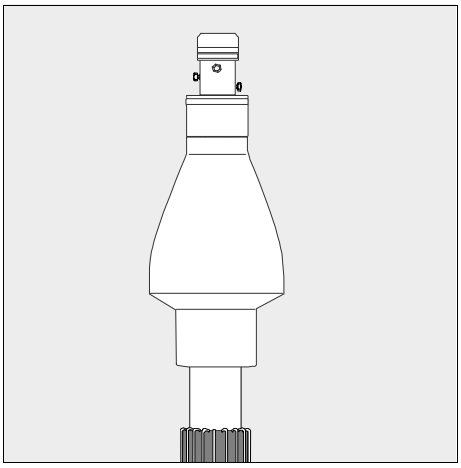
Raychem



Installation Instruction
EPP-1020-8/05

Compact Switchgear/
Transformer Terminations
Dry Version
for Polymeric Cables
with Wire Shield
U_{max} = 72.5kV / 145 kV

Cross Section
≤ 800 mm²

Tyco Electronics Raychem GmbH
Energy Products
Finsinger Feld 1
85521 Ottobrunn
Munich, Germany
Tel. ++49-89-6089-0
Fax ++49-89-6096345

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.

General Instructions (continued)

Obey relevant security and safety rules during the installation.

The cable training and laying needs to be finished and the cable ends have to be properly sealed.

Cable racks are necessary for final positioning and ensure the installation area is free from dust and kept dry.

During the cable preparation the working environment has to be kept clean (tent or shelter) and the installers should wear clean working overalls.

All tools and devices must be free from oil and grease.

All bolts and nuts should be lubricated with Molycote before use.

Torque limits must be checked.

Use appropriate stripping tools to allow for smooth and uniformly round insulation diameter and smooth insulation surface.
NOTE: Adjust the stripping tool to the thickness of the semicon layer so that only the layer is thoroughly removed.

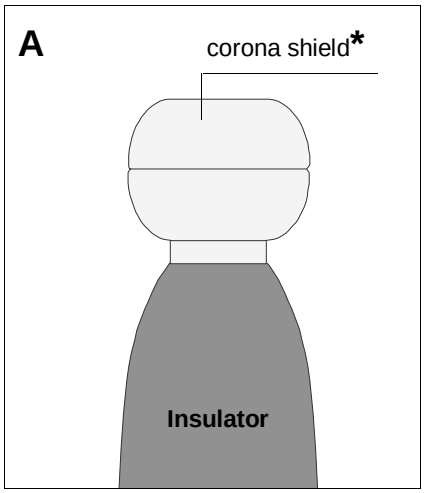
Adjust the cutting depth at the semicon cut to ensure a chamfered transition.

After the tools have been used polish the stripped surface by hand or a machine grinder using 220 grid (Aluminum Oxide cloth) followed by 400 grid.

Remove all protection varnish (red) from the sealing grooves. Grease all sealing O-rings (silicone oil or silicone grease) before application.

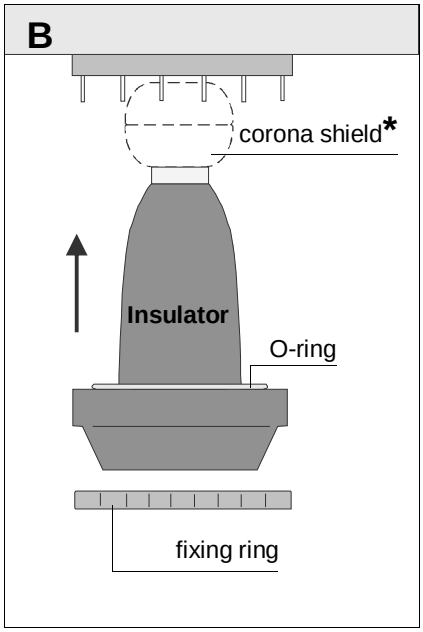
Installation of the Insulator into the Switchgear/Transformer Housing

The insulator should be installed under supervision of the switchgear/transformer manufacturer.

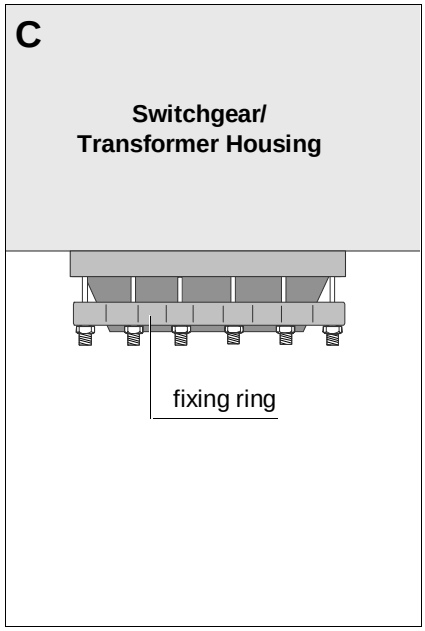


Bolt the lower part of the corona shield to the insulator electrode, then apply the top part of the corona shield.

* Corona shield for Transformer Termination only (not for Switchgear).



Put the O-ring into the sealing groove of the insulator. Clean and degrease the insulator. Keep it free from dust and dirt.



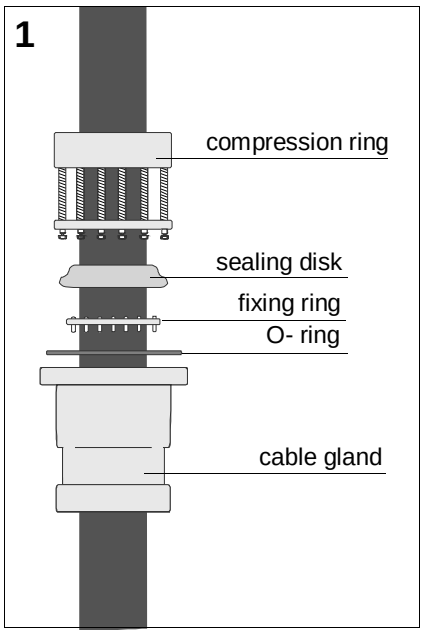
Insert the insulator into the switchgear/ transformer housing. Apply the fixing ring. Bolt the fixing ring evenly to the switchgear/transformer housing.
Note: Adhere to the torque defined by the switchgear/transformer manufacturer.

Installation of the Plug-in Termination

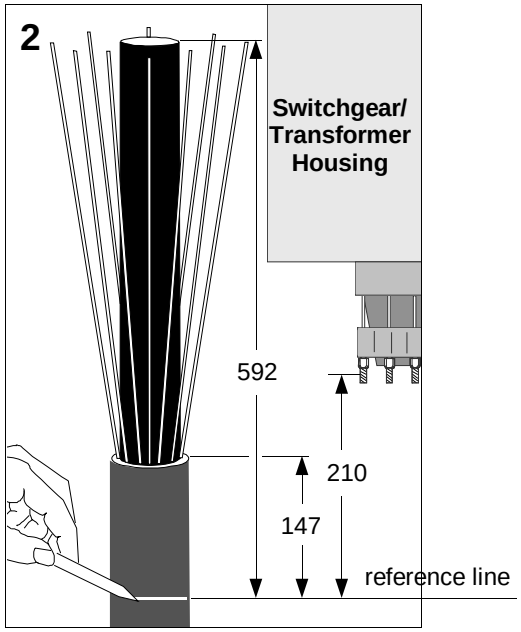
Cable Preparation
Train the cable end in the straight installation position and fix it. Heat the entire cable by applying heating tape to the over sheath for a minimum of 6 h at 70°C. The temperature needs to be controlled by appropriate thermo couples at the oversheath or by self-regulating heating tapes, which can be provided by the Tyco Electronics Energy Division.
Before stripping to the required dimensions the cable needs to be cooled down to ambient temperature.

Degrease and clean the oversheath for up to 1800 mm from the graphite coating.

For cable with laminated polymer oversheath follow the cutback and stripping dimensions as described in the separate instruction EPP-0742.

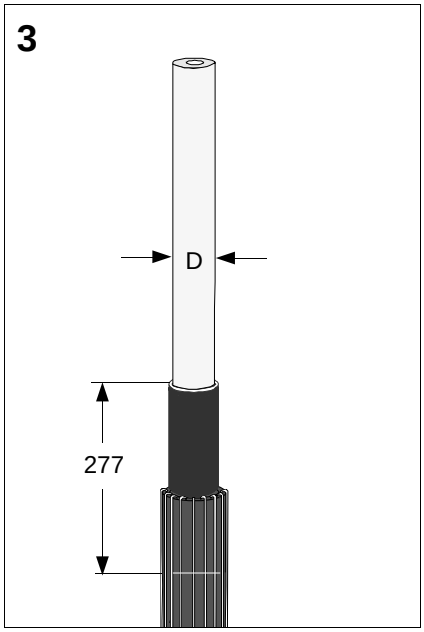


Move the cable gland, O-ring, fixing ring, sealing disk and compression ring down the cable jacket as shown in the drawing.
Make sure enough room is left for the installation of the plug-in unit.



Cable with wire shield

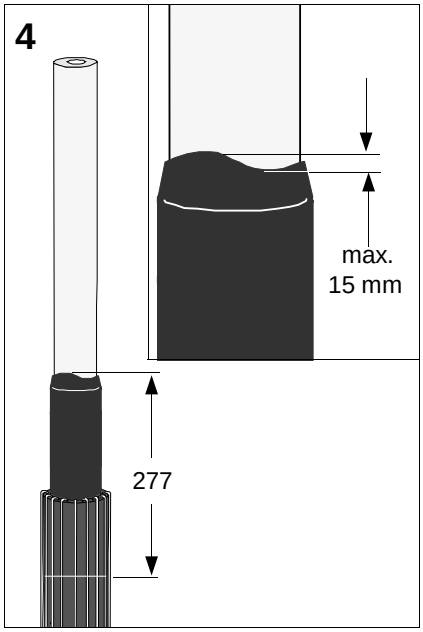
Remove the oversheath to dimension 592 mm. Mark the oversheath 147 mm top down of the oversheath cut.
This is the reference line for all further installation procedures.
The reference line has to be 210 mm below the transformer resin housing. Temporarily bend the wires back over the cable sheath.



Thoroughly remove the core screen to within 160 mm of the oversheath cut until the core's diameter is **D** (See **Table**).
The stripping tool should be adjusted to the max. diameter given in the **Table** allowing for further reduction during the polishing process.

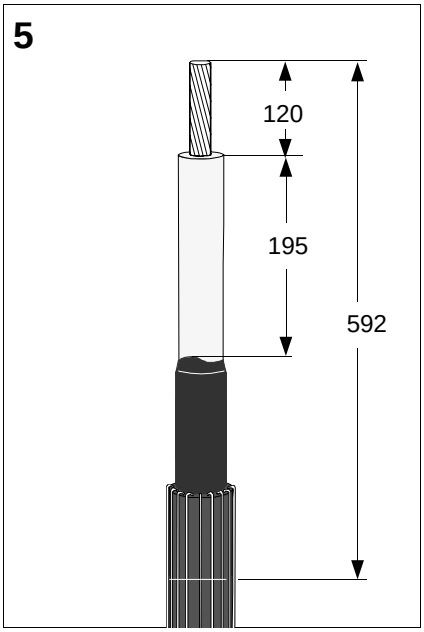
Table

As delivered	Application range
Stress cone	D
Reference	(mm)
335565-05	42. -47.0
335565-01	65.0-69.5
335565-02	69.0-74.0



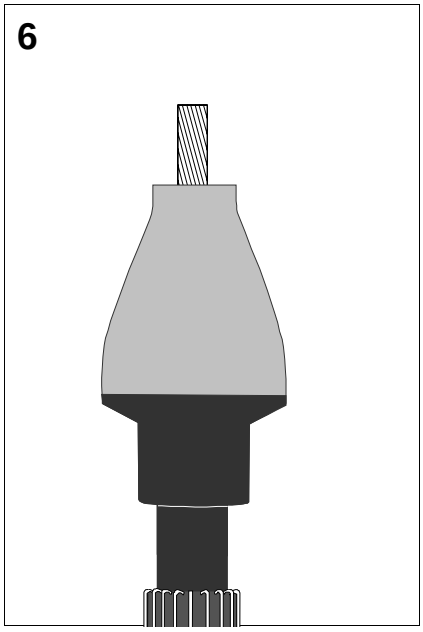
Chamfer the core screens
Abrade and smooth the insulation from the screen cut towards the end. **Note:** Do not nick the insulation.
For dimension **D** see **Table**. The tolerances given must be kept.
Make sure the semicon transition wave shape is in accordance with the values and shape shown in the drawing above.
Clean and degrease the insulation with the supplied cleanser in direction of the semicon to prevent contamination.
Protect the cleaned surface with non-adhesive PVC tape.

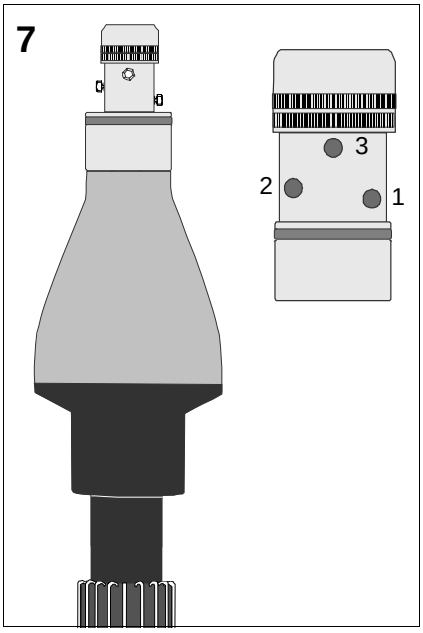
Installing the stress cone
If any, remove the PVC protection tape. Clean the cable insulation and the stress cone bore with alcohol. Thoroughly lubricate the cable insulation and the stress cone bore with silicon oil. Push the stress cone onto the cable core until the insulation levels with the stress cone top. If necessary adjust the cone according to the dimension below.
Clean silicone surplus with alcohol.

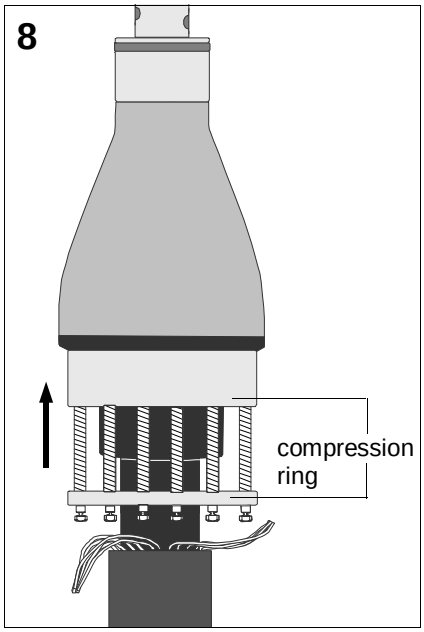


Cut the cable core back exactly 592 mm from the cable oversheath. The cut must be right-angled. Remove 120 mm of the insulation as shown in the drawing. Slightly smooth the insulation edge. **Note**: **Adhere to the dimensions in the drawing**.
Check the measure 195 mm.

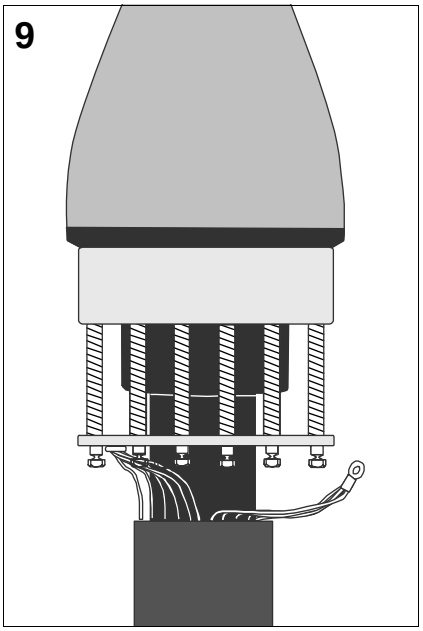
Insert the conductor in the connector barrel and butt to the insulation cut. Tighten the shear bolts firmly by hand. Use a box spanner or equivalent



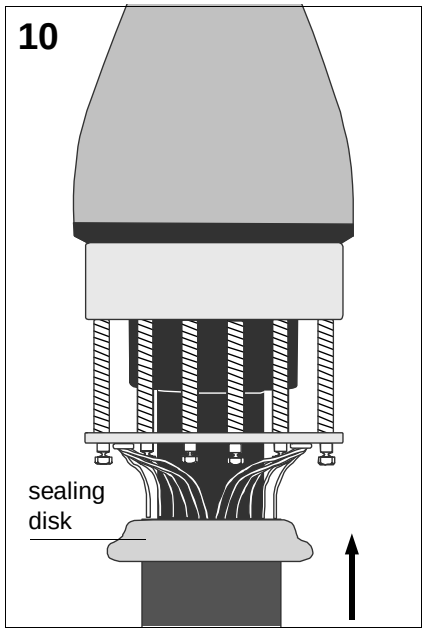




Push the compression ring firmly against the rubber cone. Bend the shielding wires back and put them together into several leads. Allow slack for the wires.



Crimp the cable lugs to the wires and bolt them to the compression ring.

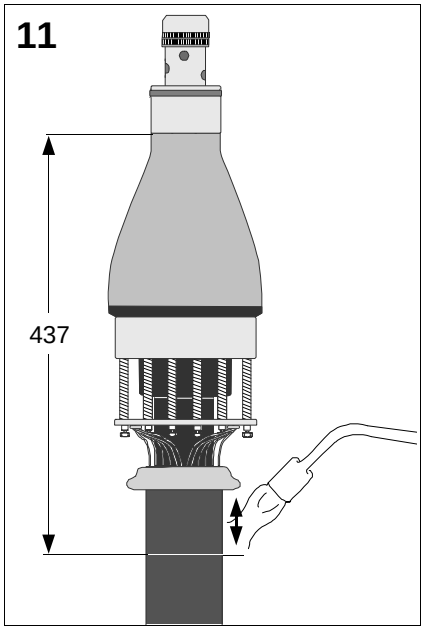


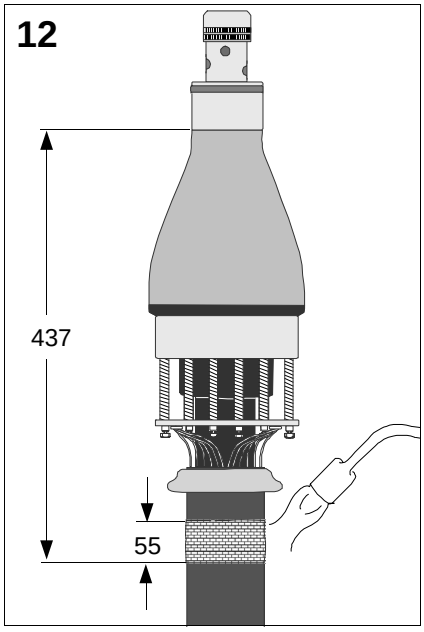
Push the sealing disk up towards the compression ring.

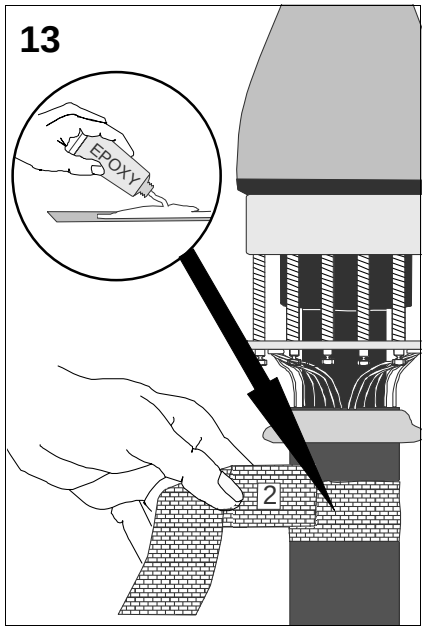
Heat the HDPE cable oversheath within a range between 380 - 430 mm until it becomes soft (see drawing).

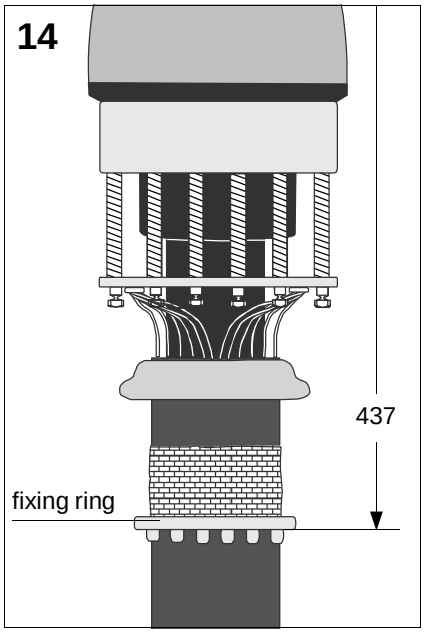
Apply the glass fiber tape onto the soft HDPE oversheath. Heat the glass fiber with a torch until the HDPE material penetrates the glass fiber tape.

Mix the epoxy resin (UHU-Plus). Soak another glass fiber tape with epoxy resin and apply a second layer of glass fiber onto the cable oversheath.

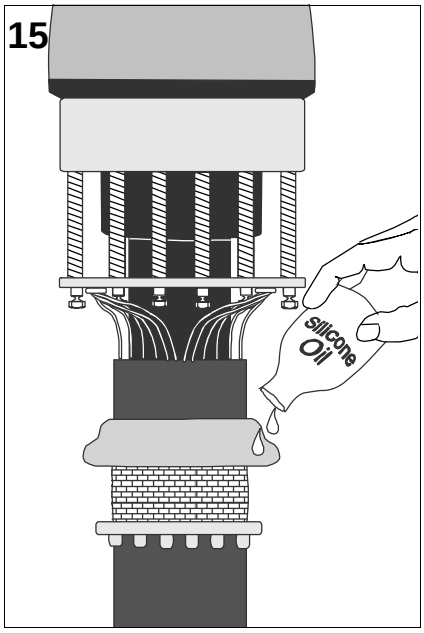




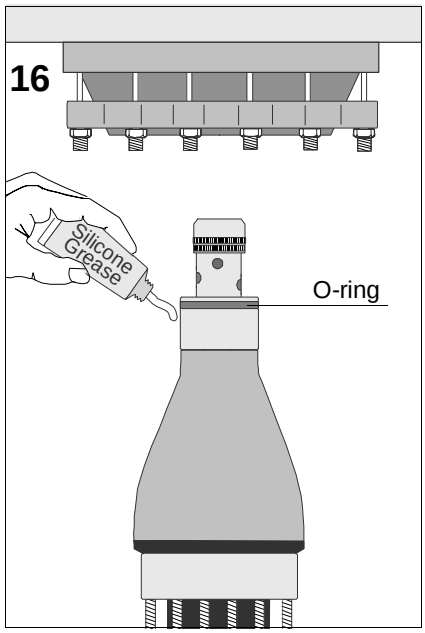




Push the fixing ring up to a position 437 mm below the stress cone top (see pict. 12).
Fix it with glass fiber tape and epoxy resin. Wait until the epoxy is hardened and the fixing ring is fastened.



Clean and degrease the cable oversheath. Remove any epoxy remnants.
Move back the sealing disk to cover the glas fibre tape.
Moderately grease the sealing disk with silicone oil.



Remove the temporary protection of the connector stud. Make sure the O-ring (gray) is applied to the connector stud. Clean and degrease the blue/gray cover part of the rubber plug with alcohol.

Note: Do not touch the conductive part with any solvent.

Clean the female part of the insulator with Shell-Sol D60 or equivalent means. Remove Shell-Sol D60 remnants with alcohol. Grease the rubber plug as well as the O-ring at the connector stud with silicone grease.

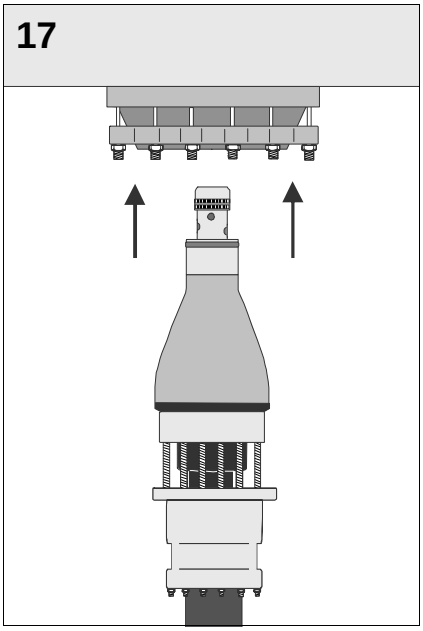
Push the cable with the male plug-in unit into the insulator housing.

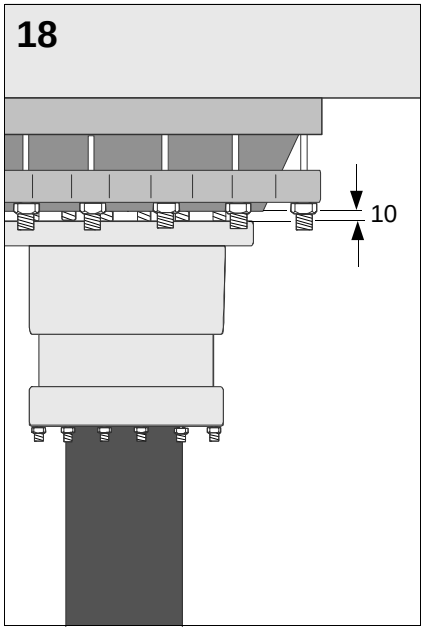
Push it until the distance between the top of the cable gland and the bottom of the insulator housing is 10 mm.

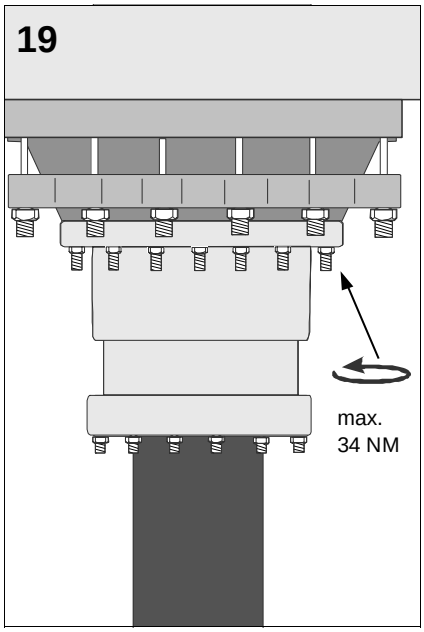
Make sure the cable gland and plug-in unit are moved vertically into position.

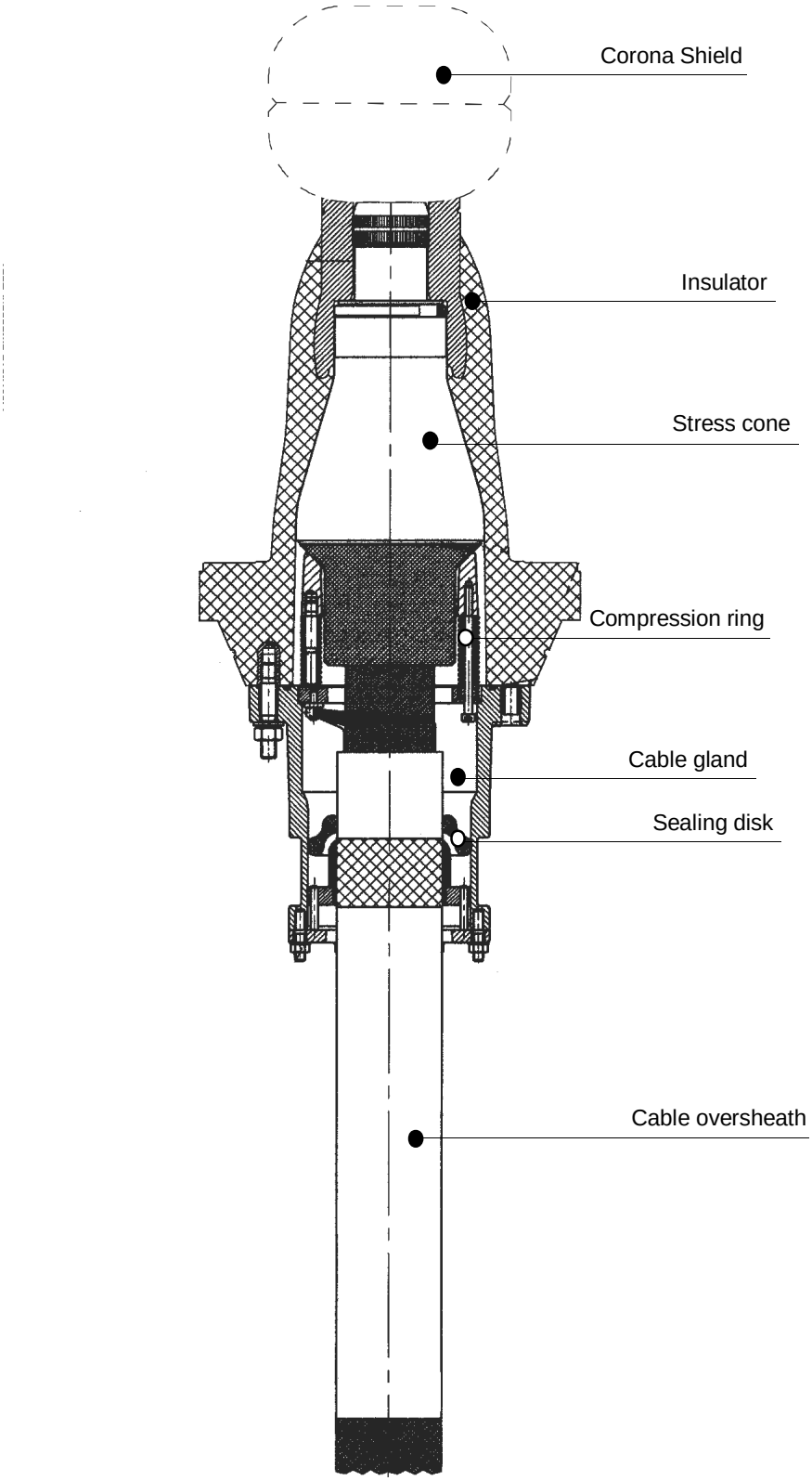
Make sure the O-ring is in position.

Bolt the cable gland to the insulator housing with the defined torque of maximally 34 Nm.
Fasten the bolts of the cable entry lid in such a way that they level up with the lid surface.
Connect the ground lead to the substation ground according to local requirements.









Please dispose of all waste according to environmental regulations.