

Single-Phase Programmable Resettable Sectionalizer (10 PRS)

Catalog 10DDD June 2015

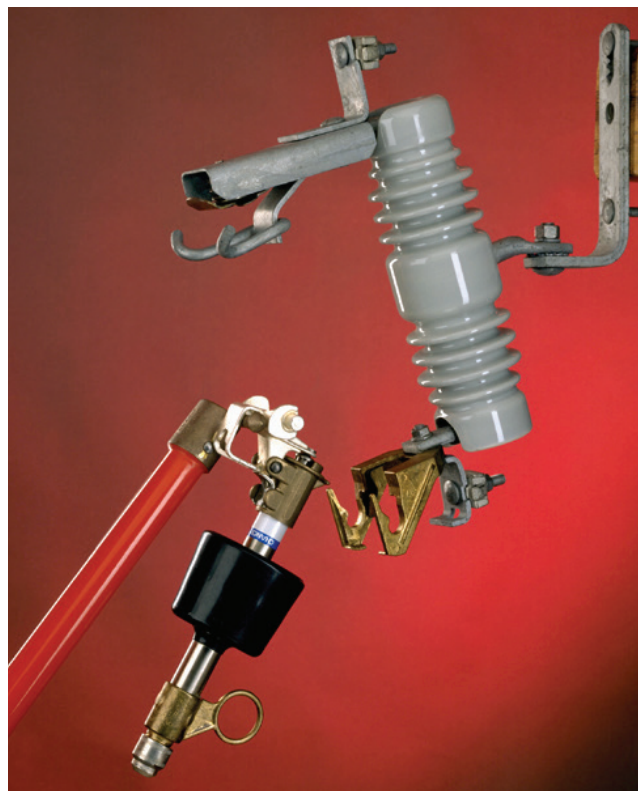
Type PRS Programmable Resettable Sectionalizer

The Programmable Resettable Sectionalizer (Type PRS) is a device which has built-in intelligence to discriminate between temporary (transient) and permanent faults on distribution systems. It operates in conjunction with a back-up automatic circuit recloser or a reclosing circuit breaker. It is specifically designed for the protection of single-phase lateral lines. When installed at the beginning of a lateral, it virtually eliminates nuisance outages. Its functional concept and design greatly improve system coordination.

Traditionally, the individual laterals are protected by expulsion-type fused cutouts. These cutouts are intended to operate only during a permanent fault on the lateral by carefully coordinating the fuse links with the time-current characteristics of the upstream automatic circuit recloser or reclosing circuit breaker. Unfortunately, coordination between fuse links and upstream automatic circuit reclosers is unachievable above a few thousand amperes. Coordination, if achieved on paper, can easily change as the fault current increases due to larger capacity facilities, addition of larger substations or reconductoring. Errors in re-fusing is another way that system coordination can be lost.

A sectionalizer is a protective device which has no time-current characteristics. With no fuse curve to intersect recloser time-current characteristics, the coordination range is extended to the maximum interrupting rating of the upstream protective device (Figure 1).

This practical function makes the sectionalizer an ideal device for application on single-phase laterals where available fault currents make coordination unachievable with fuses. Electronic resettable sectionalizers provide the utility with an economical and easily retrofittable method of enhancing protection of the distribution system. An electronic resettable sectionalizer installed at the start of a lateral, in place of a fuse, can greatly enhance system coordination service continuity and reliability at reduced costs.



The Type PRS electronic sectionalizer comprises two major components: A standard cutout mounting and an electronic module. The design and construction of the Type PRS are such as to enhance reliability and coordination of the distribution system. The electronic sectionalizer module fits into the standard mounting of a Chance Type C and S&C Type XS cutout. This interchangeability reduces the cost of retrofit installation.

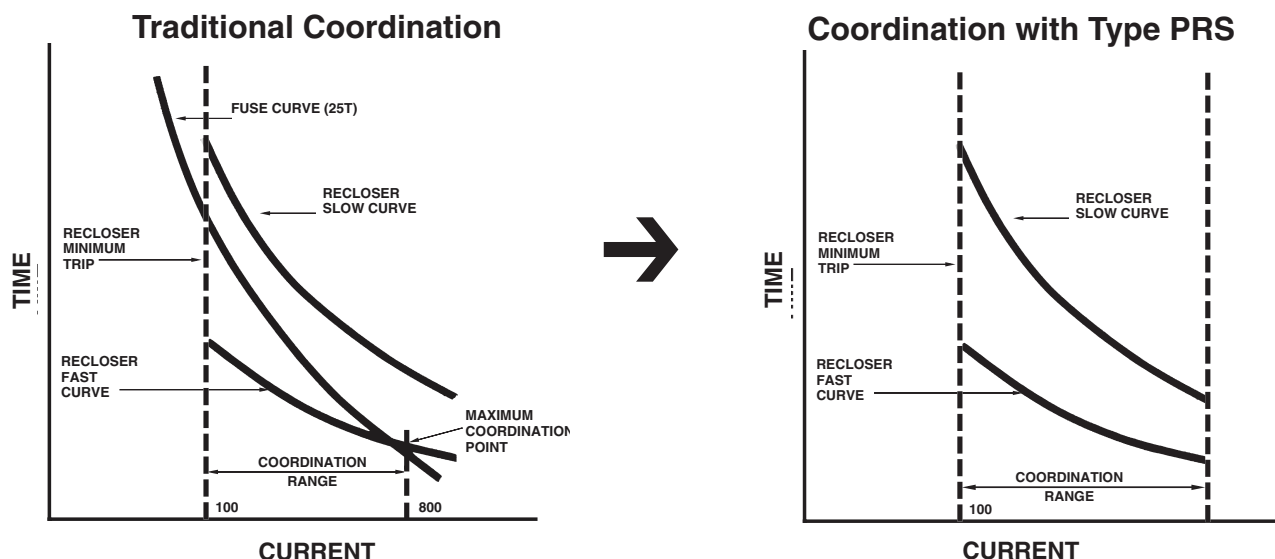


Figure 1. Addition of the CRS eliminates the fuse curve and extends the coordination range.

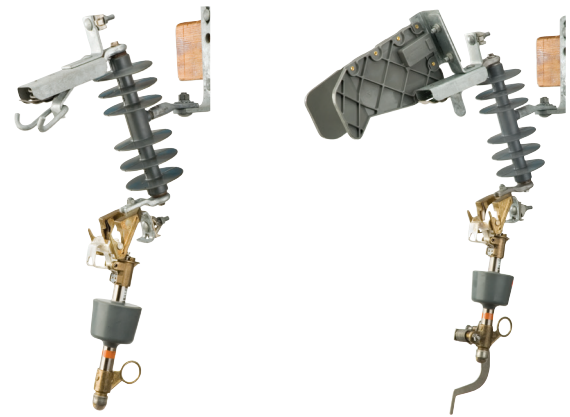
Application

The Type PRS electronic sectionalizer is best suited for use in the following applications:

- Locations where fuse coordination is difficult to achieve
- Areas with insufficient load to justify investments in apparatus such as reclosers
- Remote locations prone to transient faults caused by fauna and/or flora
- SAIDI improvements

Benefits

- Improves system reliability
- Distinguishes between permanent and transient faults to reduce outages
- Programmable parameters: Counts, actuating current, reset time
- One programmable unit to meet all needs per specific voltage class
- Historical data storage for system overview and analysis
- Resettable in the cutout mounting base



Drop-open operation is the same for both types of the PRS electronic sectionalizer: Standard (left) and Loadbreak (right, with Arc Chute interrupter). See following pages for specifications and ordering information.

Operation

The power required for the logic circuit of the Type PRS electronic sectionalizer is obtained from the built-in current transformer. When a fault occurs, which exceeds the minimum actuating current of the sectionalizer, the logic circuit will “power-up.” The upstream recloser opens the circuit causing the line current to fall below the “dead line threshold.” The logic circuit recognizes this as a “count” and stores this occurrence in its memory for two minutes. In doing so, the Type PRS merely counts the backup reclose operations.

After a predetermined number of such operations, the Type PRS isolates the circuit while the back-up recloser is in the open position. The recloser is then allowed to close, restoring service to the unfaulted sections of the system. If the fault is temporary and is cleared before the sectionalizer count reaches the predetermined number, the sectionalizer remains closed and resets to its original state after its reset time expires.

Trunnion Design

The PRS is equipped with a patent pending trunnion design which enables the sectionalizer to be reset to its initial condition while still in the cutout mounting base. If removal from the cutout mounting base is necessary, the PRS can be manually reset using a wrench.



Push towards cutout to reset

**For Specifications,
see following pages.**

Type PRS Programmable Resettable Electronic Sectionalizer

System Voltage:

The sectionalizer must have a voltage rating equal to or greater than the system voltage.

Continuous Current:

The sectionalizer must have a continuous current rating equal to or greater than the anticipated system load current plus overload.

Where hydraulic reclosers are used, the continuous current rating of the sectionalizer is typically equal to the continuous current rating of the upstream automatic circuit recloser.

Minimum Actuating Current:

The minimum actuating current of sectionalizers should be 80% of the phase minimum trip of the source side single-phase automatic circuit recloser (ACR). Where three-phase reclosers or circuit breakers are used, a user may want to coordinate the sectionalizer's actuating current with the ground trip rating.

Where hydraulic reclosers are used, this is easily accomplished by matching the sectionalizer and the

recloser's continuous current ratings. The sectionalizer's minimum actuating current is 160% of its continuous current rating and the hydraulic reclosers' phase pick-up is 200% of its continuous current rating ($160/200=.80$). (Table A).

Recloser	Typical Sectionalizer Ratings	
Minimum Trip, Amps	Minimum Actuating Current, Amps $\pm 10\%$	Continuous Current, Amps
30	24	15
50	40	25
70	56	35
100	80	50
140	112	70
200	160	100
280	224	140
400	320	200

Table A. Recloser/sectionalizer coordination.

Number of Counts:

The sectionalizer should be set to operate in at least one less count than the backup recloser. Example: a 4-shot recloser would require a maximum of a 3-count sectionalizer downstream (Figure 2, line A).

In case of a 2-fast/2-slow reclose setting, a 2-count sectionalizer may be used to reduce the number of recloser operations (Figure 2, line B).

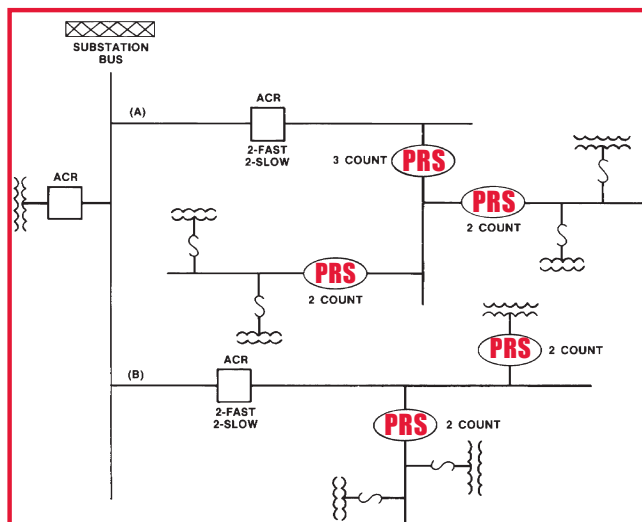


Figure 2. Typical distribution system with Type PRS two- and three-count electronic resettable sectionalizers.

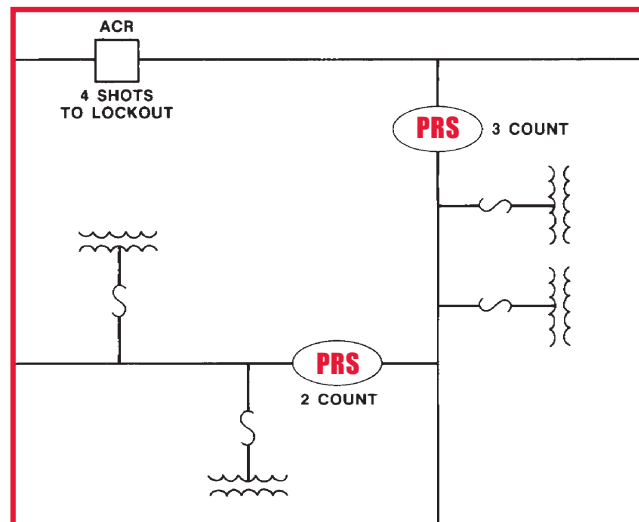


Figure 3. Coordination of sectionalizers in series.

Type PRS Programmable Resettable Electronic Sectionalizer

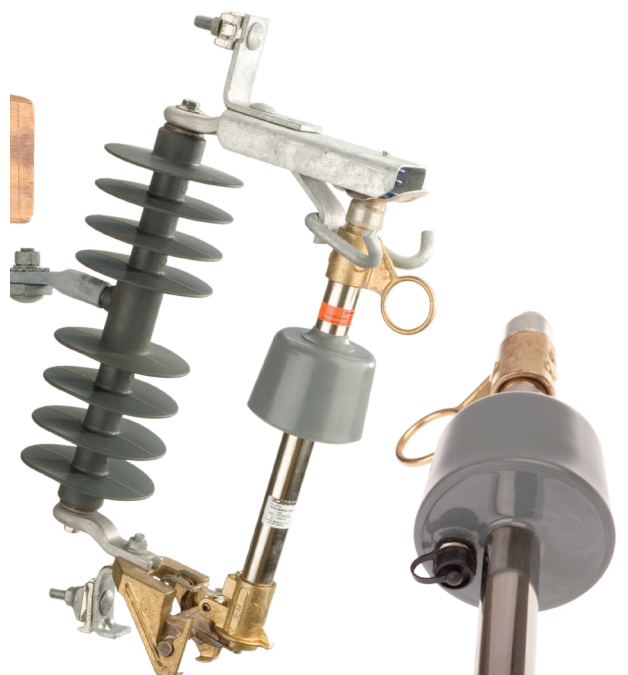
Technical Specifications

Rated Power Frequency	60 Hz/50 Hz
Rated Voltage (BIL)	15kV (110kV BIL) 27kV (125kV BIL) 38kV (150/170kV BIL)
Rated Continuous Current	300 Amps
Minimum Line Current	5 amps
Minimum Actuating Current	Programmable between 10 A and 480 A
Number of Counts:	Programmable for 1, 2, 3 or 4 counts
Reset time:	Programmable, 30 seconds to 300 seconds with resolution of 1 second
Inrush detection time	Less than 1 cycle
Types of inrush currents detected:	Symmetrical and Asymmetrical
Method of inrush currents detection:	Fourier Analysis (FFT)
Deadline detection:	≤ 200 mA
Total execution time:	100 msec (± 20 msec)
Short time current withstand, 15 cycle (at 60 Hz):	8600 Amps Sym.
1 second:	4000 Amps Sym.
3 seconds:	3200 Amps Sym.
Momentary current rating:	12,000 Amps. Asym.
*Current measurement accuracy:	± 5%
Temperature range:	-40°C to +60°C
Maximum Thermal Rating:	300 A continuous current
Surge current withstand	65KA, per ANSI C37.63
Electromagnetic interference	per ANSI C37.63
Radio frequency interference	per ANSI C37.90.2
USB port	Rated IP68

Note: Ratings are based on testing conducted at 60Hz.

* With 5% accuracy, if the unit is programmed for 50 A actuating current, then the unit will pick-up the count at 52.5 A and above but ignore a count at 47.5 A and below.

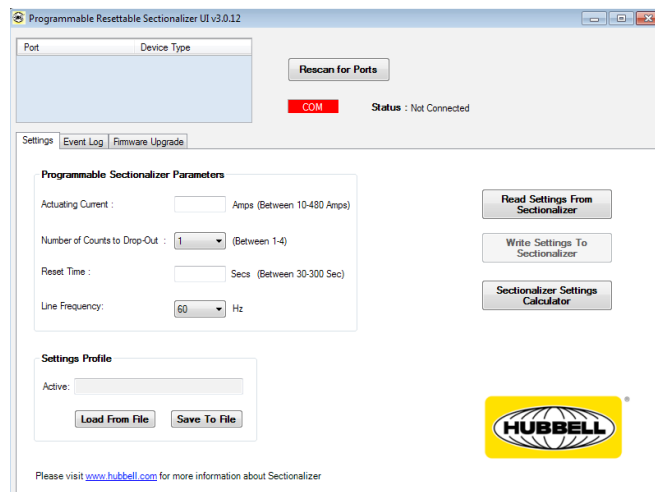
**For Catalog Number System,
see following pages.**



Type PRS Programmable Resettable Electronic Sectionalizer

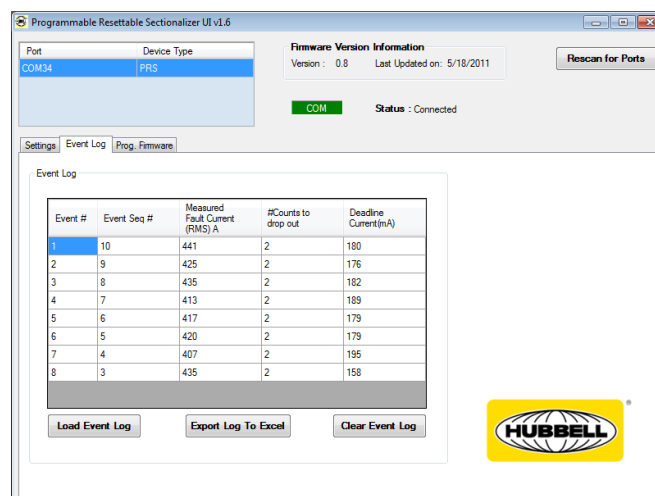
Programming

Programming of the unit has been simplified with the use of Hubbell's programming software package. Simply connect the USB cable provided into the USB port on the bottom of the unit and then into a computer with the provided software. Provide the inputs for the upstream device and the software will provide suggested settings which the user can accept or override.

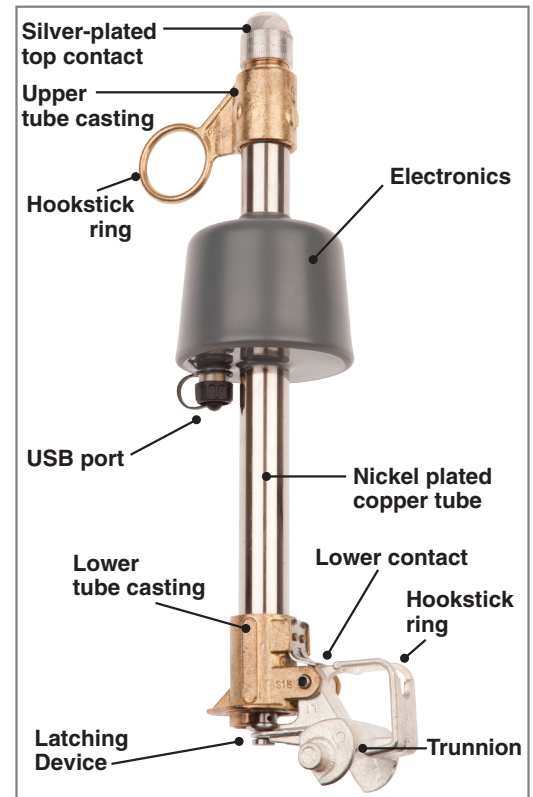
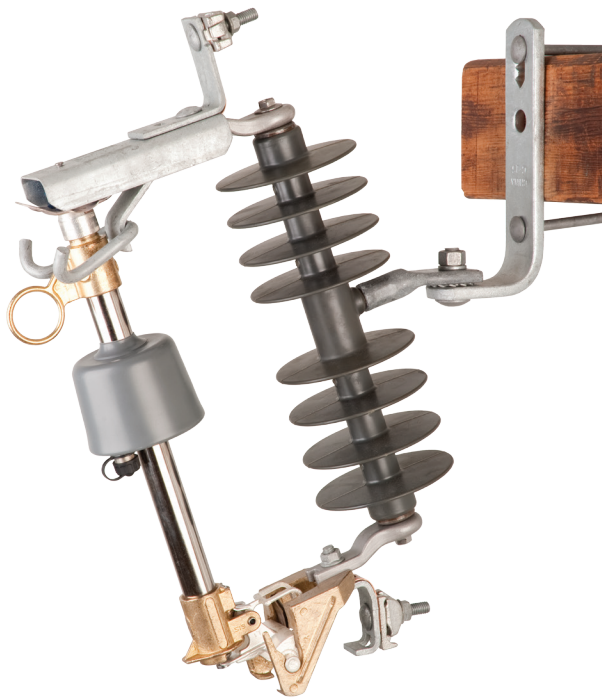


Event Log

The programmable sectionalizer contains onboard memory storage that will record the last 8 events the unit has seen. Users will be able to download the event log via the USB port and have access to the measured fault current, number of counts, and deadline current.



Type PRS Programmable Resettable Electronic Sectionalizer



POLYMER Cutout Catalog Number System

**Position 3:
Cutout Type**
4 = Non-Loadbreak
5 = Loadbreak

**Position 9:
Cutout Terminal Connectors**
P = Parallel-groove
E = Small eyebolt
L = Large eyebolt
T = Electronic Module Only

**Position 12:
[OPTIONAL]
Programmed Counts**

Number of Counts	Catalog No. Designation
1	A
2	B
3	C

USB Cable
Cat. No. PSC7400177
(must order separately)

CP7 4 00 1 PP L B G A

**Position 6:
Cutout Insulation Level**
1 = 15kV, 110kV BIL
2 = 27kV, 125kV BIL (Non-loadbreak only)
15/27kV, 125kV BIL (Loadbreak only)

**Position 10:
Cutout Bracket**
Z = No bracket
B = NEMA B bracket
D = D bracket
X = Extended bracket
Blank = Electronic Module Only
V = Easy-On Bracket

**Position 11: [OPTIONAL]
Programmed Actuating Current**

Continuous Current (Amp)	Actuating Current (Amp)	Catalog No. Designation
15	24	G
25	40	H
35	56	J
50	80	K
70	112	L
100	160	M
140	224	N
200	320	P

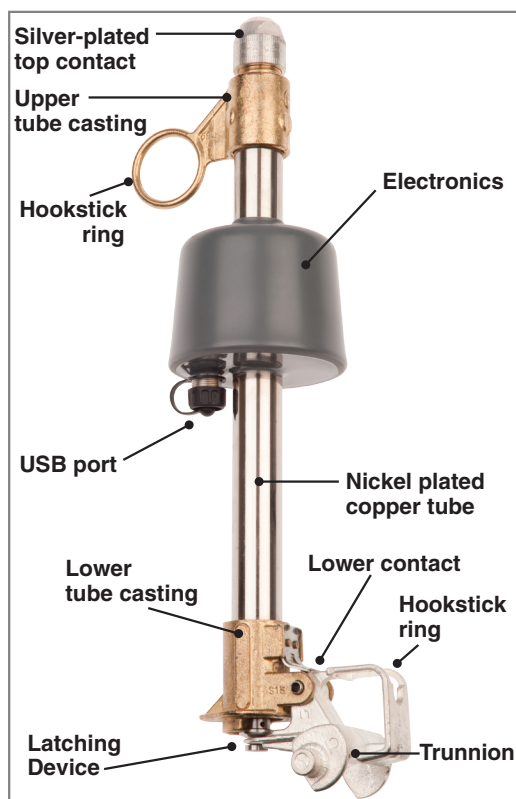
Examples:

- To order 27kV Polymer cutout programmable sectionalizer with extended bracket and large eyebolt connectors = CP74002PPLX.
- To order 27kV programmable sectionalizer module only = C74002PPT.

¹To order programmable sectionalizer module only, replace "CP7" with "C7" followed by selections for Positions 3 through 9.

Note: Position 11, Position 12 are optional and can be left blank if the PRS is not wished to be pre-programmed.

Type PRS Programmable Resettable Electronic Sectionalizer



PORCELAIN Cutout Catalog Number System

**Position 3:
Cutout Type**
4 = Non-Loadbreak
5 = Loadbreak

**Position 9:
Cutout Terminal Connectors**
P = Parallel-groove
E = Small eyebolt
L = Large eyebolt
T = Electronic Module Only

**Position 12: [OPTIONAL]
Programmed Counts**

Number of Counts	Catalog No. Designation
1	A
2	B
3	C

USB Cable
Cat. No. PSC7400177
(must order separately)

C7	4	00	1	PP	L	B	G	A
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**Position 6:
Cutout Insulation Level**
1 = 15kV, 110kV BIL
2 = 27kV, 125kV BIL (Non-loadbreak only)
15/27kV, 125kV BIL (Loadbreak only)
3 = 38kV, 150kV BIL (Non-loadbreak only)
6 = 38kV, 170kV BIL (Non-loadbreak only)

**Position 10:
Cutout Bracket**
Z = No bracket
B = NEMA B bracket
D = D bracket
X = Extended bracket
Blank = Electronic Module Only
V = Easy-On Bracket

**Position 11: [OPTIONAL]
Programmed Actuating Current**

Continuous Current (Amp)	Actuating Current (Amp)	Catalog No. Designation
15	24	G
25	40	H
35	56	J
50	80	K
70	112	L
100	160	M
140	224	N
200	320	P

Examples:
To order 38kV, 170kV BIL Porcelain cutout programmable sectionalizer with large eyebolt connectors and extended bracket = C74006PPLX.
To order 38kV, 170kV BIL programmable sectionalizer module only = C74006PPT.

Note: Position 11, Position 12 are optional and can be left blank if the PRS is not wished to be pre-programmed.



Accessories

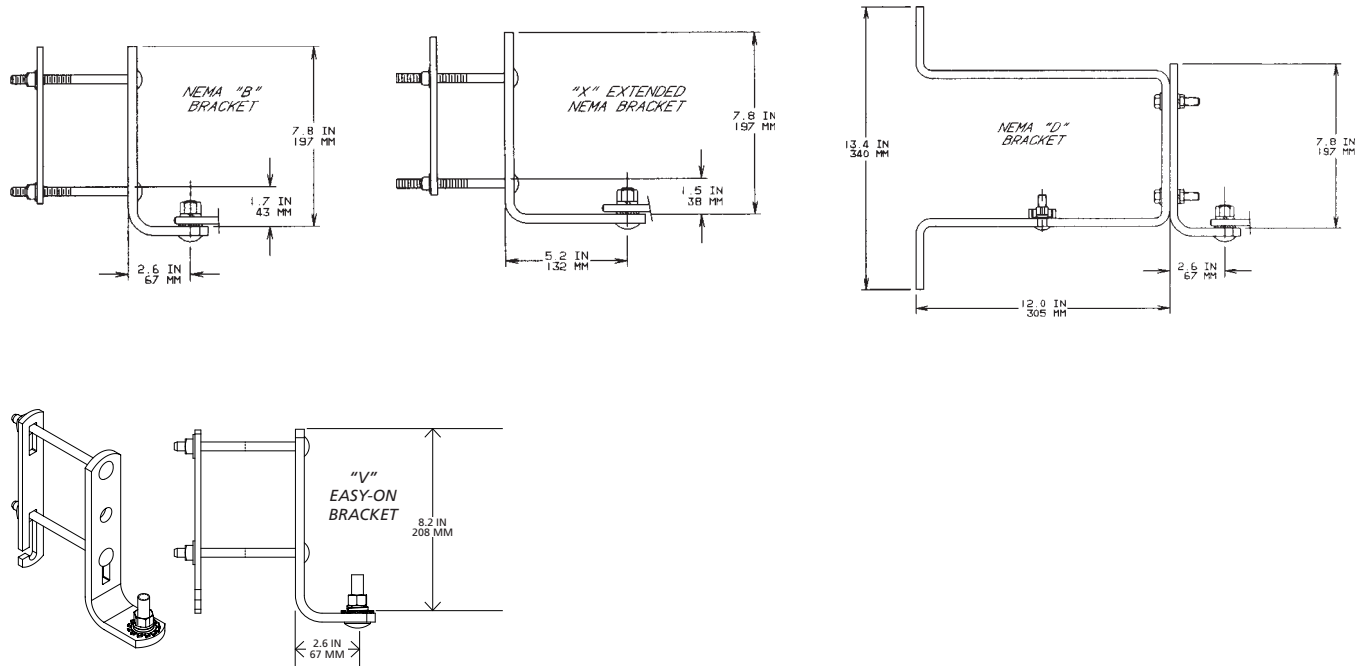
Terminal Connectors

Catalog No.	Description	Wt. (lb./kg.)	Min. Order Qty.
T7001325	Parallel-Groove Clamp, tin-plated bronze for No. 6 solid thru 4/0 ACSR or 250 kcmil stranded	0.33 / 0.15	10
T7001326	Small Eyebolt for No. 8 solid thru 2/0 stranded	0.16 / 0.07	10
T7001327	Large Eyebolt for No. 6 solid thru 4/0 ACSR or 250 kcmil stranded	0.40 / 0.14	10

Mounting Brackets

C2060283	NEMA Heavy Duty "B" Bracket with 1½" captive bolt for crossarm mounting	2.84 / 1.29	—
C2060280	Extended Crossarm Bracket (Horizontal section is 2½" longer than NEMA "B" bracket)	3.75 / 1.70	—
C2060299	"D" Pole Mounting Bracket	7.67 / 3.48	—
C2060632	Cutout/Arrester Bracket complete with carriage bolts and backstrap	4.00 / 1.81	—
PSC2060887	"V" Easy-On Bracket for Crossarm Height range: 4⅞" to 5⅝", Crossarm Width range: 2¾" to 4"	2.9 / 1.32	—

Mounting Bracket Dimensions



Universal Cutout Tool

Ideal for use with Standard Electronic Sectionalizer to easily lift out, place, *open and close. Inverted, secure method also fits 100 amp fuse holders of ABB, Chance, S&C cutouts.



Cat. No. **PSC4033484** (Wt. 4 oz.)
See Tools Catalog Section 2100.

*When opening a cutout, follow all work rules and OSHA regulations.

Not for use with Loadbreak cutouts.



NOTES



NOTES

[illegible]

HUBBELL[®]

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