

**Installation Instruction  
ESD-5713-AU-4/11**

**Raychem  
Joint for 36kV Single Core  
XLPE Insulated Cable  
without Armour with  
Integrated Fibre Optic  
Cable and Composite  
Sheath - 500mm<sup>2</sup>**

Superseded by EL 00115 v1.0

ENDORSED BY	SIGNATURE	DATE
Wilfred Leung Principal Engineer—Mains RailCorp	<i>W. Leung</i>	2.6.2011

APPROVED BY	SIGNATURE	DATE
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APPROVED BY	SIGNATURE	DATE
Andrew Thompson Product Manager TE Connectivity	<i>A Thompson</i>	14/6/11

# MXSU-RCP13

Qty: 1

## Kit Contents

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4	x	EPPA-218	Cable Bundle Tape
2	x	BOCL-20-1068	Branch Clip
2	x	WCSM-130/36-600/S	No 1 Coated Sleeve Black
2	x	MWTM-85/25-700/U	No 2 Uncoated Sleeve Black
2	x	WCSM-105/30-700/S	No 3 Coated Sleeve Black
2	x	WCSM-13/4-1200/S	Fibre Optic Protection Sleeve Black
1	x	EPPA-021-5-200	Aluminium Foil Strip
2	x	S1061-8-200	Mastic Sealant Black 200 Long
4	x	S1061-1-3000	Mastic Sealant Black 3000 Long
1	x	JSCR-76/33-470-35/U	"X" Stress Control Tubing 470 Long
1	x	ERIH-85/34-460/U	"Y" Screened Insulating Sleeve 460 Long
2	x	S1189-1-150 (A1)	Void Filling Mastic 150 Long
3	x	S1189-3-600 (A1)	Void Filling Mastic 600 Long
1	x	WCSM-160/50-900/S	"Z" Heavy Wall Tubing 900 Long Coated
2	x	EPPA-009-6000	Tinned Copper Mesh - 6000 Long
1	x	BSMB-500MK2	Mechanical Shear Bolt Connector
1	x	EPPA-048	Clay Pack
2	x	BSM-25/95	Mechanical Shear Bolt Connector Screen
6	x	EPPA-004	Cleaning Tissue
1	x	FOSC-500AA-S24-LT-NN	Fibre Optic Splice Closure
1	x	EPPA-029-3-1000	Tie Wire
2	x	PD-CAP-1/4-0	End Cap (Fibre Element)
2	x	JSCR-76/33-150/U	"W" Stress Cont Tube Black Uncoated
1	x	ESD-5713-AU-4/11	Installation Instruction

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

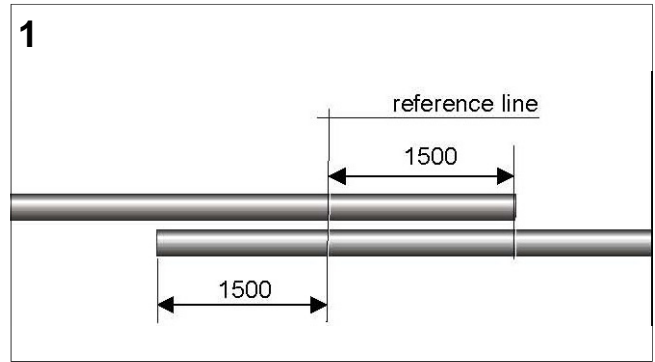
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**Table A Admissible cable dimensions for joint**

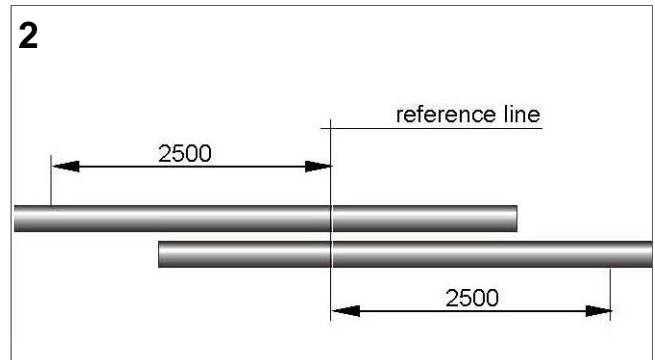
Kit Range	Conductor Ø		Core Insulation Ø		Outer Cable Ø	
	min	max	min	max	min	max
	mm	mm	mm	mm	mm	mm
500mm <sup>2</sup>	22.9	29.2	40.1	46.6	44	61

**Preparation of Cables with Copper Shield Wires and Fibre Optic Cables**

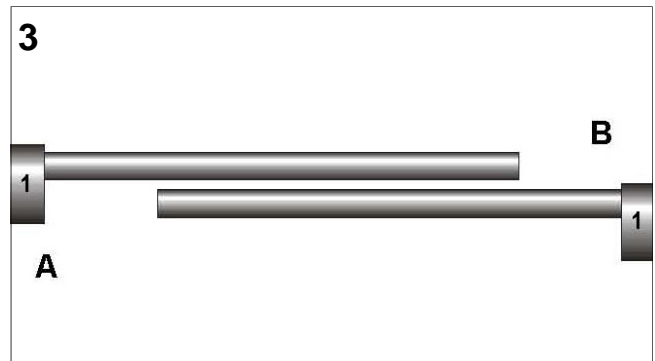
Align the cables. Make sure they are in-plane.  
 Mark the centre of the joint (reference line).  
 The cable ends have to overlap by 1.5 m on either side of the reference line, 3 m in total



The installation will need 2.5 m of cable on either side of the reference line.  
 Entirely remove the graphite coating on this cable length, if any.  
 Clean & degrease the cable oversheath.

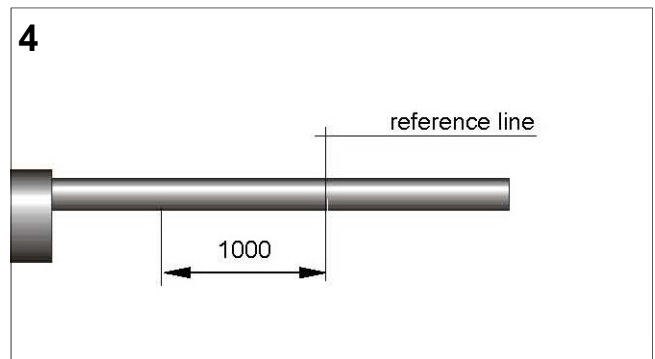


Slide the short sealing sleeve (1: WCSM-130/36) on each cable end. Park the sleeves in the outermost position.



**Cable Preparation - Side A**

Remove the inner & outer sheath 1000 mm from the reference line.



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Remove the bedding (if any) and separate fibre optic cable from the shield wires. Apply PVC tape at the end of the cable to hold the shield wires into place. Seal the end of the fibre optic cables. Apply the heat shrink (PD) end cap to the end of the fibre optic cable to protect it temporarily until splicing occurs.

Cut a 30mm wide strip from the aluminium foil. Remove the release paper and wrap the foil around the fibre optic cable, 110mm from the cable overshooth.

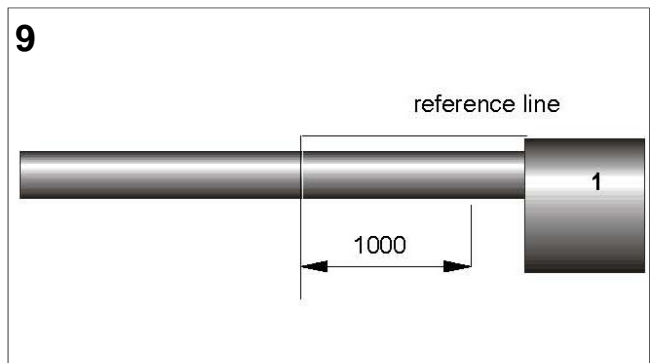
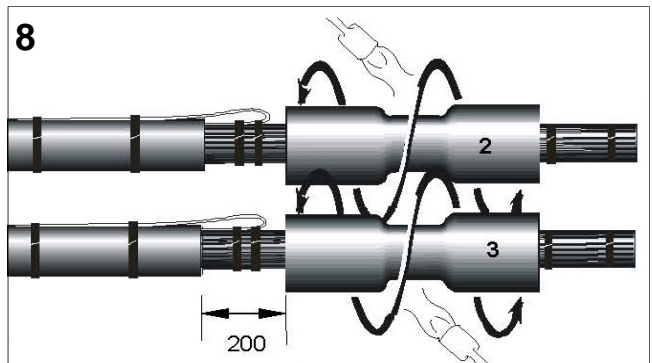
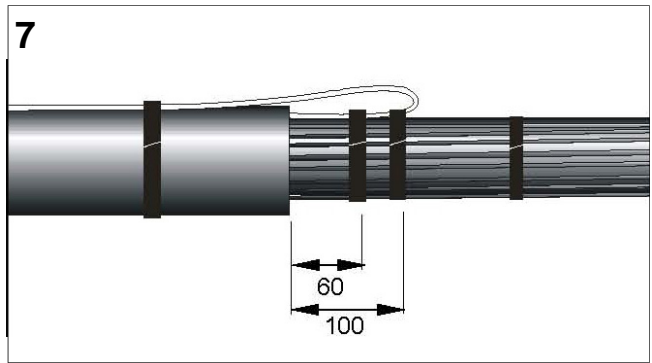
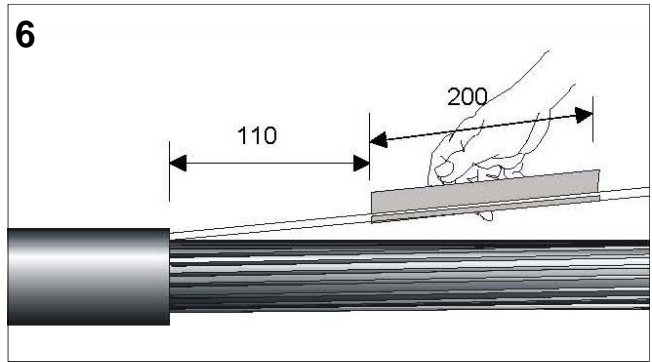
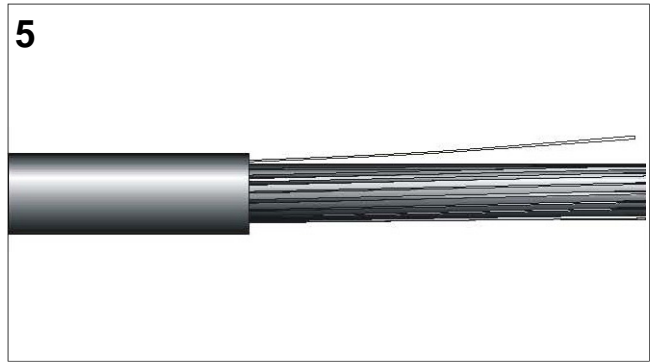
Fix the fibre cable with 5 layers of cable bundle tape 60 mm and 100 mm from the overshooth cut. Lay the fibre cable back onto the overshooth, forming a 100mm wide arc. Fix the fibre cable to the cable overshooth with PVC tape.

Slide the uncoated sleeve (2: MWTM-85/25) over the end of the cable. Position it 200 mm away from the end of the overshooth as shown. Shrink it into position starting at the centre, working towards the ends.

Slide the coated sleeve (3: WCSM-105/30) over the end of the cable. Position it 200 mm away from the end of the overshooth as shown. Shrink it into position starting at the centre, working towards the ends.

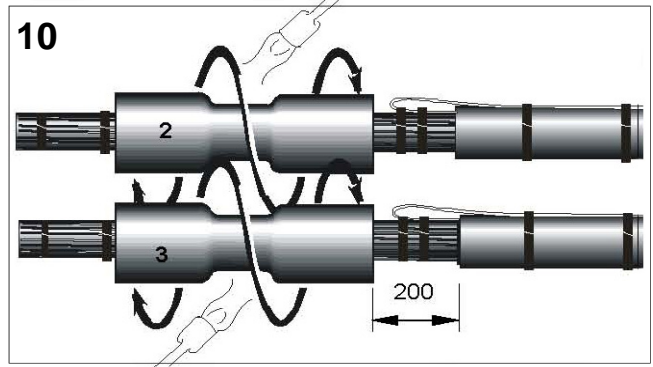
**Cable Preparation - Side B**

Remove the inner & outer sheath 1000 mm from the reference line. Repeat steps 5, 6, & 7.



Slide the uncoated sleeve (2: MWTM-85/25) over the end of the cable. Position it 200 mm away from the end of the oversheath as shown. Shrink it into position starting at the centre, working towards the ends.

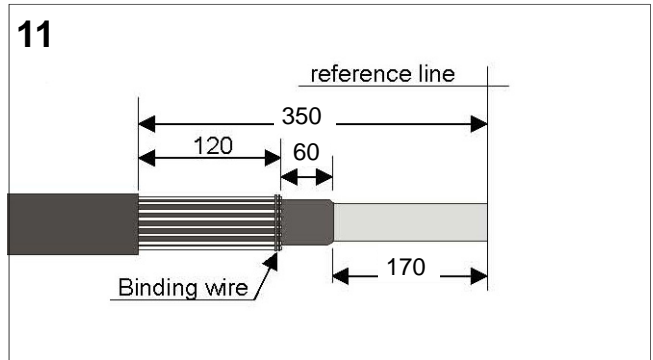
Slide the coated sleeve (3: WCSM-105/30) over the end of the cable. Position it 200 mm away from the end of the oversheath as shown. Shrink it into position starting at the centre, working towards the ends.



**Side A:**

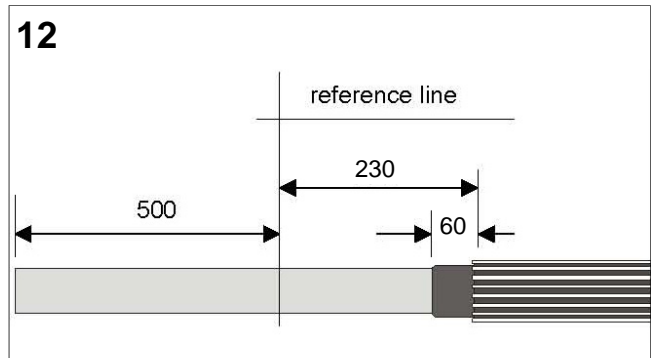
Cut the cable at the reference line using a hacksaw.  
Remove sleeves 2 and 3, 350mm from the reference line  
Cut the shield wires 120mm from the end of sleeves 2 and 3.

**Note:** Do not bend the shield wires back over sleeves 2 and 3. Thoroughly remove the core screen 170mm from the reference line, so that the insulation is free from all traces of conductive material.  
Clean & degrease the insulation using the cleaning tissues provided in the kit.  
**Note:** Do not nick the insulation.



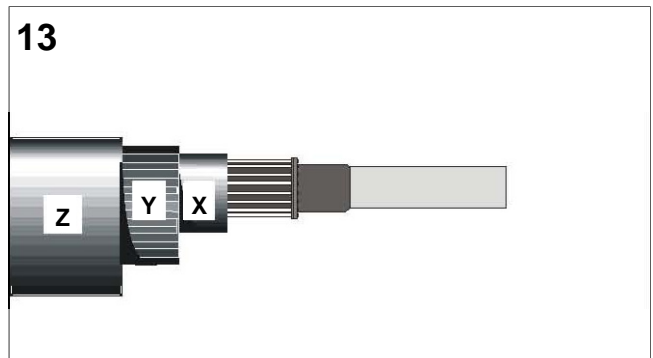
**Side B:**

Cut the cable 500mm past the reference line.  
Remove sleeves 2 and 3, 230mm from the reference line  
Bend back the shield wires onto sleeves 2 and 3.  
Fix the shield wires temporarily in place.  
Cut the cable at the reference line using a hacksaw.  
Thoroughly remove the core screen 60mm from oversheath cut, so that the insulation is free from all traces of conductive material.  
Clean & degrease the insulation using the cleaning tissues provided in the kit.  
**Note:** Do not nick the insulation.

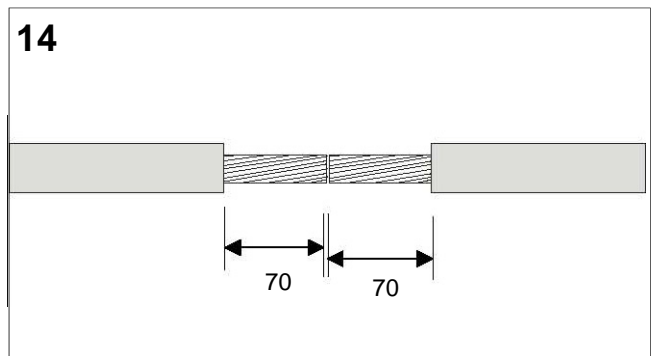


Slide the combined tubing set (X & Y) & the outer sleeve (Z) over the end of **side A**. The plastic bag of the tubing set shall be used as additional protection by placing it under the tubing set.

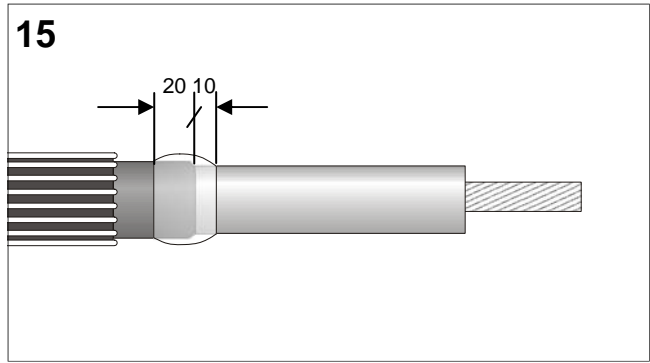
- X. Stress control tubing (black)
- Y. Screened insulation sleeve (black and red)
- Z. Outer sleeve (black)



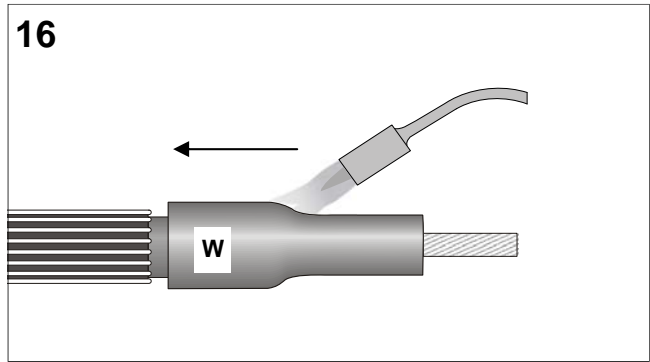
Remove the insulation on both cables to the dimensions shown.



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.

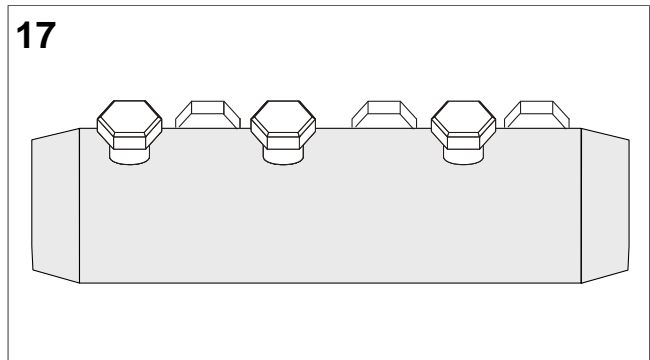


Slide the stress control tubing (W) over the plastic cable core level with the end of the insulation cut back. Shrink down starting from the insulation cut back towards the oversheath as shown in the drawing.



**Installation of the mechanical connector**

Check before installation if the conductor can be inserted into the connector.  
Check core diameter in accordance with Table A.

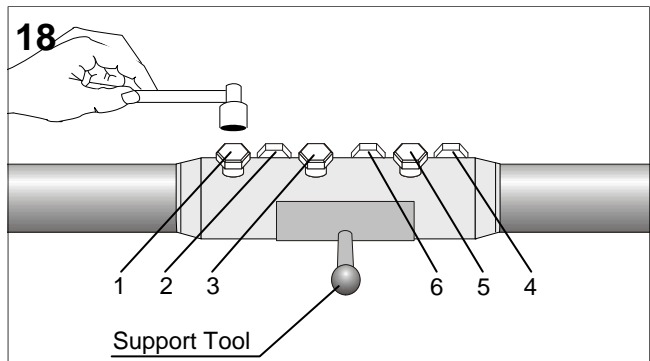


Clean and abrade the surface of the exposed conductors. Insert conductors so that the insulation butts up with the end of the connector. Hand tighten the shear bolts so that the connector stays in place. For connectors using more than one shear bolt per side, tighten the bolts alternately and shear them off starting with the outer bolts (see also sequence shown in the drawing).

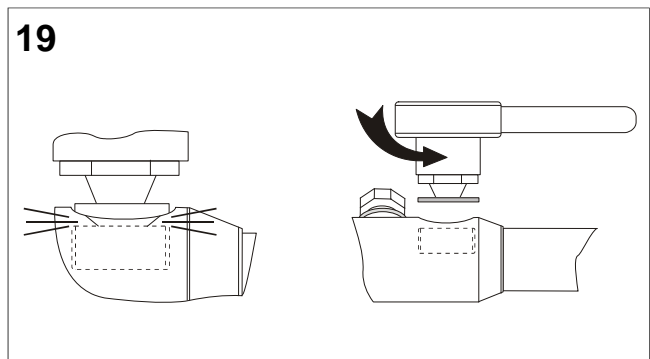
**Note:**

- When a cordless impact wrench is in use the tightening intervals should be in the range of 2 seconds.
- Avoid core bending 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 one of the release papers from the void filling tape (yellow). Apply the tape with a 50% overlap stretching it to about half of its original width.

Fill up the connector area continuing onto the insulation for not more than 10 mm. Use the filler to achieve a smooth transition from the connector onto the insulation.

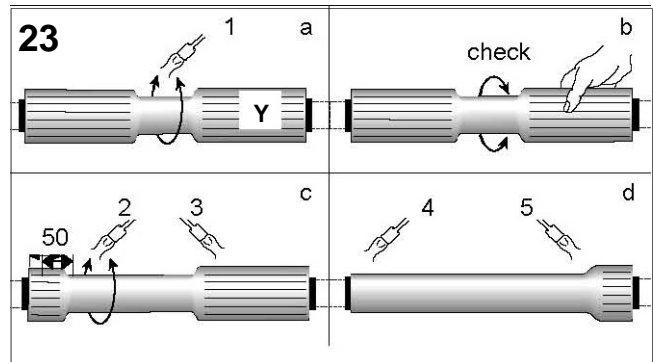
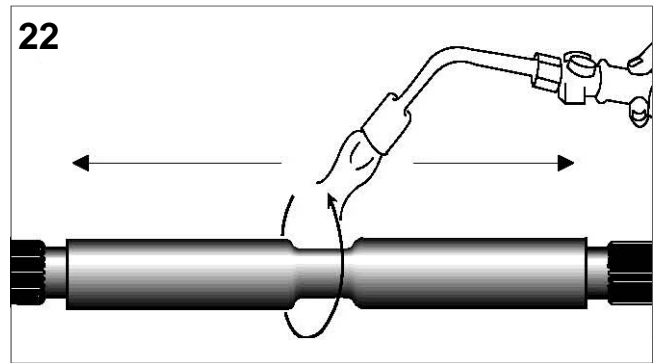
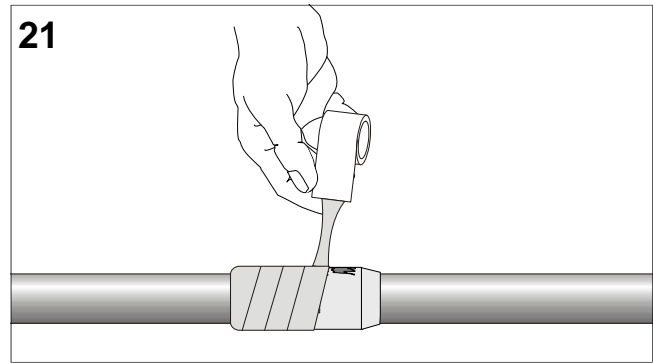
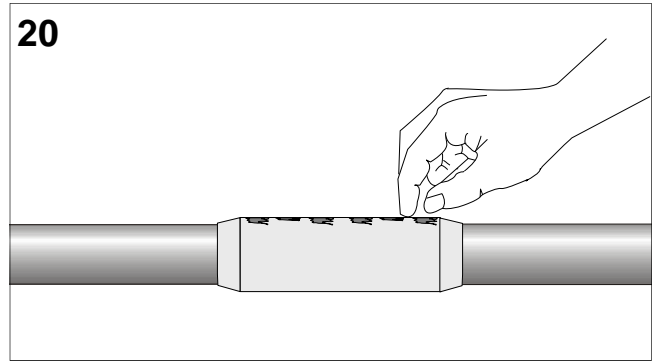
**Note:** Do not use too much void filler, max. 2 mm over the connector.

Position the stress control tubing (X) centrally over the connectors. Start shrinking in the centre working towards the ends. The tubing should be fully shrunk & wrinkle free.

**Note:** Take care not to accidentally shrink the parked tubing at this stage.

Position the screened insulating sleeves (Y) centrally over the stress control tubing.

- a. Start shrinking the sleeves in the centre (1).
- b. Check if fully shrunk by twisting the end. The sleeves should not move from its position.
- c. Continue shrinking by working towards one side (2), stopping 50 mm from the end.
- d. Shrink the other half in the same way (3).
- e. Shrink down the first end (4) and finally the second (5). The sleeves should be fully shrunk without leaving ridges.





**Side A.**

Remove the binding wire from the end of the shield wires. Lift the shield wires away from cable and wrap one layer of copper mesh across the joint, with a 50% overlap. Gather the wires together to make to 2 equal size earth leads.

Wrap a short length of oversheath over the copper mesh where the connector sit on top of the core screen.

**Side B.**

Bend the shield wires back over the joint area as 2 equal size earth leads.

Connect the shield wires together using the mechanical connectors. Tighten the bolt until the head shear off.

Wrap a second layer of copper mesh across the joint with a 50% overlap.

Clean and degrease the ends of sleeves 2 and 3 for a length of about 150 mm using the cleaning tissues provided in the kit.

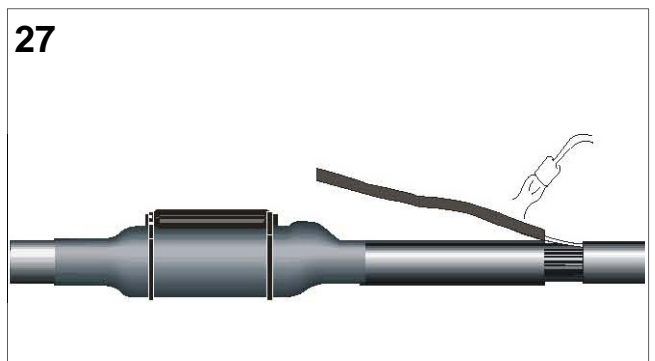
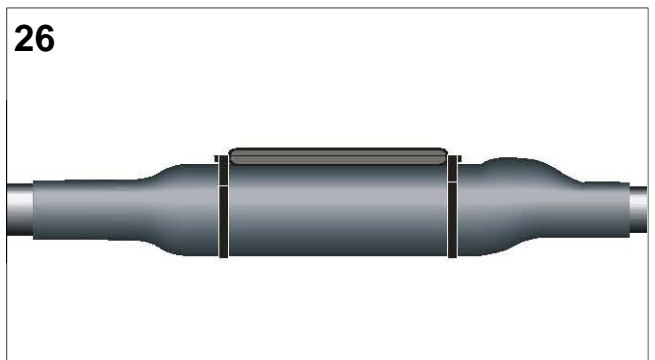
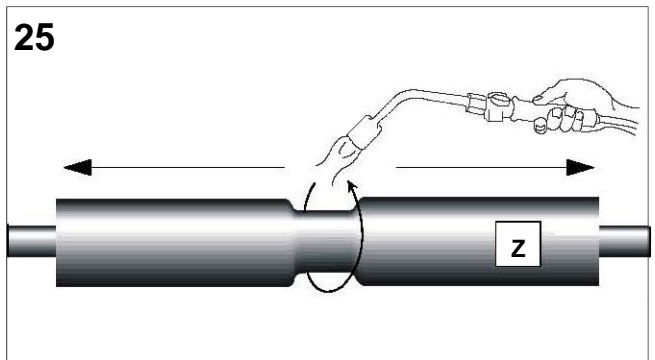
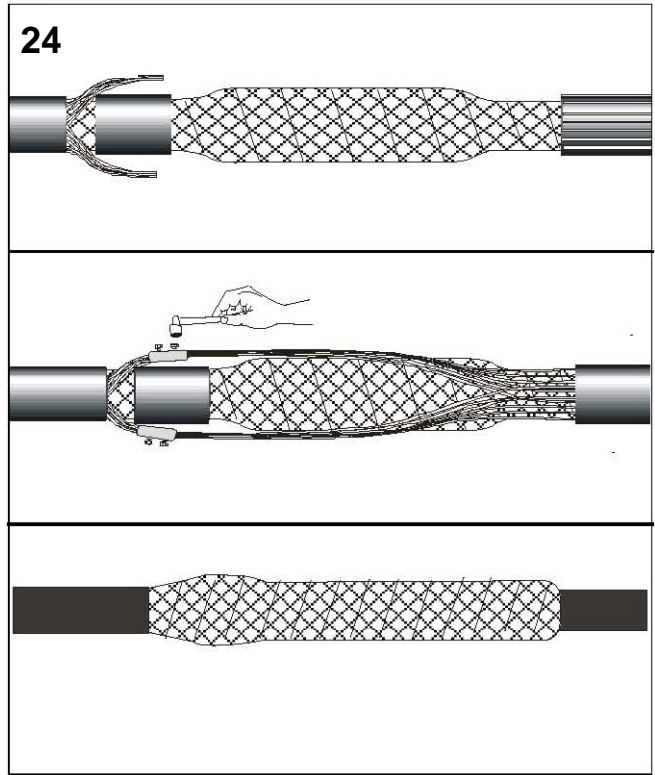
Centre the outer sleeve (Z) over the joint area. Start shrinking in the centre, working towards the ends.

Allow the joint to cool. Position the fibre optic cable housing centrally on the joint and attach it by means of 6 layers of cable bundle tape.

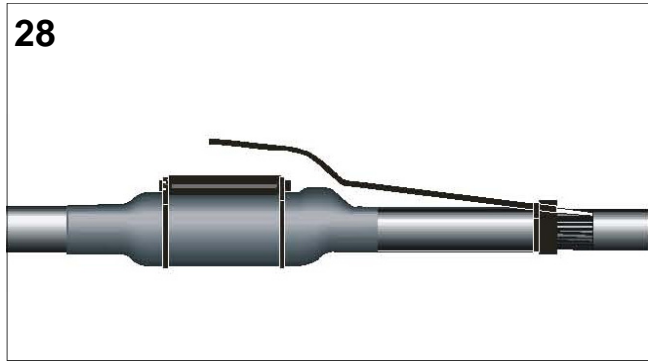
**Side B:**

Lay back the fibre optic cables towards the centre of the joint.

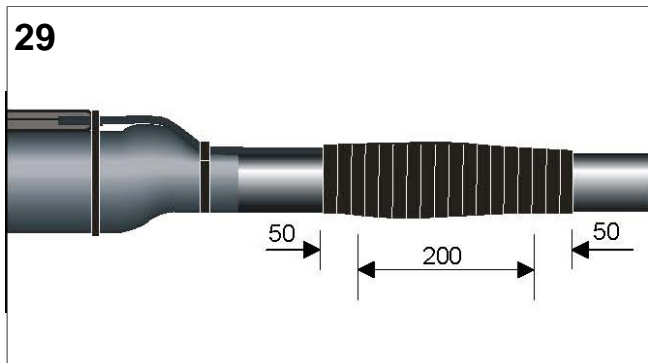
Slide the protection tubing (WCSM-13/4) over the end of the fibre optic cable and position the end level with the end of the first re-jacketing sleeve. Shrink into position starting at the end level with the re-jacketing sleeve, working towards the end of the fibre cable.



Wrap the short sealant mastic (black) strip around the end re-jacketing tubing. Lay the fibre onto the mastic and fix it into position, level with the end of the mastic, using the cable bundle tape.



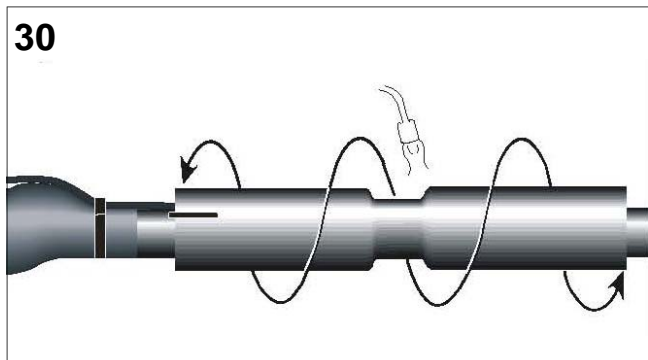
Apply two rolls of black mastic over the exposed screen wire area. Starting 50mm onto the oversheath, continue across the exposed wire shield and 50mm onto the oversheath.



Centre the sealing sleeve (1: WCSM-130/36) over the mastic area. Insert the branch-off clip. Shrink the sleeve into position starting in the centre, working towards the ends.

**Note:** Additional heat is required in the clip area to ensure the adhesive on the clips has melted.

**Side A:**  
Repeat steps 27-30

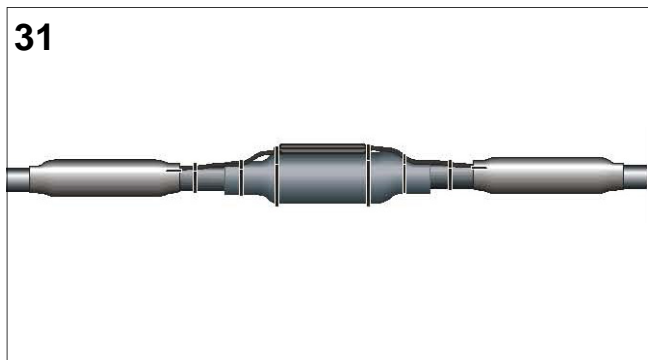


**For INSTALLING the FIBRE OPTIC CABLES inside the SPLICE HOUSING, see corresponding INSTALLATION INSTRUCTION.**

The fibre optic cables are to be installed and connected according to the installation instruction of the splice housing.

**Joint complete.**

Allow the joint to cool before applying any mechanical strain.



Please dispose of all waste according to environmental regulations.

