CAUTION : Read instructions thoroughly and completely prior to beginning installation.

Installation instructions for separable tee connector - type F interface

909TB/G

Up to 72 kV

For XLPE-insulated high voltage cable with bonded semi-conductive layer, Al laminated sheath & copper wire screen (equipotential connection of Al foil)

Check if the diameter over cable core insulation is in accordance with the cable reducer range as indicated in table below:

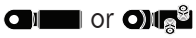
Cable reducer size (see label on cable reducer)	Dia. over core insulation (mm)	
	min	max
972CA-25	27.0	33.5
972CA-30	32.5	41.0
972CA-37	40.0	48.0
972CA-43	46.5	51.0
972CA-46	49.5	55.0
972CA-50	54.0	59.0
972CA-53	57.0	64.0
972CA-58	62.5	68.0

Required components for the connector installation :

1 x 909TB/G tee connector

1 x Cable reducer 972CA-W

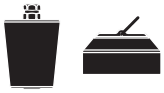
Roll adhesive tape



1 x Conductor contact - 900TBC or 900TMBC

+

Installation instructions

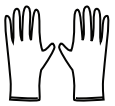


1 x Basic insulating plug + cap - 900BIPA

Water sealing mastic, type MWS

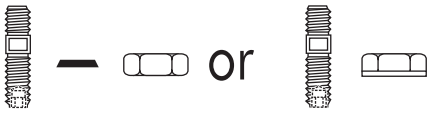
Water sealing mastic, type NGAF

1 x Heat-shrink tube



Gloves

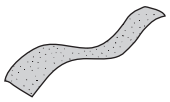
Silicone grease + wipers



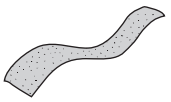
3 x Threaded stud M16, spring washer & nut

or

3 x Threaded stud M16 & flange nut



1 x Sand paper grade K220



1 x Sand paper grade K400

Earthing cable lug

Kevlar string

Constant force roll spring

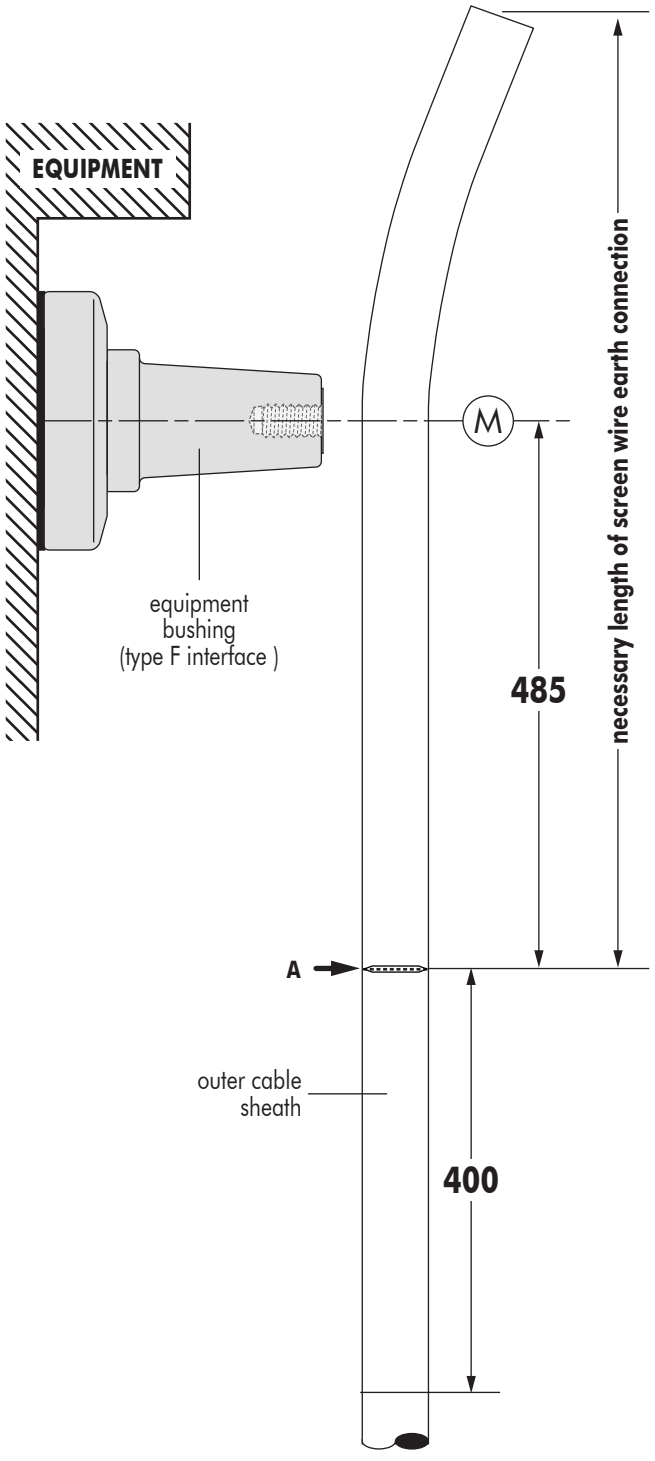
1 x Copper woven fabric tape

Nylon wire 2 m

Installation instructions

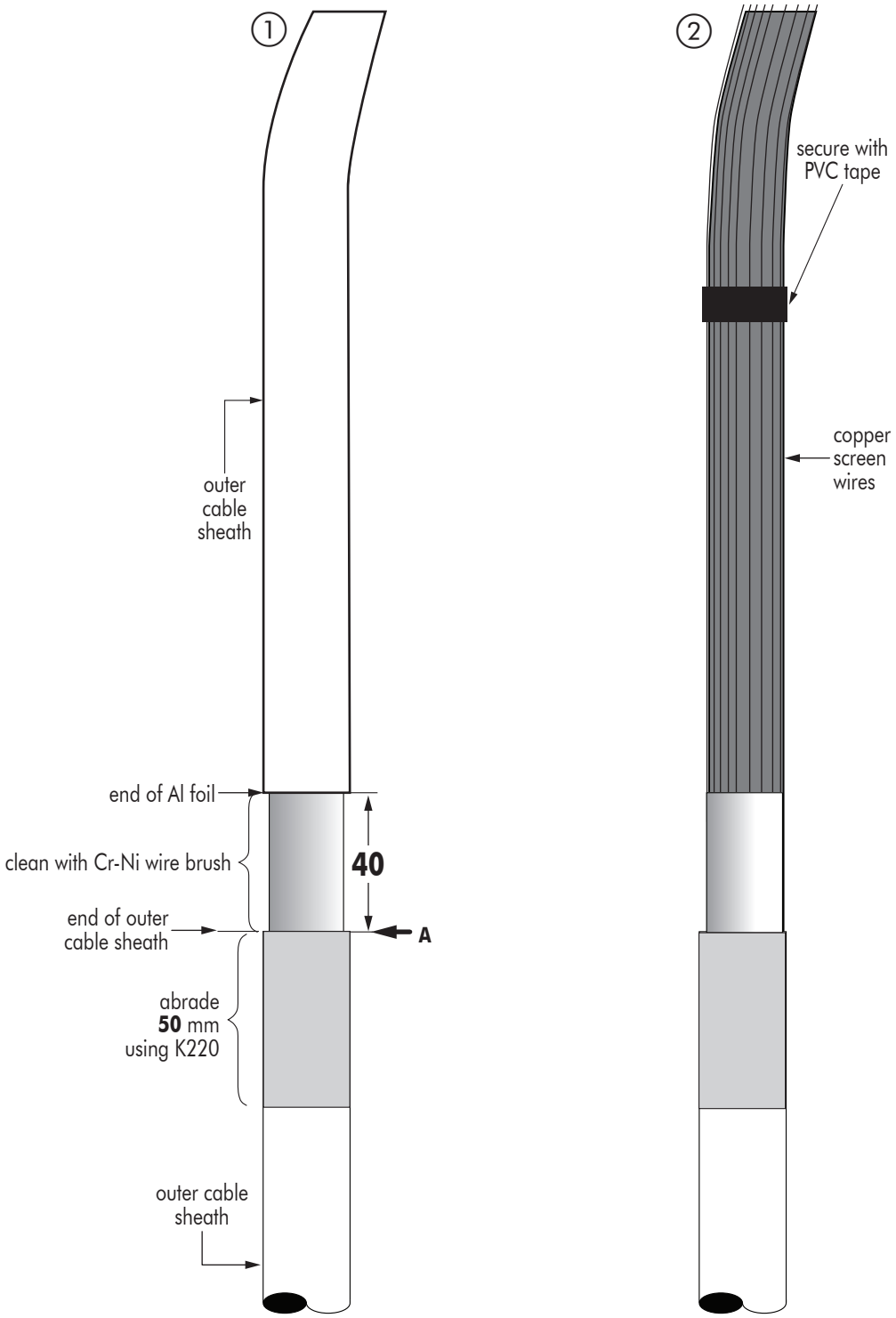
NB : Only one phase is shown in these instructions. Make off all three phases the same way. Use a cable conversion kit for 3-core cables.

CABLE PREPARATION



1. Train the cable into the approximate finished position next to the equipment bushing.
2. Mark the centre line **« M »** of the bushing.
3. Mark the outer cable sheath at a point **485** mm from the centre line **« M »** of the bushing (reference point **A**).

Caution: In the case of conductive coated outer cable sheaths, the conductive coating must be removed during the installation of accessories in order to be able to carry out e.g. cable sheath testing. For this purpose, the conductive coating of the outer cable sheath must be removed with a suitable stripping tool for a length of approx. **400** mm below the reference point **A**.



4 Mark the end of Al foil (**40** mm from the end of outer cable sheath), remove only the outer sheath between end of the outer sheath and end of the Al foil (①).

⚠ **Don't damage the Al foil.**

5 Make sure the Al foil is clean. Use a Cr-Ni wire brush

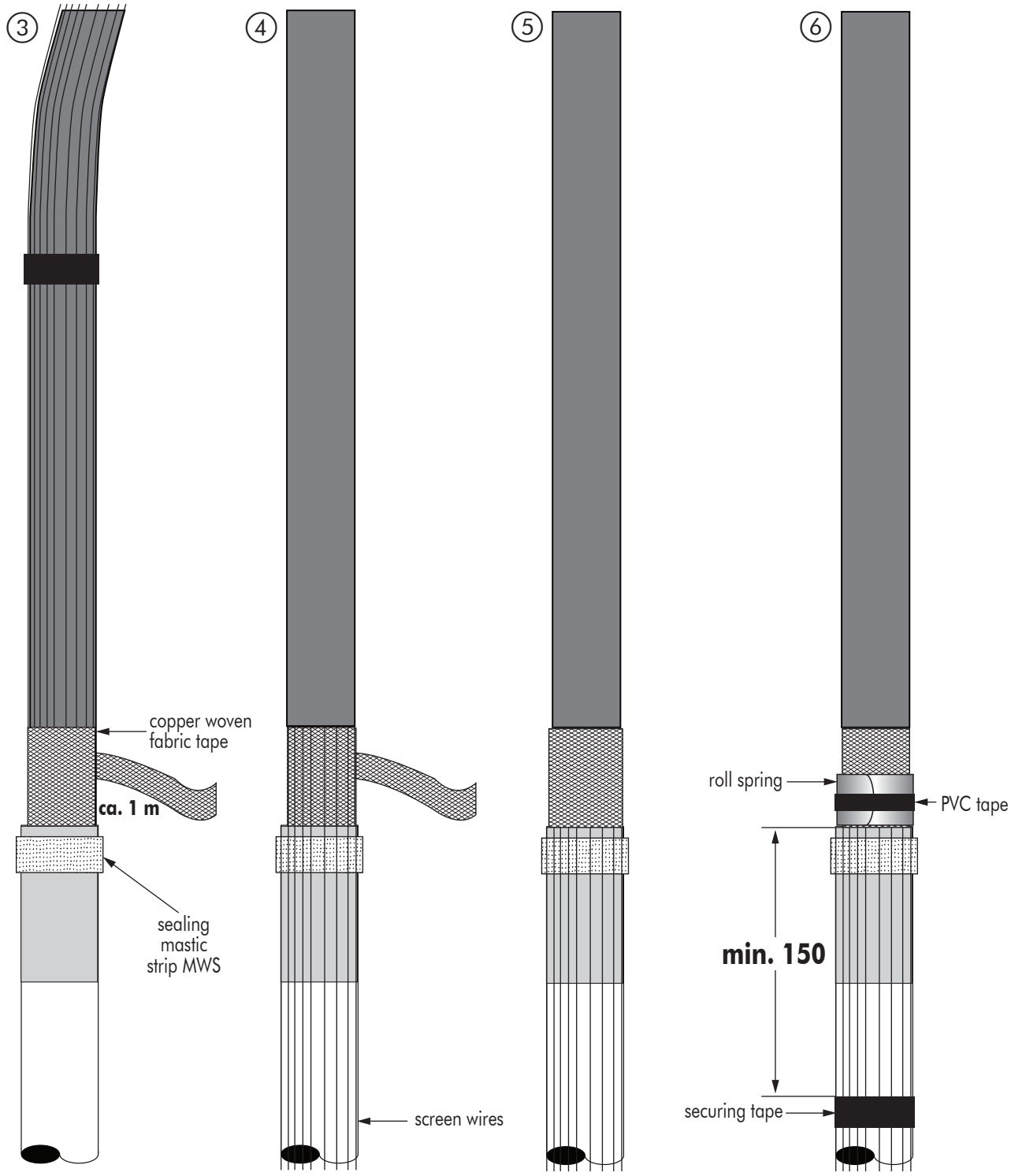
6 Abrade the outer sheath over a distance of **50** mm, using the emery cloth grade K220 (①).

7 Mark the end of Al foil with a cutter as predetermined breaking point (①).

8 Remove the rest of the outer cable sheath together with the Al foil (②).

⚠ **Don't damage the copper wire screen.**

9 Temporary secure the screen wires with the PVC tape (②).



10 Wrap two layers of copper woven fabric tape 50% overlapped and with 100% elongation on the Al foil of cable. Fix the end by a sling and fasten it with knots. **let app. 1 meter excess length to use it later** (③).

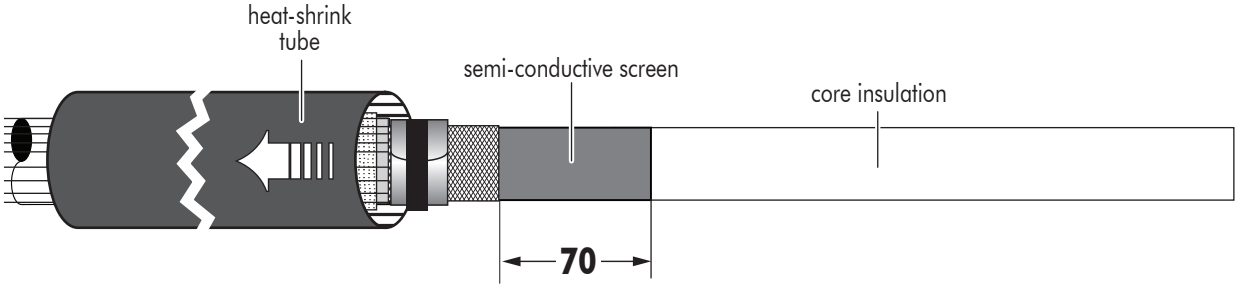
11 Apply one layer of sealing mastic around out the outer sheath (③).

12 Bend all the copper screen wires downwards, around the outer sheath, pressing them equally spaced into the mastic (④). Fix them at min. **150** mm from the edge of the outer sheath.

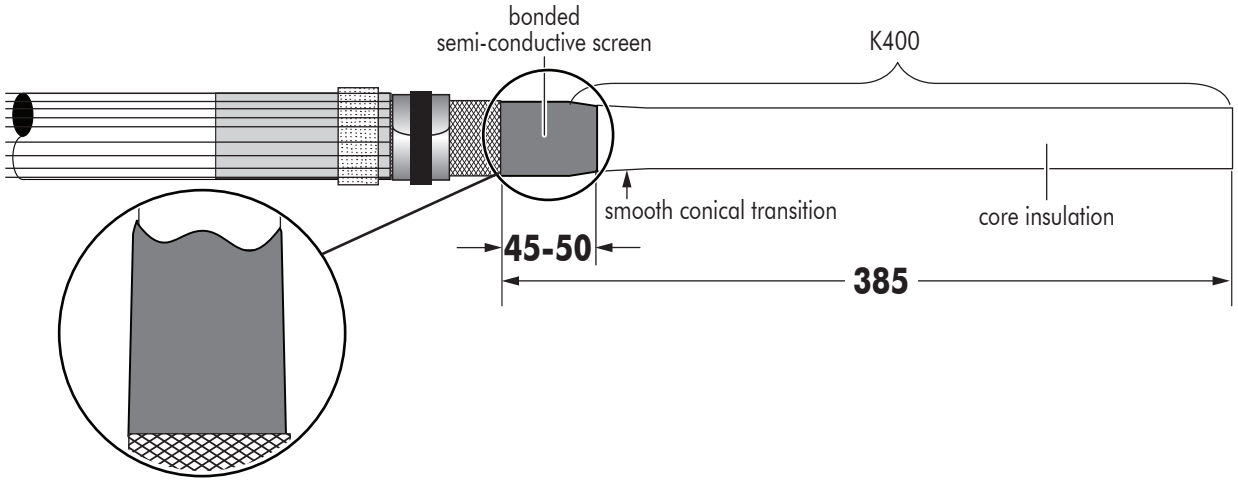
13 Fix the copper screen wires on the copper fabric tape with the residual 1 meter of copper woven fabric tape with 100% elongation. Fix the end by a sling and fasten it with knots (⑤).

14 Install the roll spring over the copper woven fabric tape (⑥).

15 Apply one layer PVC tape on the roll spring to fix it.



16 Slide the heat-shrink tube over the cable.

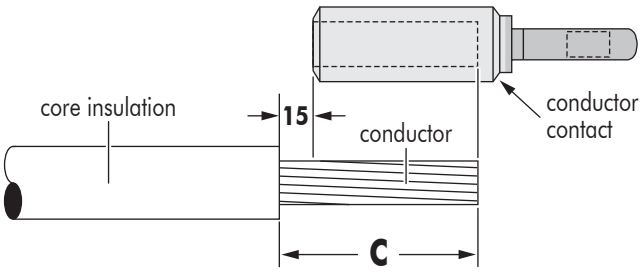


17 Cut the cable at a distance of **385** mm from the edge of the copper woven fabric tape.
18 Remove the semi-conductive screen up to **70** mm above the edge of the copper woven fabric tape.
19 Create a smooth conical transition between cable insulation and semiconductive screen (use appropriate tools and emery cloth, K400), leaving **45-50** mm of the semi-conductive screen above the edge made with the copper fabric tape.
20 **Remove any traces of conductive residue from the core insulation.**

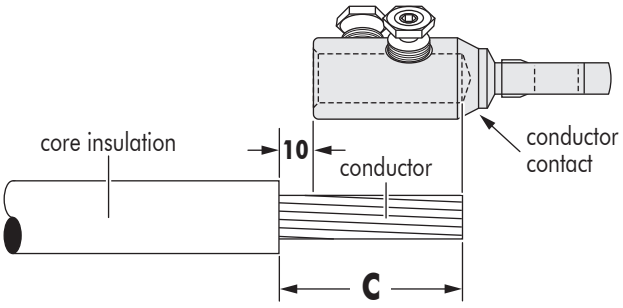
⚠ **IMPORTANT :**
Slightly roughen the insulation surface using emery cloth K400.

REMOVAL OF THE CORE INSULATION

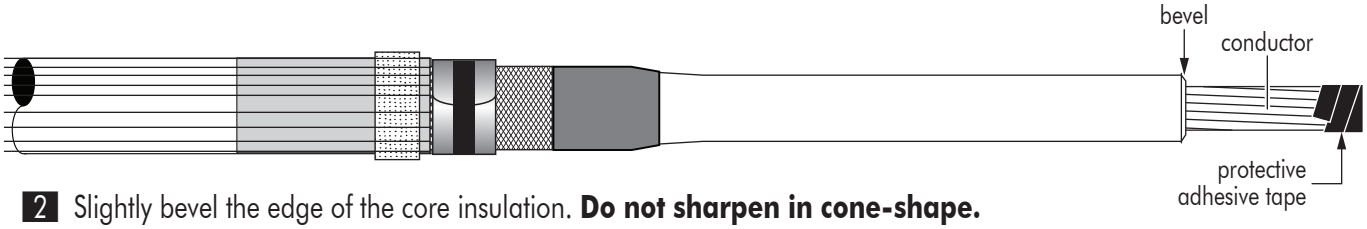
A. Compression type contacts (Type TBC-X)



B. Mechanical type contacts (Type TMBC-X)

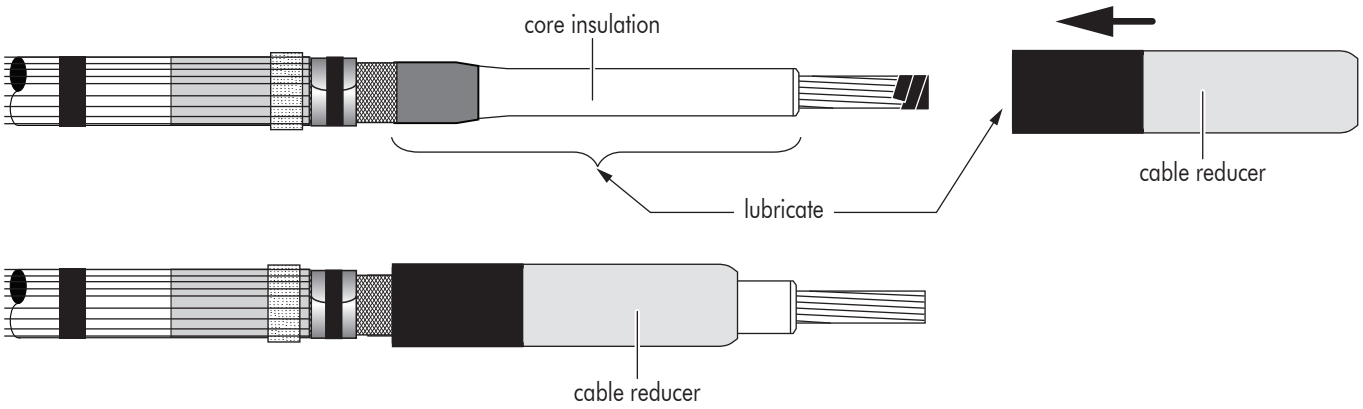


1 **A. For compression type contacts :** remove the core insulation from the conductor for a distance **« C »** mm (**C** = depth of contact bore + **15** mm).
1 **B. For mechanical type contacts :** remove the core insulation from the conductor for a distance **« C »** mm (**C** = depth of contact bore + **10** mm).



2 Slightly bevel the edge of the core insulation. **Do not sharpen in cone-shape.**
3 **Thoroughly clean core insulation.** Always wipe towards the screen wires.
4 As a protection, wrap a few turns of adhesive tape around the conductor end.

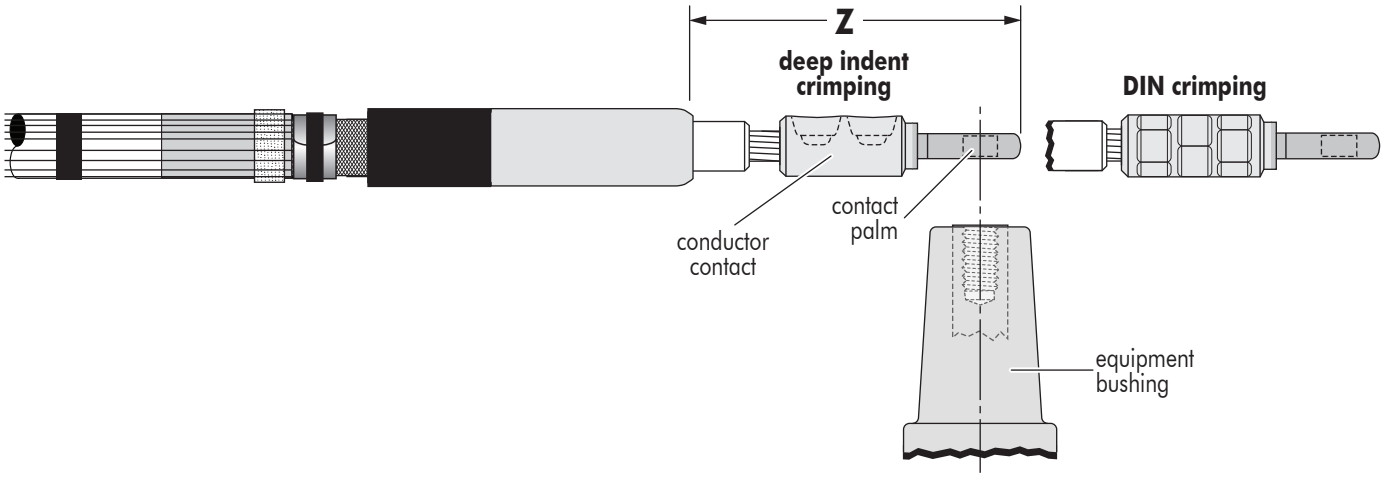
INSTALLATION OF THE CABLE REDUCER



1 Lubricate* the indicated area : core insulation, mastic, semi-conductive screen and inner surface of the reducer.
2 Slide the reducer down the cable.
3 Remove the protective adhesive tape from the conductor.

CRIMPING/TIGHTENING OF THE CONTACT

A Compression type contacts (Type TBC-X)

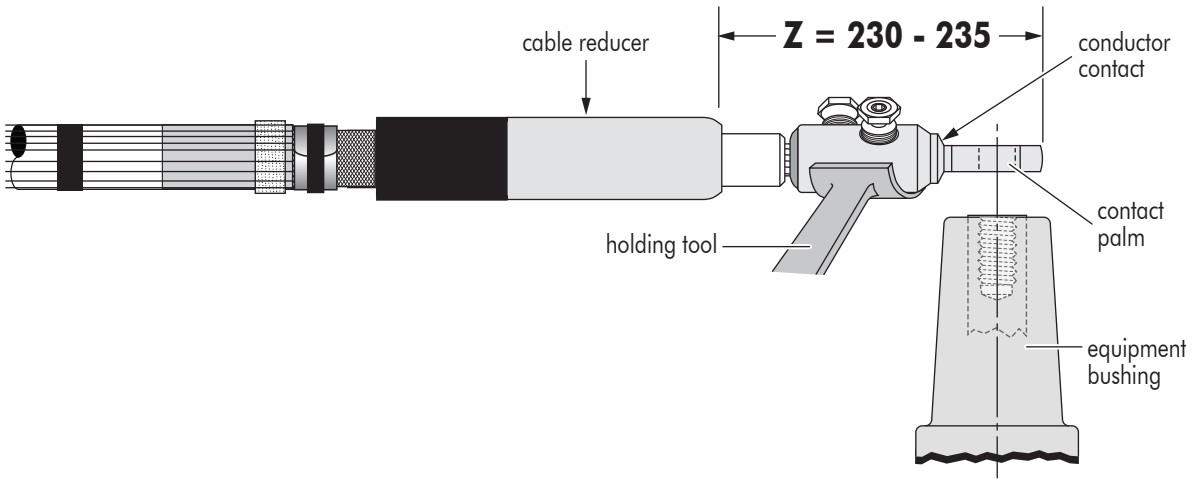


1 For aluminium conductors : before installing the conductor contact, wire brush the conductor.
2 Fit the contact on to the conductor.
3 Position the crimp contact taking care that the contact hole aligns with the bushing hole.
4 Prior to crimping, distance **« Z »** must be between **230** and **235** mm.
5 Crimp the contact. Please refer to the crimp chart for crimp sequence.
6 After crimping distance **« Z »** must be between **230** and **240** mm.
If necessary, adjust the position of the cable reducer until distance **« Z »** is within the tolerance range.
7 **Remove any burrs left after crimping and wipe-off excess inhibitor.**

* USE ONLY THE SILICONE LUBRICANT SUPPLIED

B Mechanical type contacts (Type TMBC-X)

Before tightening

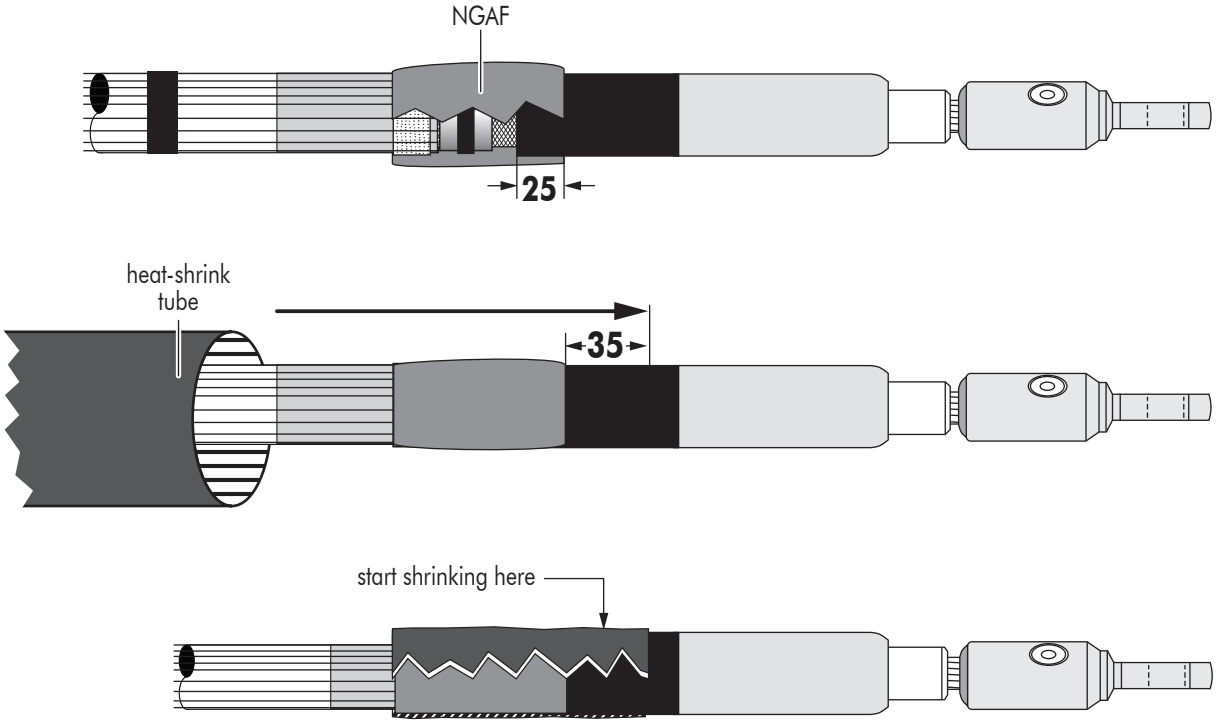


1. For aluminium conductors : before installing the conductor contact, wire brush the conductor.
2. Insert, if necessary, the centre ring into the contact barrel according to the table in the contact installation instruction.
3. Position the contact taking care that the contact hole aligns with the bushing hole.
4. Before tightening, distance **« Z »** must be between **230** and **235** mm.
5. Tighten the contact. Please refer to the installation instruction included with the contact.

After tightening

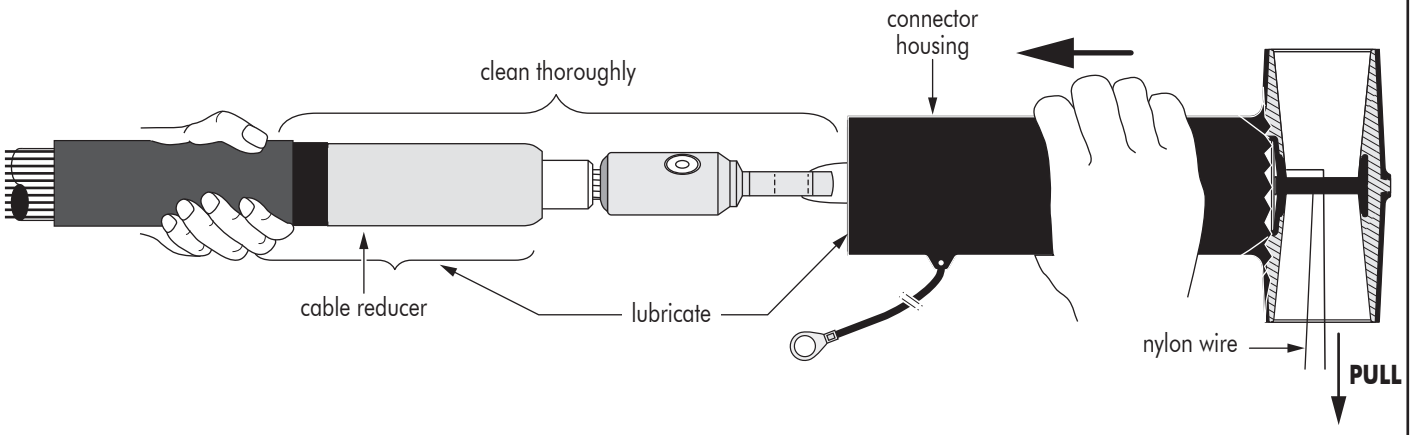
6. After tightening, distance **« Z »** must be between **230** and **240** mm.
   If necessary, adjust the position of the cable reducer until distance **« Z »** is within the tolerance range.

WATER SEALING



1. Apply one layer NGAF from MWS mastic to cable reducer (**25** mm overlap of cable reducer).
2. Mark a distance of **35** mm starting at the end of the NGAF mastic.
3. Slide the heat-shrink tube over the black part of the cable reducer until flush with the marker.
4. Shrink down the tube. Start shrinking at the side of the contact using a torch with a soft yellow flame. Heat regularly in the same direction and in a circular motion around the tube while moving forward continuously. Take care that the tube doesn't glide off during shrinking. Let the tube cool down.

CONNECTOR INSTALLATION ON CABLE



1. **Clean cable reducer, core insulation and contact.**
2. Lubricate* the inside of the connector housing and outer surface of the cable reducer.
3. Whilst preventing the cable reducer from further movement down the cable, gently slide the housing on the cable. Its final position is reached when the centre of the contact spade is along the axis of the interfaces of the connector. **The cable reducer must stay in place during installation.** In case of a flexible cable, pull the cable contact through the connector by means of the nylon wire. Afterwards remove the nylon wire.

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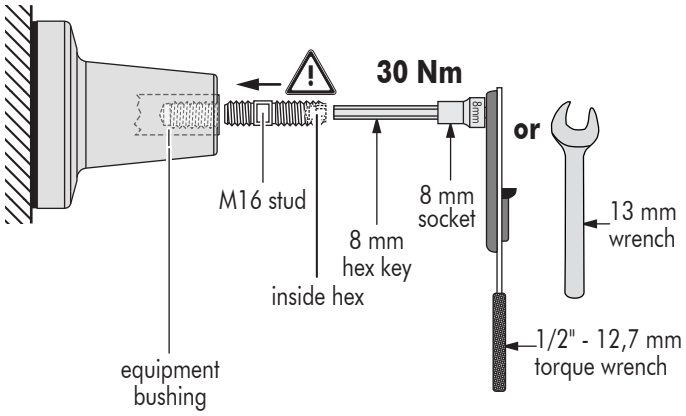
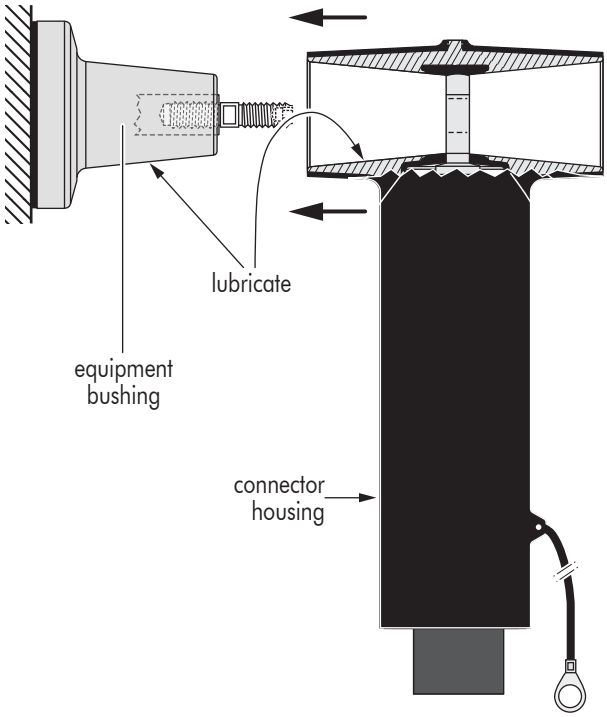
CONNECTOR INSTALLATION ON BUSHING

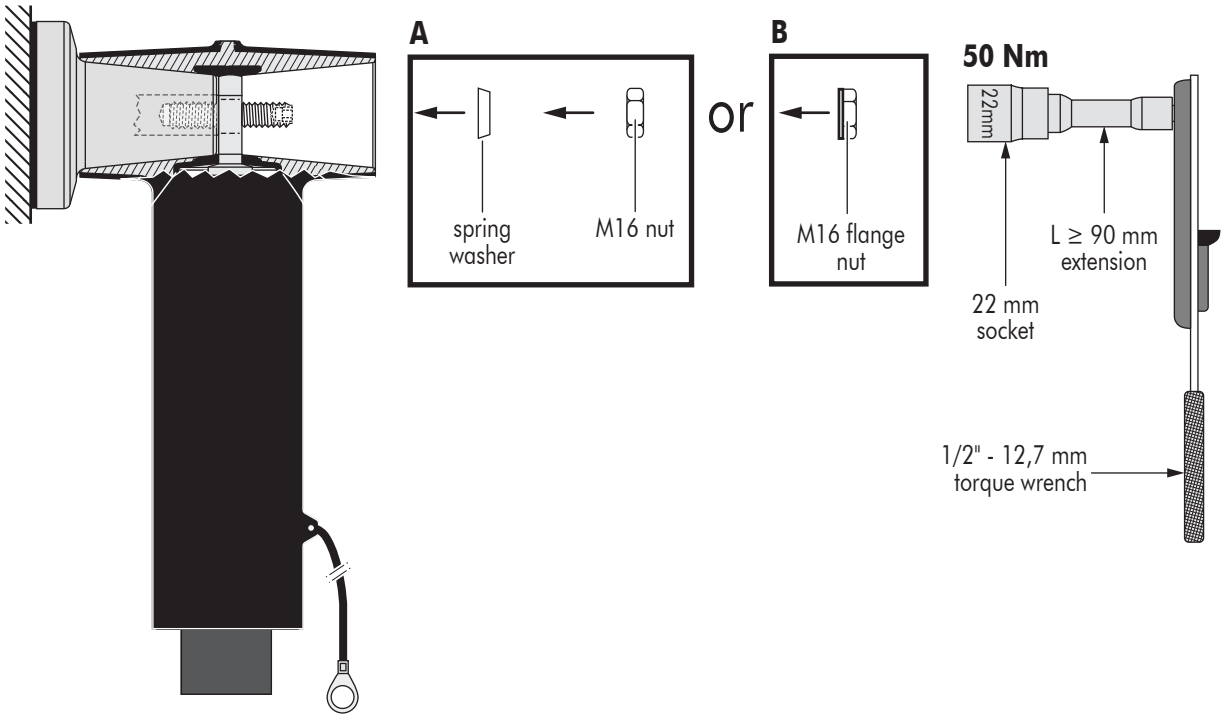


1 Install M16 threaded stud into the bushing interface.
2 Using a 13 mm wrench or a hex key of 8 mm, tighten the stud exerting **30** Nm (3 kgm or 22,1 foot-pounds).

⚠ **Position of the stud**:
The longest side with inside hex outside of the bushing interface.



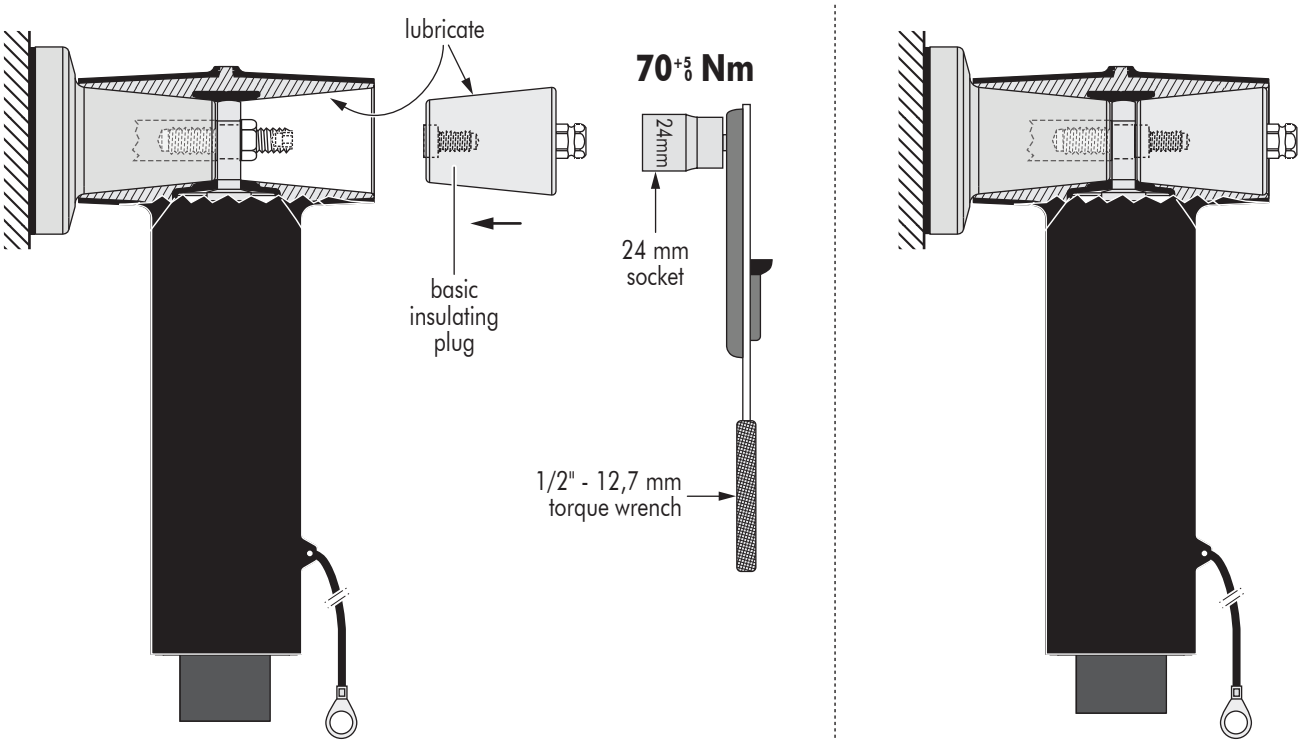
3 Clean and lightly lubricate* both connector and bushing interface.
4 Push the connector on to the bushing.



5 A: Install the spring washer and M16 nut on to the threaded stud.
B: Install the M16 flange nut on to the threaded stud.
6 Use torque wrench with a socket wrench 22 and tighten exerting **50** Nm (5 kgm or 36,9 foot-pounds) of torque.
In order to achieve the correct applied torque ensure that there is no lubricant on the threaded parts.

* USE ONLY THE SILICONE LUBRICANT SUPPLIED

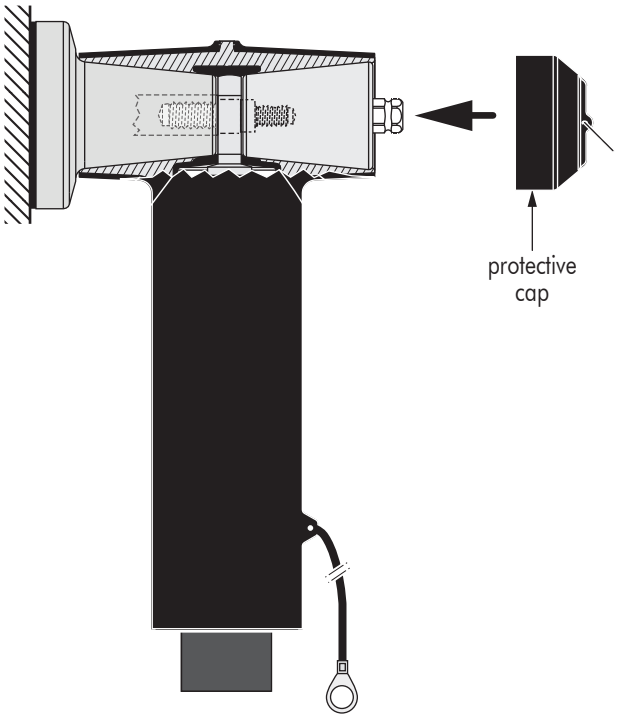
INSTALLATION OF THE BASIC INSULATING PLUG



1. Clean and lubricate* the insulating plug for the opposite side of the connector.
2. Insert the plug in the connector and tighten it untill the plug noticably blocks in its end position (no further rotation is possible), using a torque wrench with a socket of 24 mm. **Remark**: The required torque may exceed **70** Nm.
3. Once the plug is blocked, apply a torque of **70** $^{+5}_{0}$ Nm to secure.

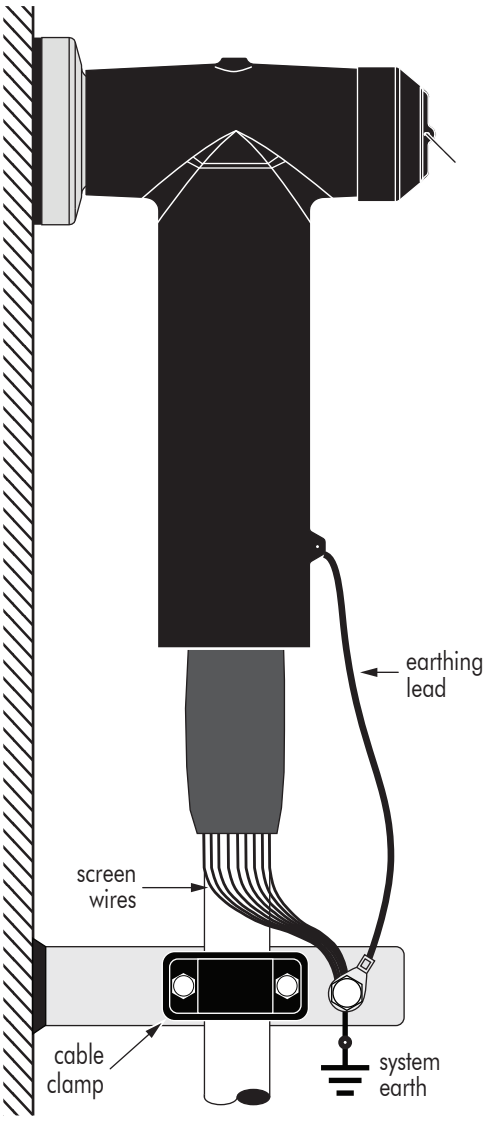
* USE ONLY THE SILICONE LUBRICANT SUPPLIED

INSTALLATION OF THE CAP



Installation on insulating plug :
Clean the inside of the cap and the outside surface of the connector and insulating plug. Push the cap over the connector and on to the insulating plug. Slightly pull up the edge of the cap to exhaust the air during assembly. Press the centre of the cap on to the locking point until it snaps in place. Position the cap with the pulling tab pointing downwards.

CONNECTOR EARTHING AND CABLE CLAMPING



1. Bend back the screen wires along the outer sheath to form a pig tail.
2. Connect the earthing lead and screen wires to the system earth.

NOTE :
A connector/bushing mated combination should not be allowed to carry the full weight of the cable. Therefore it is necessary to clamp the cable as close as possible to the connector.

IMPORTANT NOTES :
- **Never disconnect the connector from energised equipment nor energise a disconnected connector without previously installing on its appropriate corresponding mating part.**
- **Do not allow hydrocarbon oils or solvents to contaminate the E.P.D.M. rubber. In the event of contamination, wipe the surface clean with a dry cloth.**

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