



Energy Division

## Raychem Three-Piece Joint up to 145 kV

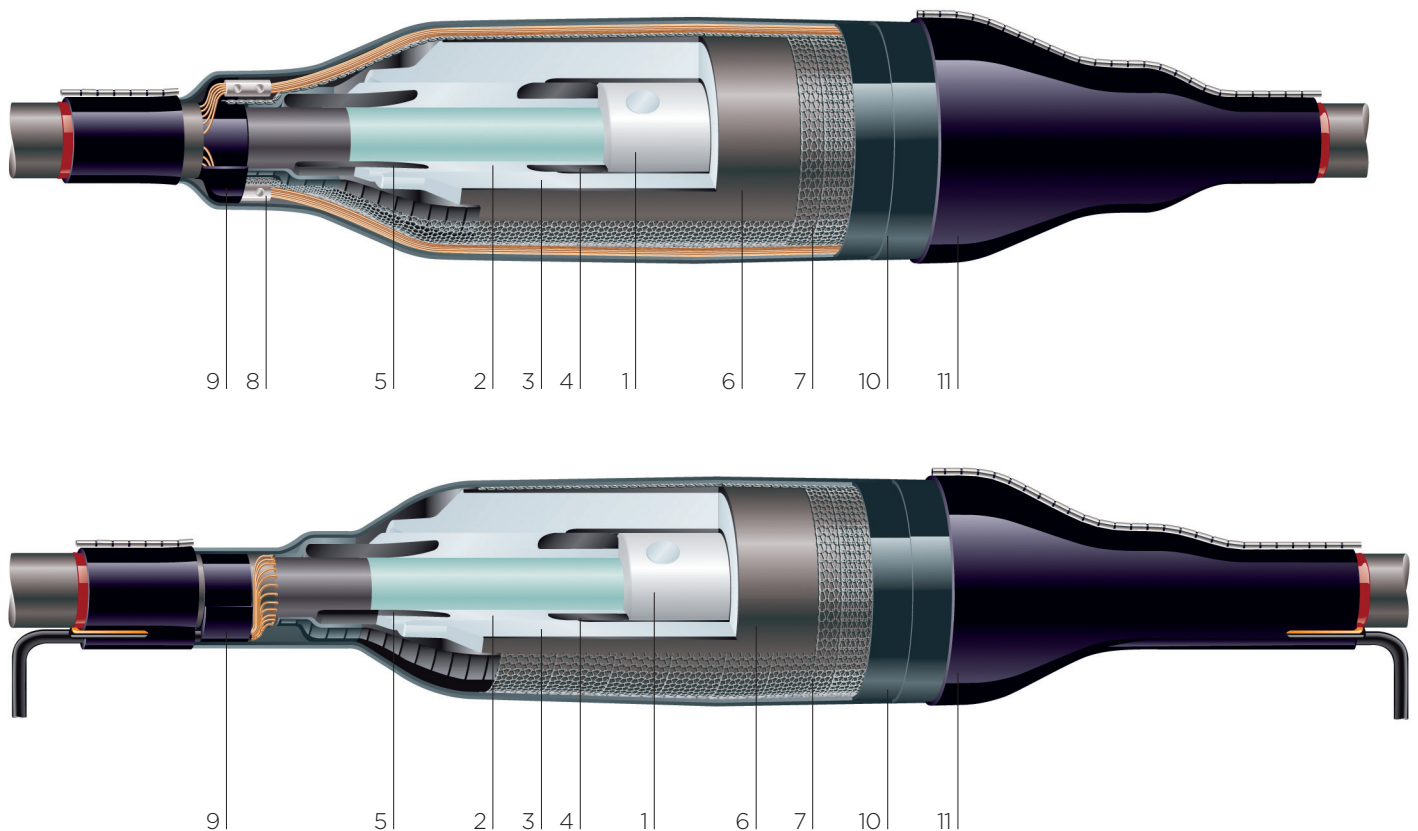
## Raychem Three Piece Joint up to 145 kV

### Application

The joint is a pre-fabricated three piece design for voltage classes up to 145 kV. Polymeric insulated cables of various designs can be adapted with respect to shielding and metal sheath. The silicone rubber joint parts with integrated geometrical stress control provides proven electrical function. The joint components combine electrical performance, stress control and moisture sealing to provide the important functions required for all High Voltage products.

### Features

- Premoulded three piece joint design
- Torque-controlled connector
- Joint fits on all polymeric cable constructions
- Proven shield continuity concept
- Factory tested silicone rubber bodies
- Special silicone rubber provides perfect compression force for optimised electrical performance
- Short cut-back dimensions
- No special tools required to install the joint
- Cable size transition possible
- No tension set of joint body
- Moulded outer conductive screen
- Geometrical electrical stress control by moulded conductive deflectors
- Type tested according to IEC60840 and IEEE404 Standards
- Manufactured according to ISO9001 and ISO14001



- 1 Mechanical connector
- 2 Silicone rubber adapter body
- 3 Silicone rubber main body
- 4 Inner electrode/Faraday cage
- 5 Deflector
- 6 Outer screen
- 7 Copper mesh
- 8 Solderless shield connection
- 9 Sealant/mastic
- 10 Insulating tubes
- 11 Outer protection with integrated moisture barrier

### Major Design Elements

The joint consists of connector (1), cable adapter bodies (2) - including deflectors (5) and main joint body (3) - containing inner electrode / Faraday cage (4) and outer screen (6) as well as outer protection by heat-shrink technology (10, 11). The conductors of the cable are connected by a mechanical connector sleeve (1) using torque controlled shear-off bolts. The connector sleeve is suitable for stranded aluminium and copper conductors. Cross-section transitions are possible without any extra components. No extra tooling is needed to push-on the silicone rubber cable adapter bodies (2) and the silicone rubber joint main body (3) due to its excellent elasticity.

During installation the joint main body is parked on the oversheath of the cable. Solderless connection technologies are used to connect the metal sheath/shield of the cable. Heat-shrink technologies (10, 11), replace the cable sheath and its moisture barrier. The joint concept is similar for inline, grounded and shield break joints, despite the shield conductivity. Special heat-activated sealant/mastic (9) is used to smooth out uneven shapes, providing a water tight seal and preventing moisture ingress.

## Construction and design

### Joint components

The joint kit contains just a few components and most of them with unlimited shelf life under normal storage conditions. The silicon rubber parts are extremely versatile and accommodate a wide range of cable diameters. The light weight of the components and limited volume of the kits facilitate safe and easy transportation and handling. All components are included in a single wooden box. The set of pre-fabricated components requires no special or expensive tools for installation. Installation involves a simple set of standard procedures with no soldering required.



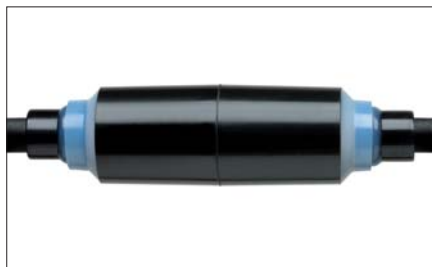
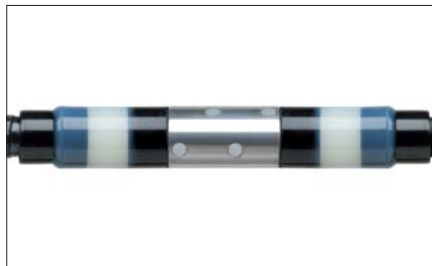
### Mechanical connector

- Mechanical connector with torque controlled shear-off bolts
- No additional metallic Faraday cage required
- One connector length for cable cross sections up to 1200 mm<sup>2</sup>
- Suitable for aluminium and copper conductors



### Silicone rubber parts

The silicone rubber parts of the three piece joint containing two cable adapter bodies and the main joint body. The adapter bodies accommodating the various cable insulation diameters and build up the connection area to an almost constant diameter with the connector. This ensures a smooth interface fit for the installation, minimize the number of joint components and keep the installation time to a minimum. Additionally the adapter bodies accommodate different cable cross sections with just one main body. All silicone parts with sustainable mechanical properties allow a wide application range. Conductive electrodes with an exactly defined geometrical design over the screen cut area provide a well defined electrical stress distribution. Electrical stress control is fully integrated in the silicone parts. The connector area is screened by an integrated conductive tube performing as a Faraday cage. The Faraday cage is designed to deal with cable insulation shrink back.



### Joint shield conductivity

- Solderless screen connection
- Typical shield wire cross sections can easily be connected by either mechanical or compression connectors
- Shield break, straight through and grounding joints using the same basic components



Straight through connection



Shield break connection

### Cable metal shielding

Grounding kits for commonly used cable constructions like lead sheath, corrugated aluminium sheath, copper tape and wire screens, etc. are available.



### Outer joint protection

Glass fibre reinforced heat shrink wrap around with integrated radial and axial moisture barrier. Other designs with metallic protection and glass fibre enclosures are available on request.





## Raychem Three Piece Joint up to 145 kV

<b>Technical data:</b>		123 kV	145 kV
Rated voltage $U_0/U$ ( $U_m$ )	kV	64/115(123)	76/132(145)
Basic impulse level	kV	550	650
Max. continuous operating temperature	°C	90	90
Max. conductor emergency temperature	°C	150	150
Conductor short circuit temperature	°C	250	250
Short circuit current (sheath)	kA / 1sec	40	40

### For shield break joints:

DC voltage between metallic sheaths/screens	kV	20	20
DC voltage between metallic sheath/screen and earthed exterior	kV	20	20
Lightning impulse voltage between metallic sheath/screen	kV	75	75
Lightning impulse voltage between metallic sheath/screen and earthed exterior	kV	37.5	37.5

### Application Range:

Conductor	mm <sup>2</sup>	1200	1200
Diameter over Insulation	mm	43 – 84	43 – 84

For special applications and bigger cable sizes please contact your Tyco Electronics representative.

### Tools

Tools required for cable preparation can also be purchased or rented at Tyco Electronics Energy Division. (See brochure EPP-0756 and EPP-1543)



Cable stripper



Gas torch



Straightening slide rails



Tool box



Heating blanket

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