

600 A 35 kV class BT-TAP™ deadbreak connector



General

Eaton terminates high-voltage underground cable to transformers, switches, switchgear and other apparatus with its Cooper Power™ series 600 A 35 kV Class BT-TAP™ deadbreak connector. Eaton designed it for use with unthreaded connectors to easily retrofit existing Cooper Power series 600 A BOL-T™ deadbreak connector installations, or in new installations where a 200 A interface is required and where the system will not need to be frequently operated. If the system will be frequently operated to sectionalize, or to achieve a visible break or ground, Eaton recommends the use of its Cooper Power series T-OP™ II connector system. (See catalog section CA650055EN.) The BT-TAP deadbreak connector is fully shielded, submersible and meets the requirements of IEEE Std 386™-2006 standard, Separable Insulated Connector Systems.

The 200 A, single-phase rated loadbreak interface provides a means for obtaining a direct conductor test, visible ground and provides a convenient location for Eaton's Cooper Power series M.O.V.E. arrester or grounding elbow.

Eaton offers an optional capacitive test point similar to test points on its 200 A elbow connectors. This allows use of Eaton's Cooper Power series Type "TPR" faulted circuit indicators, and provides a hotstick operable means of determining circuit condition when used with high impedance voltage sensing devices designed for test points.

BT-TAP connectors are designed for use on solid dielectric cable (XLPE or EPR) with extruded semiconductive shields and concentric neutral, with or without a jacket.

Installation on jacketed concentric neutral cable may require additional sealing material. Cold shrinkable adapters are available for tape shield, linear corrugated, UniShield™ cable, and drain wire cables for use with deadbreak connectors.

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900 AMP rating

The BT-TAP connector is rated for 900 A continuous when used with a coppertop compression connector and copper bushing or junction.

200 kV BIL rating

The BT-TAP connector is available with an optional 200 kV BIL rating, allowing you to match the BIL rating of the system and the equipment to which it will be connected. If 200 kV BIL rating is required, specify "38" in digits 5 and 6 in the part number. See page 4.

Interchangeability

Eaton conforms to the electrical, mechanical and dimensional requirements of IEEE Std 386™-2006 standard for its Cooper Power series 600 A deadbreak connectors. The connectors can be used on any comparably rated bushing interface that also meets the requirements of this standard. In addition, all T-bodies, cable adapters, insulating plugs and compression connectors are designed to be interchangeable with those currently available from other major manufacturers that also certify their components to IEEE Std 386™-2006 standard.

Installation

The T-body is assembled onto prepared cable with an unthreaded compression or shear bolt connector. The short end of a special copper alloy stud, provided with the kit, is torqued onto a de-energized 600 A bushing. Using a T-WRENCH, the loadbreak reducing tap plug is threaded onto the stud drawing the entire assembly tight to the apparatus bushing. The assembly is then torqued to the apparatus bushing using a torque wrench. Refer to *Service Information MN650003EN 600 A 35 kV Class BT-TAP Connector System Installation Instructions* for details.

Production tests

Tests conducted in accordance with IEEE Std 386™-2006 standard:

- ac 60 Hz 1 Minute Withstand
 - 50 kV/70 kV
- Minimum Partial Discharge Extinction Voltage
 - 26 kV

Tests conducted in accordance with Eaton 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 (loadbreak reducing tap plug only)	36.6
Maximum Rating Phase-to-Ground	21.1
AC 60 Hz 1 Minute Withstand	
150 kV BIL Class BT-TAP	50
200 kV BIL Class BT-TAP	70
DC 15 Minute Withstand	103
BIL and Full Wave Crest	150/200
Minimum Partial Discharge Extinction Voltage	26

Voltage ratings and characteristics meet or exceed IEEE Std 386™-2006 standard.

Table 2. Current Ratings and Characteristics

Description	Amperes	
Continuous	600 A rms (Aluminum)	900 A rms (Copper)
4 Hour Overload	900 A rms (Aluminum)	1,200 A rms (Copper)
Short Time	25,000/40,000 A rms sym metrical for 0.17 s	
	10,000 A rms symmetrical for 3.0 s	
200 A Interface*		
Continuous	200 A rms	
Switching**	10 operations at 200 rms at 21.1 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 meet or exceed IEEE Std 386™-2006 standard.

* System design and protection must recognize the ratings of 200 A interface.

** Switching rating limited to single-phase 21.1 kV

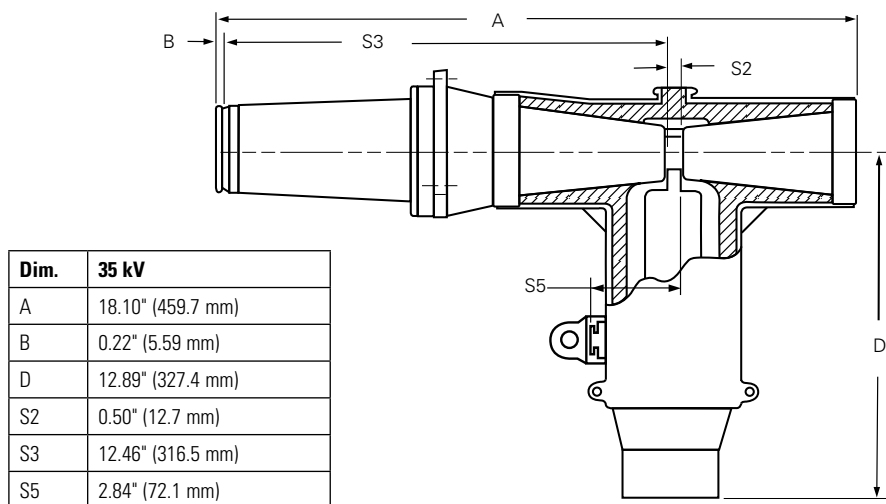
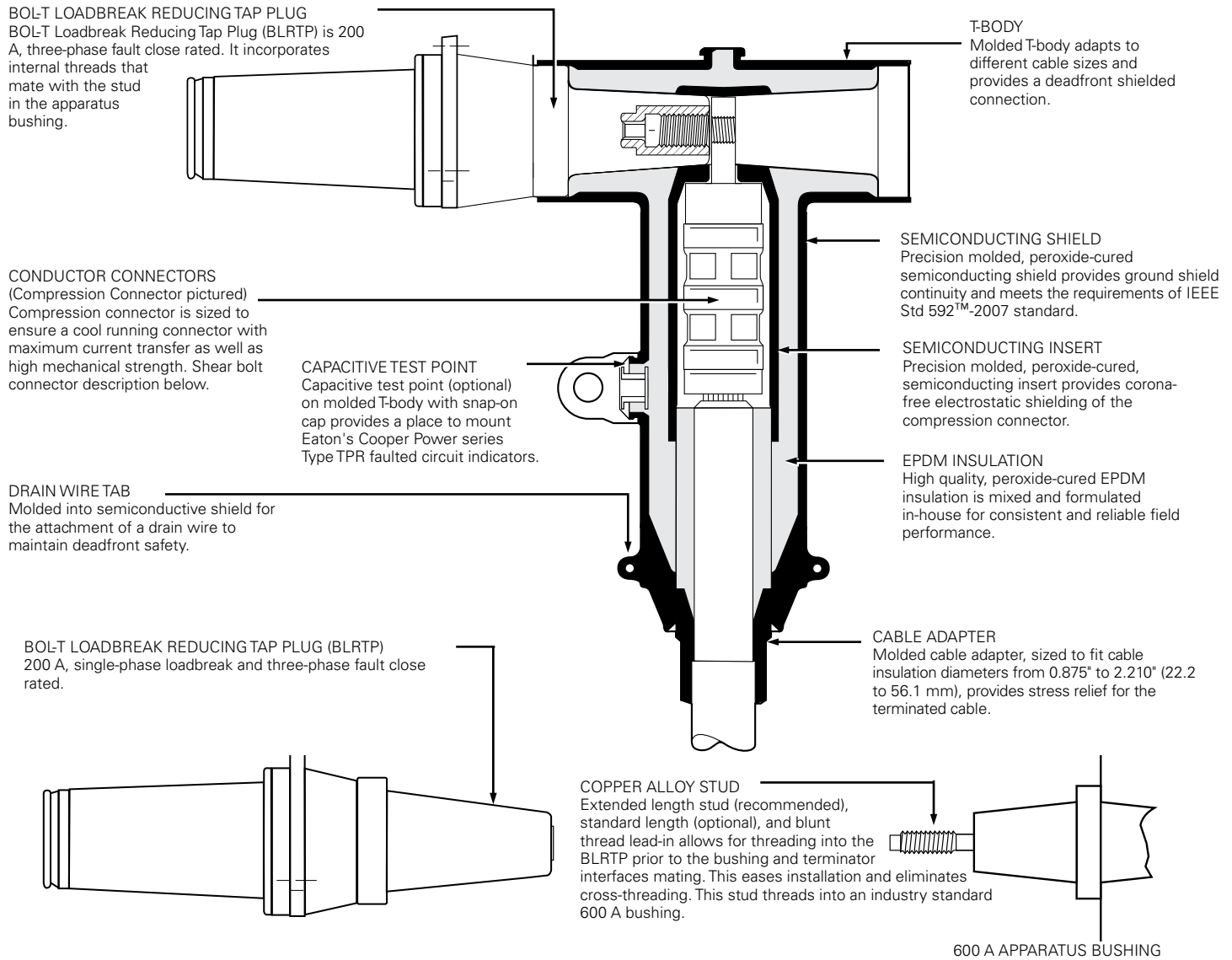


Figure 1. BT-TAP profile and stacking dimensions from Figure 11A of IEEE Std 386™-2006 standard.

Note: Dimensions given are for reference only.



Shear bolt connector

Bolted cable lug is fitted with stepless bolts, which shear off when optimum contact force has been reached. Provides electrical continuity for copper and aluminum conductors while eliminating need for dies and compression tools.

Figure 2. Cutaway drawing illustrates design features.

BT-TAP connector kit – catalog numbering system

Build the 12 digit catalog number for a 35 kV BT-TAP Kit by following the steps given below. The first 4 digits are always "BTP6"; only digits 5 through 12 need to be selected.

1	2	3	4	5	6	7	8	9	10	11	12
B	T	P	6								

Catalog number digits:

1, 2 & 3 = "BTP," BT-TAP Connector System

4 = "6," 600 A System

Step 1. Select Digits 5 and 6 Bushing Interface

5 & 6 = "35," 35 kV Class Bushing Interface, 150 kV BIL

"38", 35 kV Class Bushing Interface, 200 kV BIL

Step 2. Select Digit 7 Cable Adapter Range Code

Determine the cable's diameter over the electrical insulation as shown in Figure 3 (including tolerances).

Then identify a cable range from Table 3 that covers the minimum and maximum insulation diameters.

Select the correct CABLE RANGE CODE from Table 3.

Step 3. Select Digits 8 and 9 Conductor Code

Identify the conductor size and type in Table 4 and select the Conductor Code from the appropriate (compression or shear bolt) column.

Step 4. Select Digit 10

Determine whether 600 A or 900 A rating is required. The shear bolt connector is only available as a 600 A aluminum connector.

"A" = 600 A rating (Aluminum Compression or Shear Bolt Connector)

"C" = 900 A rating (Coppertop Compression Connector)*

Step 5. Select Digit 11 (optional)

Determine if the T-body should have a test point.

T = Test Point on T-body

If no test point is required, do not include an 11th digit.

Step 6. Select Digit 12 (optional)

Determine whether a 35 kV, 200 A protective cap is required in the kit.

C = Protective Cap

If no cap is required, do not include a 12th digit.

* Apparatus bushing and stud must also be copper to achieve a 900 A rating.

Table 3. Cable Diameter Range

Cable Diameter Range		Cable Range Code	Cable Diameter Range		Cable Range Code
Inches	mm		Inches	mm	
0.875-0.985	22.2-25.0	D	1.355-1.520	34.4-38.6	M
0.930-1.040	23.6-26.4	E	1.485-1.595	37.7-40.5	N
0.980-1.115	24.9-28.3	F	1.530-1.640	38.9-41.7	P
1.040-1.175	26.4-29.8	G	1.575-1.685	40.0-42.8	Q
1.095-1.240	27.8-31.5	H	1.665-1.785	42.3-45.3	R
1.160-1.305	29.5-33.1	J	1.755-1.875	44.6-47.9	S
1.220-1.375	31.0-34.9	K	1.845-1.965	46.9-49.9	T
1.285-1.395	32.5-35.4	L	1.960-2.210	49.8-56.1	U

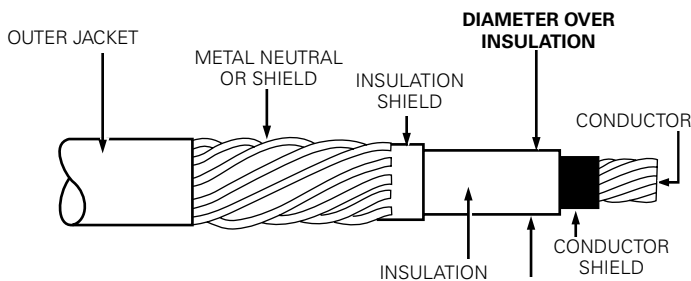


Figure 3. Illustration showing typical construction of medium voltage underground cable.

Table 4. Conductor Size and Type

Compression Connector					Shear Bolt Connector					
Concentric or Compressed		Compact or Solid		Compression Conductor Code	Cable Conductor Size				Shear Bolt Connector	
AWG or kcmil	mm²	AWG or kcmil	mm²		AWG or kcmil			mm² Standard Sized	Conductor Code	Catalog Number
					Compact	Compressed	Concentric			
No Connector				0	1/0	1/0	1/0	50		
#2	35	1	-	11	2/0	2/0	2/0	70		
#1	-	1/0	50	12	3/0	3/0	3/0	-	S1	CDT630SB150
1/0	50	2/0	70	13	4/0	4/0	4/0	95		
2/0	70	3/0	-	14	250	250	250	120		
3/0	-	4/0	95	15	350	-	-	150		
4/0	95	250	120	16	-	350	350	185		
250	120	300	-	17	500	500	500	240	S3	CDT630SB300
300	-	350	-	18	600	600	600	300		
350	-	400	185	19	700	-	-	-		
400	185	450	-	20	-	700	700	-		
450	-	500	240	21	750	750	750	-	S4	CDT630SB400
500	240	600	300	22	800	800	-	400		
600	300	700	-	23	900	-	-	-		
650	-	750	-	24	-	-	800	-		
750	-	900	-	25	-	900	900	-		
900	-	1000	500	26	1000	1000	1000	500	S6	CDT1250SB630
1000	500	-	-	27	-	1100	1100	-		
1250	630	-	-	28	-	1200	1200	-		
-	-	-	-	-	-	1250	1250	630		
-	-	-	-	-	-	1300	1300	-		
					-	1400	1400	-	S8	CDT1250SB800
					-	1500	1500	800		

Optional features

Protective cap

200 A insulated protective cap fits over loadbreak reducing tap plug for deadfront shielding.

Capacitive test point

Capacitive test point on molded T-body, with snap-on cap, provides a place to mount Eaton's Cooper Power series Type TPR faulted circuit indicators. To order replacement compression connectors and cable adapters for a BT-TAP connector system, see Catalog CA650006EN "Deadbreak Accessories, Tools and Replacement Parts."

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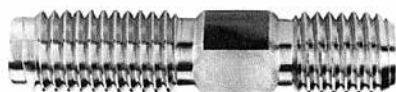


Figure 4. Catalog Number STUDAL or STUDCL

The stud with its extended length allows for threading into the connector prior to mating the bushing and terminator interfaces. Blunt start threads on the stud help eliminate cross-threading. Stud threads into an industry standard 600 A bushing.

Table 6. Replacement Parts and Tools

Description	Catalog Number	
	150 kV BIL	200 kV BIL
T-body without Test Point	DT635	DT638
T-body with Test Point	DT635T	DT638T
BOL-T Loadbreak Reducing Tap Plug (BLRTP) (includes stud)	BLRTP635	BLRTP638
5/16" Hex Shaft with 3/8" Socket Drive Tool	HD635	HD635
200 A, 35 kV Class Insulated Protective Cap	LPC235	LPC238
Extended Length Aluminum Stud	STUDAL	STUDAL
Extended Length Copper Alloy Stud	STUDCL	STUDCL

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