

Installation Instructions: Elbow Connectors 656/676DLR and K656/K676DLR with Bolt Connectors

CONTENTS: Elbow, Cable Adapter, Bolt Connector, Insulating Plug, Lubricant, Stud Prepack, Installation Instructions, Bolt Connector Instructions..

The 656/676DLR and K656/K676DLR connectors are designed to: 1) provide fully shielded, fully submersible deadfront cable connections to high voltage apparatus, 2) provide a means to splice and tap 600 ampere (656/K656DLR) or 900 ampere (676/K676DLR) systems, and 3) provide a port for direct access to the cable/elbow conductor system to allow a direct voltage measurement with appropriate direct voltage test port adapter and meter. The 656/676DLR and the K656/K676DLR are rated on 15kV and 25kV respectively.

DANGER

All apparatus must be de-energized during installation or removal of part(s).

Do not touch or move energized products in the work area.

These instructions do not attempt to provide for every possible contingency.

Failure to follow these instructions will result in damage to the product and serious or fatal injury.

This product should be installed only by competent personnel trained in good safety practices involving high voltage electrical equipment. These instructions are not intended as a substitute for adequate training or experience in such safety practices.

FOR MORE INFORMATION ON PARTS, INSTALLATION RATINGS AND COMPATIBILITY, CALL THE NEAREST ABB OFFICE.

All apparatus must be installed and operated in accordance with individual user, local and national work rules and electrical standards.

For loadbreak products follow operating instructions. All deadbreak connectors must be de-energized before operating. All 200A deadbreak connectors must be mechanically secured with bails when connected.

If this product is supplied with a protective shipping cover(s), remove this shipping cover(s) and replace with the appropriate HV insulated cap(s) or connector(s) before submerging or energizing the circuit.

Inspect parts for damage, rating and compatibility with mating parts.

Excess distortion of the assembled product may result in its failure.

Limited Warranty:

1. ABB Installation Products Inc. warrants that its products will be free from defects in materials or workmanship for a period of two (2) years, except for tools which are warranted separately (see warranty accompanying those products). Fisher Pierce™ products and Elastimold™ Reclosers are warranted for three years; and Joslyn™ VBT and VBU capacitor switches are warranted for four years or 40,000 operations whichever occurs first. Upon prompt notification of a warranted defect, ABB Installation Products Inc. will, at its option, repair, replace or refund the defective product.
2. In no event shall ABB Installation Products Inc. be liable for any consequential, indirect, incidental or special damages, whether under contract, warranty, tort, negligence, strict liability or otherwise. ABB Installation Products Inc. will not be liable for providing temporary power, removal, working access, installation, transportation to or from any repair facility, or reimbursement for labor costs, or for any other expenses arising out of the removal or reinstallation of its products. Liability for breach of warranty is limited to the cost of repair, replacement or refund of the warranted product only.
3. Misuse, misapplication or modification of ABB Installation Products Inc. products immediately voids all warranties.

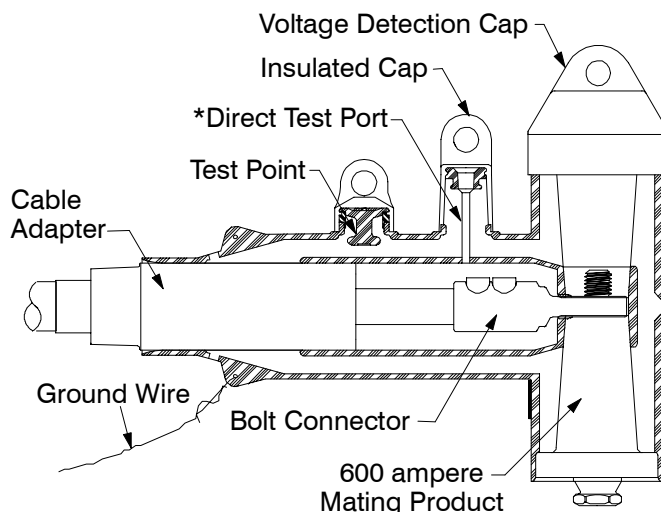
THE WARRANTIES AND REMEDIES CONTAINED HEREIN ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES AND REMEDIES, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE SPECIFICALLY DISCLAIMED.

IMPORTANT

1. Check contents of package to ensure they are complete and undamaged.
2. Check all components to ensure proper fit with cable and/or mating products.
3. Read entire installation instructions before starting.
4. Have all required tools at hand and maintain cleanliness throughout the procedure.

*CAUTION

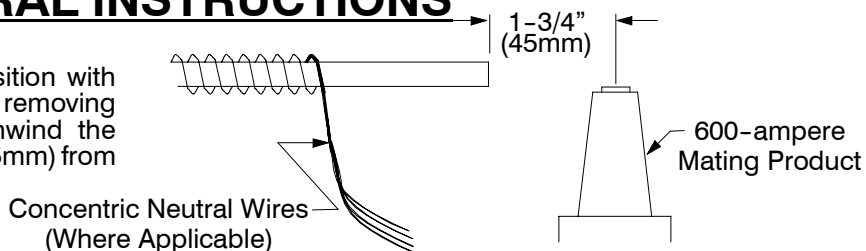
Line Voltage inside connector, not a capacitive test point. Direct Test Point for direct testing purposes only. Cap may be removed temporarily with a high voltage insulated hot stick to test for voltage using an appropriate HV meters with a Elastimold™ series 200TC-1, 200TC-2, 200TC-4 or other Elastimold™ approved meter adapters. Cap should be installed on the direct access port at all other times. Not for fluid injection purposes.



GENERAL INSTRUCTIONS

STEP 1

Assemble the cable in its final assembled position with enough slack to provide adequate clearance for removing the elbow. For concentric neutral cable, unwind the concentric neutral wires. Cut the cable 1-3/4" (45mm) from center line of the mating product.



STEP 2

Clean the outer surface of the cable a distance of 24" (610mm) or up to the bent back concentric neutral wires.

STEP 3 CABLE PREPARATION

Follow STEP A, B or C according to the cable being prepared.

A. 20MA or 21MA GROUNDING DEVICE OR 600ECS JACKET CABLE SEAL

Refer to the Installation Instructions supplied with products for removal of cable outer jacket, shield connection and grounding.

B. UNISHIELD* AND LEAD SHEATH CABLE

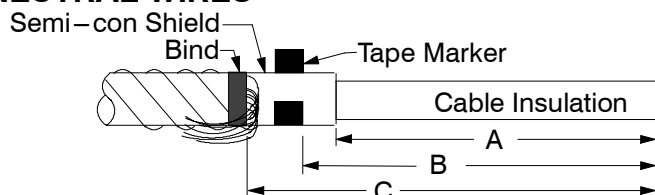
Refer to the Installation Instructions supplied with the 10TL cable shield adapter for cable preparation.

**Unishield is a trademark of General Cable Technologies Corporation.*

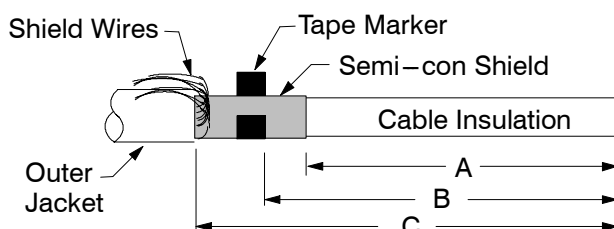
C. JACKETED AND NON-JACKETED CABLE

Remove the outer jacket (where applicable) and prepare cable as shown below. Refer to Table 1 for cable preparation lengths for the connectors.

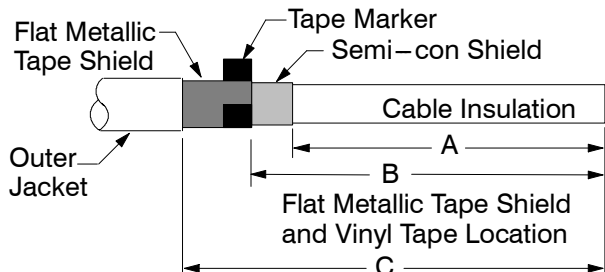
NON-JACKETED CONCENTRIC NEUTRAL WIRES



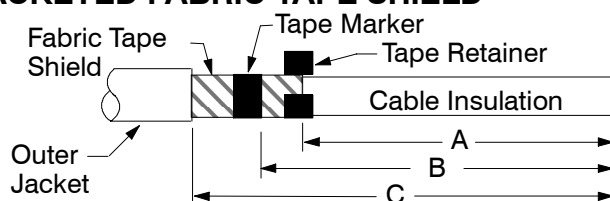
JACKETED SHIELD WIRES



JACKETED FLAT METALLIC TAPE SHIELD



JACKETED FABRIC TAPE SHIELD



JACKETED LONGITUDINALLY CORRUGATED SHIELD

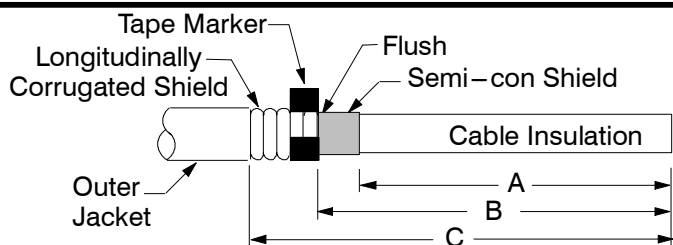
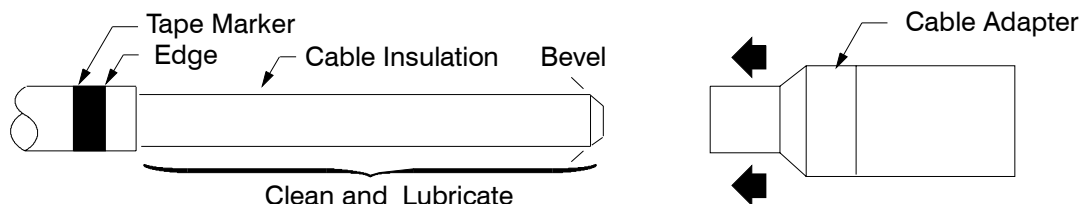


Table 1: Cable Preparation Lengths for Jacketed & Non Jacketed Cables

Cat No. / Product No.	Connector Size	A, in [mm]	B, in [mm]	C, in [mm]
EACT-0300	#2AWG - 300KCMIL	9 3/4 [248]	10 3/4 [273]	12 3/4 [324]
EACT-0500	4/0AWG - 500KCMIL			
EACT-0750	350KCMIL - 750KCMIL			
EACT-1250	750KCMIL - 1250KCMIL			

STEP 4 CABLE ADAPTER

Bevel the end of the cable insulation at a 45° angle, approximately 1/4" (6mm) back. Thoroughly clean, then lubricate cable insulation always working toward cable insulation shield. Install cable adapter, small end first, until it is flush with the edge of the tape marker.



STEP 5 CONDUCTOR

Verify cable insulation and bare conductor lengths are in accordance with the values specified in Table 2 below. If length specifications are not met, redo the assembly.

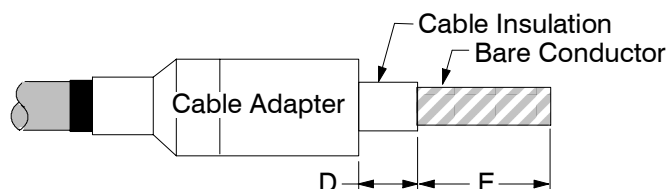


Table 2: Bare Conductor & Insulation Lengths

Cat. No. / Product No.	Connector Size	Cable Insulation, D in [mm]	Bare Conductor, E in [mm]
EACT-0300	#2AWG – 300KCMIL	2 [51]	2 1/4 – 2 3/8 [57–60]
EACT-0500	4/0AWG – 500KCMIL	2 [51]	2 1/4 – 2 3/8 [57–60]
EACT-0750	350KCMIL – 750KCMIL	0	4 1/4 – 4 5/8 [107–117]
EACT-1250	750KCMIL – 1250KCMIL	0	4 1/4 – 4 5/8 [107–117]

STEP 6 BOLT CONNECTOR

IMPORTANT: Carefully follow the order and steps involved with shearing off the bolt heads. **Start with bolt from the open end of the connector (see instruction sheet and related images)!**

Copper Conductor: Install the conductor into the connector per manufacturer's instructions *supplied with the bolted connector*.

Aluminum Conductor: Wire brush conductor and immediately install the conductor into the connector per manufacturer's instructions supplied with bolted connector. Wipe all excess inhibitor from the bolted connector and cable adapter surface after installation. The distance from end of bolted connector to cable adapter after installation should be in accordance with the values indicated in Table 3 below. These values vary based on conductor size. If length specifications are not met, redo the assembly.

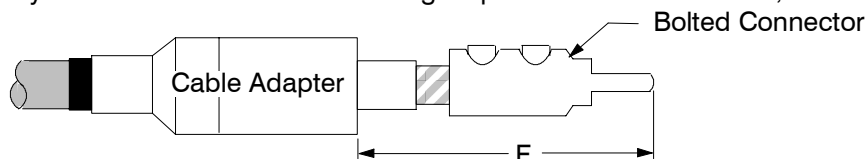


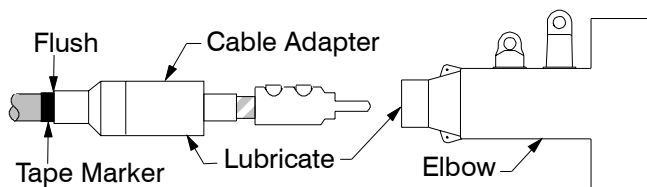
Table 3: Final Assembly with Connector after installation

Cat No. / Product No.	Connector Size	Distance from the end of the connector to the cable adapter after installation, F in [mm]
EACT-0300	#2AWG – 300KCMIL	7 – 7 1/2 [178–191]
EACT-0500	4/0AWG – 500KCMIL	
EACT-0750	350KCMIL – 750KCMIL	
EACT-1250	750KCMIL – 1250KCMIL	

CAUTION: Remove any sharp edges from the bolted connector to prevent damage to the elbow.

STEP 7 ELBOW

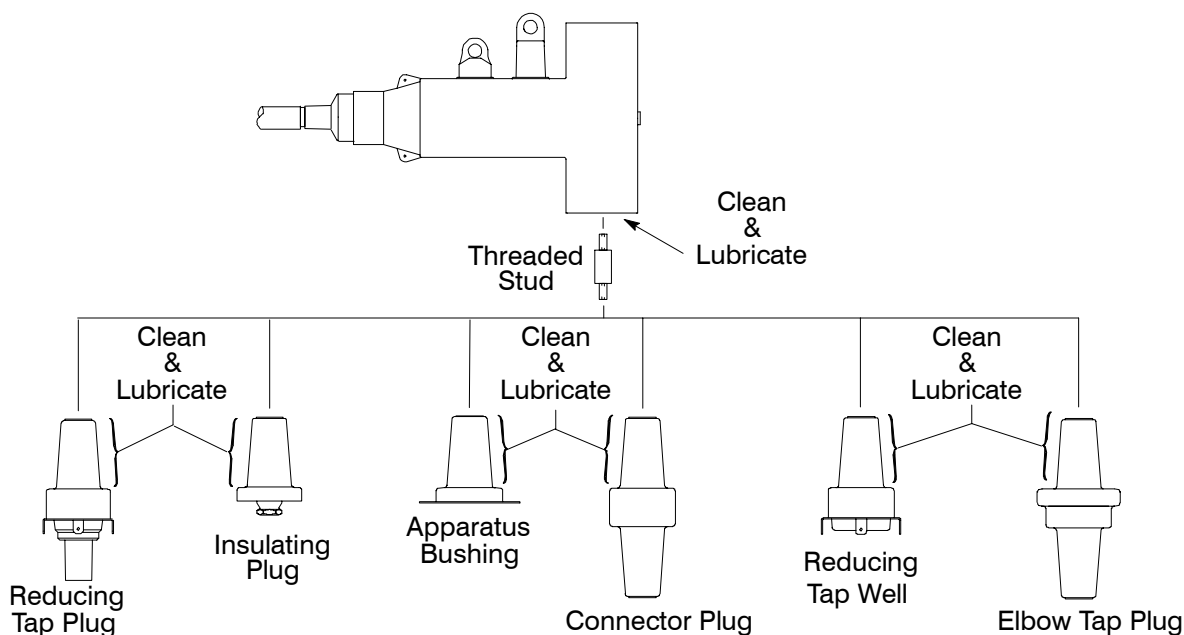
Lubricate cable adapter and inside of elbow cable entrance. Install elbow onto cable adapter until the elbow cannot advance further. Make sure cable adapter is still flush with tape marker. If not, reposition cable adapter. Remove tape marker.



STEP 8 MATING PRODUCTS

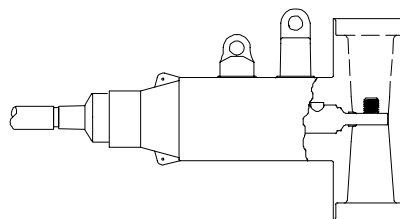
DO NOT CONNECT OR DISCONNECT MATING PRODUCTS WHILE ENERGIZED.
DO NOT ENERGIZE WHILE DISCONNECTED.

Remove protective caps from the elbow and the mating part. If the mating part is not equipped with a stud, hand tighten the threaded stud supplied with the elbow into mating part. Clean and lubricate both the elbow and the mating part with lubricant supplied.



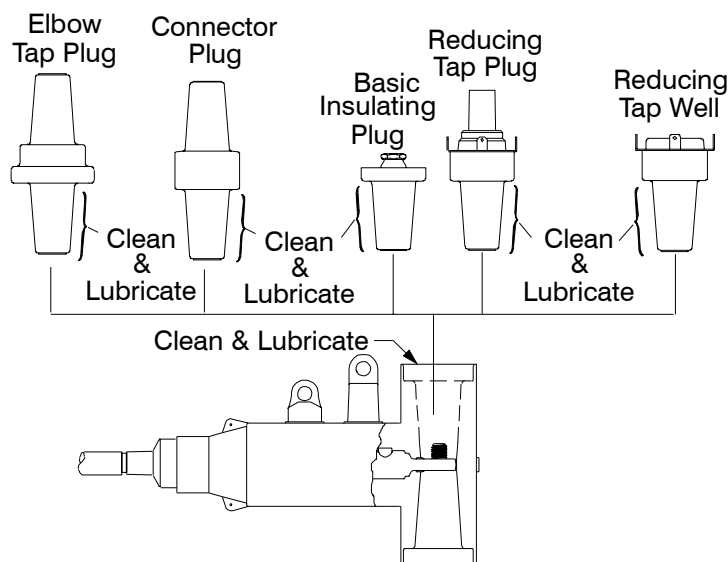
STEP 9

Push elbow onto mating part, lining up the hole in the compression lug with the stud on the mating part.



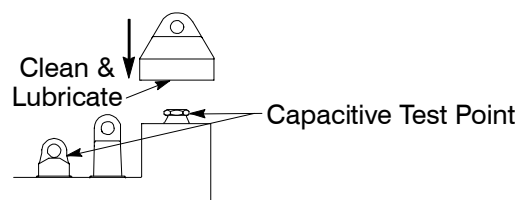
STEP 10

Clean and lubricate the mating part for the opposite end of the elbow. Insert the mating part into the elbow. Engage the threads and hand tighten. Torque mating part according to the instructions supplied with the mating part.



STEP 11

If an insulating plug is used as a mating part, clean and lubricate inner surface of the voltage detection cap and place on elbow. Push down hard until cap snaps into place. Follow voltage test directions below.

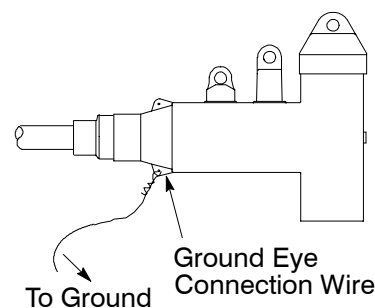


STEP 12

1. Insert one end of a piece of wire with ampacity at least equivalent to No. 14 AWG Copper through the grounding eye and twist to make a small loop. Do Not damage the eye. Connect wire to ground using a suitable connector.

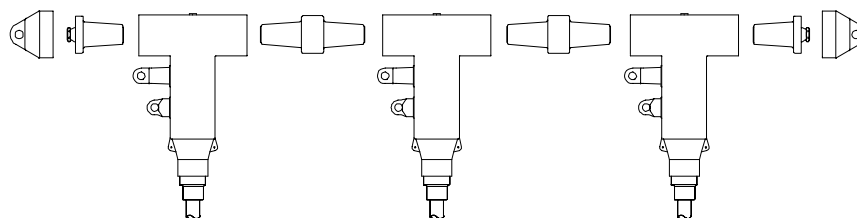
The shield of the cable must be grounded. Ground according to the instructions supplied with the grounding device. If no grounding device is used, the shield must be grounded through an alternate method.

To prevent moisture from entering cable, waterproof jacket.



STEP 13

CAUTION: Assemble 600 amp L-Kits as shown below ensuring that each component is tightened to the torque as specified in the component instructions.



DIRECT VOLTAGE TEST

DANGER: Insertion of any object, other than the appropriate direct voltage test port adapter and meter, into the direct test port or in close proximity to it can result in electric shock which will cause serious or fatal injury.

The direct test port elbow provides access to the cable conductor for the purpose of a direct voltage test with the following direct voltage test port adapter and meters.

<u>Direct Voltage Test Port Adapter</u>	<u>Voltage Meter / Indicator</u>
200TC-1	HD Electric Co. MARK I Three MARK IX Voltmeter/Phaser
200TC-2	ROSS METER Hi-ZVM 25SE-A/VM25B
200TC-4	CHANCE Auto-Ranging Voltage Indicator, Catalog No. C403-3374

It is important to read and understand the separate operating instructions for the Direct Voltage Test Port Adapter and the Voltage Meter/Indicator
