

# Loadbreak Apparatus Connectors

## 200 A 35 kV Class Three-Phase (Purple Cuff) Loadbreak Elbow Connector

500-41

### GENERAL

The Cooper Power Systems, 200 A, 35 kV three-phase rated (21.1/36.6 kV) Loadbreak Elbow Connector meets the full requirements of **IEEE Standard 386™** – 200 A Loadbreak Interface No.1A, 21.1/36.6 kV (large 35 kV interface). Elbow connectors are used in pad-mounted cabinets, underground vaults and other installations to provide three-phase rated, shielded, insulated deadfront connections. They are used to terminate underground cables on 35 kV class electrical equipment. When mated with comparably rated products (bushings, junctions or standoff bushings), the loadbreak elbow connector provides a fully shielded, submersible, separable connection for loadbreak operation.

The Cooper Power Systems 200 A three-phase rated loadbreak elbow is designed for use with 35 kV class 21.1/36.6 kV Large Interface No. 1A loadbreak bushings and accessories meeting the requirements of **IEEE Standard 386™**-latest revision.

The 21.1/36.6 kV three-phase rated elbow connector should not be used with 21.1 kV single-phase rated bushings and accessories. Elbows designed for use with large interface 21.1 kV single-phase rated products are described in Section 500-42. For quick identification, Cooper Power Systems 21.1/36.6 kV three-phase rated elbow connectors are color coded with purple cuffs. Single-phase rated products are color coded with tan nose pieces and tan cuffs.

All Cooper Power Systems Loadbreak Elbows are molded of high quality peroxide-cured EPDM insulation and have a molded on peroxide-cured semi-conducting shield. They feature a 2.88" long coppertop friction welded compression connector, a tin-plated copper probe with an ablative arc follower tip. Elbows can be ordered with a capacitive test point for determining if the circuit is energized. The test point also provides a means for mounting a Cooper Power Systems test point voltage reset fault indicator. (See Section 320-40). Elbows can be ordered with a concentric neutral jacket seal included in the kit.



Figure 1. Loadbreak Elbow Connector with test point; also available without test point.

### INSTALLATION

No special tools are required. The de-energized and grounded cable is prepared according to the installation instructions. The coppertop compression connector is crimped on the cable conductor. The cable is inserted into the elbow housing and the male probe is screwed into the threaded conductor contact. A hotstick tool is used to mate the elbow to the bushing interface. Refer to Installation Instruction Sheet S500-41-1 (5000050852) for details.

### PRODUCTION TESTS

Tests conducted in accordance with **IEEE Standard 386™**:

- AC 60 Hz 1 Minute Withstand – 50 kV
- Minimum Corona Voltage Level – 26 kV
- Test Point Voltage Test

Tests conducted in accordance with Cooper Power Systems requirements:

- Physical Inspection
- Periodic Dissection
- Periodic X-ray Analysis

TABLE 1  
Voltage Ratings and Characteristics

Description	kV
Standard Voltage Class	35
Maximum Rating Phase-to-Phase	36.6
Maximum Rating Phase-to-Ground	21.1
AC 60 Hz 1 Minute Withstand	50
DC 15 Minute Withstand	103
BIL and Full Wave Crest	150
Minimum Corona Voltage Level	26

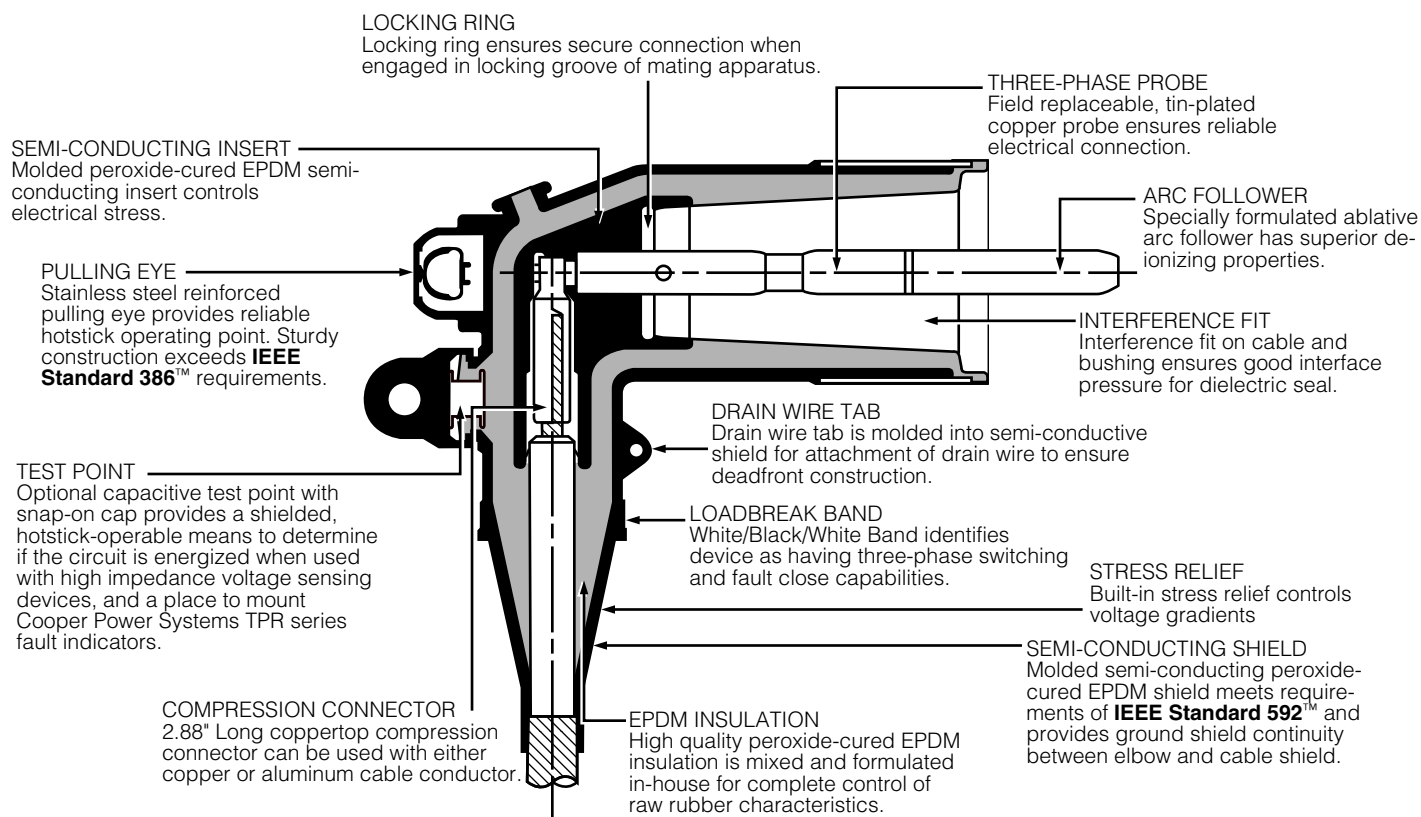
Voltage ratings and characteristics are in accordance with **IEEE Standard 386™**.

TABLE 2  
Current Ratings and Characteristics

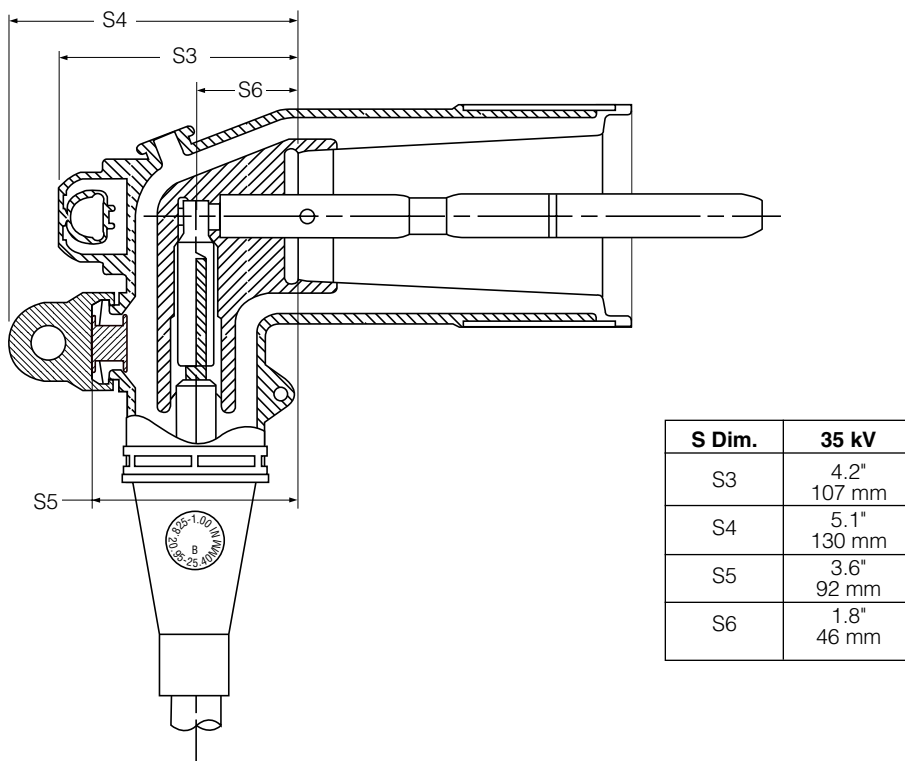
Description	Amperes
Continuous	200 A rms
Switching	10 operations at 200 A rms at 36.6 kV*
Fault Closure	10,000 A rms symmetrical at 36.6 kV for 0.17 s after 10 switching operations*
Short Time	10,000 A rms symmetrical for 0.17 s 3,500 A rms symmetrical for 3.0 s

Current ratings and characteristics are in accordance with **IEEE Standard 386™**.

\* When mated with similar rated 21.1/36.6 kV three-phase products with purple nose pieces.



**Figure 2.**  
Cutaway drawing shows design detail.



**Figure 3.**  
35 kV loadbreak elbow profile and stacking dimensions.

Note: Dimensions given are for reference only.

### ORDERING INFORMATION

The standard elbow kit is packaged in a heavy duty polyethylene bag. There are 10 bagged kits to a carton. Individual boxed kits are also available by special part number. To order a 35 kV Class Loadbreak Elbow Kit, for cable meeting all applicable industry cable standards, follow the easy steps below.

Each kit contains:

- Elbow Body
- Coppertop Compression Connector
- Loadbreak Probe
- Probe Installation Tool
- Silicone Lubricant
- Installation Instruction Sheet

**STEP 1:** Determine the cable's diameter over the insulation as shown in Figure 4 (including tolerances) from the cable manufacturer. Then identify a cable range from Table 3 that brackets the minimum and maximum insulation diameters. Select the INSULATION CODE from the far right column.

**STEP 2:** Identify the conductor size and type in Table 4 and select the CONDUCTOR CODE from the far right column.

For an elbow kit without a compression connector, use "00" for the conductor code.

**STEP 3:** For an elbow kit with a capacitive test point order:

LE235	CABLE RANGE CODE	CONDUCTOR CODE	T
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For an elbow kit without a capacitive test point order:

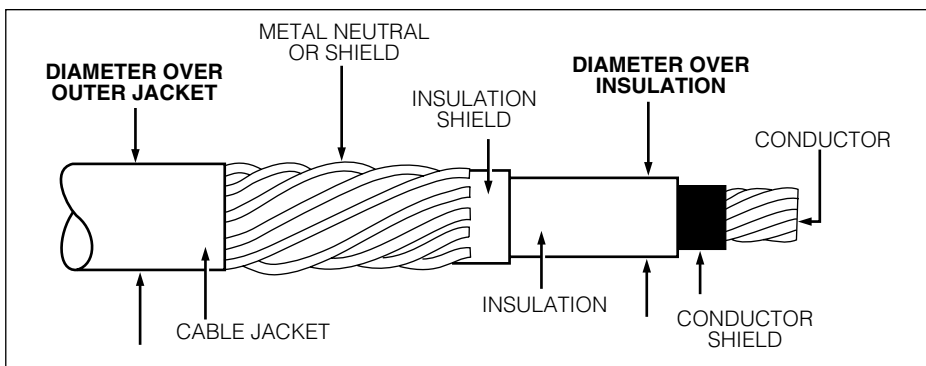
LE235	CABLE RANGE CODE	CONDUCTOR CODE
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**STEP 4:** (Optional)

To add a premolded jacket seal for concentric neutral cable to the elbow kit, consult Table 5 and add the suffix that corresponds to the diameter over the cable's outer jacket.

**STEP 5:** (Optional)

To add a cold shrinkable metallic shield adapter to the elbow kit, consult Table 6 and add the suffix that corresponds to the diameter over the cable's outer jacket.



**Figure 4.** Illustration showing typical construction of high voltage underground cable.

**TABLE 3**  
Cable Range for Loadbreak Elbow

Diameter Over Cable Insulation		CABLE RANGE CODE
Inches	Millimeters	
0.825-1.000	20.96-25.40	B
0.995-1.180	25.27-29.97	D
1.180-1.340	29.97-34.04	F

**TABLE 4**  
Conductor Size and Type

Class B Stranded or Compressed		Compact or Solid		CONDUCTOR CODE
AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	
No Connector				00
#6	16	#4	-	01
#4	-	#3	25	02
#3	25	#2	35	03
#2	35	#1	-	04
#1	-	1/0	50	05
1/0	50	2/0	70	06
2/0	70	3/0	-	07
3/0	-	4/0	95	08
4/0	95	250	120	09
250*	120	300	-	10

\*Compressed stranding only.

**TABLE 5**  
Jacket Seal for Concentric Neutral

Diameter Over Outer Jacket		Suffix
Inches	Millimeters	
0.866-1.140	22.0-29.0	GCB
1.020-1.420	25.9-36.1	GCD
1.220-1.730	31.0-43.9	GCF

**TABLE 6**  
Metallic Shield Adapter Kit

Diameter Over Outer Jacket		Suffix
Inches	Millimeters	
0.590-1.050	15.0-26.7	-SA1
0.830-1.640	21.1-41.7	-SA2
1.270-2.170	32.3-55.1	-SA3
1.700-2.600	43.2-66.0	-SA4

**STEP 6:** (Optional)

For an elbow kit individually packaged in a corrugated cardboard box, insert an "X" as the last character in the part number.

**EXAMPLE:** Select an elbow kit with a capacitive test point for use on a 1/0 concentric neutral class B stranded cable with a minimum insulation diameter of 1.095" and maximum diameter 1.155". Jacket seal included in the kit.

**STEP 1:** From Table 3, identify the cable range 0.995"-1.180" and select the "D" CABLE RANGE CODE.

**STEP 2:** The conductor size is a 1/0 and the type is class B stranded.

From Table 4, under the column “Class B Stranded or Compressed” identify 1/0 and select the “06” conductor code.

**STEP 3:** Capacitive test point required, add a “T” after the conductor code

**STEP 4:** Concentric neutral jacket seal required. The diameter of the cable over the outer jacket given by the cable manufacturer is 1.43”. Add jacket seal code “GCF” from Table 5.

**STEP 5:** Not required – concentric neutral cable.

**STEP 6:** Not required – elbows will be bulk packed.

**STEP 7:** Order catalog number

**LE235D06TGCF**

**TABLE 7**  
Replacement 2.88" Long Coppertop Connectors

Conductor Size				Catalog Number
Concentric or Compressed		Compact or Solid		
AWG	mm <sup>2</sup>	AWG	mm <sup>2</sup>	
#6	16	#4	–	CC2C01T
#4	–	#3	25	CC2C02T
#3	25	#2	35	CC2C03T
#2	35	#1	–	CC2C04T
#1	–	1/0	50	CC2C05T
1/0	50	2/0	70	CC2C06T
2/0	70	3/0	–	CC2C07T
3/0	–	4/0	95	CC2C08T
4/0	96	250	120	CC2C09T
250*	120	300	–	CC2C10T

Note:  
Coppertop compression connector may be used on both aluminum and copper cable conductors.  
\* Compressed Stranding Only

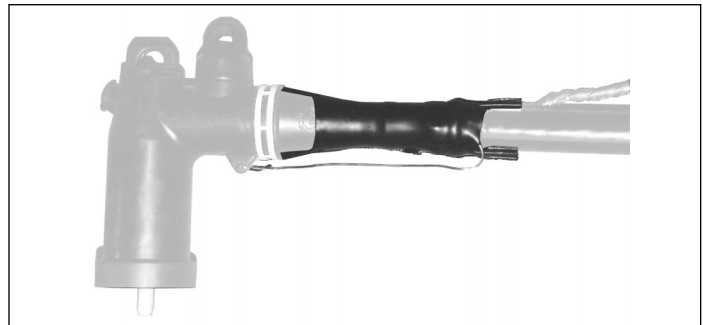
**TABLE 8**  
Replacement Parts

Description	Catalog Number
Loadbreak Probe	2606785A01
Installation Tool	2637425B01
Loadbreak Probe Only	PK235
Probe Kit (includes Probe, Installation Tool, Silicone Lubricant, Installation Instruction Sheet)	
Silicone Grease	
0.175 oz tube (5 grams)	SL005ES117
5.3 oz tube (150 grams)	SL150ES117
Test Point Cap	2605725A54

**ACCESSORIES**



**Figure 5.**  
Cold shrinkable metallic shield adapter.



**Figure 6.**  
Concentric neutral jacket seal (see catalog section 500-90).

**ISO 9001:2000-Certified Quality Management System**

