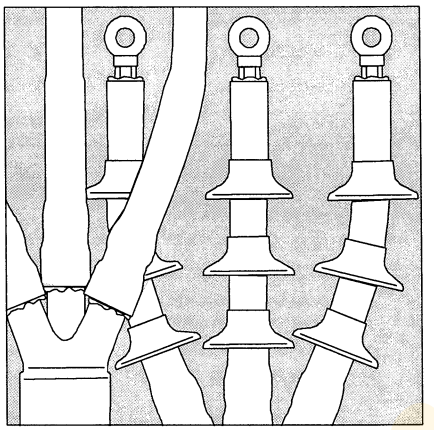
Energy Division

Tyco Electronics



Installation Instruction ESD-4761-ID-6/08

Raychem Termination for Screened 3-Core Polymeric Insulated Cables 7.2 kV to 36 kV with Armour

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Before Starting

Check to ensure that the kit you are going to use fits the cable.

Refer to the kit label and the title of the installation instruction.

Components or working steps may have been improved since you last installed this product.

Carefully read and follow the steps in the installation instruction.

General Instructions

Use a propane (preferred) or butane gas torch.

Ensure the torch is always used in a well-ventilated environment.

Adjust the torch to obtain a soft blue flame with a yellow tip.

Pencil-like blue flames should be avoided.

Keep the torch aimed in the shrink direction to preheat the material.

Keep the flame moving continuously to avoid scorching the material.

Clean and degrease all parts that will come into contact with adhesive.

If a solvent is used follow the manufacturer's handling instructions.

Tubing should be cut smoothly with a sharp knife leaving no jagged edges.

Start shrinking the tubing at the position recommended in the instruction.

Ensure that the tubing is shrunk smoothly all around before continuing along the cable.

Tubing should be smooth and wrinkle free with inner components clearly defined.

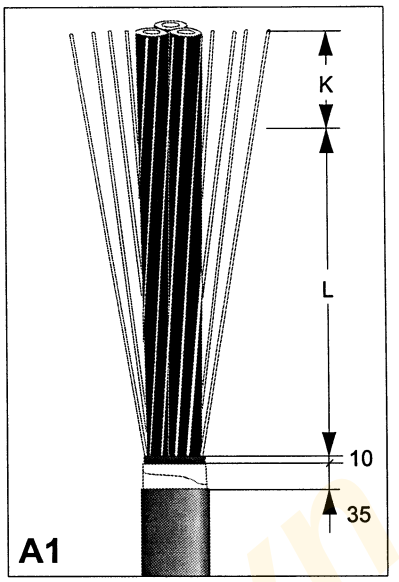
Cable Preparation

a. Cable with wire shield

Table 1

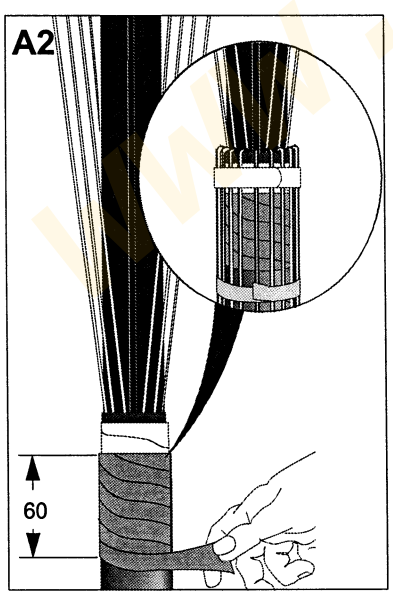
Max. system voltage (kV)	* L indoor straight connection [mm]	* L indoor crossed connection [mm]	* L outdoor [mm]	a [mm]	K
7.2	250	450	450	150	according to depth of crimp cable lug barrel hole + 5 mm
12	300	450	650	150	
17.5	350	500	650	150	
24	450	550	800	200	
36	600	800	800	250	

*L = min. length required.
The actual length will be determined by the overall geometry of the equipment.

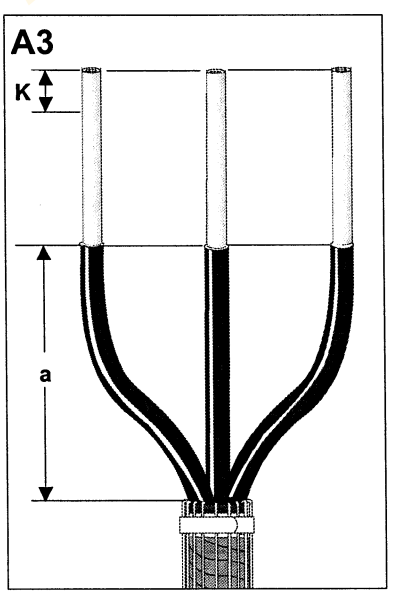


Cut the cable to the required length and remove the oversheath.
Leave enough length to set the cores into their final position.
Clean and degrease the end of the oversheath for about 100 mm.
Note: The minimum termination length (L) is given in Table 1.

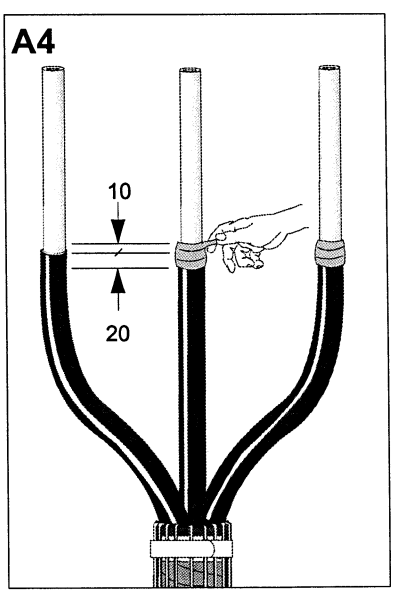
Remove the release paper and wrap one layer of sealant tape (red) with a small overlap and slight tension around the end of the oversheath for 80 mm. Bend the shielding wires back onto the oversheath. Avoid crossing individual wires.
Temporarily fix the shielding wires well below the red sealant tape to the oversheath.
For **cables with tape armour** also connect the earth lead to the armour.
For **cables with wire armour** follow the instruction as supplied in separate armour earthing kit.



Bend and shape the cores into their final position.
Cut the cores to the required length.
Thoroughly remove the core screen according to dim. **a** (see Table 1).
The surface of the insulation should be free from all traces of conductive material.
Smooth out any irregularities.
Note: Do not nick the insulation!



Remove the release paper and wrap the void filling strip (yellow) around the end of the core screen.
Cover 20 mm of the core screen and continue onto the insulation for 10 mm.
Stretch the strip to half of its original width to achieve a fine, thin edge onto the insulation.

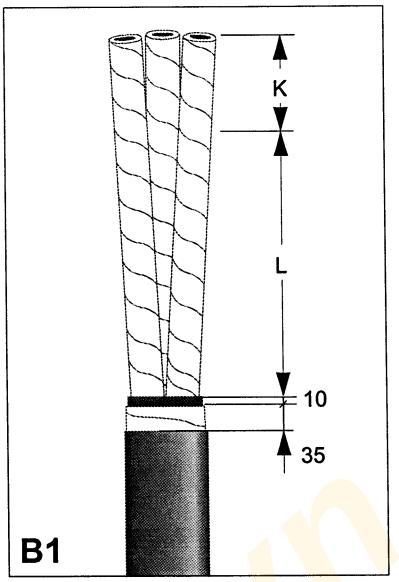


b. Cable with metal tape shield

Table 2

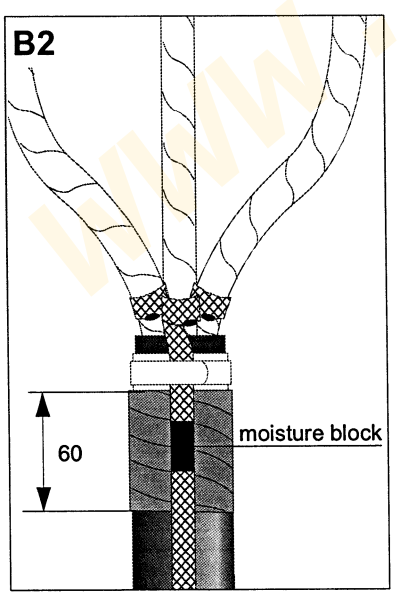
Max. system voltage (kV)	* L indoor straight connection [mm]	* L indoor crossed connection [mm]	* L outdoor [mm]	b [mm]	K
7.2	250	450	450	130	according to depth of crimp cable lug barrel hole + 5 mm
12	300	450	650	130	
17.5	350	500	650	130	
24	450	550	800	180	
36	600	800	800	210	

*L = min. length required.
The actual length will be determined by the overall geometry of the equipment.

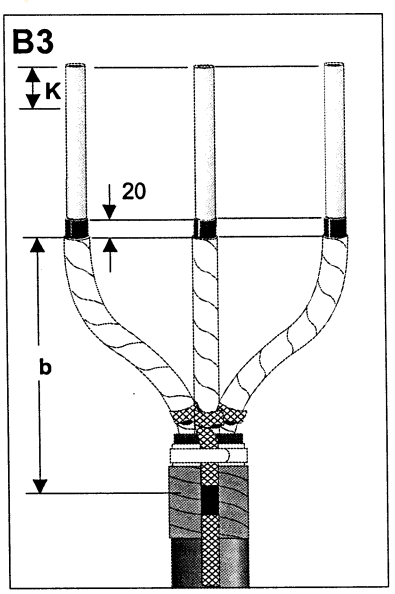


Cut the cable to the required length and remove the oversheath.
Leave enough length to set the cores into the final position.
Clean and degrease the end of the oversheath for about 100 mm.
Note: The minimum termination length (L) is given in table 2.

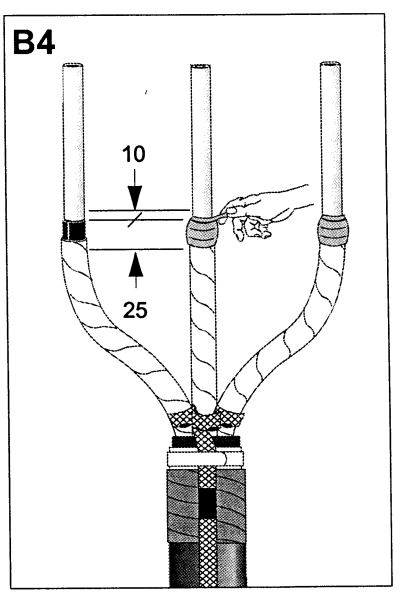
Separate the cores. Wrap an earth lead round each core and soldertack it to the metal tape shield (or attach the earth lead by any other equivalent method). Fill the earth lead with solder to form a 30 mm moisture block 30 mm from the oversheath end.
Remove the release paper and wrap one layer of sealant tape (red) round the oversheath end for 60 mm underneath the earth lead.
For **cables with tape armour** also connect the earth lead to the armour.
For **cables with wire armour** follow the instruction as supplied in separate armour earthing kit.

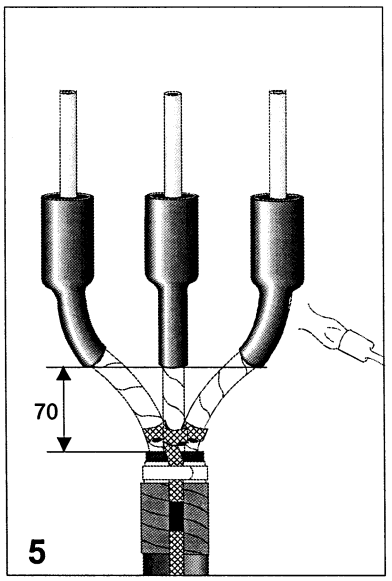


Bend and shape the cores into their final position.
Cut the cores to the required length.
Place a temporary wire binder around the cores at the position shown in the drawing. Tear off the tape shield against the wire binder.
Remove the metal tape shield according to dimension **b** (see table 2).
Thoroughly remove the core screen to 20 mm above the metal tape shield cut. The surface of the insulation should be free from all traces of conductive material.
Smooth out any irregularities.
Note: Do not nick the insulation.

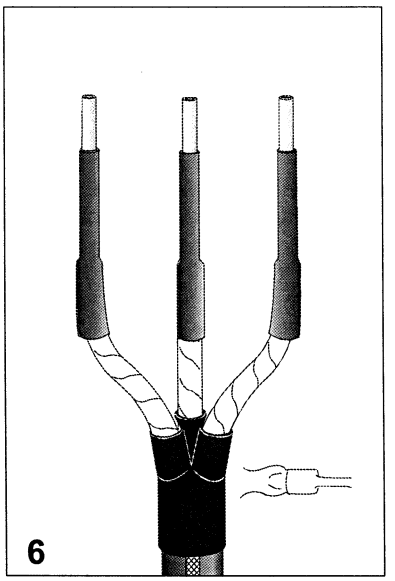


Remove the wire binder from the end of the metal tape shield.
Remove the release paper and wrap the void filling strip (yellow) for 5 mm onto the metal tape shield, continuing over the core screen and 10 mm onto the insulation.
Stretch the strip to half of its original width to achieve a fine, thin edge onto the insulation.

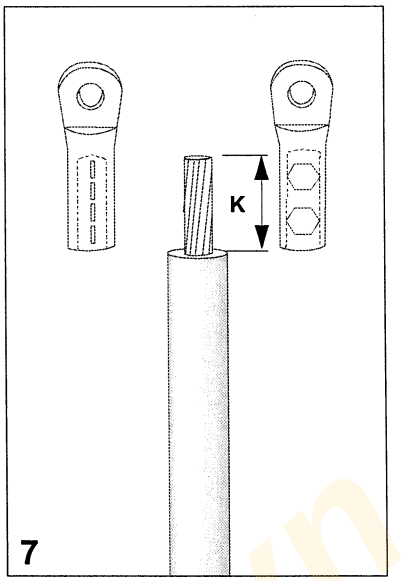




Place the stress control tubing (black) over the cores and position them 70 mm above the end of the oversheath cut.
Shrink down the tubing starting at the bottom and working upwards.



Remove the release paper and slide the breakout over the cores.
Pull the breakout as far down the crutch as possible. Shrink the breakout into place starting at the centre.
Work first towards the lower end and then shrink the turrets onto the cores.
The numbers in the drawing indicate the shrinking sequence.



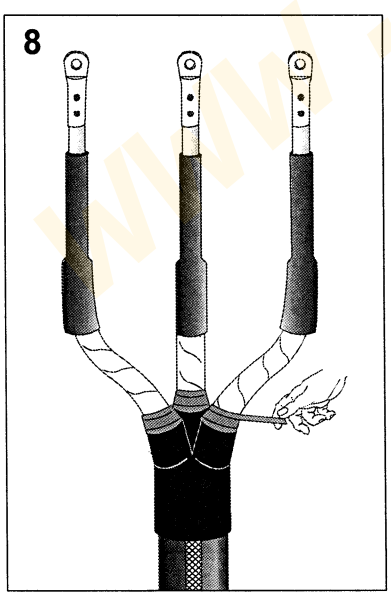
Cut back the insulation according to dimension **K = depth of cable lug barrel hole**

- for mechanical lug + 0 mm
- for crimp lug + 5 mm.

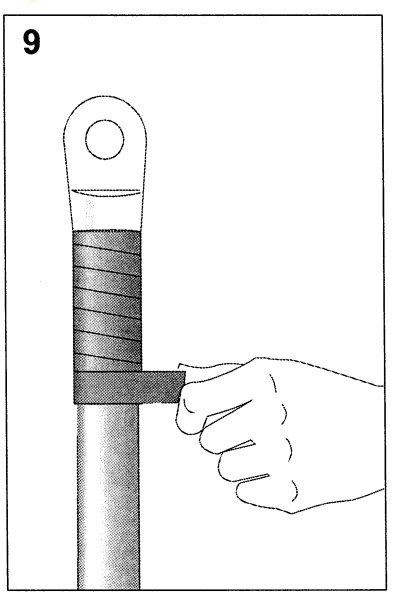
Install the cable lug.
Clean and degrease the insulation and the lug.
Remove any sharp edges.

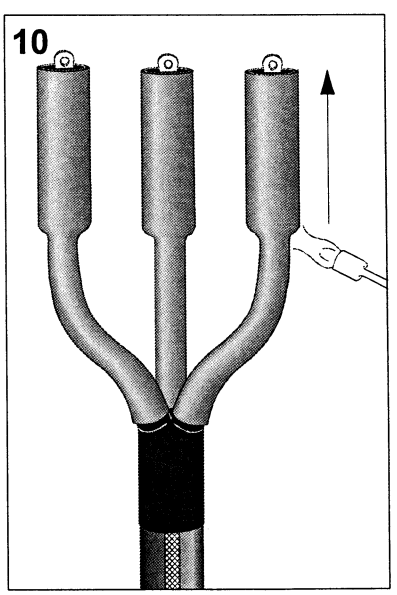
Place the tubing over the cores with the sealant coated end downwards.
Push the tubing over the breakout turrets as far as possible and shrink it down starting at the crutch and working upwards.
Tie the shielding wires or the earth lead with a wire binder to the oversheath below the breakout.
Gather the shielding wires together to form an earth lead.
Cut the tubing back onto the connector barrel if necessary.

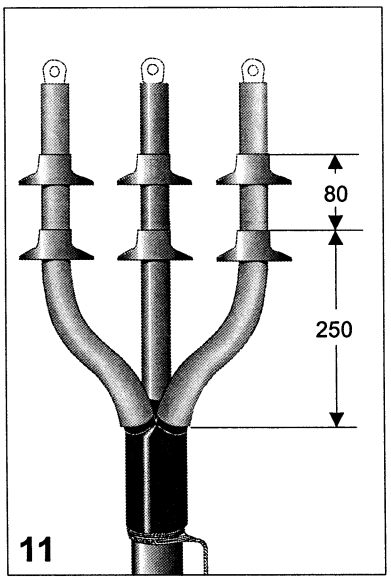
Wrap the sealant tape (red) on the end of the breakout.



Remove the release paper and wrap the sealant tape (red) around the barrel of the cable lug with a small overlap and slight tension.
Note:
Use the remaining sealant tape (red) to fill any remaining gap between the core insulation and the cable lug.



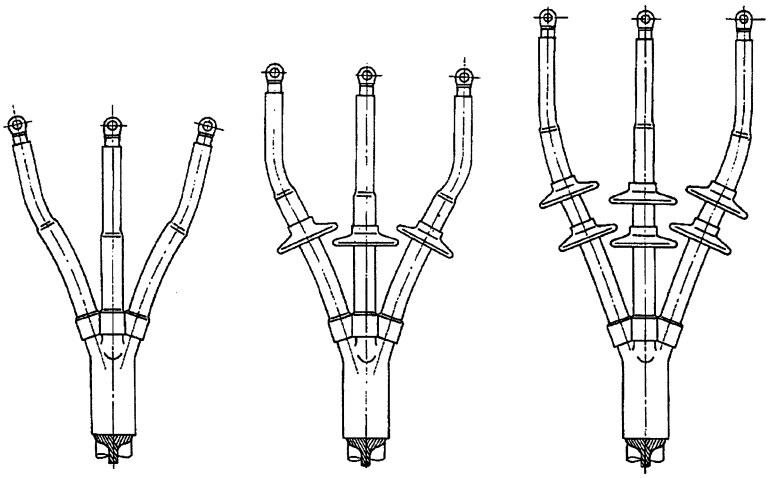




Shrink the skirts into place as shown on next page.

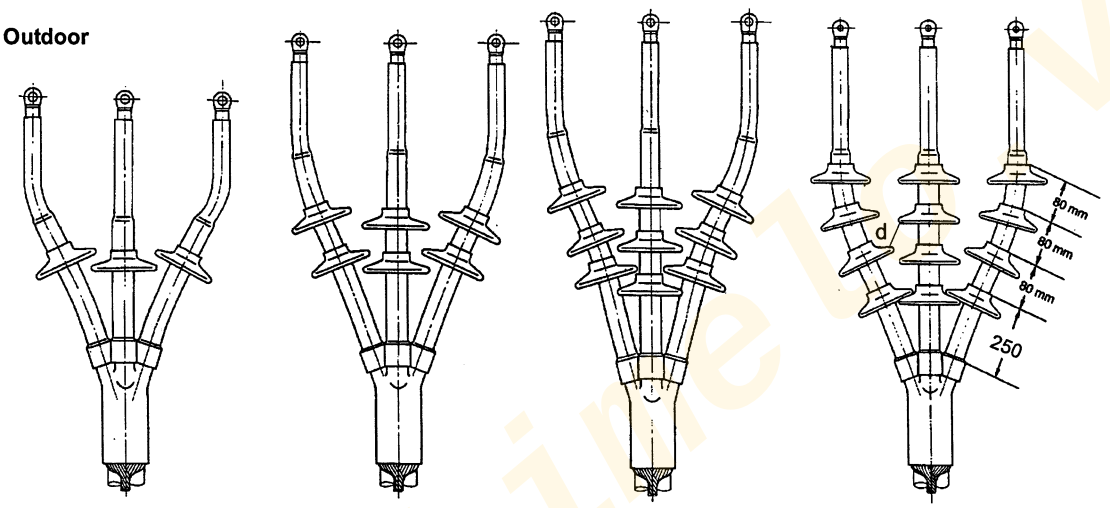
Allow the termination to cool down before applying any mechanical strain.

Indoor

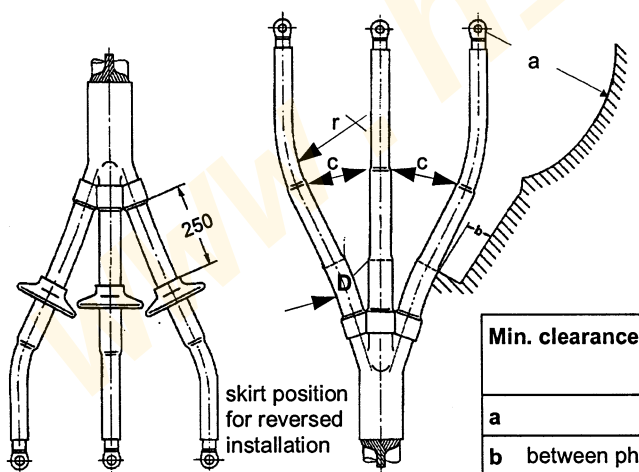


7.2, 12 and 17.5 kV | **24 kV** | **36 kV**

Outdoor



7.2 kV | **12 and 17.5 kV** | **24 kV** | **36 kV**



skirt position for reversed installation

Note: Maintain minimum distance between skirts (see table below) by staggering skirts between cores.

Min. clearances	**Max. system voltage (kV)**				
	7,2	12	17,5	24	36
a	as for local specifications				
b between ph/ground [mm]	10	15	20	25	35
c between ph/ph [mm]	15	20	30	40	50
d between skirts [mm]	10	10	15	20	25
r min. bending radius **15xD**, before bending heat cable up to approx. 70°					

Please dispose of all waste according to environmental regulations.