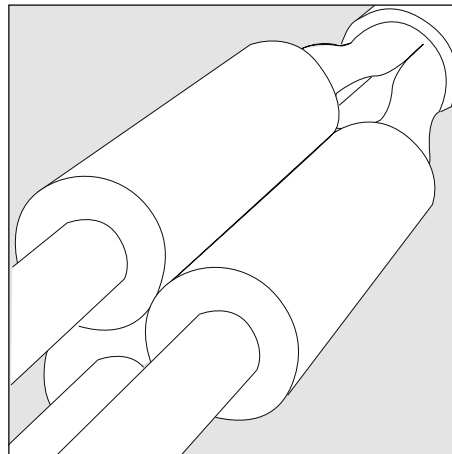


**Energy Division**

 **Tyco Electronics**



**Installation Instruction  
EPP-0844-7/10**

**Raychem  
Joint for 3-Core  
Polymeric Insulated Cables  
with Wire Shield  
12 kV to 24 kV**

**Type: MXSU**

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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.**

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, Tyco Electronics 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.

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

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## Application range of the MXSU kits

The kit is based on polymeric insulated cables for **stranded circular conductors** and wire shielding.

Different application ranges for aluminium or copper conductors are mentioned in **table A** below.

**Table A**

Voltage class 12 kV		Voltage class 17.5 kV		Voltage class 24 kV	
Kit number	Range stranded / round	Kit number	Range stranded / round	Kit number	Range stranded / round
MXSU-3311	25 - 95	MXSU-4311	50 - 95	MXSU-5311	25 - 95
MXSU-3321	70 - 150	MXSU-4321	70 - 150	MXSU-5321	50 - 150
MXSU-3331	95 - 240	MXSU-4331	120 - 240	MXSU-5331	95 - 240
MXSU-3332	150 - 300	MXSU-4332	150 - 300	MXSU-5332	150 - 300

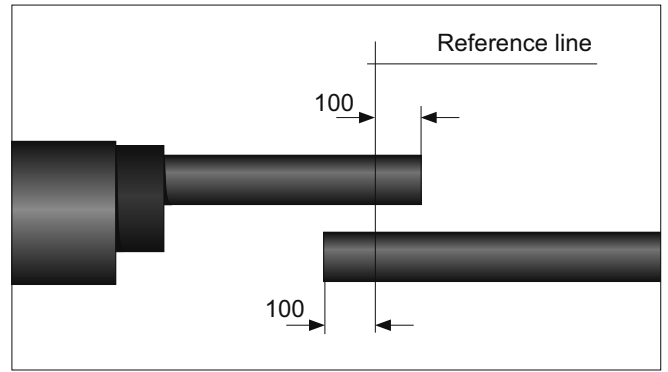
**Table B: Admissible cable dimensions for MXSU joints**

Kit Number	Conductor Ø		Core Insulation Ø		Outer Cable Ø	
	min (mm)	max (mm)	min (mm)	max (mm)	min (mm)	max (mm)
MXSU-3311	5.2	12.0	13.2	21.8	40.0	61.0
MXSU-3321	8.7	15.0	17.6	24.3	45.0	68.0
MXSU-3331	10.3	19.2	18.5	29.4	53.0	77.0
MXSU-3332	12.9	21.6	21.6	31.4	59.0	85.0
MXSU-4311	7.2	12.0	17.5	24.0	50.0	62.0
MXSU-4321	8.7	15.0	19.9	27.5	52.0	74.0
MXSU-4331	11.6	19.2	22.5	31.6	59.0	79.0
MXSU-4332	12.9	21.6	23.5	33.6	61.0	90.0
MXSU-5311	5.2	12.0	17.9	26.0	48.0	72.0
MXSU-5321	7.2	15.0	20.2	29.5	55.0	80.0
MXSU-5331	10.3	19.2	23.0	33.6	62.0	89.0
MXSU-5332	12.9	21.6	25.0	35.5	70.0	96.0

## Cable Overlap

Overlap the cables to be joined by about 200 mm. Mark the reference line (the middle of the overlap). Slide the small sealing sleeve over the long cable end.

Fold and tape it down temporarily.  
Position the remaining sleeve over the first one.



## Cable Preparation

Remove the oversheath to the dimension **a** given in **Table 1**.

Gather the wires together to form an earth conductor, and fold them back onto the cable oversheath.

Shape and position the cores as shown in drawing below. Cut the cores at the reference line using a hacksaw.

Thoroughly remove the core screen according to the dimension **c** given in **Table 1**, so that the insulation surface is free from all traces of conductive material.

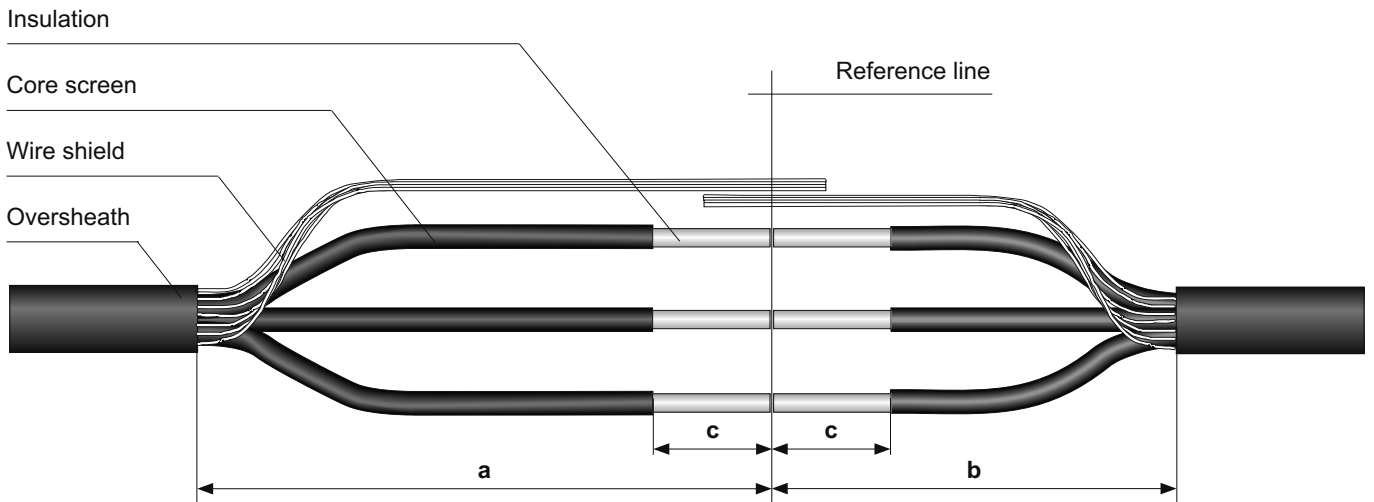
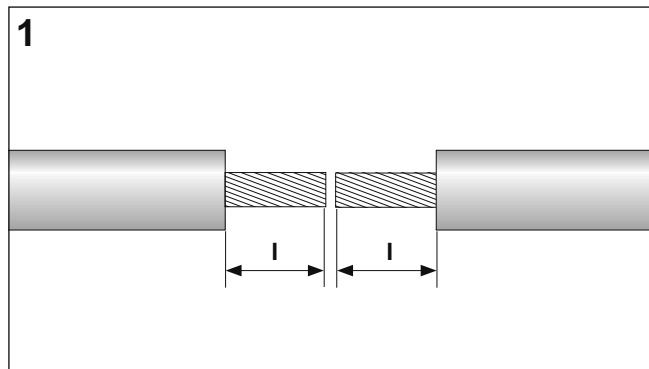


Table 1	Kit number	a mm	b mm	c mm
12 kV	MXSU-3311	500	250	100
	MXSU-3321	600	300	120
	MXSU-3331	600	300	130
	MXSU-3332	650	350	130
17.5 kV	MXSU-4311	500	250	100
	MXSU-4321	600	300	120
	MXSU-4331	600	300	130
	MXSU-4332	650	350	150
24 kV	MXSU-5311	600	300	120
	MXSU-5321	650	350	140
	MXSU-5331	700	350	150
	MXSU-5332	700	400	150

Measure the conductor bore depth of the connector and remove the insulation on both cores equal to the insert depth I (see **Table 2**).

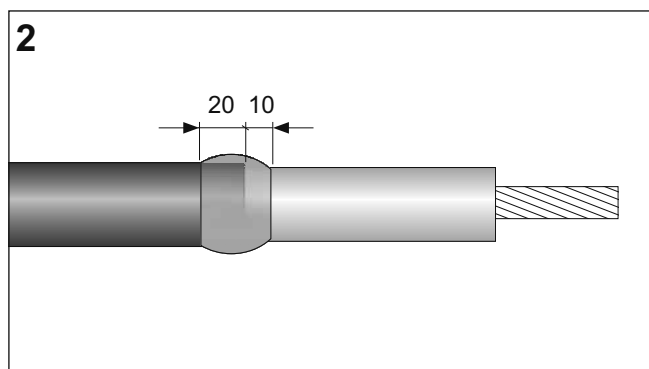
Table 2	Kit number	I (mm)
12 kV	MXSU-3311	30
	MXSU-3321	35
	MXSU-3331	60
	MXSU-3332	65
17.5 kV	MXSU-4311	30
	MXSU-4321	35
	MXSU-4331	60
	MXSU-4332	65
24 kV	MXSU-5311	30
	MXSU-5321	35
	MXSU-5331	60
	MXSU-5332	65



Take the yellow void filling strip from the alu foil pocket. Remove the release papers from the strip with the pointed ends.

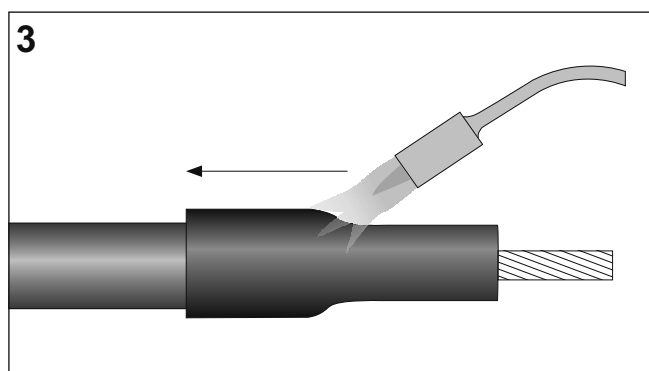
Wrap the void filler around the core screen starting 20 mm from the end of the screen and continue onto the insulation for 10 mm.

Stretch the strip to half of its original width to achieve a fine thin edge.

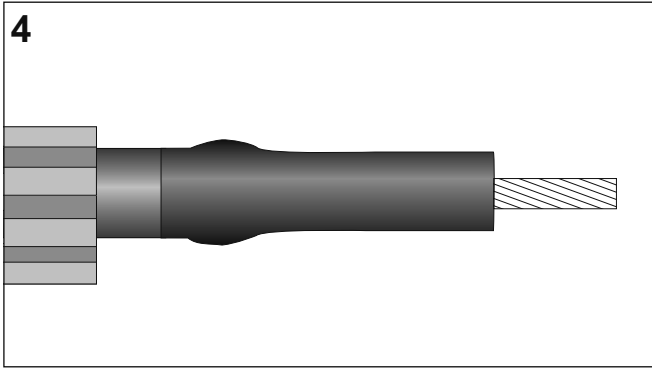


Slide the stress control tubing (black) over the plastic cable core level with the end of the insulation cut back.

Shrink down starting from the insulation cut back towards the oversheath as shown in drawing.



Slide one screened insulation sleeve (black and red) over each core on the long side of the joint.

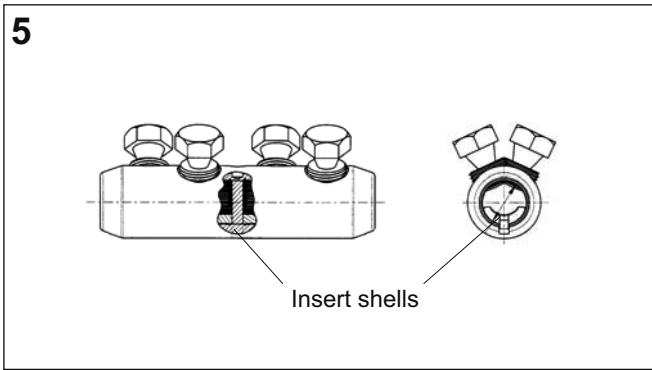


### Installation of the mechanical connector

The connector is supplied with insert half shells which have to be used on small cross sections.

Check before installation if the conductor can be inserted into the connector with the half shells installed.

In case the conductor can not be inserted, remove the inserts from the connector bore.



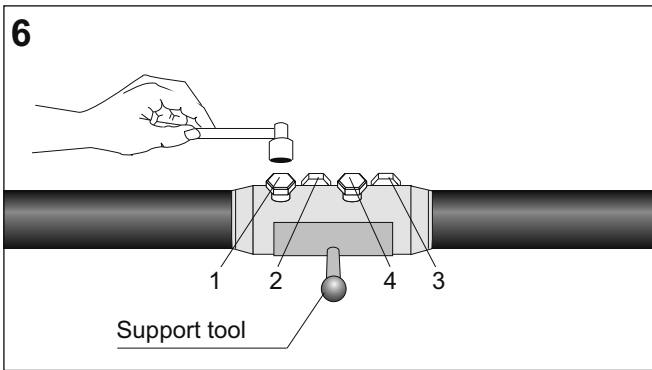
Clean and abrade the surface of the exposed conductors.

Insert conductors so that the insulation butts up with the end of the connector. Hand tighten the shear bolts so that the connector stays in place.

For connectors using more than one shear bolt per side, tighten the bolts alternately and shear them off starting with the outer bolts (see also sequence shown in the drawing).

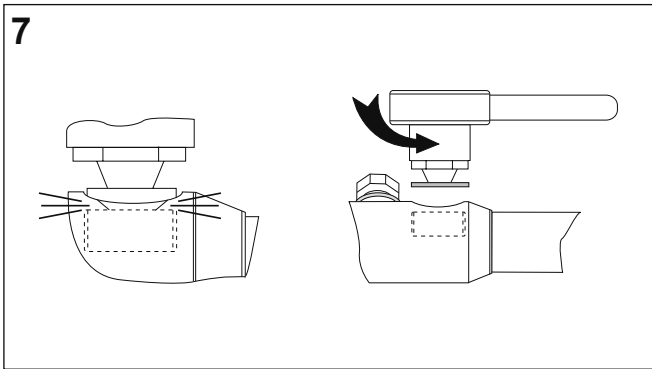
#### Notes:

- When a cordless impact wrench is in use the tightening intervals should be in the range of 2 seconds.
- Avoid core bending on smaller cross sections by using a support tool available such as IT-1000-019 or similar.



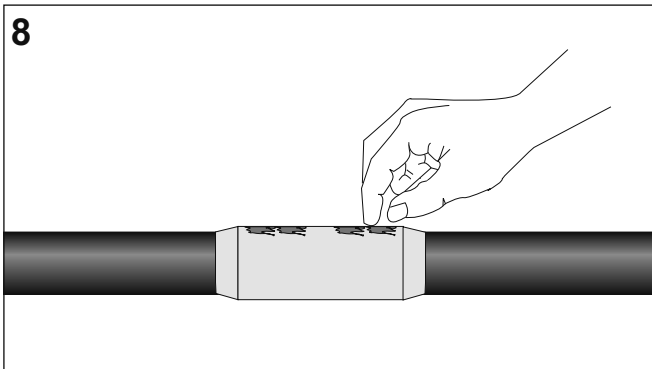
Smooth out any sharp edges of protruding bolts where appropriate. Clean and degrease the connector area and the insulation with a cleaning wipe.

It could be possible that the bolt shears but the top is retained in the connector body. In that case unscrew the head of the bolt until it is removed from the connector.



Clean and degrease the cable cores and the connector.

Fill Raychem clay over the sheared off bolts to obtain a smooth finish.

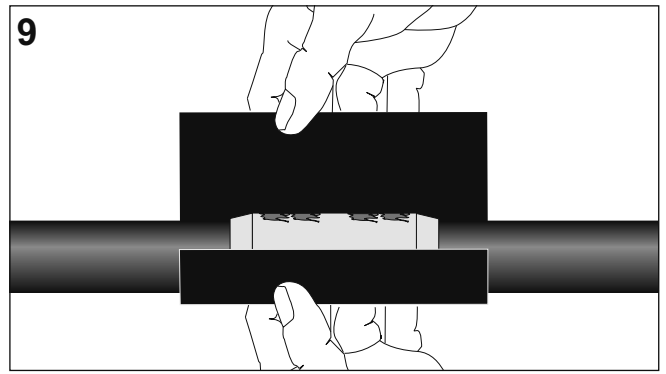


Remove the release paper from the stress grading patch (black). Position the patch centrally over the connector area.

**Note:** In case of a rectangular patch, apply the long side across the connector.

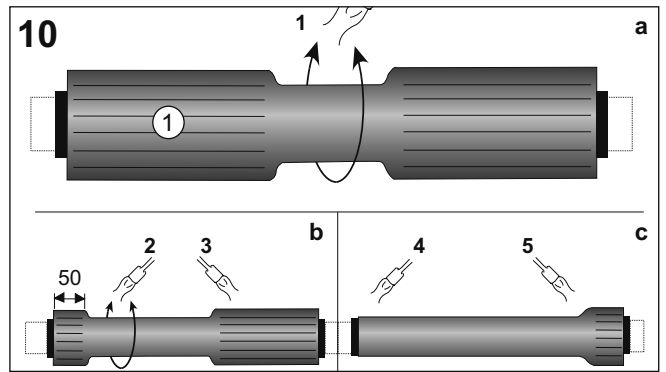
Wrap the patch over the connector area starting at the connector bolts.

**Note:** Do not stretch the patch.



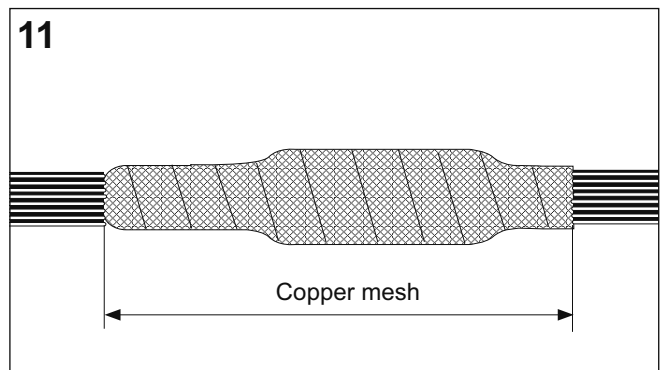
Position the screened insulating sleeve (black and red) centrally over the connector area.

- a. Start shrinking the sleeve in the centre (1).
- b. Continue shrinking by working towards one side (2), stopping 50 mm from the end. Shrink the other half in the same way (3).
- c. Shrink down the first end (4) and finally the second (5). The sleeve should be fully shrunk leaving no ridges.



Relay the cores as far as possible.

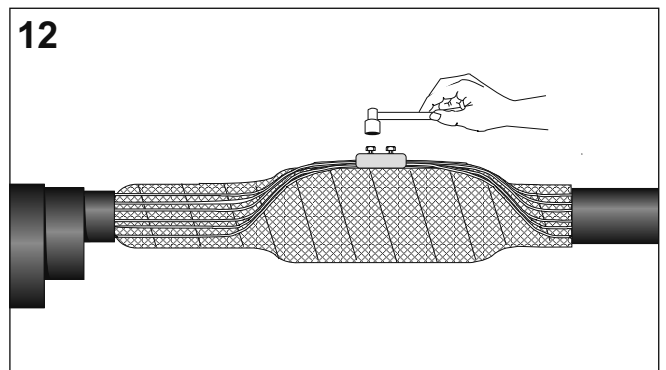
Wrap one layer of copper mesh round the cores with a 50% overlap so that the whole joint area is covered.



Fold back the shielding wires over the joint area and form an earth lead with the shield wires.

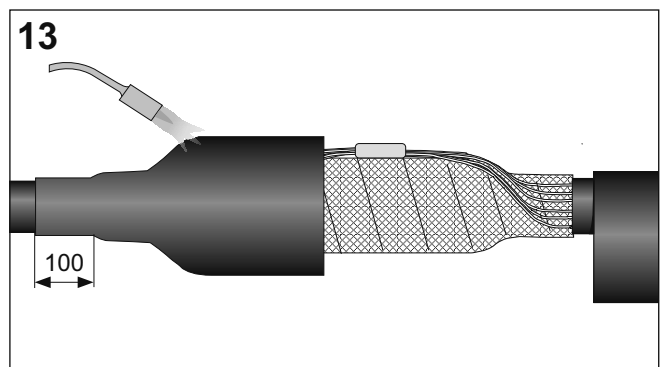
Insert both ends into the mechanical connectors supplied.

Tighten the bolts until the heads shear off.



Clean and degrease the oversheath on both cable ends for a length of about 150 mm. Move the large long sealing sleeve to the other cable side. Position the small short sealing sleeve over the long side of the joint so that it overlaps the end of the oversheath by about 100 mm min.

Start shrinking at the oversheath end, working towards the connector area.



Starting 20 mm from the inner end of the outer sealing sleeve, wrap one layer of sealant tape (black) around the sleeve.

Position the long sealing sleeve so that it overlaps the end of the oversheath by about 100 mm min.

Start shrinking at the oversheath end, working towards the connector area.

**Joint completed.**

Allow the joint to cool before applying any mechanical strain.

**Please dispose of all waste according to environmental regulations.**

