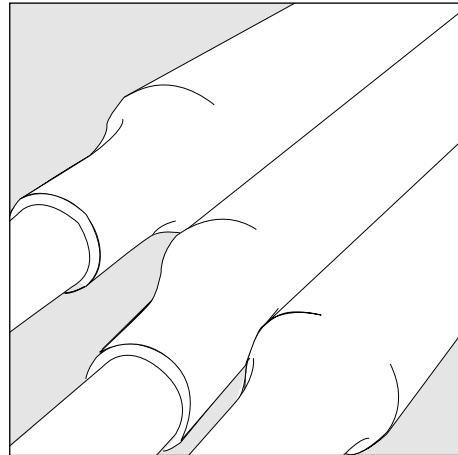




## TE's Raychem Cable Accessories



### Installation Instruction EPP-1712-7/18

### Three Piece Joint Polymeric Insulated Cables with Wire Shield

Inline

$U_m = 145 \text{ kV}$

**EHVS-145**

To view the TE Energy website:



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# General Instructions

## Before Starting

- Check the kit label and the title of the installation instructions to prove that the cable accessory you are going to use matches the cable.
- Make sure the cable is properly sealed.
- Make sure the cable is in the final installation position.
- Make sure the cable is straight at the jointing position.
- Check the position of the cables to be in alignment to the final position of the accessories.
- Make sure the joint bay/installation area provides adequate space for the cable components to be parked on either cable for later use during the installation.
- The joint bay/Installation area must be kept clean and dry during installation. For outdoor installation use tent or other appropriate shelter.
- Carefully read and follow the steps in the installation instructions. Components or working steps may have been changed/improved since you last installed this product.
- All tools, PPE and apparatus used must be kept clean during the installation.
- Obey relevant and local security and safety rules during the installation.

## Shrinking Heat-Shrink Tubing

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 adhesives.

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

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

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.

## Stripping the Cable

Use appropriate stripping tools for smooth and even insulation diameter.

Adjust the stripping tool to the thickness of the semi-conductive layer. Avoid removing too much of the insulation.

Polish the stripped surface by hand using the supplied abrasive paper beginning with the lowest grid size, or by an appropriate sanding machine and abrasive paper and grades. The surface of the insulation must be even and free of all traces of conductive material.

## Cables with Segmented Conductors

All cut back dimensions and information given in this instructions document refer to cables with non-segmented conductors only. In case of cables with segmented conductors, all insulation or conductive materials have to be removed from the conductor. If the removal of these materials require a longer cut back of the cable insulation, this length needs to be added to the cable cut back dimensions mentioned in the instructions.

NOTE: Special instructions for segmented conductors are available on request.

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The Information contained in these installation instructions is for use only by installers trained to make electrical power installations and is intended to describe the correct method of installation for this product. However, TE Connectivity has no control over the field conditions which influence product installation.

It is the user's responsibility to determine the suitability of the installation method in the user's field conditions.

TE Connectivity's only obligations are those in TE Connectivity's standard Conditions of Sale for this product and in no case will TE Connectivity be liable for any other incidental, indirect or consequential damages arising from the use or misuse of the products.

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## A. Straightening and Heating of the Cable

Before starting the cable preparation, train the cable end in the straight installation position and fix it.

The cable needs to be heated and straightened for the length of complete installation.

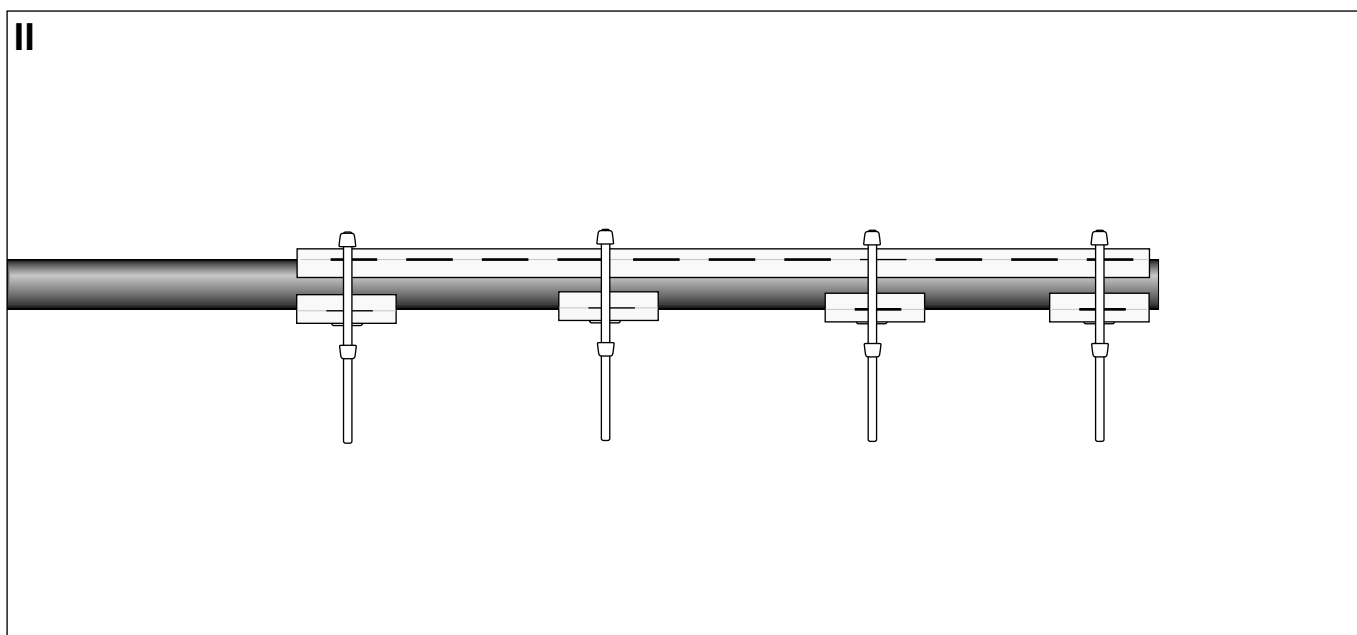
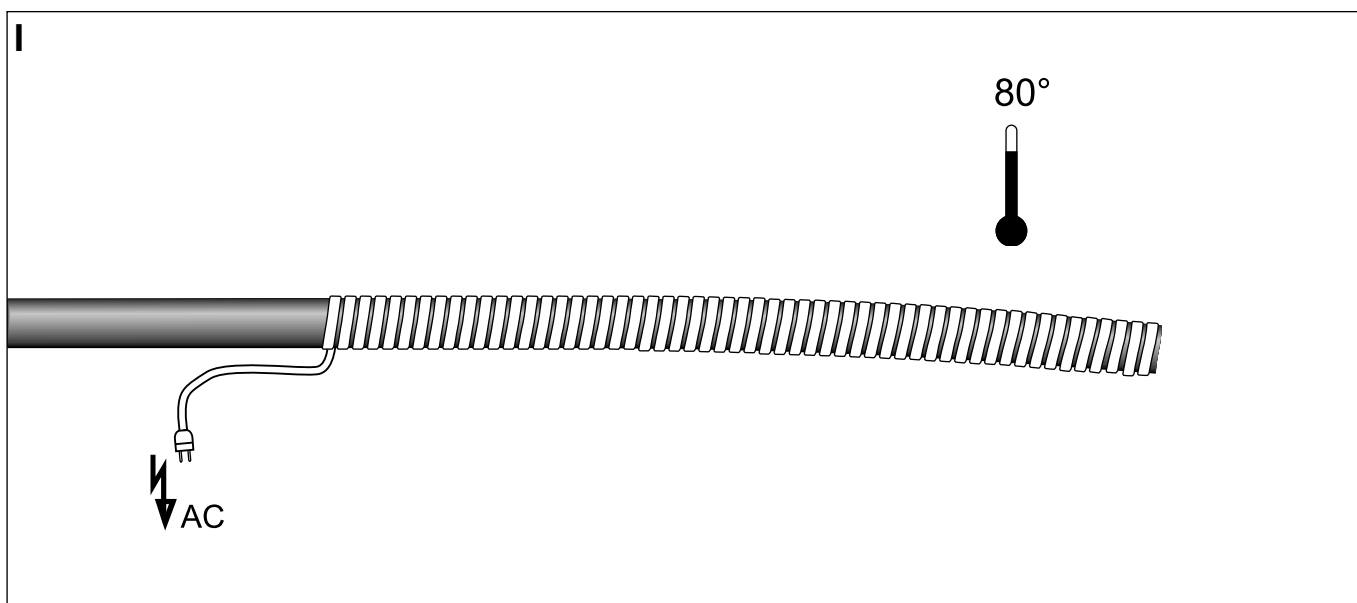
In case of graphite coating cover the cable with one layer of crepe paper.

Degrease and clean the oversheath.

Heat the cable by applying a heating device to the oversheath as shown in the TABLE BELOW.

Before stripping to the required dimensions, the cable needs to be cooled down to ambient temperature using slide rails.

Cable Cross Section	Heating Time/ Temperature
up to 400 mm <sup>2</sup>	4 h / 80 °C
up to 1200 mm <sup>2</sup>	5 h / 80 °C
up to 2500 mm <sup>2</sup>	6 h / 80 °C



## Cable Preparation

Overlap the cables **A** and **B** by at least 700 mm as shown in step 1.

### a. Cable with Laminated Foil

#### Note

For cables with metal laminated polymer oversheath follow the cutback and stripping dimensions as described in the steps 2a to 6a.

For other types of cables please continue with step 2b on page 5.

#### Cable Side A and B

Remove the graphite coating or the semiconducting layer on 500 mm length as shown in the drawing.

Heat the cable oversheath 415 mm from the reference line. Soften approx. 50 mm of the surface.

With the string, cut through the oversheath. Remove the PE-oversheath from the Al foil by slicing segments away with the string as shown in the drawing.

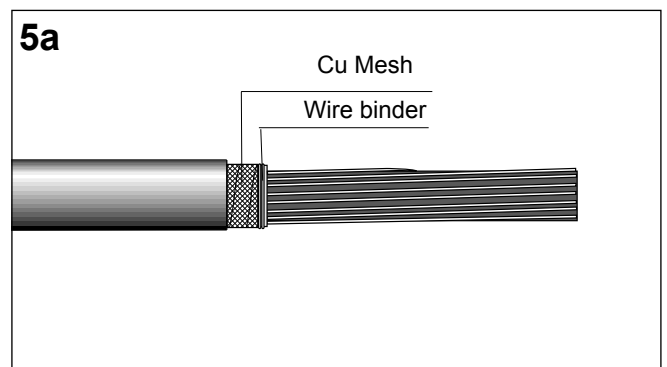
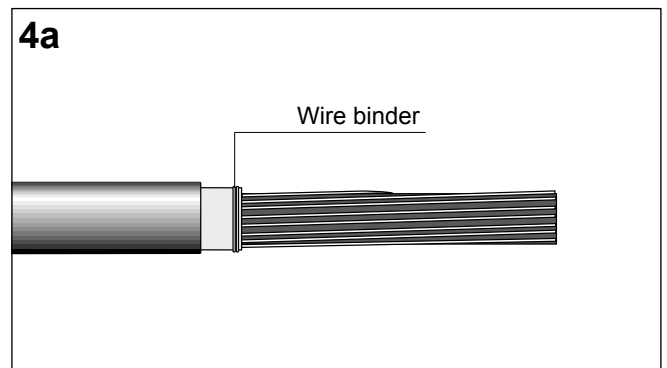
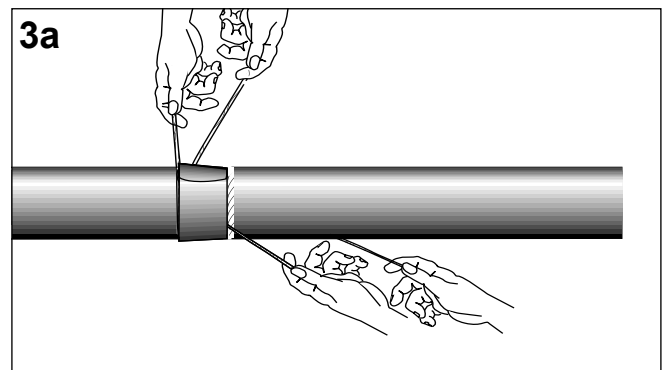
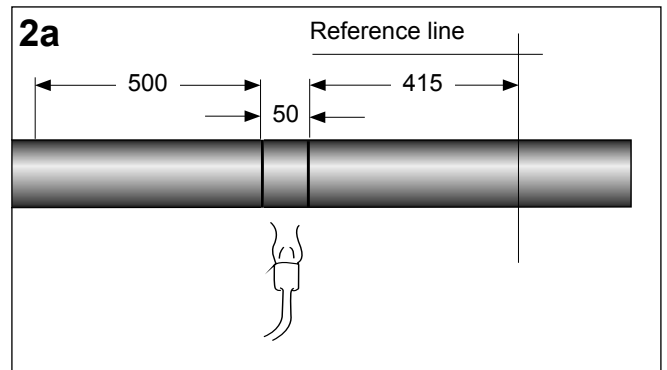
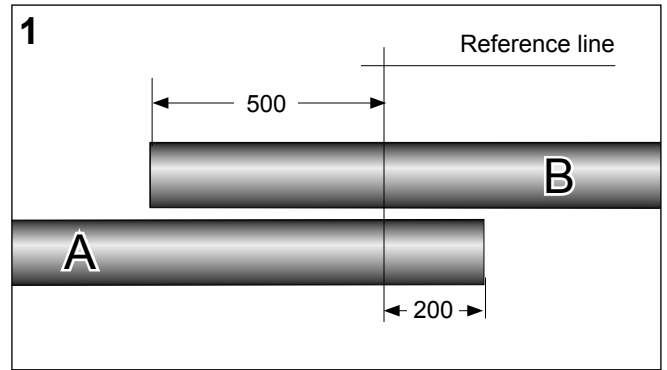
Fix the Al foil with a wire binder.

Clean the Al foil from oversheath traces.

Remove the oversheath, foil and bedding from the remaining cable-end.

Smooth the surfaces of the Al foil.

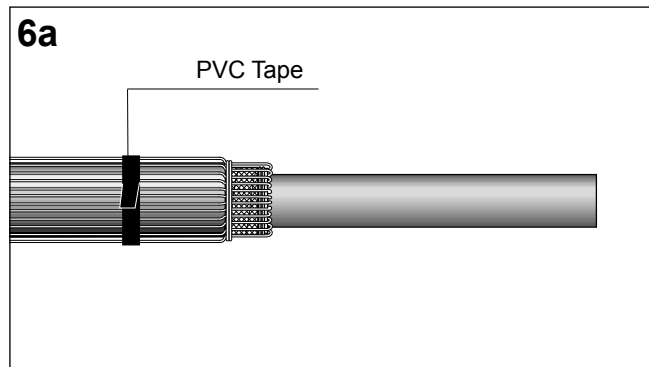
Wrap three layers of Cu-mesh over the Al foil.



Bend the shield wires back onto the oversheath and fix them temporarily in place with PVC tape.

Fix the shield wires temporarily with a wire binder close to the oversheath cut.

**Continue with step 7.**

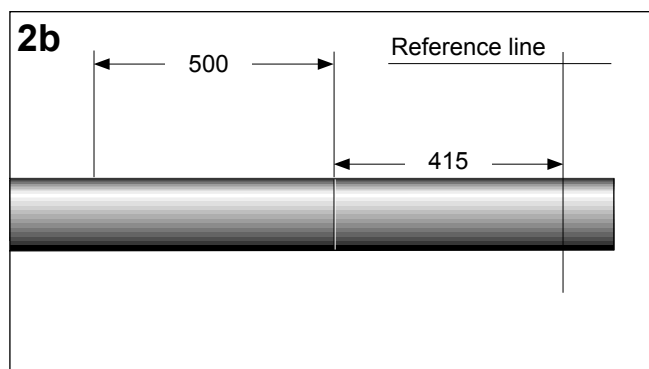


## **b. Cable without Laminated Foil**

### **Cable Side A and B**

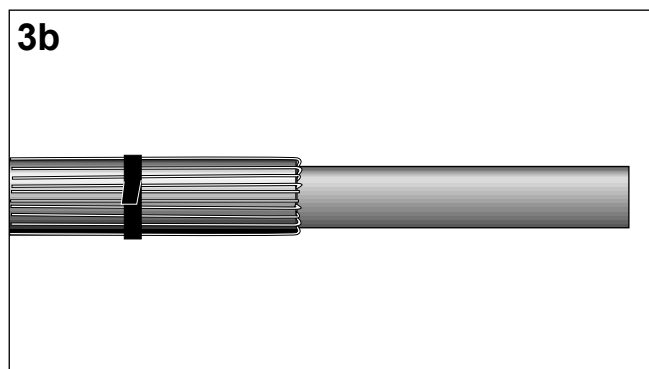
Remove the graphite coating or the semiconducting layer on 500 mm length as shown in picture 2b.

Remove the oversheath 415 mm from the reference line to the cable end.



Bend the shielding wires back onto the oversheath and fix them temporarily in place with PVC tape.

**Continue with step 7.**



## Completion of the Joint

Cut the cables exactly at the reference line 415 mm from the oversheath cut. Use a **hacksaw** to cut straight in 90° angle.

Place a mark 2 m from the reference line on the outer sheath. Use the mark to control the positioning.

Thoroughly remove the core screen to within 275 mm from the reference line. The surface of the insulation shall be free from all traces of conductive material.

### Note

Smooth the insulation as requested on page 2 (General Instructions).

Do not damage the insulation.

### Chamfer the insulation screen:

Abrade and smooth the insulation from the screen cut towards the end.

### Note

Do not nick the insulation.

Make sure the semicon transition wave shape is in accordance with the values and shape shown in the drawing. Clean and degrease the insulation with the supplied cleanser in direction of the semicon to prevent contamination.

Take care to ensure that the diameter of the insulation is not reduced close to the transition to the semiconducting layer.

Check dimension **D** in the table below. The finally prepared diameter over insulation shall be within the application range of the joint body and within +/- 2 mm of the connector's outer diameter.

**Table 1**

Tyco Description	Application Range of Joint Body D [mm]
HVCA-EHVS145T-ADAP-43/52	43-52
HVCA-EHVS145T-ADAP-52/58	52-58
HVCA-EHVS145T-ADAP-58/66	58-66
HVCA-EHVS145T-ADAP-66/75	66-75
HVCA-EHVS145T-ADAP-75/84	75-84

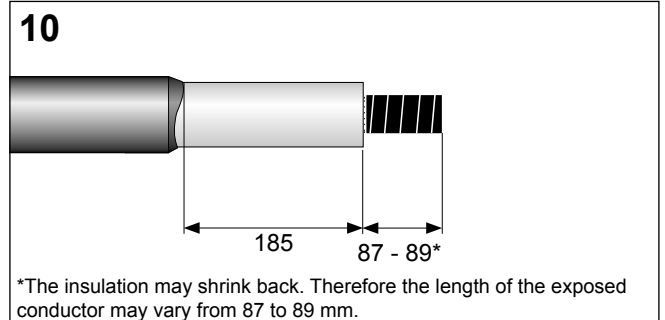
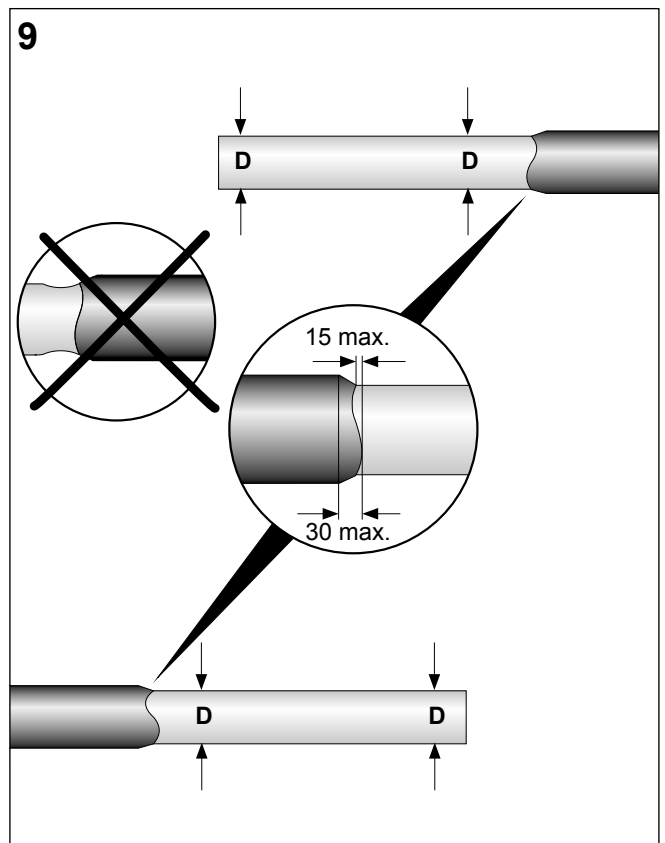
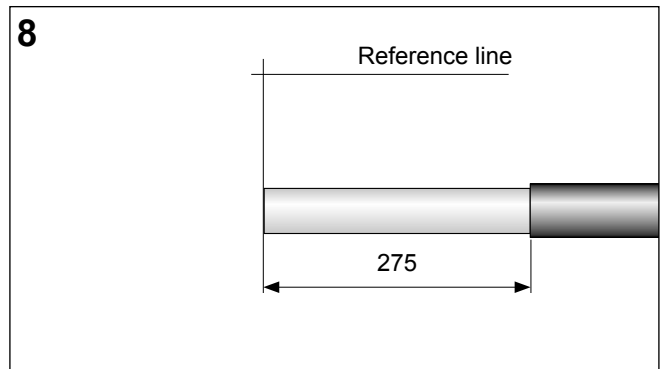
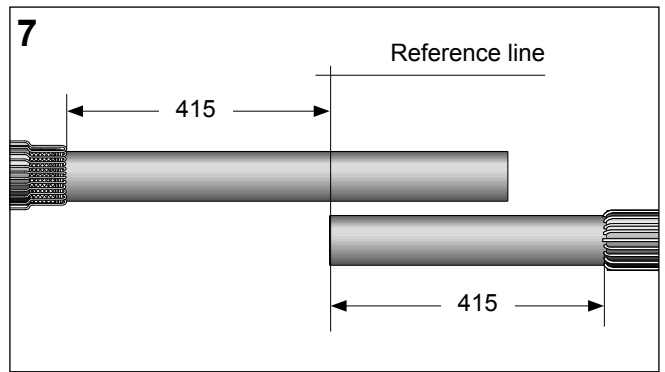
Remove the insulation using a stripper tool according to the dimensions in the drawing.

Deburr the edge of the insulation with sandpaper.

### Note

The distance between the tip of the semicon wave edge and the end of the insulation has to be 185 mm.

Cover the cable conductor with PVC tape.



Cover the oversheath with crepe tape. Wrap as much tape around it so that the complete heat shrinkable tubes can be parked on it.

Slide the combined heat shrinkable tubes over the cable core and park the tubings on the crepe tape as shown in the drawing.

Slide the tube (short) onto the other cable as shown in the drawing.

Park the sleeve on the core screen 30 mm away from the Al foil/oversheath cut.

Start shrinking on the right end of the tubing and shrink it completely down.

Smooth out the step at the tubing end with PVC tape.

Lubricate the tube and the inner part of the main body with silicone grease.

**Note**

Continue with following steps until finishing installation without any interruption.

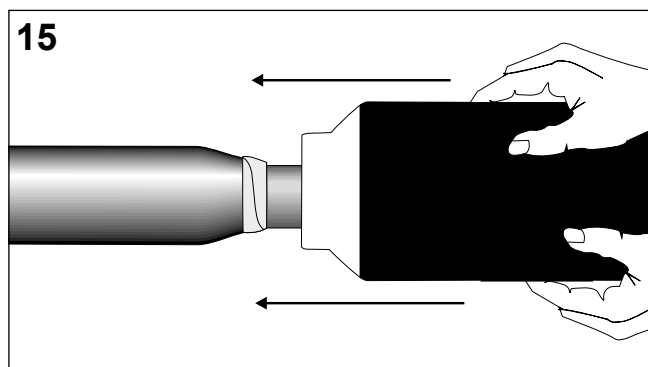
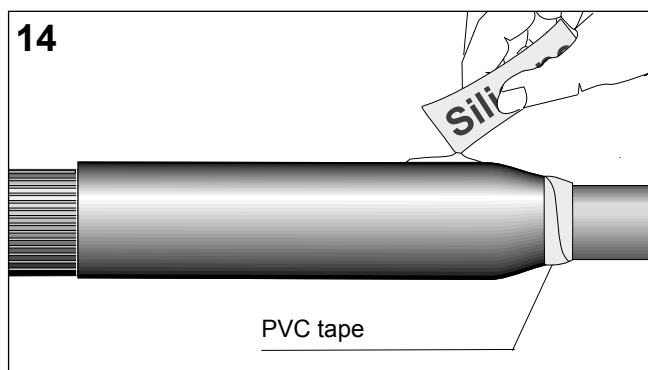
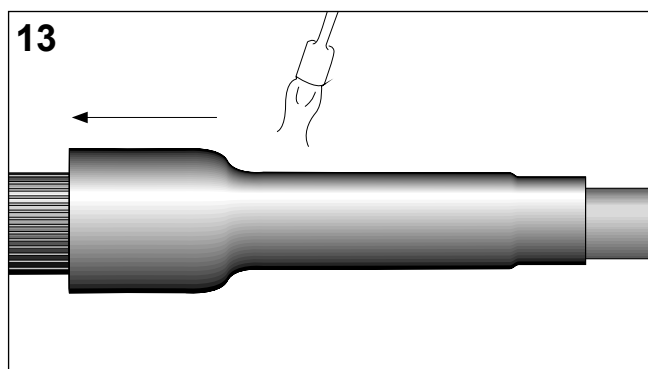
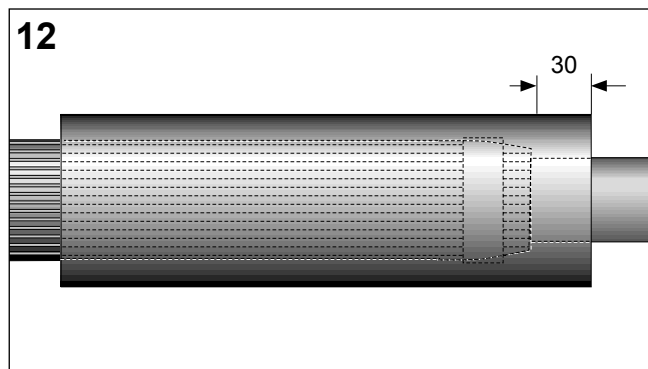
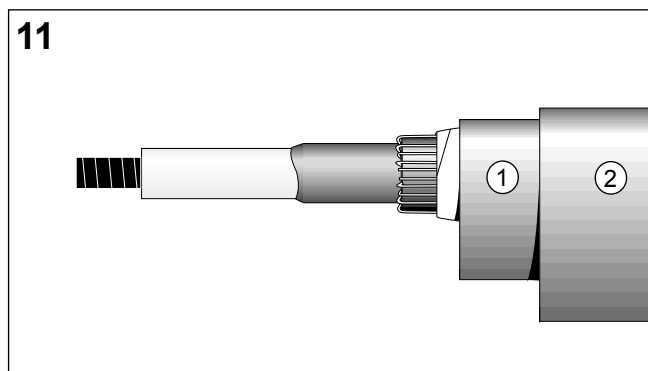
Bring the main body in parking position. In doing so, twist the main body in order to spread the silicone grease evenly under the main body.

Ensure that the inner surface of the main body will not be damaged by the conductor.

Protect the main body with the plastic bag in which it was delivered.

**Note**

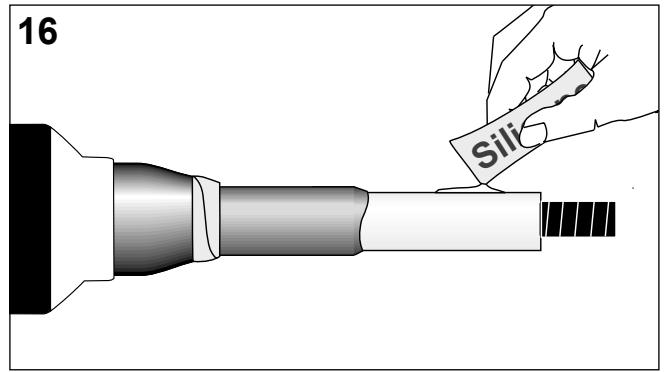
Twist the joint body occasionally in order to prevent its sticking onto the tube, especially in the case of cables with larger diameters.



Clean the cable insulation thoroughly using the supplied cable cleaner.

Thoroughly lubricate the cable insulation and the inner part of the adapter with Silicone grease as supplied.

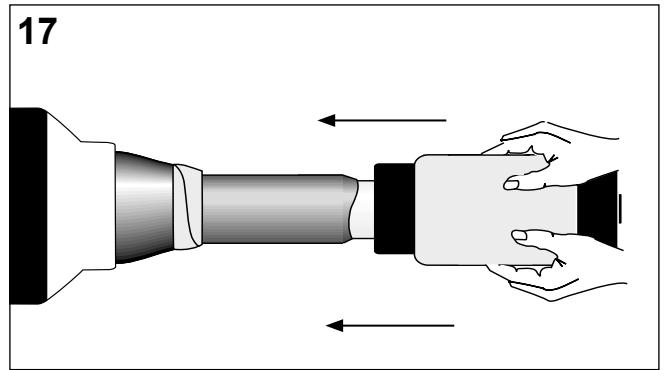
**Note** Wash and clean your hands.



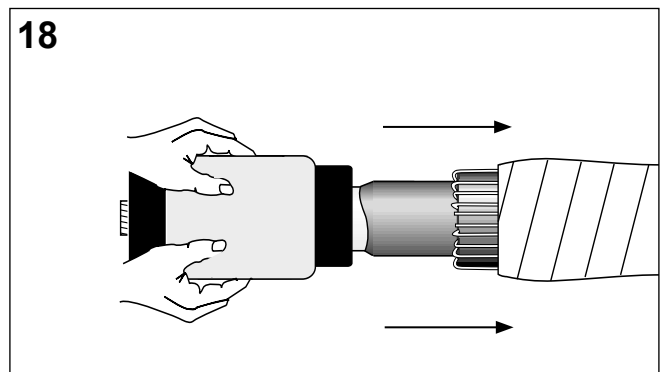
Push the adapter, small diameter first, with a twisting movement onto the cable core until the other side of the adapter (large diameter) lines up with the insulation cut.

**Note** Use your **clean** hands, not a tool!

Push from the end, do not pull at the opposite side!



Repeat the operation described in step 16 to 17 with the second adapter.

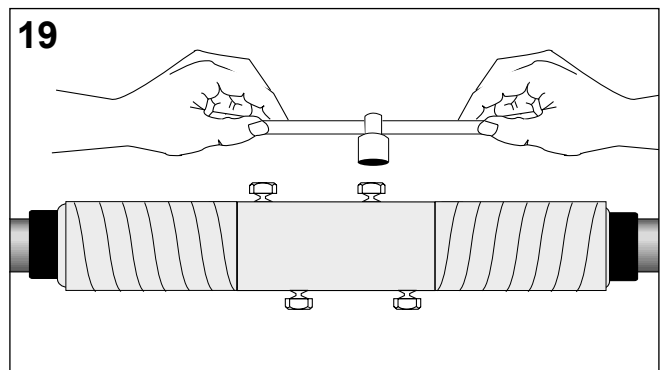


Protect the adapters temporarily with crepe tape.

Position the mechanical connector. Take up the tension equally on all bolts, using a box spanner. Do not yet shear the bolt heads.

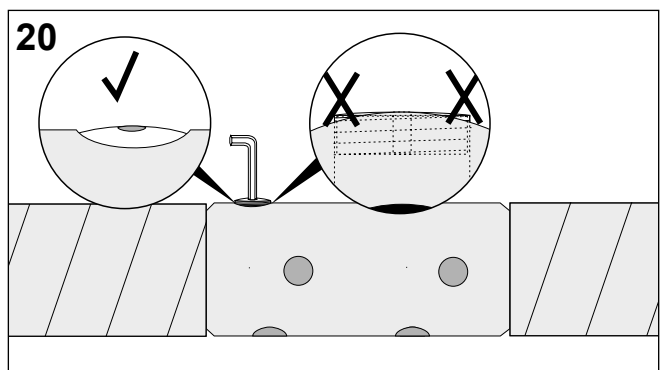
Check the distance between the adapters along the circumference of the connector. Re-align the cable if necessary and make sure that there is no gap between the insulation and the connector.

Tighten the bolts until the heads shear off, starting at the center of the connector.



Screw the thread closure into the screw hole until it levels up with the outer diameters of connector.

Make sure the thread closure lines up precisely with the connector body.



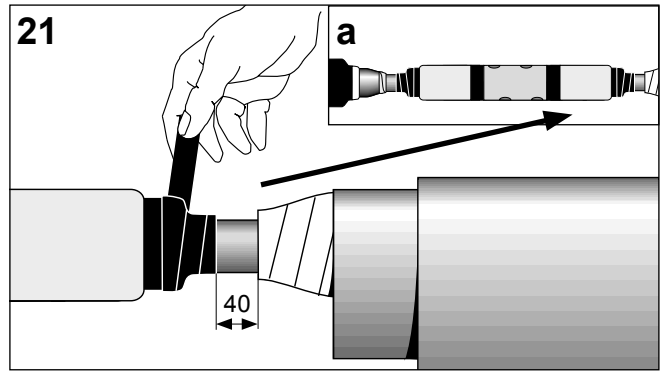


Push the adapters against the connector without any gap.

Apply conductive self-amalgamating tape onto the black part of the adapter and conductive cable screen on both ends, see drawing.

Leave 40 mm exposed as shown in the drawing.

Remove the crepe tape from both adapters.



**Note**

Wash and clean your hands.

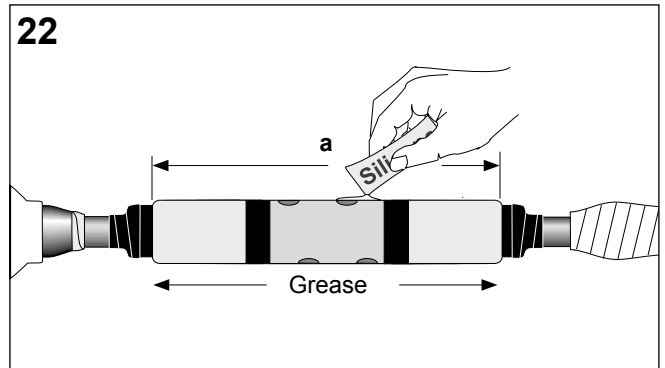
Clean the cable insulation and the adapters thoroughly using the supplied cable cleaner.

Lubricate the adapters including the connector with silicone grease as supplied. Ensure that the area is completely covered.

**Note**

Check even the lower side.

Check distance **a** and note it in the installation protocol.

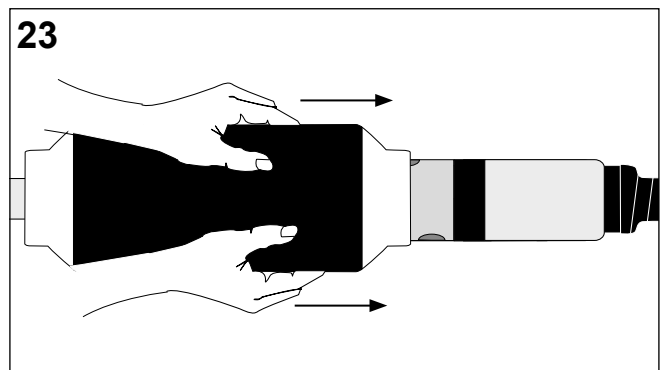


Push the main body onto the adapters with a twisting movement.

**Note**

Use your **clean** hands, not a tool!

Push from the end, do not pull from the opposite end!



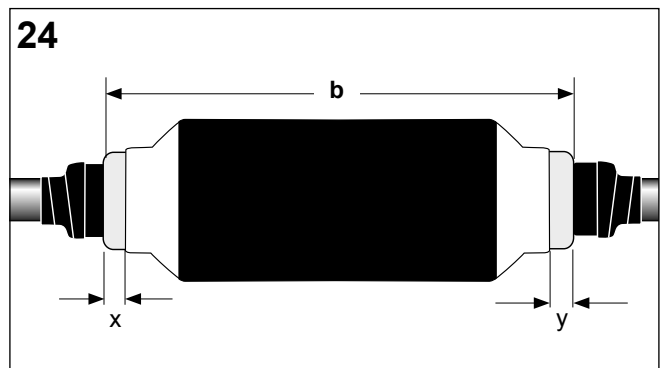
Position the main body centrally, covering the adapters.

Carefully clean and degrease the entire joint.

Measure length **b** and note it in the installation protocol.

**$a - b \ll 1,5 \text{ cm}$**

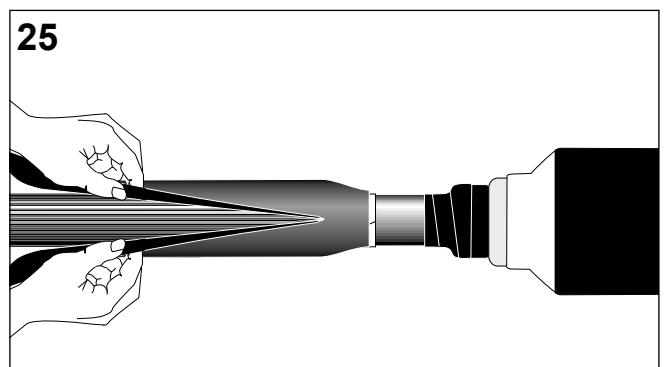
Make sure that  **$x = y$**



Remove the PVC tape from the tubing end.

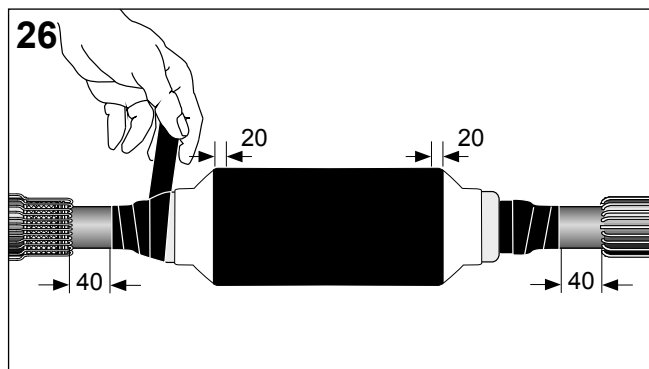
**Carefully** remove the heat shrink tube from the cable.

Do not damage the shielding wires or the cable surface.

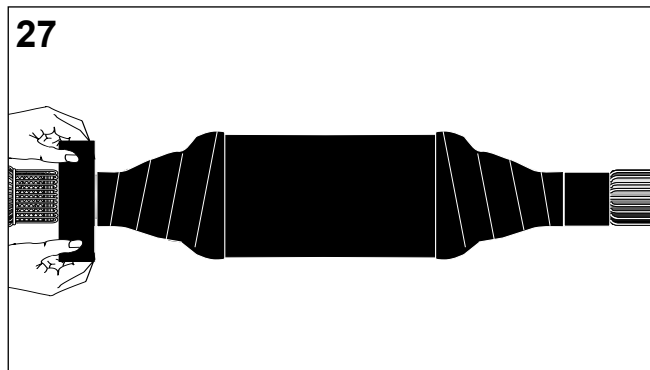


Continue applying conductive tape. End 20 mm on the black part of the main body.

Leave 40 mm of the cable screen exposed.



Smooth out the step between the conductive tape and the screen cut with black mastic tape.



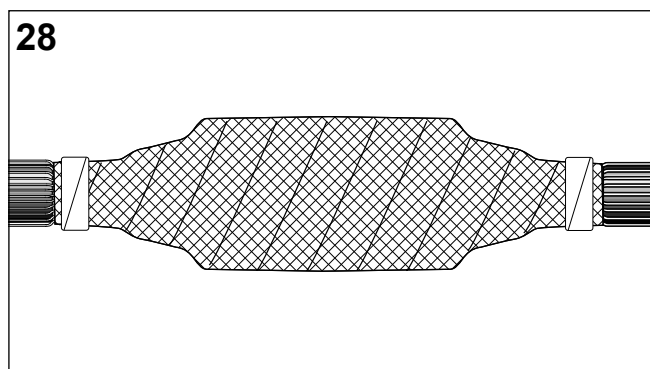
Wrap one layer of tinned copper mesh with a 50 % overlap around the joint.

Start at oversheath cut ( **cable A**) and stop at the oversheath cut ( **cable B**).

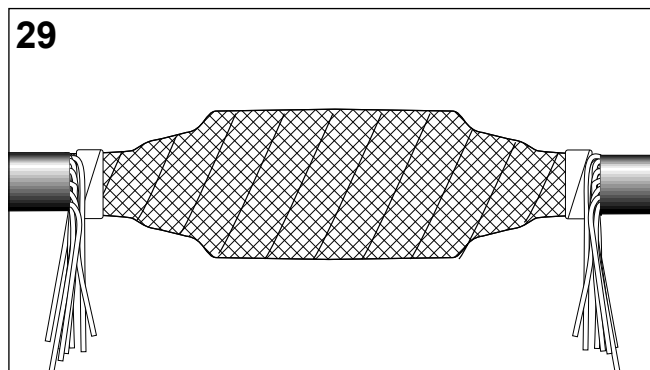
Install the roll spring on the copper wire / AL-foil area.

Tighten the roll spring with a twisting action.

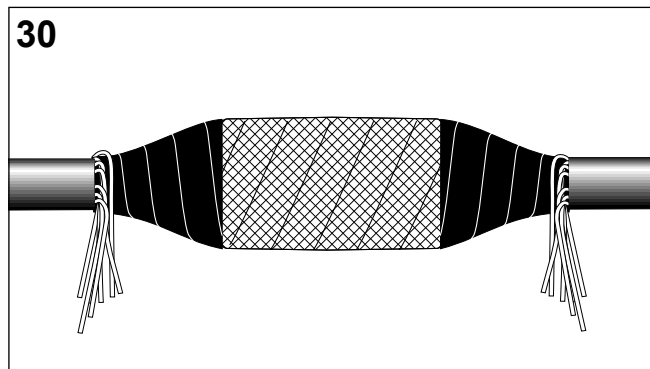
Protect the roll spring with textile tape.



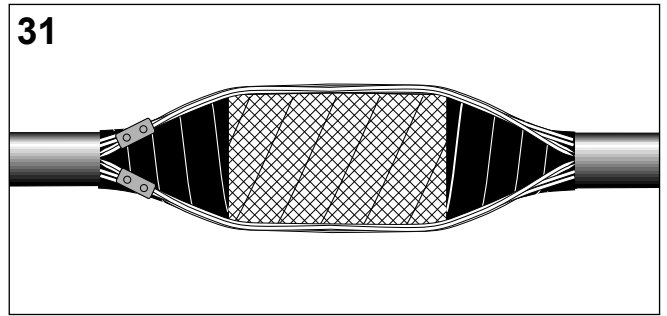
Gather the shield wires together in equal strands and bend them down.



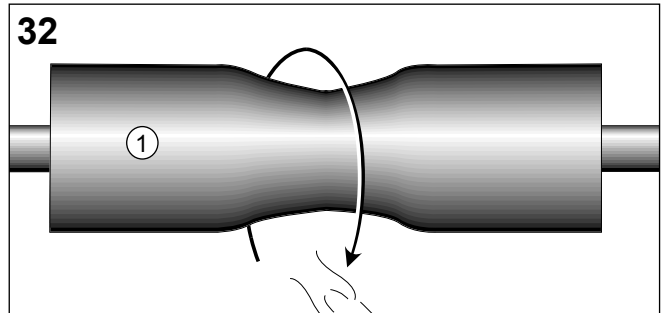
Smooth out the area between main body and oversheath cut by using black mastic as shown in the drawing.



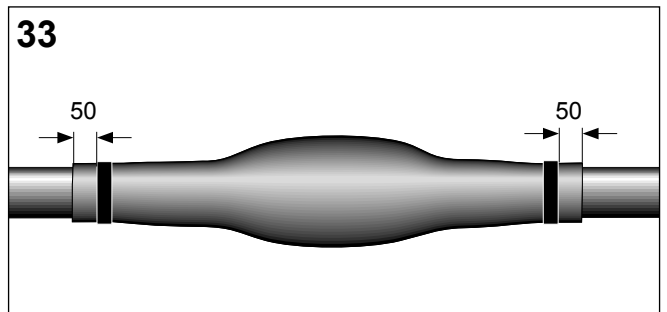
Gather the shield wires in 2 or more equal strands.  
Join the strands by using the mechanical connectors.



Slide one of the two sleeves centrally over the joint. Shrink the tubing down, starting in the centre working towards the ends.

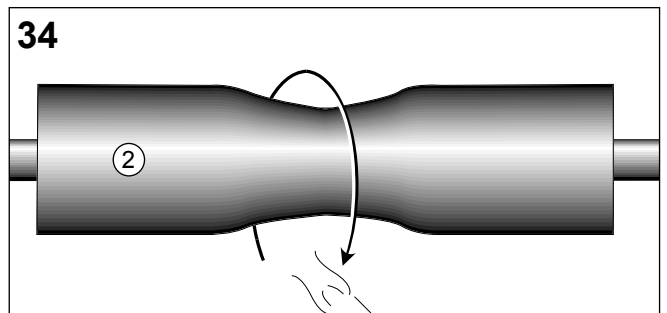


Apply one layer of black mastic 50 mm from the end of the tube on each side.



Slide tubing 2 centrally over the joint. Shrink the tubing down, starting in the center working towards the ends.

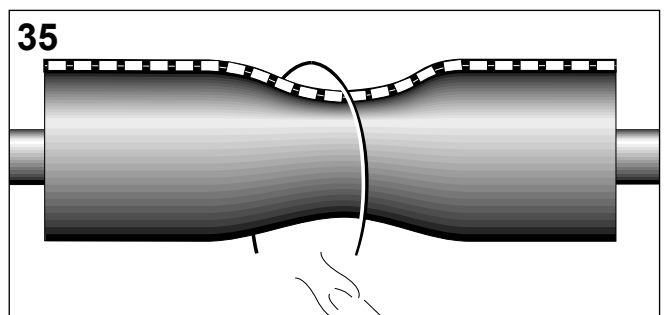
Apply one layer of black mastic at both ends of the heat shrink tube.



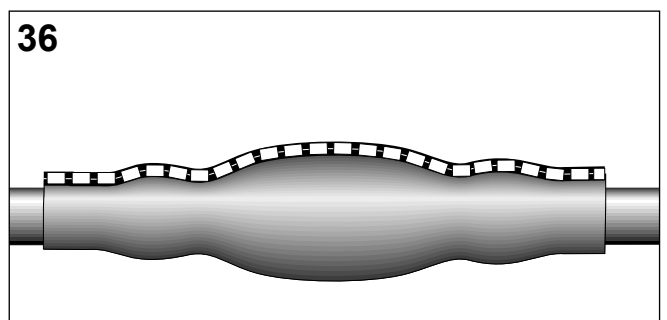
Place the wraparound centrally over the joint. Close it at the metal channel.

Start shrinking the wraparound from the center working towards the ends.

The wraparound is properly shrunk when the temperature sensitive surface has changed from green to black.



**Joint completed.**



Please dispose of all waste according to environmental regulations.

