

LOADBREAK PRODUCTS

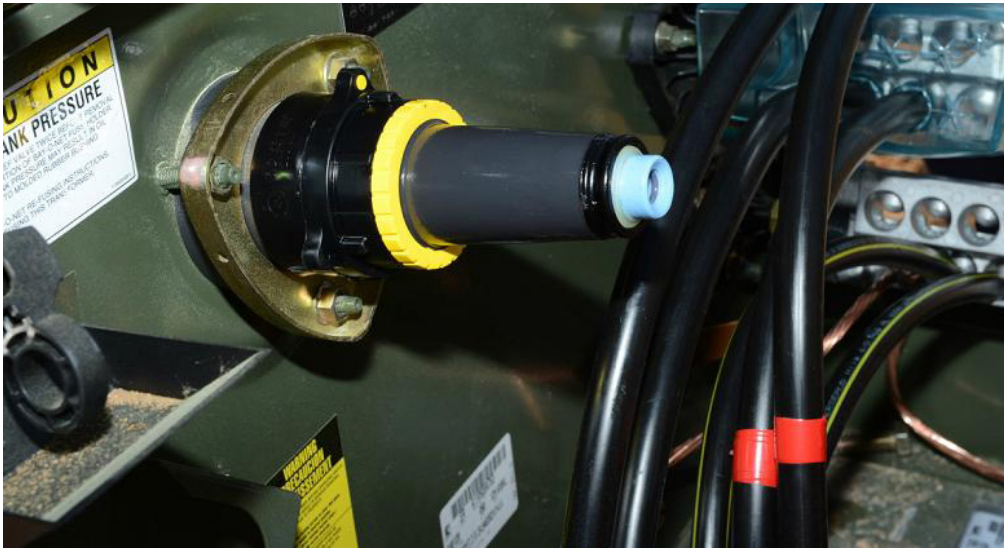
200 AMP 25/28 kV

Experience & Reliability



Cable
Accessories





cable accessories

CATALOG C2





200 AMP 25/28 kV Loadbreak Products

INSIDE.....PAGE

Ratings & Specifications.....	4-5
Loadbreak Elbows.....	6-7
Underground Arresters.....	8-9
Loadbreak Inserts.....	10
Loadbreak Accessories.....	11
Grounding Accessories.....	12
Loadbreak Junctions.....	13-14
Stacking Dimensions.....	15

25/28 kV LOADBREAK PRODUCTS

RATINGS & SPECIFICATIONS

GENERAL INFORMATION

Hubbell 25/28 kV, 200 Amp Separable Connectors are fully shielded, insulated, and submersible products that provide a means to mate or disconnect cable to switchgear, transformers, or sectionalizing equipment on power distribution systems. They are designed for pad-mounted or subsurface applications, where the components may be exposed to direct sunlight or continuously submerged in water up to 6 feet (2m).

All 25/28 kV loadbreak products and accessories are designed and tested to meet or exceed all applicable requirements of IEEE, ANSI, and other industry standards including the following:

IEEE Std 386 for Separable Connectors (Figure 7)
IEEE Std. 592 for Exposed Semi-conducting Shields
IEEE Std. C62.11 for Metal Oxide Surge Arresters
ANSI C119.4 Std. for Conductor Connectors
AEIC & ICEA for Insulated Cables

These devices are suitable for energized loadmake / loadbreak operations when using an 8' shotgun-type hot stick on grounded WYE systems(1). They are also fully interchangeable with other manufacturer's products that conform to the electrical requirements of IEEE Std. 386.

Hubbell 25/28 kV products are designed for use in ambient temperatures between -40°C and +65°C and can be operated energized between -20°C and +65°C. Loadbreak devices should not be operated at elevations over 6,000 feet.

All rubber components are manufactured using peroxide-cured insulating and conductive compounds.

(1) Contact the factory for recommendations for use on ungrounded, resistance grounded, or delta systems.

RATINGS

Max. continuous voltage	16.2 kV phase-to-ground 28.0 kV phase-to-phase
Continuous current	200 amps rms

SHORT-TIME CURRENT RATINGS

0.17 seconds duration	10,000 amps rms symmetrical
3.00 seconds duration	3,500 amps rms symmetrical

INSULATION WITHSTAND VOLTAGES

Basic Impulse Level.....	125 kV crest (1.2 x 50 µsec. wave)
60 Hertz (one minute).....	45 kV rms
DC (15 minutes)	84 kV
Corona Extinction Voltage.....	21.5 kV rms (3 pC)

SWITCHING

1-phase and 3-phase circuits	10 loadmake/loadbreak
15.2 kV phase-to-ground, 26.3 kV maximum across the open contacts.	operations at 200 amps with 70-80% lagging powerfactor.

FAULT CLOSURE

One fault-close operation at 15.2 kV phase-to-ground, or 26.3 kV phase-to-phase; 10,000 amps rms symmetrical, 10 cycles, (0.17 seconds).

PRODUCTION TESTS

100% factory test for partial discharge and either AC HI-POT (45 kV for 60 seconds) or impulse (BIL) (125 kV 1.2 x 50 µsec. wave.)

Performance



UNDERGROUND DISTRIBUTION CLASS ARRESTERS

RATINGS & SPECIFICATIONS

GENERAL INFORMATION

Hubbell elbow and parkingstand lightning arresters are gapless, metal oxide varistor (MOV) type surge arresters. They are designed to provide shielded, dead-front arrester protection for 25/28 kV underground systems. The arresters limit over-voltages to acceptable levels, protecting equipment and extending service life.

The critical values for elbow arresters are the discharge voltage (IR) and the IEEE Std. 386 interface class. In general, the lower the discharge voltage, the better the protection margin. Hubbell elbow arresters are non-fragmenting.

Hubbell underground arresters fully conform to the safe-failure mode per IEEE Std. C62.11. The standard requires that should the arrester blocks fail, they will not be ejected through the body or side wall of the housing. The MOV blocks should exit out the bottom, down and away from equipment and personnel.

Application:

Hubbell elbow arresters are designed to mate with 200 amp loadbreak interfaces that conform to IEEE Std. 386 Figure 7. The parkingstand lightning arrester contains a Figure 7 interface.

A Hubbell arrester installed at the end of a radial system or at both ends of an open point in a loop circuit will provide excellent protection against high voltage surges resulting from lightning or switching. When combined with an Ohio Brass PVR (Riser Pole) arrester, optimum protection can be achieved.

Hubbell arresters are fully shielded and submersible, either continuously or intermittently, to a depth of 6 feet (2m).

Installation:

The Hubbell arrester should be installed utilizing an 8' shotgun type hotstick.

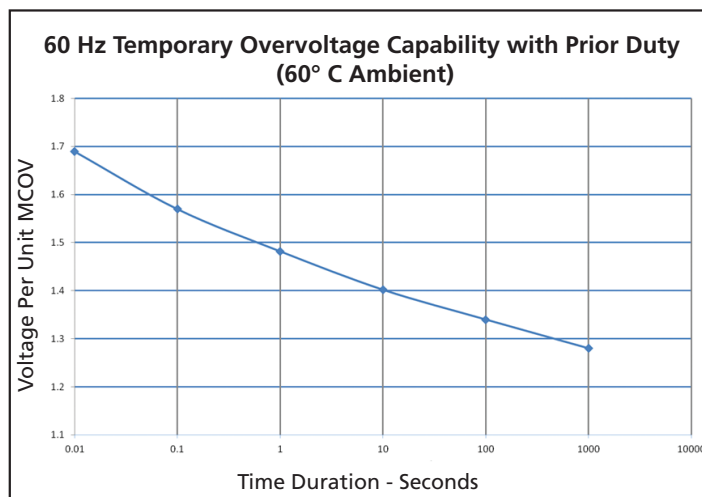
Performance Characteristics:

Tests were performed in accordance with applicable sections of IEEE Std. C62.11 (Metal Oxide Surge Arresters for Alternating Current Power Circuits) with test levels chosen that represent typical underground distribution systems.

Design Tests	
High Current, Short Duration	2 discharges of 65 kA Crest
Low Current, Long Duration	20 Surges of 75 A for 2,000 μ sec. duration
Operating Duty Cycle	22 Operations of 5 kA Crest 8 x 20 μ sec.
Safe Failure Mode	Verify blocks do not breach sidewall

Production Tests Polymer Housing Only per IEEE Std. 386	
Partial Discharge Voltage Level (3pC sensitivity)	
AC 60 Hz, 1 minute withstand or BIL impulse lightning withstand	
Periodic Fluoroscope Analysis	

Production Tests Complete Unit per IEEE Std. C62.11	
Partial Discharge Voltage Level (10pC sensitivity)	
Reference Voltage	
Power Frequency	



25/28 kV LOADBREAK ELBOWS

HUBBELL 25/28 kV Loadbreak Elbows are designed and tested to meet all requirements of IEEE Std. 386. The operating interface will mate with any product that conforms to IEEE Std. 386, Figure 7.

Elbows can be supplied with a capacitive test point that allows for the installation of faulted circuit indicators and will indicate the presence of voltage when interrogated with a high-impedance meter.

Bi-metal compression lug meets all requirements of ANSI Std. C119.4 for Class A connectors.

The integral seal elbow eliminates the need for a separate sealing kit. The integral seal elbow is supplied with mastic strips to form a barrier around the neutral wires. External grip hooks on integral seal elbow boot for easier installation.

Optional ground strap accessories can be supplied for use on tape shielded cables.

SELECTION & ORDERING INFORMATION

Determine the diameter over the cable's insulation by measuring it (Do not measure over the insulation shield) or from the cable manufacturer's catalog. Select an elbow size so that the insulation falls within the elbow's range.

Select a connector code that identifies the conductor size and stranding.

The standard long, bi-metal connector can be replaced with a ProbeLok connector.

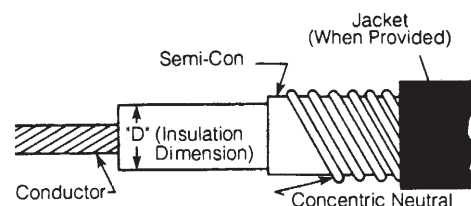
Decide if a capacitive test point is required.

The elbow can be supplied with a separate, cold-shrink seal kit for jacketed concentric neutral cable, or it can be furnished with a separate adapter kit for copper tape shield cables.

The standard elbow housing can be supplied as an integral elbow seal housing.



Cable Dimension Reference



Components:

To order a replacement probe complete with pin wrench, order 225LBP.

For a standard, long bi-metal lug, order: 200LUGBx.

For a ProbeLok lug, order: 200LUGPx.

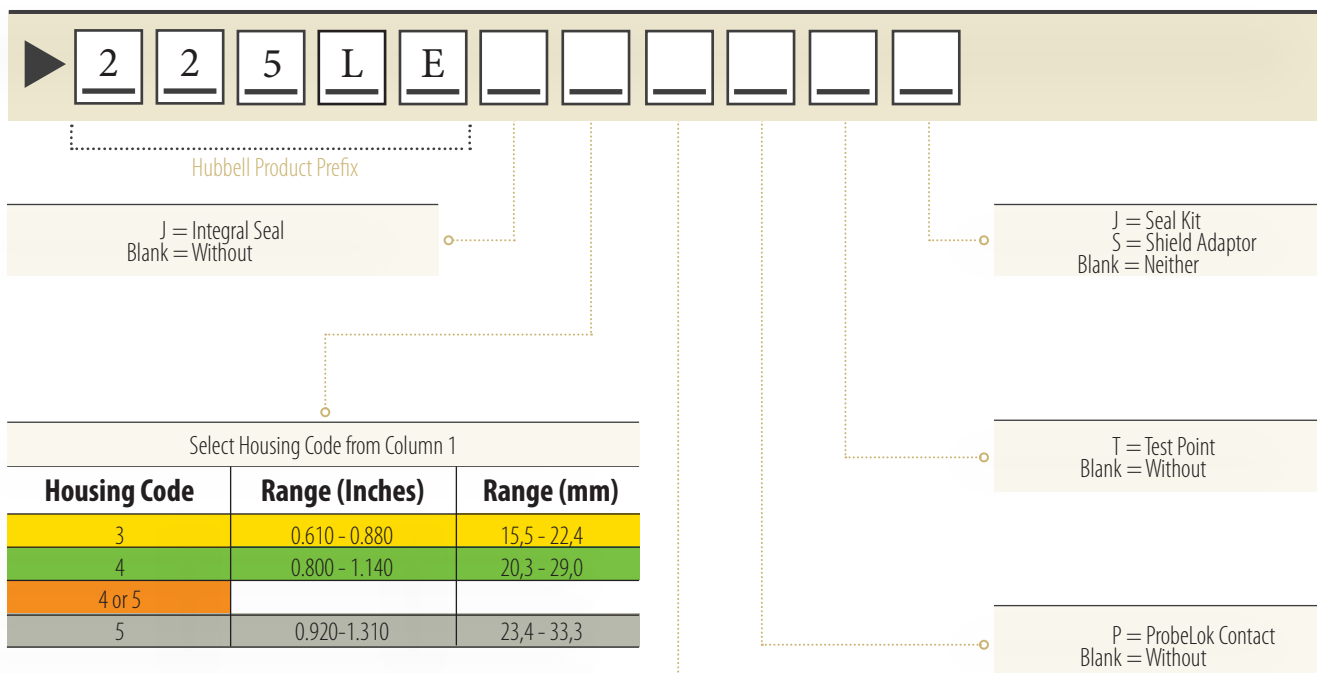
To have a loadbreak insert packaged with the elbow, add "BI" to the end of the part number: 225LEJ45BI.

625SK52 Cold Shrink Cable Seal Kit for JCN cable with an overall diameter of 0.95" to 1.94"
625SK60 Tape Shield Adapter Kit for cable with an overall diameter of 0.83" to 1.64"



CATALOG NUMBER ORDERING INFORMATION

Example: Integral seal elbow for 1/0 stranded, 260 mil cable with a test point is: 225LEJ45T



Select Connector Code from Column 1, or 0 for without Connector						
Connector Code	AWG or kcmil	Stranding	15 kV - 175mil (Inches)	15 kV - 220mil (Inches)	25 kV - 260mil (Inches)	35 kV - 345mil (Inches)
2	#2	Compact & Solid	0.610 - 0.705	0.700 - 0.800	0.780 - 0.880	
3	#2	Stranded & Compressed	0.635 - 0.730	0.725 - 0.825	0.805 - 0.905	
		Compact & Solid	0.645 - 0.735	0.735 - 0.830	0.805 - 0.905	
4	#1	Stranded & Compressed	0.675 - 0.770	0.765 - 0.855	0.835 - 0.935	
		Compact & Solid	0.680 - 0.775	0.770 - 0.865	0.835 - 0.940	1.010 - 1.120
5	1/0	Stranded & Compressed	0.715 - 0.810	0.805 - 0.905	0.875 - 0.980	1.045 - 1.155
		Compact & Solid	0.715 - 0.815	0.805 - 0.905	0.875 - 0.980	1.045 - 1.160
6	2/0	Stranded & Compressed	0.760 - 0.855	0.850 - 0.950	0.920 - 1.025	1.090 - 1.200
		Compact & Solid	0.765 - 0.860	0.855 - 0.955	0.925 - 1.030	1.095 - 1.205
7	3/0	Stranded & Compressed	0.810 - 0.905	0.900 - 1.000	0.970 - 1.075	1.140 - 1.255
		Compact & Solid	0.815 - 0.910	0.905 - 1.005	0.975 - 1.080	1.145 - 1.260
8	4/0	Stranded & Compressed	0.865 - 0.965	0.955 - 1.060	1.025 - 1.135	1.195 - 1.310
		Compact	0.880 - 0.965	0.970 - 1.060	1.040 - 1.135	1.210 - 1.315

*These ranges are taken from the AEIC/ICEA industry cable standards

25/28 kV UNDERGROUND ARRESTERS

PRODUCT FEATURES:

Fiberglass Wrap ensures that the MOV block stack remains in one piece and prevents the blocks from breaching the side wall should the arrester fail.

ID Band provides clear visual identification of arrester MCOV and duty cycle ratings.

Flexible Lead is #4 AWG copper rope lay conductor 595 strand (7 x 85). Ends are soldered to prevent fraying. Standard length is 36" long. Other lead lengths are available.

MOV Blocks are the same ones found in Ohio Brass overhead arresters.

Protective Characteristics

Catalog Number	MCOV kV	Rating kV	0.5 μ sec 5 kA Max IR-kV	Maximum Discharge Voltage (kV Crest) 8x20 μ sec. Current Wave				
				1.5 kA	3.0 kA	5.0 kA	10 kA	20 kA
225_LA09	7.65	9	33.5	26	28	30	33	39
225_LA10	8.4	10	36	27	29.5	31.5	36	41.5
225_LA12	10.2	12	50	39	41	44	49	57
225_LA15	12.7	15	58.5	45.5	48.5	52	57.5	67.5
225_LA18	15.3	18	67.0	52	56	60	66	78
225_LA21	17.0	21	73	55	60	64	73	84



Normally Recommended MCOV for Various System Voltages

System L-L Voltage (kV)		Arrester MCOV (kV)	
Nominal	Maximum	Grounded Neutral	Impedance Grounded or Ungrounded
6.9	7.26	5.1	7.65
12.0	12.7	7.65	12.7
12.47	13.2	7.65	15.3
13.2	13.97	8.4	15.3
13.8	14.52	8.4	15.3
20.78	22	12.7	22
22.86	24.2	15.3	24.4
23	24.34	15.3	24.4
24.94	26.2	15.3	-
27	28	17	-
34.5	36.2	22	-



Hubbell URD Arrester Selection

Selection of the arrester size is based upon the maximum continuous operating voltage (MCOV) line-to-ground that is applied across the arrester in service. For arresters on effectively grounded systems, this is normally the maximum line-to-ground voltage – e.g., 15.3 kV on a 23.0 kV multi-grounded system.

For ungrounded or impedance-grounded systems, the MCOV should be at least 90 percent of maximum phase-to-phase voltage. Smaller arresters than shown may be used; contact your Hubbell Power Systems account representative for details.



Catalog Number Ordering Information

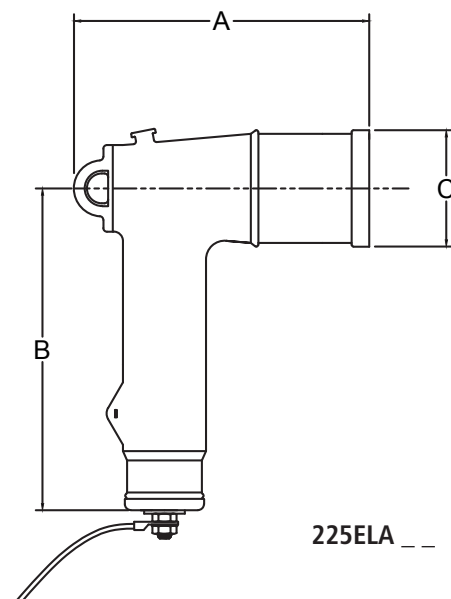
Example: Elbow arrester for use on a 23.0 kV L-L system is: 225ELA18



Hubbell Product Prefix

E = Elbow Arrester
P = Parkingstand

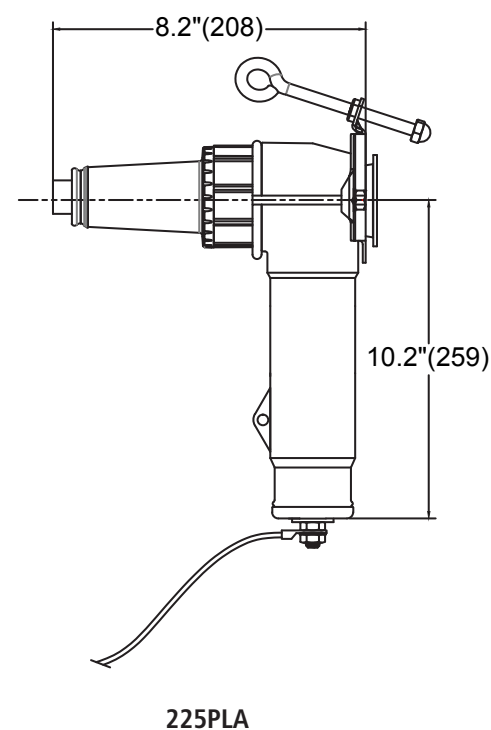
Rating	MCOV
09	7.65
10	8.4
12	10.2
15	12.7
18	15.3
21	17.0



225ELA __

ELA Reference Data:

Catalog Number	IEEE Std. 386 Interface	MCOV (kV)	Rated Voltage (kV)	Dimensions Inch (mm)			Shipping Weight Lbs (kg)	
				A	B	C		
225ELA09	25 kV Class Fig. 5	7.65	9	7.9 (201)	6.6 (168)	3.1 (79)	3.7	1.7
225ELA10		8.4	10					
225ELA12		10.2	12					
225ELA15		12.7	15					
225ELA18		15.3	18				5.2	2.4
225ELA21		17	21					



225PLA __

PLA Reference Data:

Catalog Number	IEEE Std. 386 Interface	MCOV (kV)	Rated Voltage (kV)	Weight Lbs (kg)	
225PLA09	25 kV Class	7.65	9	4.6	2.09
225PLA10		8.4	10		
225PLA12		10.2	12		
225PLA15		12.7	15		
225PLA18		15.3	18		
225PLA21		17	21		

25/28 kV LOADBREAK INSERTS

The Hubbell Loadbreak Bushing Insert meets all requirements of IEEE Std. 386. It is designed for installation on transformers, switches or other equipment having a 200 amp bushing well that meets the requirements of IEEE Std. 386, Figure 3. When mated with a comparably rated elbow or other accessory, the bushing insert provides a fully shielded and submersible connection. The bushing insert contains an all-copper current path from the female contact to the bushing well and internal connection to the switch or transformer.

225BI Bushing Insert

Internal hex broach accepts a 5/16" wrench for proper installation torque.

Vented yellow seating indicator ring provides a positive indication that the mating product is fully installed and assists in minimizing no-load, partial vacuum flashovers.



9U04BEB001 Feed-thru Insert

Create a tap position in an existing apparatus

Convert a radial-feed transformer to a loop-feed unit.

Supplied with an auxiliary hold-down bail.



Experience



25/28 kV LOADBREAK ACCESSORIES

9U01BEW500 Insulating Cap

Used as a temporary or permanent cover on an energized operating interface. Standard product has an insulating cuff. The insulating cap is supplied with a 36-inch long lead for grounding.



9U07BCF100 Insulating Parking Bushing

Provides a temporary or permanent parking position for energized loadbreak elbows. The bracket permits mounting on the apparatus parking stand.



228FT Feed-thru - Horizontal Bracket

The feed-thru can be used to test, phase, isolate, or ground a cable, add an arrester at the open point, or by-pass a transformer. The bracket allows it to be assembled into the apparatus parking stand with a hotstick.



225TR Test Rod

Fits into loadbreak bushings, junctions, and other products that contain a loadbreak interface and is used with test meters to determine if the circuit is energized or not.



SL150 Silicone Lubricant

Silicone lubricant for all Separable Connectors. Supplied in a 5.3 oz. (150 g.) tube. Sold in cartons of 24 tubes.



25/28 kV LOADBREAK GROUNDING ACCESSORIES

9U07BAF100 Grounded Bushing

Provides a temporary ground. Contains a fully functioning loadbreak mechanism and is designed to handle one fault-close of up to 10,000 amps for 10 cycles. Can be installed with a hotstick.



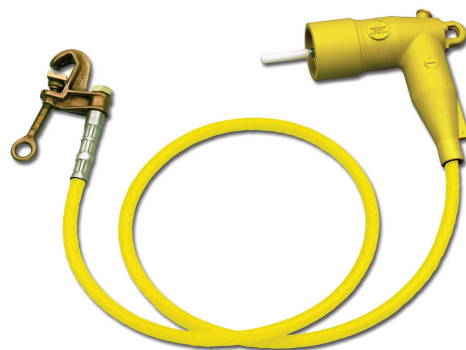
T6003091 Grounded Bushing

This set includes a loadbreak bushing and bronze ground clamp T6000466 connected by a 4-ft. yellow 1/0 cable. A tin-plated copper connector joins the cable to the bushing. A threaded copper ferrule connects the cable to the clamp. Fault current rating for each set: 10,000 amps for 10 cycles.



T6002131 Grounding Elbow

Each set includes a yellow elbow, 6 feet of 1/0 copper grounding cable with yellow jacket, and bronze ground clamp T6000466. Fault current rating for each set: 10,000 amps for 10 cycles.



C600-3103 Three-Phase Grounding Elbow Sets for Switches & Transformers

Each of these sets consists of a three-way terminal block assembly, three 6-ft. lengths of 1/0 copper ground cable with yellow jacket, a bronze ground clamp T6000466 and three elbows.

Fault current rating for each set: 10,000 amps for 10 cycles



Grounding Component Parts:

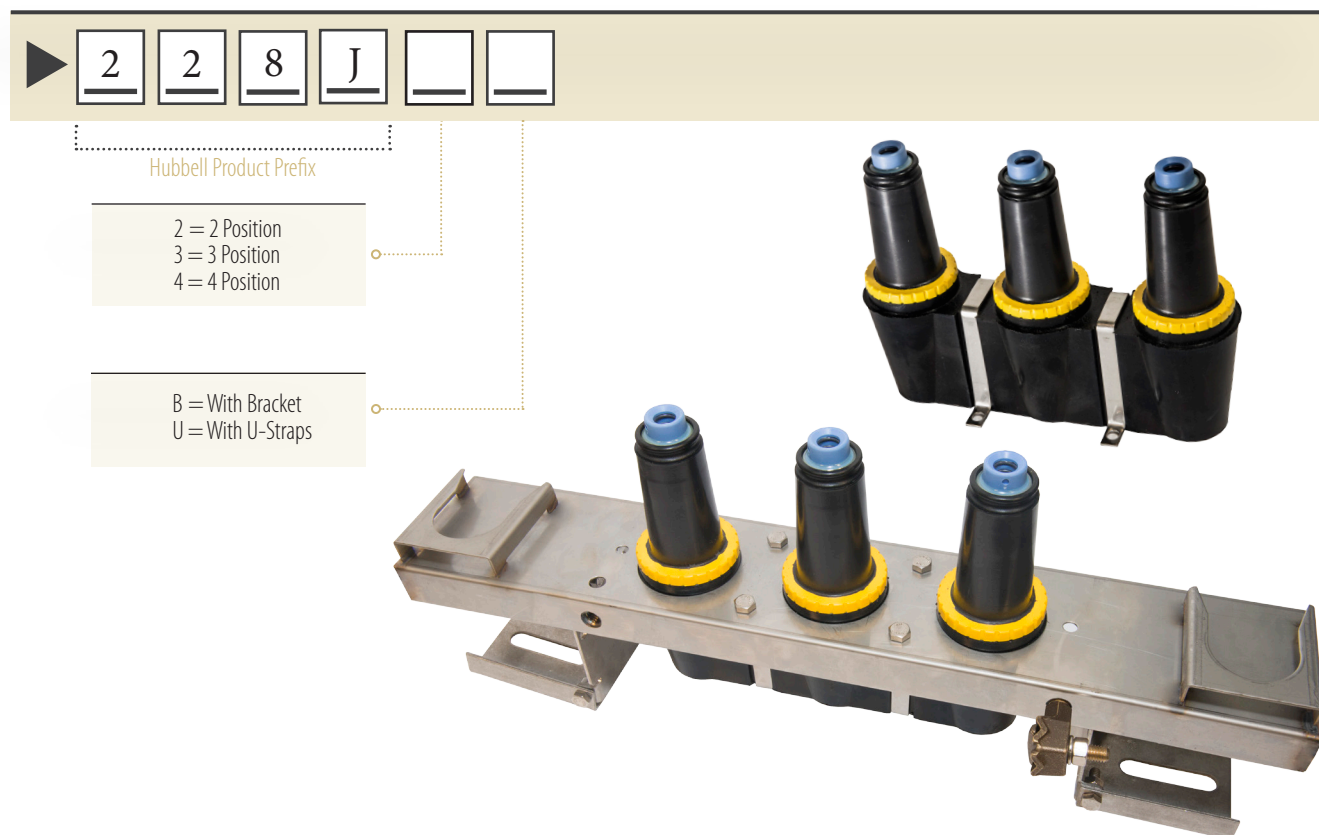
200GB6LUG	1-hole copper Lug for 1/0 grounding cable (grounding bushing component)
225GBH5G	200 Amp 25 kV Grounding Bushing Housing
225GEH5G	200 Amp 25 kV Grounding Elbow Housing
225LBP	200 Amp 25 kV Loadbreak Probe
235LUGC6	2/0 all copper Lug for use with 1/0 grounding cable
235LUGC7	3/0 all copper Lug for use with 2/0 grounding cable



25/28 kV LOADBREAK JUNCTIONS

JUNCTION SELECTION AND ORDERING

Example: 4-point junction, supplied with a SS bracket is: 228J4B



JUNCTION DESCRIPTION

Hubbell Junctions are used to sectionalize cables or as feed-thrus for making lateral taps.

They are available in two, three and four tap units and, when connected with loadbreak elbows, have ratings as shown on the 25/28 kV Loadbreak Product Ratings & Specifications sheet.

Adjacent taps are 4.0" center to center. Vented yellow

seating indicator ring provides a positive indication that the mating product is fully installed and assists in minimizing no-load, partial vacuum flashovers.

Junctions with the corrosion-resistant stainless steel mounting bracket allow back plate mounting angles of 30, 45, or 60 degrees. This bracket can be adjusted for horizontal mounting to a flat surface. Junctions can also be ordered with only U-straps for horizontal surface mounting.

Junction Component Parts:

200BRKTMF	Junction Adjustable Mounting Feet Only, Stainless Steel (1 Pair)
228J2BRKT	Junction Bracket, Stainless Steel w/Adjustable Feet, 2 Position
228J3BRKT	Junction Bracket, Stainless Steel w/Adjustable Feet, 3 Position
228J4BRKT	Junction Bracket, Stainless Steel w/Adjustable Feet, 4 Position
228US1	Junction U-strap, Stainless Steel w/hardware

Performance

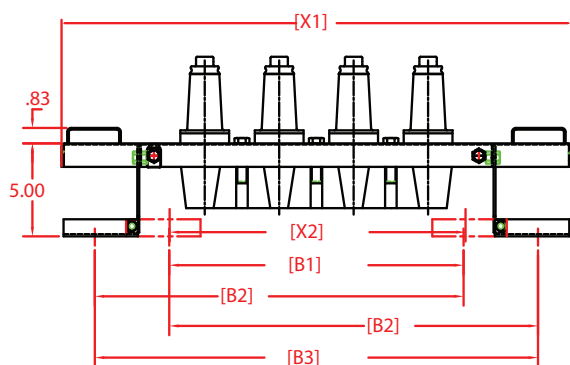
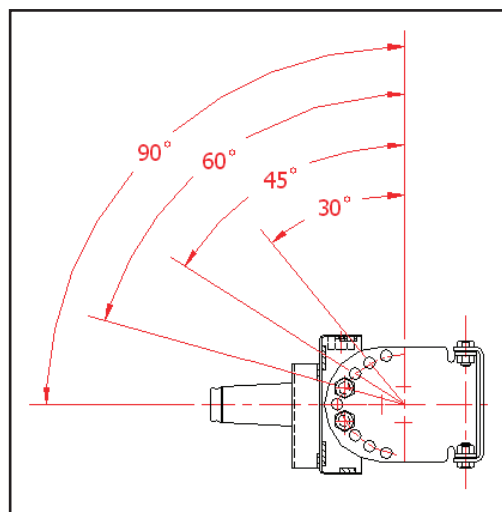
25/28 kV LOADBREAK JUNCTIONS

Bracket & U-strap Dimensions

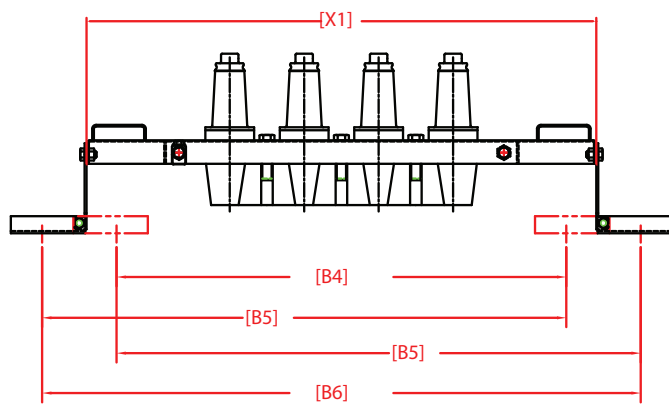
Dimension	Junction Part Number		
	228J2B	228J3B	228J4B
X1	23.45	23.45	23.45
X2	6.86	10.86	14.86
B1	6.55 to 10.55	6.55 to 10.55	10.55 to 14.55
B2	11.22 to 15.22	11.22 to 15.22	15.22 to 19.22
B3	15.89 to 19.89	15.89 to 19.89	19.89 to 23.89
B4	16.40 to 20.40	16.40 to 20.40	20.40 to 24.40
B5	21.07 to 25.07	21.07 to 25.07	25.07 to 29.07
B6	25.74 to 29.74	25.74 to 29.74	29.74 to 33.74

Note: Dimensions in Inches

Bracket Mounting Angles

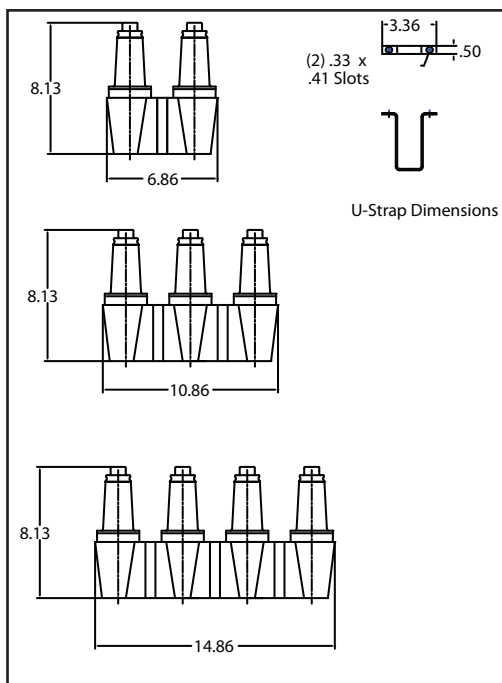


Inside Bracket Feet Dimensions



Outside Bracket Feet Dimensions

U-Strap Dimensions



U-Strap Dimensions

25/28 kV STACKING DIMENSIONS

25/28 kV Elbow
225LExx

25/28 kV Elbow Arrester
225ELAx

25/28 kV Insulating Cap
9U01BEW500

25/28 kV Parking Bushing
9U07BCF100

25/28 kV Bushing Insert
225BI

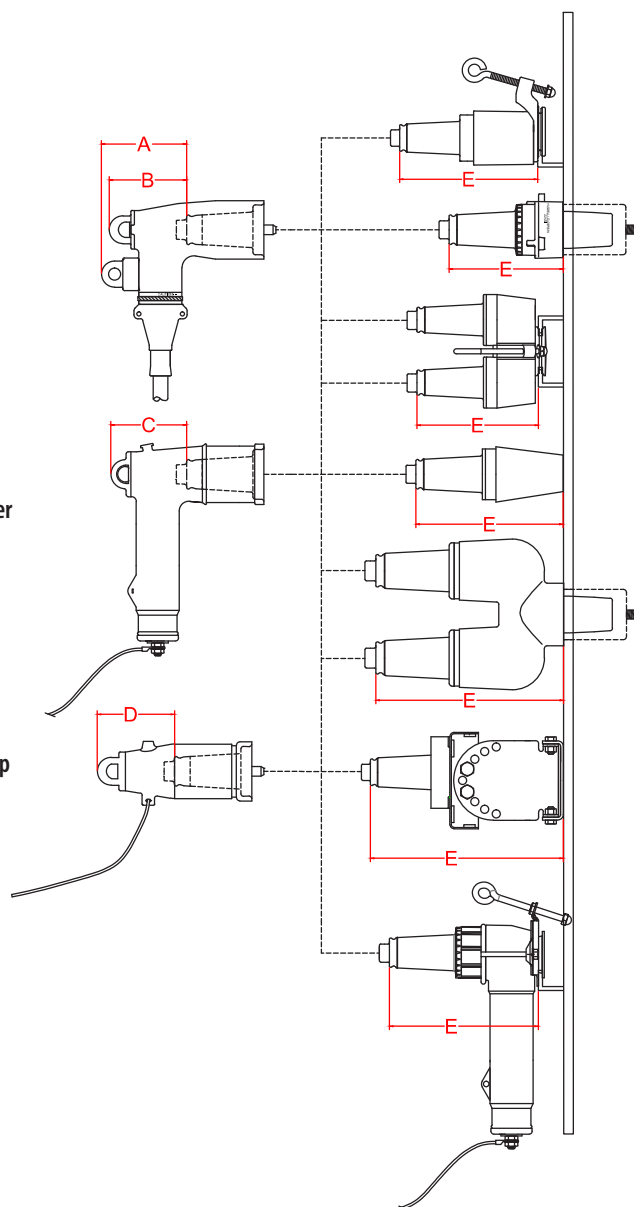
25/28 kV Feed-Thru
228FT

25/28 kV Junction w/ U-Strap
228JxU

25/28 kV Feed-Thru Insert
9U04BEB001

25/28 kV Junction w/ Bracket
228JxB

**25/28 kV Parkingstand
Lightning Arrestor**
225PLAx



Overall 25/28 kV Product Stacking Dimensions

Product	Product (E)	Elbow + Product (A + E)	Elbow + Product (B + E)	Arrester + Product (C + E)	Cap + Product (D + E)
9U07BCF100 - 25/28 kV Parking Bushing	7.85"	12.26"	11.85"	11.77"	11.85"
225BI - 25/28 kV Bushing Insert	5.92"	10.33"	9.92"	9.84"	9.92"
228FT - 25/28 kV Feed-Thru (Horizontal)	6.22"	10.63"	10.22"	10.14"	10.22"
225PLAx - 25/28 kV Parkingstand Lightning Arrestor	7.72"	12.13"	11.72"	N/A	11.72"
228JxU - 25/28 kV Junction w/U-strap	7.62"	12.03"	11.62"	11.54"	11.62"
228JxB - 25/28 kV Junction w/Bracket	8.29"	12.70"	12.29"	12.21"	12.29"
9U04BEB001 - 25/28 kV Feed-Thru Insert	8.60"	13.01"	12.60"	12.52"	12.60"

NOTE: Because Hubbell has a policy of continuous product improvement, we reserve the right to change design and specifications without notice.

©Copyright 2013 Hubbell Incorporated

Never Compromise™
www.hubbellpowersystems.com



Printed in USA

CA03005E