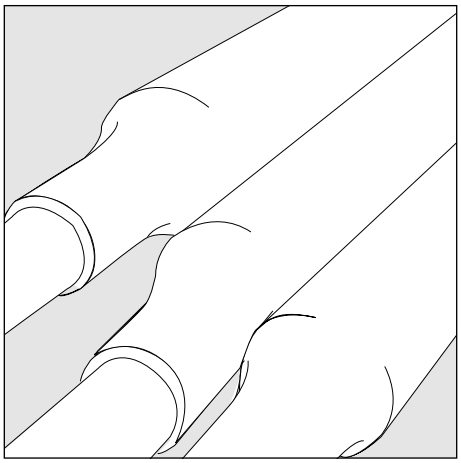
TE´s Raychem Cable Accessories



Installation Instruction EPP-2401-4/18

Raychem Three Piece Joint Polymeric Insulated Cables with Metal Tape

Shield Break

U_m = 170 kV

EHVS-170

To view the TE Energy website:

Tyco Electronics Raychem GmbH
a TE Connectivity Ltd. Company
Finsinger Feld 1
85521 Ottobrunn/Munich, Germany
Tel: +49-89-6089-0
Fax: +49-89-6096-345
TE.com/energy

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.

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 straighted for the length of complete Installation.

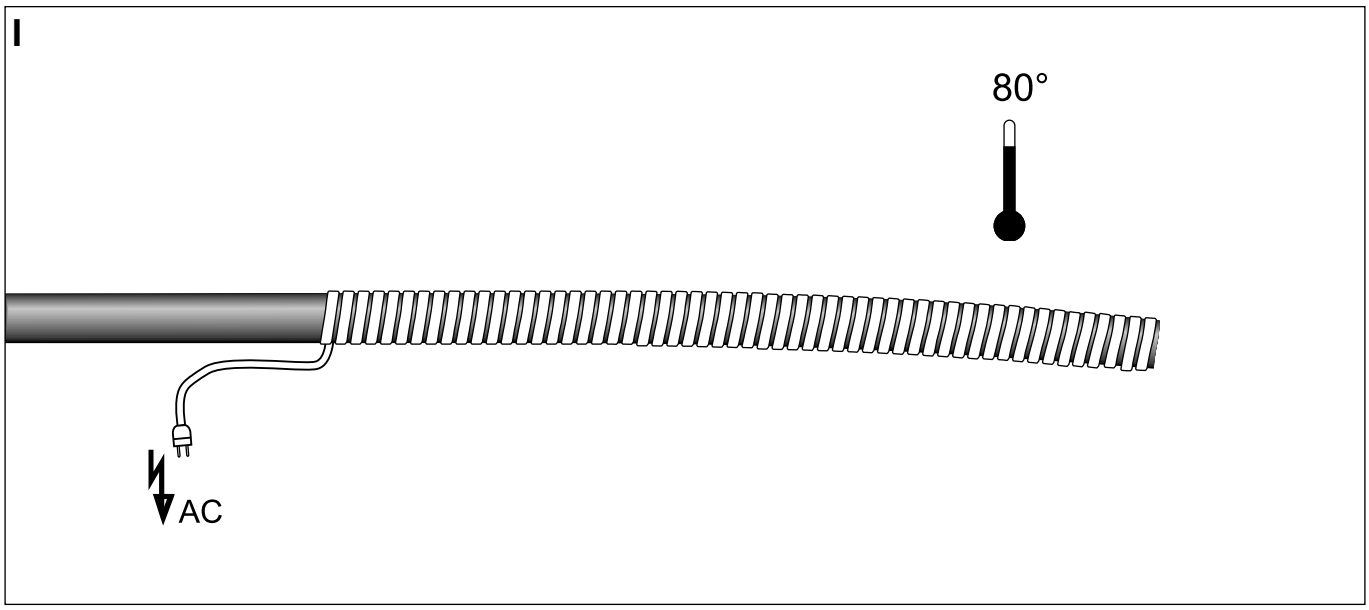
In case of graphite coating cover the cable with one layer of crepe paper.

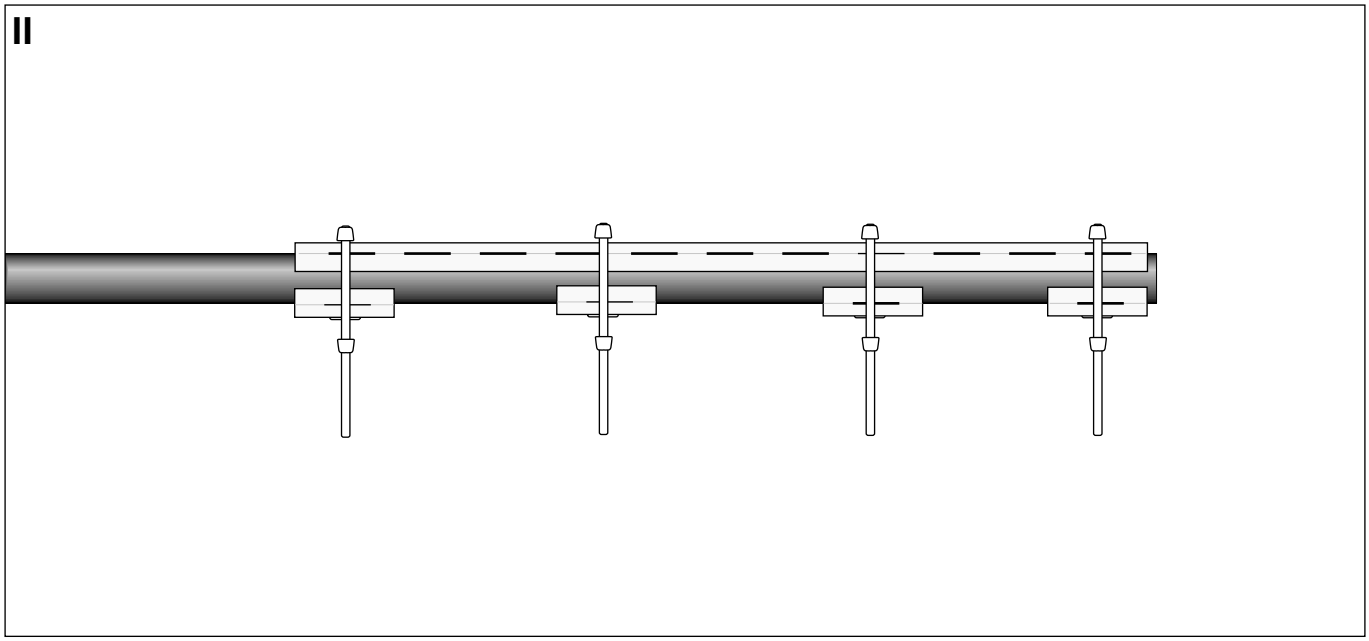
Degrease and clean the oversheath.

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.

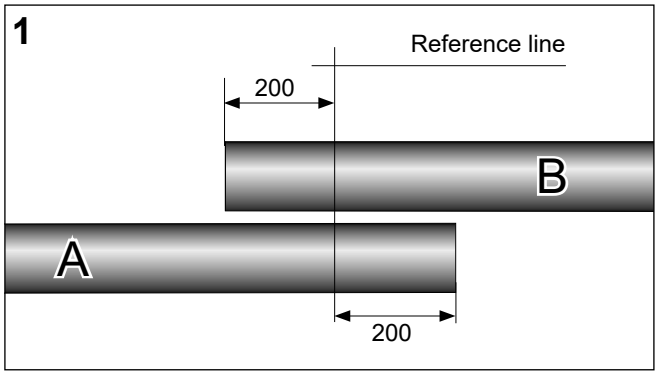
Cable Cross Section	Heating Time/ Temperature
up to 400 mm²	4 h / 80 °C
up to 1200 mm²	5 h / 80 °C
up to 2500 mm²	6 h / 80 °C





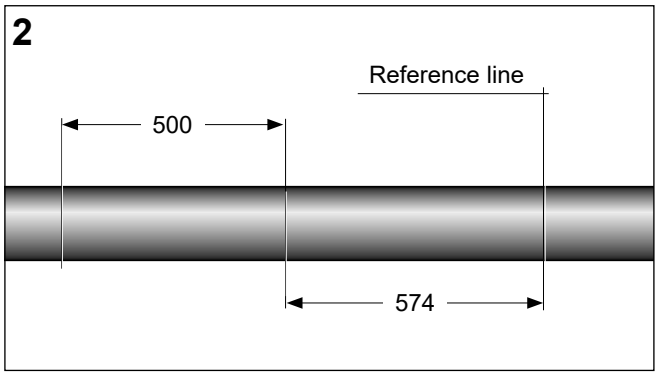
Cable Preparation

Overlap the cables **A** and **B** by 400 mm.

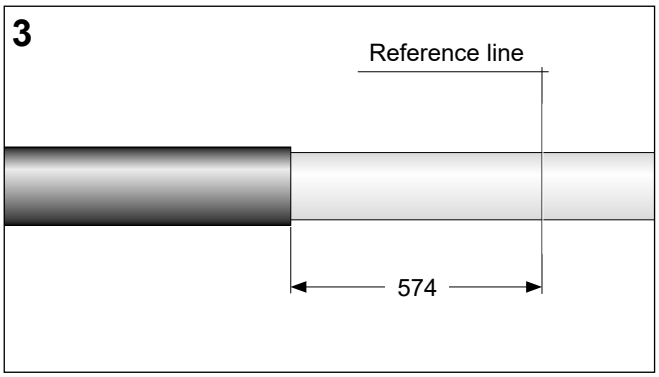


Cable A + B

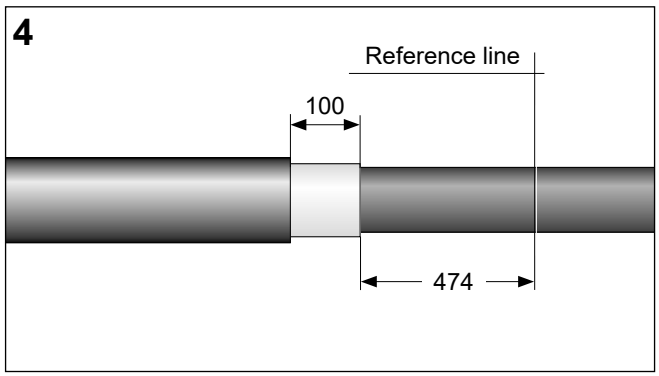
Remove the graphite coating on 500 mm length as shown in the drawing.



Remove the oversheath 574 mm from the reference line.

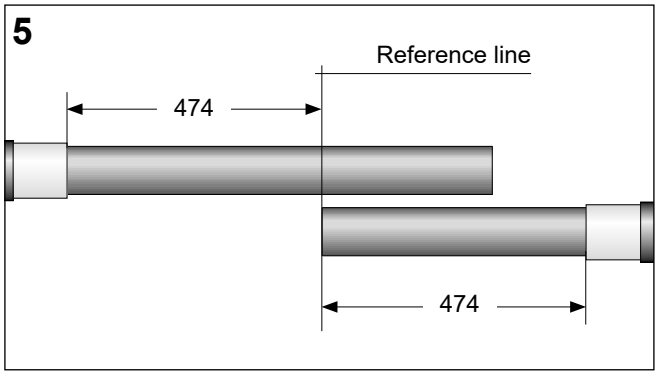


Remove the metal tape 100 mm from the oversheath cut.



Completion of the Joint

Cut the cables exactly at the reference line 474 mm from the metal tape cut. Use a **hacksaw** to cut vertically.

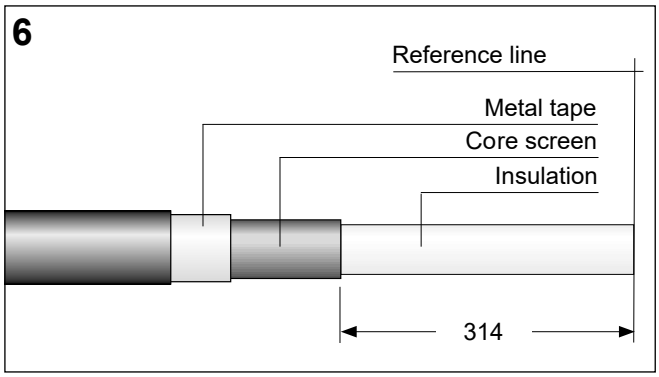


Thoroughly remove the core screen to within 314 mm from the reference line. The surface of the insulation shall be free from all traces of conductive material.

Note:

Smooth the insulation as requested on page 3 (General Instructions).

Do not damage the insulation.



Chamfer the core screen

Polish the insulation up to 200 mm from the screen cut.

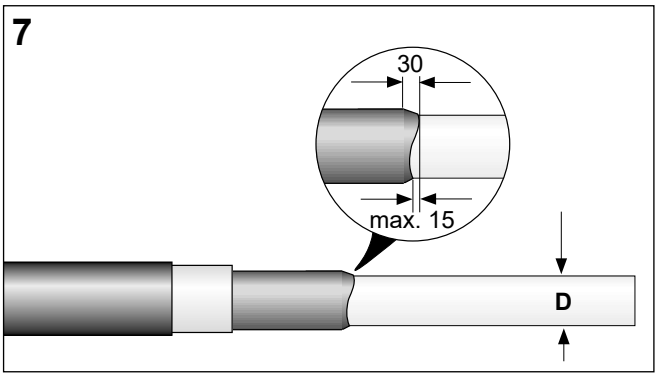
Check the dimension **D** as given in **Table 1**. **D** must keep the values within the given tolerances.

Table 1

Limit Values for Prepared Cable Cores

Description	**Range**
D* (mm)	inner Ø = DN (mm)
HVCA-EHVS170T-AB-60/66	60 – 66
HVCA-EHVS170T-AB-64/75	64 – 75
HVCA-EHVS170T-AB-72/83	72 – 83
HVCA-EHVS170T-AB-79/91	79 – 91
HVCA-EHVS170T-AB-89/112	89 – 112

*The limit values are valid for the finally prepared cable (after peeling and grinding). For peeling, it must be considered that subsequent grinding will reduce the diameter by 0.5 - 1 mm.



Note:

If cables of different sizes have to be connected, the kit may as well comprise parts of different sizes. Make sure you use the right parts for the different cable ends.
See **Table 1**.

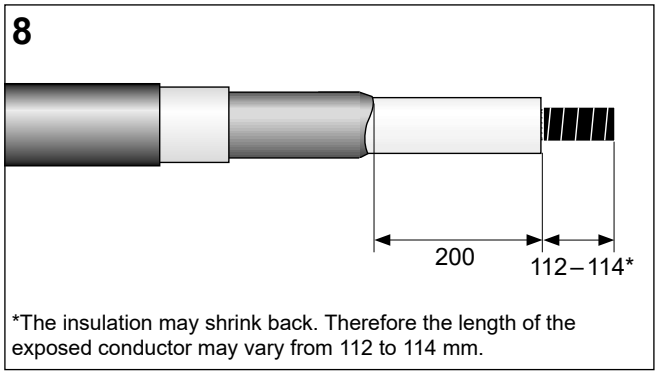
Remove the insulation using a stripper tool according to the dimensions in the drawing.

Deburr the edge of the insulation with sandpaper.

Note:

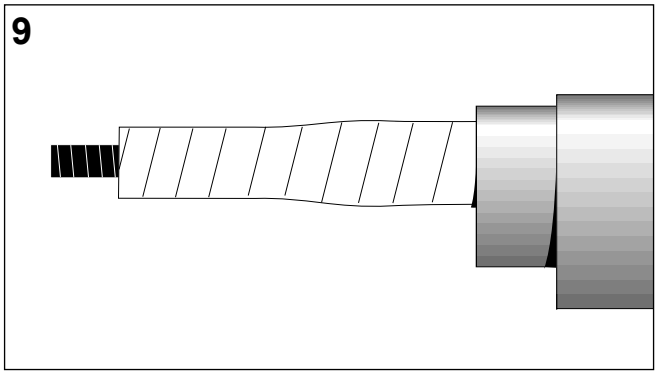
The distance between the tip of the semicon wave edge and the end of the insulation has to be 200 mm.

Cover the cable conductor with PVC tape.



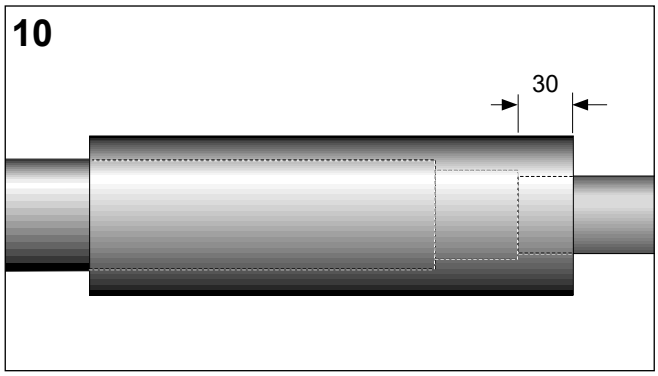
*The insulation may shrink back. Therefore the length of the exposed conductor may vary from 112 to 114 mm.

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

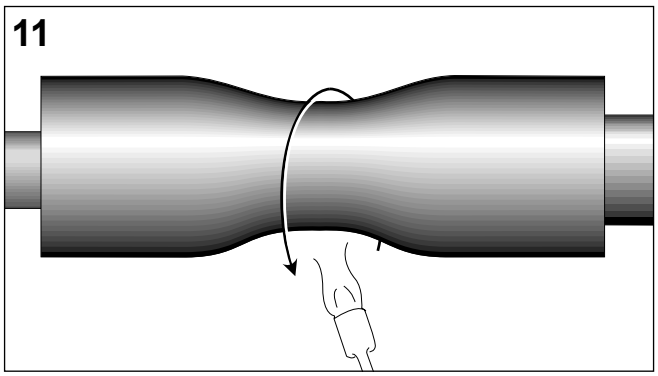


Slide the tube (short) onto the other cable as shown in the drawing.

Park the sleeve 30 mm away from the metal tape cut.

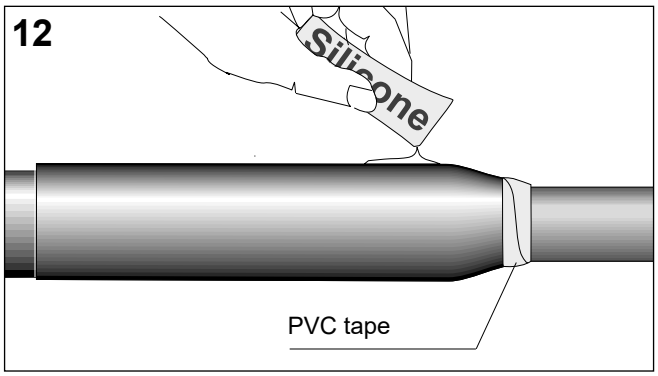


Start shrinking in the middle of the tubing and shrink it completely down.



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

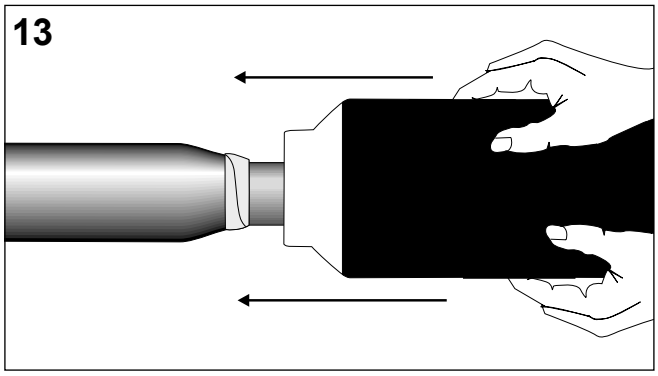
Lubricate the tubing and the inner part of the main body with silicone grease.



Push the main body on the tubing in a parking position. In doing so, twist the main body in order to spread the silicone grease evenly under the main body.

Make sure that the inner surface of the main body is not damaged by the conductor.

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



Note:

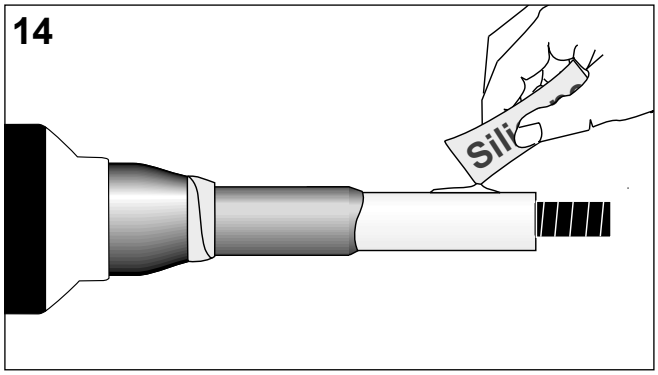
Twist the joint body occasionally in order to prevent its sticking onto the tube, especially in the case of cables with larger diameters.

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.

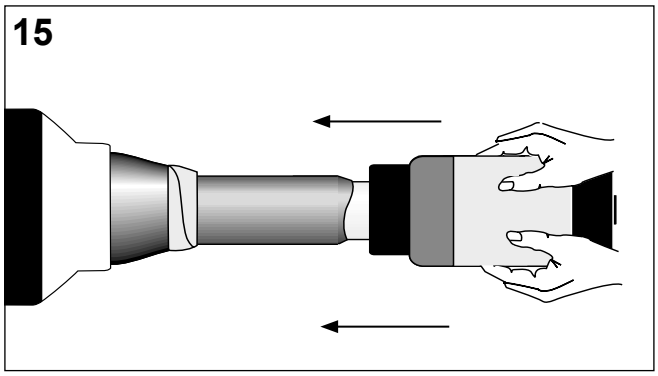
Note:

Wash and clean your hands before.

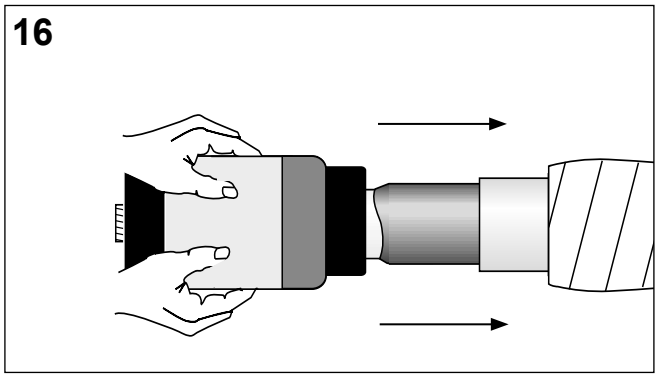


Push the adapter, small diameter first, with a twisting movement onto the cable core until the other side of the adapter (large diameter) lines up with the insulation cut. Use your **clean** hands, not a tool!

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



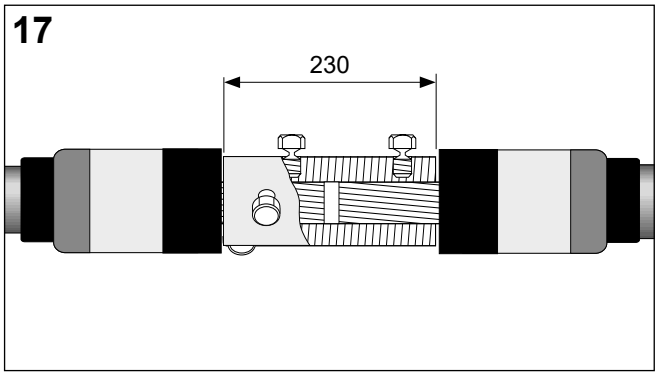
Remove the non-adhesive tape from the other cable end and repeat the operation described in step **14** to **15** with the second adapter.



Fit the conductors into the connector so that the connector end lines up with the insulation.

Do not shear off the bolt heads at this stage.

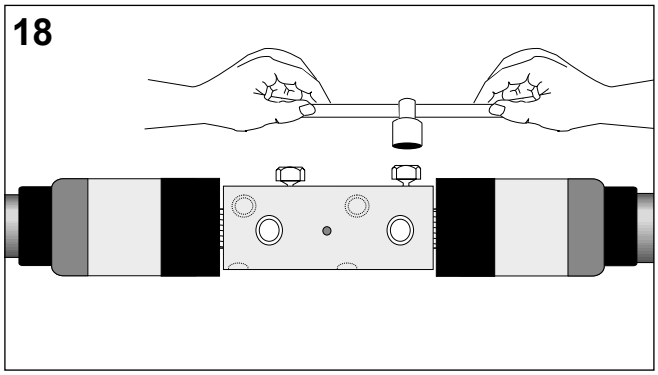
Protect the adapter temporarily with crep tape.



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

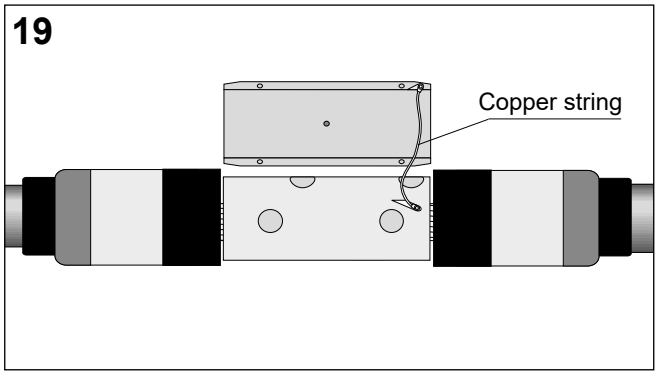
Note: Make sure that the connector is centered.

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



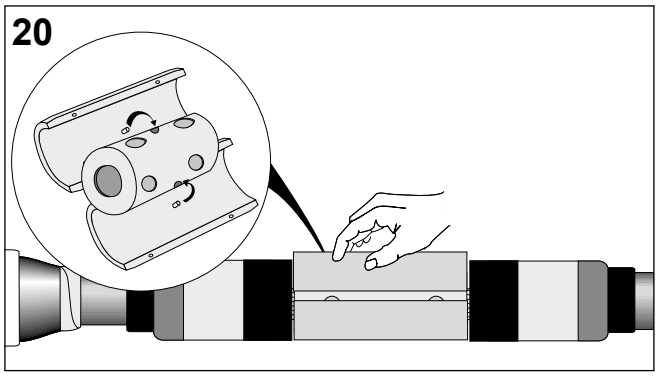
Connect the small copper string to the connector.

Connect the other end of the copper string inside to the Faraday cage.

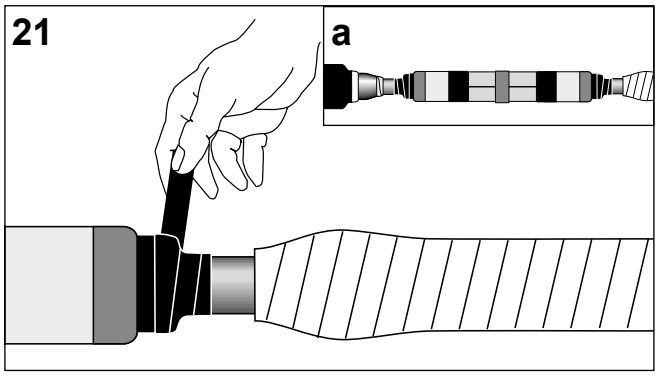


Install the Faraday cage (see detail) and make sure the step from the cable insulation to the Faraday cage does not exceed 2 mm.

Fix the cage temporarily with red PE tape.



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



Note:

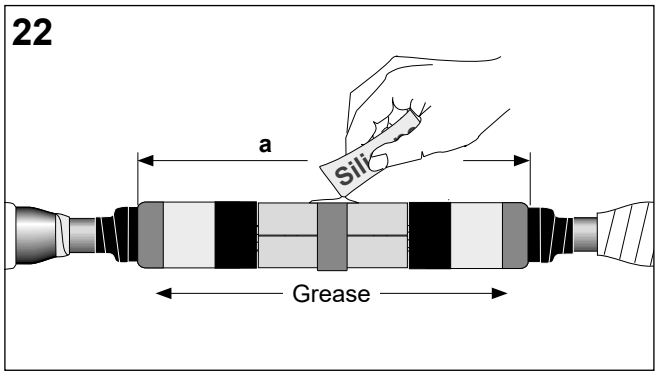
Wash and clean your hands.

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

Lubricate the adapters including the connector with silicone grease as supplied.

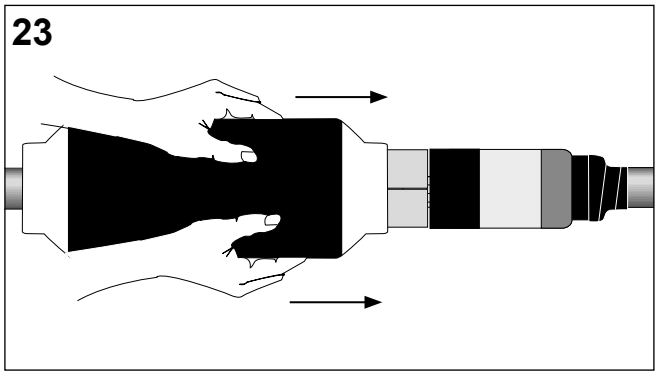
Ensure that the area is completely covered.

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



Push the main body onto the adapters with a twisting movement. Use your **clean** hands, not a tool!

Remove the red PE tape when the body is pushed over the half shell.



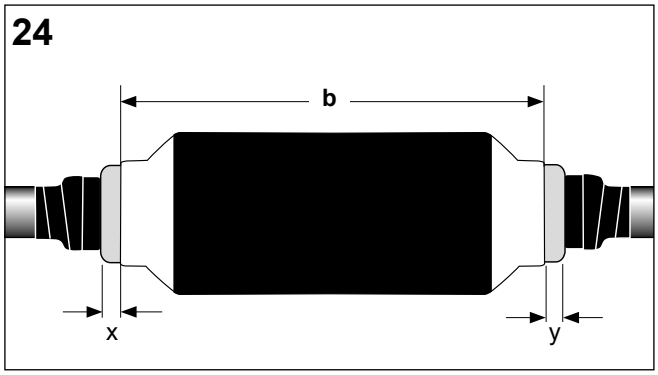
Position the main body centrally, covering the adapters.

Carefully clean and degrease the entire joint.

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

a - b << 1,5 cm

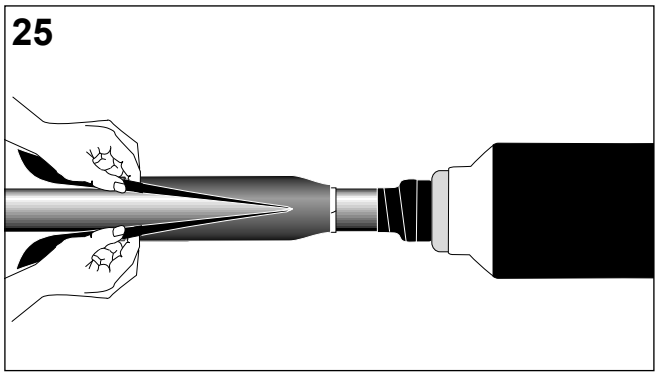
Make sure that **x = y**



Remove the PVC tape from the tubing end.

Carefully remove the heat shrink tube from the cable.

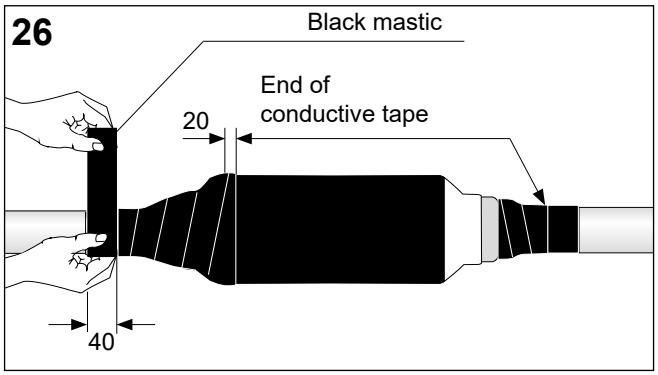
Do not damage the metal tape or the cable surface.



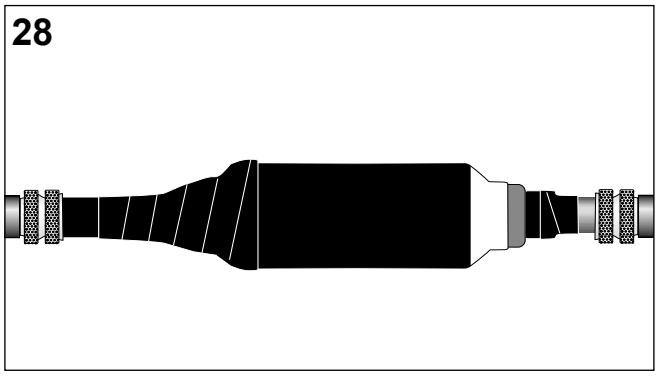
Continue applying conductive tape. End 20 mm on the black part of the main body.

Leave 40 mm of the cable screen exposed.

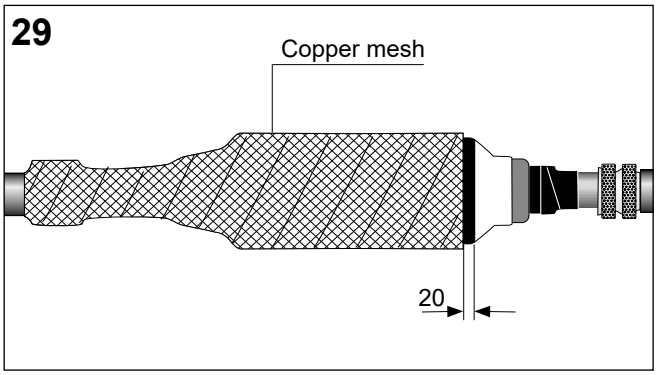
Smooth out the steps between the conductive tape and the metal tape with black mastic tape.



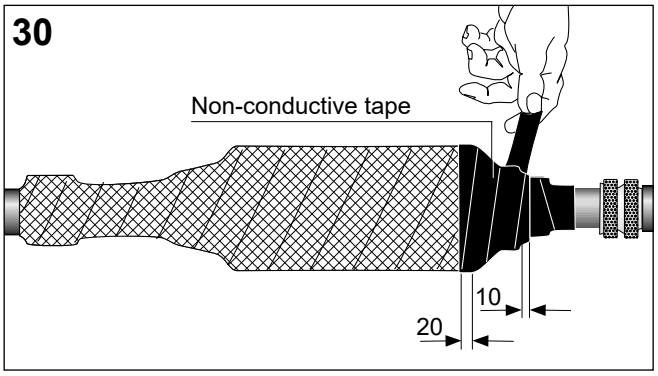
Wrap 2 punched contact strips into a circular shape and arrange them on the exposed ends of the metal tape.



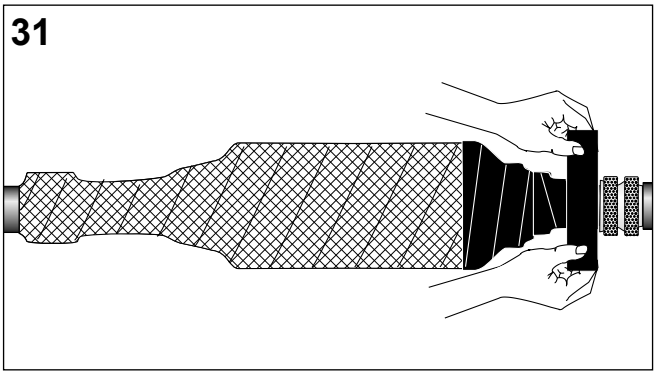
Wrap one layer of tinned copper mesh with a 50% overlap around the joint as shown. Start wrapping on the metal tape. Stop 20 mm before the semi-conductive area of main body ends.



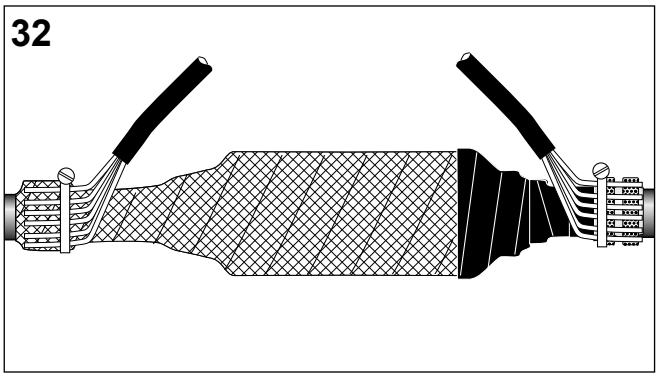
Apply non-conductive tape with at least 5 mm thickness onto the visible part of the adapter and main body as shown. Start 10 mm on the conductive part of the adapter and stop 20 mm on the semi-conductive part of the main body.



Smooth out the step between self-amalgamating tape and the sheath cut with black mastic tape.

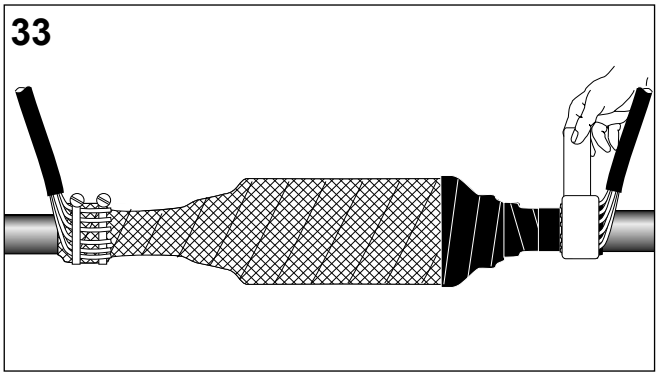


Remove the insulation on the earth leads for 120 mm. Spread the wires and position the wires onto the copper braids close to the oversheath cut. Fix the earth leads with a worm drive clamp on both sides.



Fold the earth leads back over the worm drive clamp and apply a second worm drive clamp.

Cover the worm drive clamps with textile tape.

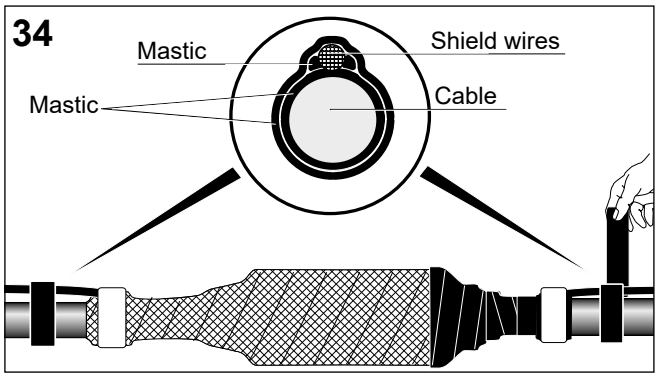


Slightly lift the shield wires.

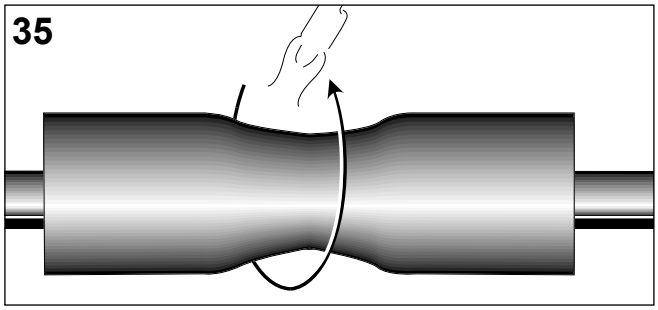
Wrap one layer of black mastic around the cable.

Wrap another layer of black mastic around the shield wire strand.

Produce two rolls of black mastic. Place them next to the wire strand on either side.

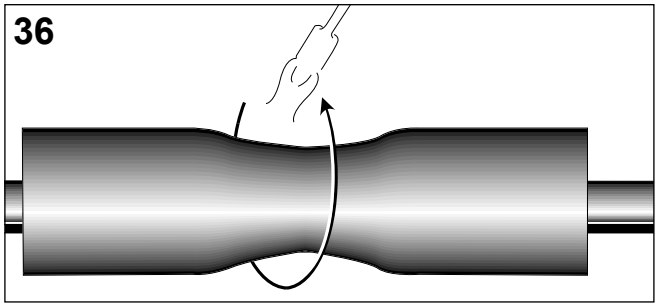


Slide one of the two sleeves centrally over the joint. Shrink the tubing down, starting in the center working towards the ends.



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

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



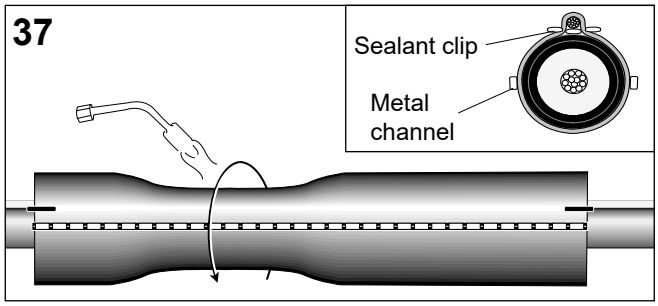
Place the wraparound centrally over the shrunk tubes. Close it at the metal channel.

In the space between the cable and the shield wires push the sealant clip onto the tubing.

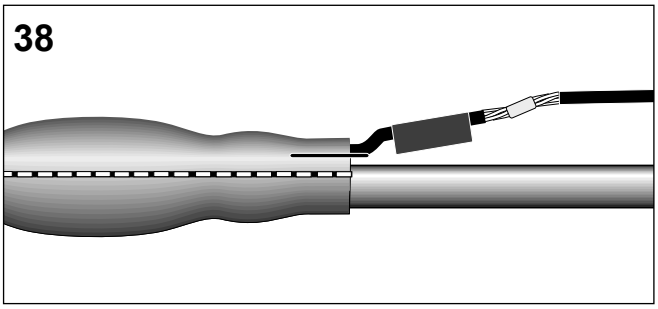
Note: Ensure that the sealant clips and the metal channel are shifted by 90° to each other.

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

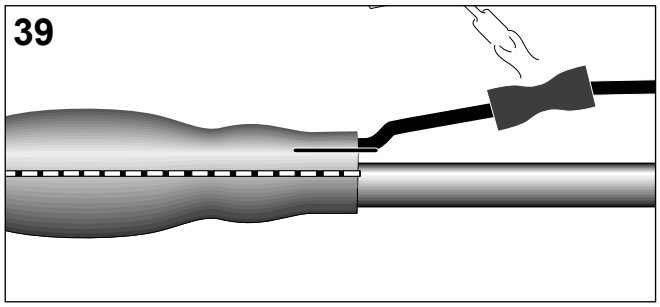
The wraparound is properly shrunk when the temperature sensitive surface has changed from green to black.



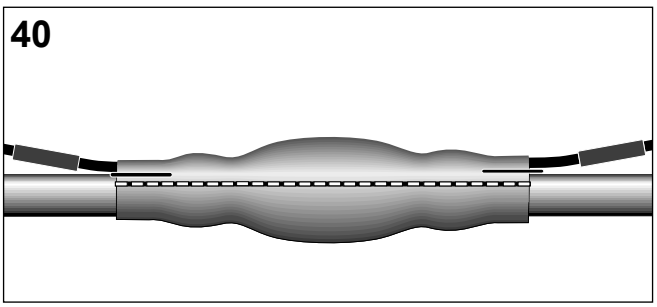
Slide the insulating tubing (black) over the earth lead. Connect the shield wires to the link box cable by crimping, using **blocked** connectors only.



Position the insulating tubing centrally over the connector and shrink down starting in the center working towards the ends.



Joint completed.



Please dispose of all waste according to environmental regulations.