

Loadbreak Apparatus Connectors

200 A 15 kV Class Loadbreak Elbow Connector with Optional Integral Jacket Seal

500-10-7

GENERAL

The Cooper Power Systems Loadbreak Elbow Connector is a fully-shielded and insulated plug-in termination for connecting underground cable to transformers, switching cabinets and junctions equipped with loadbreak bushings. The elbow connector and bushing insert comprise the essential components of all loadbreak connections. The Cooper Elbow Connector is a fully rated 200 A switching device, designed in accordance to IEEE Std 386™ standard - latest revision.

Cooper Loadbreak Elbows are molded using high quality peroxide-cured insulating and semi-conducting EPDM rubber. Standard features include a coppertop connector, tin-plated copper loadbreak probe with an ablative arc-follower tip and stainless steel reinforced pulling-eye. An optional capacitive test point, made of corrosion resistant plastic, is available for use with fault indicators (see Catalog Section 320-40 and 320-42).

Cable ranges are designed to accept a wide range of cable conductor and insulation sizes with just three elbows and accommodate cable manufactured to either **AEIC** or **ICEA** standards.

The coppertop compression connector is a standard item to transition from the cable to the loadbreak probe. An aluminum crimp barrel is inertia-welded to a copper lug. The aluminum barrel makes the connector easy to crimp and the copper lug ensures a reliable, tight, cool operating connection with the loadbreak probe.

OPTIONAL INTEGRAL JACKET SEAL*

The optional integral jacket seal provides a quick and easy means to sealing the cable jacket to prevent moisture ingress. Our jacket seal is molded to the loadbreak elbow eliminating the need for separate cable sealing products. It's available with braided ground strap/bleeder wire for terminating Tape shielded cable. (See Figure 5.)



Figure 1. Loadbreak Elbow Connector with optional integral jacket seal and without test point shown.

Figure 1A (right) Loadbreak Elbow without jacket seal and with test point.

*US Patent 7,661,979

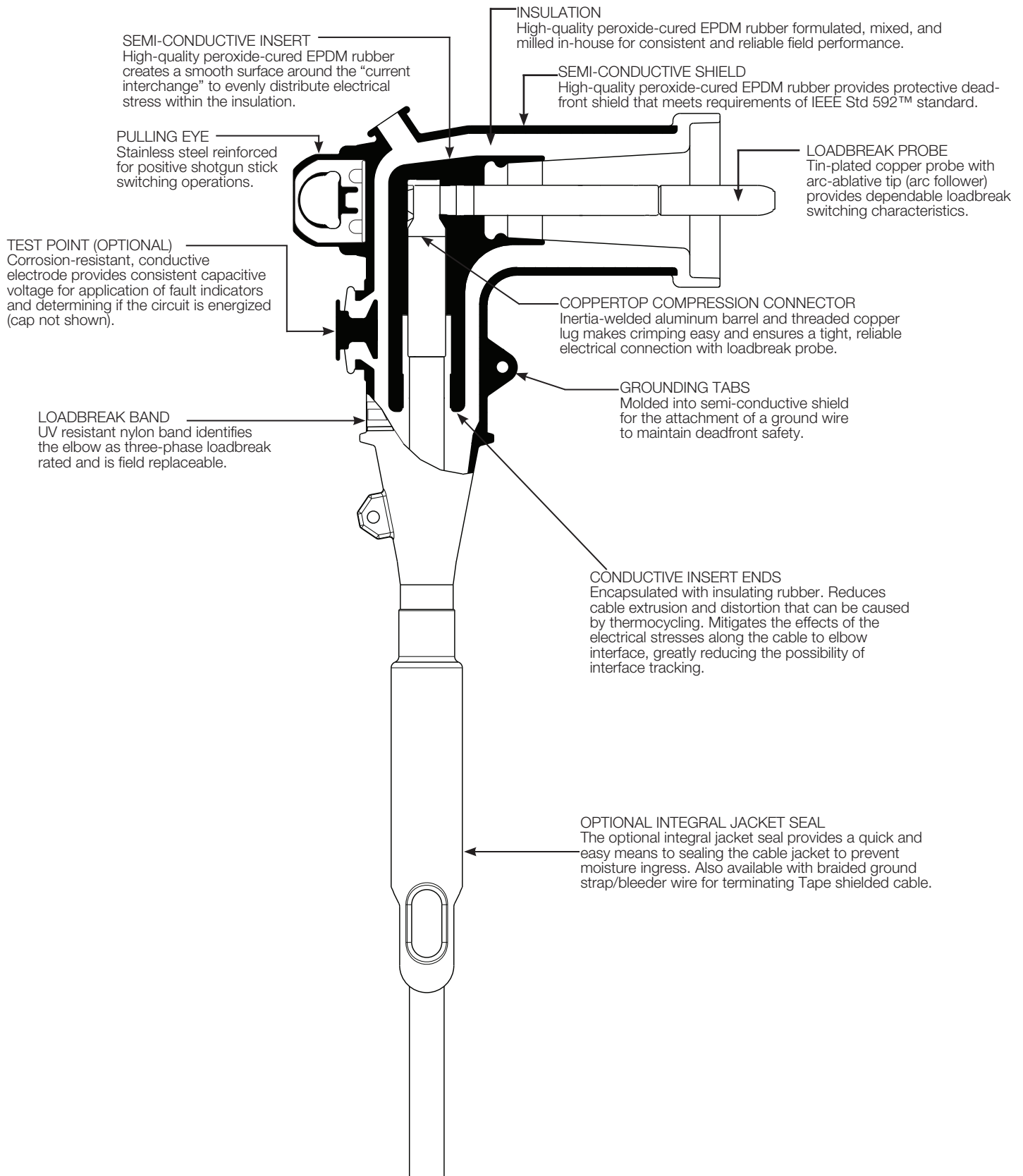


Figure 2.
Cutaway drawing shows design detail.

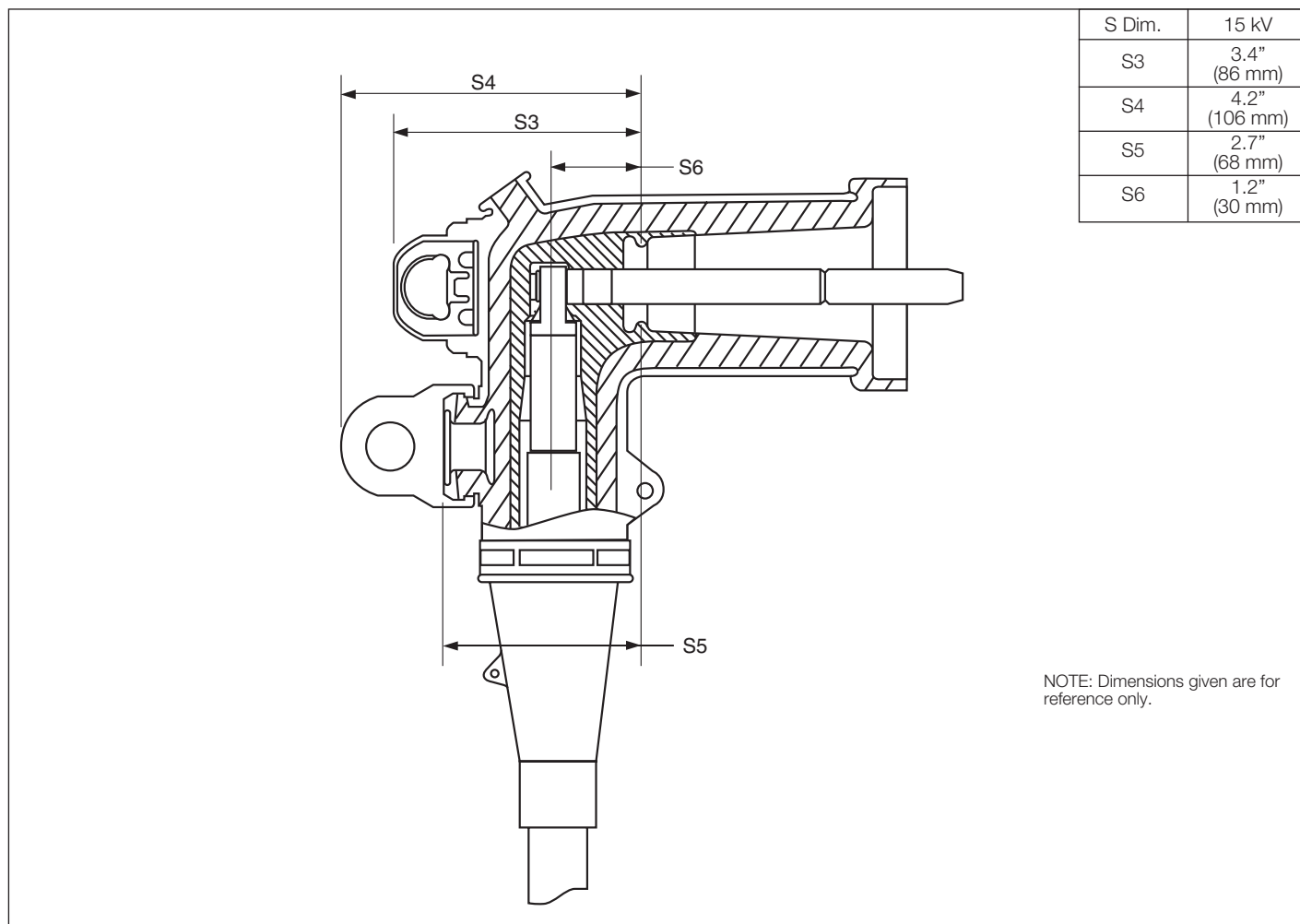


Figure 3.
Elbow profile and stacking dimensions as referenced in IEEE Std 386™ standard.

INSTALLATION

Cable stripping and scoring tools, available from various tool manufacturers, are recommended for use when installing loadbreak elbows. After preparing the cable, the elbow housing is pushed onto the cable. The loadbreak probe is threaded into the coppertop connector using the supplied installation tool or an approved equivalent. Use a shotgun stick to perform loadmake and loadbreak operations. Refer to Installation Sheet S500-10-7 for details.

PRODUCTION TESTS

Tests conducted in accordance with IEEE Std 386™ standard:

- AC 60 Hz 1 Minute Withstand
 - 34 kV
- Minimum Corona Voltage Level
 - 11 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	15
Maximum Rating Phase-to-Phase	14.4
Maximum Rating Phase-to-Ground	8.3
AC 60 Hz 1 Minute Withstand	34
DC 15 Minute Withstand	53
BIL and Full Wave Crest	95
Minimum Corona Voltage Level	11

Voltage ratings and characteristics are in accordance with IEEE Std 386™ standard.

TABLE 2
Current Ratings and Characteristics

Description	Amperes
Continuous	200 A rms
Switching	10 operations at 200 A rms at 14.4 kV
Fault Closure	10,000 A rms symmetrical at 14.4 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 Std 386™ standard.

ORDERING INFORMATION

The Elbow kits are packaged in a heavy duty polyethylene bag. There are 20 bagged kits to a carton. Individual boxed kits are also available by special part number. To order a 15 kV Class Loadbreak Elbow Kit follow the easy steps below.

Each kit contains:

- Standard Elbow Body or Elbow Body with Jacket Seal
- Coppertop Compression Connector
- Loadbreak Probe
- Probe Installation Tool
- Silicone Lubricant
- Mastic Strips (**Jacket Seal Elbow Only**)
- Installation Instruction Sheet

STEP 1: Determine the cable’s diameter over the electrical insulation as shown in Figure 4 (including tolerances) from cable manufacturer. Then identify a cable range from Table 3 that brackets the minimum and maximum insulation diameters. Select the CABLE RANGE 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.

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

LE215

CABLE RANGE CODE

CONDUCTOR CODE

T

For an integral jacket seal elbow kit with a capacitive test point order:

LEJ215

CABLE RANGE CODE

CONDUCTOR CODE

T

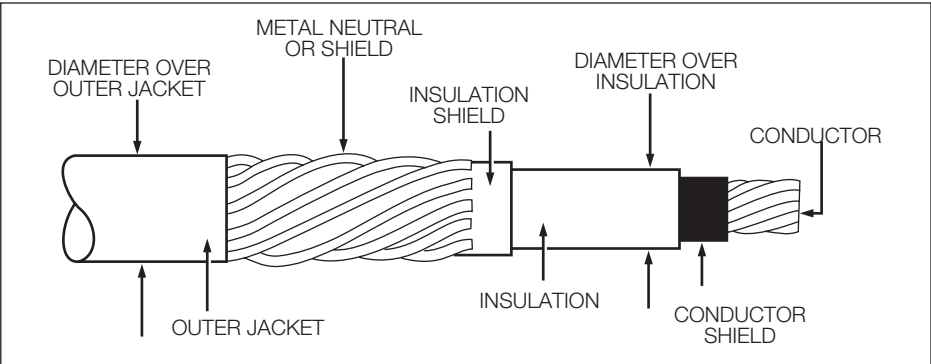


Figure 4. Illustration showing typical construction of high voltage underground cable.

For an elbow kit without a capacitive test point order:

LE215

CABLE RANGE CODE

CONDUCTOR CODE

For an integral jacket seal elbow kit without a capacitive test point order:

LEJ215

CABLE RANGE CODE

CONDUCTOR CODE

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

For an elbow kit with a hold down bail assembly included, insert a “B” after the test point option code.

STEP 4: For optional braided ground strap/bleeder wire for terminating tape shielded cable, insert “GS” after test point and/or bail option code. (**Integral Jacket Seal Elbow Only**)

STEP 5: (Optional) For an elbow kit individually packaged in a corrugated cardboard box, insert an “X” as the last character in the part number.

Table 3
Cable Range for Loadbreak Elbow

Inches	Millimeters	Cable Range Code
0.495" - 0.585"	12.6 - 14.9	CCA*
0.575" - 0.685"	14.6 - 17.4	CCB*
0.610" - 0.970"	15.5 - 24.6	AB
0.750" - 1.080"	19.1 - 27.4	CC
0.920" - 1.310"	23.3 - 33.2	DD

* Uses 5 kV cable adapter.
(For use with “CC” range elbow only.)

TABLE 4
Conductor Size and Type

Class B Stranded or Compressed		Compact or Solid		CONDUCTOR CODE
AWG	mm ²	AWG	mm ²	
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.

EXAMPLE: Select an integral jacket seal elbow kit with a capacitive test point for use on a #1 compact cable with a minimum insulation diameter of 0.770" and a maximum diameter of 0.830".

STEP 1: From Table 3, identify the cable range 0.610"—0.970" and select the "AB" CABLE RANGE CODE.

STEP 2: The conductor size is a #1 and the type is compact.

From Table 4, under the column "Compact or Solid" identify #1 and select the "04" conductor code.

STEP 3: Order catalog number.

LEJ215AB04T

TABLE 5
Replacement 2.88” Long Coppertop Connectors

Conductor Size				Catalog Number
Concentric or Compressed		Compact or Solid		
AWG	mm ²	AWG	mm ²	
#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

* Compressed stranding only.
Note: Coppertop compression connector may be used on both aluminum and copper cable conductors.

ACCESSORIES



Figure 5.
Braided Ground Strap Accessories (see Table 6).



Figure 6.
5 kV Cable Adapter (see Table 6).

TABLE 6
Replacement Parts

Description	Catalog Number
Hold Down Bail Assembly	2638351C01B
5 kV Cable Adapter (for use with “C” Elbow size only), .495” — .585” .575” — .685”	CA225A CA225B
Loadbreak Band (package of 25)	2639139B01B
Probe Kit (includes Probe, Installation Tool, Silicone Lubricant, Installation Instruction Sheet)	PK215
Loadbreak Probe Installation Tool	2602733A01
Loadbreak Probe Only	2637552C03
Silicone Grease 0.175 oz tube (5 grams) 5.3 oz tube (150 grams)	2603393A03 2605670A02M
Includes Ground Braid, Constant Force Spring and Mastic	GRDBRAIDKIT



Figure 7.
Optional Bail Assembly (see Table 6).

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