



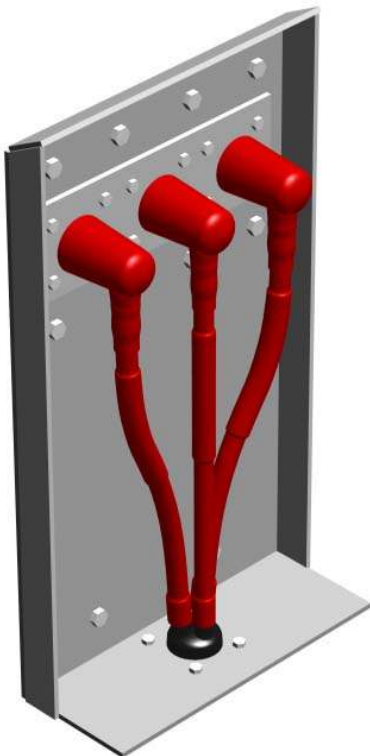
Shrink Polymer Systems

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



ISSUE DATE: 24.10.08

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
- * 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	650mm	LENGTH OF LUG BARREL + 10%
12kV	650mm	650mm	
17.5kV	650mm	650mm	
24kV	650mm	800mm	
36kV	800mm	800mm	

Table 1

Note:- Dimension L is only a guide. Shorter tail lengths are possible, as long as important clearance dimensions are observed.

Alternative tail lengths available upon request.

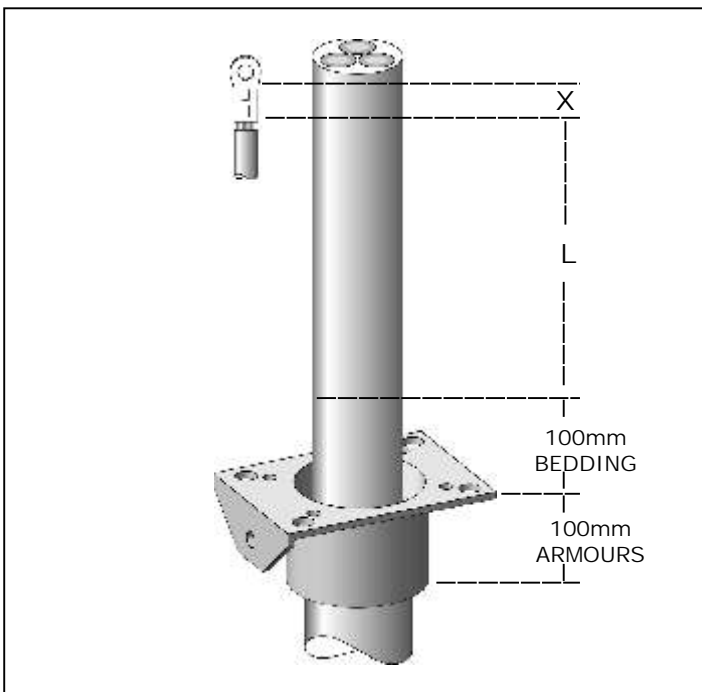
3 Core Cable With Armour

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 - 16-95mm² at 7.2 to 17.5kV
SPS 193 - 120-300mm² at 7.2 to 17.5kV
(For other voltages see selection chart in general catalogue)



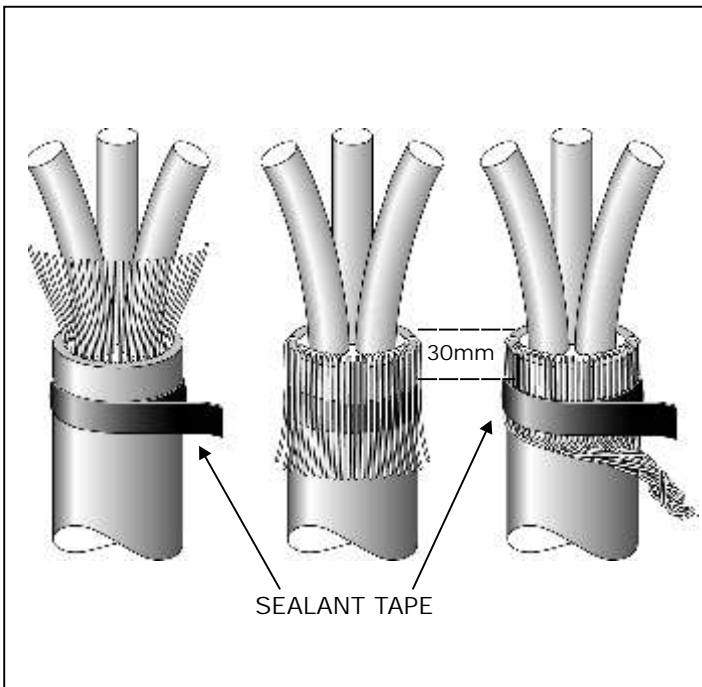
1. Installation

Strip off the outer sheath of the cable to the dimensions in Table 1.

Standard length dimensions = $L+X$ leave 200mm for the cable breakout boot and armour wires. Remove any cable fillers.

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

Note: - User may wish to alter bedding dimensions to suit the type of gland being fitted.

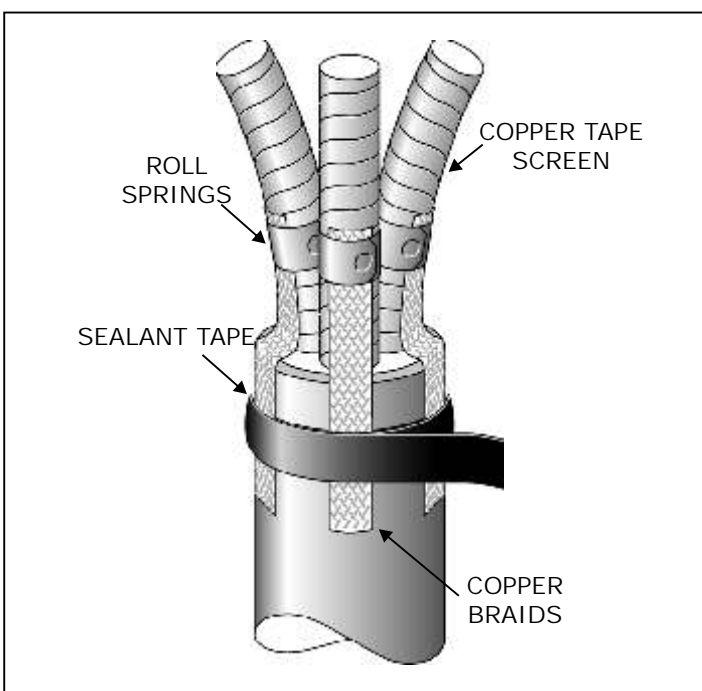


2. Screen Preparation

Copper Wire Screen

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

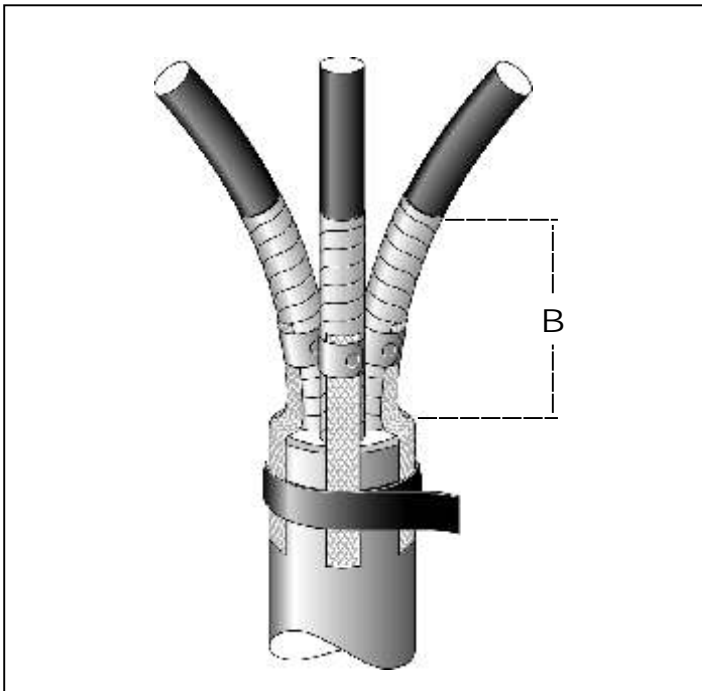
Bend back each screen wire and press them into the sealant tape. Apply another layer of tape over the bent back wires.



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 tape should be applied beneath and on top of the solder block.

If roll spring method is used the spring should preferably be positioned above the fingers of the breakout boot.



Remove the copper tape screen to length B as indicated in Table 2.

Note: - We highly recommend that the alternative dimensions given in section 10 are used, which enables the stress control tubes to be fitted in a higher position, which in turn offers many advantages.

VOLTAGE	B	A
7.2kV	150mm	170mm
12kV	150mm	170mm
17.5kV	150mm	170mm
24kV	165mm	185mm
36kV	215mm	235mm

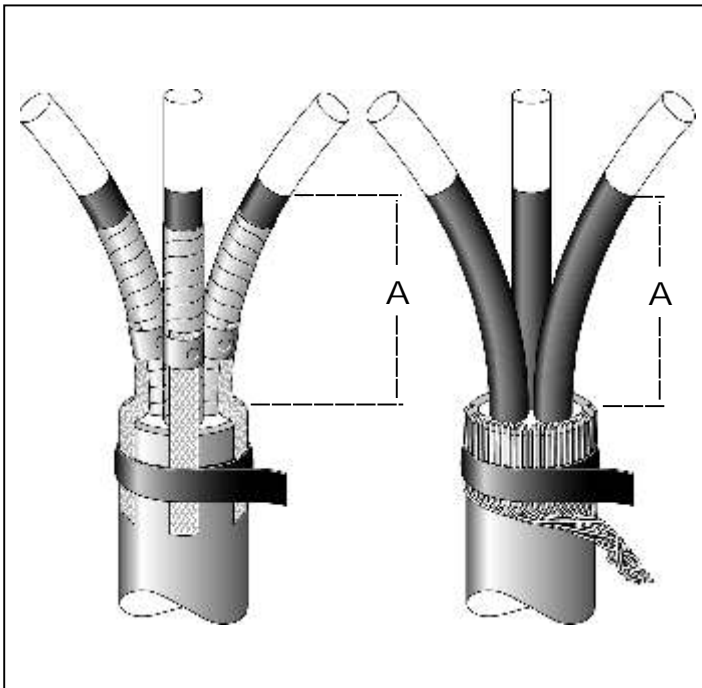
Table 2

3. Conductive Layer Treatment

Extruded Conductive Layer

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

Note: - It is very important that the screen is removed leaving a clean cut end and that no scoring and damage is done to the primary insulation. The smallest 'Nick' can produce very high levels of discharge, therefore we highly recommend the use of approved screen removal tools (see page 38 in our general catalogue).



Soluble Layer

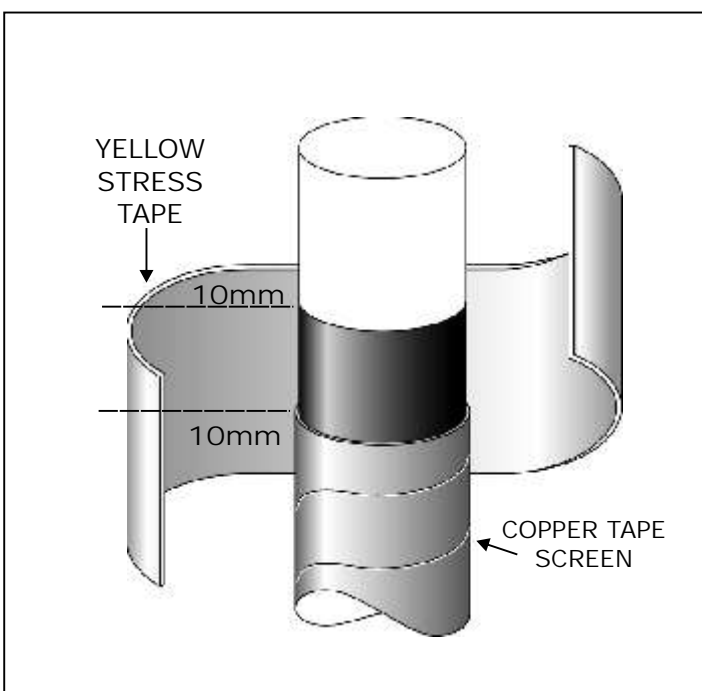
Using either non adhesive tape or tape turned backwards, cover the top of dimension A and remove the soluble layer above using a clean cloth and suitable solvent.

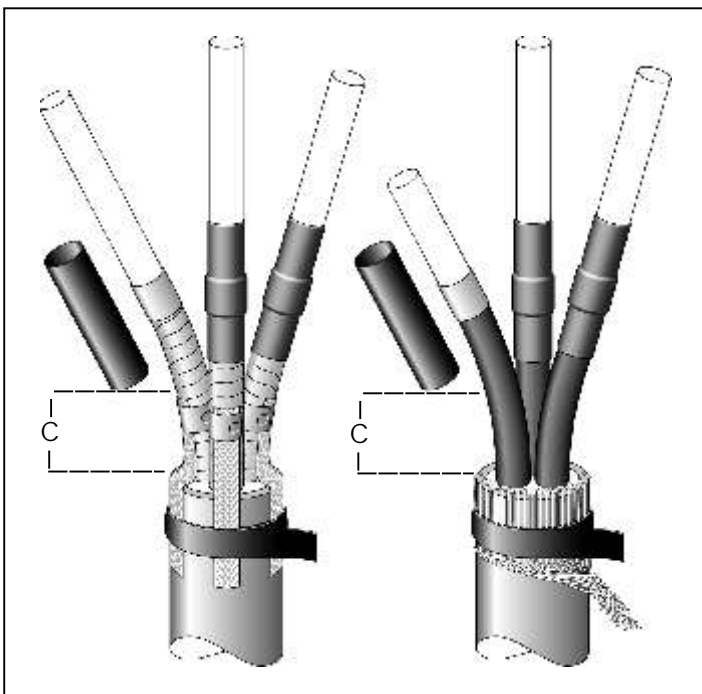
Note: - Remember to remove the tape

It is good practice to flame brush the primary insulation and conductive screen cut. This has the effect of removing any minor surface scratches or burrs that may be present.

Apply Stress Control Tape

Remove the release paper from the Yellow Stress Control Tape (TS31785Y). Stretch and apply the tape around the end of each core screen to cover the copper tape (if present) and insulation by 10mm either way.





4. Stress Control Tubes

Position the stress control tubes onto each core so that the bottom of each tube is a distance C from the outer sheath cut as indicated in Table 3.

Shrink each tube one at a time and keep the flame on the move to ensure an even wall thickness.

VOLTAGE	C
7.2kV	100mm
12kV	100mm
17.5kV	100mm
24kV	150mm
36kV	200mm

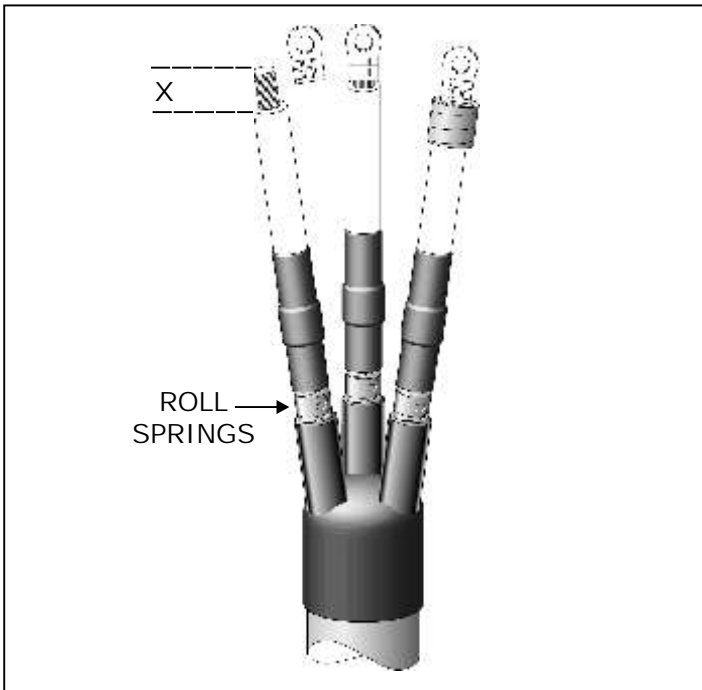
Table 3

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.

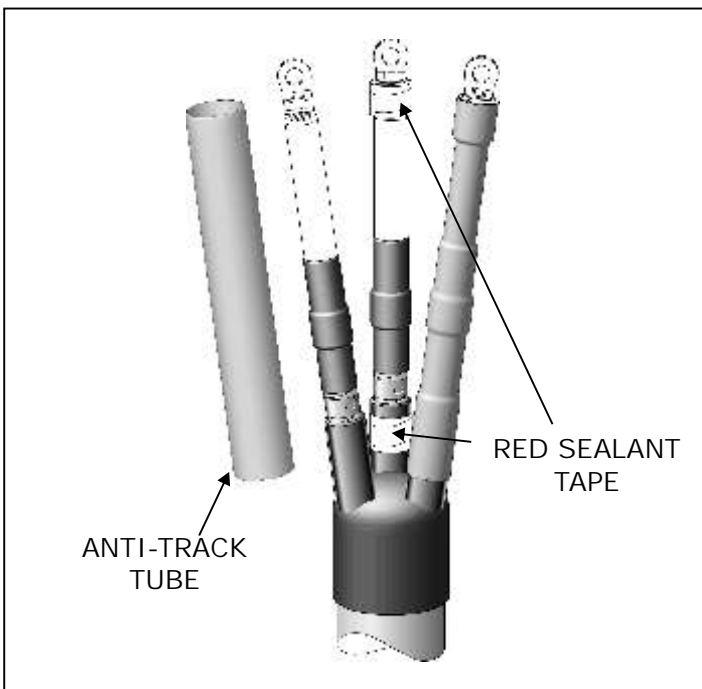
Preheat each lug and wrap two layers of red sealant tape over the lug barrel and extend onto the insulation by approx 10mm.



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 centre of the skirt to the cable sheath and from the turrets to the cores.

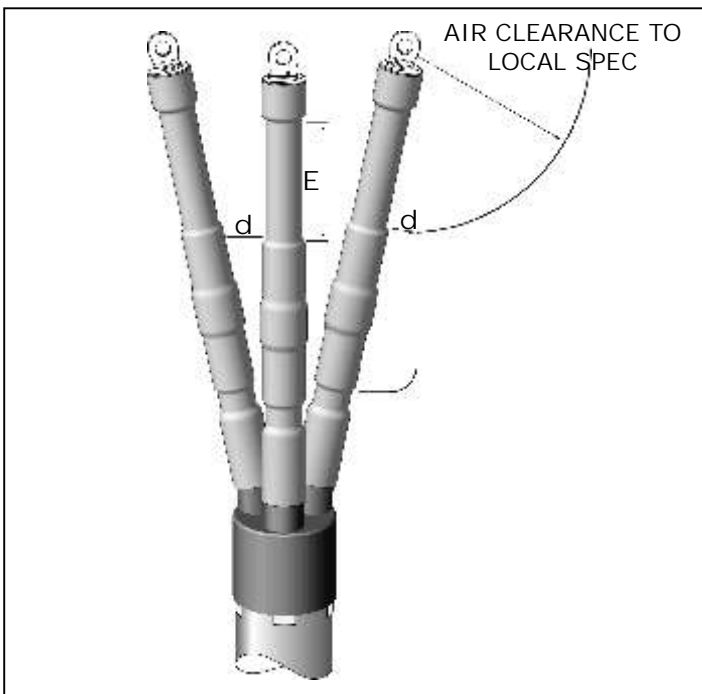
Apply a turn of red sealant tape around each breakout turret as shown.



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.

Shrink the tubes starting from the bottom towards the top. Keep the flame on the move to ensure an even wall thickness and that the tubes are wrinkle free. Allow the tubes to cool to hand hot and trim at the lug end with a sharp knife if necessary.



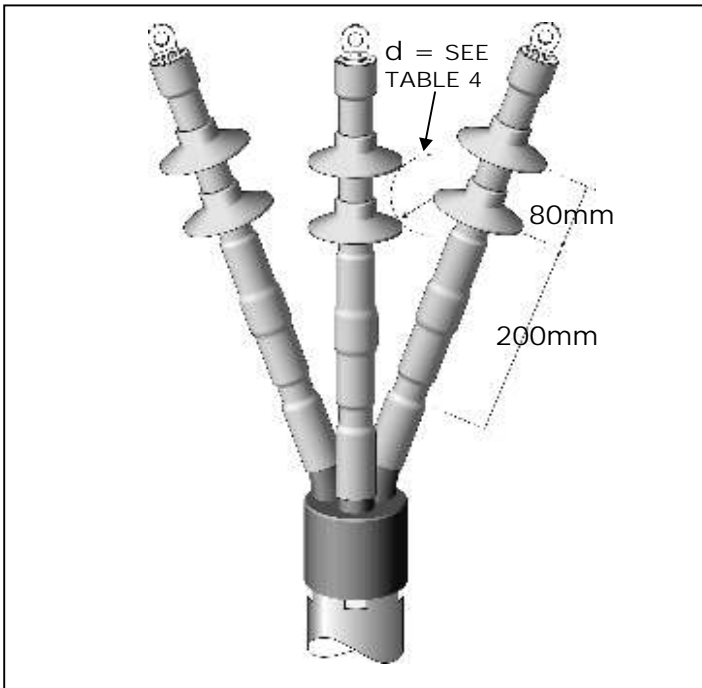
Indoor Terminations

To ensure long term performance of medium voltage terminations, certain separation distances are required as indicated in Table 4.

DISTANCE (d) PHASE/PHASE & PHASE/GROUND		TOP OF STRESS TUBE TO LUG BARREL
VOLTAGE	d (mm)	E
7.2kV	15mm	30mm
12kV	20mm	50mm
17.5kV	20mm	75mm
24kV	40mm	95mm
36kV	50mm	250mm

Table 4

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



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.

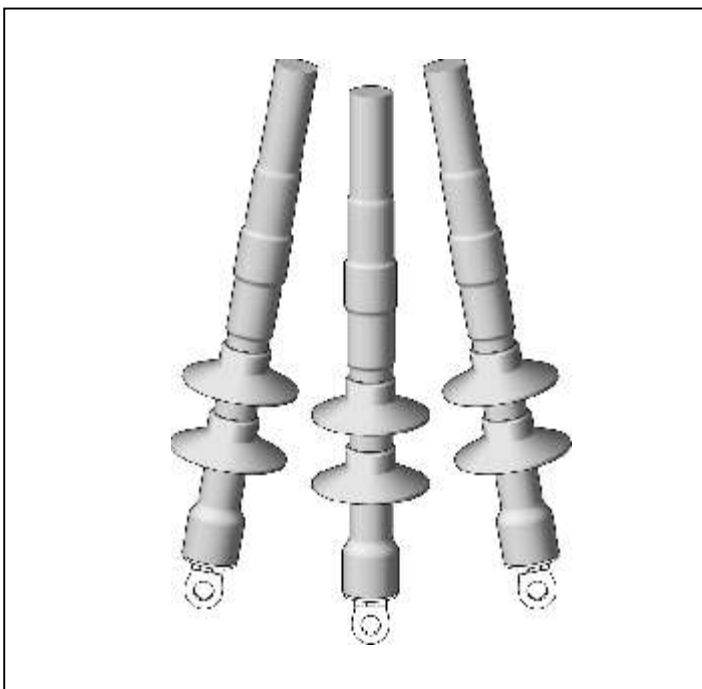
VOLTAGE	NUMBER OF SHEDS PER PHASE	
	INDOOR	OUTDOOR
7.2kV	-	1
12kV	-	2
17.5kV	-	2
24kV	-	3
36kV	1	4

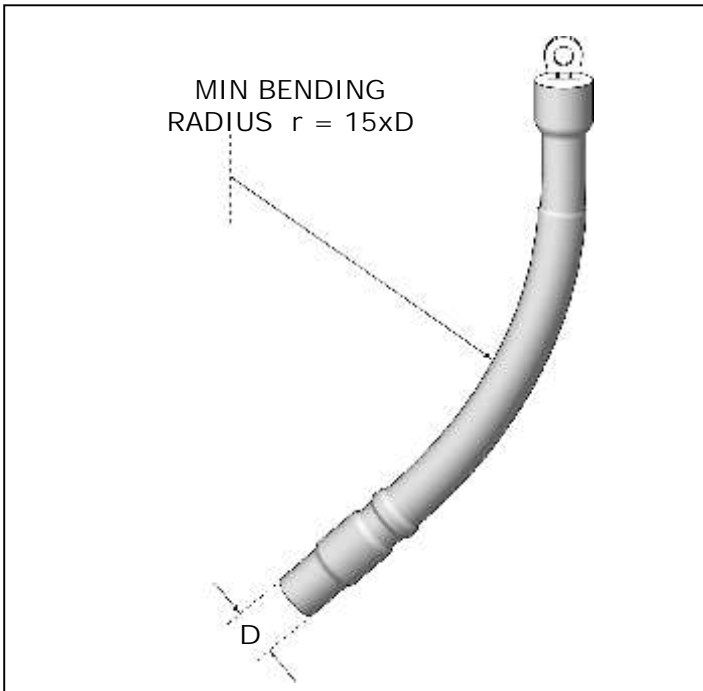
Table 5

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.

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





9. Cable Bending Radius

If required, the cable can be heated to approximately 70°C to enable a bend to be introduced. See the drawing opposite.

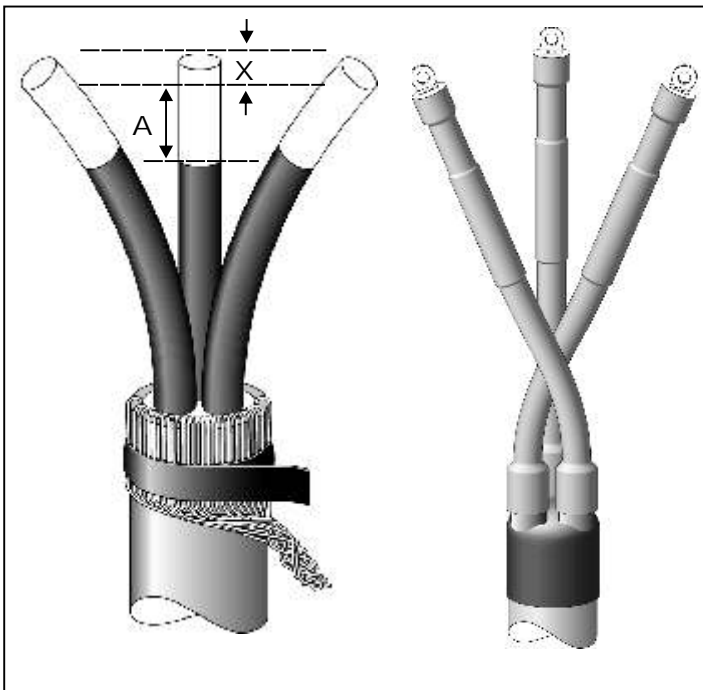
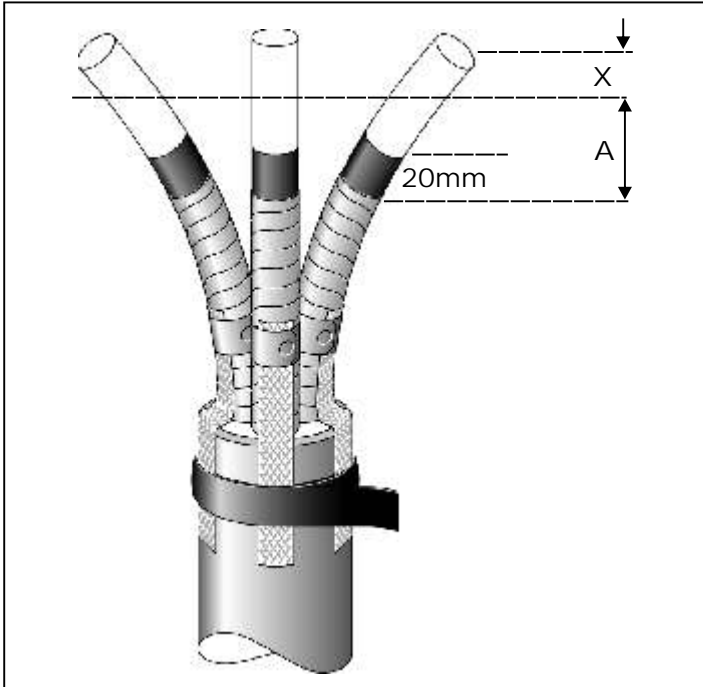
10. Alternative Screen Preparation

If the screens are terminated at a higher point on the cable it offers many advantages: -

- A) Improved clearance dimensions at the top of the stress control tubes.
- B) The ability to core cross whilst retaining the required clearances.
- C) More room between the cores whilst using screen removal tools.
- D) More likelihood of achieving even shrinkage of the materials at the screen cut.

Therefore we recommend that the semi-conductive screen is removed in accordance with the dimensions shown in the picture opposite and indicated in Table 6. Dimension A should be taken from the bottom of the lug barrel.

If the cable has copper tape screens, these tapes should be removed to a point 20mm below the conductive screen as shown.



VOLTAGE	A	X
7.2kV	110mm	LUG BARREL LENGTH + 5mm
12kV	185mm	
17.5kV	185mm	
24kV	310mm	
36kV	460mm	

Table 6

Fitting The Stress Control Tubes

After applying the stress control tape as shown in section 3. Position each tube at a point approximately 5mm past the Stress Tape, overlapping onto the Copper Tape Screens and shrink one at a time starting at the bottom.

Continue with the installation from section 5 onwards.