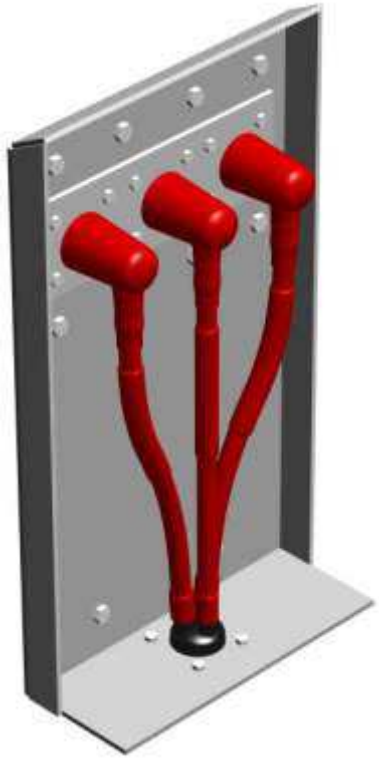
Shrink Polymer Systems

Cable Installation Materials – 24 volts to 36 kV

Installation Instruction Heatshrink Termination For 3 Core Polymeric Cables 7.2kV to 36kV

*** PLEASE READ INSTRUCTIONS THOROUGHLY BEFORE PROCEEDING ***

INDOOR



OUTDOOR

Download free QR code scanning software on your smartphone and scan to see a jointer training video on a termination with earthing

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THORNE & DERRICK INTERNATIONAL

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General Fitting Instructions

* **It is highly recommended that a tool suitable for the removal of the semi-conductive screen is used to provide a reliable discharge free termination screen point. See our website for training videos.**
* **Use a propane gas torch with a soft flame**
* **Avoid a pencil like blue flame which is caused by unregulated supply**
* **Keep the flame on the move to ensure even shrinkage of all the materials and also helps to reduce scorching**
* **Ensure that all components are kept clean and grease free during installation**
* **Allow to cool before applying any mechanical strain**

Remove Outer Cable Sheath:

VOLTAGE	INDOOR L	OUTDOOR L	X
7.2kV	650mm	700mm	LENGTH OF LUG BARREL + 5mm
12kV	650mm	700mm	
17.5kV	650mm	700mm	
24kV	700mm	800mm	
36kV	800mm	900mm	

Table 1

Note:- Dimension "L" is a guide only. The actual length is determined by the overall geometry of the equipment.

3 Core Cable With Armour

If the cable is armoured, bonding of the armours must be completed using the appropriate armour earthing kit.

A) For indoor terminations (cable end box) - Order kits Ref: SPS 180, SPS 193 *

B) For outdoor terminations (pole top) - Please advise conductor size and voltage.

* SPS 180 - 16-95mm^2 at 7.2 to 17.5kV

  SPS 193 - 120-300mm^2 at 7.2 to 17.5kV

  (For other voltages see selection chart in general catalogue)

IMPORTANT NOTICE TO PURCHASER:- Sellers and Manufacturere's only obligation shall be to replace such quantity of the product proved to be defective. Neither the Seller nor Manufacturer shall be liable for any injury, loss or damage, direct or consequential, arising out of the use or inability to use the product. Before using, User shall determine the suitability of the product for his or her intended use and User assumes all risk and liability whatsoever in connection therewith.

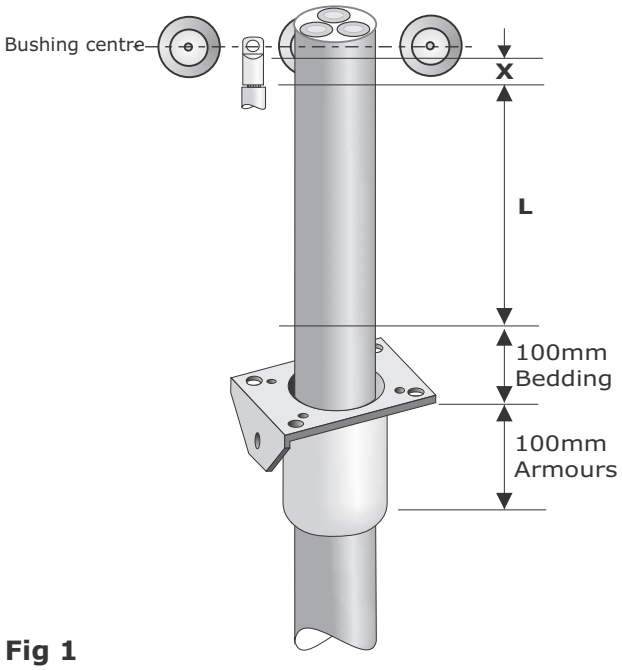

Fig 1

1. Installation

Prepare the cable as shown.

Note:- The "L" dimension should not be longer than the distance between bushing centres and base plate.

De-grease and abrade the cable for a distance of 100mm below the outer sheath cut.

Note:- User may wish to alter bedding and armour dimensions to suit the type of gland/earthing arrangement to be used.

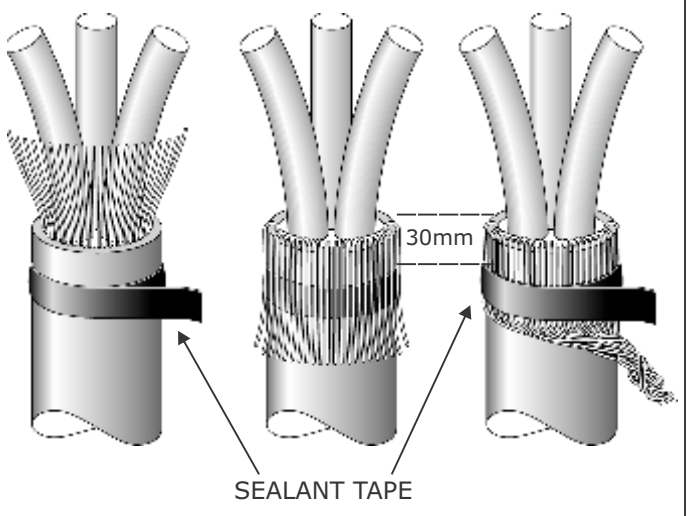

Fig 2

2. Screen Preparation

Copper Wire Screen

Apply one layer of sealant tape around the outer cable sheath 30mm below the sheath cut.

Bend back each screen wires and press them into the sealant tape. Apply another layer of tape over the bent back wires. Twist together to form a conductor and bond to a suitable earth point.

Note:- If cable has copper screen wires on each core, bend these back and press into the mastic tape. Just like the overall copper screen wires, twist together and bond to earth.

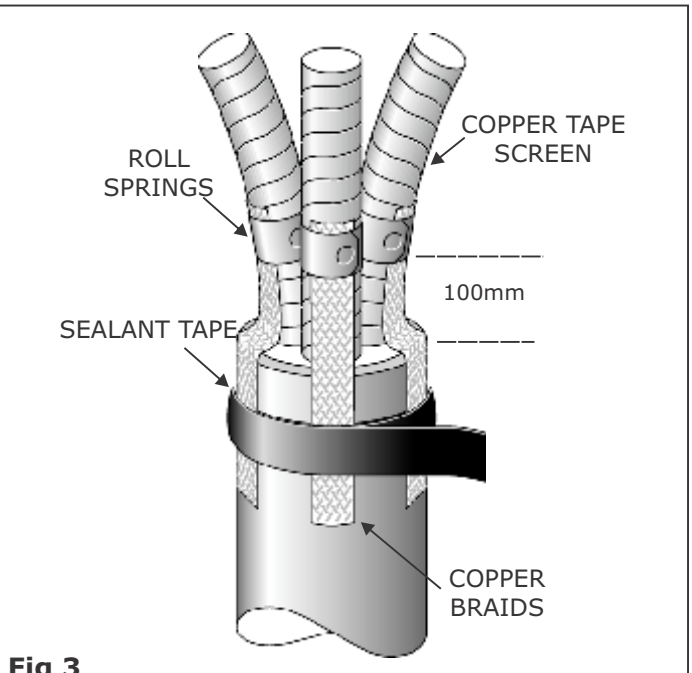

Fig 3

Copper Tape Screen

Secure the earth braids to the copper tape screens so that the solder block is positioned upon the cable bedding. A turn of mastic sealant tape should be applied beneath and on top of the solder block.

If a constant force spring is used to connect the earth braids, the spring should preferably be positioned above the fingers of the breakout boot.

These braids will either be bonded to the earth gland or other suitable earth point.

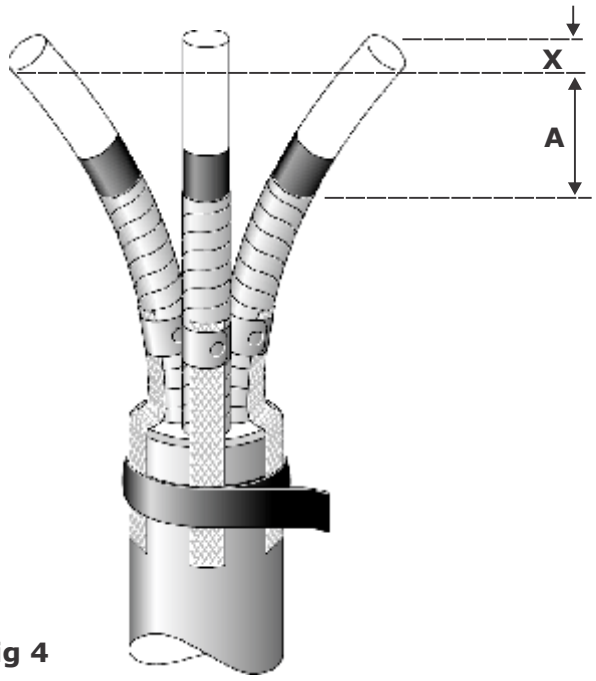

Fig 4

Remove the copper tape screen to length A+X as indicated in Table 2.

Note:- If the cores are to be crossed the copper screen should be removed after the initial setting of the cores.

It may be necessary to temporarily secure the copper tapes to prevent them from unwinding.

Voltage	A	B	X
7.2kV	130mm	110mm	Lug Barrel Length + 5mm
12kV	185mm	165mm	
17.5kV	240mm	220mm	
24kV	310mm	290mm	
36kV	500mm	480mm	

Table 2

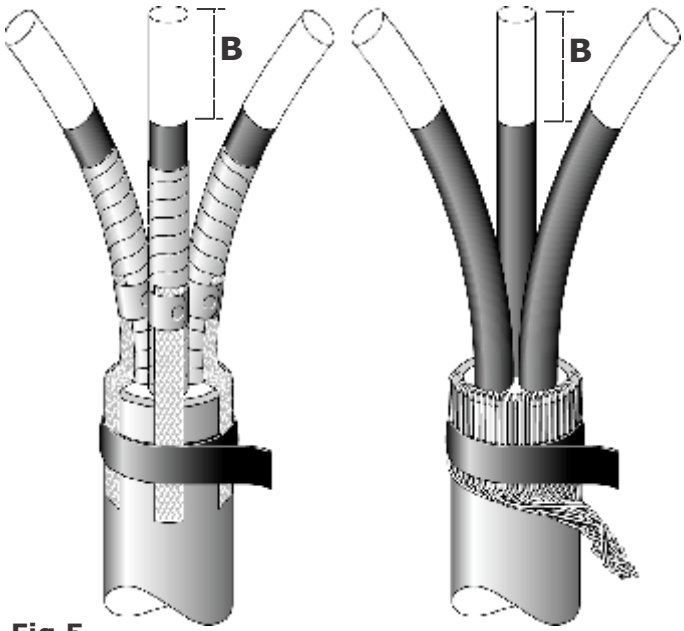

Fig 5

3. Conductive Layer Treatment

Extruded Conductive Screen Layer

Remove the semi-conductive screen layer using a suitable tool to dimension B+X as indicated in Table 2.

Note:- It is very important that the screen is removed leaving a clean straight cut and that no scoring or damage is done to the primary insulation. We highly recommend the use of approved screen removal tools (see our website for tools and demonstration videos). It is good practice to flame brush the primary insulation and conductive screen cut, this has the effect of removing any minor surface irregularities or burrs that may be present.

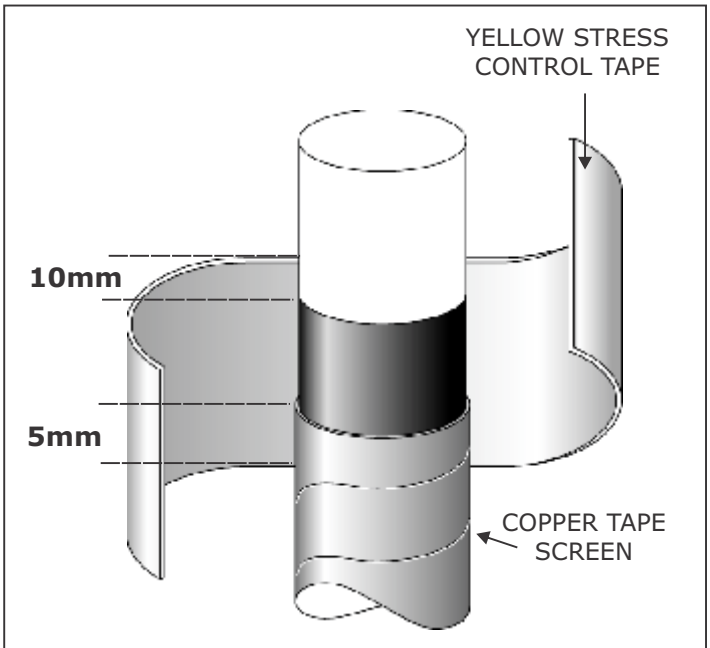

Fig 6

Apply Stress Control Tape

De-grease the insulation and screen using the solvent tissues provided.

Remove the release paper from the yellow stress control tape. Stretch to approx. 50% width and apply the tape around the end of each core screen. Extend onto the primary insulation by 10mm and about 5mm onto the copper tape screens.

Note: It may not be necessary to use all of the tape supplied.

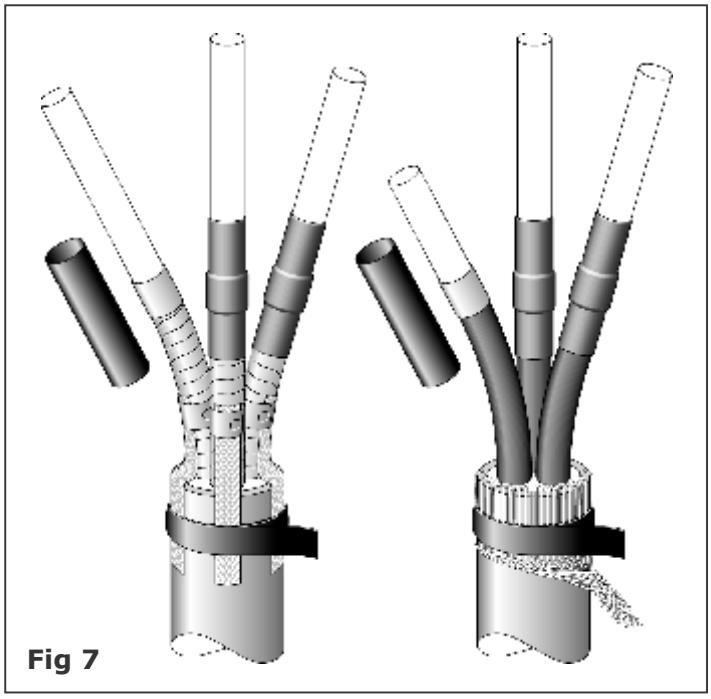

Fig 7

4. Stress Control Tubes

Position the stress control tubes onto each core so that the bottom of each tube extends past the yellow mastic by a maximum of 10mm.

Starting at the end closest to the cable crutch, Shrink each tube one at a time keep the flame on the move to ensure an even wall thickness.

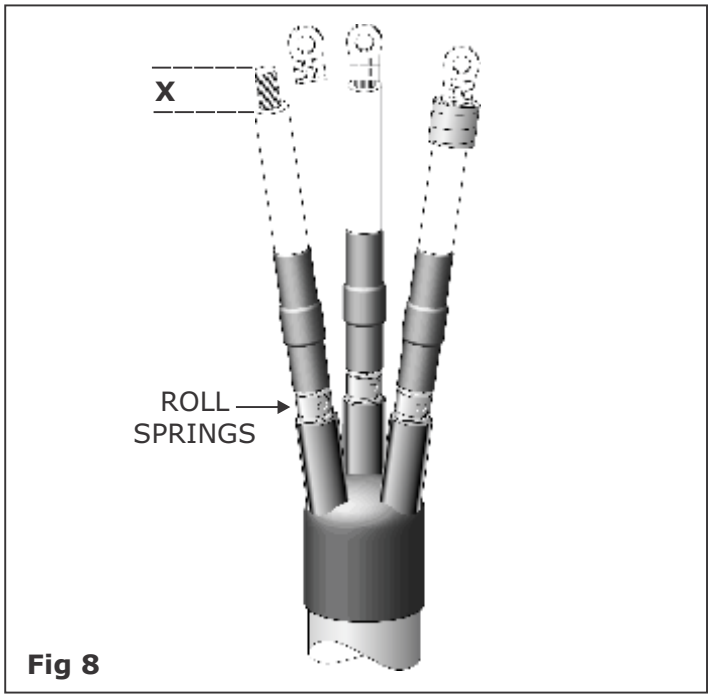

Fig 8

5. Installing Cable Lugs

Remove the insulation from each core to the X dimension in Table 1.

Install cable lug and remove any burrs or sharp points that may be present.

Preheat each Lug and wrap two layers of Red Sealant Tape over the Lug barrel and extend onto the Insulation by approx 10mm. Ensure the Tape is applied as shown. **Important:-** use more tape to build up the diameter to ensure tube recovers upon it and creates a moisture seal.

6. Installing The Breakout Boot

Slide the three legged boot over the cores and push down into the crutch of the cable. Shrink from the shoulder of the breakout and down to the cable sheath, then from the shoulder to the cores.

Apply a turn of red sealant tape around each breakout turret as shown.

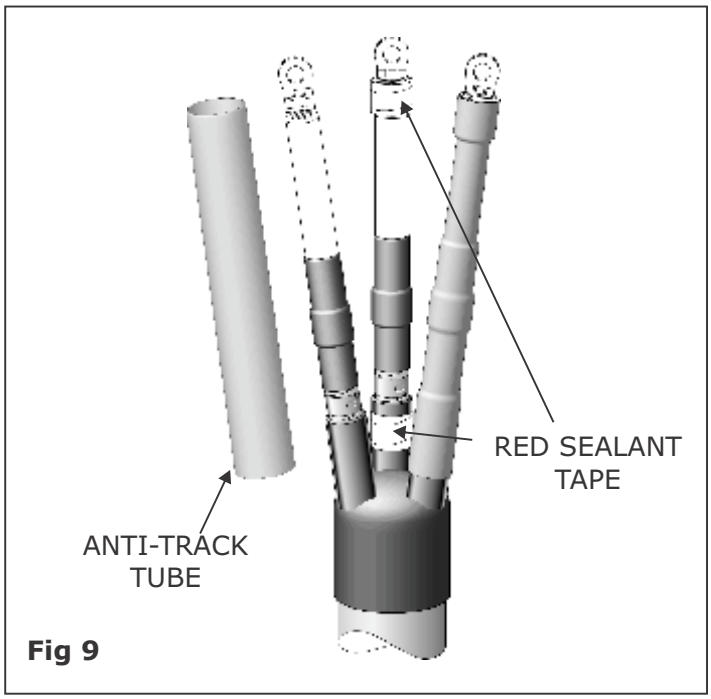

Fig 9

7. Installing The Anti-Track Tube

Position the anti-track tubes so that they cover the turrets of the breakout boot and the barrels of the lugs.

Starting from the cable crutch area, Shrink the tubes in place. Keeping the flame moving to ensure an even wall thickness, ensure the tubes are fully recovered and wrinkle free.

Allow the tubes to cool to hand hot and trim at the lug end with a sharp knife if necessary.

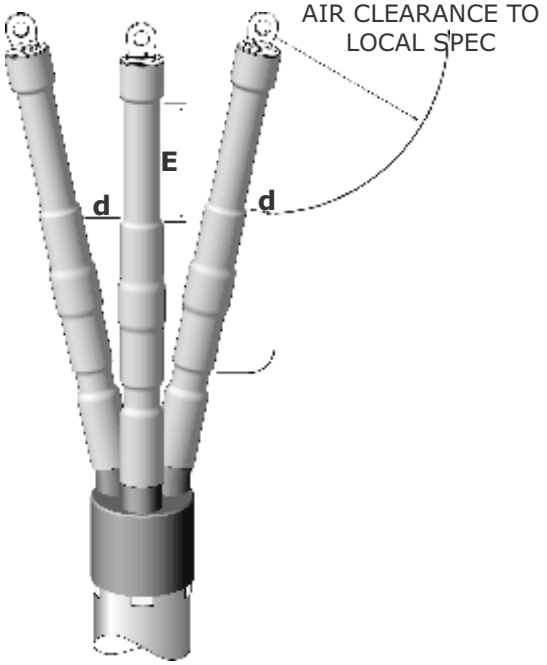

Fig 10

Indoor Terminations

To ensure long term performance of medium voltage terminations, certain separation distances are required as indicated in Table 3.

Distance (d) Phase/Phase & Phase/Ground		Top of Stress Control Tube To Bottom of Lug Barrel
Voltage	**d=(mm)**	**E**
7.2kV	15mm	30mm
12kV	20mm	50mm
17.5kV	20mm	75mm
24kV	40mm	95mm
36kV	50mm	250mm

Table 3

Note:- Bushing protection boots will be required for the majority of installations.

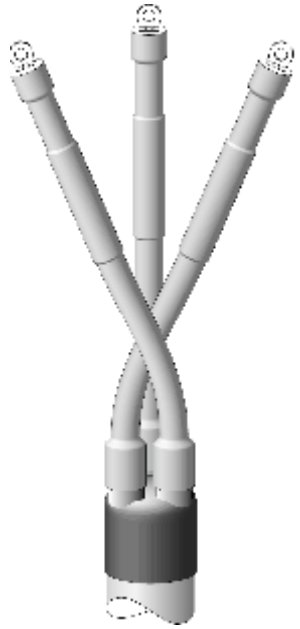

Fig 11

If it is necessary to cross the cores, the cross **MUST** be in a screened area as shown.

8. Installation Of Rain Sheds

On outdoor terminations the sheds should be fitted from the bottom up as indicated in the drawing opposite.

Indoor 36kV terminations are supplied with one shed per phase and four sheds per phase for outdoor.

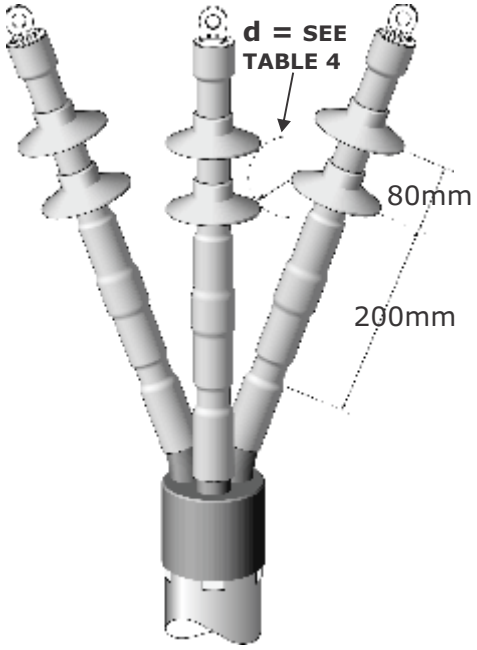

Fig 12

NUMBER OF SHEDS PER PHASE		
VOLTAGE	**INDOOR**	**OUTDOOR**
7.2kV	-	1
12kV	-	2
17.5kV	-	2
24kV	-	3
36kV	1	4

Table 4

The first shed should be fitted at a distance 200mm from the lower edge of the anti-track tube to the edge of the shed. All subsequent sheds should be fitted at a distance of 80mm from edge to edge.

Note:- It is advisable not to position rain sheds at the top of stress control tubes, re-position if necessary.

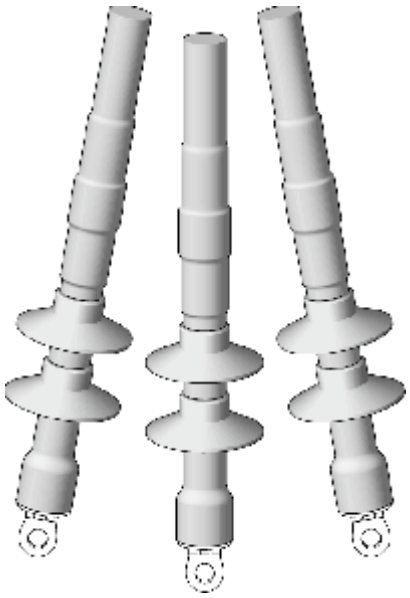

Fig 13

Inverted Connections

If a termination is to mounted for connection from above the equipment i.e in the inverted position, sheds should be installed through 180° as shown

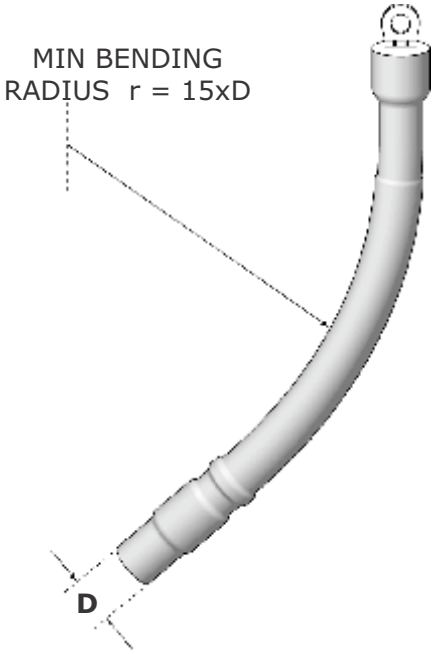

Fig 14

Cable Bending Radius

During installation care should be taken not to over bend the cable. In cold condition it may be necessary to gently heat the cable to prevent damage whilst bending.