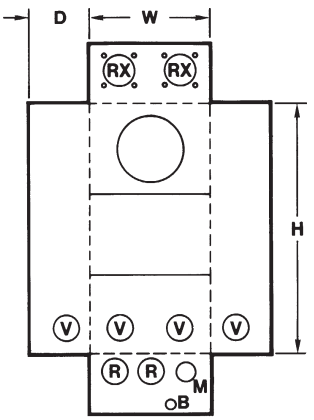


FIGURE 7

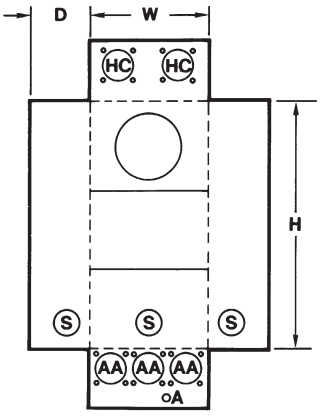


FIGURE 8

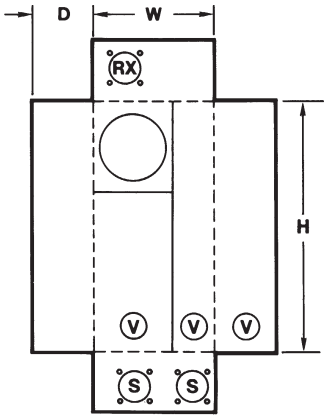


FIGURE 9

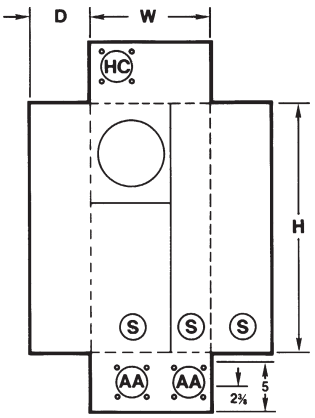


FIGURE 10

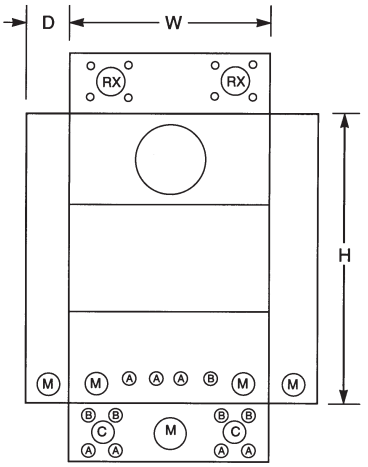


FIGURE 11

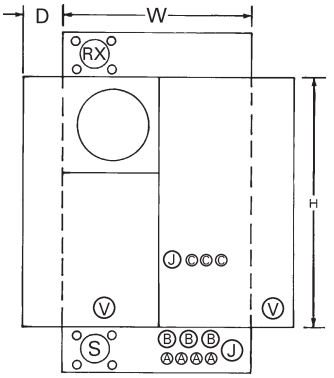


FIGURE 12

DIMENSIONS (inches)									
Catalog Number	K.O. Fig.	Height	Width	Depth	Catalog Number	K.O. Fig.	Height	Width	Depth
MS14TB	5	24	12-1/2	4-7/8	MS27TB	6	30	14-1/4	6-3/8
MS15TB	5	24	12-1/2	4-7/8	MM0202F1200ESS	8	45	14-1/4	6-3/8
MS17TB	5	24	12-1/2	4-7/8	MM0202F1200CESS	10	30	23-1/4	6-3/8
MM0202B1100ESS	7	36	12-1/2	4-7/8	MM0202F3200ESS	8	45	14-1/4	6-3/8
MM0202B3100ESS	7	36	12-1/2	4-7/8	MM0202F3200CESS	10	30	23-1/4	6-3/8
MM0202F1100ESS	7	36	12-1/2	4-7/8	MM0202B1200ESS	8	45	14-1/4	6-3/8
MM0202F1100CESS	9	24	20-1/8	4-7/8	MM0202B1200CESS	10	30	23-1/4	6-3/8
MM0202F3100ESS	7	36	12-1/2	4-7/8	MM0202B3200ESS	8	45	14-1/4	6-3/8
MM0202F3100CESS	9	24	20-1/8	4-7/8	MM0202B3200CESS	10	30	23-1/4	6-3/8
MC1020B1100ESS	11	36	12-1/2	4-7/8	MC2440B1200CESS	13	30	25-3/4	6-3/8
MC1224B1100CESS	12	24	20-1/8	4-7/8	MC2442F3200CESS	15	42	27-1/4	6-3/8
MC1830F3100CESS	14	26	24-1/4	4-7/8	MC3040MB21SS	18	40	30-1/4	6
MS24TB	6	30	14-1/4	6-3/8	MC3040MB22SS	18	40	30-1/4	6
MS25TB	6	30	14-1/4	6-3/8					

EUSERC Commercial Metering

Dimensions and Knockout Diagrams

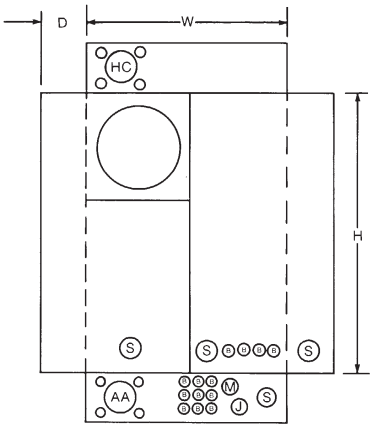


FIGURE 13

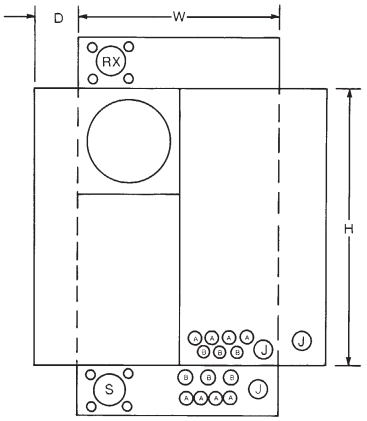


FIGURE 14

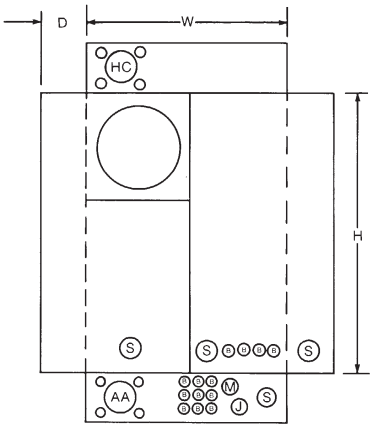


FIGURE 15

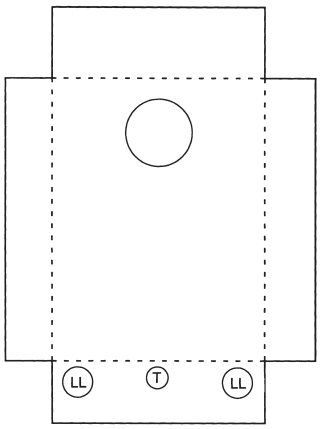


FIGURE 16

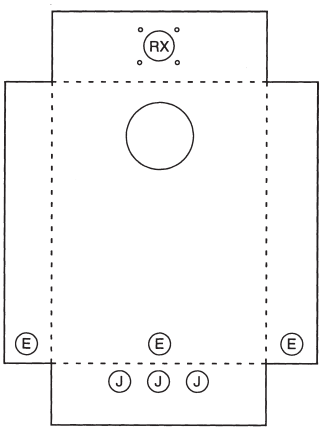


FIGURE 17

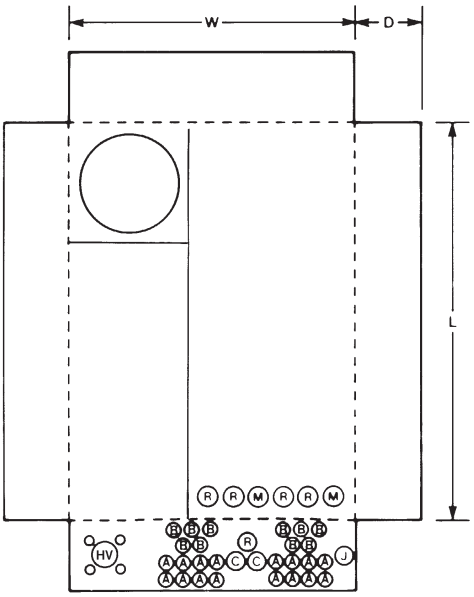


FIGURE 18

Knockout Code - Conduit Sizes (inches)

◕ = 1/4	S = 1, 1-1/4, 1-1/2, 2, 2-1/2
A = 1/2	T = 1-1/4
B = 1/2, 3/4	U = 1-1/4, 1-1/2
C = 1/2, 3/4, 1	V = 1-1/4, 1-1/2, 2
D = 1/2, 1	W = 1-1/4, 2
E = 1/2, 3/4, 1, 1-1/4	X = 1-1/4, 1-1/2, 2, 2-1/2
F = 1/2, 1-1/4, 1-1/2	Y = 1-1/2, 2
G = 3/4	Z = 1-1/2, 2, 2-1/2
H = 3/4, 1	AA = 1-1/2, 2, 2-1/2, 3
J = 3/4, 1, 1-1/4	BB = 1-1/2, 2, 2-1/2, 3, 3-1/2
K = 3/4, 1-1/4	CC = 2, 2-1/2, 3, 3-1/2
M - 3/4, 1, 1-1/4, 1-1/2	EE = 2, 2-1/2, 3
N = 3/4, 1, 1-1/4, 1-1/2, 2	FF = 2-1/2, 3
P = 1, 1-1/4	GG = 2-1/2, 3, 3-1/2
Q = 1, 1-1/4, 1-1/2	HH = 2-1/2, 3, 3-1/2, 4
R = 1, 1-1/4, 1-1/2, 2	JJ = 3-1/2, 4
	LL = 3
	V V = 2

EUSERC Commercial Metering
Dimensions, Wiring, and Knockout Diagrams

Knockout Schedule
A = 1/2"
B = 1/2", 3/4"
C = 1/2", 3/4", 1"
D = 3/4", 1", 1-1/4", 1-1/2", 2"
E = 1", 1-1/4", 1-1/2", 2", 2-1/2"
F = 1-1/4", 1-1/2", 2", 2-1/2", 3"
G = 0.31 diameter Ground Wire K.O.

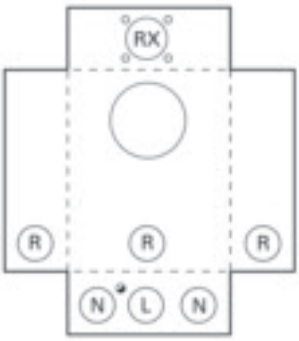


FIGURE 19



FIGURE 20

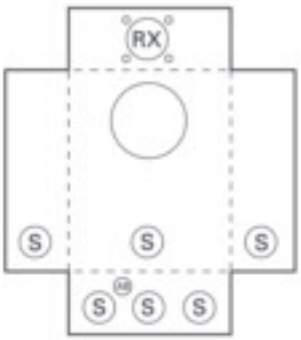


FIGURE 21

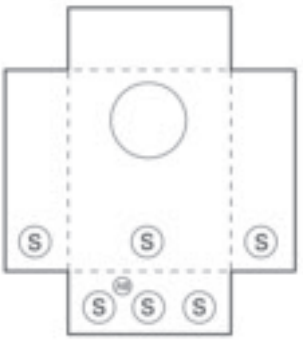
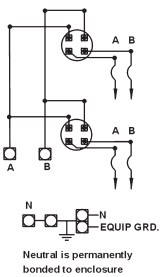
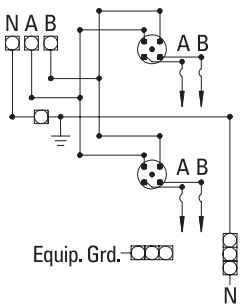


FIGURE 22

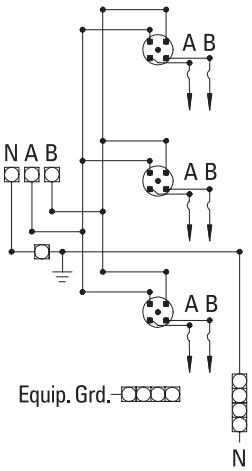
Pak Metering
Wiring Diagrams



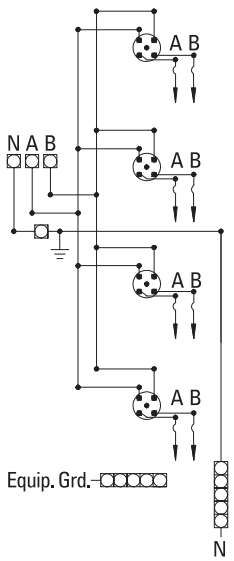
2 POSITION 125 AMP



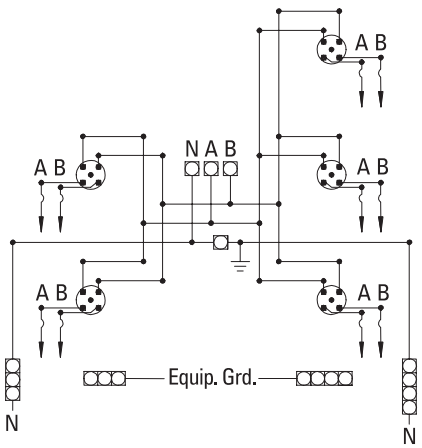
2 POSITION 200 AMP



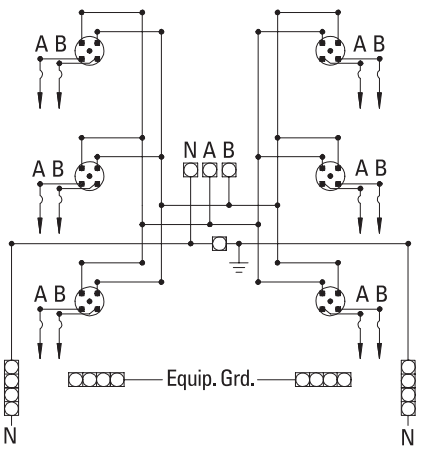
3 POSITION 125 & 200 AMP



4 POSITION 125 & 200 AMP

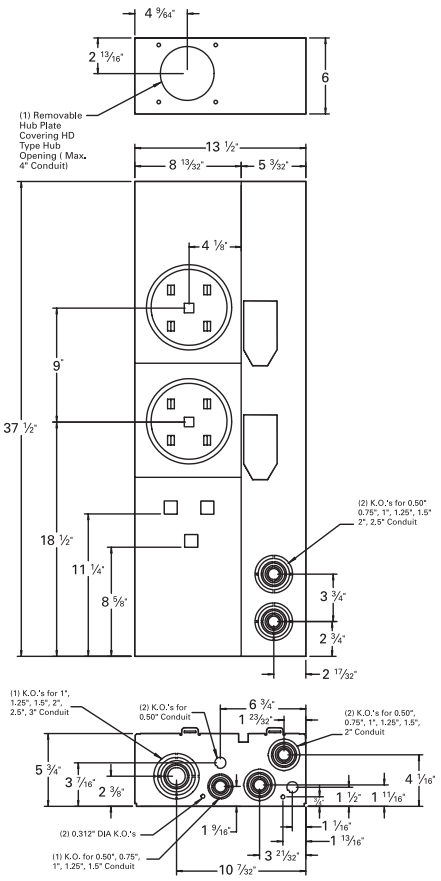


5 POSITION 125 & 200 AMP

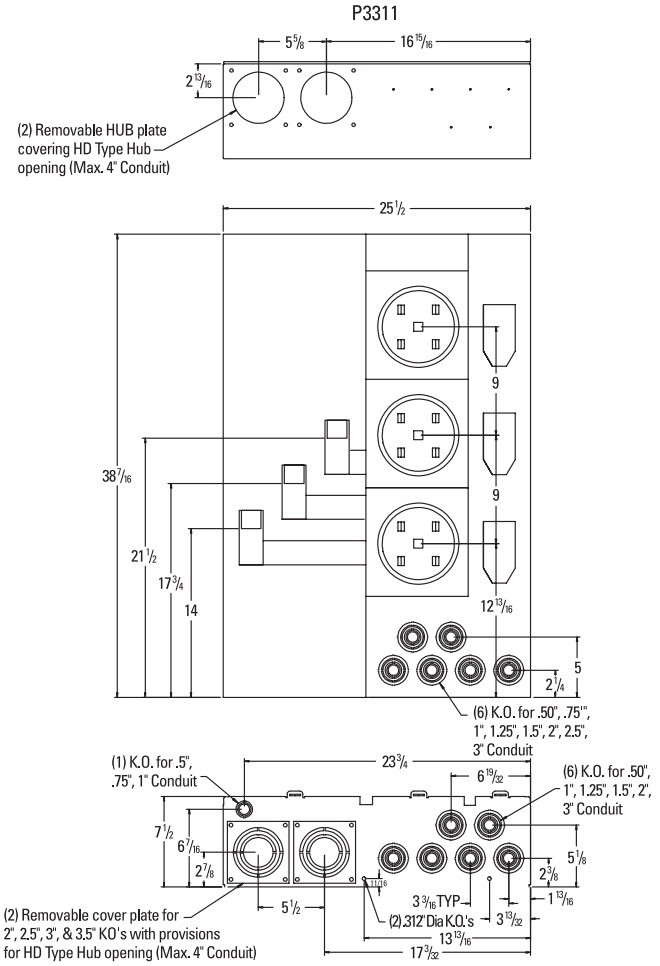


6 POSITION 125 & 200 AMP

Pak Metering
Knockout Diagrams



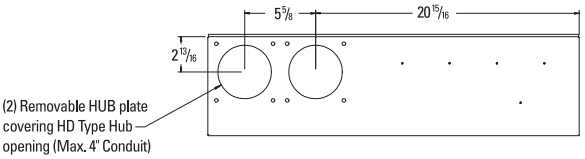
SP2211X

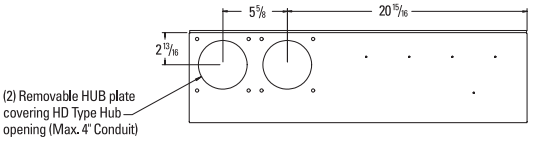


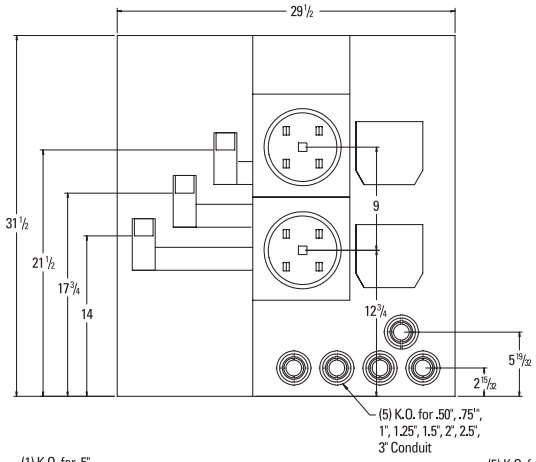
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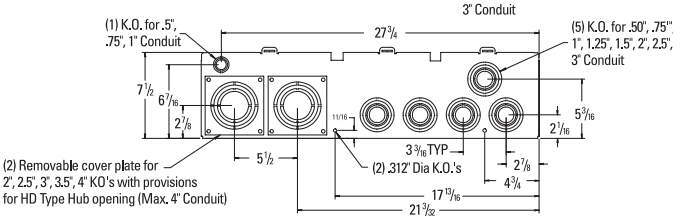


Pak Metering
Knockout Diagrams

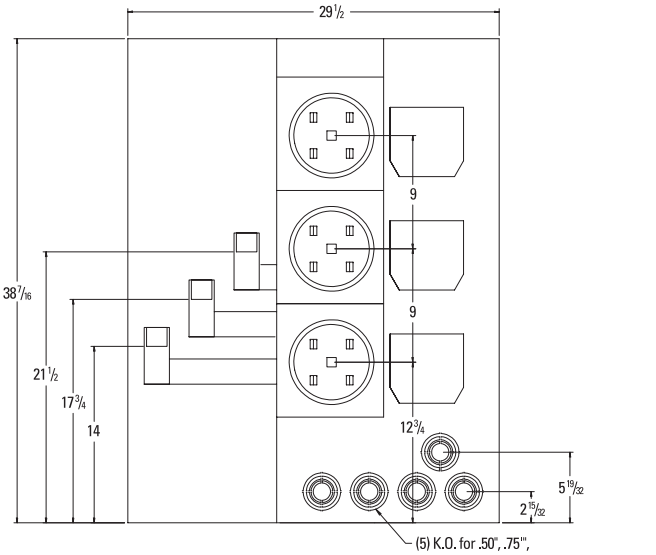


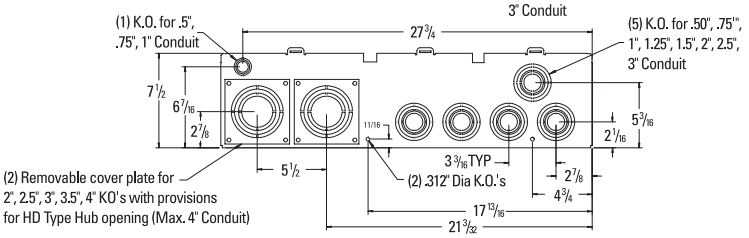




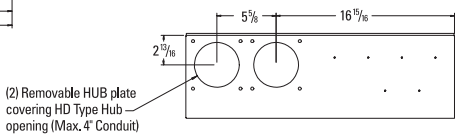


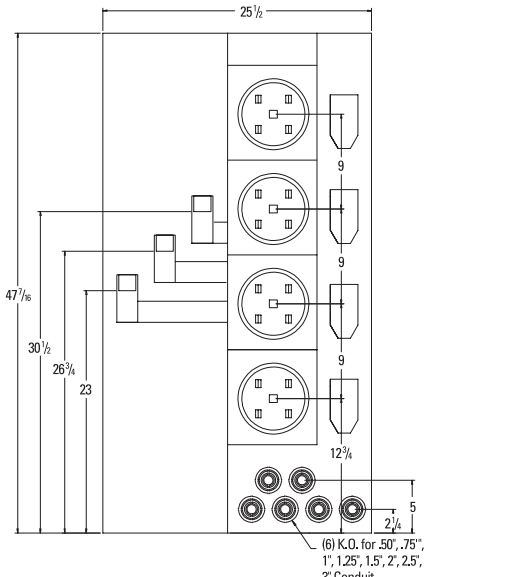
SP4212X

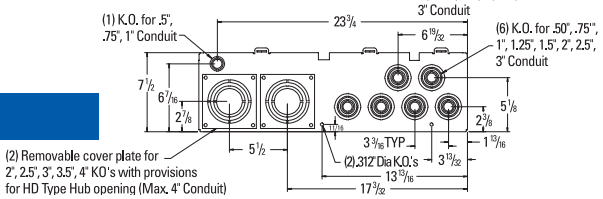




SP4312X

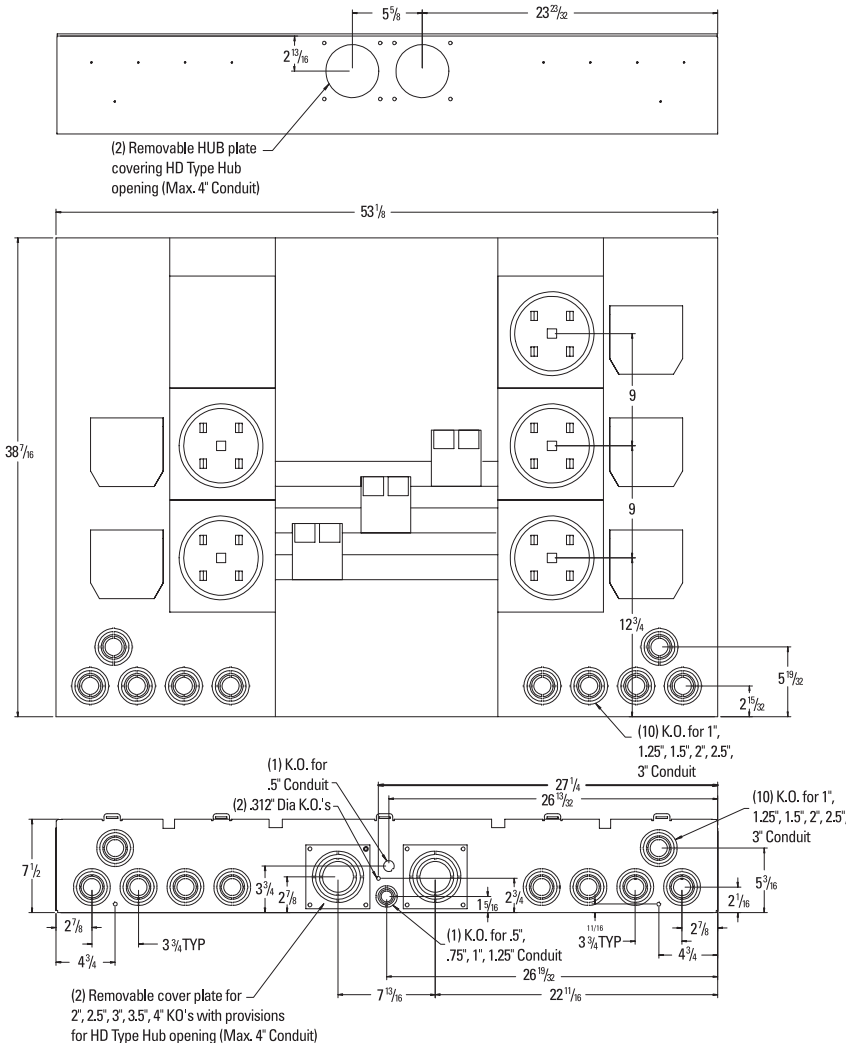






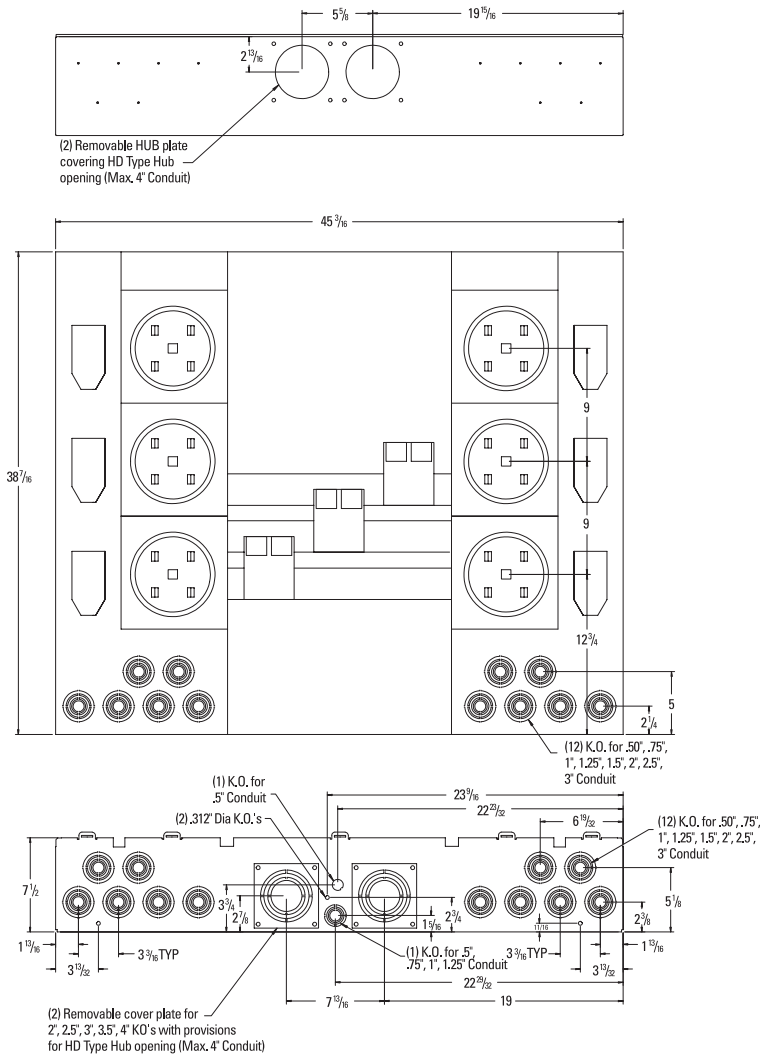
SP4411X

Pak Metering
Knockout Diagrams



SP6512X

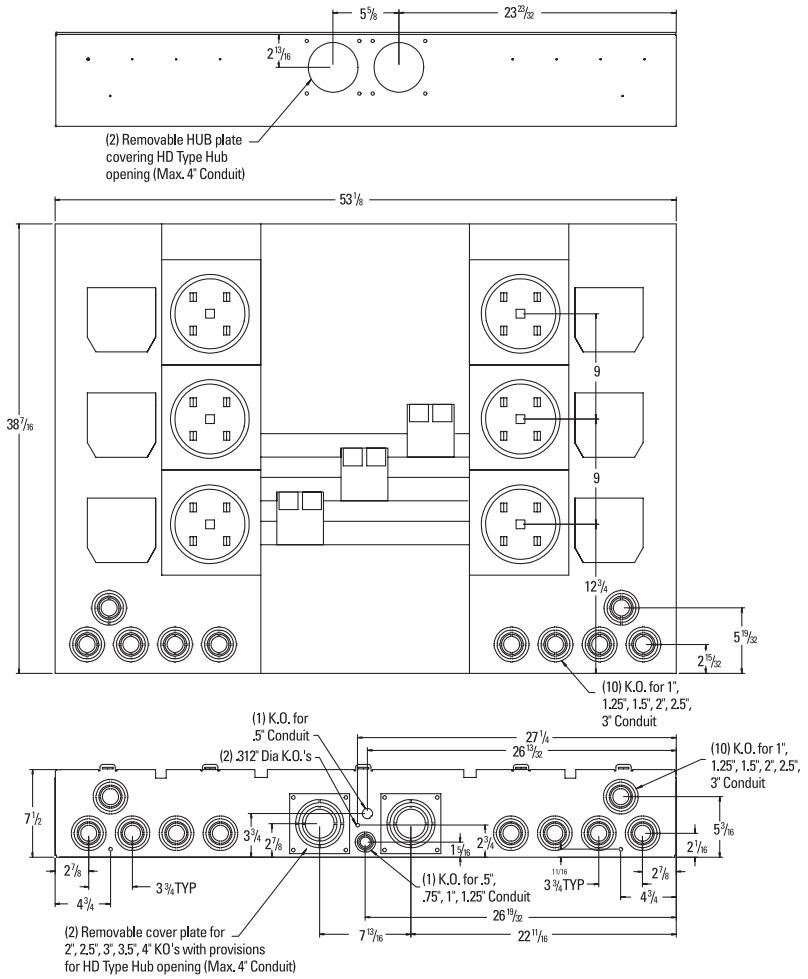
Pak Metering
Knockout Diagrams



SP6611X



Pak Metering
Knockout Diagrams



SP6612X

Ultimate® Load Centers

MAIN BREAKER / CONVERTIBLE LOAD CENTERS ①
100-225 Amperes, 1 Phase 3 Wire, SN 120/240 Volts

Aluminum or Copper Bus
60/75°C Rated 22,000A IR②

Branch Circuits				Indoor Enclosure – NEMA Type 1			Outdoor Enclosure – NEMA Type 3R	
Main Ampere Rating	Max. No. of 1-Pole Spaces	Max. No. of 1-Pole Circuits	Max. 2-Pole	Aluminum Bus Catalog Number	Copper Bus ③ Catalog Number	Enclosure Height (inches) ④	Copper Bus ③ Catalog Number	Enclosure Height (inches) ⑤
100	12	24	6	**G1224B1100**	**G1224B1100CU**	18	**W1224B1100CU**	20
100	16	24	8	**G1624B1100**	**G1624B1100CU**	21	**W1624B1100CU**	20
100	20	20	10	**G2020B1100**	**G2020B1100CU**	24	**W2020B1100CU**	29
100	24	24	12	–	**G2424B1100CU**	24	–	–
100	30	30	15	–	**G3030B1100CU**	30	–	–
125	24	24	12	**G2424B1125**	–	24	–	–
150	16	30	8	**G1630B1150**	–	24	–	–
150	20	30	10	**G2030B1150**	**G2030B1150CU**	30	–	–
150	24	30	12	**G2430B1150**	–	30	–	–
150	30	30	15	**G3030B1150**	**G3030B1150CU**	36	–	–
200	8	16	4	–	–	–	**W0816B1200CT**	28
200	20	40	10	**G2040B1200**	**G2040B1200CU**	30	**W2040B1200CU**	29
200	24	40	12	**G2442B1200**	–	30	–	–
200	30	40	15	**G3040B1200**	**G3040B1200CU**	36	**W3040B1200CU**	38
200	40	40	20	**G4040B1200**	**G4040B1200CU**	39	**W4040B1200CU**	38
225	42	42	21	–	**G4242B1225CU** ⑥	42	**W4242B1225CU** ⑥	42

Single phase factory installed 22KA IR main circuit breaker offers 22/10kA IR series combination rating when using 10kA IR Type QP, QT, QPF, QE, QN, and QAF branch breakers.

MAIN LUG / CONVERTIBLE LOAD CENTERS ⑦
12-42 Circuits, 1 Phase 3 Wire SN, 125-225 Amperes

Aluminum or Copper Bus
60/75°C Rated 100,000A IR

Branch Circuits				Indoor Enclosure – NEMA Type 1			Outdoor Enclosure – NEMA Type 3R	
Main Ampere Rating	Max. No. of 1-Pole Spaces	Max. No. of 1-Pole Circuits	Max. 2-Pole	Aluminum Bus Catalog Number	Copper Bus ③ Catalog Number	Enclosure Height (inches) ④	Copper Bus ③ Catalog Number	Enclosure Height (inches) ⑤
125	12	12	6	**G1212L1125** ⑧	**G1212L1125CU** ⑧	21	**W1212L1125CU** ⑧	20
125	12	24	6	**G1224L1125** ⑧	**G1224L1125CU** ⑧	21	**W1224L1125CU** ⑧	20
125	16	24	8	**G1624L1125**	**G1624L1125CU**	21	**W1624L1125CU**	28
125	20	20	10	**G2020L1125**	**G2020L1125CU**	24	–	–
125	24	24	12	**G2424L1125**	–	30	–	–
125	24	40	12	–	**G2440L1125CU**	30	–	–
125	30	40	15	–	**G3040L1125CU**	30	**W3040L1125CU**	38
150	20	30	10	**G2030L1150**	**G2030L1150CU**	30	**W2030L1150CU**	28
200	8	16	4	–	–	–	**W0816L1200CT**	28
200	12	24	6	–	**G1224L1200CU** ⑧	24	**W1224L1200CU** ⑧	28
200	20	40	10	**G2040L1200**	**G2040L1200CU**	30	**W2040L1200CU**	28
200	24	40	12	**G2442L1200**	**G2440L1200CU**	30	–	–
200	30	30	15	**G3030L1200**	**G3030L1200CU**	36	–	–
200	30	40	15	**G3040L1200**	**G3040L1200CU**	36	**W3040L1200CU**	38
200	40	40	20	**G4040L1200**	**G4040L1200CU**	39	**W4040L1200CU**	38
225	42	42	21	–	**G4242L1225CU** ⑥	42	**W4242L1225CU** ⑥	42

SG SERIES MAIN LUG / CONVERTIBLE LOAD CENTERS ⑦
12-40 Circuits, 1 Phase 3 Wire SN, 125-200 Amperes

Aluminum or Copper Bus
60/75°C Rated 100,000A IR

Branch Circuits				Indoor Enclosure – NEMA Type 1	
Main Ampere Rating	Max. No. of 1-Pole Spaces	Max. No. of 1-Pole Circuits	Max. 2-Pole	Copper Bus ③ Catalog Number	Enclosure Height (inches) ④
125	12	24	6	**G1224L1125CUSG**	21
125	16	24	8	**G1624L1125CUSG**	24
125	20	30	10	**G2030L1125CUSG**	24
125	24	30	12	**G2430L1125CUSG**	30
150	20	30	10	**G2030L1150CUSG**	30
200	30	40	15	**G3040L1200CUSG**	36
200	40	40	20	**G4040L1200CUSG**	39

① Suitable for use as service entrance equipment.
② May be installed on higher rated system when protected by a circuit breaker with a higher AIR rating. See equipment markings.
③ Copper bus load centers are recommended for those applications where the environment may be severe (i.e., farm and coastal areas).
④ Indoor encl. are 14-5/16" W by 3-15/16" D.
⑤ Outdoor encl. are 14-1/2" W by 4-1/4" D.
⑥ All 225A load centers are provided with tin-plated copper bus bars.
⑦ See equipment markings for details.
⑧ Suitable for use as service entrance equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance branch circuit panelboard. See article 408.14 of the NEC.
⑨ Factory installed 100% neutral with factory bonded 100% ground. No neutral tie strap.

EQ Small Circuit Load Centers

FEATURES / APPLICATIONS

EQ load centers with main lugs feature a combination trim box in one package.

- Interiors offer removal in seconds
- Single phase
- One piece bus bar construction designed for use only with circuit breakers
- UL listed on 60/75°C conductors (see equipment markings for applications)
- Main lugs and neutral on same plane, same drive
- Simple deadfront adjustment after trim is installed
- Positive load side circuit breaker hook rails
- Outdoor Type 3R devices use Type HS hubs

MAIN LUGS WITH ALUMINUM BUS ①
100-125 Amperes, 1 Phase 3 Wire, SN, 4–16 Circuits, 120/240 Volts AC, 100,000A IR

Branch Circuits				Indoor Enclosure – NEMA Type 1					Outdoor Enclosure – NEMA Type 3R				
Amp Rtg.	Max. No. of 1-Pole Spaces	Max. No. of 1-Pole Circuits	QP Max. 2P	Catalog Number Replace Suffix F (Flush) with S for Surface Mounting	Std. Pkg.	Dimensions (inches) H	W	D	Catalog Number	Std. Pkg.	Dimensions (inches) H	W	D
100	12	24	6	**E1224ML1100FG②**	1	14-3/4	12-3/8	3-7/8	–	–	–	–	–
125	4	8	2	**E0408ML1125F③④⑤**	5	12-5/8	6-5/8	3-1/2	**W0408ML1125④⑥**	5	12-1/4	6	4-1/4
125	4	8	2	–	–	–	–	–	**W0408L1125SPA50④⑥⑦**	1	12-1/4	6	4-1/4
125	4	8	2	–	–	–	–	–	**W0408L1125SPA60④⑥⑦**	1	12-1/4	6	4-1/4
125	8	16	4	**E0816ML1100F③⑤**	1	14-3/4	12-3/8	3-7/8	–	–	–	–	–

MAIN LUGS AND MAIN BREAKERS WITH COPPER BUS ①⑧
100-200 Amperes, 1 Phase 3 Wire, SN, 4–24 Circuits, 120/240 Volts AC, 100,000A IR

Copper bus load centers are recommended for those applications where the environment may be severe (i.e., farm and coastal areas) or where a premium panel is desired. Construction offers the same features of the standard EQ design.

Branch Circuits				Indoor Enclosure – NEMA Type 1					Outdoor Enclosure – NEMA Type 3R				
Amp Rtg.	Max. No. of 1-Pole Spaces	Max. No. of 1-Pole Circuits	QP Max. 2-Pls.	Catalog Number Replace Suffix F (Flush) with S for Surface Mounting	Std. Pkg.	Dimensions (inches) H	W	D	Catalog Number	Std. Pkg.	Dimensions (inches) H	W	D
100	10	20	4	**E1020MB1100FCGP⑨⑩**	1	14-3/4	12-3/8	3-7/8	–	–	–	–	–
100	12	24	6	**E1224ML1100FCU**	1	14-3/4	12-3/8	3-7/8	–	–	–	–	–
125	8	16	4	**E0816ML1125FCU⑤**	1	14-3/4	12-3/8	3-7/8	**W0816ML1125CU⑤**	1	14-3/4	12-1/8	4-1/4
125	4	6	2	–	–	–	–	–	**W0406ML1125CU③**	1	23	10	4-1/8
200	4	4	2	–	1	–	–	–	**W0404MB1200CT⑩⑪**	1	20	11-1/8	4-3/4

① Suitable for use as service entrance equipment when not more than six main disconnecting means are provided and when not used as a lighting and appliance branch circuit panelboard. Check local codes and restrictions.
② 70 amp maximum breaker.
③ Will not accommodate 2-pole GFCI or circuit breaker with shunt trip.
④ 100 amp maximum breaker.
⑤ Suitable for use as service entrance equipment when a main breaker (125A maximum) is back-fed in a branch position and used with main breaker retainer clip (Cat. No. MBR1).
⑥ Suitable for use as service entrance equipment when a main breaker (100A maximum) is backfed in a branch position and used with main breaker retainer clip (Cat. No. MBR1).
⑦ W0408L1125SPA50 provided with factory installed QF250 and ground bar. W0408L1125SPA60 provided with factory installed QF260 and ground gar.
⑧ Copper bus load centers are recommended for those applications where the environment may be severe (i.e., farm and coastal areas).
⑨ Two Q115 and one Q230 breaker included.
⑩ Main breaker factory installed.
⑪ 2" Type HS hub provided.





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SEA Order No. RPSA-WCMSA-0305 New 5M0305BC Printed in USA

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By Keyword | Go

◉ All Categories ○ 30mm Push-Pull Operators - Non-Illuminated

Design Time
SAVE up to 50%
Schneider Electric

Item # 9001SKR9R, 30mm Push-Pull Operators - Illuminated



larger image

Representative Photo Only. Actual Product May Differ.

VIEW CAD DRAWING

- 3D
- 2D Front View
- 2D Right Side View
- 2D Sales Drawing

Specifications

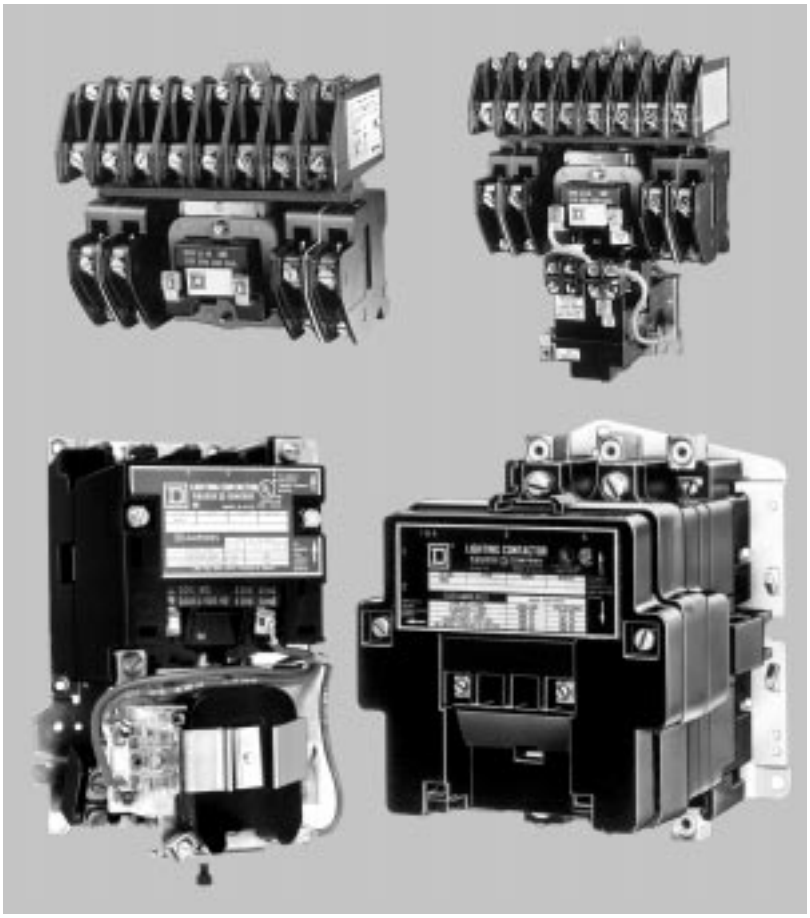
UL File	E78403 CCN NKCR
CSA File	LR24590 Class 3211-03
CE Marked	Yes
RoHS compliant	Yes
Ring Nut Material	Black Plastic
Button/Cap Color	Red
Button Type	Screw-On Plastic Mushroom (1.63 Inch/41mm)
Guard Type	No Guard
NEMA / IP Rating	NEMA 1/2/3/3R/4/4X/6/12/13 Water tight, Dust tight, Oil tight and Corrosion Resistant (Indoor/Outdoor), IP66
Key Removal	n/a
Knob Color	n/a
Knob Type	not applicable
Lens Color	not applicable

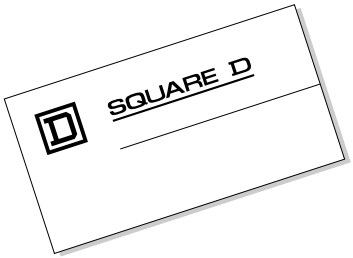
Lens Type	not applicable
Light Module Supply Voltage	not applicable
Light Module Type	not applicable
Number of Operators	1
Number of Positions	2
Operator Action	Maintained (Push/Pull)
Operator Type	Non-Illuminated

Request Information

Lighting Contactors

Class 8903



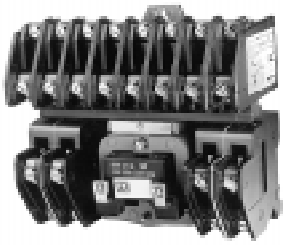


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SQUARE D
GROUPE SCHNEIDER

Lighting Control
Class 8903 – Multipole Lighting Contactors, Type L & LX



Type L



Type LX

Features

- 30 Amp ballast lighting rating, 20 Amp tungsten lighting rating
- Electrically and mechanically held
- 2 thru 12 pole versions
- Field-convertible contacts with N.O. and N.C. indicators (8 N.C. contacts maximum▼)
- Silver-Cadmium-Oxide double break contacts

File E78427
CCN NRNT

File LR60905 (Open Devices Only)
Class 3211 07

Multipole Lighting Contactors (50-60 Hz)

Contact Ampere Ratings	No. of Poles	NEMA Type 1 General Purpose Enclosure	NEMA Type 1 Flush Mounting General Purpose Enclosure with Plaster Adjustment	NEMA Type 3R Rainproof Enclosure	NEMA Type 4 & 4X Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure	▲NEMA Type 4 & 4X Watertight, Dusttight Brushed Stainless Steel Enclosure	NEMA Type 12‡ Dusttight and Driptight Industrial Use Enclosure	Open Type●
		Type	Type	Type	Type	Type	Type	Type
Electrically Held■								
30▼	2 3 4	LG20∗ LG30∗ LG40∗	LF20∗ LF30∗ LF40∗	LH20∗ LH30∗ LH40∗	LWW20∗ LWW30∗ LWW40∗	LW20∗ LW30∗ LW40∗	LA20∗ LA30∗ LA40∗	LO20∗ LO30∗ LO40∗
	6 8 10	LG60∗ LG80∗ LG1000∗	LF60∗ LF80∗ LF1000∗	LH60∗ LH80∗ LH1000∗	LWW60∗ LWW80∗ LWW1000∗	LW60∗ LW80∗ LW1000∗	LA60∗ LA80∗ LA1000∗	LO60∗ LO80∗ LO1000∗
	12	LG1200∗	LF1200∗	LH1200∗	LWW1200∗	LW1200∗	LA1200∗	LO1200∗
Mechanically Held■								
30▼	2 3 4	LXG20∗ LXG30∗ LXG40∗	LXF20∗ LXF30∗ LXF40∗	....	LXWW20∗ LXWW30∗ LXWW40∗	LXW20∗ LXW30∗ LXW40∗	LXA20∗ LXA30∗ LXA40∗	LXO20∗ LXO30∗ LXO40∗
	6 8 10	LXG60∗ LXG80∗ LXG1000∗	LXF60∗ LXF80∗ LXF1000∗	....	LXWW60∗ LXWW80∗ LXWW1000∗	LXW60∗ LXW80∗ LXW1000∗	LXA60∗ LXA80∗ LXA1000∗	LXO60∗ LXO80∗ LXO1000∗
	12	LXG1200∗	LXF1200∗	....	LXWW1200∗	LXW1200∗	LXA1200∗	LXO1200∗

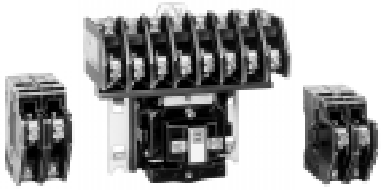
‡ NEMA Type 12 enclosures may be field modified for outdoor applications. For details, see the Class 9991 section in Catalog 9999CT9701.
● Separate enclosures are available for these devices. It may be possible to improve delivery by ordering an open type contactor and separate Class 9991 enclosure.
▲ For electropolished finish, specify Form **G16**.
∗ Coil voltage code must be specified to order this product. Refer to standard voltage codes listed below.
▼ Factory conversion of N.O. contacts to N.C., order by description. There is a maximum of eight N.C. poles for Type L and a maximum of six N.C. poles for Type LX contactors (field conversion only). Versions are available with up to 12 N.C. poles (factory only).
■ All lighting contactors are provided with separate control as standard.

Power Poles for Type L or LX

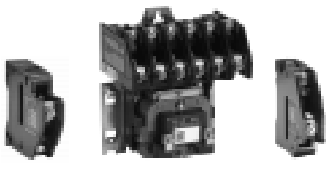
The kits below are used to add 30 Ampere power poles to existing Type L contactors when additional circuits are required. Type L lighting contactors are supplied with mounting brackets, so that adder poles may be mounted from the front by a single captive screw. Adder poles are supplied standard with N.O. contacts which are convertible to N.C.

Power Pole Adder Kit Class 8903 Type Single Pole	Can Only Be Added to Contactor Type	Power Pole Adder Kit Class 8903 Type Double Pole	Can Only Be Added to Contactor Type
L1L	LO60 LO80 LXO60	L3L	LO80 LO1000★ LXO80
L1R	LXO80	L3R	LXO1000★

★ Single-pole power pole must be removed before double-pole power pole can be installed.



Type L3L Type LO80 Type L3R

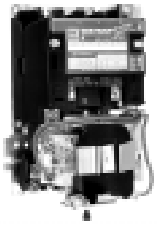


Type L1L Type LO60 Type L1R

Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24	...	V01
120	110	V02
208	...	V08
240	220	V03
277	...	V04
480	440	V06
Specify	Specify	V99

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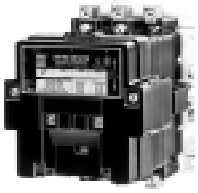


Features

- Electrically and mechanically held
- 30 - 800 Amp lighting ratings
- 2 thru 5 pole versions (5 poles thru 200 Amps)
- UL Listed short-circuit rating up to 100,000 Amperes
- Mixed load ratings (lighting and motor)
- Factory wired controls and clearly marked termination points
- Quick ship on most items in 5-7 days

File E78427
CCN NRNT

File LR60905
(Open Devices Only)
Class 3231 01



Multipole Lighting Contactors – Type S (50-60 Hz)

Contact Ampere Ratings	No. of Poles	NEMA Type 1 General Purpose Enclosure	NEMA Type 1 Flush Mounting General Purpose Enclosure with Plaster Adjustment	NEMA Type 3R Rainproof Enclosure	NEMA Type 4 & 4X Watertight, Dusttight and Corrosion-Resistant Glass-Polyester Enclosure	NEMA Type 4 & 4X▲ Watertight and Dusttight Enclosure	NEMA Type 12‡ Dusttight and Driptight Industrial Use Enclosure	Open Type
		Type	Type	Rainproof Enclosure Type	Type	Type	Type	Type
Electrically Held▼								
30	2	SMG1∗	SMF1∗	SMH1∗	SMW21∗	SMW1∗	SMA1∗	SMO1∗●
	3	SMG2∗	SMF2∗	SMH2∗	SMW22∗	SMW2∗	SMA2∗	SMO2∗●
	4	SMG3∗	SMF3∗	SMH3∗	SMW23∗	SMW3∗	SMA3∗	SMO3∗●
	5	SMG4∗	SMF4∗	SMH4∗	SMW24∗	SMW4∗	SMA4∗	SMO4∗●
60	2	SPG1∗	SPF1∗	SPH1∗	SPW21∗	SPW1∗	SPA1∗	SPO1∗●
	3	SPG2∗	SPF2∗	SPH2∗	SPW22∗	SPW2∗	SPA2∗	SPO2∗●
	4	SPG3∗	SPF3∗	SPH3∗	SPW23∗	SPW3∗	SPA3∗	SPO3∗●
	5	SPG4∗	SPF4∗	SPH4∗	SPW24∗	SPW4∗	SPA4∗	SPO4∗●
100	2	SQG1∗	SQF1∗	SQH1∗	SQW21∗	SQW1∗	SQA1∗	SQO1∗●
	3	SQG2∗	SQF2∗	SQH2∗	SQW22∗	SQW2∗	SQA2∗	SQO2∗●
	4	SQG3∗	....	SQH3∗	....	SQW3∗	SQA3∗	SQO3∗●
	5	SQG4∗	....	SQH4∗	....	SQW4∗	SQA4∗	SQO4∗●
200	2	SVG1∗	....	SVH1∗	....	SVW1∗	SVA1∗	SVO1∗
	3	SVG2∗	....	SVH2∗	....	SVW2∗	SVA2∗	SVO2∗
	4	SVG3∗	....	....	....	SVW3∗	SVA3∗	SVO3∗
	5	SVG4∗	....	....	....	SVW4∗	SVA4∗	SVO4∗
300	2	SXG1∗	....	....	....	SXW1∗	SXA1∗	SXO1∗
	3	SXG2∗	....	....	....	SXW2∗	SXA2∗	SXO2∗
400■	2	SYG1∗	....	....	....	SYW1∗	SYA1∗	SYO1∗
	3	SYG2∗	....	....	....	SYW2∗	SYA2∗	SYO2∗
600■	2	SZG1∗	....	....	....	SZW1∗	SZA1∗	SZO1∗
	3	SZG2∗	....	....	....	SZW2∗	SZA2∗	SZO2∗
800■	2	SJG1∗	....	....	....	SJW1∗	SJA1∗	SJO1∗
	3	SJG2∗	....	....	....	SJW2∗	SJA2∗	SJO2∗
Mechanically Held▼								
30	2	SMG10∗	SMF10∗	....	SMW31∗	SMW10∗	SMA10∗	SMO10∗●
	3	SMG11∗	SMF11∗	....	SMW32∗	SMW11∗	SMA11∗	SMO11∗●
	4	SMG12∗	SMF12∗	....	SMW33∗	SMW12∗	SMA12∗	SMO12∗●
	5	SMG13∗	SMF13∗	....	SMW34∗	SMW13∗	SMA13∗	SMO13∗●
60	2	SPG10∗	SPF10∗	....	SPW31∗	SPW10∗	SPA10∗	SPO10∗●
	3	SPG11∗	SPF11∗	....	SPW32∗	SPW11∗	SPA11∗	SPO11∗●
	4	SPG12∗	SPF12∗	....	SPW33∗	SPW12∗	SPA12∗	SPO12∗●
	5	SPG13∗	SPF13∗	....	SPW34∗	SPW13∗	SPA13∗	SPO13∗●
100	2	SQG10∗	SQF10∗	....	SQW31∗	SQW10∗	SQA10∗	SQO10∗●
	3	SQG11∗	SQF11∗	....	SQW32∗	SQW11∗	SQA11∗	SQO11∗●
	4	SQG12∗	....	....	....	SQW12∗	SQA12∗	SQO12∗●
	5	SQG13∗	....	....	....	SQW13∗	SQA13∗	SQO13∗●
200	2	SVG10∗	....	....	....	SVW10∗	SVA10∗	SVO10∗
	3	SVG11∗	....	....	....	SVW11∗	SVA11∗	SVO11∗
	4	SVG12∗	....	....	....	SVW12∗	SVA12∗	SVO12∗
300	2	SXG13∗	....	....	....	SXW13∗	SXA13∗	SXO13∗
	3	SXG14∗	....	....	....	SXW14∗	SXA14∗	SXO14∗
400	2	SYG16∗	....	....	....	SYW16∗	SYA16∗	SYO16∗
	3	SYG17∗	....	....	....	SYW17∗	SYA17∗	SYO17∗
600	2	SZG18∗	....	....	....	SZW18∗	SZA18∗	SZO18∗
	3	SZG19∗	....	....	....	SZW19∗	SZA19∗	SZO19∗
800	2	SJG10∗	....	....	....	SJW10∗	SJA10∗	SJO10∗
	3	SJG11∗	....	....	....	SJW11∗	SJA11∗	SJO11∗

‡ **NEMA Type 12** enclosures may be field modified for outdoor applications or **NEMA Type 3R** separate enclosures can be ordered. See the Class 9991 Section in Catalog 9999CT9701.
● Separate enclosures are available for these devices. It may be possible to improve delivery by ordering an open type contactor and separate Class 9991 enclosure.
▲**NEMA Type 4 & 4X** enclosures are brush finished stainless steel for contactors sized 30 Amp thru 300 Amp. Sizes 400 Amp thru 800 Amp are painted sheet steel. For electropolished finish, specify **Form G16**.
■ **Form F4T** is provided as standard; include line voltage when ordering. Control voltage is 120-60.
∗ Voltage code must be specified to order this product. Refer to standard voltage codes below.
▼ All lighting contactors are provided with separate control as standard.

Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24♦	...	V01
120	110	V02
208	...	V08
240	220	V03
277	...	V04
480	440	V06
Specify	Specify	V99

♦ 24 volt coils are not available for 200 Amp thru 800 Amp devices. Contact local Square D Field Sales Office for additional information.

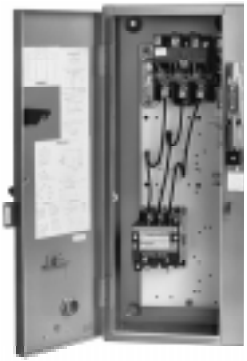
Poles for Type S Only

A single-pole or double-pole kit can be added to any 2 or 3 pole 30 or 60 Ampere Type S lighting contactor to make a 4 or 5 pole device. Factory assembled 4 and 5 pole contactors utilize the basic 3 pole device with a single or double-pole kit installed. Only one power pole can be added per contactor. Sufficient room is provided in all enclosure styles for the addition of a power pole kit.

Ampere Rating	Description	Class 9999 Type
30	One N.O.	SB6
	One N.C.	SB7
	One N.O. and One N.C.	SB8
	Two N.O.	SB9
	Two N.C.	SB10
60	One N.O.	SB21
	One N.C.	SB22★
	One N.O. and One N.C.	SB23★
	Two N.O.	SB24★
	Two N.C.	SB25★

★ When power pole is added to 60 A contactor, a 4-pole coil is also required. Order from Coil Table in Catalog 9999CT9701. 60 A power poles are suitable for use with copper or aluminum wire.

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It is desirable to install the branch-circuit protective device and lighting contactor, combining switching and over-current protection, in one enclosure. Combination lighting contactors are well suited for industrial, highway and area lighting applications, or where a lighting circuit may have to be disconnected for periodic maintenance. They may also be used for resistance heating loads.

Features

The features include: disconnect switch and circuit breaker versions; rugged flange-mounted handle; easy installation; occupation of less space; increased operator protection; room to spare for modifications; Class R fuse clips standard; electrically and mechanically held; 30–600 Amperes.

Fusible or Non-Fusible Disconnect Switch (3-Pole, 50-60 Hz)

Contactor Ampere Rating	Fuse Clip Size (Amps)	Fuse Clip Spacing (Volts)	NEMA Type 1 General Purpose Enclosure Type	NEMA Type 4 & 4X ▲ Watertight and Dusttight Enclosure Stainless Steel Type	NEMA Type 12‡ Dusttight, Oiltight Driptight, Industrial Use Enclosure Type
Electrically Held■					
30	None 30 30	.... 600 250	SMG60✱ SMG61✱ SMG62✱	SMW60✱ SMW61✱ SMW62✱	SMA60✱ SMA61✱ SMA62✱
60	None 60 60	.... 600 250	SPG60✱ SPG61✱ SPG62✱	SPW60✱ SPW61✱ SPW62✱	SPA60✱ SPA61✱ SPA62✱
100	None 100 100	.... 600 250	SQG60✱ SQG61✱ SQG62✱	SQW60✱ SQW61✱ SQW62✱	SQA60✱ SQA61✱ SQA62✱
200	None 200 200	.... 600 250	SVG60✱ SVG61✱ SVG62✱	SVW60✱ SVW61✱ SVW62✱	SVA60✱ SVA61✱ SVA62✱
300	None 400 400	.... 600 250	SXG60✱ SXG61✱ SXG62✱	SXW60✱ SXW61✱ SXW62✱	SXA60✱ SXA61✱ SXA62✱
Mechanically Held■					
30	None 30 30	.... 600 250	SMG70✱ SMG71✱ SMG72✱	SMW70✱ SMW71✱ SMW72✱	SMA70✱ SMA71✱ SMA72✱
60	None 60 60	.... 600 250	SPG70✱ SPG71✱ SPG72✱	SPW70✱ SPW71✱ SPW72✱	SPA70✱ SPA71✱ SPA72✱
100	None 100 100	.... 600 250	SQG70✱ SQG71✱ SQG72✱	SQW70✱ SQW71✱ SQW72✱	SQA70✱ SQA71✱ SQA72✱
200	None 200 200	.... 600 250	SVG70✱ SVG71✱ SVG72✱	SVW70✱ SVW71✱ SVW72✱	SVA70✱ SVA71✱ SVA72✱
300	None 400 400	.... 600 250	SXG70✱ SXG71✱ SXG72✱	SXW70✱ SXW71✱ SXW72✱	SXA70✱ SXA71✱ SXA72✱

Circuit Breaker (3-Pole, 50-60 Hz)

Contactor Ampere Rating	Circuit Breaker		NEMA Type 1 General Purpose Enclosure	NEMA Type 4 & 4X▲ Watertight and Dusttight Enclosure Stainless Steel (30-300 Amp)	NEMA Type 12‡ Dusttight, Oiltight, Driptight, Industrial Use Enclosure
	Ampere Rating	Maximum Volts	Type	Type	Type
Electrically Held■					
30	30 30	600 240	SMG81✱ SMG82✱	SMW81✱ SMW82✱	SMA81✱ SMA82✱
60	60 60	600 240	SPG81✱ SPG82✱	SPW81✱ SPW82✱	SPA81✱ SPA82✱
100	100	600	SQG81✱	SQW81✱	SQA81✱
200	200	600	SVG81✱	SVW81✱	SVA81✱
300	300	600	SXG81✱	SXW81✱	SXA81✱
400♦	400	600	SYG81✱	SYW81✱	SYA81✱
600♦	600	600	SZG81✱	SZW81✱	SZA81✱
Mechanically Held■					
30	30 30	600 240	SMG91✱ SMG92✱	SMW91✱ SMW92✱	SMA91✱ SMA92✱
60	60 60	600 240	SPG91✱ SPG92✱	SPW91✱ SPW92✱	SPA91✱ SPA92✱
100	100	600	SQG91✱	SQW91✱	SQA91✱
200	200	600	SVG91✱	SVW91✱	SVA91✱
300	300	600	SXG91✱	SXW91✱	SXA91✱
400	400	600	SYG91✱	SYW91✱	SYA91✱
600	600	600	SZG91✱	SZW91✱	SZA91✱

♦ **Form F4T** is standard; Include line voltage when ordering. Control voltage is 120V/60 Hz.

▲ For **NEMA Type 4 & 4X** Watertight, Dusttight and Corrosion-Resistant Glass-Polyester enclosure pricing, multiply stainless steel enclosed price by 1.25 and add **Form G18** (limited to 100 Amp max.). 400 & 600 Amp enclosures are painted sheet steel **(NEMA Type 4 & 4X)**.

‡ **NEMA Type 12** enclosures may be field modified for outdoor applications. See the Class 9991 section in Catalog 9999CT9701.

■ All lighting contactors are provided with separate control as standard.

✱ Coil voltage codes must be specified to order this product. Refer to standard voltage codes shown to the left.

File E16151
CCN NRNT

and

Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24◑	...	V01
120	110	V02
208	...	V08
240	220	V03
277	...	V04
480	440	V06
Specify	Specify	V99

◑ 24 volt coils are not available for 200 Amp devices. Contact local Square D Field Sales Office for additional information.

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Long Version

NIGHT-MASTER Outdoor Combination Lighting Contactors offer disconnecting means, overcurrent protection and a lighting contactor in one NEMA Type 3R Rainproof enclosure. These combination units satisfy requirements of the National Electrical Code and UL 508 for service entrance equipment.

Features:

- Solid neutral standard
- Grounding lug standard
- Padlocking provisions
- Short and long versions available
- Electrically held Type S lighting contactor
- Eliminates the need for separate time clocks and safety switches

NIGHT-MASTER™

Disconnect Switch Type▼ (3-Pole)

Contactor Ampere Rating	Fuse Clip Size (Amperes)	Fuse Clip Spacing (Volts)	Short Version	Long Version
			Class 8903 Type	Class 8903 Type
30	30 30	600 250	SMC61✱ SMC62✱	SMC63✱ SMC64✱
60	60 60	600 250	SPC61✱ SPC62✱	SPC63✱ SPC64✱
100	100 100	600 250	SQC61✱ SQC62✱	SQC63✱ SQC64✱
200	200 200	600 250	SVC61✱ SVC62✱	SVC63✱ SVC64✱



Short Version

Circuit Breaker Type▼ (3-Pole)

Contactor Ampere Rating	Circuit Breaker		Short Version	Long Version
	Ampere Rating	Maximum Volts	Class 8903 Type	Class 8903 Type
30	30	600	SMC81✱	SMC83✱
60	60	600	SPC81✱	SPC83✱
100	100	600	SQC81✱	SQC83✱
200	200	600	SVC81✱	SVC83✱

▼ All lighting contactors are provided with separate control as standard.

✱ Coil Voltage codes must be specified to order this product. Refer to standard voltage codes listed below.

UL Approved for Service Entrance

File E16151
CCN NRNT

and

C

NIGHT-MASTER Combination Lighting Contactors

The Class 8903 NIGHT-MASTER Outdoor Combination Lighting Contactor is the only product on the market that is UL Listed for Service Entrance. This allows the contactor to be pole mounted when used to control lighting in remote locations such as parks, monuments, group sports facilities, and streets and highways.

Factory modifications such as photocells, time switches, key operated selector switches, and the combination of photocells and time switches (photocell on, time switch off) allow the NIGHT-MASTER to be located in applications where manual operation of lights is not practical.

NIGHT-MASTER comes in long and short versions in sizes 30 through 200 Amperes. Most common modifications can be provided from the factory, or added in the field to pre-drilled and pre-tapped panels.

Coil Voltage Codes

Voltage		Code
60 Hz	50 Hz	
24▲	...	V01
120	110	V02
208	...	V08
240	220	V03
277	...	V04
480	440	V06
Specify	Specify	V99

▲ 24 volt coils are not available for 200 Amp devices. Contact local Square D Field Sales Office for additional information.

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File E78427
CCN NRNT

LR 60905
Class 3231 01

General Information

Panelboard Lighting Contactors, sometimes called remote control switches, are designed for use with lighting panelboards and motor control centers where either panel or bus mounting is desirable. Type PB lighting contactors can be used in a retrofit or new project without increasing the panelboard depth. They can be used to directly replace many inoperative existing switches.

The features include: mechanically held; compatible with Square D panelboards; short-circuit ratings to 100 KA; compact arc suppression; bus or panel mounted; fits in standard-depth lighting panelboards; easy manual operation; standard coil clearing contacts; and the ability to operate in any position.

Class 8903 Type PB Lighting Contactors

Description		Bus Mount	Panel Mount
Amp Size	Poles	Type	Type
30	2 3	PBM 10B∗ PBM 11B∗	PBM 10∗ PBM 11∗
60	2 3	PBP 10B∗ PBP 11B∗	PBP 10∗ PBP 11∗
75	2 3	PBN 10B∗ PBN 11B∗	PBN 10∗ PBN 11∗
100	2 3	PBQ 10B∗ PBQ 11B∗	PBQ 10∗ PBQ 11∗
150	2 3	PBR 10B∗ PBR 11B∗	PBR 10∗ PBR 11∗
200	2 3	PBV 10B∗ PBV 11B∗	PBV 10∗ PBV 11∗
225	2 3	PBW 10B∗ PBW 11B∗	PBW 10∗ PBW 11∗

∗ Voltage code must be specified to order this product. Refer to standard voltage codes listed below.

AC Coil Voltage Codes

60 Hz	Voltage Code
120/208 240/277 480	V38 V39 V28

Maximum Wire Size

Current Range	Power Wire (CU/AL)	Control Wire (CU Only)
30-100 Amps 150-225 Amps	1/0 Max. 350 MCM Max.	#18 - #10 #18 - #10

Factory Modifications

Form	Description
X11 X22	(1) Auxiliary Contacts SPDT (2) Auxiliary Contacts SPDT

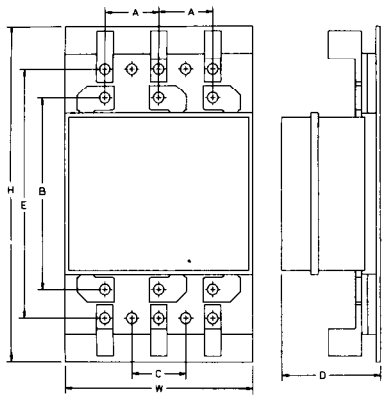
Wire Gauge AWG	Distance (feet)				
	120V	208V	240V	277V	480V
#14 #12 #10	550 900 1425	1650 2700 4275	2200 3600 5700	2925 4700 7550	8800 14400 22800

Short-Circuit Ratings

RMS Sym. Current (Amp)	Max. Volts	Short Circuit Protection Device Recommended
100,000 22,000 65,000	600 600 240	Class J Fuses Circuit Breaker - Square D - Type LHL Circuit Breaker - Square D - Type LHL

Dimensions (Panel Mount)

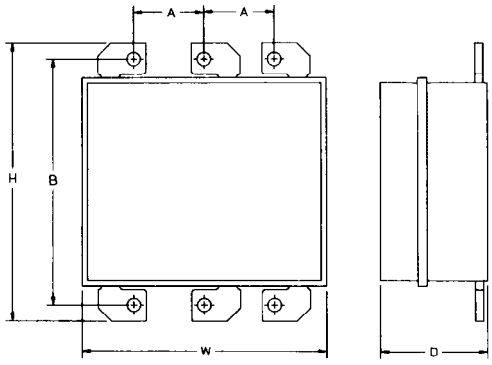
Amps	Dimensions Inches (mm)						
	H	W	D	A	B	C	E
30-100	11.75 (298)	7.50 (191)	3.88 (98)	2.25 (57)	7.38 (187)	2.25 (57)	9.25 (234)
150-225	14.50 (368)	7.50 (191)	3.88 (98)	2.88 (73)	8.50 (216)	3.00 (76)	10.50 (266)



Dimensions (Bus Mount)

Amps	Dimensions Inches (mm)				
	H	W	D	A	B
30-100	8.31 (211)	7.50 (191)	3.38 (86)	2.25 (57)	7.38 (187)
150-225	9.50 (241)	7.50 (191)	3.38 (86)	2.88 (73)★	8.50 (216)

★ Slotted mounting holes suitable for 2.88 to 3.19 in. (73 to 81 mm) mounting centers.



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REQ 2815-G2

Open Type Only

File E78401
CCN WPWR 2

Electrically Held ♦

Amperes	Poles	Open Type Catalog Number	NEMA Type 1 † Enclosed Catalog Number
30	2 pole / 2 pole 3 pole / 3 pole 4 pole / 4 pole	8903REQ2814-G1 8903REQ2814-G2 8903REQ2814-G3	8903REQ2814-G7 8903REQ2814-G8 8903REQ2814-G9
60	2 pole / 2 pole 3 pole / 3 pole 4 pole / 4 pole	8903REQ2815-G1 8903REQ2815-G2 8903REQ2815-G3	8903REQ2815-G7 8903REQ2815-G8 8903REQ2815-G9
100	2 pole / 2 pole 3 pole / 3 pole 4 pole / 4 pole	8903REQ2816-G1 8903REQ2816-G2 8903REQ2816-G3	8903REQ2816-G7 8903REQ2816-G8 8903REQ2816-G9
150	2 pole / 2 pole 3 pole / 3 pole 4 pole / 4 pole	8903REQ2817-G1 8903REQ2817-G2 8903REQ2817-G3	8903REQ2817-G7 8903REQ2817-G8 8903REQ2817-G9

♦ UL Recognized as "Components – Automatic Transfer Switches For Use In Option Stand – By Systems" only.
† NEMA Type 1 devices are not UL1008 Recognized.

Mechanically Held ▲

Amperes	Poles	Open Type Catalog Number	NEMA Type 1 † Enclosed Catalog Number
30	2 pole / 2 pole 3 pole / 3 pole 4 pole / 4 pole	8903REQ2814-G4 8903REQ2814-G5 8903REQ2814-G6	8903REQ2814-G10 8903REQ2814-G11 8903REQ2814-G12
60	2 pole / 2 pole 3 pole / 3 pole 4 pole / 4 pole	8903REQ2815-G4 8903REQ2815-G5 8903REQ2815-G6	8903REQ2815-G10 8903REQ2815-G11 8903REQ2815-G12
100	2 pole / 2 pole 3 pole / 3 pole 4 pole / 4 pole	8903REQ2816-G4 8903REQ2816-G5 8903REQ2816-G6	8903REQ2816-G10 8903REQ2816-G11 8903REQ2816-G12
150	2 pole / 2 pole 3 pole / 3 pole 4 pole / 4 pole	8903REQ2817-G4 8903REQ2817-G5 8903REQ2817-G6	8903REQ2817-G10 8903REQ2817-G11 8903REQ2817-G12
225	2 pole / 2 pole 3 pole / 3 pole	8903REQ2818-G1 8903REQ2818-G2	8903REQ2818-G3 8903REQ2818-G4
260	2 pole / 2 pole 3 pole / 3 pole	8903REQ2819-G1 8903REQ2819-G2	8903REQ2819-G3 8903REQ2819-G4
400	2 pole / 2 pole 3 pole / 3 pole	8903REQ2820-G1 8903REQ2820-G2	8903REQ2820-G3 8903REQ2820-G4
600	2 pole / 2 pole 3 pole / 3 pole	8903REQ2821-G1 8903REQ2821-G2	8903REQ2821-G3 8903REQ2821-G4
800	2 pole / 2 pole 3 pole / 3 pole	8903REQ2822-G1 8903REQ2822-G2	8903REQ2822-G3 8903REQ2822-G4

▲ UL Recognized as "Components – Automatic Transfer Switches For Use In Option Stand – By Systems".
† NEMA Type 1 devices are not UL1008 Recognized.

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Description	Form Letter	NEMA Enclosure Type	Used On				
			Std.		Combo		NIGHT-MASTER® ①
			Elec. Held	Mech. Held	Elec. Held	Mech. Held	
"On-off" (momentary contact) push button	A3	1		✱		✱	
	A3	3R, 4, 12		✱		✱	
"On-off" push button (with holding circuit interlock)	A12	Any	✱		✱		✱
"HAND-OFF-AUTO" selector switch. For key operator, add Form C33, i.e. CC33	C	1	✱	✱	✱	✱	
	C	3R, 4, 12	✱	✱	✱	✱	✱
"On-off" selector switch. For key operator, add Form C33, i.e. C6C33	C6	1	✱	✱	✱	✱	
	C6	3R, 4, 12	✱	✱	✱	✱	✱
Control circuit fuse (1 fuse)	F	Any	✱	✱	✱	✱	✱
Control circuit fuses (2 fuses)	F4	Any	✱	✱	✱	✱	✱
Control circuit transformer standard capacity 50/60 Hz Primary (Fuses) Secondary 2 100 Cap. 0 ③, ④ for 300 A	F4T	Any	✱	✱	✱	✱	✱
2 100 Cap. 1 ③, ④ for 300 A	FF4T	Any	✱	✱	✱	✱	✱
2 100 VA Add. Cap. 1 ④ for 200 and 300 A	FF4T11	Any	✱	✱	✱	✱	✱
2 200 VA Add. Cap. 1 ④ for 100, 200 and 300 A	FF4T12	Any	✱	✱	✱	✱	✱
2 300 VA Add. Cap. 1 ④ for 30 to 300 A	FF4T13	Any	✱	✱	✱	✱	✱
Noise reduced enclosure and shock mounted panel	G4	Any		✱		✱	
Addition of photoelectric receptacle	G10	1, 3R, 12	✱		✱		✱
Addition of photoelectric receptacle with photo-cell	G101	1, 3R, 12	✱		✱		✱
Addition of photoelectric receptacle and relay (R6)	G10R6	1, 12		✱		✱	
With photo-cell installed	G101R6	1, 12		✱		✱	
Addition of terminal blocks (other than standard). "xx" Represents the number of terminals needed.	G50xx	Any					
(PER TERMINAL PRICE) WIRED			✱	✱	✱	✱	✱
(PER TERMINAL PRICE) UNWIRED			✱	✱	✱	✱	✱
Bracketing for internally mounted pilot device	G53	Any	✱	✱	✱	✱	✱
Addition of 24 hour time clock (120-277v only)	K14	1, 4, 12	✱	✱	✱	✱	
Addition of 24 hour time clock w/day omission (120-277v)	K141	1, 4, 12	✱	✱	✱	✱	
Addition of 7 day time clock (120-277v)	K142	1, 4, 12	✱	✱	✱	✱	
Addition of 8865 TC12 lighting controller to lighting contactors of any size. REQUIRES A 24V 60 Hz CONTROL CIRCUIT.	K143	1, 4, 12	✱	✱			
Addition of 24 hour time clock (120-277v only)	K14	3R					✱
Addition of 24 hr time clock w/skip day (120-277v)	K141	3R					✱
Addition of 7 day time clock (120-277v)	K142	3R					✱
Addition of solid neutral terminal block	N	1, 4, 12	✱	✱	✱	✱	Std.
Red Pilot Light	P1	Any	✱	✱	✱	✱	✱
Two or more lights ⑥ (each)	P	Any	✱	✱	✱	✱	✱
Red Push To Test Pilot Light	P21	Any	✱	✱	✱	✱	✱
Interlock necessary for pilot light one needed for each additional pilot light	②, ⑦	Any	✱	✱	✱	✱	✱
Two Wire Interface for Mechanically held	R6	Any		✱		✱	
Three wire control for long distance applications.	R62	Any		✱		✱	
Auxiliary contacts (specify number of N.O. + N.C.)	X ⑦	Any	✱	✱	✱	✱	✱
Addition of DC coil to Type L (7 poles max)	Y48	Any	✱				
Auxiliary electrical interlock installed on disconnect switch or circuit breaker operating mechanism	Y74	Any			✱	✱	✱
Coil Transient suppressor (120Vac Only)	Y145	Any	✱		✱		✱
Coil Transient suppressor (120Vac Only)	Y145	Any		✱		✱	
Addition of lightning arrestor	Y1532	3R, 4, 12	✱	✱	✱	✱	✱
Substitute copper only lugs for standard	Y157	Any	✱	✱	✱	✱	✱
Substitute Anderson VC crimp style lugs for standard – per lug adder – specify lug	Y1574	Any	✱	✱	✱	✱	✱
Addition of under and overvoltage relay	Y449	Any	✱	✱	✱	✱	✱
Multiple contactors in common enclosure "xx" = number of contactors needed ⑤	Y10XX	1, 4, 12	✱	✱			

✱ Available.

① NIGHT-MASTER maximum 200 Amps, minimum 30 Amps.

② DO NOT use Form X for any interlock which is wired in series with pilot light, but DO specify how pilot light and interlock are to be wired into the circuit.

③ Not required on 400 A through 800 A electrically held versions only, which have a control circuit requiring a 120V secondary; therefore, a transformer is supplied. The transformer comes wired to L1 and L2 unless Form "S" is called for. It is supplied with two primary and one secondary fuse.

④ Single primary voltage must be specified using the codes shown below:

Voltage 60 Hz	Code
120-24	V89
208-120	V84
240-24	V82
240-120	V80
277-120	V85
480-24	V83
480-120	V81
480-240	V87
600-120	V86

⑤ Limited to 16 contactors thru 60 Amps, 4 contactors thru 200 Amps.

⑥ For electrically-held enclosed devices, the first pilot is wired in parallel with the coil. Operating interlocks are required for all additional pilot lights. Mechanically held devices require operating interlocks for all pilot lights.

⑦ Electrically held 20 Amp multipole contactors cannot add interlocks. Additional poles can be used for the same function, however. Mechanically held (Type LX) provide one double throw auxiliary (or status) contact as standard.

Order Example

You have previously selected a Class 8903SMG2V02. V02 means that you need a coil voltage of 120-60/110-50 wired for separate control. You would like to add form FF4T with the transformer voltages being 480 volt primary, 120 volt secondary.

The new and complete Class, Type, Voltage Code and Form number:

Class	Type	VoltageCode	Form♦
8903	SMG2	V81	FF4T

♦ Form numbers should always be shown in alphabetical order.

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Description	Types L & LX	Type S						Form No.
	30 Amp	30 Amp	60 Amp	100 Amp	200 Amp	300 Amp	400, 600, 800 Amp	
	Kit	Kit	Kit	Kit	Kit	Kit	Kit	
AUXILIARY CONTACTS 1 N.O. LH or RH Mounting 1 N.C. LH or RH Mounting 1 N.C. & 1 N.O. Isolated LH or RH 1 N.O. Overlapping LH or RH 1 N.C. Overlapping LH or RH		 9999 SX6 9999 SX7 9999 SX8 9999 SX9 9999 SX10	 9999 SX6 9999 SX7 9999 SX8 9999 SX9 9999 SX10	 9999 SX6 9999 SX7 9999 SX8 9999 SX9 9999 SX10	 9999 SX6 9999 SX7 9999 SX8 9999 SX9 9999 SX10	 9999 SX6 9999 SX7 9999 SX8 9999 SX9 9999 SX10	 9999 SX6 9999 SX7 9999 SX8 9999 SX9 9999 SX10	X
CONTROL CIRCUIT FUSE HOLDER Single Fuse Unit Two Fuse Unit	9999 LLX and 9999 SFR3 9999 LLX and 9999 SFR4	9999 SFR3 9999 SFR4	9999 SFR3 9999 SFR4	9999 SFR3 9999 SFR4	9999 SFR3 9999 SFR4	9999 SFR3 9999 SFR4	9999 SFR3 9999 SFR4	F F4
TRANSFORMERS (For Prices See Class 9070 Section)	9070 T50	9070 T100	9070 T100	9070 T300	9070 T300	9070 T500	9070 T750	T
OVERSIZED ENCLOSURES (Non-Combo) NEMA 1 NEMA 4 NEMA 12	 9991 SDG3 9991 SDW3 9991 SDA3	 9991 SDG3 9991 SDW3 9991 SDA3	 9991 SDG3 9991 SDW3 9991 SDA3					 ....
STANDARD ENCLOSURES NEMA 1 – Surface Mount NEMA 3R NEMA 4 – Standard NEMA 4 – With 2 Cover Mtd. Closing Plates NEMA 4X – Glass Polyester NEMA 12 NEMA 1 – Flushmount – Complete NEMA 1 – Flush Mount Parts FLUSH PARTS Standard – Elec. held – Mech. held Mounting Strap Pull Box	 9991 LXG1 9991 SDH1 9991 SDW1 9991 SDW11 9991 SDW20 9991 SDA11 .... 9991 SDF13 9991 SDF13 9991 SDF2 9991 SDF1	 9991 SCG7① 9991 SCH2 9991 SCW1 9991 SCW11 9991 SCW20 9991 SCA11 .... 9991 SCF11 9991 SCF13 9991 SCF2 9991 SCF1	 9991 SDG7① 9991 SDH1 9991 SDW1 9991 SDW11 9991 SDW20 9991 SDA11 .... 9991 SDF11 9991 SDF13 9991 SDF2 9991 SDF1	 9991 SFG8 9991 SEH1 ..... 9991 SEW11 ..... 9991 SEA11 9991 SEF11	 ..... 9991 SFH1	 9991 SGG8		 ....
Internal Operator Mounting Bracket	30102-159-01	30102-159-01	30102-159-01	30102-159-01	30102-159-01	30102-159-01	30102-159-01	G53
Solid Neutral	9999 SN1	9999 SN1	9999 SN1	9999 SN1	9999 SN2	9999 SN2	9999 SN3③	N
(Combination Lighting Contactor Disconnect Interlock Kit)								
Breaker Type 1 Pole 2 Pole		 9999 R26 9999 R27	 9999 R26 9999 R27	 9999 R26 9999 R27	 9999 R26 9999 R27	 9999 R26 9999 R27	 9999 R26 9999 R27	Y74
Disconnect Type 1 Pole 2 Pole		 9999 R45 9999 R46	 9999 R43 9999 R44	 9999 R41 9999 R42	 9999 R8 9999 R9	 9999 R35 9999 R36	 9999 R26 9999 R27	
Lightning Arrestor 175Vac to Ground Max 2 or 3 wire Grounded	J9200-10	J9200-10	J9200-10	J9200-10	J9200-10	J9200-10	J9200-10	
650Vac to Ground Max 3 or 4 wire Grounded	J9200-9A	J9200-9A	J9200-9A	J9200-9A	J9200-9A	J9200-9A	J9200-9A	
Hardware 2 Pole 3 Pole 4 Pole	....	....	....	 Not Needed	9999 AL 13 9999 AL 14 9999 AL 15	 9999 AL 11 9999 AL 11	 9999 AL 12 9999 AL 12	
Versa Crimp Lugs Range #8-1/0 AL/CU #1-2/0 AL/CU 2/0-4/0 AL/CU 4-300 MCM AL/CU 2/0-500 MCM AL/CU 400-600 MCM AL 400-500 MCM CU 500-750 MCM AL 500 MCM CU 400-600 MCM AL 400-500 MCM CU 500-750 MCM AL 500 MCM CU	....	....	....	..... VCEL02114S1	.... VCEL022516H1 VCEL024516H1 VCEL030516H1	.... VCEL05012H1 VCEL06012H1 VCEL06012H1 VCEL07512H1 VCEL07512H1	.... VCEL06012H2 ② VCEL06012H2 ② VCEL07512H2 ② VCEL07512H2 ②	Y1532
Relay Under and Over Voltage	8430 DWU	8430 DWU	8430 DWU	8430 DWU	8430 DWU	8430 DWU	8430 DWU	Y449

① For electrically held only.

② One or two lugs may be mounted on each terminal. Limited to 400 and 600 Amp versions. 800 Amp is factory modification only.

③ Limited to 400 and 600 Amp versions. 800 Amp is a factory modification only.

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	Description	TYPE L & LX	TYPE S						
		30 Amp	30 Amp	60 Amp	100 Amp	200 Amp	300 Amp	400, 600, 800 Amp	Form No.
		Kit	Kit	Kit	Kit	Kit	Kit	Kit	
Mechanically-Held	**PUSH BUTTON (ON-OFF)** NEMA Type 1 Enclosure	9999BLX & 9999LXPB	✱	9001KA2 & 9999SA3▲	9001KA2 & 9999SA3▲	9001KA2 & 9999SA3▲	9001KA2 & 9999SA3▲	9001KA2 & 9999SA3▲	A3
	NEMA Type 3R, 4 or 12 Enclosure	9001KA2 9999SA3▲	9001KA2 9999SA3▲	9001KA2 9999SA3▲	9001KA2 9999SA3▲	9001KA2 9999SA3▲	9001KA2 9999SA3▲	9001KA2 9999SA3▲	
	SELECTOR SWITCH (2 POSITION) NEMA Type 1 Enclosure	9999BLX & 9999LXS	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	C6
	NEMA Type 3R, 4 or 12 Enclosure	9001KN244 9001KS11BH1	9001KN244 9001KS11BH1	9001KN244 9001KS11BH1	9001KN244 9001KS11BH1	9001KN244 9001KS11BH1	9001KN244 9001KS11BH1	9001KN244 9001KS11BH1	
	SELECTOR SWITCH (3 POSITION) NEMA 1 Enclosure (MUST INCLUDE TWO WIRE CONTROL RELAY (Form R6)	9999BLX & 9999SC2	–	–	–	–	–	–	C
	NEMA Type 3R, 4 or 12 Enclosure	9001KN260 & 9001KS46BH2	9001KN260 & 9001KS46BH2	9001KN260 & 9001KS46BH2	9001KN260 & 9001KS46BH2	9001KN260 & 9001KS46BH2	9001KN260 & 9001KS46BH2	9001KN260 & 9001KS46BH2	
	TWO WIRE CONTROL RELAY (Form R6)	9999RLX CA2SK11_	8501X011	8501X011	8501X011	8501X011	8501X011	8501X011	R6
Electrically-Held	**PILOT LIGHTS (RED)** NEMA Type 1 Enclosure NEMA Type 3R, 4 or 12 Enclosure	9999SP28R	9999SP2R 9999SP28R	9999SP3R 9999SP28R	♦ 9999SP14R 9999SP28R	★ 9999SP28R 9999SP28R	★ 9999SP28R 9999SP28R	9999SP28R 9999SP28R	P1
	PUSH BUTTONS● NEMA Type 1 Enclosure	9999BLX & 9999SA10	9999SA10	9999SA10	9999SA3	9999SA3	9999SA3	9999SA3	A12
	NEMA Type 3R, 4 or 12 Enclosure	9999SA3	9999SA3	9999SA3	9999SA3	9999SA3	9999SA3	9999SA3	
	SELECTOR SWITCH (2 POSITION) NEMA Type 1 Enclosure	9999BLX & 9999SC22	9999SC22	9999SC22	9999SC22	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	C6
	NEMA Type 3R, 4 or 12 Enclosure	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BM1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	9001KN244 & 9001KS11BH1	
	SELECTOR SWITCH (3 POSITION) NEMA Type 1 Enclosure	9999BLX & 9999SC2	9999SC2	9999SC2	9999SC2	9999SC8	9999SC8	9999SC8	C
	NEMA Type 3R, 4 or 12 Enclosure	9999SC8	9999SC8	9999SC8	9999SC8	9999SC8	9999SC8	9999SC8	

✱ No field installed kit available.
▲ Mechanically-held contactors need two distinct signals to operate. If is necessary to add a N.O. contact block to the Class 9999 Type SA3 push button kit.
♦ Selection for 2 or 3 pole only; for 4 or 5 pole use Class 9999 SP15R.
★ The coil voltage must be the same as the pilot light rating. Kit contains one (1) Class 9001, Type KP1R6 120V/60Hz red pilot light control unit. For other voltages, refer to the Class 9001, Type KP Control Section.
● Requires holding circuit interlock or additional power pole on 20 Amp size.

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Application of Lighting Contactors

Lighting contactors have evolved from the need for more than just simple on-off manual control of lights. Today's requirements call for the development of new and varied types of control. Often the application will call for remote control of lighting from some distant location. This control may or may not be in addition to a master control station at a central location. Certain applications include the use of automatic control by time clocks or photelectric cells. Whatever the need may be, applications are increasing, and lighting contactors are designed to meet the ever-changing requirements.

Square D lighting contactors offer a time-proven design for better electrical and mechanical performance. They are used wherever reliable, convenient and economical control of indoor and outdoor lighting is required. Typical installations include:

- parking lots
- industrial plants
- office buldings
- theaters and auditoriums
- hospitals and institutions
- shopping centers
- stadiums
- airports

Tungsten Lamp Loads

Tungsten lamps have a positive resistance characteristic (resistance to the flow of electric current increases as its operating temperature increases), thus exhibiting an increase in resistance when the lamp is energized. Therefore, these lamps have a high inrush current of up to 18 times normal current resulting from the low cold resistance of the tungsten. Examples of tungsten lamps include incandescent lamps, iodine lamps, quartz-iodine lamps and infrared lamps.

Ballast Lighting Loads

A ballast lighting load consists of electric discharge (vapor) lamps. All types of vapor lamps possess a negative resistance characteristic. The resistance within the lamp decreases with an increase in current and vice-versa. Without some form of current limiting device in the electric circuit, the current would rise quickly until lamp failure occured. This current limiting element is known as the ballast. A ballast is an impedance used to stabilize the current in a vapor lamp. It has the property of increasing in resistance as current through it increases and decreasing in resistance as current decreases. Thus it tends to maintain a constant current through it. Types of ballast lighting include high intensisty discharge (HID) lamps – mercury vapor, metal halide and high pressure sodium – and flourescent lamps.

Resistance Loads

Square D lighting contactors are fully rated for resistance loads up to 600 volts. They can be used on resistance-type boilers, electric furnaces, electric water heaters and snow melting cables and panels.

Motor Loads

These loads consist of motors having an inrush current, or locked-rotor current, of approximately six times the full-load current. Square D Type S lighting contactors are fully rated for motor loads and have a horsepower rating equal to the equivalent NEMA-Size motor contactor.

Lighting Contactors for Energy Management

Lighting contactors should be an integral part of any Energy Management System. They help conserve energy consumption and reduce utility bills by providing three types of control.

Lighting contactors offer both centralized and remote control of lighting. Cirucits can be turned on and off from a number of remote locations in addition to a master control station.

They also offer selective switching of lights. Selective switching is the control of one or more individual lighting circuits, independent of the other circuits. This design allows the potential for turning on only the amount of lighting that is actually needed.

Lighting contactors can provide automatic control to insure that lights will be turned off when not needed. There are a number of devices that, when used with lighting contactors, offer a convenient and reliable method of automatically controlling lighting loads: program time clock, photoelectric cell, programmable controller and demand controller.

Installation of Lighting Contactors

For new installations, lighting contactors can either be installed right in the lighting panelboard, or in their own enclosure next to or remote from the panelboard.

In existing applications where the lighting control system is being updated, lighting contactors can be installed in their own enclosure next to a lighting panelboard.

Compression Lugs

Square D Versa-Crimp® compression lugs for Type S lighting contactors, 100–800 ampers, are available factory installed (Form Y157-4) or as a field modification kit (see table on page 9). They are suitable for both copper and aluminum wire.



One VCEL lug (one or two on the 400 and 600 amperes devices) is required for each line or load terminal. Each Class 9999 Type AL hardware kit includes mounting hardware for 3 terminals, line or load side.

EXAMPLE: To install compression lugs on a 300 ampere 3 pole device, line and load sides, order six (6) VCEL-060-12H1 lugs and two (2) Class 9999 Type AL11 hardware kits.

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Maximum Voltage Rating

When selecting lighting contactors, the maximum voltage rating of the device must be considered in addition to its current rating. The table below lists the maximum ac voltage ratings of the Types L and S lighting contactors for ballast, tungsten and resistance loads. Lighting contactors also have dc ratings which are shown below.

Current Ratings

All Class 8903 lighting contactors are fully rated for tungsten, ballast and resistance loads. This means that a contactor can be used to control a load up to its full nameplate rating. Derating of the contactor is not necessary, as is the standard practice with circuit breakers and fuses.

AC Voltage Ratings

Type of Load	Types L & LX 30 Amperes		Type SM 30 Amperes		Types SP, SQ, SV & SX 60-300 Amperes		Types SY, SZ & SJ 400-800 Amperes	
	When Connected 1 Pole to Load	When Connected 2 Poles to Load on 1PH and 3 Poles to Load on 3PH	When Connected 1 Pole to Load	When Connected 2 Poles to Load on 1PH and 3 Poles to Load on 3PH	When Connected 1 Pole to Load	When Connected 2 Poles to Load on 1PH and 3 Poles to Load on 3PH	When Connected 1 Pole to Load	When Connected 2 Poles to Load on 1PH and 3 Poles to Load on 3PH
Tungsten	20 Amp 277 Vac	480 Vac	277 Vac	480 Vac	277 Vac	480 Vac	....	....
Ballast	277 Vac▲	480 Vac▲	347 Vac	600 Vac	347 Vac	600 Vac	347 Vac	600 Vac
Resistance	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac	600 Vac
Control Circuit (Coil) Voltage	Type L 12-600 Vac; 24, 32, 48, 115/125, 230/250 Vdc Type LX 24-600 Vac		6-600 Vac		6-600 VacType SP 24-600 VacTypes SQ & SV 120-600 VacType SX		120-600 Vac	

▲ Types L and LX contactors also have a ballast lamp rating of 15 Amperes 347 Vac when connected 1 Pole to Load and 600Vac when connected 2 Poles to Load on 1PH and 3 Poles to Load on 3PH.
NOTE: 600 Ampere devices are derated to 540 Amperes for resistance heating loads when aluminum wire is used.

DC Voltage Ratings for Tungsten Lamp or Resistance Loads Only

Type of Load	Types L &LX 20 Amperes	Type SM 30 Amperes	Types SP, SQ, SV & SX 60-300 Amperes	Types SY, SZ, & SJ 400-800 Amperes
DC with 2 Poles in Series	125 Vdc	125 Vdc	250 Vdc	....
DC with 3 Poles in Series	250 Vdc	250 Vdc	250 Vdc	....

UL Listed Short-Circuit Rating

Contactors Protected by Fusible Disconnect Switches

Contactor Continuous Rating Amps	Maximum Class RK5 Fuse Rating	Maximum Voltage	Available Amperes (RMS Sym.)
20, 30	30	600	100,000
60	60	600	100,000
100	100	600	100,000
200	200	480	100,000
300	400	600	100,000
400	400	600	100,000

Contactors Protected by Circuit Breakers

Contactor Continuous Rating Amps	Maximum Circuit Breaker Rating Amps	Recommended Square D Circuit Breaker Types	Maximum Voltage	Available Amperes (RMS Sym.)
20	25	EH-EHB, FH-FHL	240	22,000
20	25	EH-EHB, FA-FAL, FH-FHL	480	14,000
30	40	FA-FAL, FH-FHL	600	10,000
30	40	IF-IFL	480	100,000
60	80	FH-FHL	600	18,000
60	90	IF-IFL	480	100,000
100	125	KA-KAL, KH-KHL	600	10,000
100	125	IK-IKL	480	100,000
200	250	LA-LAL, LH-LHL	600	14,000
200	225	IK-IKL	480	100,000
300	400	LA-LAL, LH-LHL	600	22,000
400	800	MA-MAL, MH-MHL	600	22,000
600	800	MA-MAL, MH-MHL	600	22,000

Table 1 — Kilowatt Ratings∗

Voltage	Lighting Contactor Size							
	30 Amp	60 Amp	100 Amp	200 Amp	300 Amp	400 Amp	600 Amp	800 Amp
200 Vac	10.3	20.7	34.6	69.2	103.9	138.5	207.8	277.1
230 Vac	11.9	23.9	39.8	79.6	119.5	159.3	239.0	318.7
380 Vac	19.7	39.4	65.8	131.6	197.4	263.2	394.9	526.5
460 Vac	23.9	47.8	79.6	159.3	239.0	318.6	478.0	637.4
575 Vac	30.0	60.0	99.0	199.0	299.0	398.4	597.6	796.7

∗ Resistance heating only (three phase system).

Table 2 — Motor Load Ratings

Lighting Contactor Size	Has Same HP Ratings As Equivalent NEMA Size Contactor
30 Amperes	NEMA Size 1
60 Amperes	NEMA Size 2
100 Amperes	NEMA Size 3
200 Amperes	NEMA Size 4
300 Amperes	NEMA Size 5
400 Amperes	—
600 Amperes	NEMA Size 6
800 Amperes	NEMA Size 7

Table 3 — Mixed Load Ratings

Motor Voltage and PH ▼	Contactor Ampere Rating	Percent Lighting (and/or Resistive) Load							
		0%		25%		50%		75%	
		Max. Non-Motor Amp	Max. Motor HP	Max. Non-Motor Amp	Max. Motor HP	Max. Non-Motor Amp	Max. Motor HP	Max. Non-Motor Amp	Max. Motor HP
200 V 3PH	30	0	7 1/2	7.5	5	15	3	22.5	1 1/2
	60	0	10	15	10	30	7 1/2	45	3
	100	0	25	25	20	50	15	75	5
	200	0	40	50	40	100	30	150	15
	300	0	75	75	75	150	50	226	20
	400	0	125	100	100	200	60	300	30
	600	0	150	150	150	300	100	450	50
	800	0	250	200	200	400	125	600	60
230 V 3PH	30	0	7 1/2	7.5	7 1/2	15	3	22.5	2
	60	0	15	15	10	30	10	45	3
	100	0	30	25	25	50	15	75	7 1/2
	200	0	50	50	50	100	30	150	15
	300	0	100	75	75	150	50	226	25
	400	0	150	100	100	200	75	300	30
	600	0	200	150	150	300	100	450	50
	800	0	300	200	200	400	150	600	75
380 V 3PH	30	0	10	7.5	7 1/2	15	7 1/2	22.5	3
	60	0	25	15	20	30	15	45	7 1/2
	100	0	50	25	40	50	30	75	10
	200	0	75	50	75	100	60	150	30
	300	0	150	75	150	150	100	226	40
	400	0	250	100	200	200	125	300	60
	600	0	300	150	250	300	150	450	75
	800	0	400	200	350	400	250	600	125
460-575 V 3PH	30	0	10	7.5	7 1/2	15	7 1/2	22.5	3
	60	0	25	15	20	30	20	45	10
	100	0	50	25	40	50	30	75	15
	200	0	100	50	100	100	75	150	30
	300	0	200	75	150	150	100	226	50
	400	0	300	100	200	200	150	300	75
	600	0	400	150	350	300	200	450	100
	800	0	600	200	500	400	300	600	150
115 V Single PH	30	0	2	7.5	1 1/2	15	3/4	22.5	1/2
	60	0	3	15	3	30	2	45	3/4
	100	0	7 1/2	25	5	50	3	75	2
230 V Single PH	30	0	3	7.5	2	15	2	22.5	3/4
	60	0	7 1/2	15	5	30	5	45	2
	100	0	15	25	15	50	10	75	3

▼ Select lighting contactor on basis of rated motor voltage, whether non-motor load is connected line-to-line or line-to-neutral.

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Coil Information (120 Volts, 60 Hertz)

Amperes	Poles	Ohms	Inrush			Sealed		
			Henries	VA	Power Factor	Henries	VA	Power Factor
30 to 60	3	17.80	0.110	311	0.46 ▼	1.000	37	0.28 ▼
100	3	8.48	0.048	700	0.46 ▼	0.764	46	0.33 ▼
200	3	3.57	0.032	1185	0.37	0.490	85	0.23
300	3	0.95	0.013	2970	0.23	0.187	212	0.13

▼ Worst case; all others are mean values.

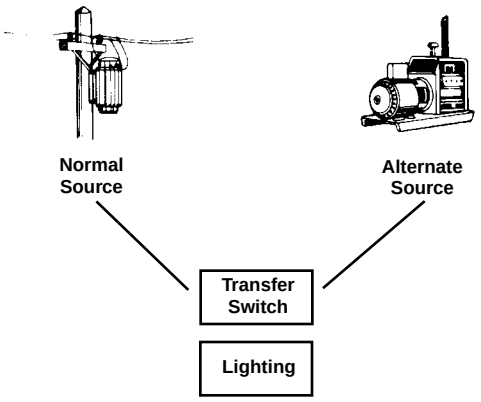
Maximum Voltage Ratings

30 - 300 Amperes

Type of Load	When connected 1ϕ pole to load	When connected 2ϕ poles to load on 1ϕ and 3ϕ poles to load on 3ϕ
Tungsten	277 Vac	480 Vac
Ballast	277 Vac	480 Vac

400 - 800 Amperes

Type of Load	When connected 1ϕ pole to load	When connected 2ϕ poles to load on 1ϕ and 3ϕ poles to load on 3ϕ
Tungsten	277 Vac	480 Vac
Ballast	277 Vac	480 Vac



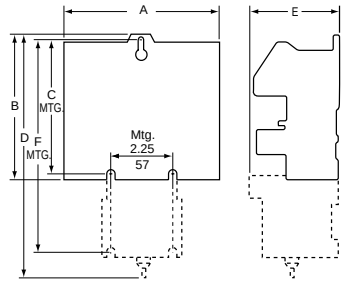
The automatic transfer switch, as part of the emergency lighting system, provides the important function of switching an essential electrical load from the normal source of lighting supply to an alternate source of supply.

Wiring Terminals

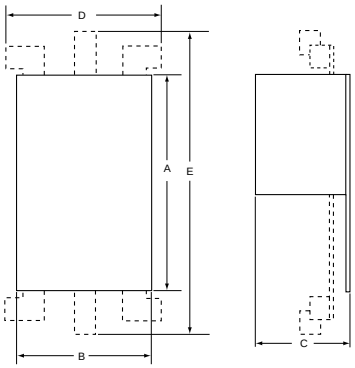
Ampere Rating	Power Terminals On Contactor		Control Terminals On All Contactors	
	Type of Lug	Wire Size Min. - Max.	Type of Lug	Wire Size Min. - Max.
30	Screw Lug	#14 - #8 copper or aluminum	Clamp	#16 - #12 copper
60		#14 - #2 copper or aluminum		#16 - #12 copper
100		#14 - #2/0 copper or aluminum		#16 - #12 copper
200		#6 -350KCMIL copper or aluminum		#16 - #12 copper
300		one #4 - 600 KCMIL or Two #0 - 250 KCMIL or aluminum		#16 - #12 copper
400		One or two #6 - 250 KCMIL copper or aluminum		Elec. Held: #16 - #14 copper Mech. held: #16 - #12 copper
600		One or two #6 - 600 KCMIL copper or aluminum		Elec. Held: #16 - #14 copper Mech. held: #16 - #12 copper
800		One, two or three #3/0 - 750 KCMIL copper or aluminum		Elec. Held: #16 - #14 copper Mech. held: #16 - #12 copper

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Lighting Control
Class 8903 – Approximate Dimensions



Open Type L & LX



Open Type S

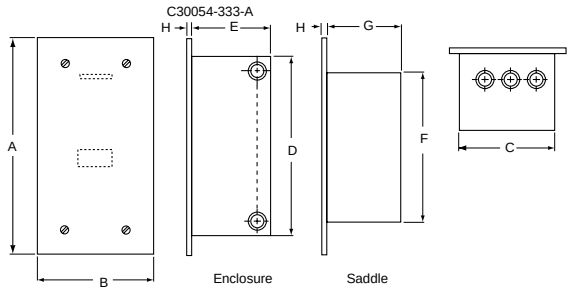
Open Type

Electrically Held									Mechanically Held						
Ampere Rating	Type	Number of Poles	Dimensions▼					Type	Dimensions▼						
			A	B	C	D	E		A	B	C	D	E	F	
30	LO	2-4	2.88 (73)	5 (127)	4.62 (117)	....	3.12 (79)	LXO	2.88 (73)	....	....	8.81 (224)	3.25 (83)	7.70 (196)	
		6	4.25 (108)	5 (127)	4.62 (117)	....	3.12 (79)		4.25 (108)	....	....	8.81 (224)	3.25 (83)	7.70 (196)	
		8-12	5.63 (143)	5 (127)	4.62 (117)	....	3.12 (79)		5.63 (143)	....	....	8.81 (224)	3.25 (83)	7.70 (196)	
30	SMO	2-3	4.34 (110)	3.22 (82)	4.22 (107)	....	....	....	7.15 (182)	3.79 (96)	4.68 (119)	....	....	....	
		4-5	4.34 (110)	4.25 (108)	4.22 (107)				7.15 (182)	4.54 (116)	4.68 (119)				
60	SPO	2-3	5.33 (135)	4.31 (110)	4.94 (125)	....	....	....	8.25 (210)	4.61 (117)	5.23 (133)	....	....	....	
		4-5	6.22 (158)	5.61 (143)	4.94 (125)				8.70 (221)	5.90 (150)	5.23 (133)				
100	SQO	2-3	7.09 (180)	5.45 (139)	6.50 (165)	....	....	....	10.13 (257)	5.94 (151)	6.72 (171)	....	....	....	
		4-5	7.82 (199)	9.75 (248)	6.50 (165)				10.56 (268)	9.75 (248)	6.72 (171)				
200	SVO	2-3	9.14 (232)	6.00 (152)	6.50 (165)	....	....	SVO	11.35 (293)	6.00 (152)	6.72 (171)	....	....	....	
		4 & 5■	9.14 (232)	9.75 (248)	6.50 (165)				11.55 (293)	9.75 (248)	6.72 (171)				
300	SXO	2-3	12.31 (313)	8.66 (220)	8.74 (222)	....	....	SXO	12.31 (313)	8.66 (220)	10.50 (267)	....	....	....	
400	SYO	2-3	....	12.33 (313)	9.00 (229)	....	27.78 (706)	SYO	....	8.66 (220)	10.50 (267)	....	21.00 (533)	....	
600	SZO							SZO							
800	SJO	2-3	....	12.33 (313)	11.94 (303)	....	42.70 (1085)	SJO	....	8.66 (220)	11.94 (303)	....	35.35 (898)	....	

■ 5 pole, electrically-held only.
▼ Dimensions are in inches (millimeters).

NEMA Type 1 Flush Mounted

Ampere Rating	Type	Form(s)		Dimensions in inches (millimeters)						
				A	B	C	D	E	F	G
30	LF LXF	Standard, F, Y48, R6		15.19 (386)	8.94 (227)	7.63 (194)	12.88 (327)	5.44 (138)	10.94 (278)	5.13 (130)
		A3, A12, C, C6, T, P		24.00 (610)	17.50 (445)	15.00 (381)	19.25 (489)	7.12 (181)	...	...
30	SMF	Electrically Held	Std., A12, C, C6, P, X	13.44 (341)	7.19 (183)	5.88 (149)	11.13 (283)	4.75 (121)	9.19 (233)	4.50 (114)
		Mechanically Held	Std., X							
		Electrically Held	T, N	24.00 (610)	17.50 (445)	15.00 (381)	19.25 (489)	5.75 (146)	...	...
		Mechanically Held	A3, C, C6, T, N, P, R6							
60	SPF	Electrically Held	Std., A12, C, C6, P, X	15.19 (386)	8.94 (227)	7.63 (194)	12.88 (327)	5.44 (138)	10.94 (278)	5.13 (130)
		Mechanically Held	Std., X							
		Electrically Held	T, N	24.00 (610)	17.50 (445)	15.00 (381)	19.25 (489)	5.75 (146)	...	...
		Mechanically Held	A3, C, C6, T, N, P, R6							
100	SQF	With or without any forms		31.00 (787)	16.75 (425)	14.25 (362)	26.25 (667)	8.00 (203)	...	...



NEMA Type 1 Enclosure (Non-Combination) Electrically and Mechanically Held

Ampere Rating	Type	Number of Poles	Form(s)		Dimensions▼		
					Width	Height	Depth
30	LG, LXG	Any	Standard, A3, A12, C, C6, F, R6, Y48		7.81 (198)	12.69 (322)	6.03 (153)
			P, T		11.88 (302)	11.88 (302)	7.44 (189)
30			K14, K141, K142		16.00 (406)	22.00 (559)	7.13 (181)
30	SMG	2-5	Electrically Held	Std., A12, C, C6, P, X	6.00 (152)	10.00 (254)	5.28 (134)
			Mechanically Held	Std., X			
			Electrically Held	T	6.34 (161)	15.88 (403)	5.19 (132)
				N	14.88 (378)	14.12 (359)	7.56 (192)
			Mechanically Held	T, N, R6			
				A3, C, C6, P	8.12 (206)	14.12 (359)	9.73 (247)
60	SPG	2-5	Electrically Held	Std., A12, C, C6, P, X	7.81 (198)	12.69 (322)	6.03 (153)
		2-5	Electrically Held & Mechanically Held	T, N, R6	14.88 (378)	14.12 (359)	7.56 (192)
		2-5	Mechanically Held	Std., A3, C, C6, P, X	8.12 (206)	14.12 (359)	9.73 (247)
100	SQG	2 & 3	Electrically Held	Std., A12, C, C6, F, P, X, T	11.25 (286)	25.15 (639)	8.99 (288)
			Mechanically Held	Std., F, X, T			
			Electrically Held	N, R6, T, T10-T13,✱	18.15 (461)	29.15 (740)	9.24 (234)
			Mechanically Held	A3, C, C6, N, R6, T, T10-T13,✱			
		4 & 5	Electrically Held	Std., A12, C, C6, F, P, X	11.25 (286)	25.15 (639)	8.99 (288)
			Mechanically Held	Std., F, X			
			Electrically Held	✱	18.15 (461)	29.15 (740)	9.24 (234)
			Mechanically Held	A3, C, C6, ✱			
			Electrically Held	N, R6, T, T10-T13	22.15 (563)	39.15 (994)	10.24 (260)
			Mechanically Held	N, R6, T, T10-T13			
200	SVG	All	Electrically and Mechanically Held	Standard and All Forms	22.15 (563)	39.15 (994)	10.24 (260)
300	SXG	All	Electrically and Mechanically Held	Standard and All Forms	17.21 (437)	44.21 (1123)	12.83 (325)
400 and 600	SYG & SZG	All	Electrically and Mechanically Held	Standard and All Forms	20.21 (513)	65.75 (1670)	13.10 (333)
800	SJG	2-3	With or without any forms		34.50 (876)	93.00 (2362)	23.50 (597)

✱ All "Type K" Forms.
▼ Dimensions are in inches (millimeters).

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NEMA Type 3R

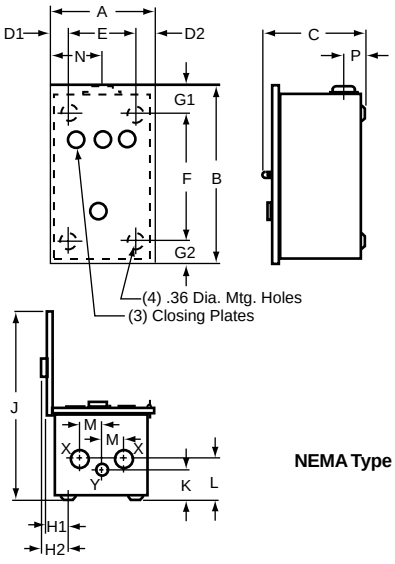
Amps	Type	Number of Poles	A	B	C	D1	D2	E	F	G1	G2	H1	H2	J	K	L	M	N	P	K.O. X	K.O. Y
30	SMH	All	8.83 (224)	12.30 (312)	7.12 (181)	1.39 (35)	1.44 (37)	6.00 (152)	7.50 (191)	2.64 (67)	2.16 (55)	2.08 (53)	2.62 (66)	14.28 (363)	1.37 (35)	1.37 (35)	1.88 (48)	4.38 (111)	1.83 (46)	1/2 3/4 1	1/2 3/4 1
30 60	LH SPH	All	9.83 (250)	16.30 (414)	8.62 (219)	1.39 (35)	1.44 (37)	7.00 (178)	11.50 (292)	2.64 (67)	2.16 (55)	2.08 (53)	2.62 (66)	16.78 (426)	1.31 (33)	1.75 (44)	2.13 (54)	4.88 (124)	1.83 (46)	1 1 1/4 1 1/2	1/2 3/4
100	SQH	All	12.83 (326)	25.30 (643)	8.62 (219)	1.39 (35)	1.44 (37)	10.00 (254)	20.50 (521)	2.64 (67)	2.16 (55)	2.08 (53)	2.62 (66)	19.78 (502)	1.31 (33)	1.94 (49)	2.44 (62)	6.38 (162)	1.83 (46)	1 1 1/4 2 2 1/2	1/2 3/4
200	SVH	All	12.83 (326)	40.30 (1024)	9.12 (232)	1.39 (35)	1.44 (37)	10.00 (254)	35.50 (902)	2.64 (67)	2.16 (55)	2.08 (53)	2.62 (66)	20.28 (515)	1.31 (33)	2.31 (59)	2.69 (68)	6.38 (162)	1.83 (46)	1 1 1/4 2 2 1/2	1/2 3/4

NEMA Type 4 and 4X

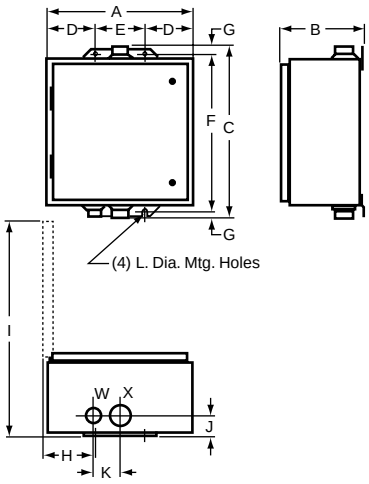
Ampere Rating	Type	Number of Poles	Form(s)		Dimensions in inches (millimeters)												Bottom Hub Only	Top & Bottom Hub
					A	B	C	D	E	F	G	H	I	J	K	L	W	X
30	LW LXW	Any	Standard, F, R6, Y48		8.13 (206)	7.88 (200)	16.19 (411)	1.56 (40)	5.00 (127)	15.00 (381)	0.60 (15)	1.94 (49)	14.75 (375)	2.00 (51)	2.63 (67)	0.31 (8)	3/4 in.	1 1/2 in.
			A3, A12, C, C6, P, T		12.62 (321)	7.81 (198)	14.69 (373)	2.56 (65)	7.50 (191)	13.50 (343)	0.63 (16)	3.38 (86)	18.44 (468)	1.69 (43)	2.31 (59)	0.31 (8)	3/4 in.	1 in.
30	SMW	2-5	Electrically Held	Std., A12, C, C6, P, X	6.38 (162)	7.13 (181)	13.19 (351)	1.56 (40)	3.25 (83)	12.00 (305)	0.63 (16)	1.91 (30)	11.81 (300)	1.63 (41)	2.31 (59)	0.31 (8)	3/4 in.	1 in.
			Mechanically Held	Std., F, X														
			Electrically Held	T	12.63 (321)	7.11 (181)	14.69 (373)	2.56 (65)	7.50 (191)	13.50 (343)	0.63 (16)	3.19 (81)	18.50 (470)	1.64 (42)	2.31 (59)	0.31 (8)	3/4 in.	1 in.
			Electrically Held	N, R6	14.88 (378)	7.25 (184)	16.31 (414)	2.56 (65)	9.75 (248)	15.00 (381)	0.63 (16)	3.19 (81)	20.88 (530)	2.06 (52)	2.63 (67)	0.31 (8)	3/4 in.	1 1/2 in.
			Mechanically Held	A3, C, C6, T, N, P, R6														
60	SPW	2-5	Electrically Held	Std., A12, C, C6, P, X	8.13 (206)	7.88 (200)	16.19 (411)	1.56 (40)	5.00 (127)	15.00 (381)	0.60 (15)	1.94 (49)	14.75 (375)	2.00 (51)	2.63 (67)	0.31 (8)	3/4 in.	1 1/2 in.
			Mechanically Held	Std., A3, C, C6, P, X														
			Electrically Held	T, N, R6	14.88 (378)	7.25 (184)	16.31 (414)	2.56 (65)	9.75 (248)	15.00 (381)	0.63 (16)	3.88 (98)	20.88 (530)	2.06 (52)	2.63 (67)	0.31 (8)	3/4 in.	1 1/2 in.
			Mechanically Held	A3, C, C6, T, N, P, R6														
100	SQW	2 & 3	Electrically Held	Std., A12, C, C6, F, N, R6, P, T, T10-13, X	18.15 (461)	8.77 (223)	32.21 (818)	3.08 (78)	12.00 (305)	30.50 (775)	0.61 (15)	3.67 (93)	26.71 (678)	2.58 (66)	3.19 (81)	0.44 (11)	3/4 in.	2 1/2 in.
			Mechanically Held	Std., A3, C, C6, F, N, P, R6, T, T10-13, X														
		4 & 5	Electrically Held	Std., A12, C, C6, F, P, ★	18.15 (461)	8.77 (223)	32.21 (818)	3.08 (78)	12.00 (305)	30.50 (775)	0.61 (15)	3.67 (93)	26.71 (678)	2.58 (66)	3.19 (81)	0.44 (11)	3/4 in.	2 1/2 in.
			Mechanically Held	Std., A3, C, C6, P, ★														
			Electrically Held	N, R6, T, T10-13	22.15 (563)	9.77 (248)	42.21 (1072)	3.08 (78)	16.00 (406)	40.50 (1029)	0.61 (15)	3.67 (93)	31.71 (805)	2.33 (59)	2.88 (73)	0.44 (11)	3/4 in.	2 1/2 in.
			Mechanically Held	N, R6, T, T10-13														
200	SVW	All	Electrically and Mechanically Held	Standard and All Forms	22.15 (563)	9.77 (248)	42.21 (1072)	3.08 (78)	16.00 (406)	40.50 (1029)	0.61 (15)	3.67 (93)	31.71 (805)	2.33 (59)	2.88 (73)	0.44 (11)	3/4 in.	2 1/2 in.
300	SXW	All	Electrically and Mechanically Held	Standard and All Forms	17.21 (437)	12.63 (321)	47.21 (1199)	4.11 (104)	9.00 (229)	46.00 (1168)	0.61 (15)	4.59 (117)	28.32 (719)	3.11 (79)	5.75 (146)	0.56 (14)	3/4 in.	3 1/2 in.
400 & 600	SYW & SZW	All	Electrically and Mechanically Held	Standard and All Forms	20.21 (513)	12.13 (308)	65.21 (1656)	4.11 (104)	12.00 (305)	64.00 (1626)	0.61 (15)	4.59 (117)	30.82 (783)	2.67 (68)	4.50 (114)	0.56 (14)	3/4 in. ■	Two 3 in. ■
800	SJW	2-3	With or without any forms		34.50 (876)	23.50 (597)	101.00 (2565)	Floor Mounting										

■ X hub is 1/4 in. left of center. W hub shown is another X hub. K dimension is distance between two X hubs. Actual W hub is located 3 3/16 in. to the right of X hub shown.

★ All "K" forms.



NEMA Type 3R



NEMA Type 4 and 4X

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Lighting Control
Class 8903 – Approximate Dimensions

NEMA Type 12

Ampere Rating	Type	Number of Poles	Form(s)		Dimensions in inches (millimieters) ▼									
					A	B	C	D	E	F	G	H	I	J
30	LA LXA	Any	Standard, F, R6, Y48		8.13 (206)	8.50 (216)	15.75 (400)	1.56 (40)	5.00 (127)	15.00 (381)	0.31 (8)	2.13 (54)	14.75 (375)	0.31 (8)
			A3, A12, C, C6, P, T		11.88 (302)	7.75 (197)	13.50 (343)	3.81 (97)	4.25 (108)	12.75 (324)	0.38 (10)	4.94 (125)	18.12 (460)	0.31 (8)
30	SMA	2-5	Electrically Held	Std., A12, C, C6, P, X	6.38 (162)	8.53 (217)	12.75 (324)	1.56 (40)	3.25 (83)	12.00 (305)	0.38 (10)	3.56 (90)	12.50 (318)	0.31 (8)
			Mechanically Held	Std., F, P, X										
			Electrically Held	T	11.88 (302)	7.75 (197)	13.50 (343)	2.56 (65)	6.75 (171)	12.75 (324)	0.38 (10)	3.66 (93)	18.12 (460)	0.31 (8)
			Electrically Held	N, R6	14.88 (378)	7.88 (200)	16.00 (406)	2.56 (65)	9.75 (248)	15.00 (381)	0.50 (13)	3.66 (93)	21.25 (540)	0.31 (8)
			Mechanically Held	A3, C, C6, T, N, P, R6										
60	SPA	2-5	Electrically Held	Std., A12, C, C6, P, X	8.13 (206)	9.28 (236)	16.00 (406)	1.56 (40)	5.00 (127)	15.00 (381)	0.50 (13)	3.66 (93)	15.38 (391)	0.31 (8)
			Mechanically Held	Std., A3, C, C6, P, X										
			Electrically Held	T, N, R6	14.88 (378)	7.88 (200)	15.75 (400)	2.56 (65)	9.75 (248)	15.00 (381)	0.38 (10)	3.66 (93)	21.25 (540)	0.31 (8)
			Mechanically Held	A3, C, C6, T, N, P, R6										
100	SQA	2 & 3	Electrically Held	Std., A12, C, C6, F, N, R6, P, T, T10-13, X	18.15 (461)	9.24 (234)	31.50 (800)	3.08 (78)	12.00 (305)	30.50 (775)	0.50 (13)	3.67 (93)	26.71 (678)	0.44 (11)
			Mechanically Held	Std., A3, C, C6, F, N, P, R6, T, T10-13, X										
		4 & 5	Electrically Held	Std., A12, C, C6, F, N, P, ★										
			Mechanically Held	Std., A3, C, C6, P, ★										
			Electrically Held	N, R6, T, T10-13, ★	22.15 (563)	10.24 (260)	41.50 (1054)	3.08 (78)	16.00 (406)	40.50 (1029)	0.50 (13)	3.67 (93)	31.71 (805)	0.44 (11)
			Mechanically Held	N, R6, T, T10-13, ★										
200	SVA	All	Electrically and Mechanically Held	Standard and All Forms	22.15 (563)	10.24 (260)	41.50 (1054)	3.08 (78)	16.00 (406)	40.50 (1029)	0.50 (15)	3.67 (93)	31.71 (805)	0.44 (11)
300	SXA	All	Electrically and Mechanically Held	Standard and All Forms	17.21 (437)	13.33 (339)	47.00 (1193)	4.11 (104)	9.00 (229)	46.00 (1168)	0.50 (13)	4.59 (117)	28.32 (719)	0.56 (14)
400 & 600	SYA & SZA	All	Electrically and Mechanically Held	Standard and All Forms	20.21 (513)	13.00 (330)	65.00 (1651)	4.11 (104)	12.00 (305)	64.00 (1625)	0.50 (13)	5.31 (135)	30.87 (784)	0.69 (18)
800	SJA	2-3	With or without any forms		93.00 (2362)	34.50 (876)	23.50 (597)	Floor Mounting						

▼ See Figure 1 for all dimensions except 800A; for 800A dimensions, see Figure 2.

★ All Type "K" Forms using Class 9001 Type K Control Units.

NIGHT-MASTER Outdoor Lighting Contactors (Short Version) – NEMA Type 3R

Ampere Rating	Description	Type Number	A	B	C	D	E	F	G	H	Cond. J	K	L	M	Knockouts N	Knockouts P	Knockouts Q
30	Disconnect Switch & Circuit Breaker Types	SMC61, 62 & 81	23.50 (597)	15.00 (381)	8.42 (214)	10.50 (267)	19.00 (483)	22.38 (568)	7.00 (178)	2.18 (55)	1.50 (38)	2.13 (54)	2.13 (54)	2.13 (54)	0.50-0.75	1.-1.25 1.50	0.50-0.75
60	Disconnect Switch & Circuit Breaker Types	SPC61, 62 & 81															
100	Disconnect Switch & Circuit Breaker Types	SQC61, 62 & 81	34.53 (877)	20.00 (508)	8.42 (214)	10.50 (267)	30.04 (763)	33.41 (849)	7.00 (178)	2.18 (55)	2.0 (2.50)	2.68 (68)	2.68 (68)	3.44 (87)	0.50-0.75	1.-1.25 2.-2.50	1.-1.25 1.5-2.0
200	Disconnect Switch Type Circuit Breaker Type	SVC61 & 62 SVC81	48.37 (1229)	19.00 (483)	9.12 (232)	10.53 (267)	44.00 (1118)	47.25 (1200)	7.00 (178)	2.18 (55)	2.50 (64)	2.68 (68)	2.68 (68)	3.44 (87)	0.50-0.75	1.-1.25 2.-2.50	1.-1.25 1.5-2.0

NIGHT-MASTER Outdoor Lighting Contactors (Long Version) – NEMA Type 3R

Ampere Rating	Description	Type Number	A	B	C	D	E	F	G	H	Cond. J	K	L	M	Knockouts N	Knockouts P	Knockouts Q
30	Disconnect Switch & Circuit Breaker Types	SMC63, 64 & 83	38.88 (987)	15.00 (381)	8.42 (214)	10.42 (265)	34.38 (873)	37.76 (959)	7.00 (178)	2.18 (55)	1.50 (38)	2.13 (54)	2.13 (54)	2.13 (54)	0.50-0.75	1.-1.25 1.50	0.50-0.75
60	Disconnect Switch & Circuit Breaker Types	SPC63, 64 & 83															
100	Disconnect Switch & Circuit Breaker Types	SQC63, 64 & 83	42.53 (1080)	20.00 (508)	8.42 (214)	10.42 (265)	38.04 (966)	41.41 (1052)	7.00 (178)	2.18 (55)	2.0 (2.50)	2.68 (68)	2.68 (68)	3.44 (87)	0.50-0.75	1.-1.25 2.-2.50	1.-1.25 1.5-2.0
200	Disconnect Switch Type Circuit Breaker Type	SVC63 & 64 SVC83	56.37 (1432)	19.00 (483)	9.12 (232)	10.53 (267)	52.00 (1321)	55.25 (1403)	7.00 (178)	2.18 (55)	2.50 (64)	2.68 (68)	2.69 (68)	3.44 (87)	0.50-0.75	1.-1.25 2.-2.50	1.-1.25 1.5-2.0

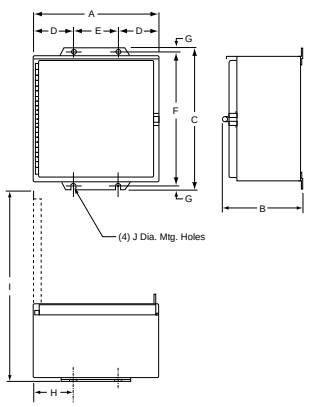


Figure 1: NEMA Type 12 (30-600A)

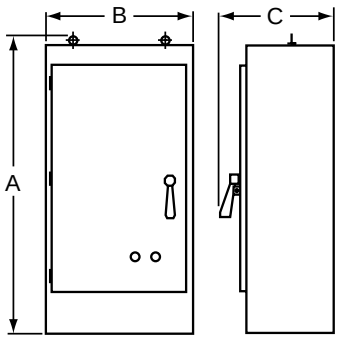


Figure 2: NEMA Type 12 (800A)

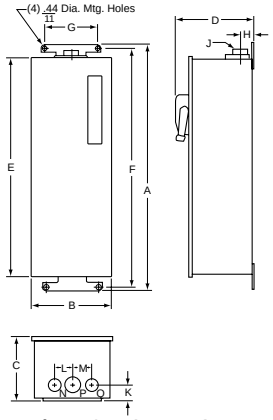


Figure 3: NIGHT-MASTER

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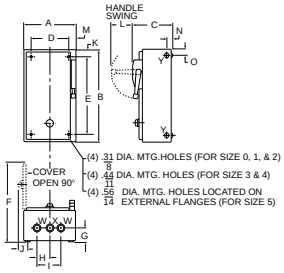


Figure 1
NEMA Type 1 Enclosure

Combination Lighting Contactors – NEMA Type 1 Enclosure

Ampere Rating	Type	Dimensions in inches (millimeters) ∗ (see Figure 1)															Top & Bot.		Sides
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	W	X	Y
30	SMG6– & 8–	9.50 (241)	22.50 (572)	8.37 (213)	6.38 (162)	20.50 (521)	14.68 (373)	1.81 (46)	1.69 (43)	3.37 (86)	3.38 (86)	1.06 (27)	3.25 (83)	2.18 (55)	1.25 (32)	0.87 (22)	0.50-0.75	0.50-0.75	.50
	SMG7– & 9–	13.75 (349)	23.00 (584)	8.36 (212)	10.63 (270)	21.00 (533)	20.07 (510)	1.87 (47)	1.88 (48)	3.76 (96)	2.06 (52)	1.06 (27)	3.25 (83)	2.18 (55)	1.25 (32)	0.87 (22)	0.50-0.75-1.0	0.50-0.75-1.0	.50
60	SPG6– & 8–	10.50 (267)	26.00 (660)	9.62 (244)	7.37 (187)	24.00 (610)	17.00 (432)	2.12 (54)	2.00 (51)	4.00 (102)	2.06 (52)	1.06 (27)	3.25 (83)	2.18 (55)	1.25 (32)	0.87 (22)	1.0-1.25	0.50-0.75	.50
	SPG7– & 9–	15.00 (381)	28.75 (730)	9.62 (244)	11.62 (295)	26.25 (667)	21.50 (546)	2.18 (55)	2.00 (51)	4.00 (102)	2.56 (65)	1.31 (33)	3.25 (83)	2.18 (55)	1.25 (32)	0.87 (22)	1.0-1.25	0.50-0.75	.50

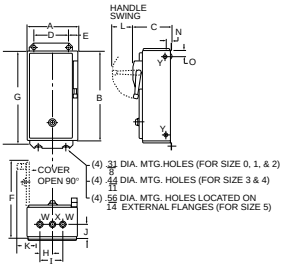


Figure 2
NEMA Type 1 Enclosure

NEMA Type 1 Enclosure

Ampere Rating	Type	Dimensions in inches (millimeters) ∗ (see Figure 2)															Top & Bot.		Sides
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	W	X	Y
100	SQG6– & 7– SQG81 & 91	15.25 (387)	39.50 (1003)	10.60 (269)	9.25 (235)	3.00 (76)	22.68 (576)	41.00 (1041)	2.69 (68)	5.38 (137)	2.83 (72)	3.74 (95)	5.00 (127)	...	1.21 (31)	0.90 (23)	1.-1.25 2.-2.50	0.50-0.75	.50
200	SVG6– & 7– SVG81 & 91	16.00 (406)	50.00 (1270)	10.68 (271)	10.00 (254)	3.00 (76)	23.68 (601)	51.50 (1308)	2.69 (68)	5.38 (137)	2.83 (72)	3.74 (95)	5.00 (127)	...	1.21 (31)	0.90 (23)	2.50	0.50-0.75	.50
200	SXG6– & 7–	20.00 (508)	75.00 (1905)	14.37 (365)	12.00 (305)	4.00 (102)	29.43 (748)	77.00 (1956)	3.19 (81)	...	3.52 (89)	7.00 (178)	9.25 (235)	...	...	...	0.50-0.75	3.00	...
	SXG81 & 91	20.00 (508)	63.00 (1600)	14.37 (365)	12.00 (305)	4.00 (102)	27.43 (697)	65.00 (1651)	3.19 (81)	...	3.52 (89)	7.00 (178)	5.00 (127)	...	...	...	0.50-0.75	3.00	...
400	SYG81 & 91	36.00 (914)	90.00 (2286)	17.00 (432)	Floor Mounting Enclosure												...	...	...
600	SZG81 & 91																		

NEMA Type 4 & 4X Enclosure

Ampere Rating	Type	Dimensions in inches (millimeters) ∗													
		A	B	C	D	E	F	G	H	I	J	K	L	W	X
30	SMW6–& 8–	9.50 (241)	8.36 (212)	24.76 (629)	3.25 (83)	2.50 (64)	4.50 (114)	23.50 (597)	0.63 (16)	3.00 (76)	1.62 (41)	2.31 (59)	14.31 (363)	0.75 Hub	1.0 Hub
	SMW7– & 9–	13.75 (349)	8.36 (212	25.26 (642)	3.25 (83)	4.75 (121)	4.25 (108)	24.00 (610)	0.63 (16)	5.25 (133)	1.62 (941)	2.31 (59)	20.14 (512)	0.75 Hub	1.0 Hub
60	SPW6– & 8–	10.50 (267)	9.61 (244)	28.26 (718)	3.25 (83)	2.50 (64)	5.50 (140)	27.00 (686)	0.63 (16)	3.00 (76)	2.00 (51)	2.63 (67)	16.56 (421)	0.75 Hub	1.50 Hub
	SPW7– & 9–	15.00 (381)	9.61 (244)	31.01 (788)	3.25 (83)	5.38 (137)	4.25 (108)	29.75 (756)	0.63 (16)	5.88 (149)	2.00 (51)	2.63 (67)	21.06 (535)	0.75 Hub	1.50 Hub
100	SQW6– & 7– SQW81 & 91	15.25 (387)	10.60 (269)	41.76 (1061)	5.00 (127)	2.50 (64)	10.25 (260)	40.50 (1028)	0.63 (16)	3.24 (82)	2.61 (66)	3.19 (81)	22.18 (563)	0.75 Hub	2.50 Hub
200	SVW6– & 7– SVW81 & 91	16.00 (406)	10.56 (268)	52.26 (1327)	5.00 (127)	2.50 (64)	11.00 (279)	51.00 (1295)	0.63 (16)	3.24 (82)	2.61 (66)	3.19 (81)	23.00 (584)	0.75 Hub	2.50 Hub
300	SXW6– & 7–	20.00 (508)	14.21 (361)	78.12 (1984)	9.25 (235)	4.00 (102)	12.00 (305)	77.00 (1956)	0.56 (14)	4.77 (121)	2.96 (75)	3.50 (89)	29.43 (748)	0.75 Hub	3.50 Hub
	SXW81 & 91	20.00 (508)	14.21 (361)	66.12 (1679)	5.00 (127)	4.00 (102)	12.00 (305)	65.00 (1651)	0.56 (14)	4.77 (121)	2.96 (75)	3.50 (89)	27.43 (697)	0.75 Hub	3.50 Hub
400	SYW81 & 91	36.00 (914)	17.71 (450)	98.00 (2489)	Floor Mounting Enclosure									...	...
600	SZW81 & 91														

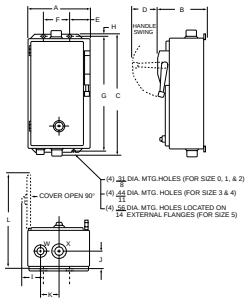


Figure 3
NEMA Type 4 Enclosure

∗ Dimensions are the same for Form F4T (standard control transformer), Form F4T11 (100 VA extra capacity) and Form F4T12 (200 VA extra capacity).

NEMA Type 12 Enclosure

Ampere Rating	Type	Dimensions in inches (millimeters) ∗									
		A	B	C	D	E	F	G	H	I	J
30	SMA6– & 8–	9.50 (241)	8.36 (212)	24.26 (616)	3.25 (83)	2.50 (64)	4.50 (114)	23.50 (597)	0.38 (10)	3.25 (83)	14.31 (363)
	SMA7– & 9–	13.75 (349)	10.10 (257)	24.76 (629)	3.25 (83)	4.75 (121)	4.25 (108)	24.00 (610)	0.38 (10)	5.50 (140)	22.00 (559)
60	SPA6– & 8–	10.50 (267)	9.61 (244)	27.76 (705)	3.25 (83)	2.50 (64)	5.50 (140)	27.00 (686)	0.38 (10)	3.25 (83)	16.56 (421)
	SPA7– & 9–	15.00 (381)	10.98 (279)	30.51 (775)	3.25 (83)	5.38 (137)	4.25 (108)	29.75 (756)	0.38 (10)	6.13 (156)	23.43 (595)
100	SQA6– & 7– SQA81 & 91	15.25 (387)	10.59 (259)	42.00 (1067)	5.00 (127)	3.00 (76)	9.25 (235)	41.00 (1041)	0.50 (13)	3.75 (95)	22.31 (567)
200	SVA6– & 7– SVA81 & 91	16.00 (406)	10.52 (267)	52.50 (1334)	5.00 (127)	3.00 (76)	10.00 (254)	51.50 (1308)	0.50 (13)	3.75 (95)	23.00 (584)
300	SXA6– & 7–	20.00 (508)	14.21 (361)	78.00 (1981)	9.25 (235)	4.00 (102)	12.00 (305)	77.00 (1956)	0.50 (13)	7.75 (197)	29.43 (748)
	SXA81 & 91	20.00 (508)	14.21 (361)	66.00 (1676)	5.00 (127)	4.00 (102)	12.00 (305)	65.00 (1651)	0.50 (13)	7.75 (197)	27.43 (697)
400	SYA81 & 91	36.00 (914)	17.71 (450)	90.00 (2286)	Floor Mounting Enclosure						
600	SZA81 & 91										

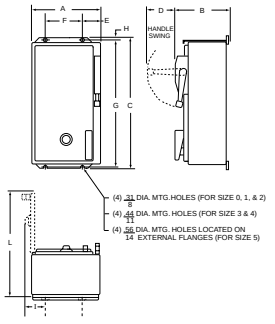


Figure 4
NEMA Type 12 Enclosure

∗ Dimensions are the same for Form F4T (standard control transformer), Form F4T11 (100 VA extra capacity) and Form F4T12 (200 VA extra capacity).

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Class 8903 REQ Open Type
Electrically Held

Figure	Device	Poles	Mounting	A	B	C	D	E	F	G	H	I	J
1	30 A	2P – 2P	(4) #10	12.13 (308)	6.75 (171)	6.03 (153)	11.63 (295)	6.25 (159)	–	–	0.50 (13)	0.25 (6)	0.25 (6)
		3P – 3P	(4) #10	12.13 (308)	6.75 (171)	6.03 (153)	11.63 (295)	6.25 (159)	–	–	0.50 (13)	0.25 (6)	0.25 (6)
		4P – 4P	(4) #10	13.27 (337)	6.75 (171)	6.03 (153)	11.63 (295)	6.25 (159)	–	–	0.50 (13)	0.25 (6)	0.25 (6)
	60 A	2P – 2P	(4) #10	12.13 (308)	6.75 (171)	6.03 (153)	11.63 (295)	6.25 (159)	–	–	0.50 (13)	0.25 (6)	0.25 (6)
		3P – 3P	(4) #10	12.13 (308)	6.75 (171)	6.03 (153)	11.63 (295)	6.25 (159)	–	–	0.50 (13)	0.25 (6)	0.25 (6)
		4P – 4P	(4) #10	13.27 (337)	6.75 (171)	6.03 (153)	11.63 (295)	6.25 (159)	–	–	0.50 (13)	0.25 (6)	0.25 (6)
	100 A	2P – 2P	(4) 5/16	12.72 (323)	7.97 (202)	7.00 (178)	11.75 (299)	7.00 (178)	–	–	0.48 (122)	0.48 (122)	0.49 (12.5)
		3P – 3P	(4) 5/16	12.72 (323)	7.97 (202)	7.00 (178)	11.75 (299)	7.00 (178)	–	–	0.48 (122)	0.48 (122)	0.49 (12.5)
		4P – 4P	(4) 5/16	21.71 (551)	8.96 (228)	7.00 (178)	20.75 (527)	8.00 (203)	–	–	0.48 (122)	0.48 (122)	0.48 (122)
	150 A	2P – 2P	(4) 5/16	14.21 (361)	8.96 (228)	7.00 (178)	13.25 (337)	8.00 (203)	–	–	0.48 (122)	0.48 (122)	0.49 (12.5)
		3P – 3P	(4) 5/16	14.21 (361)	8.96 (228)	7.00 (178)	13.25 (337)	8.00 (203)	–	–	0.48 (122)	0.48 (122)	0.49 (12.5)
		4P – 4P	(4) 5/16	21.71 (551)	8.96 (228)	7.00 (178)	20.75 (527)	8.00 (203)	–	–	0.48 (122)	0.48 (122)	0.48 (122)

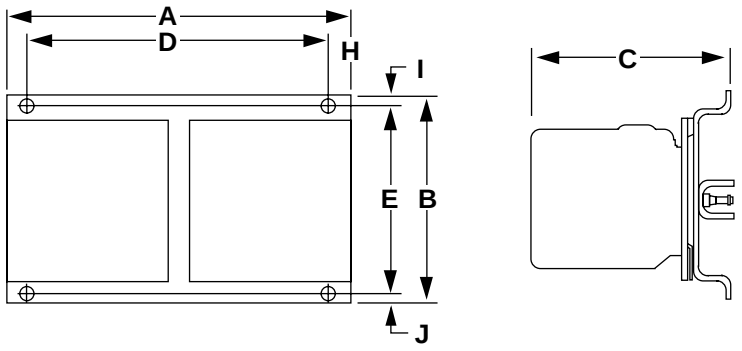


Figure 1

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Class 8903 REQ Open Type
Mechanically Held

Figure	Device	Poles	Mounting	A	B	C	D	E	F	G	H	I	J
2	30 A	2P – 2P	(4) #10	12.13 (308)	8.53 (217)	6.31 (160)	11.63 (295)	6.25 (159)	8.13 (207)	9.31 (237)	0.50 (13)	0.25 (6)	2.03 (51.6)
		3P – 3P	(4) #10	12.13 (308)	8.53 (217)	6.31 (160)	11.63 (295)	6.25 (159)	8.13 (207)	9.31 (237)	0.50 (13)	0.25 (6)	2.03 (51.6)
		4P – 4P	(4) #10	13.27 (337)	8.53 (217)	6.31 (160)	11.63 (295)	6.25 (159)	8.13 (207)	9.31 (237)	0.50 (13)	0.25 (6)	2.03 (51.6)
	60 A	2P – 2P	(4) #10	12.13 (308)	8.53 (217)	6.31 (160)	11.63 (295)	6.25 (159)	8.13 (207)	9.31 (237)	0.50 (13)	0.25 (6)	2.03 (51.6)
		3P – 3P	(4) #10	12.13 (308)	8.53 (217)	6.31 (160)	11.63 (295)	6.25 (159)	8.13 (207)	9.31 (237)	0.50 (13)	0.25 (6)	2.03 (51.6)
		4P – 4P	(4) #10	13.27 (337)	8.53 (217)	6.31 (160)	11.63 (295)	6.25 (159)	8.13 (207)	9.31 (237)	0.50 (13)	0.25 (6)	2.03 (51.6)
3	100 A	2P – 2P	(4) 5/16	12.98 (330)	10.50 (267)	7.22 (183)	11.75 (299)	7.00 (178)	–	–	0.48 (122)	0.48 (122)	3.02 (76.7)
		3P – 3P	(4) 5/16	12.98 (330)	10.50 (267)	7.22 (183)	11.75 (299)	7.00 (178)	–	–	0.48 (122)	0.48 (122)	3.02 (76.7)
		4P – 4P	(4) 5/16	21.71 (551)	10.93 (278)	7.22 (183)	20.75 (527)	8.00 (203)	–	–	0.48 (122)	0.48 (122)	2.45 (62.2)
	150 A	2P – 2P	(4) 5/16	14.21 (361)	10.93 (278)	7.22 (183)	13.25 (337)	8.00 (203)	–	–	0.48 (122)	0.48 (122)	2.45 (62.2)
		3P – 3P	(4) 5/16	14.21 (361)	10.93 (278)	7.22 (183)	13.25 (337)	8.00 (203)	–	–	0.48 (122)	0.48 (122)	2.45 (62.2)
		4P – 4P	(4) 5/16	21.71 (551)	10.93 (278)	7.22 (183)	20.75 (527)	8.00 (203)	–	–	0.48 (122)	0.48 (122)	2.45 (62.2)

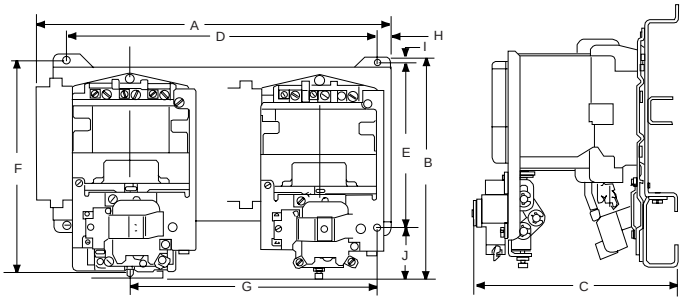


Figure 2

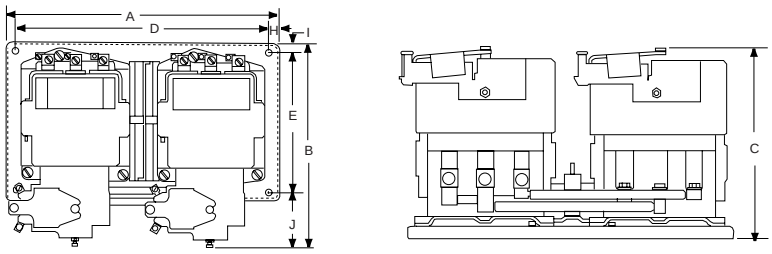


Figure 3

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Square D Company
8001 Hwy 64 East
Knightdale, NC 27545
(919) 266-3671

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Ⓒ is a registered trademark of Canadian Standard Association.
VERSA-CRIMP is a registered trademark of Hubbell Incorporated.
NIGHT-MASTER is a trademark of Square D Company

Catalog No. 8903CT9701 January 1998 © 1998 Square D All Rights Reserved.

Product data sheet
Characteristics

9001SKS53FB
selector switch Ø 30 - 3 positions - spring return to center

Product availability: Stock - Normally stocked in distribution facility



Main

Commercial Status	Commercialised
Range of product	Harmony 9001SK
Product or component type	Complete selector switch
Device short name	9001SK
Type of operator	Spring return (to centre)
Operator profile	Black long handle

Complementary

Bezel material	Plastic
Mounting diameter	1.18 in (30 mm)
Product weight	0.13 lb(US) (0.059 kg)
Shape of signaling unit head	Octagonal
Operator position information	3 positions +/- 45°
Contacts type and composition	Without contact block
Mechanical durability	500000 cycles
Product compatibility	9001KA1, mounting on side 1 or 2

Environment

Protective treatment	TC
Ambient air temperature for storage	-40...158 °F (-40...70 °C)
Ambient air temperature for operation	-13...158 °F (-25...70 °C)
Class of protection against electric shock	Class II
IP degree of protection	IP66 conforming to IEC 60529
NEMA degree of protection	NEMA 6 NEMA 4X NEMA 4 NEMA 3R NEMA 3 NEMA 2 NEMA 13 NEMA 12 NEMA 1
Standards	EN/IEC 60947-1 EN/IEC 60947-5-1 EN/IEC 60947-5-4 JIS C 4520 JIS C 852 UL 508 CSA C22.2 No 14
Product certifications	NEMA UL 508
Vibration resistance	7 gn (f = 2...500 Hz) conforming to IEC 60068-2-6
Shock resistance	50 gn conforming to IEC 60068-2-27

The information provided in this documentation contains general descriptions and/or technical characteristics of the performance of the products contained herein.
This documentation is not intended as a substitute for and is not to be used for determining suitability or reliability of these products for specific user applications.
It is the duty of any such user or integrator to perform the appropriate and complete risk analysis, evaluation and testing of the products with respect to the relevant specific application or use thereof.
Neither Schneider Electric Industries SAS nor any of its affiliates or subsidiaries shall be responsible or liable for misuse of the information contained herein.

Ordering and shipping details

Category	21429 - 9001 SK,SKY
Discount Schedule	CS1
GTIN	00785901044048
Nbr. of units in pkg.	1
Package weight(Lbs)	0.13
Product availability	Stock - Normally stocked in distribution facility
Returnability	Y
Country of origin	MX

Offer Sustainability

Sustainable offer status	Not Green Premium product
RoHS	Compliant - since 0921 - Schneider Electric declaration of conformity
REACh	Reference not containing SVHC above the threshold

Contractual warranty

Period	18 months

Heavy-Duty, Industrial Limit Switches and Actuators

Flexible: With five bodies, 20 heads and more than 200 lever styles the 9007C heavy-duty limit switches are easy to install, versatile and offer a wide range of options including a complete choice of enclosures to meet virtually any application.

Simple: The modularity of the 9007C makes maintenance a breeze with variable components, plug-in body styles and over 80 modifications and options available to meet specific application needs.

Rugged: These heavy-duty switches can be applied with confidence that they will withstand the harshest environments. They feature the largest diameter shaft in the industry, with a Viton quad-ring shaft seal to ensure positive head and shaft sealing that is dust and water tight. Enclosure ratings are IP67 NEMA 4, 6P and 13. Options are available to completely seal the conduit entry and wiring to the contact block.

The standard 9007C heavy-duty limit switch is NEMA A600, 600 V, 10 A continuous and is UL listed, CSA certified, and CE marked.

Specifications
- Actuation CW and CCW on Side Rotary Models
- Maximum Voltage Rating 600 V
- Ampere Rating 10 A
- Contact Rating NEMA A600/Q600
- Body Type Standard Plug-In
- Contact Material Silver Alloy
- Contact Operation Snap Action
- Terminal Type Screw Clamp
- Enclosure Rating NEMA 1/2/4/6/6P/12/13
- UL Listed File Number E42259 CCN NKCR — CSA Certified File Number LR25490 Class 3211-03 — CE Marked

Applications
- Process Machinery
- Machine Tools
- Plastic, Rubber, Molding
- Printing
- Textile
- Pulp, Paper, Wood


9007C54A2


9004C54D


9007C54E


9007C54F

Limit Switches, Include Heads — Order Actuators Separately

Stock No.	Mfr.'s Type	Contact Configuration	Actuator Type	Action	Pre/Total Travel	EACH
70060491	9007C54A2	1 NO/1 NC	Rotary Lever Arm	Low Differential, Spring Return	5°/90°	186.55
70060492	9007C54B2	1 NO/1 NC	Rotary Lever Arm	Standard Travel, Spring Return	10°/90°	174.26
70060493	9007C54C	1 NO/1 NC	Rotary Lever Arm	Maintained Contacts	45°/90°	212.19
70060494	9007C54D	1 NO/1 NC	Top Roller Plunger	Spring Return	0.08"/0.25"	206.05
70060495	9007C54E	1 NO/1 NC	Top Push-Rod Plunger	Spring Return	0.08"/0.25"	193.74
70060496	9007C54ED	1 NO/1 NC	Adjustable Top Push-Rod Plunger	Spring Return	0.08"/0.25"	206.05
70060497	9007C54F	1 NO/1 NC	Vertical Side Roller Plunger	Spring Return	0.08"/0.25"	226.54
70060498	9007C54G	1 NO/1 NC	Side Push-Rod Plunger	Spring Return	0.08"/0.25"	206.05
70060499	9007C54GD	1 NO/1 NC	Adjustable Side Push-Rod Plunger	Spring Return	0.08"/0.25"	216.29
70060500	9007C54H	1 NO/1 NC	Side Push-Rod Plunger	Maintained Contacts	0.14"/0.25"	241.91
70060501	9007C54J	1 NO/1 NC	Delrin® Wobble Stick	Spring Return	10°/90°	193.74
70060502	9007C54K	1 NO/1 NC	Wire Wobble Stick	Spring Return	10°/90°	193.74
70060503	9007C54KC	1 NO/1 NC	Universal Wobble Stick	Spring Return	10°/90°	193.74
70060504	9007C54N2	1 NO/1 NC	Rotary Lever Arm	Light Operating Torque	10°/90°	212.19
70060505	9007C68T10	2 NO/2 NC	Rotary Lever Arm	Standard Travel, Spring Return, Neutral Position	10°/90°	220.38


9007C54G


9007C54H


9007C54KC

Limit Switch Actuators

Stock No.	Mfr.'s Type	Description	Actuator Length	Roller Specifications			EACH
				Diameter	Width	Material	
70060488	9007AA1	Cast Zinc Lever Arm	7/8"	5/8"	1/4"	Sintered Iron	30.27
70060489	9007BA1	Cast Zinc Lever Arm	1 3/8"	5/8"	1/4"	Sintered Iron	17.85
70060490	9007BA11	Cast Zinc Lever Arm	1 3/8"	3/4"	1/4"	Sintered Iron	17.85
70060506	9007CA1	Cast Zinc Lever Arm	2"	5/8"	1/4"	Sintered Iron	30.27
70060507	9007CA11	Cast Zinc Lever Arm	2"	3/4"	1/4"	Sintered Iron	30.27
70060508	9007DA1	Cast Zinc Lever Arm	2 1/2"	5/8"	1/4"	Sintered Iron	30.27
70060509	9007DA11	Cast Zinc Lever Arm	2 1/2"	3/4"	1/4"	Sintered Iron	30.27
70060510	9007EA1	Cast Zinc Lever Arm	3"	5/8"	1/4"	Sintered Iron	30.27
70060511	9007EA11	Cast Zinc Lever Arm	3"	3/4"	1/4"	Sintered Iron	29.63
70060512	9007FA1	Steel Rod Type Lever Arm	10.71"	—	—	—	30.27
70060513	9007FA3	Steel Rod Spring Base Lever Arm	12.63"	—	—	—	30.27
70060514	9007FA5	Delrin® Rod Type Lever Arm	12.63"	—	—	—	41.50
70060515	9007HA1	Adjustable Length Lever Arm	7/8" to 4"	5/8"	1/4"	Sintered Iron	30.27
70060516	9007HA2	Adjustable Length Lever Arm	7/8" to 4"	5/8"	5/8"	Sintered Iron	29.63
70060517	9007HA4	Adjustable Length Lever Arm	7/8" to 4"	5/8"	1/4"	Nylon	29.63
70060518	9007HA5	Flexible, Adjustable Length Lever Arm	7/8" to 4"	5/8"	1/4"	Sintered Iron	29.63
70060519	9007MA1	Cast Zinc Lever Arm	1 1/2"	5/8"	1/4"	Sintered Iron	17.85
70060520	9007MA11	Cast Zinc Lever Arm	1 1/2"	3/4"	1/4"	Sintered Iron	17.85
70060521	9007MA18	Cast Zinc Lever Arm	1 1/2"	3/4"	1/4"	Nylon	17.85
70278178	9007LA4	90 deg. Lever Arm, Cast Zinc, 2 Rollers	1 1/2"	3/4"	1/4"	Sintered Iron	29.77


9007AA1


9007BA1


9007CA11


9007DA1


9007FA1


9007FA3


9007HA1


9007HA5


9007MA18

SQD NEMA 9007 Type MS Miniature Limit Switches

The **9007 MS/ML** Limit Switches have a full range of styles available, including top push plunger, parallel roller plunger, cross roller plunger, rotary lever and omni directional whisker. Factory pre-wiring with industrial grade cable (type SJTO) eliminates the need to remove the cover to wire the switch. Bottom or side entrance cable connections and bottom or side connectors are available along with a symmetrical design and top mounting holes for easy gang mounting of several switches for multiple switching.

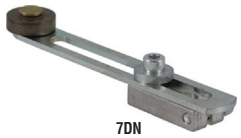
Specifications:
- Heavy-Duty Epoxy Encapsulated with #18 AWG SJTO Cable
- Enclosure Ratings: NEMA 1, 2, 4, 6, 6P, 12, 13 (IP67)
- SPDT 1 NC/1 NO Form C or Form Z Contacts
- Maximum Rating: SPDT, 120 VAC 6 A, 240 VAC 3 A
- Top Mounting Holes (40 mm) for Easy Gang Mounting
- Product Certification: UL, CSA, CE

Stock No.	Mfr.'s Type	Description	Cable Length	Force Range	EACH
70060766	9007MS01S0300	Metal Plunger	9 Ft.	55 Oz.	93.21
70060767	9007MS02S0300	Metal Parallel Roller Plunger	9 Ft.	55 Oz.	104.70
70060768	9007MS03S0300	Metal Cross Roller Plunger	9 Ft.	55 Oz.	107.85
70060769	9007MS04S0300	Rotary Spring Return CW/CCW shaft	9 Ft.	48 In. Oz.	130.88
70060770	9007MS05S0300	Metal Wire Whisker Omnidirectional Spring Return	9 Ft.	15 In. Oz.	130.88
70060771	9007MS10S0300	Metal Booted Top Push Plunger	9 Ft.	55 Oz.	103.66
70060772	7A1	Lever Arm, Cast Metal Steel Roller	—	—	16.17
70060773	7DN	Lever Arm, Cast Steel Adjustable Wide Nylon Roller	—	—	26.80


9007MS01S0300


9007MS05S0300

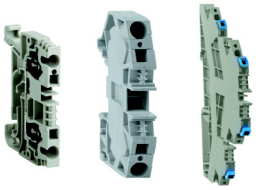
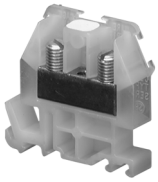
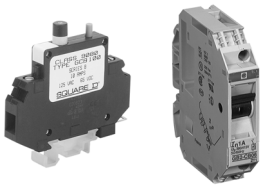

7A1


7DN

Terminal Blocks

Family	Description
 **Class 9080 Type LB**	**Power Distribution Blocks** Available in a wide varity of sizes, these power distribution and splicer blocks are available in one, two, and three pole versions, with either aluminum or copper lugs. Whatever your application, the class 9080 type LB blocks should have a component to meet your needs. A wide selection of covers completes this family. The power distribution blocks are UL component recognized and CSA approved; many blocks have been tested to achieve a higher SCCR according to the 2005 NEC and UL508A.
 **Class 9080 Type FB**	**Fuse Holders** This family of fuse holders will accept Types H, R, CC, M and J fuses up to 200 amperes. Both 250 V and 600 V versions are available. All Class H, R and J fuses are supplied as standard. All fuse holders are UL Listed and CSA approved.

NOTE: The product lines listed below are not shown in this catalog.
Please refer to the referenced catalog included with each family.

Family	Description
	**IEC Terminal Blocks** Depending on the application, there are several types of IEC terminal blocks: • Spring terminal • Screw terminal • Insulation displacement connection Refer to catalog 9080CT9901R7/07
 **Class 9080 Type G**	**NEMA Type Terminal Blocks** This family of blocks and accessories offers a wide variety of features like DIN 3 track mounting, colored blocks, terminal screws shipped backed out, captive screws and higher density to save you both money and time. This line also includes a direct mount block that can be panel or track mounted. Standard track comes in common lengths and breakoff styles. All blocks are UL component recognized and CSA approved. Refer to Catalog 9080CT9601.
	**Circuit Protectors** There are two families of circuit protectors. One will be right for your application. The Class 9080 Type GCB thermal magnetic product is available from 0.1 A through 15 A and offers high density. The Telemecanique GB2 thermal magnetic product is available from 0.5 A through 12 A and is available world wide. Refer to Catalog 9080CT9601 or Catalog 9080CT9602.

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Terminal Blocks
9080LBC Power Distribution Blocks Copper Wire Only

Class 9080	Standard			
				
Maximum Voltage Rating	600	600	600	600
Service Class	C	C	C	C
Current Rating-CU Wire	380 A	350 A	760 A	760 A
Current Rating-AL Wire	N/A	N/A	N/A	N/A
SCCR w/Circuit Breakers	N/A	See page 21	N/A	N/A
SCCR with Fuses	See page 23	See page 23	See page 23	See page 23
Wire Range **Lugs suitable for use with** **75° C Conductors**	**Main** (1) #4 - 500 MCM **Branch** (6) #14-2 AWG	**Main** (2) #14 - 2/0 AWG **Branch** (6) #14 - #4 AWG	**Main** (2) #4 - 500 MCM **Branch** (8) #14 - 2/0 AWG	**Main** (2) #4 - 500 MCM **Branch** (12) #14-2 AWG
Tightening Torque	**Main** #4-500 MCM - 375 lb-in (42.3 N-m) **Branch** #3-#2 50 lb-in (5.6 N-m) #6-#4 45 lb-in (5.1 N-m) #8 40 lb-in (4.5 N-m) #14-#10 35 lb-in (4.0 N-m)	**Main** #6-2/0 120 lb-in (13.5 N-m) #8 40 lb-in (4.5 N-m) #14-#10 35 lb-in (4.0 N-m) **Branch** #14-#4 35 lb-in (4.0 N-m)	**Main** #4-500 MCM - 375 lb-in (42.3 N-m) **Branch** #6-2/0 120 lb-in (13.5 N-m) #8 40 lb-in (4.5 N-m) #14-#10 35 lb-in (4.0 N-m)	**Main** #4-500 MCM - 375 lb-in (42.3 N-m) **Branch** #3-#2 50 lb-in (5.6 N-m) #6-#4 45 lb-in (5.1 N-m) #8 40 lb-in (4.5 N-m) #14-#10 35 lb-in (4.0 N-m)
Lug Material	Tin Plated High Conductive CU	Tin Plated High Conductive CU	Tin Plated High Conductive CU	Tin Plated High Conductive CU
Base Material	General Purpose Phenolic	General Purpose Phenolic	General Purpose Phenolic	General Purpose Phenolic
Temperature Rating	-40 to 302° F -40 to 150° C	-40 to 302° F -40 to 150° C	-40 to 302° F -40 to 150° C	-40 to 302° F -40 to 150° C
Certifications	File E60616 Guide XCFR2	File 070361 / Class 6228-01	RoHS Compliant	Marked
Flammability Rating	UL94V-0	UL94V-0	UL94V-0	UL94V-0
		One Pole Blocks		
Block Catalog Number	9080LBC163106	9080LBC163206	9080LBC165208	9080LBC165212
Clear Plastic Covers	9080LB31	9080LB31	9080LB51	9080LB51
Block Dimensions **(D) x (H) x (W)**	2.61 x 4.00 x 1.94 in. 66.3 x 101.6 x 49.3 mm	2.61 x 4.00 x 1.94 in. 66.3 x 101.6 x 49.3 mm	3.12 x 5.50 x 3.17 in. 79.2 x 139.7 x 80.5 mm	3.12 x 5.50 x 3.17 in. 79.2 x 139.7 x 80.5 mm
		Two Pole Blocks		
Block Catalog Number	9080LBC263106	9080LBC263206	N/A	N/A
Clear Plastic Covers	9080LB32	9080LB32	N/A	N/A
Block Dimensions **(D) x (H) x (W)**	2.61 x 4.00 x 3.47 in. 66.3 x 101.6 x 88.1 mm	2.61 x 4.00 x 3.47 in. 66.3 x 101.6 x 88.1 mm	N/A	N/A
		Three Pole Blocks		
Block Catalog Number	9080LBC363106	9080LBC363206	9080LBC365208	9080LBC365212
Clear Plastic Covers	N/A	9080LB33	9080LB53	9080LB53
Block Dimensions **(D) x (H) x (W)**	2.61 x 4.00 x 5.00 in. 66.3 x 101.6 x 127.0 mm	2.61 x 4.00 x 5.00 in. 66.3 x 101.6 x 127.0 mm	3.12 x 5.50 x 8.54 in. 79.2 x 139.7 x 216.9 mm	3.12 x 5.50 x 8.54 in. 79.2 x 139.7 x 216.9 mm

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Catalog Number Description

Number Segment	Character	Description	D	3	2	1	N	RB	—
Type of Switch	Fusible	L=Light duty							
		D=General duty							
		H=Heavy duty							
		DT=Double throw							
	Non-Fusible	DU=General duty							
		HU=Heavy duty							
		DTU=Double throw							
Blades–Switchable Poles	1	1 pole							
	2	2 poles							
	3	3 poles							
	4	4 poles							
	6	6 poles							
Voltage Rating[1]	1	120 Vac (plug fuse)							
	2	240 Vac							
	6	600 Vac							
Ampere Rating	1	30 A							
	2	60 A							
	3	100 A							
	4	200 A							
	5	400 A							
	6	600 A							
	7	800 A							
	8	1200 A							
Neutral	N	Factory-installed neutral (neutrals are field-installed on most general duty, heavy duty, and double throw safety switches).							
Enclosure	No suffix	NEMA Type 1							
	A	NEMA Type 12K							
	AWK	NEMA Type 12 (without K.O.)							
	DF	NEMA Type 4X Fiberglass reinforced polyester							
	DS	NEMA Types 4, 4X, and 5 (Type 304 stainless steel)							
	DX	NEMA Type 4X Krydon®							
	R	NEMA Type 3R							
	RB	NEMA Type 3R (bolt-on hub provision)							
	SS	NEMA Types 4, 4X, and 5 (Type 316 stainless steel)							
Factory Modifications	CLR	Class R fuse kit							
	EI or EI2	Electrical interlock kit							
	GL	Equipment ground lugs							
	GLC	Equipment ground lug, copper only							
	KI, KI2 or KIKI	1 or 2 Key interlocks							
	LK	Compression lugs (800 and 1200 A only)							
	NP	Phenolic legend plate							
	PB	Push buttons, pilot lights, selector switches. Customer must provide catalog number of control device to be installed							
	SLC	Copper lugs (30–600 A)							
	SP	Special paint colors							
	SPLO	Lock-on provision							
	VW	Viewing window							
	WA	Appleton interlocked receptacle							
	WC	Crouse-Hinds Arktite® interlocked receptacle							
	WH	Hubbellock™ interlocked receptacle							

[1] For dc ratings, see the latest catalog listing.

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Table 14: Accessories for Current Series Heavy Duty Safety Switches

Catalog Number	Series	Electrical Interlock (1 Contact)	Electrical Interlocks (2 Contacts)	Class R Kits	Solid Neutral (Al/Cu)	Solid Neutral (Cu Only)	Grounding Kit (Al)	Grounding Kit (Cu)	Fuse Puller	Receptacle Plugs
H362NRB	F5	EIK1	EIK2	RFK06H	Std.	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H362RB	F5	EIK1	EIK2	RFK06H	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H362WA	F6	EIK1	EIK2	RFK06H	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	ACP6034BC
H362WC	F6	EIK1	EIK2	RFK06H	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	APJ6485
H362WH	F5	EIK1	EIK2	RFK06H	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	SD12781
H363	F5	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H363A	F6	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	Std.	N/A
H363AWA	F6	EIK1	EIK2	RFK10	N/A	N/A	N/A	Std.	Std.	ACP1034CD
H363AWC	F6	EIK1	EIK2	RFK10	N/A	N/A	N/A	Std.	Std.	N/A
H363AWK	F6	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	Std.	N/A
H363DF	F1	9999TC10	9999TC20	RFK10	SN0610	SN0610C	Std.	N/A	Std.	N/A
H363DS	F6	EK10201	EIK10202	HRK1020	H100SN	H100SNC	PKOGTA2	PKOGTC2	Std.	N/A
H363DSWA	F7	EK10201	EIK10202	HRK1020	N/A	N/A	N/A	Std.	Std.	ACP1034CD
H363DSWC	F7	EK10201	EIK10202	HRK1020	N/A	N/A	N/A	Std.	Std.	APJ10487
H363DX	F1	9999TC10	9999TC20	RFK10	SN0610	SN0610C	Std.	N/A	Std.	N/A
H363N	F5	EIK1	EIK2	RFK10	Std.	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H363NRB	F5	EIK1	EIK2	RFK10	Std.	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H363RB	F5	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H363WA	F6	EIK1	EIK2	RFK10	N/A	N/A	N/A	N/A	FPK0610	ACP1034CD
H363WC	F6	EIK1	EIK2	RFK10	N/A	N/A	N/A	N/A	FPK0610	APJ10487
H364	F5	EIK10201	EIK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H364A	F6	EIK10201	EIK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H364AWK	F6	EIK10201	EIK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H364DF	E1	9999R8	9999R9	HRK1020	N/A	N/A	Std.	N/A	N/A	N/A
H364DS	F6	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H364N	F5	EK10201	EK10202	HRK1020	Std.	H200SNC	PKOGTA2	PKOGTC2	N/A	N/A
H364NA	F6	EK10201	EK10202	HRK1020	H200SN	Std.	PKOGTA2	PKOGTC2	N/A	N/A
H364NAWK	F6	EK10201	EK10202	HRK1020	H200SN	Std.	PKOGTA2	PKOGTC2	N/A	N/A
H364NDS	F6	EK10201	EK10202	HRK1020	H200SN	Std.	PKOGTA2	PKOGTC2	N/A	N/A
H364NRB	F5	EK10201	EK10202	HRK1020	Std.	H200SNC	PKOGTA2	PKOGTC2	N/A	N/A
H364RB	F5	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H365	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365AWK	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365DS	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365N	E4	EIK40601	EIK40602	HRK4060	Std.	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365NAWK	E4	EIK40601	EIK40602	HRK4060	H600SN	Std.	PKOGTA2	PKOGTC3	N/A	N/A
H365NDS	E4	EIK40601	EIK40602	HRK4060	H600SN	Std.	PKOGTA2	PKOGTC3	N/A	N/A
H365NR	E4	EIK40601	EIK40602	HRK4060	Std.	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365R	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366AWK	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366DS	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366N	E4	EIK40601	EIK40602	HRK4060	Std.	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366NAWK	E4	EIK40601	EIK40602	HRK4060	H600SN	Std.	PKOGTA2	PKOGTC3	N/A	N/A
H366NDS	E4	EIK40601	EIK40602	HRK4060	H600SN	Std.	PKOGTA2	PKOGTC3	N/A	N/A
H366NR	E4	EIK40601	EIK40602	HRK4060	Std.	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366R	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H367	E4	EIK40601	EIK40602	N/A	H800SNE4	N/A	PKOGTA7	N/A	N/A	N/A
H367AWK	E4	EIK40601	EIK40602	N/A	H800SNE4	N/A	PKOGTA7	N/A	N/A	N/A
H367N	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA7	N/A	N/A	N/A
H367NAWK	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA7	N/A	N/A	N/A
H367NR	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA7	N/A	N/A	N/A
H367R	E4	EIK40601	EIK40602	N/A	H800SNE4	N/A	PKOGTA7	N/A	N/A	N/A
H368	E4	EIK40601	EIK40602	N/A	H1200SNE4	N/A	PKOGTA8	N/A	N/A	N/A
H368AWK	E4	EIK40601	EIK40602	N/A	H1200SNE4	N/A	PKOGTA8	N/A	N/A	N/A
H368N	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA8	N/A	N/A	N/A
H368NAWK	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA8	N/A	N/A	N/A
H368NR	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA8	N/A	N/A	N/A
H368R	E4	EIK40601	EIK40602	N/A	H1200SNE4	N/A	PKOGTA8	N/A	N/A	N/A
H461	F5	EIK1	EIK2	RFK06	N/A	N/A	GTK0610	GTK0610C	FPK0610	N/A
H461AWK	F6	EIK1	EIK2	RFK06	N/A	N/A	GTK0610	GTK0610C	Std.	N/A
H462	F5	EIK1	EIK2	RFK06H	N/A	N/A	GTK0610	GTK0610C	FPK0610	N/A
H462AWK	F6	EK3061	EIK2	RFK06H	N/A	N/A	GTK0610	GTK0610C	Std.	N/A
H462DS	F6	EIK1	EK3062	HRK30H	N/A	N/A	PK3GTA1	PKOGTC1	Std.	N/A
H463	F5	EIK1	EIK2	RFK10	N/A	N/A	GTK0610	GTK0610C	FPK0610	N/A
H463AWK	F6	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	Std.	N/A
H463DS	F6	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	Std.	N/A
H464	F5	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H464AWK	F6	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H464DS	F6	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H465	E4	EIK40601	EIK40602	HRK4060	N/A	N/A	PKOGTA2	PKOGTC3	N/A	N/A
H465AWK	E4	EIK40601	EIK40602	HRK4060	N/A	N/A	PKOGTA2	PKOGTC3	N/A	N/A

Continued on next page

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General Information

UL Listed Maximum Short Circuit Current Ratings—AC Only

NOTE: Consult the wiring diagram of the switch to verify the UL Listed short circuit current rating.

Table 15: Fusible Short Circuit Current Ratings

Heavy Duty Safety Switch Type	UL Listed Fuse Class	UL Listed Short Circuit Current Ratings
Fusible	H, K	10 kA
	R, J, L	200 kA [1]

1 On 600 V 200 A switches, 100,000 A max. on corner grounded delta when protected by Class J or R fuses.

Table 16: Non-Fusible Safety Switches

Heavy Duty Safety Switch Type	Switch Rating (A) [1]	Fuse or Circuit Breaker Type[2]	3-Phase		
			240 Vac	480 Vac	600 Vac
Non-Fusible Switches	All	Any brand circuit breaker	Up to 10 kA		
		H, K			
		R,T,J.L	200 kA	200 kA	200 kA
	30–100	H [3]	65 kA	35 kA	25 kA
	30–100	FA	14 kA	14 kA	14 kA
	30–100	FH	18 kA	18 kA	18 kA
	200	H, J [3]	65 kA	35 kA	25 kA
	200	KA	22 kA	22 kA	22 kA
	400	LA			
	600	MA			
	200	KH	25 kA	25 kA	25 kA
	400	LH			
	600	MH			

1 Applies to NEMA Types 1, 3R, 4X stainless, 12 switches.

2 Ampere rating of fuse or circuit breaker not to exceed switch ampere rating.

3 All H and J circuit breakers are acceptable, but will only support the noted Short Circuit Current Rating.

Table 17: Terminal Lug Data (NEMA Types 1, 3R, 4, 4X, 5, 7, 9, 12) [1]

Rating (A)	Conductors Per Phase and Neutral	Wire Range Wire Bending Space Per NEC Table 312.6 AWG/kcmil	Lug Wire Range AWG/kcmil	Optional Versa-Crimp® Compression Lug Field-Installed [2]
30 [3]	1	12–6 (Al) or 14–6 (Cu)	12–2 (Al) or 14–2 (Cu)	—
	2	14–10 (Cu) solid or 14–10 (Cu) stranded		
60 [4]	1	14–3 (Al) or 14–3 (Cu)	12–2 (Al) or 14–2 (Cu)	—
100	1	12–1/0 (Al) or 14–1/0 (Cu)	12–1/0 (Al) or 14–1/0 (Cu)	VCEL02114S1
200 [5]	1	6–250 (Al/Cu)	6–300 (Al/Cu)	VCEL030516H1
400	1 or 2	1/0–750 (Al/Cu) [6] or 1/0–300 (Al/Cu)	1/0–750 (Al/Cu) and 1/0–300 (Al/Cu)	VCEL07512H1 or VCEL030516H1 [7] and VCEL05012H1
600	2	3/0–500 (Al/Cu)	3/0–500 (Al/Cu)	VCEL05012H1
800	3	3/0–750 (Al/Cu)	3/0–750 (Al/Cu)	H8LKE2 [8]
1200	4	3/0–750 (Al/Cu)	3/0–750 (Al/Cu)	H12LKE2 [8]

1 30–100 A switches suitable for 60°C or 75°C conductors. 200–1200 A switches suitable for 75°C conductors.

2 For NEMA Types 1 and 3R only.

3 HU461AWK— 14–6 AWG (Cu).

4 H60XFA— 14–6 AWG (Cu).

5 H225XKA— 4 AWG–300 kcmil (Cu).

6 Maximum wire range is (1) 600 kcmil or (2) 300 kcmil Al/Cu on NEMA Type 4X Stainless and NEMA Type 12.

7 Order two PK516KN mounting kits when installing VCEL030516H1 lugs. Only one kit is required on two-pole switches.

8 See Digest 175 page 13, 800 and 1200 A compression lug kits for additional information.

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Table 20: 100 A Heavy Duty Ratings

Catalog Number	Series	120 Vac		240 Vac				480 Vac				600 Vac				Vdc			240 Vac		480 Vac		600 Vac	
		Std.	Max.	Std.		Max.		Std.		Max.		Std.		Max.		Max. hp Ratings			Std.	Max.	Std.	Max.	Std.	Max.
		1Ø	1Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	125	250	600	2Ø	2Ø	2Ø	2Ø	2Ø	2Ø
H223DS	F6	—	—	7-1/2	—	15	—	—	—	—	—	—	—	—	—	—	20	—	—	—	—	—	—	—
H223AWK	F6	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H223A	F6	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H223N	F5	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H223NRB	F5	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H323DS	F6	—	—	—	15	—	30	—	—	—	—	—	—	—	—	—	20	—	—	—	—	—	—	—
H323A	F6	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H323AWK	F6	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H323N	F5	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H323NRB	F5	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H363	F5	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363RB	F5	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363DS	F6	—	—	—	—	—	—	—	25	—	60	—	30	—	75	—	—	30	—	—	—	—	—	—
H363A	F6	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363AWK	F6	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363N	F5	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363NRB	F5	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H463	F5	—	—	—	15	—	30	—	25	—	60	—	30	—	75	—	20[3]	30	7-1/2	20	15	40	20	50
H463DS	F6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H463AWK	F6	—	—	—	15	—	30	—	25	—	60	—	30	—	75	—	20[3]	30	7-1/2	20	15	40	20	50
H663DS	F6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H663AWK	F6	—	—	—	15	—	30	—	25	—	60	—	30	—	75	—	—	—	—	—	—	—	—	—
HU363	F5	—	7-1/2	—	—	20[1]	40[2 6]	—	—	40[1]	75[5 6]	—	—	40[1]	75[6]	7-1/2	20	50	—	—	—	—	—	—
HU363RB	F5	—	7-1/2	—	—	20[1]	40[2 6]	—	—	40[1]	75[5 6]	—	—	40[1]	75[6]	7-1/2	20	50	—	—	—	—	—	—
HU363DS	F6	—	10[1]	—	—	15[1]	40[4]	—	—	30[1]	75	—	—	40[1]	75[4]	10	20	—	—	—	—	—	—	—
HU363A	F6	—	7-1/2	—	—	20[1]	40[2 6]	—	—	40[1]	75[5 6]	—	—	40[1]	75[6]	7-1/2	20	50	—	—	—	—	—	—
HU363AWK	F6	—	7-1/2	—	—	20[1]	40[2 6]	—	—	40[1]	75[5 6]	—	—	40[1]	75[6]	7-1/2	20	50	—	—	—	—	—	—
HU463	F5	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	20	30	—	30	—	50	—	50
HU463DS	F6	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	20	30	—	30	—	50	—	50
HU463AWK	F6	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	20	30	—	30	—	50	—	50
HU663DS	F6	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	—	—	—	—	—	—	—	—
HU663AWK	F6	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	—	—	—	—	—	—	—	—

[1] Use both outer switching poles.

[2] For corner grounded delta only, install neutral and use switching poles for ungrounded conductors.

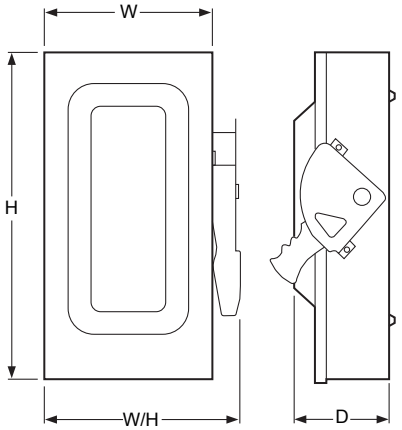
[3] Standard hp rating.

[4] Use 75°C No. 1 copper conductor only.

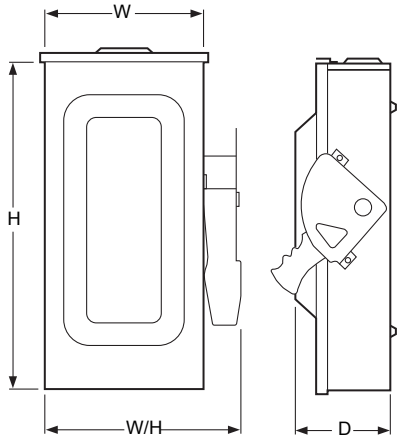
[5] 60 hp maximum on corner grounded delta.

[6] Use 75°C N.O. 4 Cu or N.O. 2 Al conductors.

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Typical NEMA Type 1



Typical NEMA Type 3R

Table 28: Dimensions

Catalog Number	Series	Approximate Dimensions							
		H		W		W/H		D	
		in.	mm	in.	mm	in.	mm	in.	mm
H221N	F5	14.60	371	6.50	165	7.55	192	4.88	124
H221NRB		14.88	378	6.63	168	7.55	192	4.88	124
H222N		14.60	371	6.50	165	7.55	192	4.88	124
H222NRB		14.88	378	6.63	168	7.55	192	4.88	124
H223N	F5	21.25	540	8.50	216	10.50	267	6.38	162
H223NRB		21.25	540	8.50	216	10.50	267	6.38	162
H224N		29.00	737	17.13	435	18.50	470	8.25	210
H224NRB		29.25	743	17.25	438	18.63	473	8.50	216
H225, N	E4	50.25	1276	27.63	702	27.63	702	10.13	257
H225NR, R		50.31	1278	27.88	708	27.88	708	10.13	257
H226, N		50.25	1276	27.63	702	27.63	702	10.13	257
H226NR, R		50.31	1278	27.88	708	27.88	708	10.13	257
H227, N	E4	69.13	1756	36.62	930	36.62	930	17.75	451
H227NR, R		69.13	1756	36.62	930	36.62	930	17.75	451
H228, N		69.13	1756	36.62	930	36.62	930	17.75	451
H228NR, R		69.13	1756	36.62	930	36.62	930	17.75	451
H265	E4	50.25	1276	27.63	702	27.63	702	10.13	257
H265R		50.31	1278	27.88	708	27.88	708	10.13	257
H266		50.25	1276	27.63	702	27.63	702	10.13	257
H266R		50.31	1278	27.88	708	27.88	708	10.13	257
H267	E4	69.13	1756	36.62	930	36.62	930	17.75	451
H267R		69.13	1756	36.62	930	36.62	930	17.75	451
H268		69.13	1756	36.62	930	36.62	930	17.75	451
H268R		69.13	1756	36.62	930	36.62	930	17.75	451
H321N	F5	14.60	371	6.50	165	7.55	192	4.88	124
H321NRB		14.88	378	6.63	168	7.55	192	4.88	124
H322N		14.60	371	6.50	165	7.55	192	4.88	124
H322NRB		14.88	378	6.63	168	7.55	192	4.88	124
H323N	F5	21.25	540	8.50	216	10.50	267	6.38	162
H323NRB		21.25	540	8.50	216	10.50	267	6.38	162
H324N		29.00	737	17.13	435	18.50	470	8.25	210
H324NRB		29.25	743	17.25	438	18.63	473	8.50	216
H325, N	E4	50.25	1276	27.63	702	27.63	702	10.13	257
H325R, NR		50.31	1278	27.88	708	27.88	708	10.13	257
H326, N		50.25	1276	27.63	702	27.63	702	10.13	257
H326R, NR		50.31	1278	27.88	708	27.88	708	10.13	257
H327, N	E4	69.13	1756	36.62	930	36.62	930	17.75	451
H327R, NR		69.13	1756	36.62	930	36.62	930	17.75	451
H328, N		69.13	1756	36.62	930	36.62	930	17.75	451
H328R, NR		69.13	1756	36.62	930	36.62	930	17.75	451
H361, N	F5	14.60	371	6.50	165	7.55	192	4.88	124
H361-2		17.50	445	9.00	229	10.50	267	6.38	162
H361NRB, RB		14.88	378	6.63	168	7.55	192	4.88	124
H361WA	F6	18.19	462	9.00	229	10.50	267	6.81	173
H361WC		18.19	462	9.00	229	10.50	267	6.81	173
H362, N	F5	17.50	445	9.00	229	10.50	267	6.38	162
H362NRB, RB		17.50	445	9.00	229	10.50	267	6.38	162
H362WA	F6	18.19	462	9.00	229	10.50	267	6.81	173
H362WC		16.75	425	9.00	229	10.50	267	7.00	178
H362WH	F5	18.19	462	9.00	229	10.50	267	6.81	173
H363, N		21.25	540	8.50	216	10.50	267	6.38	162
H363NRB, RB		21.25	540	8.50	216	10.50		6.38	162
H363WA	F6	21.85	462	9.00	229	10.50	267	6.81	173
H363WC		21.85	555	9.00	229	10.50	267	6.81	173

SQUARE D
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Catalog Number Description

Number Segment	Character	Description	D	3	2	1	N	RB	—
Type of Switch	Fusible	L=Light duty							
		D=General duty							
		H=Heavy duty							
		DT=Double throw							
	Non-Fusible	DU=General duty							
		HU=Heavy duty							
		DTU=Double throw							
Blades–Switchable Poles	1	1 pole							
	2	2 poles							
	3	3 poles							
	4	4 poles							
	6	6 poles							
Voltage Rating[1]	1	120 Vac (plug fuse)							
	2	240 Vac							
	6	600 Vac							
Ampere Rating	1	30 A							
	2	60 A							
	3	100 A							
	4	200 A							
	5	400 A							
	6	600 A							
	7	800 A							
	8	1200 A							
Neutral	N	Factory-installed neutral (neutrals are field-installed on most general duty, heavy duty, and double throw safety switches).							
Enclosure	No suffix	NEMA Type 1							
	A	NEMA Type 12K							
	AWK	NEMA Type 12 (without K.O.)							
	DF	NEMA Type 4X Fiberglass reinforced polyester							
	DS	NEMA Types 4, 4X, and 5 (Type 304 stainless steel)							
	DX	NEMA Type 4X Krydon®							
	R	NEMA Type 3R							
	RB	NEMA Type 3R (bolt-on hub provision)							
	SS	NEMA Types 4, 4X, and 5 (Type 316 stainless steel)							
Factory Modifications	CLR	Class R fuse kit							
	EI or EI2	Electrical interlock kit							
	GL	Equipment ground lugs							
	GLC	Equipment ground lug, copper only							
	KI, KI2 or KIKI	1 or 2 Key interlocks							
	LK	Compression lugs (800 and 1200 A only)							
	NP	Phenolic legend plate							
	PB	Push buttons, pilot lights, selector switches. Customer must provide catalog number of control device to be installed							
	SLC	Copper lugs (30–600 A)							
	SP	Special paint colors							
	SPLO	Lock-on provision							
	VW	Viewing window							
	WA	Appleton interlocked receptacle							
	WC	Crouse-Hinds Arktite® interlocked receptacle							
	WH	Hubbellock™ interlocked receptacle							

[1] For dc ratings, see the latest catalog listing.

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Table 14: Accessories for Current Series Heavy Duty Safety Switches

Catalog Number	Series	Electrical Interlock (1 Contact)	Electrical Interlocks (2 Contacts)	Class R Kits	Solid Neutral (Al/Cu)	Solid Neutral (Cu Only)	Grounding Kit (Al)	Grounding Kit (Cu)	Fuse Puller	Receptacle Plugs
H362NRB	F5	EIK1	EIK2	RFK06H	Std.	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H362RB	F5	EIK1	EIK2	RFK06H	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H362WA	F6	EIK1	EIK2	RFK06H	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	ACP6034BC
H362WC	F6	EIK1	EIK2	RFK06H	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	APJ6485
H362WH	F5	EIK1	EIK2	RFK06H	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	SD12781
H363	F5	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H363A	F6	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	Std.	N/A
H363AWA	F6	EIK1	EIK2	RFK10	N/A	N/A	N/A	Std.	Std.	ACP1034CD
H363AWC	F6	EIK1	EIK2	RFK10	N/A	N/A	N/A	Std.	Std.	N/A
H363AWK	F6	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	Std.	N/A
H363DF	F1	9999TC10	9999TC20	RFK10	SN0610	SN0610C	Std.	N/A	Std.	N/A
H363DS	F6	EK10201	EIK10202	HRK1020	H100SN	H100SNC	PKOGTA2	PKOGTC2	Std.	N/A
H363DSWA	F7	EK10201	EIK10202	HRK1020	N/A	N/A	N/A	Std.	Std.	ACP1034CD
H363DSWC	F7	EK10201	EIK10202	HRK1020	N/A	N/A	N/A	Std.	Std.	APJ10487
H363DX	F1	9999TC10	9999TC20	RFK10	SN0610	SN0610C	Std.	N/A	Std.	N/A
H363N	F5	EIK1	EIK2	RFK10	Std.	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H363NRB	F5	EIK1	EIK2	RFK10	Std.	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H363RB	F5	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	FPK0610	N/A
H363WA	F6	EIK1	EIK2	RFK10	N/A	N/A	N/A	N/A	FPK0610	ACP1034CD
H363WC	F6	EIK1	EIK2	RFK10	N/A	N/A	N/A	N/A	FPK0610	APJ10487
H364	F5	EIK10201	EIK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H364A	F6	EIK10201	EIK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H364AWK	F6	EIK10201	EIK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H364DF	E1	9999R8	9999R9	HRK1020	N/A	N/A	Std.	N/A	N/A	N/A
H364DS	F6	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H364N	F5	EK10201	EK10202	HRK1020	Std.	H200SNC	PKOGTA2	PKOGTC2	N/A	N/A
H364NA	F6	EK10201	EK10202	HRK1020	H200SN	Std.	PKOGTA2	PKOGTC2	N/A	N/A
H364NAWK	F6	EK10201	EK10202	HRK1020	H200SN	Std.	PKOGTA2	PKOGTC2	N/A	N/A
H364NDS	F6	EK10201	EK10202	HRK1020	H200SN	Std.	PKOGTA2	PKOGTC2	N/A	N/A
H364NRB	F5	EK10201	EK10202	HRK1020	Std.	H200SNC	PKOGTA2	PKOGTC2	N/A	N/A
H364RB	F5	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H365	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365AWK	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365DS	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365N	E4	EIK40601	EIK40602	HRK4060	Std.	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365NAWK	E4	EIK40601	EIK40602	HRK4060	H600SN	Std.	PKOGTA2	PKOGTC3	N/A	N/A
H365NDS	E4	EIK40601	EIK40602	HRK4060	H600SN	Std.	PKOGTA2	PKOGTC3	N/A	N/A
H365NR	E4	EIK40601	EIK40602	HRK4060	Std.	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H365R	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366AWK	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366DS	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366N	E4	EIK40601	EIK40602	HRK4060	Std.	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366NAWK	E4	EIK40601	EIK40602	HRK4060	H600SN	Std.	PKOGTA2	PKOGTC3	N/A	N/A
H366NDS	E4	EIK40601	EIK40602	HRK4060	H600SN	Std.	PKOGTA2	PKOGTC3	N/A	N/A
H366NR	E4	EIK40601	EIK40602	HRK4060	Std.	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H366R	E4	EIK40601	EIK40602	HRK4060	H600SN	H600SNC	PKOGTA2	PKOGTC3	N/A	N/A
H367	E4	EIK40601	EIK40602	N/A	H800SNE4	N/A	PKOGTA7	N/A	N/A	N/A
H367AWK	E4	EIK40601	EIK40602	N/A	H800SNE4	N/A	PKOGTA7	N/A	N/A	N/A
H367N	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA7	N/A	N/A	N/A
H367NAWK	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA7	N/A	N/A	N/A
H367NR	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA7	N/A	N/A	N/A
H367R	E4	EIK40601	EIK40602	N/A	H800SNE4	N/A	PKOGTA7	N/A	N/A	N/A
H368	E4	EIK40601	EIK40602	N/A	H1200SNE4	N/A	PKOGTA8	N/A	N/A	N/A
H368AWK	E4	EIK40601	EIK40602	N/A	H1200SNE4	N/A	PKOGTA8	N/A	N/A	N/A
H368N	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA8	N/A	N/A	N/A
H368NAWK	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA8	N/A	N/A	N/A
H368NR	E4	EIK40601	EIK40602	N/A	Std.	N/A	PKOGTA8	N/A	N/A	N/A
H368R	E4	EIK40601	EIK40602	N/A	H1200SNE4	N/A	PKOGTA8	N/A	N/A	N/A
H461	F5	EIK1	EIK2	RFK06	N/A	N/A	GTK0610	GTK0610C	FPK0610	N/A
H461AWK	F6	EIK1	EIK2	RFK06	N/A	N/A	GTK0610	GTK0610C	Std.	N/A
H462	F5	EIK1	EIK2	RFK06H	N/A	N/A	GTK0610	GTK0610C	FPK0610	N/A
H462AWK	F6	EK3061	EIK2	RFK06H	N/A	N/A	GTK0610	GTK0610C	Std.	N/A
H462DS	F6	EIK1	EK3062	HRK30H	N/A	N/A	PK3GTA1	PKOGTC1	Std.	N/A
H463	F5	EIK1	EIK2	RFK10	N/A	N/A	GTK0610	GTK0610C	FPK0610	N/A
H463AWK	F6	EIK1	EIK2	RFK10	SN0610	SN0610C	GTK0610	GTK0610C	Std.	N/A
H463DS	F6	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	Std.	N/A
H464	F5	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H464AWK	F6	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H464DS	F6	EK10201	EK10202	HRK1020	N/A	N/A	PKOGTA2	PKOGTC2	N/A	N/A
H465	E4	EIK40601	EIK40602	HRK4060	N/A	N/A	PKOGTA2	PKOGTC3	N/A	N/A
H465AWK	E4	EIK40601	EIK40602	HRK4060	N/A	N/A	PKOGTA2	PKOGTC3	N/A	N/A

Continued on next page

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General Information

UL Listed Maximum Short Circuit Current Ratings—AC Only

NOTE: Consult the wiring diagram of the switch to verify the UL Listed short circuit current rating.

Table 15: Fusible Short Circuit Current Ratings

Heavy Duty Safety Switch Type	UL Listed Fuse Class	UL Listed Short Circuit Current Ratings
Fusible	H, K	10 kA
	R, J, L	200 kA [1]

1 On 600 V 200 A switches, 100,000 A max. on corner grounded delta when protected by Class J or R fuses.

Table 16: Non-Fusible Safety Switches

Heavy Duty Safety Switch Type	Switch Rating (A) [1]	Fuse or Circuit Breaker Type[2]	3-Phase		
			240 Vac	480 Vac	600 Vac
Non-Fusible Switches	All	Any brand circuit breaker	Up to 10 kA		
		H, K			
		R,T,J.L	200 kA	200 kA	200 kA
	30–100	H [3]	65 kA	35 kA	25 kA
	30–100	FA	14 kA	14 kA	14 kA
	30–100	FH	18 kA	18 kA	18 kA
	200	H, J [3]	65 kA	35 kA	25 kA
	200	KA	22 kA	22 kA	22 kA
	400	LA			
	600	MA			
	200	KH	25 kA	25 kA	25 kA
	400	LH			
	600	MH			

1 Applies to NEMA Types 1, 3R, 4X stainless, 12 switches.

2 Ampere rating of fuse or circuit breaker not to exceed switch ampere rating.

3 All H and J circuit breakers are acceptable, but will only support the noted Short Circuit Current Rating.

Table 17: Terminal Lug Data (NEMA Types 1, 3R, 4, 4X, 5, 7, 9, 12) [1]

Rating (A)	Conductors Per Phase and Neutral	Wire Range Wire Bending Space Per NEC Table 312.6 AWG/kcmil	Lug Wire Range AWG/kcmil	Optional Versa-Crimp® Compression Lug Field-Installed [2]
30 [3]	1	12–6 (Al) or 14–6 (Cu)	12–2 (Al) or 14–2 (Cu)	—
	2	14–10 (Cu) solid or 14–10 (Cu) stranded		
60 [4]	1	14–3 (Al) or 14–3 (Cu)	12–2 (Al) or 14–2 (Cu)	—
100	1	12–1/0 (Al) or 14–1/0 (Cu)	12–1/0 (Al) or 14–1/0 (Cu)	VCEL02114S1
200 [5]	1	6–250 (Al/Cu)	6–300 (Al/Cu)	VCEL030516H1
400	1 or 2	1/0–750 (Al/Cu) [6] or 1/0–300 (Al/Cu)	1/0–750 (Al/Cu) and 1/0–300 (Al/Cu)	VCEL07512H1 or VCEL030516H1 [7] and VCEL05012H1
600	2	3/0–500 (Al/Cu)	3/0–500 (Al/Cu)	VCEL05012H1
800	3	3/0–750 (Al/Cu)	3/0–750 (Al/Cu)	H8LKE2 [8]
1200	4	3/0–750 (Al/Cu)	3/0–750 (Al/Cu)	H12LKE2 [8]

1 30–100 A switches suitable for 60°C or 75°C conductors. 200–1200 A switches suitable for 75°C conductors.

2 For NEMA Types 1 and 3R only.

3 HU461AWK— 14–6 AWG (Cu).

4 H60XFA— 14–6 AWG (Cu).

5 H225XKA— 4 AWG–300 kcmil (Cu).

6 Maximum wire range is (1) 600 kcmil or (2) 300 kcmil Al/Cu on NEMA Type 4X Stainless and NEMA Type 12.

7 Order two PK516KN mounting kits when installing VCEL030516H1 lugs. Only one kit is required on two-pole switches.

8 See Digest 175 page 13, 800 and 1200 A compression lug kits for additional information.

SQUARE D
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Table 20: 100 A Heavy Duty Ratings

Catalog Number	Series	120 Vac		240 Vac				480 Vac				600 Vac				Vdc			240 Vac		480 Vac		600 Vac	
		Std.	Max.	Std.		Max.		Std.		Max.		Std.		Max.		Max. hp Ratings			Std.	Max.	Std.	Max.	Std.	Max.
		1Ø	1Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	1Ø	3Ø	125	250	600	2Ø	2Ø	2Ø	2Ø	2Ø	2Ø
H223DS	F6	—	—	7-1/2	—	15	—	—	—	—	—	—	—	—	—	—	20	—	—	—	—	—	—	—
H223AWK	F6	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H223A	F6	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H223N	F5	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H223NRB	F5	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H323DS	F6	—	—	—	15	—	30	—	—	—	—	—	—	—	—	—	20	—	—	—	—	—	—	—
H323A	F6	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H323AWK	F6	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H323N	F5	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H323NRB	F5	—	—	7-1/2[1]	15[2]	15[1]	30[2]	—	—	—	—	—	—	—	—	—	20[3]	—	—	—	—	—	—	—
H363	F5	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363RB	F5	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363DS	F6	—	—	—	—	—	—	—	25	—	60	—	30	—	75	—	—	30	—	—	—	—	—	—
H363A	F6	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363AWK	F6	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363N	F5	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H363NRB	F5	—	—	—	—	—	—	10[1]	25[2]	30[1]	60[2]	—	30	—	75	—	50	30	—	—	—	—	—	—
H463	F5	—	—	—	15	—	30	—	25	—	60	—	30	—	75	—	20[3]	30	7-1/2	20	15	40	20	50
H463DS	F6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H463AWK	F6	—	—	—	15	—	30	—	25	—	60	—	30	—	75	—	20[3]	30	7-1/2	20	15	40	20	50
H663DS	F6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
H663AWK	F6	—	—	—	15	—	30	—	25	—	60	—	30	—	75	—	—	—	—	—	—	—	—	—
HU363	F5	—	7-1/2	—	—	20[1]	40[2 6]	—	—	40[1]	75[5 6]	—	—	40[1]	75[6]	7-1/2	20	50	—	—	—	—	—	—
HU363RB	F5	—	7-1/2	—	—	20[1]	40[2 6]	—	—	40[1]	75[5 6]	—	—	40[1]	75[6]	7-1/2	20	50	—	—	—	—	—	—
HU363DS	F6	—	10[1]	—	—	15[1]	40[4]	—	—	30[1]	75	—	—	40[1]	75[4]	10	20	—	—	—	—	—	—	—
HU363A	F6	—	7-1/2	—	—	20[1]	40[2 6]	—	—	40[1]	75[5 6]	—	—	40[1]	75[6]	7-1/2	20	50	—	—	—	—	—	—
HU363AWK	F6	—	7-1/2	—	—	20[1]	40[2 6]	—	—	40[1]	75[5 6]	—	—	40[1]	75[6]	7-1/2	20	50	—	—	—	—	—	—
HU463	F5	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	20	30	—	30	—	50	—	50
HU463DS	F6	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	20	30	—	30	—	50	—	50
HU463AWK	F6	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	20	30	—	30	—	50	—	50
HU663DS	F6	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	—	—	—	—	—	—	—	—
HU663AWK	F6	—	—	—	—	—	40	—	—	—	75	—	—	—	75	—	—	—	—	—	—	—	—	—

[1] Use both outer switching poles.

[2] For corner grounded delta only, install neutral and use switching poles for ungrounded conductors.

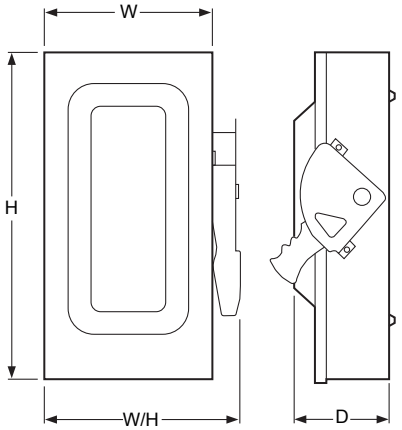
[3] Standard hp rating.

[4] Use 75°C No. 1 copper conductor only.

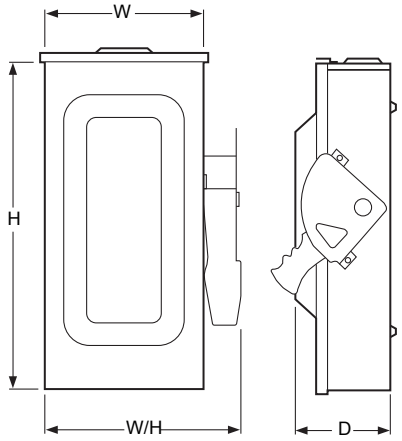
[5] 60 hp maximum on corner grounded delta.

[6] Use 75°C N.O. 4 Cu or N.O. 2 Al conductors.

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Typical NEMA Type 1

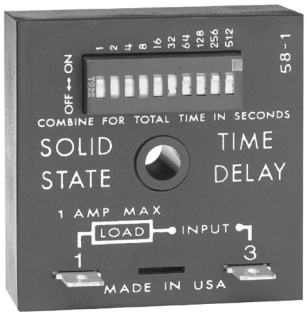


Typical NEMA Type 3R

Table 28: Dimensions

Catalog Number	Series	Approximate Dimensions							
		H		W		W/H		D	
		in.	mm	in.	mm	in.	mm	in.	mm
H221N	F5	14.60	371	6.50	165	7.55	192	4.88	124
H221NRB		14.88	378	6.63	168	7.55	192	4.88	124
H222N		14.60	371	6.50	165	7.55	192	4.88	124
H222NRB		14.88	378	6.63	168	7.55	192	4.88	124
H223N	F5	21.25	540	8.50	216	10.50	267	6.38	162
H223NRB		21.25	540	8.50	216	10.50	267	6.38	162
H224N		29.00	737	17.13	435	18.50	470	8.25	210
H224NRB		29.25	743	17.25	438	18.63	473	8.50	216
H225, N	E4	50.25	1276	27.63	702	27.63	702	10.13	257
H225NR, R		50.31	1278	27.88	708	27.88	708	10.13	257
H226, N		50.25	1276	27.63	702	27.63	702	10.13	257
H226NR, R		50.31	1278	27.88	708	27.88	708	10.13	257
H227, N	E4	69.13	1756	36.62	930	36.62	930	17.75	451
H227NR, R		69.13	1756	36.62	930	36.62	930	17.75	451
H228, N		69.13	1756	36.62	930	36.62	930	17.75	451
H228NR, R		69.13	1756	36.62	930	36.62	930	17.75	451
H265	E4	50.25	1276	27.63	702	27.63	702	10.13	257
H265R		50.31	1278	27.88	708	27.88	708	10.13	257
H266		50.25	1276	27.63	702	27.63	702	10.13	257
H266R		50.31	1278	27.88	708	27.88	708	10.13	257
H267	E4	69.13	1756	36.62	930	36.62	930	17.75	451
H267R		69.13	1756	36.62	930	36.62	930	17.75	451
H268		69.13	1756	36.62	930	36.62	930	17.75	451
H268R		69.13	1756	36.62	930	36.62	930	17.75	451
H321N	F5	14.60	371	6.50	165	7.55	192	4.88	124
H321NRB		14.88	378	6.63	168	7.55	192	4.88	124
H322N		14.60	371	6.50	165	7.55	192	4.88	124
H322NRB		14.88	378	6.63	168	7.55	192	4.88	124
H323N	F5	21.25	540	8.50	216	10.50	267	6.38	162
H323NRB		21.25	540	8.50	216	10.50	267	6.38	162
H324N		29.00	737	17.13	435	18.50	470	8.25	210
H324NRB		29.25	743	17.25	438	18.63	473	8.50	216
H325, N	E4	50.25	1276	27.63	702	27.63	702	10.13	257
H325R, NR		50.31	1278	27.88	708	27.88	708	10.13	257
H326, N		50.25	1276	27.63	702	27.63	702	10.13	257
H326R, NR		50.31	1278	27.88	708	27.88	708	10.13	257
H327, N	E4	69.13	1756	36.62	930	36.62	930	17.75	451
H327R, NR		69.13	1756	36.62	930	36.62	930	17.75	451
H328, N		69.13	1756	36.62	930	36.62	930	17.75	451
H328R, NR		69.13	1756	36.62	930	36.62	930	17.75	451
H361, N	F5	14.60	371	6.50	165	7.55	192	4.88	124
H361-2		17.50	445	9.00	229	10.50	267	6.38	162
H361NRB, RB		14.88	378	6.63	168	7.55	192	4.88	124
H361WA	F6	18.19	462	9.00	229	10.50	267	6.81	173
H361WC		18.19	462	9.00	229	10.50	267	6.81	173
H362, N	F5	17.50	445	9.00	229	10.50	267	6.38	162
H362NRB, RB		17.50	445	9.00	229	10.50	267	6.38	162
H362WA	F6	18.19	462	9.00	229	10.50	267	6.81	173
H362WC		16.75	425	9.00	229	10.50	267	7.00	178
H362WH	F5	18.19	462	9.00	229	10.50	267	6.81	173
H363, N		21.25	540	8.50	216	10.50	267	6.38	162
H363NRB, RB		21.25	540	8.50	216	10.50		6.38	162
H363WA	F6	21.85	462	9.00	229	10.50	267	6.81	173
H363WC		21.85	555	9.00	229	10.50	267	6.81	173

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The TDU and KSDU Series are encapsulated solid-state, delay-on-make timers that combine digital timing circuitry with universal voltage operation. The TDU offers DIP switch adjustment allowing accurate selection of the time delay over the full time delay range. The KSDU is factory fixed from 0.1s to 10,230s and does not include the DIP switch. These series are excellent choices for process control systems and OEM equipment.

Operation (Delay-on-Make):
Upon application of input voltage, the time delay begins. The output is de-energized before and during the time delay. At the end of the time delay, the output energizes and remains energized until input voltage is removed.
Reset: Removing input voltage resets the time delay and output.

For more information see:
Appendix A, pages 156-164 for function descriptions and diagrams.
Appendix B, page 165, Figure 1 for dimensional drawing.

Features:

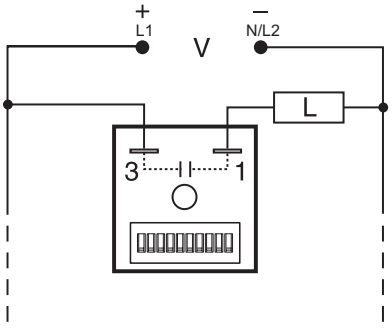
- 2 universal voltage ranges from 24 to 240VAC/DC
- Digital integrated circuitry
- Switch selectable delays from 0.1s - 2.8h in 3 ranges or factory fixed
- ±0.5% repeat accuracy
- 1A steady, 10A inrush
- Totally solid state & encapsulated

Approvals:

Auxiliary Products:

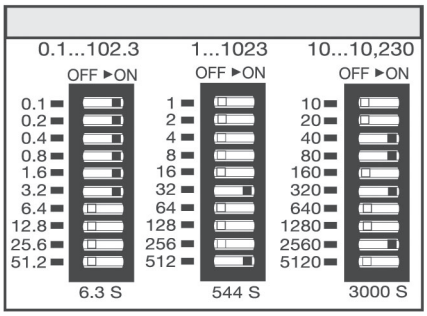
- **Female quick connect:** P/N: P1015-64 (AWG 14/16)
- **Quick connect to screw adaptor:** P/N: P1015-18
- **Mounting bracket:** P/N: P1023-6
- **DIN rail:** P/N: C103PM (Al)
- **DIN rail adaptor:** P/N: P1023-20

Connection:



Load may be connected to terminal 3 or 1.
TDU has DIP switch adjustment; KSDU is fixed.

Digi-Set Binary Switch Operation:



Available Models:

KSDU8110	TDUH3000A
KSDU811200	TDUH3001A
TDU3000A	TDUL3000A
TDU3001A	TDUL3001A
TDU3003A	

If desired part number is not listed, please call us to see if it is technically possible to build.

Order Tables:

~~KSDU~~ ~~X~~ ~~X~~ ~~X~~

~~Input Voltage Range~~
~~8 - 24 to 120VAC/DC~~
~~9 - 100 to 240VAC/DC~~

~~Type~~
~~1 - Fixed~~

~~Time Delay (Seconds)~~
~~Specify fixed delay in seconds 0.1 - 10230~~

TDU	Input Voltage Range	Time Range - Seconds	Part Number
	24 to 120VAC/DC	0.1 - 102.3	TDUL3000A
	100 to 240VAC/DC	0.1 - 102.3	TDUL3001A
	24 to 120VAC/DC	1 - 1023	TDU3000A
	100 to 240VAC/DC	1 - 1023	TDU3001A
	120 to 277VAC	1 - 1023	TDU3003A
	24 to 120VAC/DC	10 - 10230	TDUH3000A
	100 to 240VAC/DC	10 - 10230	TDUH3001A

Specifications

Time Delay
Type . . . . . Digital integrated circuitry
Range* Adjustable (TDU) . . . . . 0.1 - 102.3s in 0.1s increments
1 - 1023s in 1s increments
10 - 10230s in 10s increments
Fixed (KSDU) . . . . . Fixed from 0.1s - 10230s
Repeat Accuracy . . . . . ±0.5% or 20ms, whichever is greater
Tolerance (Factory Calibration) . . . . . ±10%
Recycle Time . . . . . ≤ 150ms
Time Delay vs Temp. & Voltage . . . . . ±5%
Input
Voltage . . . . . 24 to 120VAC/DC; 100 to 240VAC/DC
AC Line Frequency . . . . . 50/60 Hz
Tolerance . . . . . ±20%
Output
Type . . . . . Solid state
Form . . . . . NO, open during timing
Maximum Load Current . . . . . 1A steady state, 10A inrush at 60°C
Minimum Holding Current 40mA
Voltage Drop . . . . . ≅ 2.5V @ 1A
Protection
Circuitry . . . . . Encapsulated
Dielectric Breakdown . . . . . ≥ 2000V RMS terminals to mounting surface
Insulation Resistance . . . . . ≥100 MΩ
Mechanical
Mounting . . . . . Surface mount with one #10 (M5 x 0.8) screw
Dimensions . . . . . 2 x 2 x 1.21 in. (50.8 x 50.8 x 30.7 mm)
Termination . . . . . 0.25 in. (6.35 mm) male quick connect terminals
Environmental
Operating / Storage Temperature . . . . . -40° to 60°C / -40° to 85°C
Humidity . . . . . 95% relative, non-condensing
Weight . . . . . ≅ 2.4 oz (68 g)

* For CE approved applications, power must be removed from the unit when a switch position is changed.

Appendix A - Timer Functions

Selecting a Timer's Function

Selecting one of the five most common timing functions can be as easy as answering three questions on the chart below. If you have trouble answering these questions, try drawing a connection diagram that shows how the timer and load are connected. Time diagrams and written descriptions of the five most popular functions, plus other common functions. Instantaneous contacts, accumulation, pause timing functions, and flashing LED's are included in some units to expand the versatility of the timer. These expanded operations are explained on the product's catalog page. Time diagrams are used on these pages along with text and international symbols for functions.

Function Selection Guide

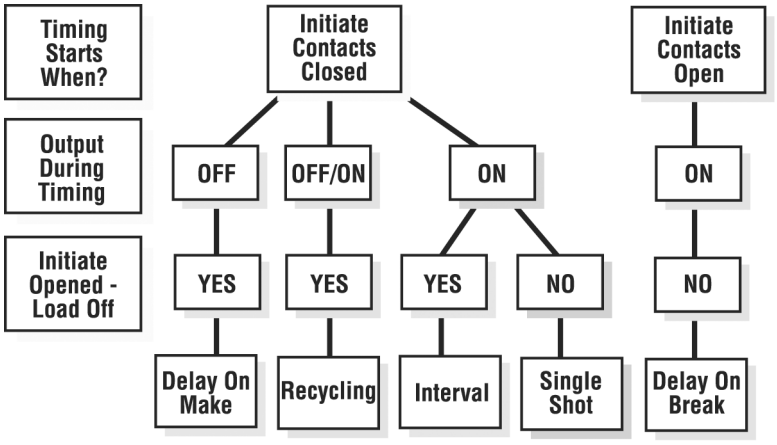
Selection Questions

1) The timing starts when the initiate (starting) contacts are:
   A) Closed B) Opened

2) What is the status of the output (or load) during timing:
   A) On B) Off C) On/Off

3) Will the load de-energize (or remain de-energized) if the initiate (starting) contacts are opened during timing:
   A) Yes B) No

THE FIVE MOST USED FUNCTIONS



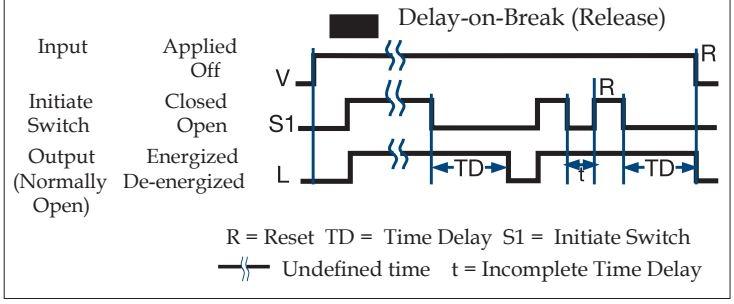
Understanding Time Diagrams

Time diagrams are used to show the relative operation of switches, controls, and loads as time progresses. Time begins at the first vertical boundary. There may be a line indicating the start of the operation or it may just begin with the transition of the device that starts the operation. Each row in the time diagram represents a separate component. These rows will be labeled with the name of the device or its terminal connection numbers. In a bistable or digital system, the switches, controls, or loads can only be ON or OFF. The time lines are drawn to represent these two possible conditions. Vertical lines are used to define important starting or ending points in the operation.

The example to the right is the most common type of time diagram in use in North America. It shows the energizing of loads, and the closing of switches and contacts by an ascending vertical transition of the time line. Opening switches or contacts or de-energizing loads are represented by descending vertical transitions.

TIME DIAGRAM

Example:

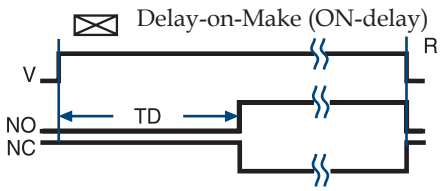


INTERNATIONAL TIMING FUNCTION SYMBOLS

= Delay-on-Make; ON-delay
= Delay-on-Break; OFF-delay
= Delay-on-Make & Break; ON and OFF-delay
= Interval; Impulse-ON
= Trailing Edge Interval; Impulse-OFF
= Single Shot; Pulse Former
= Flasher - ON Time First; Recycling Equal Times - ON First
= Flasher - OFF Time First; Recycling Equal Times - OFF First
= Recycling - Unequal Times; Pulse Generator
= Recycling - Unequal Times Starting with ON or OFF
= Delay-on-Make & Interval; Single Pulse Generator

Delay-on-Make: (ProgramaCube® Function M)

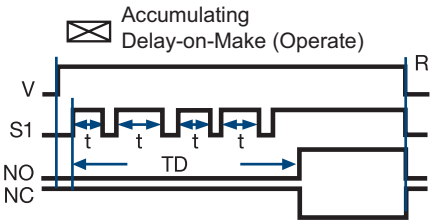
(ON-delay, Delay on Operate, On Delay, Operate Delay, Delay On, Prepurge Delay)
OPERATION: Upon application of input voltage, the time delay begins. The output (relay or solid state) is de-energized before and during the time delay. At the end of the time delay, the output energizes and remains energized until input voltage is removed.
RESET: Removing input voltage resets the time delay and output.
See: HRPS, KRPS, KSPS, KSPU, NHPS, NHPU, TDM, TRDU



Extra Functions Included in Some Delay-on-Make (DOM) Timers:

Accumulating Time Delay Feature: (ProgramaCube® Function AM)

Some DOM timers allow the time delay to be stopped and held and then resumed by opening and closing an external switch. The total time delay, TD is the sum of the accumulated partial time delays, "t".
See: KRPD, KRPS, HRPS, NHPS, KSPD, KSPS, TRDU

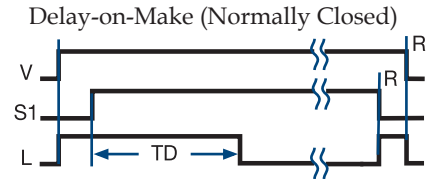


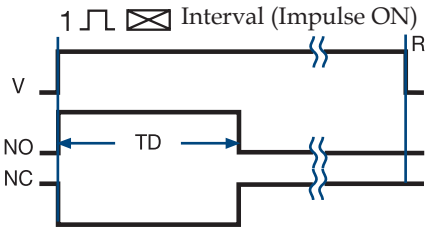
Instantaneous Contacts:

Some DOM timers have a set of instantaneous contacts in addition to the delayed contacts. Instantaneous contacts energize when input voltage is applied and remain until voltage is removed.

Delay-on-Make, Normally Closed Output:

All relay output delay-on-make timers with normally closed contacts include this function. (See Delay-on-Make NC Contacts) This function is also available in solid-state output timers. The solid-state output energizes when input voltage is applied. The time delay begins when an optional initiate switch S1 is closed (timing starts when voltage is applied if S1 is not used). The output de-energizes at the end of the time delay.
Reset: Opening S1 resets the time delay and the output immediately energizes (or remains energized). Removing input voltage resets the time delay and de-energizes the output.
See: KSD4, THD4, TS4, TSD4





Interval: (ProgramaCube® Function I)

(Impulse-ON, Single Pulse on Operate, On Interval, Interval On, Pulse Shaping, Bypass Timing)
OPERATION: Upon application of input voltage, the time delay begins. The output (relay or solid state) energizes during the time delay. At the end of time delay the output de-energizes and remains de-energized until input voltage is removed.
RESET: Removing input voltage resets the time delay and output.
See: HRPS, KRPS, KSPS, KSPU, NHPS, NHPU, TDI, TSD2

Extra Functions Included on Some Interval Timers:

Instantaneous Contacts:

Some Interval timers have a set of intantaneous contacts in addition to the delayed contacts. Intantaneous contacts energize when input voltage is applied and remain until voltage is removed.

Legend

V = Voltage
R = Reset
TD = Time Delay
S1 = Initiate Switch
NO = Normally Open Contact
NC = Normally Closed Contact
t = Incomplete (Partial) Time Delay
L = Load
= Undefined time

Timer Functions
Popular Functions

Recycling: (ProgramaCube®Functions RE, RD, RXE, RXD)

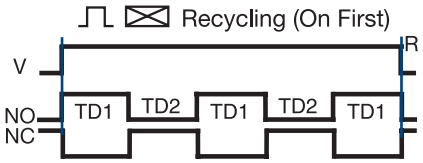
(Flasher, Pulse Generator, Recycle Timing, Repeat Cycle, Duty Cycling)

OPERATION: Upon application of input voltage, the output (relay or solid state) energizes and the ON time begins. At the end of the ON time, the output de-energizes and the OFF time begins. At the end of the OFF time, the output energizes and the cycle repeats as long as input voltage is applied. The OFF time may be the first delay in some recycling timers.

RESET: Removing input voltage resets the output and time delays, and returns the sequence to the first delay.

The time delays in some recycling timers are equal TD1=TD2. Flashers are an example of this type of recycling timer. Others have separately selectable time delays.

See: HRPD, HRPS, KRPD, KRPS, KSPD, KSPS, KSPU, NHPD, NHPS, NHPU, TDR



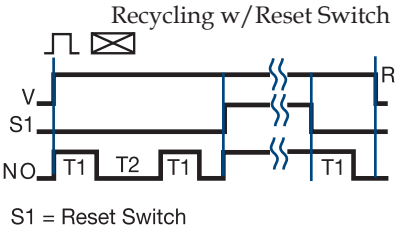
Extra Functions Included in Some Recycling Timers:

Instantaneous Contacts:

Some Recycling timers have a set of instantaneous contacts in addition to the delayed contacts. Instantaneous contacts energize when input voltage is applied and remain until voltage is removed.

RESET SWITCH: Closing an external switch transfers the output and resets the sequence to the first delay.

See: HRDR



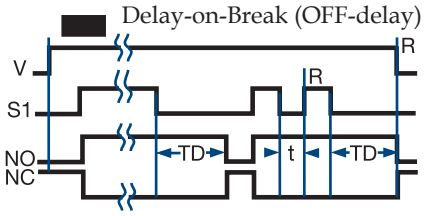
Delay-on-Break: (ProgramaCube® Function B)

(Delay on Release, OFF-delay, Release Delay, Postpurge Delay)

OPERATION: Input voltage must be applied before and during timing. Upon closure of the initiate switch, the output (relay or solid state) energizes. The time delay begins when the initiate switch is opened. The output remains energized during timing. At the end of the time delay, the output de-energizes. The output will energize if the initiate switch is closed when input voltage is applied.

RESET: Reclosing the initiate switch during timing resets the time delay. Removing input voltage resets the time delay and output.

See: HRPS, HRPU, KRPS, KSPS, KSPU, NHPS, NHPU, TRDU, TDB



Extra Functions Included in Some Delay-on-Break (DOB) Timers:

Instantaneous Contacts:

Some DOB timers have a set of instantaneous contacts in addition to the delayed contacts. Instantaneous contacts energize when input voltage is applied and remain until voltage is removed.

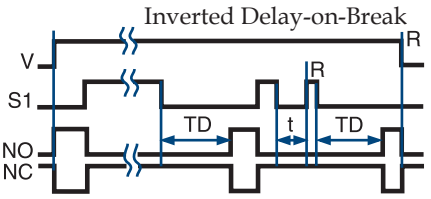
Related Functions:

Inverted Delay-on-Break: (ProgramaCube® Function UB)

OPERATION: Input voltage must be applied before and during timing. Upon closure of the initiate switch S1, the output (relay or solid state) de-energizes. The time delay begins when S1 is opened. The output remains de-energized during timing. At the end of the time delay, the output energizes. The output remains de-energized if S1 is closed when input voltage is applied

RESET: Reclosing S1 during timing resets the time delay. Removing input voltage resets the time delay and output.

See: HRPS, HRPU, KRPS, KSPS, KSPU, NHPS, NHPU, TRDU

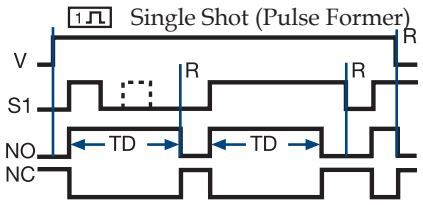


Legend

V = Voltage	NO = Normally Open Contact
R = Reset	NC = Normally Closed Contact
T1 = ON Time	t = Incomplete Time Delay
T2 = OFF Time	TD, TD1, TD2 = Time Delay
S1 =Initiate Switch	= Undefined Time

Single Shot: (ProgramaCube® Functions S or SD)

(Pulse Former, One Shot Relay, Single Shot Interval, Pulse Shaping)
OPERATION: Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch, the output (relay or solid state) energizes and the time delay begins. At the end of the delay, the output de-energizes. Opening or reclosing the initiate switch during timing has no effect on the time delay. Note (for most single shot timers): If the initiate switch is closed when input voltage is applied, the output energizes and the time delay begins.
RESET: Reset occurs when the time delay is complete and the initiate switch is opened. Removing input voltage resets the time delay and output.
See: HRPS, HRPU, KRPS, KSPS, KSPU, NHPS, NHPU, TDS, TSDS, TRDU



Extra Functions Included in Some Single Shot Timers:

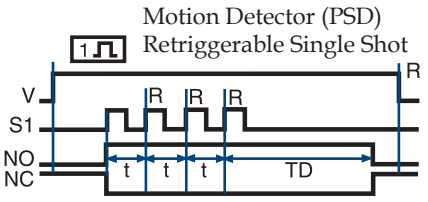
Instantaneous Contacts:

Some Single Shot timers have a set of instantaneous contacts in addition to the delayed contacts. Instantaneous contacts energize when input voltage is applied and remain until voltage is removed.

Related Functions:

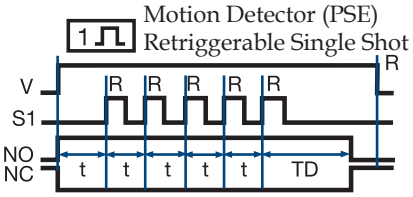
Retriggerable Single Shot (Motion Detector): (ProgramaCube® Function PSD)

(Motion Detector, Zero Speed Switch, Watchdog Timer, Missing Pulse Timer)
OPERATION: Input voltage must be applied prior to and during timing. The output (relay or solid state) is de-energized. When the initiate switch S1 closes momentarily or maintained, the output energizes and the time delay begins. Upon completion of the delay, the output de-energizes.
RESET: Reclosing S1 resets the time delay and restarts timing. Removing input voltage resets the time delay and output.
See: HRD9, HRPS, HRPU, KRD9, KRPS, KSPS, KSPU, NHPS, NHPU, TRDU, TRU



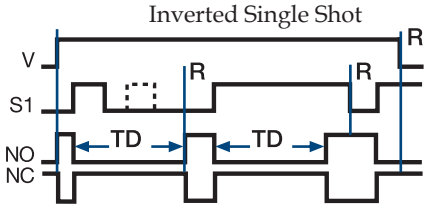
Retriggerable Single Shot (Motion Detector): (ProgramaCube® Function PSE)

OPERATION: Similar to retriggerable single shot function PSD above except, when input voltage is applied, the output (relay or solid state) immediately energizes and timing begins. At the end of the time delay, the output de-energizes. The unit will timeout as long as S1 remains open or closed for a full time delay period.
RESET: During timing, reclosing S1 resets and restarts the time delay and the output remains energized. After timeout, reclosing S1 starts a new operation. Removing input voltage resets the time delay and the output.
See: KRD9



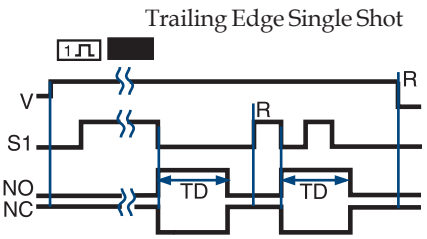
Inverted Single Shot: (ProgramaCube® Function US)

OPERATION: Input voltage must be applied before and during timing. Upon momentary or maintained closure of the initiate switch S1, the output (relay or solid state) de-energizes. At the end of the time delay, the output energizes. Opening or reclosing S1 during timing has no affect on the time delay. The output will remain de-energized if S1 is closed when input voltage is applied.
RESET: Reset occurs when the time delay is complete and S1 is open. Removing input voltage resets the time delay and output.
See: HRPS, HRPU, KRPS, KSPS, KSPU, NHPS, NHPU, TRDU



Trailing Edge Single Shot (Impulse-OFF): (ProgramaCube® Function TS)

OPERATION: Input voltage must be applied before and during timing. When the initiate switch S1 opens, the output (relay or solid state) energizes. At the end of the time delay, the output de-energizes. Reclosing and opening S1 during timing has no affect on the time delay. The output will not energize if S1 is open when input voltage is applied.
RESET: Reset occurs when the time delay is complete and S1 is closed. Removing input voltage resets the time delay and output.See: HRPS, KRPS, KSPS, KSPU, NHPU, TRDU



Timer Functions
Two Functions in One Timer

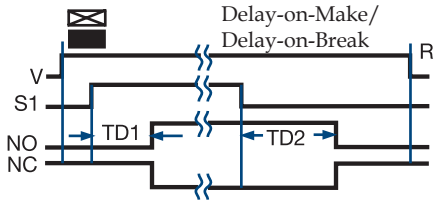
Delay-on-Make/Delay-on-Break: (ProgramaCube® Function MB)

(ON-delay/OFF-delay, Delay on Operate/Delay on Release, Sequencing ON & OFF, Fan Delay, Prepurge & Postpurge)

OPERATION: Input voltage must be applied at all times. The output (relay or solid state) is de-energized. Upon closure of the S1 initiate switch, the delay-on-make time delay (TD1) begins. At the end of TD1, the output (relay or solid state) energizes. Opening S1 starts the delay-on-break time delay (TD2). At the end of TD2, the output de-energizes.

RESET: Removing input voltage resets time delays and the output.If S1 is a) opened during TD1, then TD1 is reset and the output remains de-energized. b) reclosed during TD2, then TD2 is reset and the output remains energized.

See: HRPD, KRPD, KSPD, NHPD



Extra Functions Included in Some Delay-on-Make/Delay-on-Break Timers:

Instantaneous Contacts:

Some DOM/DOB timers have a set of instantaneous contacts in addition to the delayed contacts. Instantaneous contacts energize when input voltage is applied and remain until voltage is removed.

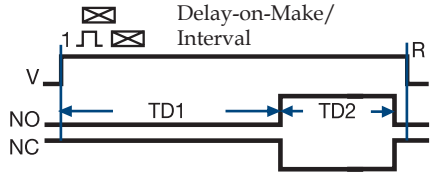
Delay-on-Make/Interval: (ProgramaCube® Function MI)

(Single Pulse Generator, Delayed Interval, Delay on Operate/Single Pulse on Operate)

OPERATION: Upon application of input voltage, the delay-on-make time delay (TD1) begins, the output remains de-energized. At the end of this delay, the output (relay or solid state) energizes and the interval delay (TD2) begins. At the end of the interval delay (TD2), the output de-energizes.

RESET: Removing input voltage resets the output, the time delays and returns the sequence to the first delay.

See: ESD5, HRPD, KRPD, KSPD, NHPD, TRDU

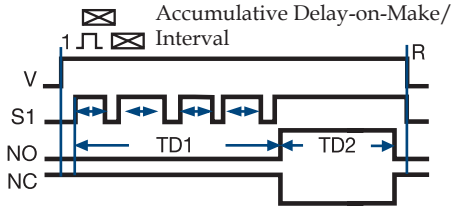


Accumulative Delay-on-Make/Interval: (ProgramaCube® Function AMI)

OPERATION: Input voltage must be applied before and during timing. The output is de-energized before and during the TD1 time delay. Each time S1 closes, the time delay progresses; when it opens, timing stops. When the amount of time S1 is closed equals the full TD1 delay, the output (relay or solid state) energizes for TD2. Upon completion of TD2, the output relay de-energizes. Opening S1 during TD2 has no affect.

RESET: Removing input voltage resets the time delay, output relay, and the sequence to the first delay.

See: HRPD, KRPD, KSPD, NHPD



Legend

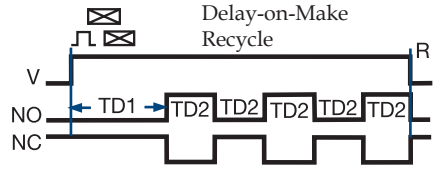
V = Voltage	TD1, TD2 = Time Delay
S1 = Initiate Switch	NO = Normally Open
R = Reset	NC = Normally Closed

≀≀ = Undefined Time

Timer Functions
Two Functions in One Timer

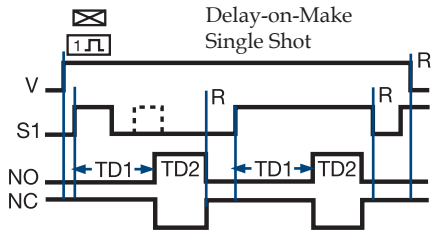
Delay-on-Make/Recycle: (ProgramaCube® Function MRE)

OPERATION: Upon application of input voltage, TD1 begins and the output (relay or solid state) remains de-energized. At the end of TD1, the TD2 recycle function begins and the output (relay or solid state) cycles ON and OFF for equal delays. This cycle continues until input voltage is removed.
RESET: Removing input voltage resets the output and time delays, and returns the sequence to the first delay.
See: KSPD, KRPD, NHPD, HRPD, TRDU



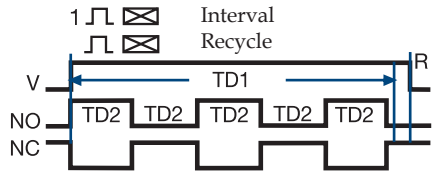
Delay-on-Make/Single Shot: (ProgramaCube® Function MS)

OPERATION: Upon application of input voltage and the closure of S1, TD1 begins and the output (relay or solid state) remains de-energized. The output (relay or solid state) energizes at the end of TD1, and TD2 begins. At the end of TD2, the output (relay or solid state) de-energizes. Opening or reclosing S1 during timing has no affect on the time delays.
RESET: Reset occurs when the time delay is complete and S1 is open. Removing input voltage resets the time delay, output, and the sequence to the first delay.
See: KSPD, KRPD, NHPD, HRPD, TRDU



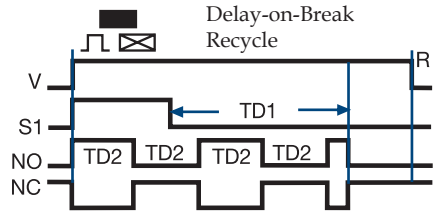
Interval/Recycle: (ProgramaCube® Function IRE)

OPERATION: Upon application of input voltage TD1 begins. At the same time, the TD2 ON time begins and the output (relay or solid state) energizes. At the end of the ON time, the TD2 OFF time begins and the output de-energizes. The equal ON time OFF time cycle continues until TD1 is completed at which time the output de-energizes.
RESET: Removing input voltage resets the time delays, output, and the sequence to the Interval function.
See: KSPD, KRPD, NHPD, HRPD, TRDU



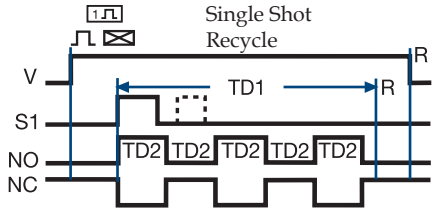
Delay-on-Break/Recycle: (ProgramaCube® Function BRE)

OPERATION: Upon application of input voltage and the closure of S1, the TD2 ON time begins and the output (relay or solid state) energizes. Upon completion of the ON time, the output de-energizes for the TD2 OFF time. At the end of the OFF time, the equal ON/OFF cycle repeats. When S1 opens, the TD1 delay begins. TD1 and TD2 run concurrently until the completion of TD1 at which time, the TD2 ON/OFF cycle terminates and the output de-energizes. The output energizes if S1 is closed when input voltage is applied.
RESET: Reclosing S1 during timing resets the TD1 time delay. Removing input voltage resets the time delay, output, and the sequence to the Delay-on-Break function.
See: KSPD, KRPD, NHPD, HRPD, TRDU



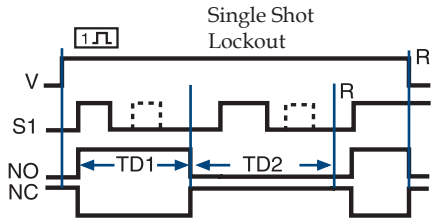
Single Shot/Recycle: (ProgramaCube® Function SRE)

OPERATION: Upon application of input voltage and the closure of S1, TD1 begins. At the same time, the TD2 ON time begins and the output (relay or solid state) energizes. Upon completion of the ON time, the output de-energizes for the TD2 OFF time. At the end of the OFF time, the equal ON/OFF cycle repeats. TD1 and TD2 run concurrently until the completion of TD1 at which time, the TD2 ON/OFF cycle terminates and the output de-energizes. Opening or reclosing S1 during timing has no affect on the time delays. The output will energize if S1 is closed when input voltage is applied.
RESET: Removing input voltage resets the time delay, output, and the sequence to the first delay.
See: HRPD, KRPD, KSPD, NHPD, TRDU



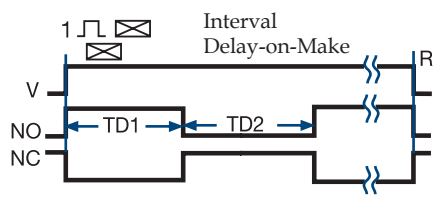
Single Shot/Lockout: (ProgramaCube® Function SL)

OPERATION: Upon application of input voltage and momentary or maintained closure of S1, the output (relay or solid state) energizes and TD1 single shot time delay begins. The output relay de-energizes at the end of TD1 and the TD2 lockout time delay begins. During TD2 (and TD1) closing switch S1 has no effect on the operation. After TD2 is complete, closing S1 starts another operation. If S1 is closed when input voltage is applied, the output energizes and the TD1 time delay begins.
RESET: Removing input voltage resets the time delays and the output and returns the cycle to the first delay.



Interval/Delay-on-Make: (ProgramaCube® Function IM)

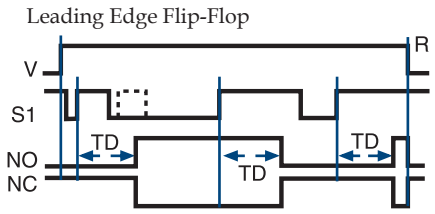
OPERATION: Upon application of input voltage, the output (relay or solid state) energizes and TD1 begins. At the end of TD1, the output de-energizes and TD2 begins. At the end of TD2, the output energizes.
RESET: Removing input voltage resets the time delays, output, and the sequence to the first delay.
See: HRPD, KRPD, KSPD, NHPD, TRDU



Timer Functions
Counting and Switching Functions

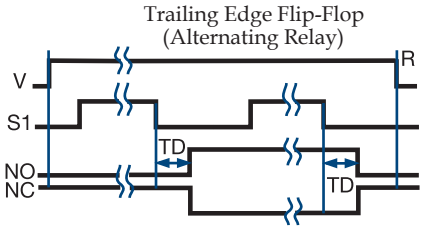
Leading edge flip-flop: (ProgramaCube® Function F)

OPERATION: Input voltage must be applied before and during operation. The operation begins with the output (relay or solid state) de-energized. Upon momentary or maintained closure (leading edge triggered) of the initiate switch S1, the time delay begins. At the end of the time delay, the output energizes and remains energized. Opening or re-closing S1 during timing has no affect. After the output transfers, the next closure of S1 starts a new operation. Each time an S1 closure is recognized, the time delay occurs and then the output transfers, ON to OFF, OFF to ON, ON to OFF. The first operation will occur if S1 is closed when input voltage is applied.
RESET: Removing input voltage resets the time delay and the output to the de-energized state.
Function can be applied to ProgramaCube Series: HRPS, KRPS, KSPS



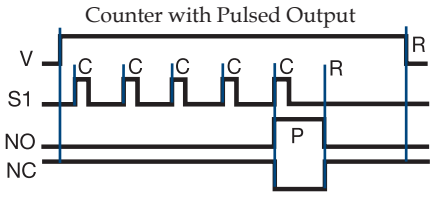
Alternating Relay (Trailing edge flip-flop): (ProgramaCube® Function FT)

OPERATION: Input voltage must be applied at all times for proper operation. The operation begins with the output (relay or solid state) de-energized. Closing S1 enables the next alternating operation. When S1 opens (trailing edge triggered), the time delay begins. At the end of the time delay, the output energizes and remains energized until S1 is (re-closed and) re-opened. Then the output relay de-energizes and remains until S1 opens again. Each time S1 opens the time delay occurs and the output transfers.
RESET: Removing input voltage resets the output and the time delay.
See: ARP, HRPS, KRPS



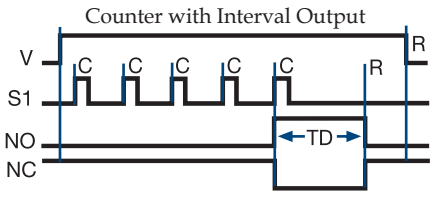
Counter with Pulsed Output: (ProgramaCube® Function C)

Function Limited to Switch Adjustable ProgramaCubes®
OPERATION: Input voltage must be applied before and during operation. Each time S1 is closed, a count is added. When the total number of S1 closures equals the total count selected on the unit, the output energizes. The output remains energized for the pulse duration specified for the product, and then de-energizes. If S1 is closed while the output is energized, a count is not added. If S1 is closed when input voltage is applied, a count is not added.
RESET: The unit automatically resets at the end of each operation. Removing input voltage resets the output, counter, and pulse delay.
See: HRPU, KSPU, NHPU



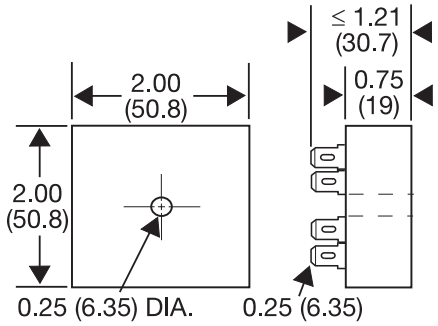
Counter with Interval Output: (ProgramaCube® Function CI)

Function Limited to Switch Adjustable ProgramaCubes®
OPERATION: Input voltage must be applied before and during operation. Each time S1 is closed, a count is added. When the total number of S1 closures equals the total count selected on the unit, the output energizes and the interval time delay begins. The output de-energizes at the end of the time delay. If S1 is closed during the time delay, a count is not added. If S1 is closed when input voltage is applied, a count is not added.
RESET: The counter is reset during the time delay, the unit automatically resets at the end of the interval time delay. Removing input voltage resets the output, counter, and time delay.
See: HRPU, HRV, HSPZ, KSPU, NHPU



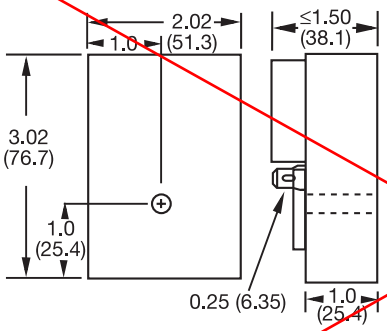
Legend
V = Voltage
R = Reset
S1 = Initiate Switch
Td, TD1, TD2 = Time Delay
NO = Normally Open Contact
NC = Normally Closed Contact
C = Count
P = Pulse Duration
—⫽— = Undefined Time

FIGURE 1



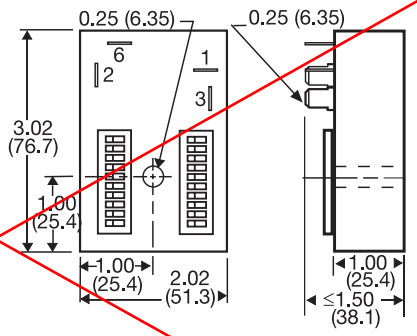
CT; ESD5; ESDR; FS100; FS200; FS300; KRD3; KRD9; KRDB; KRDI; KRDM; KRDR; KRDS; KRPD; KRPS; KSD1; KSD2; KSD3; KSD4; KSDB; KSDR; KSDS; KSDU; KSPD; KSPS; KSPU; KVM; T2D; TA; TAC1; TAC4; TDU; TDUB; TDUI; TDUS; TL; TMV8000; TS1; TS2; TS4; TS6; TSB; TSD1; TSD2; TSD3; TSD4; TSD6; TSD7; TSDB; TSDR; TSDS; TSS; TSU2000

FIGURE 2



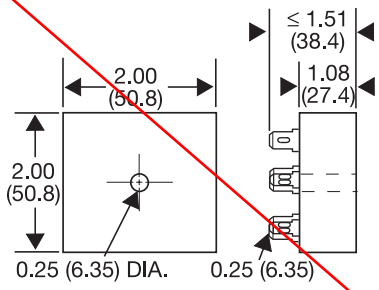
HLV; HRD3; HRD9; HRDB; HRDI; HRDM; HRDR; HRDS; HRID; HRIS; HRIU; HRPD; HRPS; HRPU; HRV; RS

FIGURE 3



HSPZ

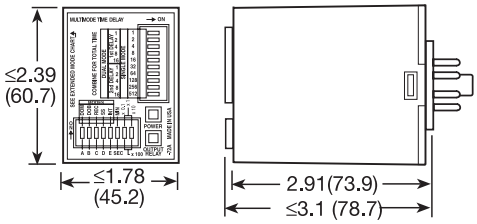
FIGURE 4



FA; FS; FSU1000*; NHPD; NHPS; NHPU; NLF1*; NLF2*; PHS*; PTHF*; SIR1; SIR2; SLR1*; SLR2*; TH1; TH2; THC; THD1; THD2; THD3; THD4; THD7; THDB; THDM; THDS; THS

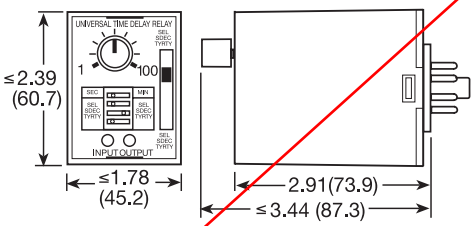
*If unit is rated @ 1A, see Figure 1

FIGURE 5



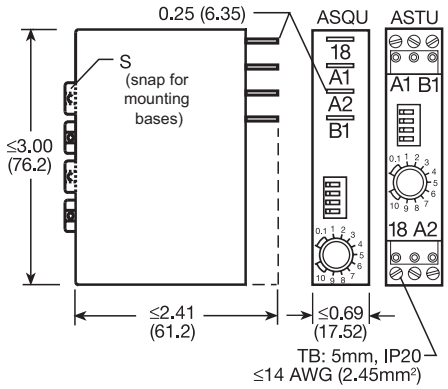
TRDU

FIGURE 6



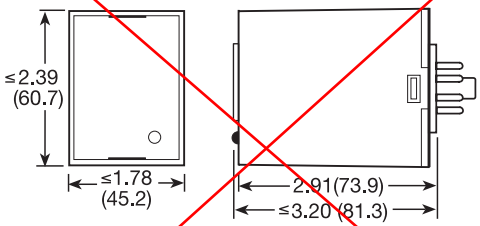
TRU

FIGURE 7



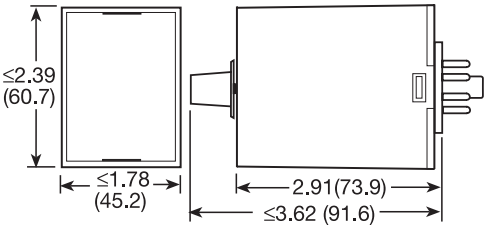
ASQU; ASTU; DSQU; DSTU

FIGURE 8



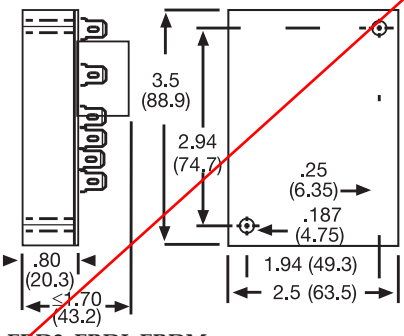
PLM; PLR; TDB; TDBH; TDBL; TDI; TDIH; TDIL; TDM; TDMB; TDMH; TDML; TDR; TDS; TDSH; TDSL

FIGURE 9



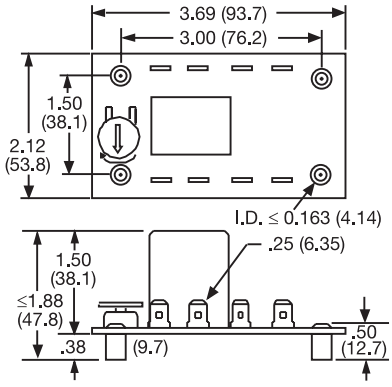
FS500; PRLB; PRLM; PRLS; TRB; TRM; TRS

FIGURE 10



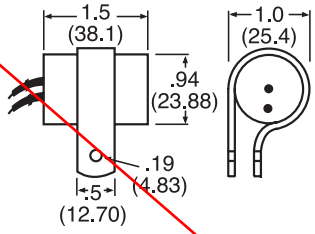
ERD3; ERDI; ERDM

FIGURE 11



ORB; ORM; ORS

FIGURE 12



FS100; FS400

inches (millimeters)