1 INTRODUCTION

The LV Jointing Manual covers the approved methods and associated jointing kits for use on LV mains and service cables in UK Power Networks.

The LV Jointing Manual is split into five sections:

Section 1 Introduction

Section 2 Jointing Instructions

Section 3 Standard Procedures for Preparing LV Mains and Service Cables

Section 4 Standard Procedures for Installing Mechanical Connectors and Components

Section 5 Cut-Out Changes

This manual covers all the joints you are most likely to need and Section 2 of this manual covers the most common types of LV joint used on the Network. However, the cable preparation and material installation instruction in Sections 3, 4 and 5 can be combined to form any type of joint that may be required. It may be necessary to combine procedures to achieve joints not covered by this manual. If you need to do this, always use approved tools and procedures, and seek advice from the Craft Training Centres at Bury St Edmunds and Sundridge, or Asset Management.

The electrical gloves illustrated in this document are representative of the different types used within UK Power Networks.

2 JOINTING INSTRUCTIONS

This section contains most of the common types of joint used on the LV Network. However, the methods in Sections 3, 4 and 5 can be combined to form any joint required on site.

2.1 Conductor Sizes

To simplify the kit selection tables only metric cable sizes are used. To convert from imperial to metric conductor sizes refer to the comparison table below:

Imperial Conductor Size (sq. in)	Metric Equivalent Conductor Size (sq. mm)
0.007	4
0.0225	16
0.04	25
0.06	35
0.1	70
0.15	95
0.2	120
0.25	150
0.3	185
0.4	240
0.5	300

All sizes apply to both copper and aluminium conductor sizes.

2.2 Comparison of Cable Ratings Based on Cable Type and Size

Imperial Conductor Size (sq. in)	Metric Conductor Size (sq.mm)	Cable Type	Equivalent Current Cable Size and Type
-	4 Cu	Concentric	4mm Cu Concentric
0.007 Cu	-	PILC	4mm Cu Concentric
0.0145 Cu	-	PILC	16mm Al Concentric
0.0225 Al	-	PILC	16mm Al Concentric
0.0225 Cu	-	PILC	35mm Al Concentric
-	25 Al	Concentric	35mm Al Concentric
-	25 Cu	Concentric	35mm Al Concentric
0.04 Al	-	PILC	35mm Al Concentric
0.04 Cu	-	PILC	35mm Al Concentric
-	35 Al	Concentric	35mm Al Concentric
0.06 Al	-	PILC	35mm Al Concentric
0.06 Cu	-	PILC	95mm Waveform
0.1 Al	-	PILC	95mm Waveform
0.1 Cu	-	PILC	95mm Waveform
-	70 Al	PILC	95mm Waveform
-	70 Cu	PILC	95mm Waveform
-	70 Al	Waveform	95mm Waveform
0.15 Al	-	PILC	95mm Waveform
0.15 Cu	-	PILC	185mm Waveform
-	95 Al	Waveform	95mm Waveform
-	120 Al	PILC	185mm Waveform
-	120 Cu	PILC	185mm Waveform
-	120 Al	Waveform	185mm Waveform
0.2 Al	-	PILC	185mm Waveform
0.2 Cu	-	PILC	185mm Waveform
-	150 Al	PILC	185mm Waveform
-	150 Cu	PILC	300mm Waveform
0.25 Al	-	PILC	185mm Waveform
0.25 Cu	-	PILC	300mm Waveform
-	185 Al	PILC	185mm Waveform
-	185 Cu	PILC	300mm Waveform
-	185 Al	Waveform	185mm Waveform
0.3 Al	-	PILC	185mm Waveform
0.3 Cu	-	PILC	300mm Waveform
-	240 Al	PILC	300mm Waveform
-	240 Al	Waveform	300mm Waveform
-	240 Cu	PILC	300mm Waveform
0.4 Al	-	PILC	300mm Waveform
0.4 Cu	-	PILC	300mm Waveform
-	300 Al	PILC	300mm Waveform
-	300 Cu	PILC	300mm Waveform
-	300 Al	Waveform	300mm Waveform
0.5 Al	-	PILC	300mm Waveform
0.5 Cu	-	PILC	300mm Waveform

2.3 Jointers Tool Kit

The list below contains a number of tools which are specific to cable jointing.

Description	Stores Code	Number Required
100A Cut-out Safety Shield	11757V	3
13mm Magnetic Nut Holder	33589P	1
150mm Core Wedge	33598N	4
185mm Waveform Core Twister	33156D	2
2-Way Earth Continuity Strap	03543Q	2
200 & 400A Cut-out Safety Shield	11759Q	3
225mm Core Wedge	33599X	4
240mm Waveform Core Twister	31608J	2
300mm Waveform Core Twister	33157N	2
600A Cut-out Safety Shield	11766U	3
7mm Insulated Nut Spinner	33704L	1
8mm Insulated Nut Spinner	33705V	1
95mm Waveform Core Twister	31607Y	2
Cable Armour Saw	33528C	1
Core Guard for Cable Ratchet Cropper	33601Y	1
Fire Blanket	03527M	1
First Aid Kit	38537X	1
IIPC Holding Tool	32047S	1
Insulated Core Knife	31400Q	1
Insulated Inspection Mirror	31435Q	1
Insulated Ratchet Cable Cutter	01134C	1
Insulated Universal Connector Holding Tool	31046D	1
Insulated Waveform Neutral Connector Holder	33163H	1
Insulated 13/17mm Ratchet Spanner	31045T	1
Jointer Shrouding Kit	03522N	1
Jokari Knife	33358N	1
Metal Hack Knife	31399Y	1
Plastic Core Seperator	33600P	2
Plastic Hack Knife	31981H	2
Plastic Lead Belling Tool	19415D	1
Plastic Medium Wedge	32266Q	2
Plastic Mini Wedge	32265F	2
Plastic Mini-Hepnyf	31401A	1
Rubber Mat	33411S	1
Shroud for Waveform Neutral Connector	03521D	6
Sicame Insulated Universal Screw Ratchet Tool	31547B	1
Spirit Level	33380L	1
Straight Tin Snips	33447C	1
Temporary Core Shroud - Size 0	03533G	8
Temporary Core Shroud - Size 1	03534T	8
Temporary Core Shroud - Size 2	03535B	8
Temporary Core Shroud - Size 3	03536L	8
Test lamp - Long Probes	19440F	2
Un-insulated Ratchet Cutters	33170M	1
Voltstick Tester	32255W	1

2.4 New Harmonised Phase Colours

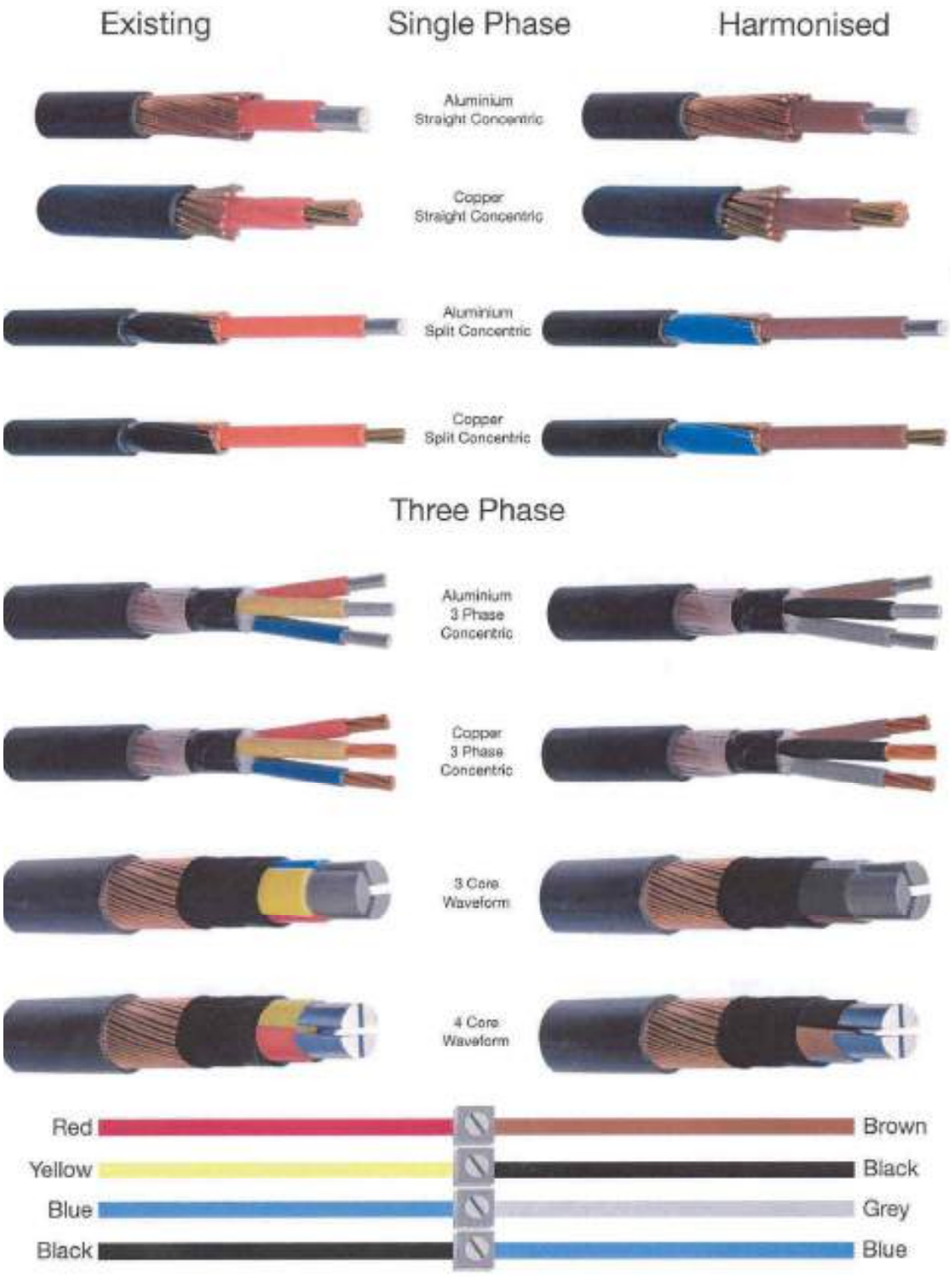
The IEE Wiring Regulations (BS 7671:2001 Amendment 2) set out the changeover requirements from the existing wiring colours to the new harmonised colours:

- After 31 March 2004 – either the pre-existing colours or the new colours can be used, but not both.
- After 31 March 2006 – new installations must only use the new harmonised colours.

There is no change to earth conductors, which will still be green and yellow.

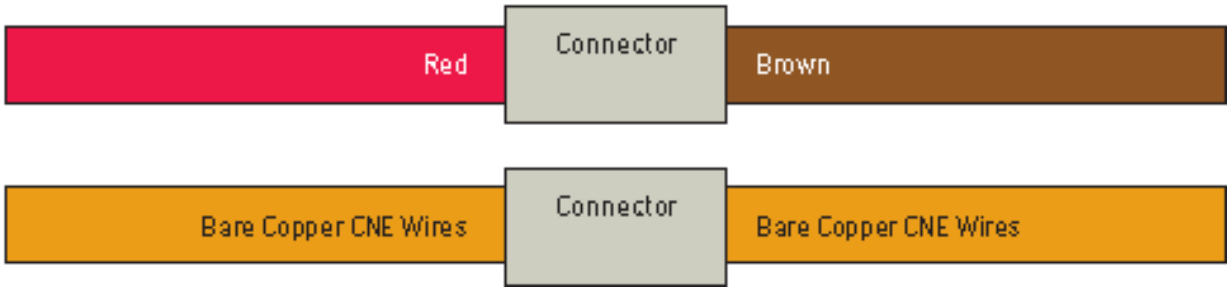
For example, If single-core cables – meter tails are being used, then old and new cable colours must not be mixed.

UK Power Networks has adopted the cable colours shown below:

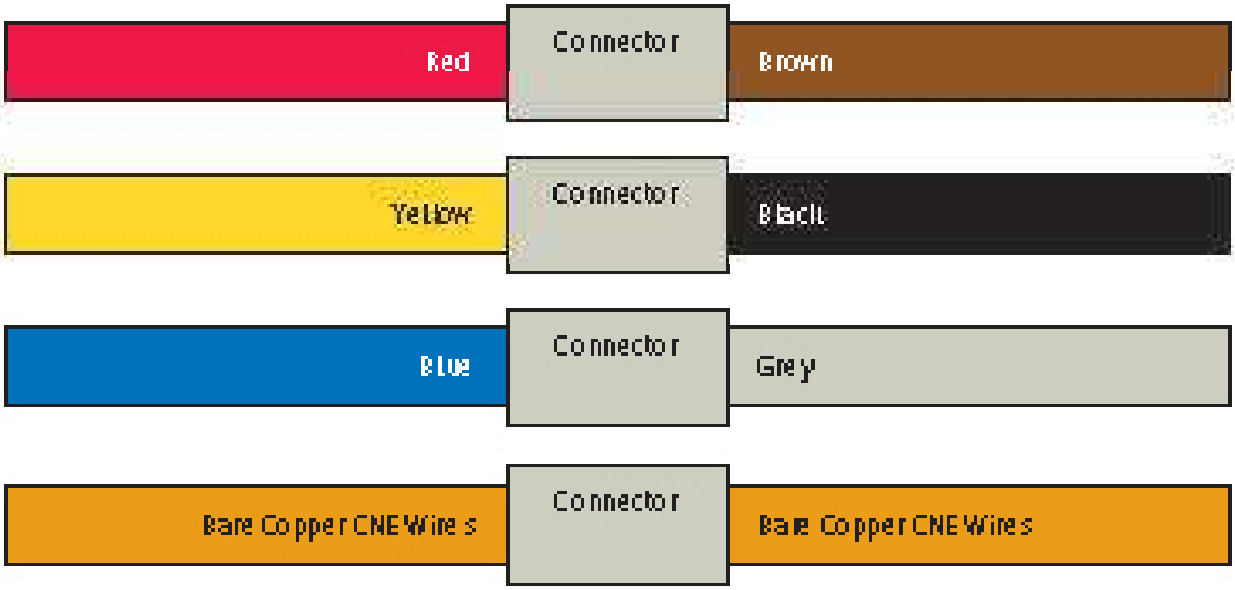


If old and new cables are to be joined, only do so as shown below:

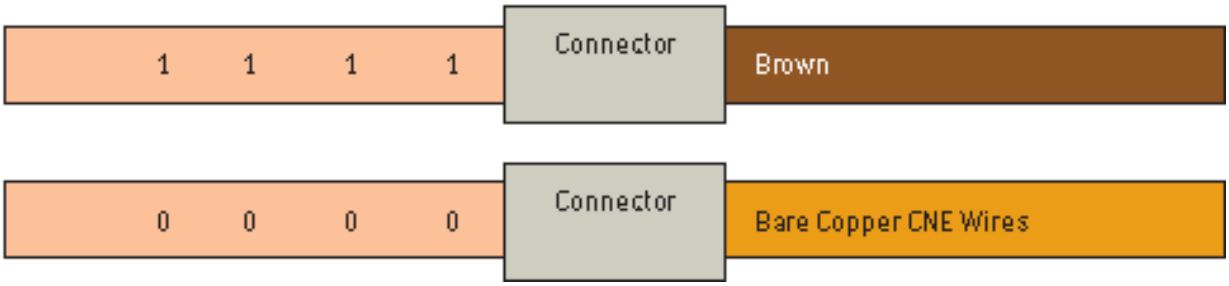
2.4.1 Single-Phase Plastic Service Cables



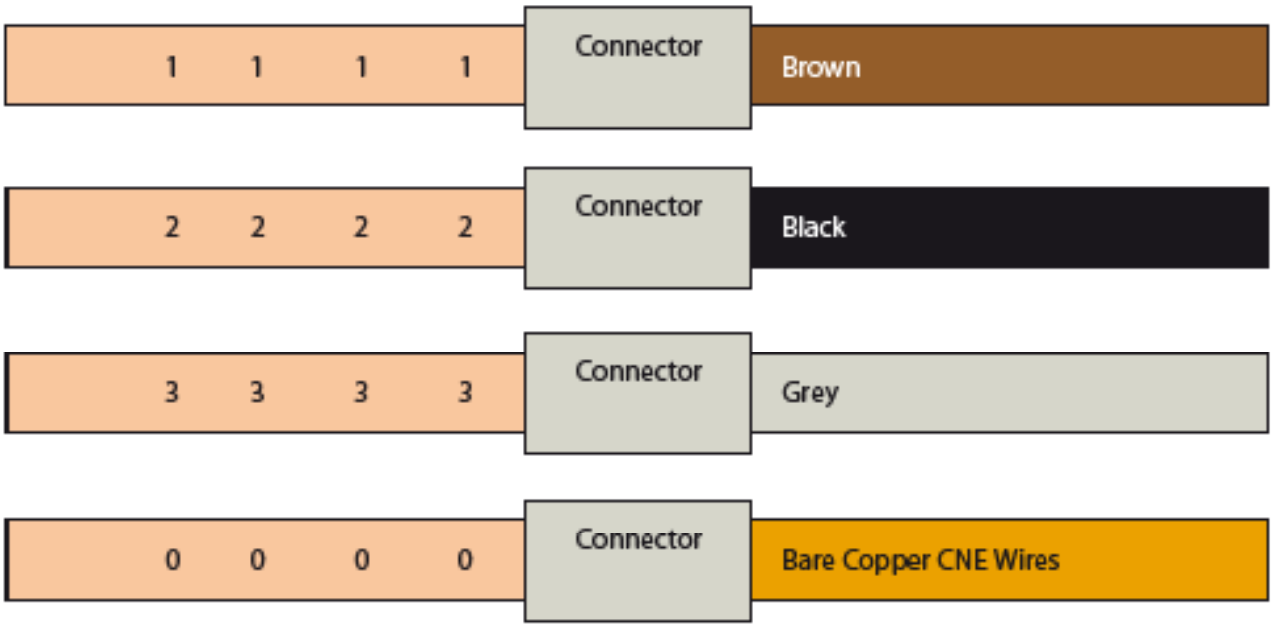
2.4.2 3-Phase Plastic Service and Waveform Cables



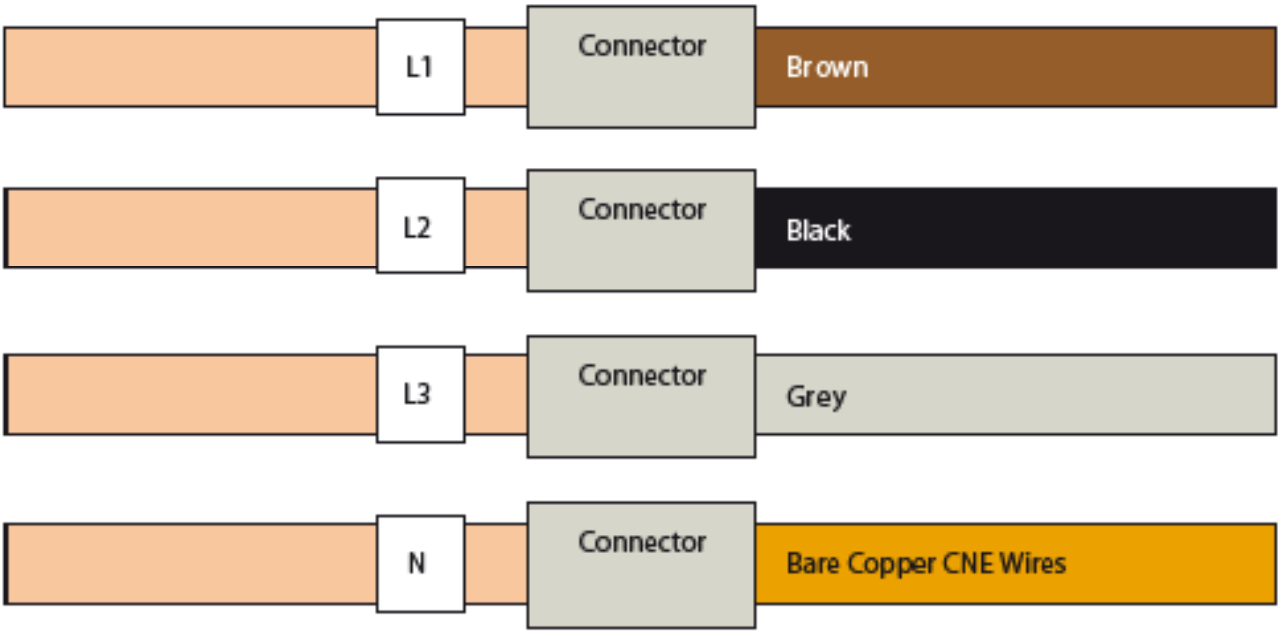
2.4.3 Single-Phase PILC to Plastic Service Cables



2.4.4 3-Phase PILC Mains/Service to XLPE Mains/Service Cables



- Where the phasing of existing cables is non-standard, identify and mark up the phases and neutral with phase tapes (L1, L2, L3 and N).

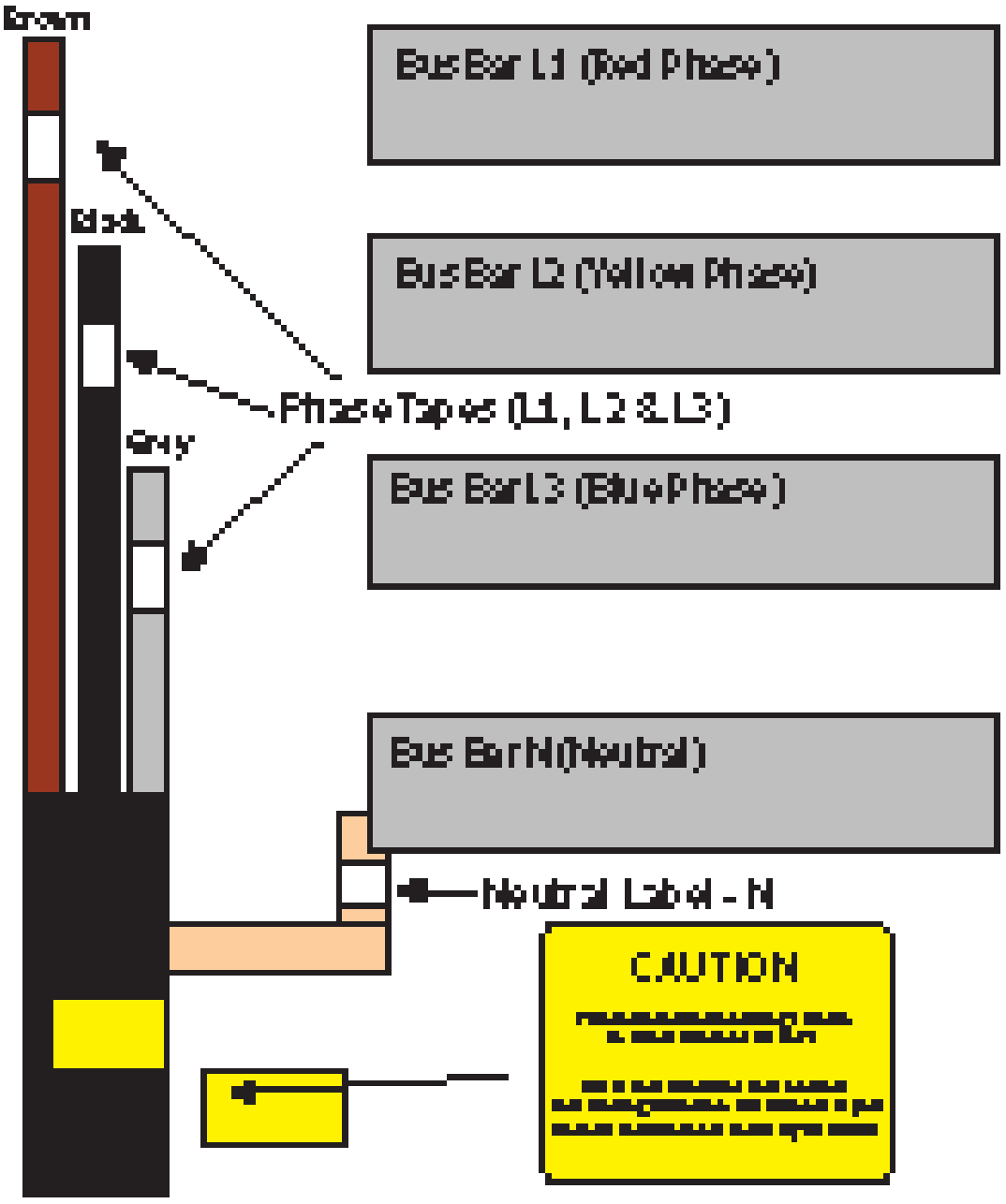


2.4.5 LV Boards, Pillars and Take-Off Cabinets

If connecting a new cable to a LV board, pillar or take-off cabinet:

- Make off the cable termination in the usual way, with the brown phase longest and the grey phase shortest.
- Mark each core with a phase tape (L1, L2 and L3).
- Mark the neutral with a neutral tape (N).
- Fix a yellow caution label either directly to the cable sheath or next to the connections onto the LV equipment.

The drawing below shows how to do this for a LV board with standard phasing. If the phasing is non-standard (a red-blue cross, for example), determine the phasing and mark the board before attempting to connect the new cable to it.



UK Power Networks Commodity 20070R

2.5 Service Straight Joints

2.5.1 Single-Phase 4mm² to 4mm² Plastic CNE Cables

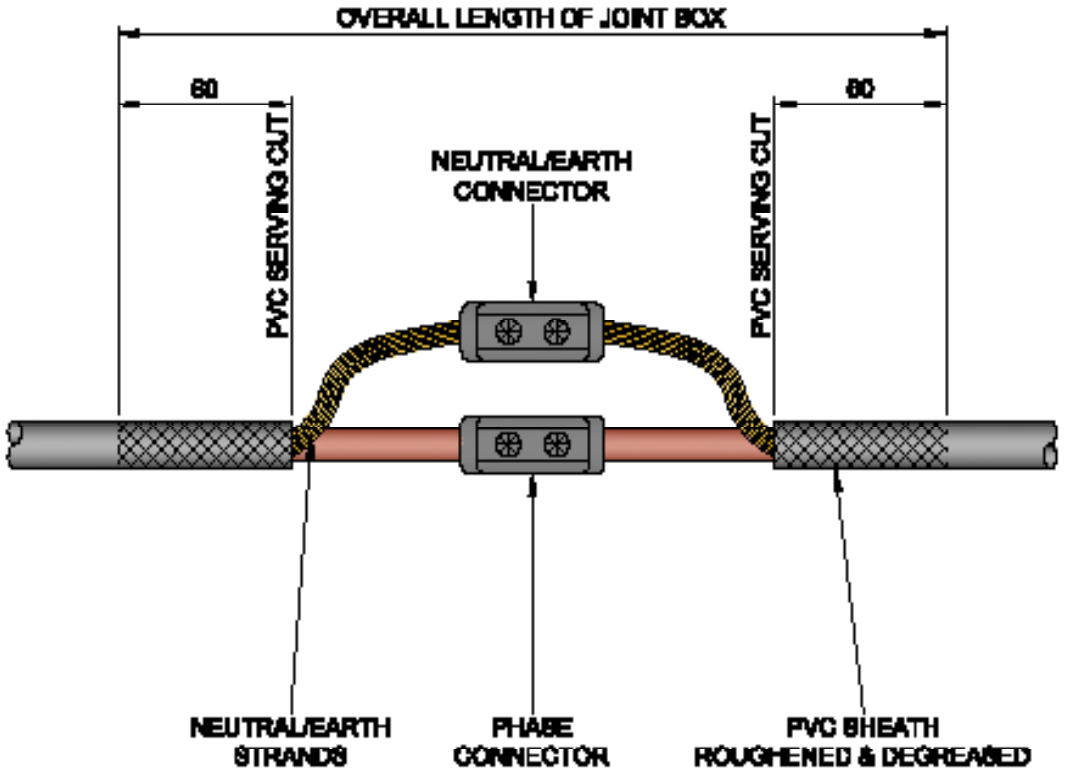
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4	4	01709V	SSJ1/UPN	0.4 Litres

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Overlap the 'live' service cable with at least 300mm of the new cable.
- Set the cables into their final jointing position and strip the cables (Sections 3.5 and 3.7), using the plastic joint shell as a guide.
- Position a temporary core shroud over the 'live' cable core.
- Fit the MFB2/i connector onto the neutral earth wires (Section 4.2.5).
- Fit the MFB2/i connector onto the phase cores (Section 4.2.5).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).



SINGLE PHASE CNE
4mm²
SERVICE STRAIGHT JOINT

UK Power Networks

REF. UPNJI/02
ISS D
DATE 05.11.14

2.5.2 Single-Phase 4mm² to 35mm² Plastic CNE Cables

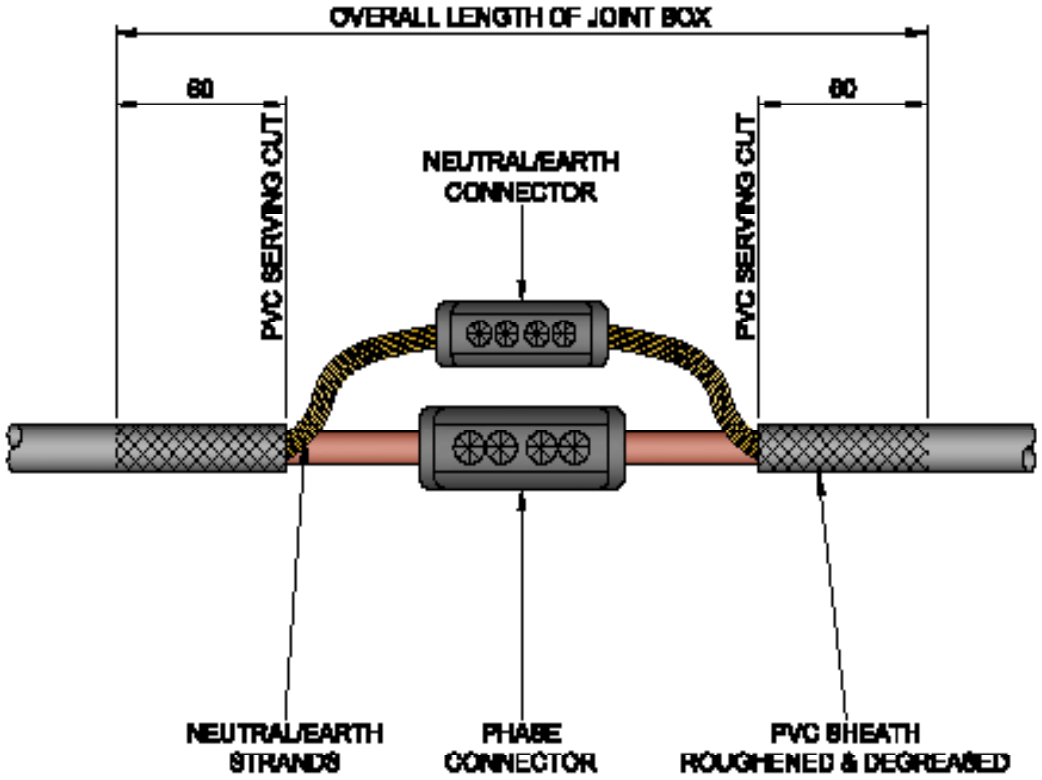
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4	16	02704B	SSJ2/UPN	0.7 Litres
16	35			
35				

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Overlap the 'live' service cable with at least 300mm of the new cable.
- Set the cables into their final jointing position and strip the cables (Sections 3.5 and 3.7), using the plastic joint shell as a guide.
- Position a temporary core shroud over the 'live' cable core.
- Fit the MF4/23i connector onto the neutral earth wires (Section 4.2.5).
- Fit the MF4/28i connector onto the phase cores (Section 4.2.5).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).



SINGLE PHASE CNE
4 - 35mm²
SERVICE STRAIGHT JOINT

UK Power Networks

REF. UPNJI/03
ISS D
DATE 05.11.14

2.5.3 Single-Phase Transition 4mm² Plastic CNE to 4mm² 2-Core PILC Cables

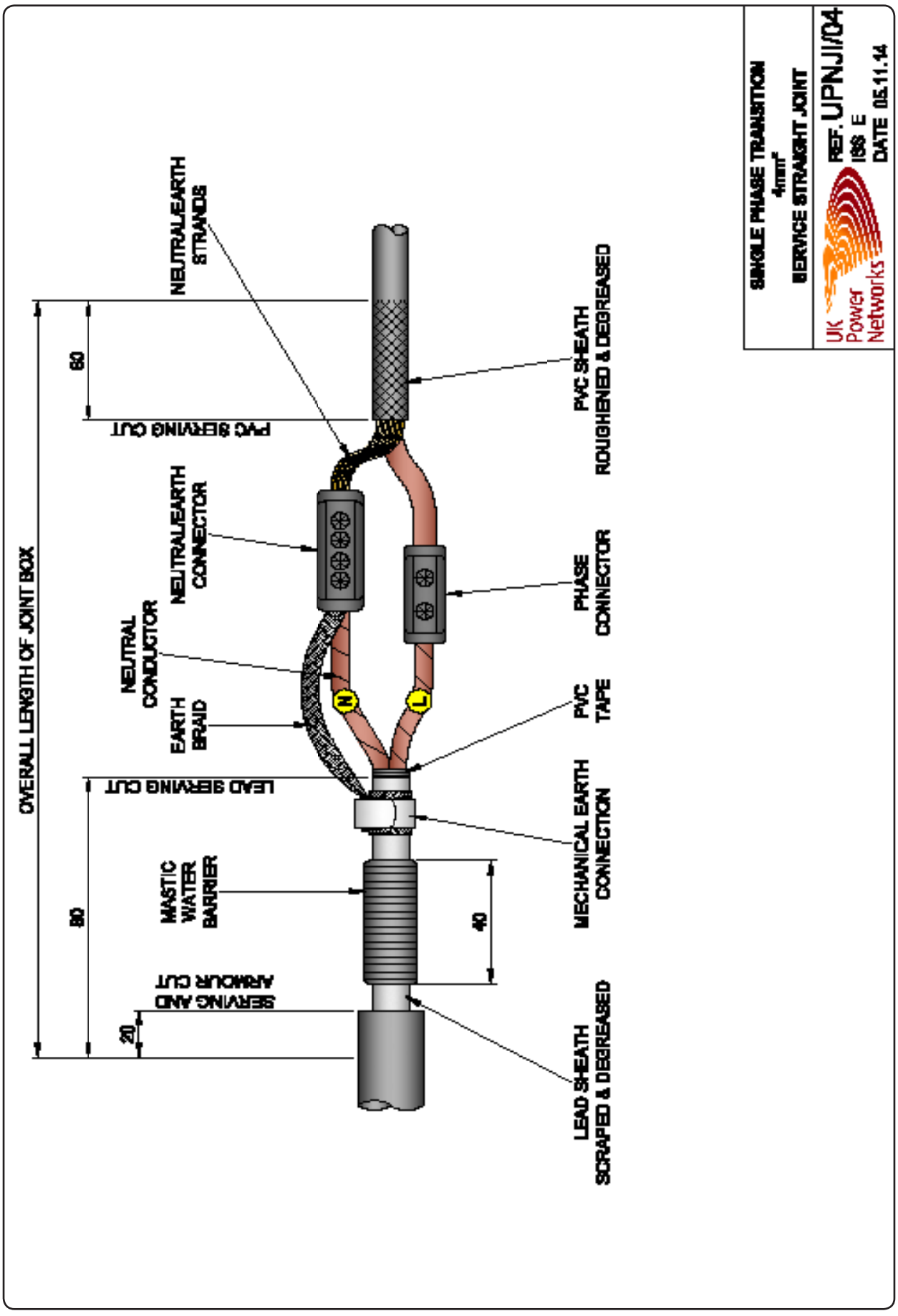
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4	4	01708L	SSJ3/UPN	1.8 Litres

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables into their final jointing position and strip the cables (Sections 3.2 and 3.5), using the plastic joint shell as a guide.
- Position a temporary core shroud over the ‘live’ cable core.
- Set the cores ready for connection.
- Use the MF4/28i neutral earth connector to connect together the bunch of neutral earth wires from the plastic service cable, the neutral conductor of the PILC service cable and the earth braid for the neutral to lead sheath bond (Section 4.2.5).
- Insulate the connector with the CR sheet patch (Section 4.9.4).
- Connect earth braid to lead sheath using the mechanical earth bond kit, as shown on the drawing UPNJI/32 (Section 4.7.2).
- Fit the MFB2/i connector onto the phase cores (Section 4.2.5).
- Apply the moisture barrier mastic tape to the lead sheaths next to the mechanical earth bonds (Section 4.7.2).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


SINGLE PHASE TRANSITION
4mm²
SERVICE STRAIGHT JOINT
REF. UPNJI/04
ISS E
DATE 05.11.14
UK Power Networks
OVERALL LENGTH OF JOINT BOX
80
20
60
PVC SERVING CUT
LEAD SERVING CUT
SERVING AND ARMOUR CUT
NEUTRAL/EARTH STRANDS
NEUTRAL/EARTH CONNECTOR
NEUTRAL CONDUCTOR
EARTH BRAID
MASTIC WATER BARRIER
40
PVC SHEATH ROUGHENED & DEGREASED
PHASE CONNECTOR
PVC TAPE
MECHANICAL EARTH CONNECTION
LEAD SHEATH SCRAPED & DEGREASED
N
L

2.5.4 Single-Phase Transition 4mm² to 35mm² Plastic CNE to 2-Core PILC Cables

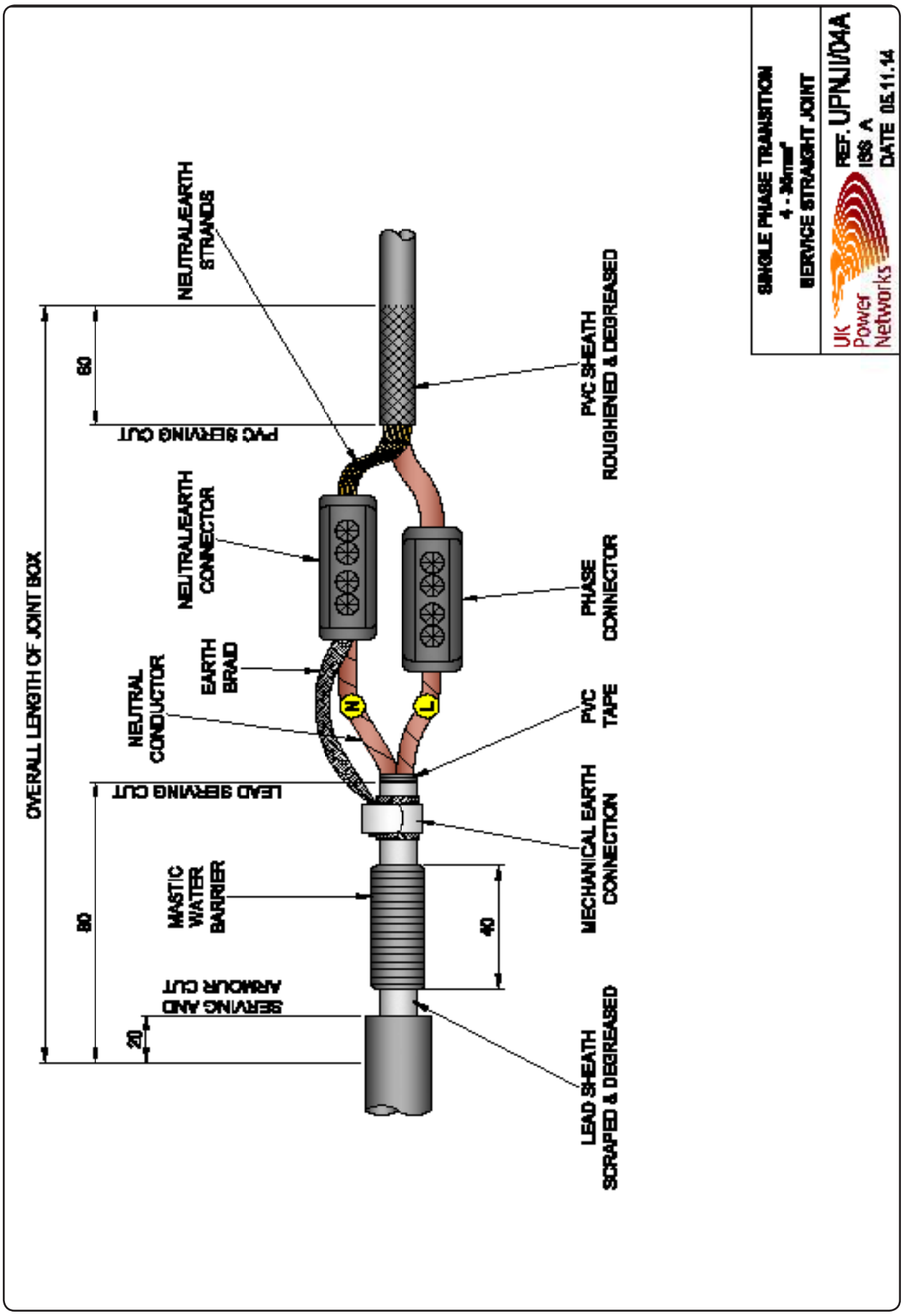
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4	16	02709A	SSJ4/UPN	1.9 Litres
16	35			
35				

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables into their final jointing position and strip the cables (Sections 3.2 and 3.5), using the plastic joint shell as a guide.
- Position a temporary core shroud over the 'live' cable core.
- Set the cores ready for connection.
- Use the MF4/28i neutral earth connector to connect together the bunch of neutral earth wires from the plastic service cable, the neutral conductor of the PILC service cable and the earth braid for the neutral to the lead sheath bond (Section 4.2.5).
- Insulate the connector with the CR sheet patch (Section 4.9.4).
- Connect the earth braid to the lead sheath using the mechanical earth bond kit, as shown on drawing UPNJI/32 (Section 4.7.2).
- Use the MF4/28i connector to connect the 2 phase conductors together (Section 4.2.5).
- Apply the moisture barrier mastic tape to the lead sheath next to the mechanical earth bond (Section 4.7.2).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


SINGLE PHASE TRANSITION
4 - 35mm²
SERVICE STRAIGHT JOINT
REF. UPNJ/04A
ISS A
DATE 05.11.14
UK Power Networks
OVERALL LENGTH OF JOINT BOX
NEUTRAL/EARTH STRANDS
PVC SHEATH ROUGHENED & DEGREASED
PVC SERVING CUT
60
NEUTRAL/EARTH CONNECTOR
PHASE CONNECTOR
EARTH BRAID
NEUTRAL CONDUCTOR
PVC TAPE
LEAD SERVING CUT
MECHANICAL EARTH CONNECTION
MASTIC WATER BARRIER
80
40
SERVING AND ARMOUR CUT
20
LEAD SHEATH SCRAPED & DEGREASED
N
L

2.5.5 3-Phase 16mm² to 35mm² Plastic CNE Cables

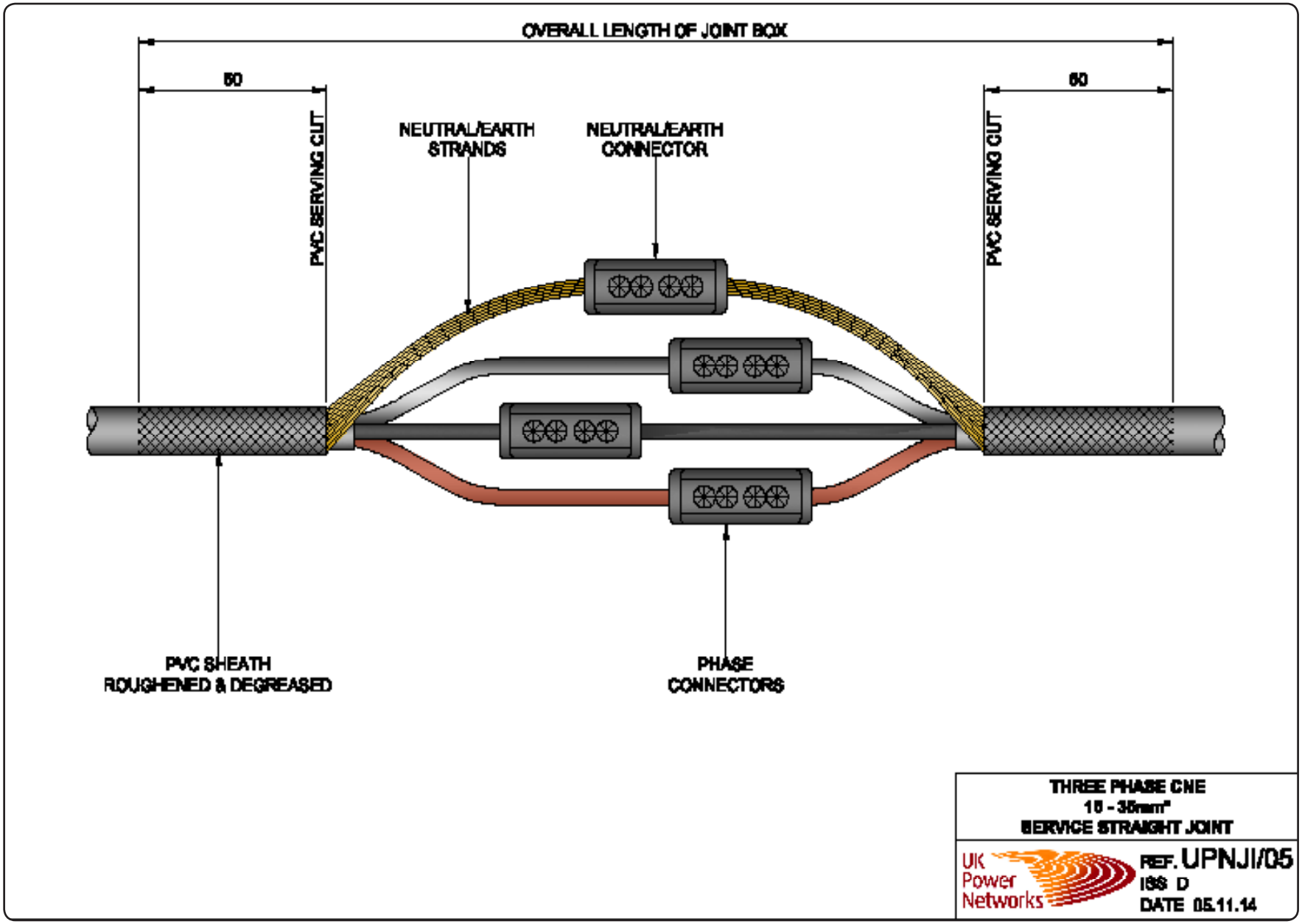
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
16	16	02710V	SSJ5/UPN	3.4 Litres
35	35			

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Overlap the 'live' service cable with at least 300mm of the new cable.
- Set the cables into their final jointing position and strip the cables (Sections 3.6 and 3.8), using the plastic joint shell as a guide.
- Position a temporary core shrouds over the 'live' cable cores.
- Fit the MF4/28i connector onto the neutral earth wires (Section 4.2.5).
- Fit the MF4/28i connectors onto the phase cores, one at a time (Section 4.2.5).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


OVERALL LENGTH OF JOINT BOX
60
60
PVC SERVING CUT
PVC SERVING CUT
NEUTRAL/EARTH STRANDS
NEUTRAL/EARTH CONNECTOR
PVC SHEATH ROUGHENED & DEGREASED
PHASE CONNECTORS
THREE PHASE CNE
16 - 35mm²
SERVICE STRAIGHT JOINT
UK Power Networks
REF. UPNJI/05
ISS D
DATE 05.11.14

2.5.6 3-Phase Transition 16mm² to 35mm² Plastic CNE to 4-Core PILC Cables

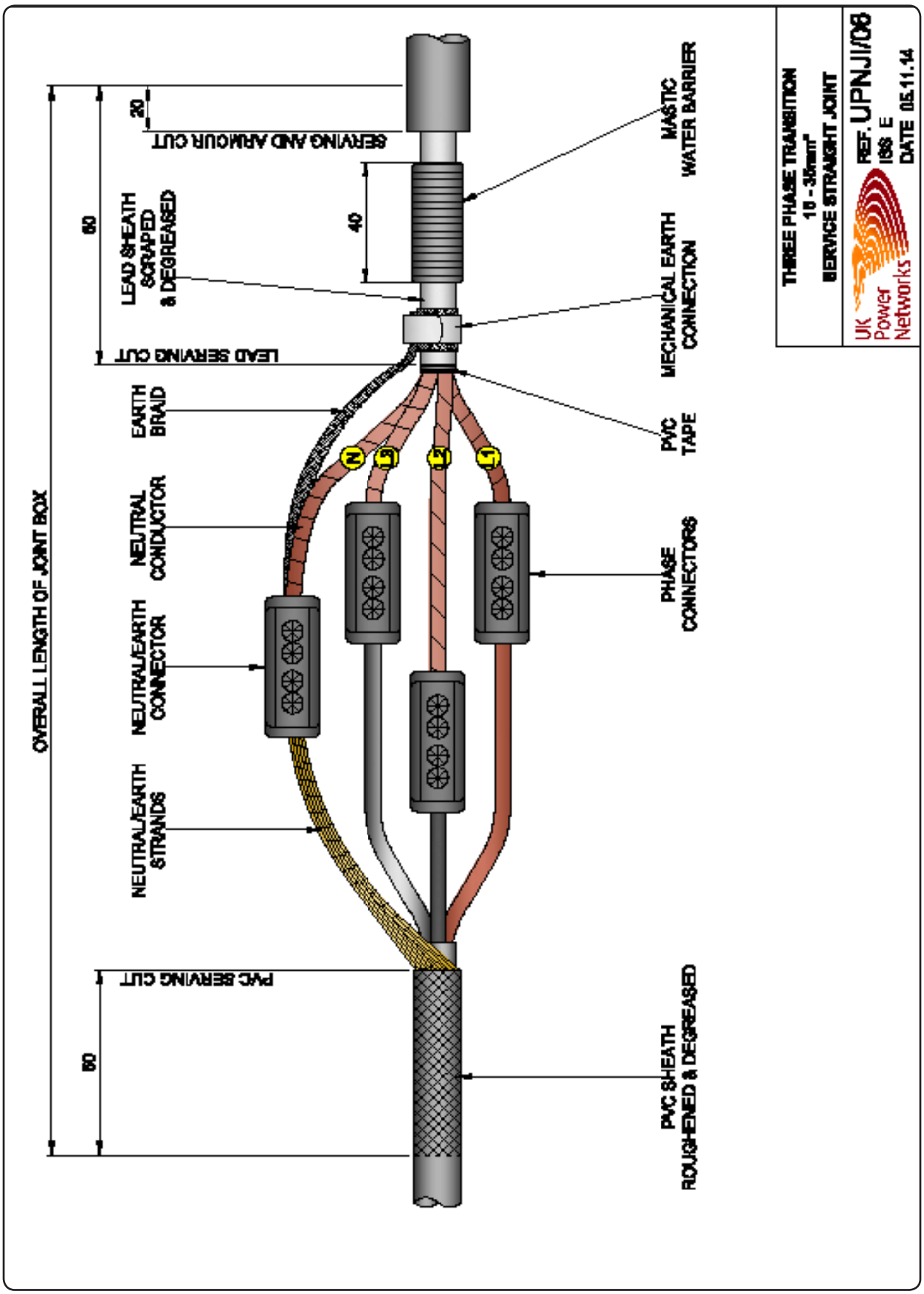
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
16	16	02710V	SSJ5/UPN	3.4 Litres
35	35			

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Overlap the 'live' service cable with at least 300mm of the new cable.
- Set the cables into their final jointing position and strip the cables (Sections 3.2 and 3.6), using the plastic joint shell as a guide.
- Position a temporary core shrouds over the 'live' cable cores.
- Using the MF4/28i neutral earth connector; connect together the bunch of neutral earth wires from the plastic service cable, the neutral conductor of the PILC service cable and the earth braid for neutral to lead sheath bond (Section 4.2.5).
- Insulate the connector with the CR sheet patch (Section 4.9.4).
- Connect the earth braid to lead sheath using the mechanical earth bond kit, as shown on drawing UPNJI/32 (Section 4.7.2).
- Use the MF4/28i phase connectors to connect together each phase in turn, as shown in drawing (Section 4.2.5).
- Apply the moisture barrier mastic tape to the lead sheath next to the mechanical earth bond (Section 4.7.2).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


THREE PHASE TRANSITION
10 - 35mm²
SERVICE STRAIGHT JOINT
REF. UPNJ/08
ISS E
DATE 05.11.14
UK Power Networks
MASTIC WATER BARRIER
MECHANICAL EARTH CONNECTION
PVC TAPE
PHASE CONNECTORS
PVC SHEATH ROUGHENED & DEGREASED
NEUTRAL/EARTH STRANDS
NEUTRAL/EARTH CONNECTOR
NEUTRAL CONDUCTOR
EARTH BRAID
LEAD SHEATH SCRAPED & DEGREASED
SERVING AND ARMOUR CUT
LEAD SERVING CUT
PVC SERVING CUT
OVERALL LENGTH OF JOINT BOX
20
60
40
60
2
3
4
5

2.6 Service Branch Joints

2.6.1 Single-Phase 4mm² to 4mm² Plastic CNE Cables

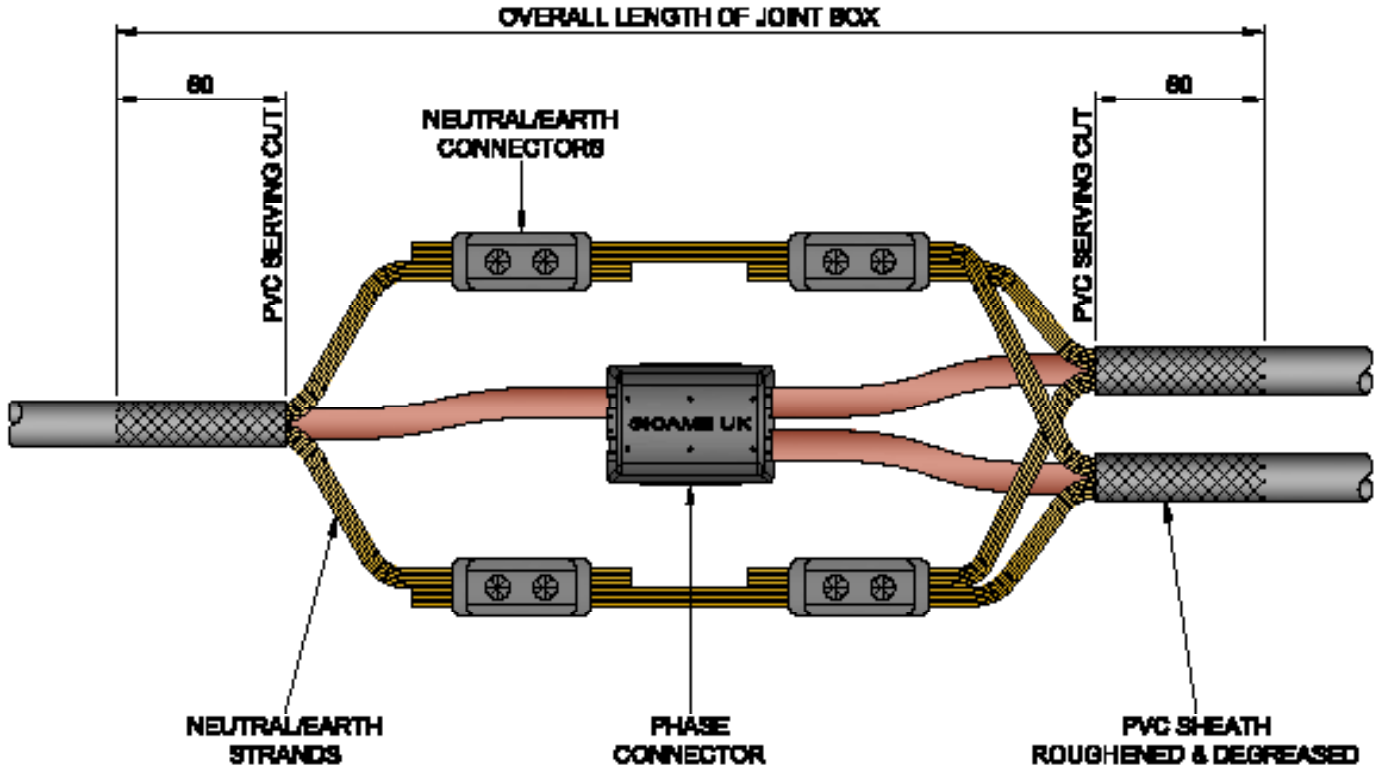
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4	4	01707B	SBJ1/UPN	1.6 Litres

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Overlap the 'live' service cable with at least 300mm of the new cable.
- Set the cables into their final jointing position and strip the cables (Sections 3.5 and 3.7), using the plastic joint shell as a guide.
- Prepare the through service cable CNE wires (Sections 3.7.2 and 3.7.4) and connect to the branch service cable wires, using the MFB2 connectors (Section 4.2.5).
- Fit the MB21 phase connector onto the phase cores (Section 4.2.7).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).



SINGLE PHASE CNE
4mm² TO 4mm²
SERVICE BRANCH JOINT

UK Power Networks

REF. UPNJI/07
ISS C
DATE 11.09.14

2.6.2 Single-Phase 4mm² to 35mm² Plastic CNE Cables

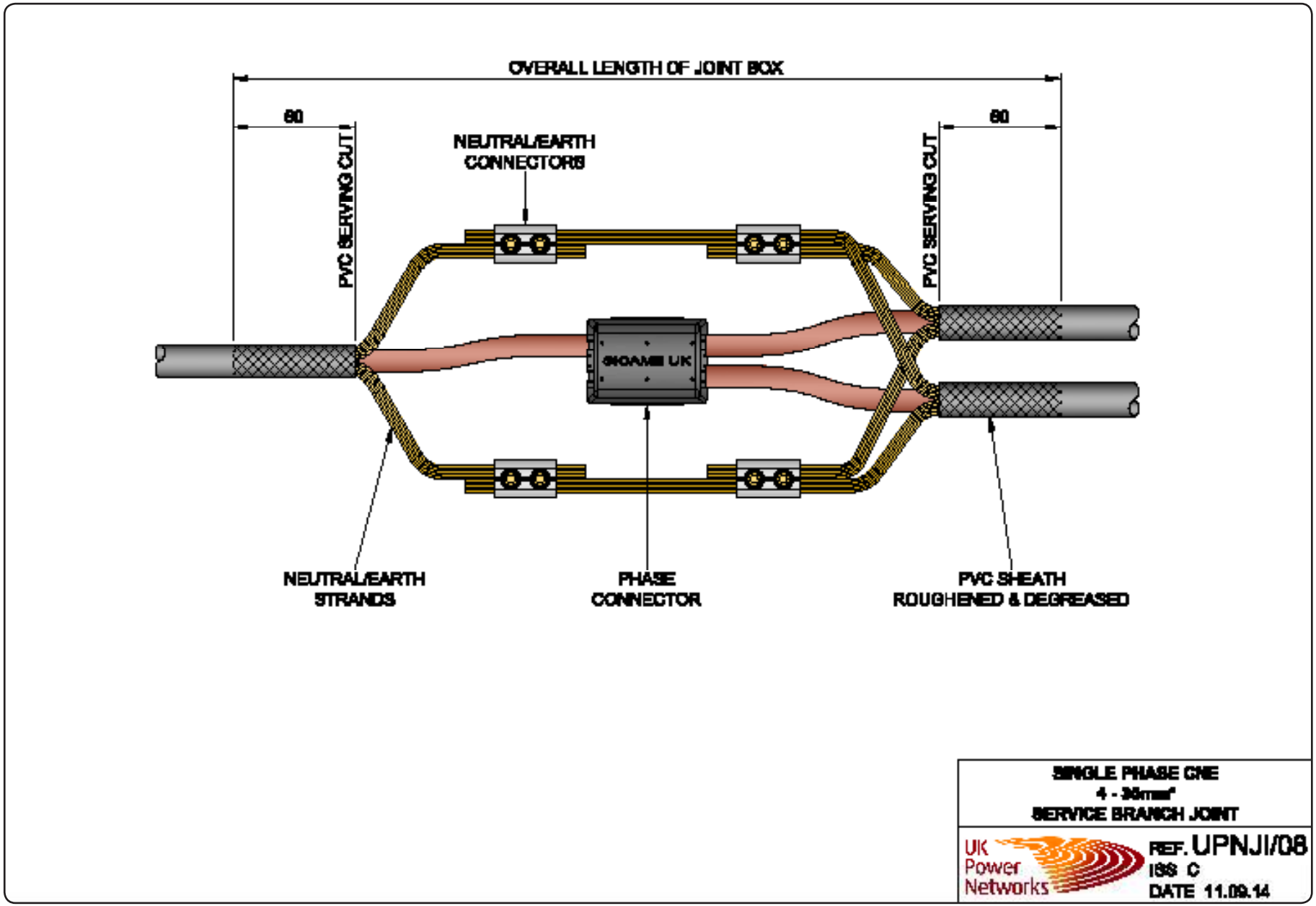
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4	16	02708Q	SBJ2/UPN	1.6 Litres
16	35			
35				

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Overlap the 'live' service cable with at least 300mm of the new cable.
- Set the cables into their final jointing position and strip the cables (Sections 3.5 and 3.7), using the plastic joint shell as a guide.
- Prepare the through service cable CNE wires (Sections 3.7.2 and 3.7.4) and connect to the branch service cable wires using the MF4 connectors (Section 4.2.5).
- Fit the MB21 phase connector onto the phase cores (Section 4.2.7).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


OVERALL LENGTH OF JOINT BOX
80
80
PVC SERVING CUT
PVC SERVING CUT
NEUTRAL/EARTH CONNECTORS
SIGAMS UK
NEUTRAL/EARTH STRANDS
PHASE CONNECTOR
PVC SHEATH ROUGHENED & DEGREASED
SINGLE PHASE CNE
4 - 35mm²
SERVICE BRANCH JOINT
UK Power Networks
REF. UPNJI/08
ISS C
DATE 11.09.14

2.6.3 Single-Phase 4mm² Plastic CNE to 4mm² 2-Core PILC Cables

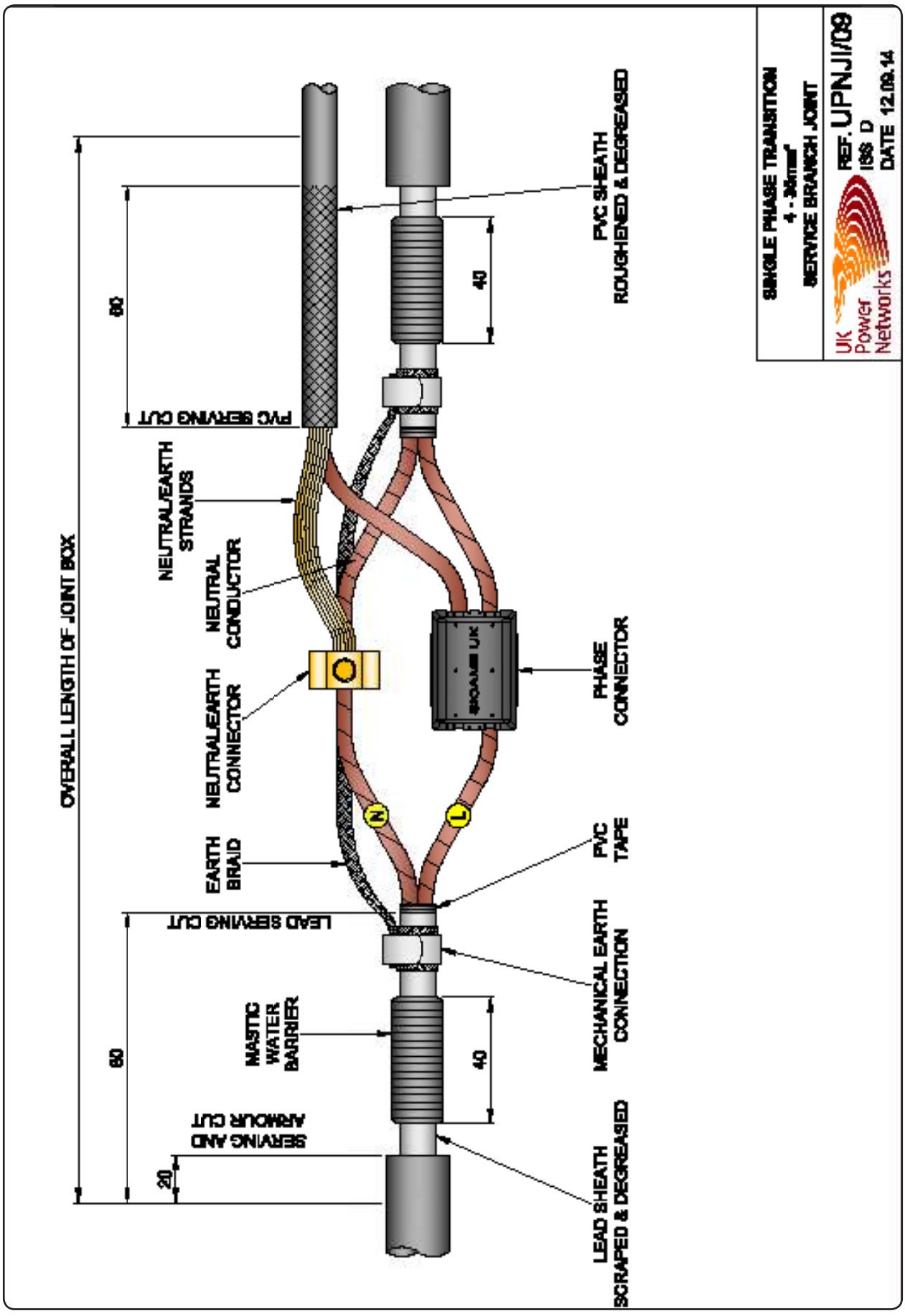
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4	4	02705L	SBJ3/UPN	3.4 Litres

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables in to their final jointing position and strip the cables, using the plastic joint shell as a guide (Sections 3.2 and 3.5).
- Remember to install a temporary continuity bond before removing the lead sheath (Section 3.2.5).
- Set the cores ready for connection.
- Use the NE26 neutral earth connector to connect together the bunch of neutral earth wires from the plastic service cable, the neutral conductor of the PILC service cable and the earth braid for the neutral to lead sheath bond (Section 4.1.3).
- Insulate the connector with the CR sheet patch (Section 4.9.4).
- Connect earth braid to lead sheath at each end of the joint using the mechanical earth bond kits, as shown on drawing UPNJI/32 (Section 4.7.2).
- Use the MB21 phase connector to connect the two phase conductors together (Section 4.2.7).
- Apply the moisture barrier mastic tape to the lead sheaths next to the mechanical earth bonds (Section 4.7.2).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


SINGLE PHASE TRANSITION
4 - 35mm²
SERVICE BRANCH JOINT
REF. UPNJI/09
ISS D
DATE 12.09.14
UK Power Networks
PVC SHEATH ROUGHENED & DEGREASED
40
60
PVC SERVING CUT
NEUTRAL/EARTH STRANDS
NEUTRAL CONDUCTOR
NEUTRAL/EARTH CONNECTOR
EARTH BRAID
PHASE CONNECTOR
PVC TAPE
LEAD SERVING CUT
MECHANICAL EARTH CONNECTION
MASTIC WATER BARRIER
40
60
SERVING AND ARMOUR CUT
20
LEAD SHEATH SCRAPED & DEGREASED
OVERALL LENGTH OF JOINT BOX
N
L

2.6.4 Single-Phase Plastic CNE to 2-Core PILC 4mm² to 35mm² Cables

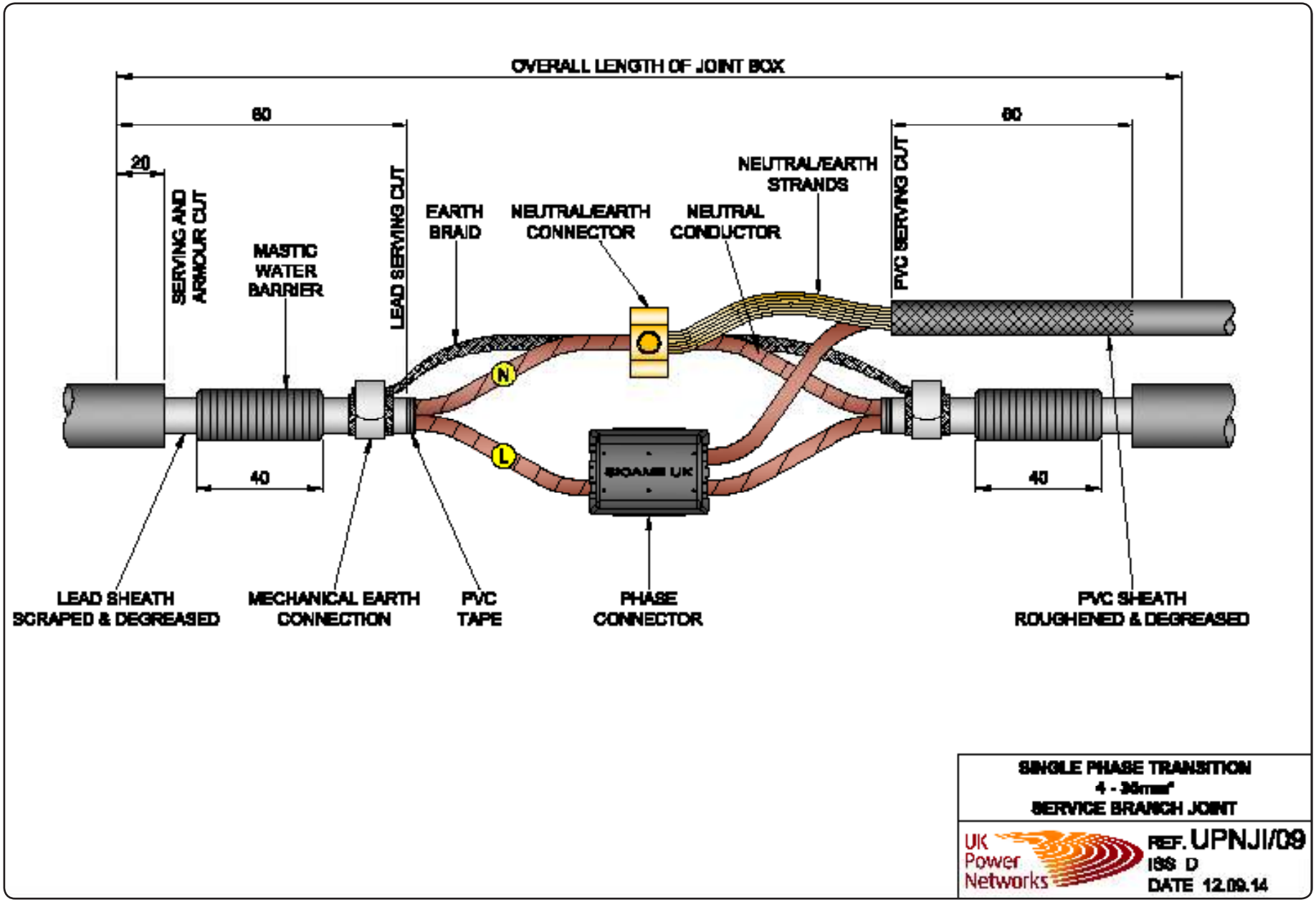
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4	16	02705L	SBJ3/UPN	3.4 Litres
16	35			
35				

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables in to their final jointing position and strip the cables, using the plastic joint shell as a guide (Sections 3.2 and 3.5).
- Remember to install a temporary continuity bond before removing the lead sheath (Section 3.2.5).
- Set the cores ready for connection.
- Use the NE26 neutral earth connector to connect together the bunch of neutral earth wires from the plastic service cable, the neutral conductor of the PILC service cable and the earth braid for the neutral to lead sheath bond (Section 4.1.3).
- Insulate the connector with the CR sheet patch (Section 4.9.4).
- Connect the earth braid to lead sheath at each end of the joint using the mechanical earth bond kits, as shown on drawing UPNJI/32 (Section 4.7.2).
- Use the MB21 phase connector to connect the two phase conductors together (Section 4.2.7).
- Apply the moisture barrier mastic tape to the lead sheaths next to the mechanical earth bonds (Section 4.7.2).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


OVERALL LENGTH OF JOINT BOX
60
60
20
SERVING AND ARMOUR CUT
MASTIC WATER BARRIER
LEAD SERVING CUT
EARTH BRAID
NEUTRAL/EARTH CONNECTOR
NEUTRAL CONDUCTOR
NEUTRAL/EARTH STRANDS
PVC SERVING CUT
N
L
40
40
LEAD SHEATH SCRAPED & DEGREASED
MECHANICAL EARTH CONNECTION
PVC TAPE
PHASE CONNECTOR
PVC SHEATH ROUGHENED & DEGREASED
SINGLE PHASE TRANSITION
4 - 35mm²
SERVICE BRANCH JOINT
UK Power Networks
REF. UPNJI/09
ISS D
DATE 12.09.14

2.6.5 Single or 3-Phase Plastic Service to a 3-Phase Plastic CNE 16mm² to 35mm² Cables

Materials

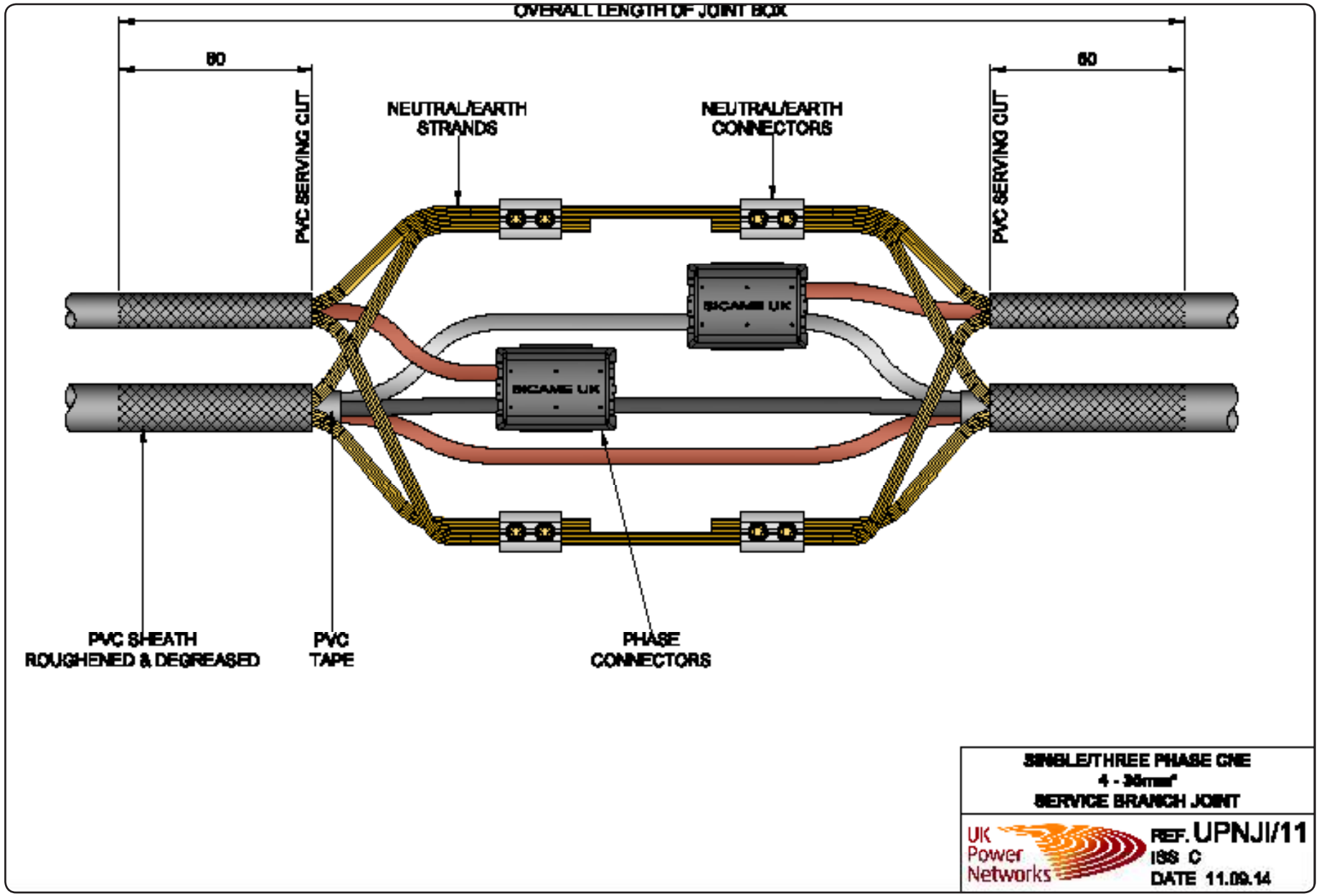
Mains Cable Size (mm²)		No. of Services (16 to 35mm²)	Stores Code	Sicame Kit No.	Module No. SSM1/UPN Stores Code	Empty Shell Resin Volume
16	16	2	02706V	SBJ5/UPN	1 x 01706R	3.4 Litres
35	35	3			2 x 01706R	

Note: Each standard joint only contains a single-phase connector.

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Overlap the 'live' service cable with at least 300mm of the new cable.
- Set the cables into their final jointing position and strip cables cores (Sections 3.5 to 3.8) using the plastic joint shell as a guide.
- Prepare the through service cable CNE wires (Sections 3.8.2 and 3.8.4) and connect to the branch service cable wires, using the MF4 connectors (Section 4.2.5).
- Fit the MB21 phase connector onto the phase core(s), one at a time (Section 4.2.7).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


OVERALL LENGTH OF JOINT BOX
60
60
PVC SERVING CUT
PVC SERVING CUT
NEUTRAL/EARTH STRANDS
NEUTRAL/EARTH CONNECTORS
SICAME UK
SICAME UK
PVC SHEATH ROUGHENED & DEGREASED
PVC TAPE
PHASE CONNECTORS
SINGLE/THREE PHASE CNE
4 - 35mm²
SERVICE BRANCH JOINT
UK Power Networks
REF. UPNJI/11
ISS C
DATE 11.09.14

2.6.6 Single or 3-Phase Service to a PILC Service or Main 16mm² to 35mm² Cables

Materials

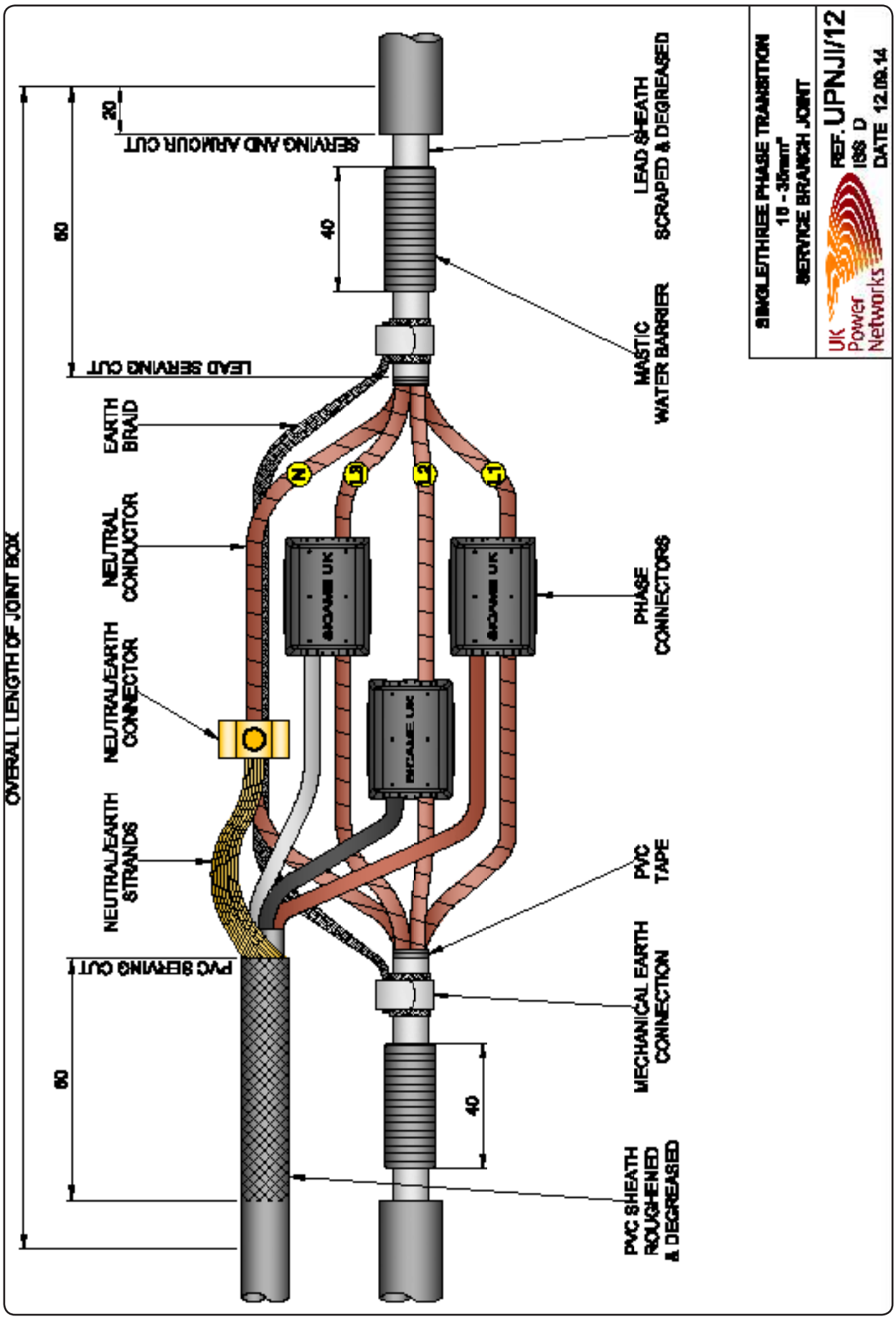
Mains Cable Size (mm²)		No. of Services (16 to 35mm²)	Stores Code	Sicame Kit No.	Module No. SSM1/UPN Stores Code	Empty Shell Resin Volume
16	16	2	02707F	SBJ6/UPN	1 x 01706R	5.7 Litres
35	35	3			2 x 01706R	

Note: Each standard joint only contains a single-phase connector.

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables in to their final jointing position and strip the cables, using the plastic joint shell as a guide (Sections 3.2, 3.5 and 3.6).
- Install a temporary continuity bond before removing the lead sheath (Section 3.2.5).
- Set the cores ready for connection.
- Use the NE26 neutral earth connector to connect together the bunch of neutral earth wires from the plastic service cable, the neutral conductor of the PILC service cable and the earth braid for the neutral to lead sheath bond (Section 4.1.3).
- Insulate the connector with the CR sheet patch (Section 4.9.4).
- Connect the earth braid to lead sheath at each end of the joint using the mechanical earth bond kits, as shown on drawing UPNJI/32 (Section 4.7.2).
- Use the MB21 phase connectors to connect each service(s) to each of the phase of the PILC main in turn, as shown in the drawing (Section 4.2.7).
- Apply the moisture barrier mastic tape to the lead sheaths next to the mechanical earth bonds (Section 4.7.2).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


SINGLE/THREE PHASE TRANSITION
16 - 35mm²
SERVICE BRANCH JOINT
REF. UPNJI/12
ISS D
DATE 12.09.14
UK Power Networks
LEAD SHEATH SCRAPED & DEGREASED
MASTIC WATER BARRIER
PHASE CONNECTORS
PVC TAPE
MECHANICAL EARTH CONNECTION
PVC SHEATH ROUGHENED & DEGREASED
NEUTRAL/EARTH STRANDS
NEUTRAL/EARTH CONNECTOR
NEUTRAL CONDUCTOR
EARTH BRAID
SERVING AND ARMOUR CUT
LEAD SERVING CUT
PVC SERVING CUT
OVERALL LENGTH OF JOINT BOX
20
60
40
60
40

2.7 Service Cut and Test Joints

2.7.1 Single-Phase Plastic CNE Cables 4mm² to 35mm²

Materials

Cable Size (mm²)	Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4 to 35	02708Q	SBJ2/UPN	1.3 Litres
Cable Size (mm²)	**Stores Code**	**Sicame Kit No.**	**No. Required per Joint**
4 to 35	02770X	MF428I/UPN	1

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the service cable using the plastic joint shell as a guide (Section 3.7).
- When the cable is ready to be put back together, connect all the copper wires together with the MF4/34A connectors (Section 4.2.5). Use additional copper wires from a spare piece of cable of equivalent size, if there is gap between the cut ends.
- Reconnect the two halves of the phase conductor using a MF4/28i connector (Section 4.2.5).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).

2.7.2 3-Phase Plastic CNE Cables 16mm² to 35mm²

Materials

Cable Size (mm²)	Stores Code	Sicame Kit No.	Empty Shell Resin Volume
16 to 35	02706V	SBJ5/UPN	3.4 Litres
Cable Size (mm²)	**Stores Code**	**Sicame Kit No.**	**No. Required per Joint**
4 to 35	02770X	MF428I/UPN	3

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the service cable using the plastic joint shell as a guide, (Sections 3.8).
- When the cable is ready to be put back together, connect all the copper wires together with the MF4/34A connectors (Section 4.2.5). Use additional copper wires from a spare piece of cable of equivalent size, if there is gap between the cut ends.
- Reconnect the two halves of each phase conductor using a MF4/28i connectors (Section 4.2.4).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).

2.7.3 2-Core PILC Cables 4mm² to 35mm²

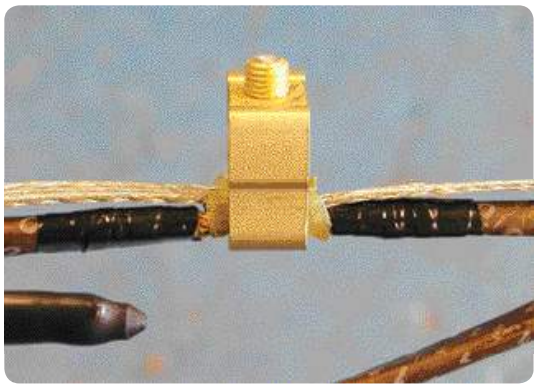
Materials

Cable Size (mm²)	Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4 to 35	02705L	SBJ3/UPN	3.4 Litres
Cable Size (mm²)	**Stores Code**	**Sicame Kit No.**	**No. Required per Joint**
4 to 35	02770X	MF428I/UPN	1

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the service cable using the plastic joint shell as a guide (Section 3.2).
- Remember to install a temporary continuity bond before removing the lead sheath (Section 3.2.5).
- When the cable is ready to be put back together, connect the earth braid to lead sheath at each end of the joint using the mechanical earth bond kits, as shown on drawing UPNJI/32 (Section 4.7.2).
- Use the NE26 neutral earth connector to connect together the neutral conductor of the PILC service cable and the earth braid for the neutral to lead sheath bond (Section 4.1.3). Use additional copper wires of equivalent size and an additional NE26 connector to bridge any gap between the ends of the neutral conductor.



- Insulate the connector with the CR sheet patch (Section 4.9.4).

- Reconnect the two halves of the phase conductor, using a MF4/28I connector (Section 4.2.5).
- Apply the moisture barrier mastic tape to the lead sheath next to the mechanical earth bonds (Section 4.7.2).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table on the previous page (Section 4.8.2).

2.7.4 4-Core PILC Service or Main Cables 16mm² to 35mm²

Materials

Cable Size (mm²)	Stores Code	Sicame Kit No.	Empty Shell Resin Volume
4 to 35	02707F	SBJ6/UPN	5.7 Litres
Cable Size (mm²)	**Stores Code**	**Sicame Kit No.**	**No. Required per Joint**
4 to 35	02770X	MF428I/UPN	3

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the service cable using the plastic joint shell as a guide (Section 3.2).
- Install a temporary continuity bond before removing the lead sheath (Section 3.2.5).
- When the cable is ready to be put back together, connect the earth braid to lead sheath at each end of the joint using the mechanical earth bond kits, as shown on drawing UPNJI/32 (Section 4.7.2).
- Use the NE26 neutral earth connector to connect together the neutral conductor of the PILC service cable and the earth braid for the neutral to lead sheath bond (Section 4.1.3). Use additional copper wires of equivalent size and an additional NE26 connector to bridge any gap between the ends of the neutral conductor.
- Insulate the connector with the CR sheet patch (Section 4.9.4).
- Reconnect the two halves of each phase conductor using a MF4/28I connectors (Section 4.2.5).
- Apply the moisture barrier mastic tape to the lead sheaths next to the mechanical earth bonds (Section 4.7.2).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).

2.8 Service Cable Pot Ends

2.8.1 Single-Phase Plastic CNE Cables 4mm² to 35mm²

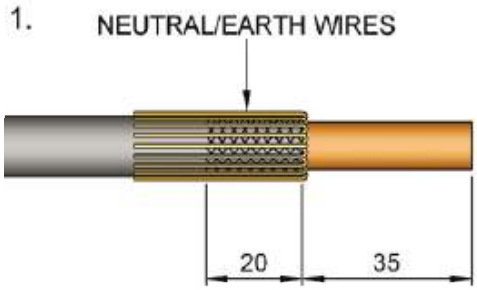
Materials

Cable Size (mm²)	Stores Code	Tyco Kit No.
4 16 35	02790Q	BAH-038081484

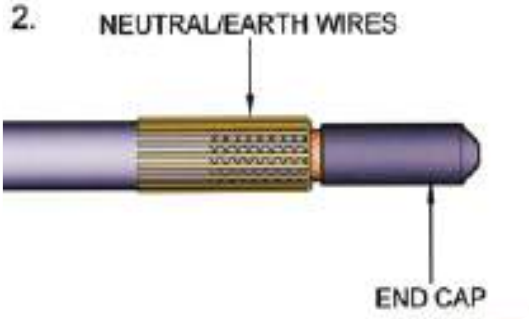
Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the cable as detailed in the following procedures.
- If working on cable end refer to Section 3.7.
- If working on a 'live' through cable refer to Sections 3.7.1 and 3.7.2.
- Clean and abrade the cable sheath for a distance of 20mm.
- Fold the copper neutral earth wires back over the cable sheath.
- Cut the phase core to the dimension in the drawing (Section 3.7.3).



- Slide the small end cap over the end of the phase conductor and shrink into place starting at the end working towards the cable sheath (Section 4.10.4).
- **Note:** As the cap shrinks it may begin to slide off. An insulated core wedge can be used to hold it in position.

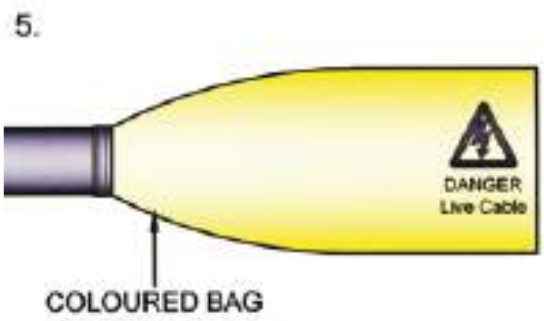


- Lay the copper neutral/earth wires back over the end cap and space them evenly to cover it.
- Cut off any excess length of wire.
- Secure the copper neutral/earth wires in place with PVC tape.

- Position the supplied length of tube over the cable end and shrink in place.

- Position the large end cap over the end of the cable.
- Shrink the end cap starting at the end, before working towards the cable sheath (Section 4.10.4).
- **Note:** As the cap shrinks it may begin to slide off. An insulated core wedge can be used to hold it in position.

- Allow the pot end to cool before applying any mechanical strain.
- When cool, place the opened end of the yellow bag over the joint and fasten to the cable using PVC tape.



2.8.2 Single-Phase PILC Service Cables 4mm² to 35mm²

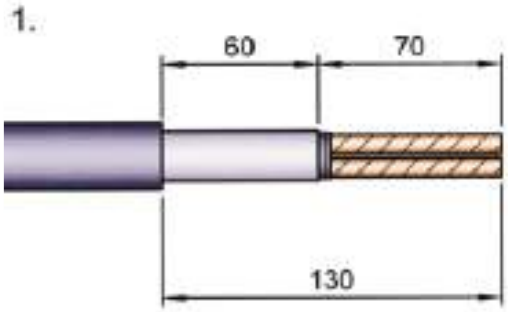
Materials

Cable Size (mm²)	Stores Code	Tyco Kit No.
4 16 35	02793U	BAH-038081486

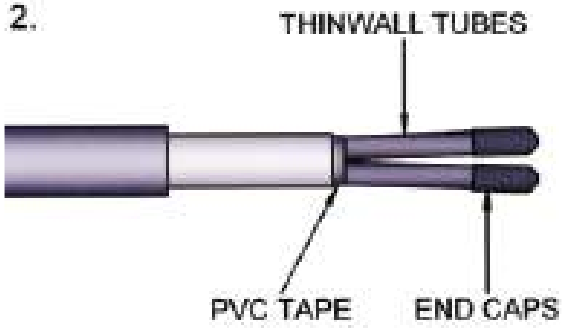
Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

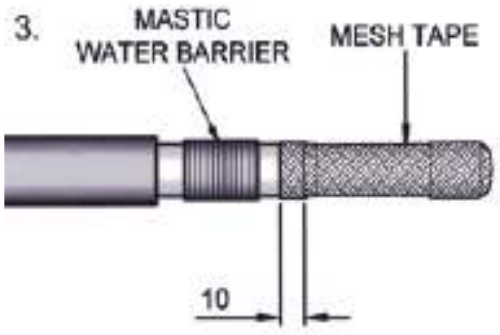
- Remove the cable outer serving, armour and lead sheath to the dimensions shown in the drawing (Sections 3.2.1 to 3.2.6).
- Remove the belt papers and carefully separate the cores, taking care not to damage the paper insulation (Section 3.2.7).
- Cut each core, starting with the ‘live’, and temporarily insulate with the un-shrunk heat-shrink caps from in the kit (Section 3.2.8).



- Remove one of the caps and slide one of the short lengths of heat-shrink tube over the core so it covers the paper insulation down into the crutch of the cable.
- Shrink the thin-wall heat-shrink tubes with a soft flame starting from the crutch working towards the core ends (Section 4.10.1).
- Shrink the small end caps over the ends of the cores, starting from the closed end (Section 4.10.4).
- **Note:** As the caps shrink they may begin to slide off. An insulated core wedge can be used to hold them in position.
- Repeat the process with the other core.
- Apply three turns of PVC tape around the cores to protect the papers in the cable crutch.



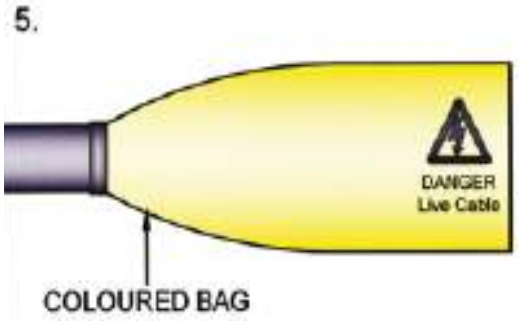
- Wrap the joint with a half-lap layer of tinned copper mesh tape.
- Start at the cut end by forming the tape into a star and then work along the cable until the mesh overlaps the lead sheath by 10mm.
- Install a single half-lap layer of black moisture sealing tape on to the lead sheath between the end of the copper mesh tape and the armour/outer sheath cut.



- Once complete, position the supplied length of tube over the cable end and shrink in place.

- Position the outer end cap over the joint and commence shrinking from the end towards the cable (Section 4.10.4).
- **Note:** As the caps shrink it may begin to slide off. An insulated core wedge can be used to hold it in position.

- Allow the pot end to cool before applying any mechanical strain.
- When cool, place the opened end of the yellow bag over the joint and fasten to the cable using PVC tape.



2.8.3 3-Phase Plastic CNE Cables 16mm² to 35mm²

Materials

Cable Size (mm²)	Stores Code	Sicame Kit No.
16 35	02791A	SE3/UPN

Installation Instructions

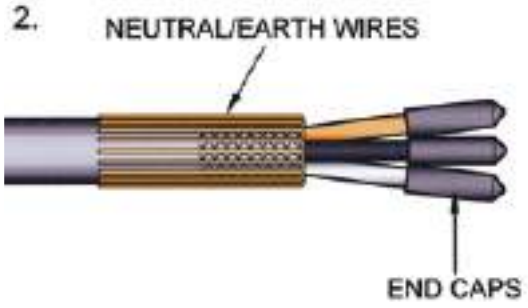
For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Remove the cable sheath and prepare the copper neutral earth wires to the dimension shown in the drawing.
- If working on cable end refer to Section 3.8.
- If working on through cable refer to Sections 3.8.1 and 3.8.2.
- Clean and abrade the cable sheath for a distance of 50mm.

1.

- Fold the copper neutral earth wires back over the cleaned cable sheath.
- Cut each of the phase cores in turn (Section 3.8.3) and install the small heat shrink caps over the end of each phase. Shrink each one in place, starting at the end and working towards to cable sheath (Section 4.10.4).
- **Note:** As the caps shrink they may begin to slide off. An insulated core wedge can be used to hold them in position.

2.



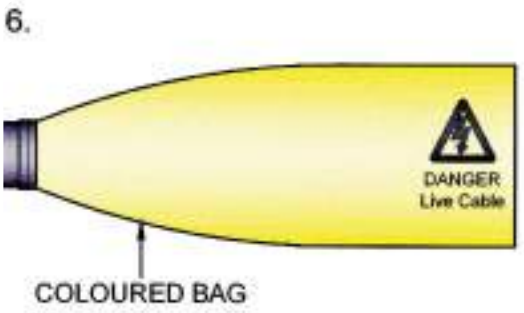
- Pull the cores back together and secure them in place with PVC tape.

- Lay the copper neutral earth wires back over the cores and secure in place with PVC tape.
- Cut off any lengths of copper wire that over hang the end caps.

- Once complete, position the supplied length of tube over the cable end and shrink in place.

- Position the large end cap over the end of the cable and shrink down starting at the end working towards the cable oversheath (Section 4.10.4).
- **Note:** As the cap shrinks it may begin to slide off. An insulated core wedge can be used to hold it in position.

- Allow the pot end to cool before applying any mechanical strain.
- When cool, place the opened end of the coloured bag over the joint and fasten to the cable using insulating tape.



2.8.4 3-Phase PILC Service Cables 4mm² to 35mm²

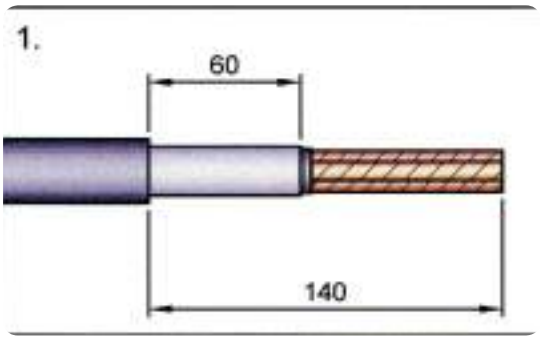
Materials

Cable Size (mm²)	Stores Code	Sicame Kit No.
16 35	02794E	SE4/UPN

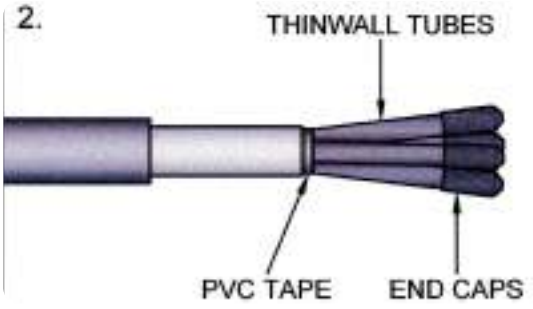
Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Remove the cable sheath, armour and lead sheath to the dimensions shown in the drawing (Section 3.2.1 to 3.2.6).
- Remove the belt papers and carefully separate the cores, taking care not to damage the paper insulation (Section 3.2.7).

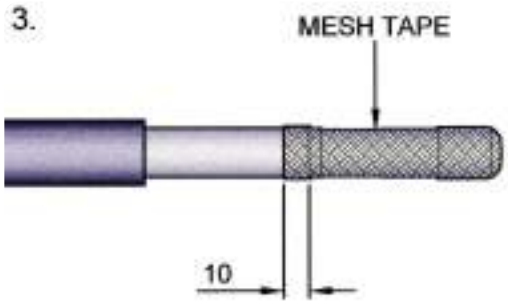


- Cut each of the cores starting with one of the 'lives', and temporarily insulate with an un-shrunk heat-shrink caps supplied in the kit (Section 3.2.8).
- Remove one of the caps and slide one of the short lengths of heat-shrink tube over the core so it covers the paper insulation down into the crutch of the cable.
- Shrink the black thin wall heat shrink tube with a soft flame starting from the crutch working towards the core ends (Section 4.10.1).
- Shrink the small end cap over the end of the core, starting from the closed end (Section 4.10.4).
- **Note:** As the caps shrink they may begin to slide off. An insulated core wedge can be used to hold them in position.
- Repeat the process with the other cores.
- Apply three turns of PVC tape around the cores to protect the papers in the cable crutch.



- Form the cores back together and secure with PVC tape.

- Wrap the joint with a half-lap layer of tinned copper mesh tape. Starting at the joint end by forming into a star and working towards the lead sheath and overlap by 10mm.



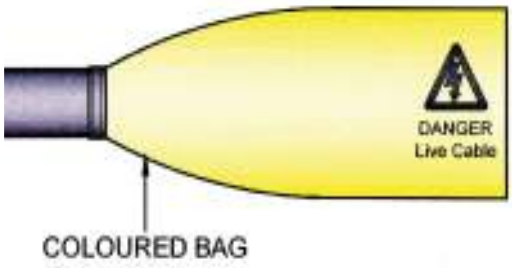
- Once complete, position the supplied length of tube over the cable end and shrink in place.

- Position the large end cap over the end of the cable and commence shrinking from the end towards the cable (Section 4.10.4). This cap is adhesive coated so no additional moisture sealing mastic is required.

- **Note:** As the cap shrinks it may begin to slide off. An insulated core wedge can be used to hold it in position.

- Allow the pot end to cool before applying any mechanical strain.
- When cool, place the opened end of the yellow bag over the joint and fasten to the cable using PVC tape.

5.



COLOURED BAG

2.9 Waveform Cables Mains Service Branch Joints

2.9.1 Waveform Cables 70mm² to 185mm² (Up To Six Single-Phase Or Two 3-Phase Services)

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
70 to 185	4	02741G	MSJ185W/UPN	7.2 Litres
	16			
	35			

Note: Each standard joint only contains a single-phase connector, which can accomodate two services. For additional phase connections refer to the table below.

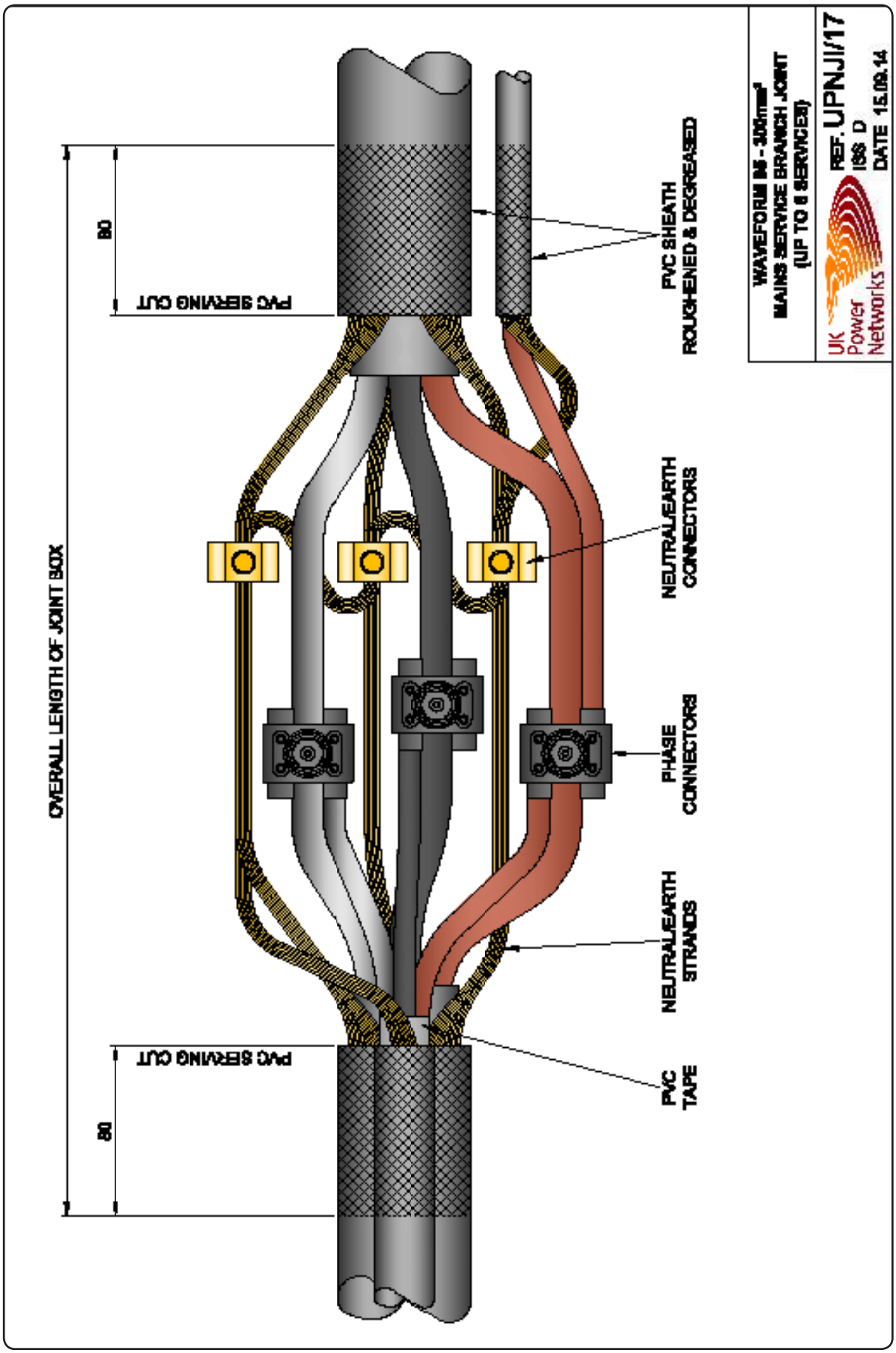
Additional Service Connections

Total No. of Service Phases	Module Description	Stores Code	Sicame Kit No.	No. of Sub Modules Required
3 or 4	70 to 185 Service to Mains Connector	02772S	MSM1/UPN	1
5 or 6	70 to 185 Service to Mains Connector	02772S	MSM1/UPN	2

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the waveform mains cable (Sections 3.3.1 to 3.3.5), using the plastic joint shell as a guide.
- Overlap the ‘live’ waveform mains cable with at least 300mm of the new service cable.
- Prepare the service cables down to the cores (Sections 3.5.1 and 3.5.2 or 3.6.1 to 3.6.3).
- Position the service cable onto the main, inline with the service ports to be used on the joint shell.
- Carry out pre-commissioning continuity and installation resistance tests on the new service cables.
- Connect all the service cable copper neutral earth wires to the waveform neutral earth wires, using the NE13 connectors (Section 4.1.3).
- Fit the NMS insulation piercing connector(s) onto the phase core(s), one at a time (Section 4.2.6).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table on the previous page (Section 4.8.2).


WAVEFORM N6 - 300mm²
MAINS SERVICE BRANCH JOINT
(UP TO 6 SERVICES)
REF. UPNJ//17
ISS D
DATE 15.09.14
UK Power Networks
PVC SHEATH ROUGHENED & DEGREASED
NEUTRAL/EARTH CONNECTORS
PHASE CONNECTORS
NEUTRAL/EARTH STRANDS
PVC TAPE
PVC SERVING CUT
80
PVC SERVING CUT
80
OVERALL LENGTH OF JOINT BOX

2.9.2 Waveform Cables 240mm² to 300mm² (Up to Six Single-Phase or Two 3-Phase Services)

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
240 to 300	4	02742R	MSJ300W/UPN	8.8 Litres
	16			
	35			

Note: Each standard joint only contains a single-phase connector, which can accomodate two services. For additional phase connections refer to the table below.

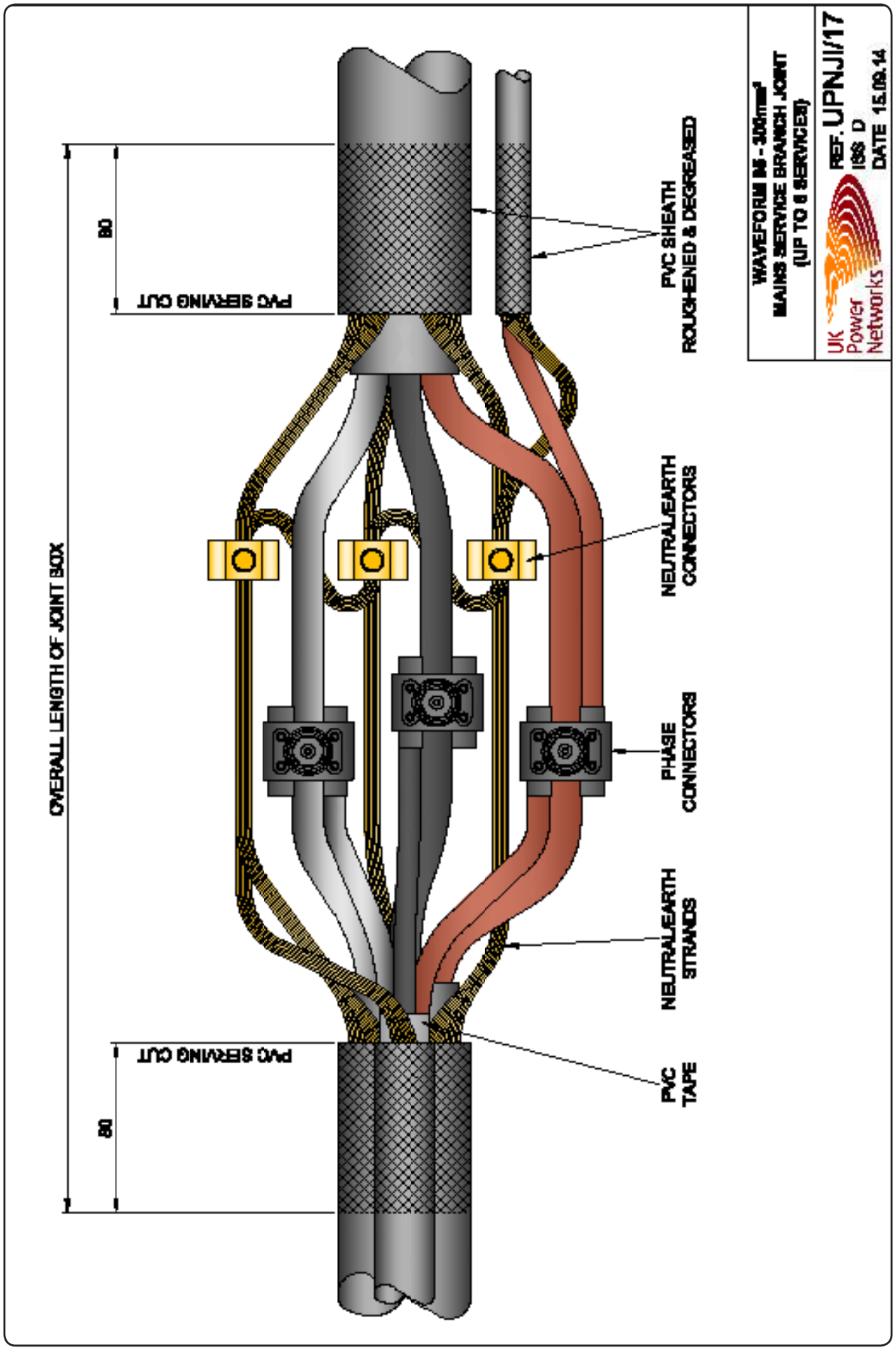
Additional Service Connections

Total No. of Service Phases	Module Description	Stores Code	Sicame Kit No.	No. of Sub Modules Required
3 or 4	240 to 300 Service to Mains Connector	02773C	MSM2/UPN	1
5 or 6	240 to 300 Service to Mains Connector	02773C	MSM2/UPN	2

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the waveform mains cable (Sections 3.3.1 to 3.3.5), using the plastic joint shell as a guide.
- Overlap the ‘live’ waveform mains cable with at least 300mm of the new service cable.
- Prepare the service cables down to the cores (Sections 3.5.1 and 3.5.2 or 3.6.1 to 3.6.3).
- Position the service cable onto the main, inline with the service ports to be used on the joint shell.
- Carry out pre-commissioning continuity and installation resistance tests on the new service cables.
- Connect all the service cable copper neutral earth wires to the waveform neutral earth wires, using the NE13 connectors (Section 4.1.3).
- Fit the NMS insulation piercing connector(s) onto the phase core(s), one at a time (Section 4.2.6).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table on the previous page (Section 4.8.2).


WAVEFORM 95 - 300mm²
MAINS SERVICE BRANCH JOINT
(UP TO 6 SERVICES)
REF. UPNJ/17
ISS D
DATE 15.09.14
UK Power Networks
PVC SHEATH ROUGHENED & DEGREASED
NEUTRAL/EARTH CONNECTORS
PHASE CONNECTORS
NEUTRAL/EARTH STRANDS
PVC TAPE
PVC SERVING CUT
80
PVC SERVING CUT
80
OVERALL LENGTH OF JOINT BOX

2.10 PILC Mains Service Branch Joints

2.10.1 PILC Cables 70mm² to 300mm² (up to six single-phase or two 3-phase services)

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
70 to 185	4	02745V	MSJ185P/UPN	11 Litres
	16			
	35			
240 to 300	16	02746F	MSJ300P/UPN	16.5 Litres
	35			

Note: Each standard joint only contains a single-phase connector. For additional phase connections refer to the table below.

Additional Service Connections

Total No. of Service Phases	Module Description	Stores Code	Sicame Kit No.	No. of Sub Modules Required
3 or 4	70 to 185 Service to Mains Connector	02772S	MSM1/UPN	1
5 or 6	70 to 185 Service to Mains Connector	02772S	MSM1/UPN	2
3 or 4	240 to 300 Service to Mains Connector	02773C	MSM2/UPN	1
5 or 6	240 to 300 Service to Mains Connector	02773C	MSM2/UPN	2

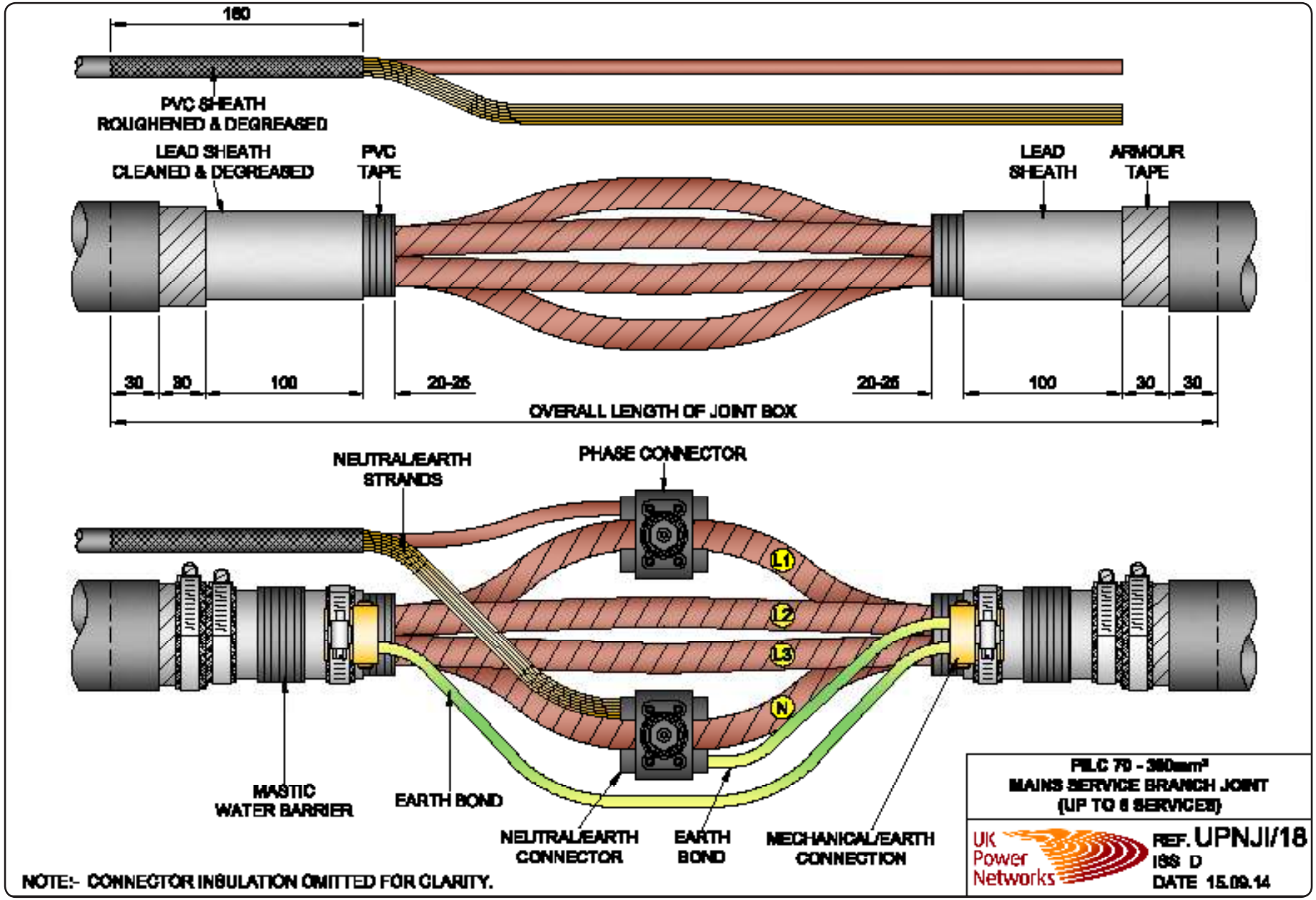
Additional Van Stock Items

Description	Stores Codes
35mm² Green and Yellow Earth Wire	05864Y
50mm² Green and Yellow Earth Wire	05866T

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the PILC Mains Cable (Sections 3.2.1 to 3.2.4), using the plastic joint shell as a guide.
- Connect armours to lead sheaths using the mechanical earth bond kits supplied (Section 4.7.3).
- Install the temporary continuity bond onto the lead sheath next to both armour bonds (Section 3.2.5), in a position that allows the lead sheath to be removed and the new cables to be installed without disturbing it.
- Remove the lead sheath from the cable, 100mm from the armour cut at each end (Section 3.2.6).
- Remove the belt papers and fillers (Section 3.2.7).
- Install one of the brass saddles on to the lead sheath at one end of the joint (Section 4.7.3).
- Install one end of the green and yellow earth wire into the brass saddle (Section 4.7.3).
- Overlap the ‘live’ PILC mains cable with at least 100mm of the new service cable.
- Prepare the service cables down to the cores (Sections 3.5 to 3.6).
- Position the service cable onto the main, inline with the service ports to be used on the joint shell.
- Carry out pre-commissioning continuity and installation resistance tests on the new service cables.
- Connect the green and yellow earth wire to the neutral conductor of the main, using the NMS insulation piercing connector (Section 4.2.6).
- Wrap the copper neutral earth wires from the service cables with the brass gauze and connect them into the NMS insulation piercing connector(Section 4.2.6).
- Install the other end of the green and yellow earth wore into the brass saddle (Section 4.7.3).
- Install the brass saddle onto the lead sheath at the other end of the joint (Section 4.7.3).
- Fit the NMS insulation piercing connector(s) onto the phase core(s), one at a time (Section 4.2.6).
- Apply the moisture barrier mastic tape to the lead sheath between the brass saddles and the armour bonds (Section 4.7.3).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table on the previous page (Section 4.8.2).


180
PVC SHEATH
ROUGHENED & DEGREASED
LEAD SHEATH
CLEANED & DEGREASED
PVC
TAPE
LEAD
SHEATH
ARMOUR
TAPE
30
30
100
20-25
20-25
100
30
30
OVERALL LENGTH OF JOINT BOX
NEUTRAL/EARTH
STRANDS
PHASE CONNECTOR
L1
L2
L3
N
MASTIC
WATER BARRIER
EARTH BOND
NEUTRAL/EARTH
CONNECTOR
EARTH
BOND
MECHANICAL/EARTH
CONNECTION
NOTE:- CONNECTOR INSULATION OMITTED FOR CLARITY.
PILC 70 - 300mm²
MAINS SERVICE BRANCH JOINT
(UP TO 6 SERVICES)
UK
Power
Networks
REF. UPNJI/18
ISS D
DATE 15.09.14

2.10.2 PILC Triple Concentric Cables 70mm² to 185mm² (up to four single-phase or two 3-phase services)

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
Triple Concentric Main	Service cable			
70 (0.1") to 185 (0.3")	4 to 35	02747Q	MSJCON/UPN	16.5 Litres

Materials

Note: Each standard joint only contains a two single-phase connectors. For additional phase connections refer to the table below.

Additional Service Connections

Additional Service Position	Module Description	Stores Code	Sicame Kit No.
Centre Phase	Additional LVM 2 Connector	02822G	LVM2/UPN
Outer Phase	Additional 185mm² Service Bridge Piece	02779L	SMJ2SM/UPN

Additional Van Stock Items

Description	Stores Codes
35mm² Green and Yellow Earth Wire	05864Y
50mm² Green and Yellow Earth Wire	05866T

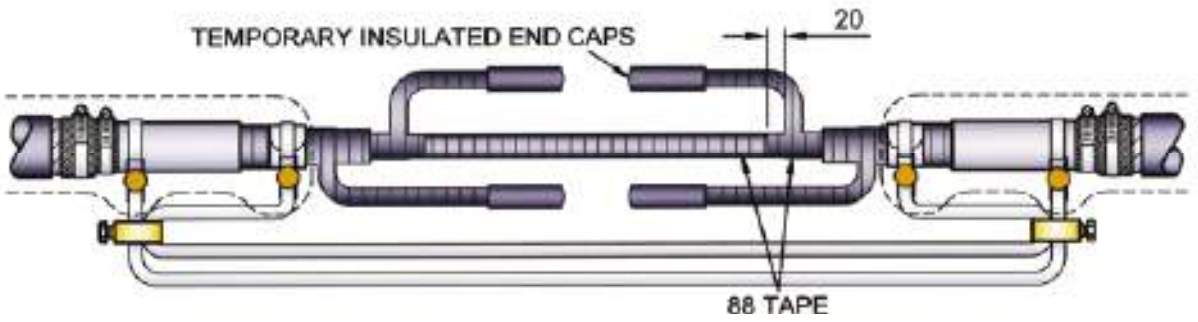
Important Note:

- **To complete this task additional training and experience is required.**
- **Confirm that the concentric cables are 'live' from both directions.**
- **Do not work on any 'live' cable below 0.1 Sq. In.**
- **Confirm the satisfactory condition of the triple concentric mains cable insulation.**
- **Make 'dead' any jute-insulated cables before any jointing work.**
- **If in doubt make dead.**

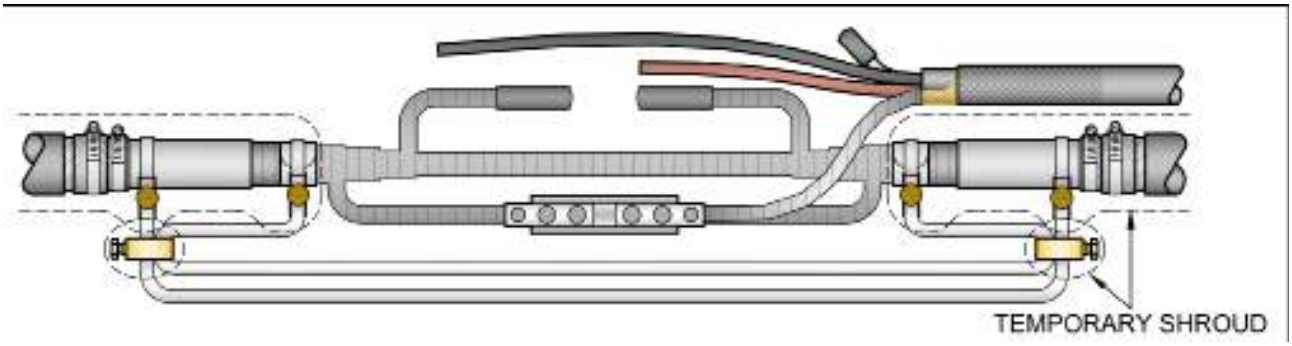
Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

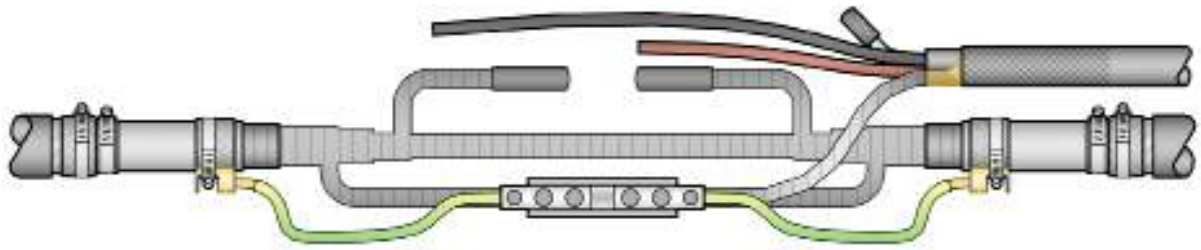
This instruction illustrates the jointing of a three-phase service, for a single-phase joint the same procedure is followed, but the service cable should be connected to the phase indicated on the job instruction.



- Prepare the triple concentric main cable using the joint shell as a guide (Section 3.10).

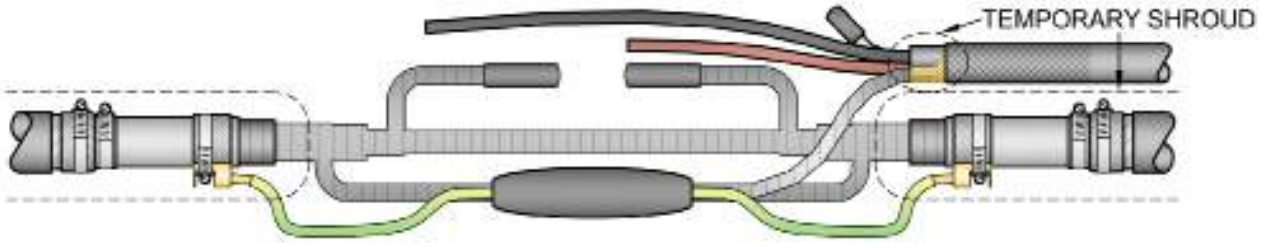


- Prepare the plastic service cable using the joint shell as a guide (Section 3.5 or 3.6).
- For a three-phase service fit the heat-shrink end cap onto the service core to be stubbed (Section 4.10.4).
- Form the neutral earth wires of the service into a single conductor and insulate with a minimum of four half-lap layers of 88 tape.
- Use the UM mechanical connector to connect the main-neutral and service-neutral earth conductors. Use the brass gauze to prevent the copper wires splaying out (Section 4.3.1).

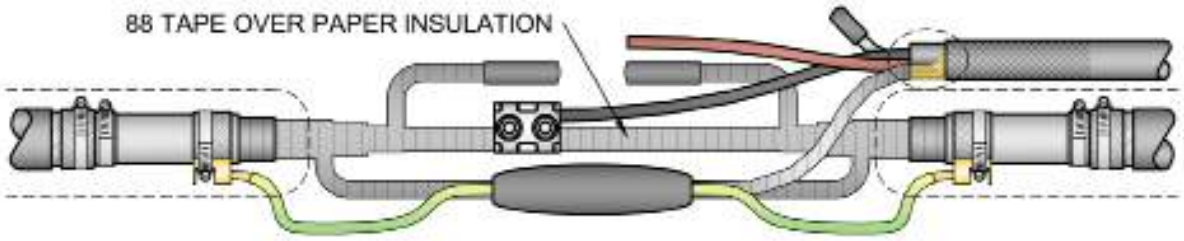


- Remove the temporary shrouding from the lead sheath on the triple concentric main.
- Install the green and yellow earth wire earth continuity bond into the service bridge pieces fitted to the neutral earth connector (Section 4.3.2).
- Cut the earth wires to length and then install them into the brass saddles from the earth bond kits (Section 4.7.3).
- Clean and de-grease the lead sheath and fit the brass saddles from the earth bond kits on to the lead sheath at both ends (Section 4.7.3).

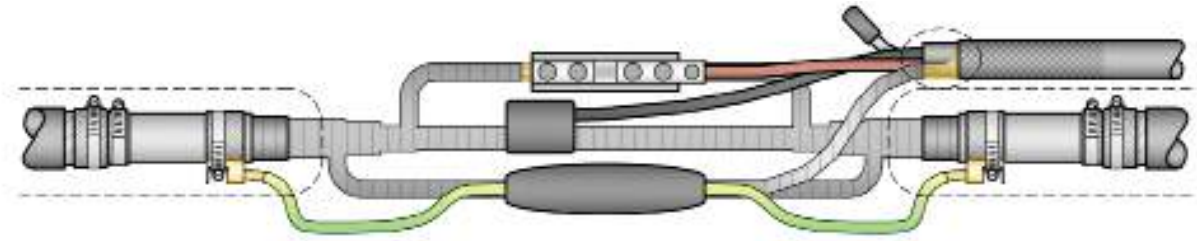
- Remove both temporary earth and neutral continuity bonds (Section 3.2.5).



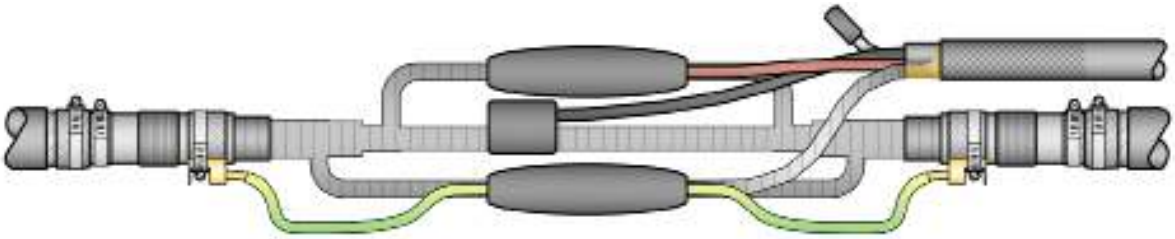
- Permanently insulate the neutral earth connector with the Injection moulded shroud (Section 4.9.4) and shroud all the exposed metal work and conductors (Sections 4.9.1 and 4.9.3).



- Select the appropriate service cable core to be connected to the main.
- For a connection to the centre phase, cut the cores to length using the LVM connector as a guide. Remove the paper insulation from the triple concentric main (Section 3.2.10) and the XLPE insulation from the service cable (Section 3.5.3 or 3.6.4).
- Install the LVM mechanical connector (Section 4.4.1).
- Insulate the inner phase core connection with the dip moulded shroud supplied (Section 4.9.5).



- Select the remaining waveform branch cable phase core for connection.
- For a connection to the outer phase, cut the cores to length using the double width UM connector as a guide. Remove the required amount of 88 tape insulation from the main and XLPE insulation from the sevice cable (Section 3.5.3 or 3.6.4).
- Install the triple concentric main conductors into the two opposite ends of the connector and the service cable conductor into service bridge piece at one of the parallel ends (Sections 4.3.1 or 4.3.2).
- Rotate the connector as required to ensure that the finished joint fits in to the joint shell.
- Insulate the outer phase connection with the injection moulded shroud (Section 4.9.4).



- Remove all temporary shrouding material.
- Fit the moisture barrier mastic tape to the lead sheaths between the brass saddles and the armour bonds (Section 4.7.3).
- Double check the tension of all worm drive clips.
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table at the start of this section (Section 4.8.2).

2.11 Mains Straight Joints

2.11.1 Waveform to Waveform Straight 95mm² to 300mm²

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
35 to 185	70 to 95	02721P	SMJ95W/UPN	8.4 Litres
70 to 185	120 to 185	02722Y	SMJ185W/UPN	11.7 Litres
70 to 300	240 to 300	02723J	SMJ300W/UPN	14.8 Litres

Note: For connection of services additional bridge pieces should be used as described below.

Waveform Straight Joint Service Bridge Pieces

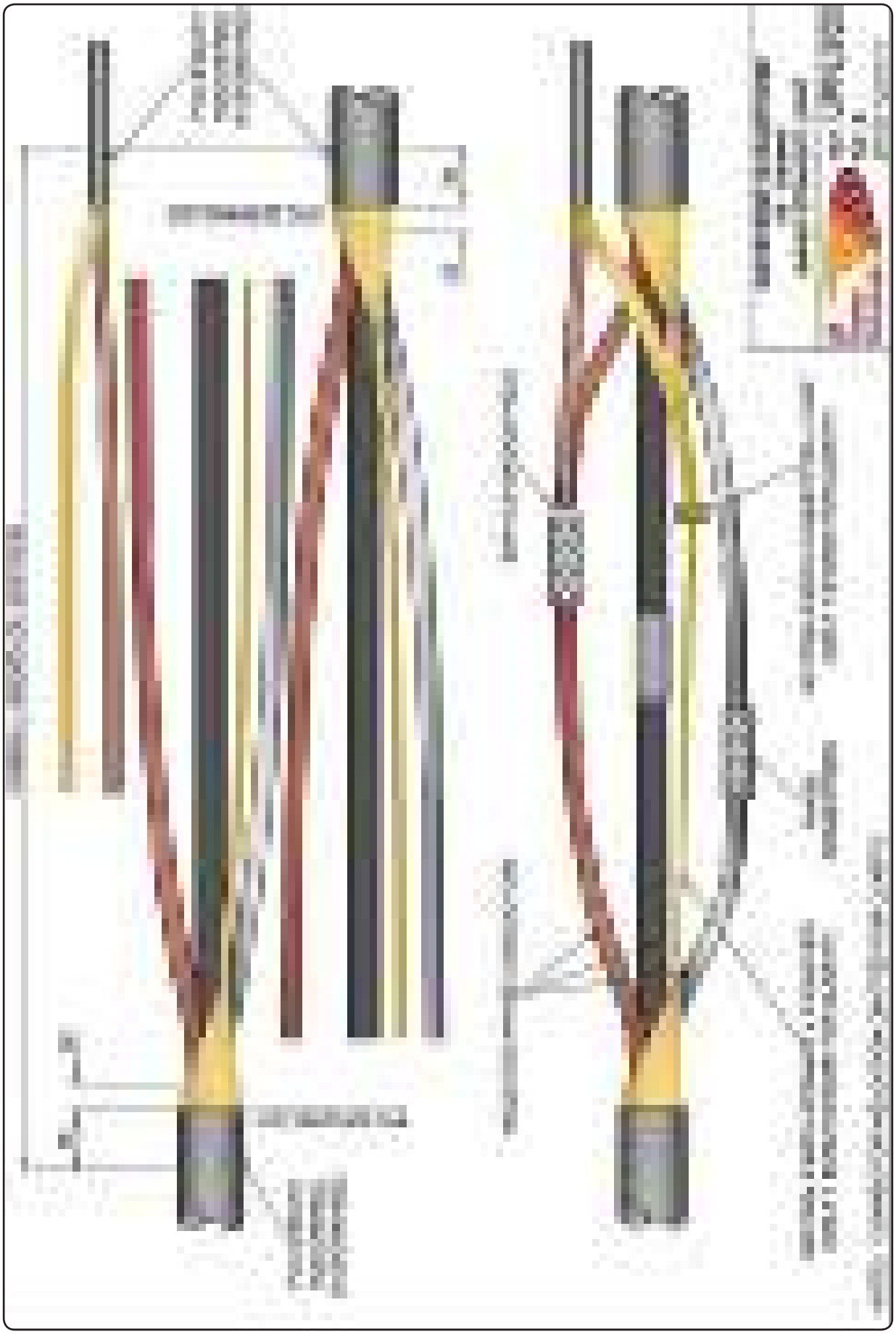
No. of Service Phases	Module Description	Stores Code	Sicame Kit No.	No. of Sub Modules Required
1	35 to 95mm² S.B.P.	02778B	SMJ1SM/UPN	1
2	35 to 95mm² S.B.P.	02778B	SMJ1SM/UPN	2
3	35 to 95mm² S.B.P.	02778B	SMJM1S/UPN	3
1	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	1
2	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	2
3	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	3
1	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	1
2	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	2
3	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	3

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables into their final jointing position with a large enough overlap to allow the copper neutral earth wires to be connected together.
- Prepare the waveform cables (Sections 3.4.1 to 3.4.5), using the plastic joint shell as a guide.
- Set the phase cores ready for connection.
- Temporarily connect the three bunches of neutral earth wires together. Use the NE13 neutral earth connectors (Section 4.1.3) but do not shear the screws off. Allow sufficient space to connect the other 3-Phase cores together.
- Connect any service neutral wires to one end of the joint permanently with another NE13 neutral earth connector (Section 4.1.3).
- Shroud all exposed neutral earth wires and connectors (Sections 4.9.1 to 4.9.3).
- Connect each phase together in turn using the UM mechanical phase connectors (Section 4.3.1) and insulate with the injection moulded shrouds (Section 4.9.6).
- If you are connecting a service cable, replace the standard bridge piece with the service bridge piece before connecting the phase conductors.
- Any service cables should be installed into the appropriate service bridge pieces (Section 4.3.2) before the injection moulded shrouds are installed.

- Remove the temporary shrouding from the neutral earth wires.
- Disconnect each of the NE13 neutral connectors in turn, reform the two bunches into a conductor and position them so they will fit in to the joint shell.
- Cut both bunches to length and permanently connect them together with the previously removed NE13 connector (Section 4.1.3).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table on the previous page (Section 4.8.2).



2.11.2 Waveform to PILC Transition Straight 95mm² to 300mm²

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
35 to 185	70 to 95	02726N	SMJ95T/UPN	9.2 Litres
70 to 185	120 to 185	02727X	SMJ185T/UPN	12.8 Litres
70 to 300	240 to 300	02728H	SMJ300T/UPN	18.0 Litres

PILC to Waveform Transition Service Bridge Pieces

No. of Service Phases	Module Description	Stores Code	Sicame Kit No.	No. of Sub Modules Required
1	35 to 95mm² S.B.P.	02778B	SMJ1SM/UPN	1
2	35 to 95mm² S.B.P.	02778B	SMJ1SM/UPN	2
3	35 to 95mm² S.B.P.	02778B	SMJM1S/UPN	3
1	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	1
2	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	2
3	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	3
1	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	1
2	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	2
3	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	3

Additional Van Stock Items

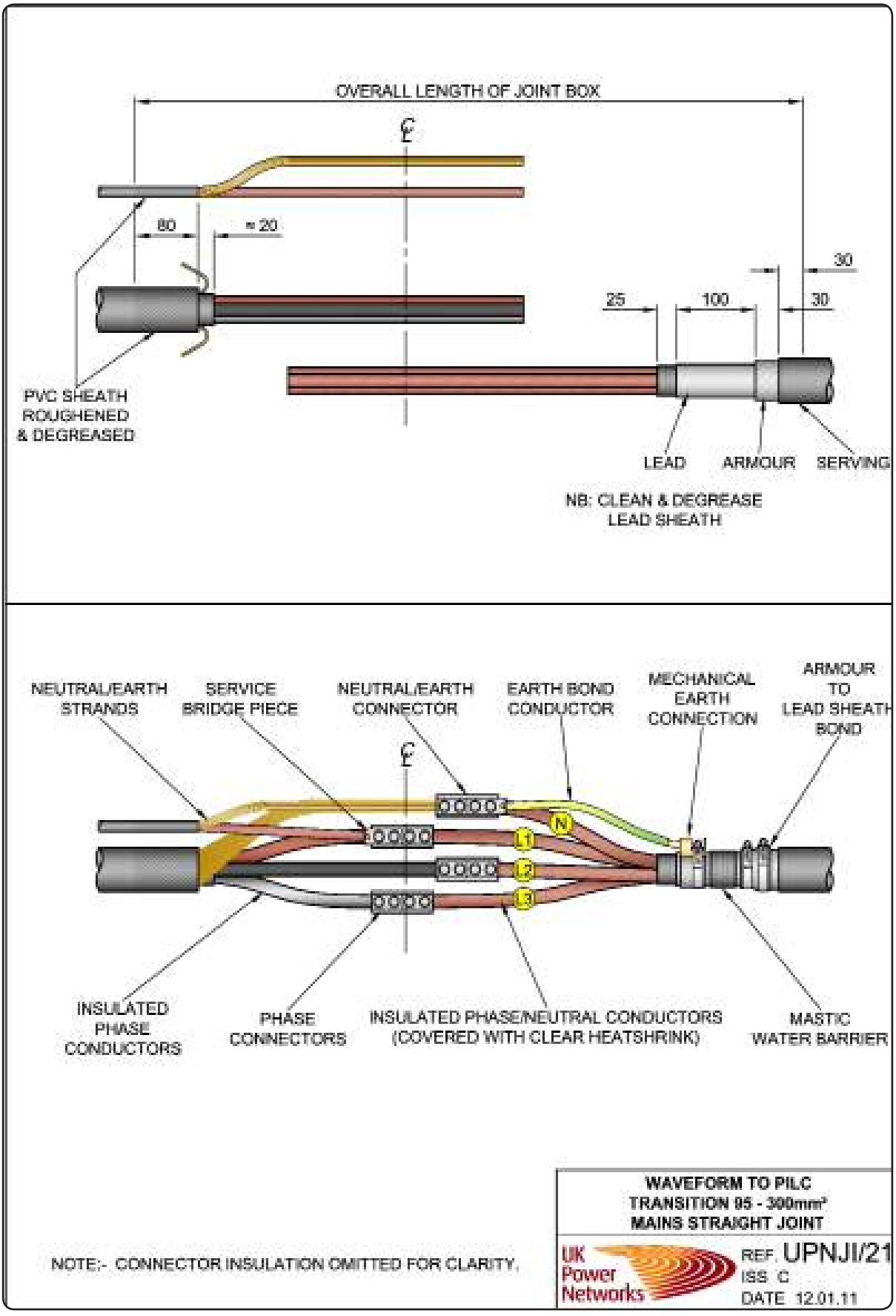
Description	Stores Codes
35mm² Green and Yellow Earth Wire	05864Y
50mm² Green and Yellow Earth Wire	05866T

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables into their final jointing position with a large enough overlap to allow the copper neutral earth wires to be connected to the PILC Cable.
- Prepare the PILC cable (Sections 3.2.1 to 3.2.4) using the plastic joint shell as a guide.
- Connect the armours to the lead sheath on the PILC cable using the mechanical earth bond kit supplied (Section 4.7.3).
- Install the temporary continuity bond onto the lead sheath next to both armour bonds (Section 3.2.5), in a position that allows removal of the lead sheath.
- Remove the lead sheath from the cable,100mm from the armour and cut at each end (Section 3.2.6).

- Remove the belt papers and fillers (Section 3.2.7).
- Cut each phase core in turn (Section 3.2.8), slide a length of appropriately sized clear heat-shrink tube over the cut core and shrink into place. Place an un-shrunk heat-shrink cap or temporary cap over the ‘live’ end.
- Repeat the process with the neutral core.
- Prepare the waveform cable (Sections 3.4.1 to 3.4.5) using the joint shell as a guide.
- Install the brass saddle to the lead sheath (Section 4.7.3).
- Install one end of the green and yellow earth wire into the brass saddle (Section 4.7.3).
- Connect the green and yellow earth wire to the neutral conductors of the PILC and Waveform cables using the main yoke of the UM neutral earth connector, including any service cable copper neutral earth wires (Section 4.3.2).
- Insulate the connector with the injection moulded shrouds (Section 4.9.6).
- Temporarily shroud all exposed bare metalwork, neutral/earth wires and connectors (Section 4.9).
- Connect together each phase in turn using the UM mechanical phase connectors (Section 4.3.1) and insulate them using supplied injection moulded shrouds (Section 4.9.6).
- If you are connecting a service cable, replace the standard bridge piece with the service bridge piece before connecting the phase conductors.
- Install any service cables into the appropriate service bridge pieces (Section 4.3.2) before applying the injection moulded shrouds.
- Remove all temporary shrouding and apply the moisture barrier mastic tape to the lead sheath between the brass saddles and the armour bonds (Section 4.7.3).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table at the start of the section (Section 4.8.2).


OVERALL LENGTH OF JOINT BOX
℄
80
≈ 20
30
25
100
30
PVC SHEATH
ROUGHENED
& DEGREASED
LEAD
ARMOUR
SERVING
NB: CLEAN & DEGREASE
LEAD SHEATH
NEUTRAL/EARTH
STRANDS
SERVICE
BRIDGE PIECE
NEUTRAL/EARTH
CONNECTOR
EARTH BOND
CONDUCTOR
MECHANICAL
EARTH
CONNECTION
ARMOUR
TO
LEAD SHEATH
BOND
℄
N
L1
L2
L3
INSULATED
PHASE
CONDUCTORS
PHASE
CONNECTORS
INSULATED PHASE/NEUTRAL CONDUCTORS
(COVERED WITH CLEAR HEATSHRINK)
MASTIC
WATER BARRIER
NOTE:- CONNECTOR INSULATION OMITTED FOR CLARITY.
WAVEFORM TO PILC
TRANSITION 95 - 300mm²
MAINS STRAIGHT JOINT
UK
Power
Networks
REF. UPNJI/21
ISS C
DATE 12.01.11

2.11.3 Waveform to CONSAC Transition Straight 95mm² to 300mm²

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	CONSAC Neutral Earth Connector Module		Empty Shell Resin Volume
				Stores Code	Sicame Kit No.	
35 to 185	70 to 95	02726N	SMJ95T/UPN	01830R	NET1/UPN	9.2 Litres
70 to 185	120 to 185	02727X	SMJ185T/UPN			12.8 Litres
70 to 300	240 to 300	02728H	SMJ300T/UPN			18.0 Litres

Waveform to CONSAC Transition Service Bridge Pieces

No. of Service Phases	Module Description	Stores Code	Sicame Kit No.	No. of Sub Modules Required
1	35 to 95mm² S.B.P.	02778B	SMJ1SM/UPN	1
2	35 to 95mm² S.B.P.	02778B	SMJ1SM/UPN	2
3	35 to 95mm² S.B.P.	02778B	SMJM1S/UPN	3
1	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	1
2	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	2
3	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	3
1	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	1
2	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	2
3	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	3

Installation Instructions

Important Note:

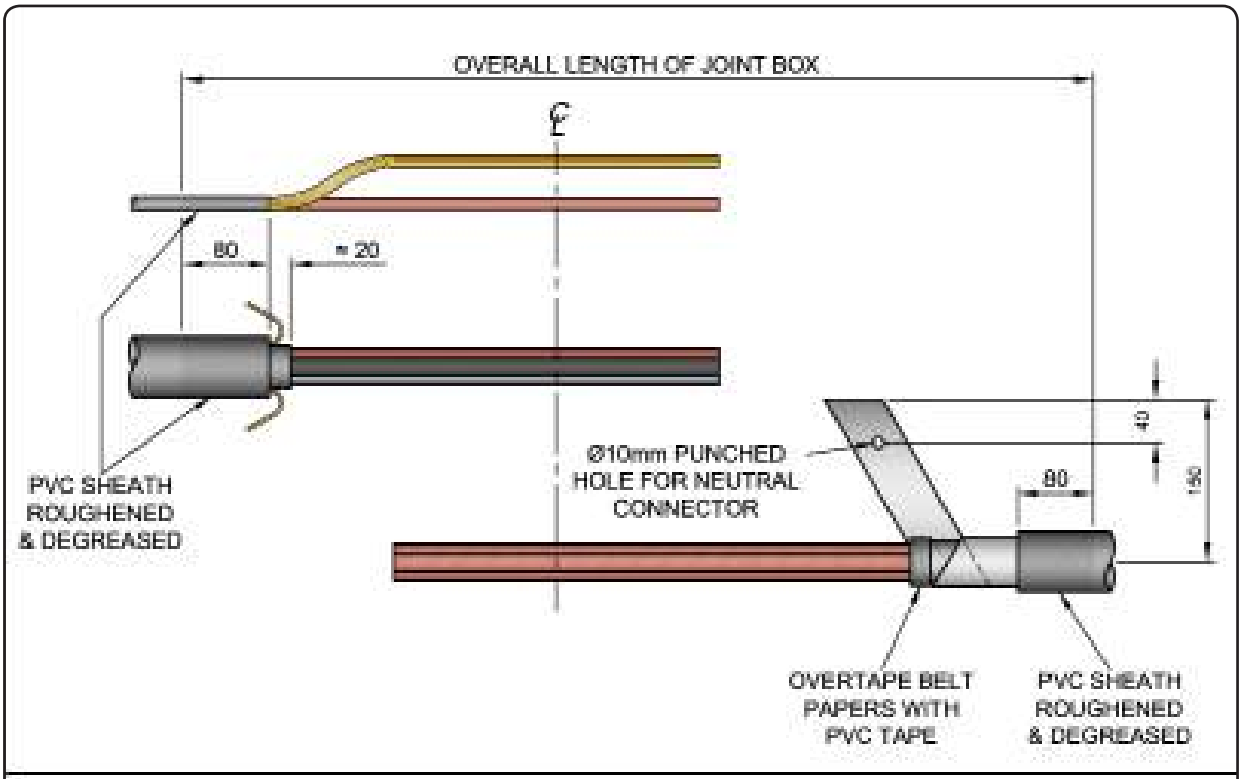
- **To complete this task additional training and experience is required.**
- **If in doubt make dead.**

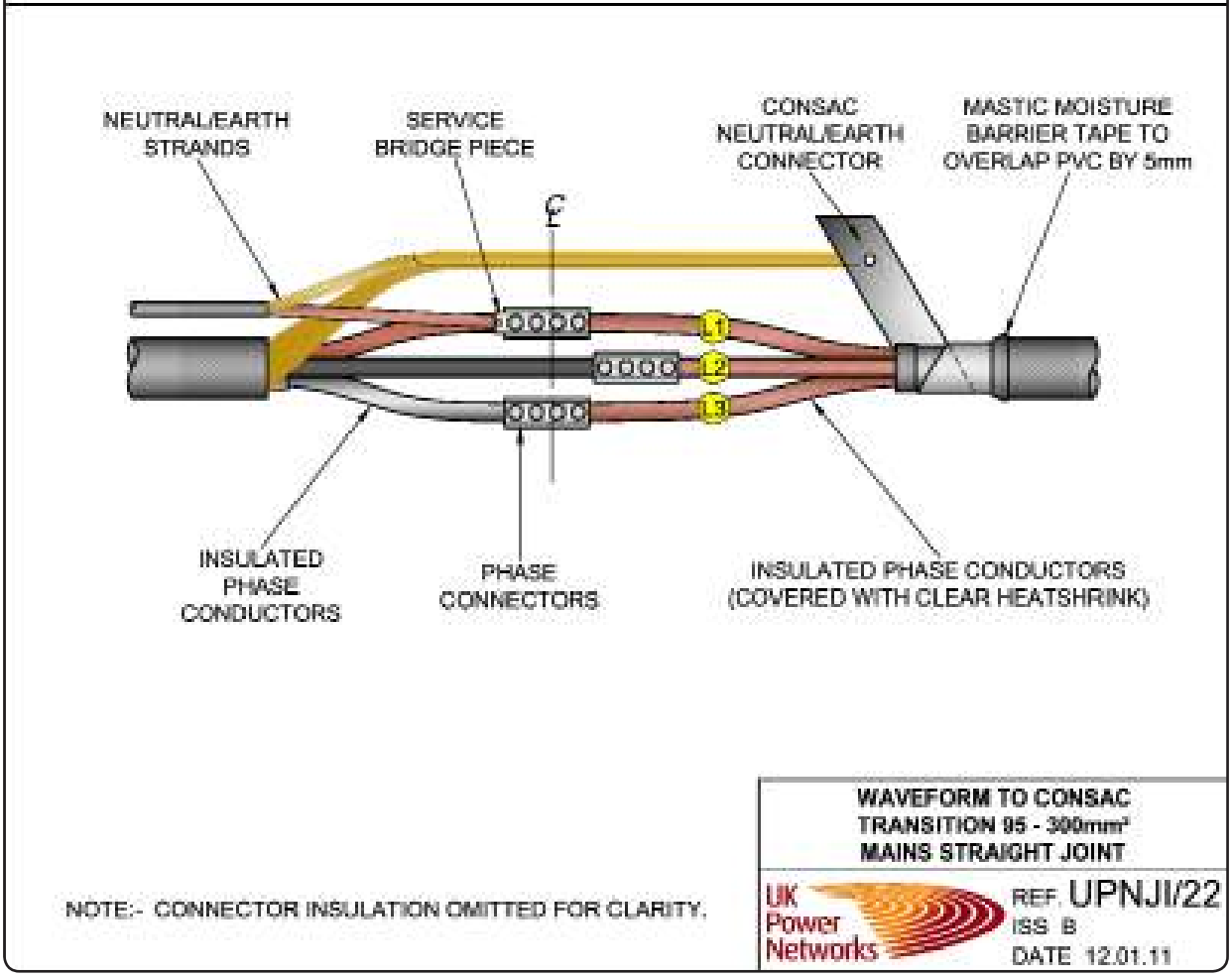
Do not attempt to make this joint unless all tools mentioned in Section 3.9.2 are available on site.

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables into their final jointing position with a large enough overlap to allow the copper neutral earth wires on the waveform to reach the position of the neutral earth connector on the CONSAC.
- Prepare the CONSAC (Section 3.9.1 to 3.9.6) and waveform cables (Sections 3.4.1 to 3.4.5), using the plastic joint shell as a guide.
- If working on an uncut main follow Section 3.9.3.
- If working on a cable end follow Section 3.9.4.
- Set the phase cores ready for connection.

- Fit the NET/1 neutral earth connector to the CONSAC aluminium sheath at the position shown on the jointing instruction UPNJI/22 (Section 4.1.1).
- Connect the waveform cable neutral earth wires to the CONSAC aluminium sheath using the NET/1 connector and tighten until the head shears off (Section 4.1.1).
- Shroud the CONSAC aluminium sheath, connector, neutral/earth strands and all exposed metalwork using Velcro edged temporary insulation and non-adhesive PVC Tape (Sections 4.9.1 and 4.9.3).
- Connect together each phase in turn using the UM mechanical phase connectors (Section 4.3.1) and insulate them using supplied injection moulded shrouds (Section 4.9.6).
- If you are connecting a service cable, replace the standard bridge piece with the service bridge piece before connecting the phase conductors.
- Install any service cables into the appropriate service bridge pieces (Section 4.3.2) before applying the injection moulded shrouds.
- Remove all temporary shrouding and apply the moisture barrier mastic tape to the aluminium sheath from the cut up to and onto the PVC sheath.
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table on the previous page (Section 4.8.2).





NOTE:- CONNECTOR INSULATION OMITTED FOR CLARITY.

WAVEFORM TO CONSAC TRANSITION 95 - 300mm² MAINS STRAIGHT JOINT

UK Power Networks

REF. UPNJI/22
ISS B
DATE 12.01.11

2.11.4 Waveform to Single or Triple Concentric Transition Straight 95mm² to 300mm²

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
95	95	02726N	SMJ95T/UPN	9.2 Litres
95 to 185	120 to 185	02727X	SMJ185T/UPN	12.8 Litres
95 to 300	240 to 300	02728H	SMJ300T/UPN	18.0 Litres

Waveform to Triple Concentric Transition Service Bridge Pieces

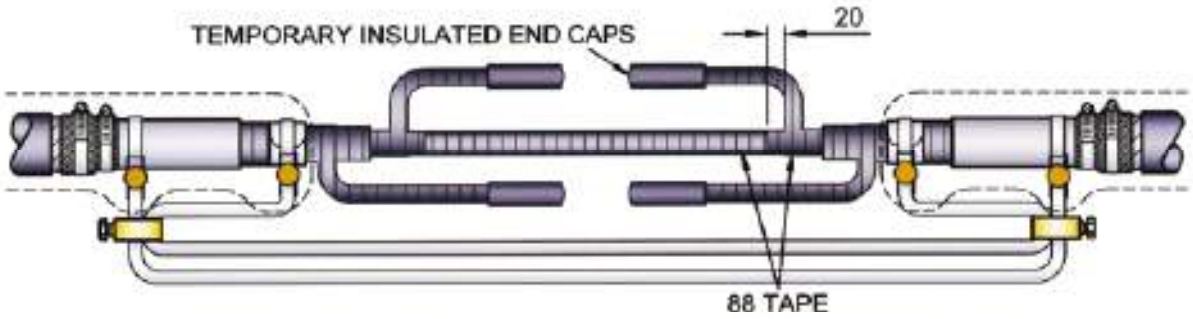
No. of Service Phases	Module Description	Stores Code	Sicame Kit No.	No. of Sub Modules Required
1	35 to 95mm² S.B.P.	02778B	SMJ1SM/UPN	1
2	35 to 95mm² S.B.P.	02778B	SMJ1SM/UPN	2
1	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	1
2	120 to 185mm² S.B.P.	02779L	SMJ2SM/UPN	2
1	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	1
2	240 to 300mm² S.B.P.	02780G	SMJ3SM/UPN	2

Additional Van Stock Items

Description	Stores Codes
35mm² Green and Yellow Earth Wire	05864Y
50mm² Green and Yellow Earth Wire	05866T

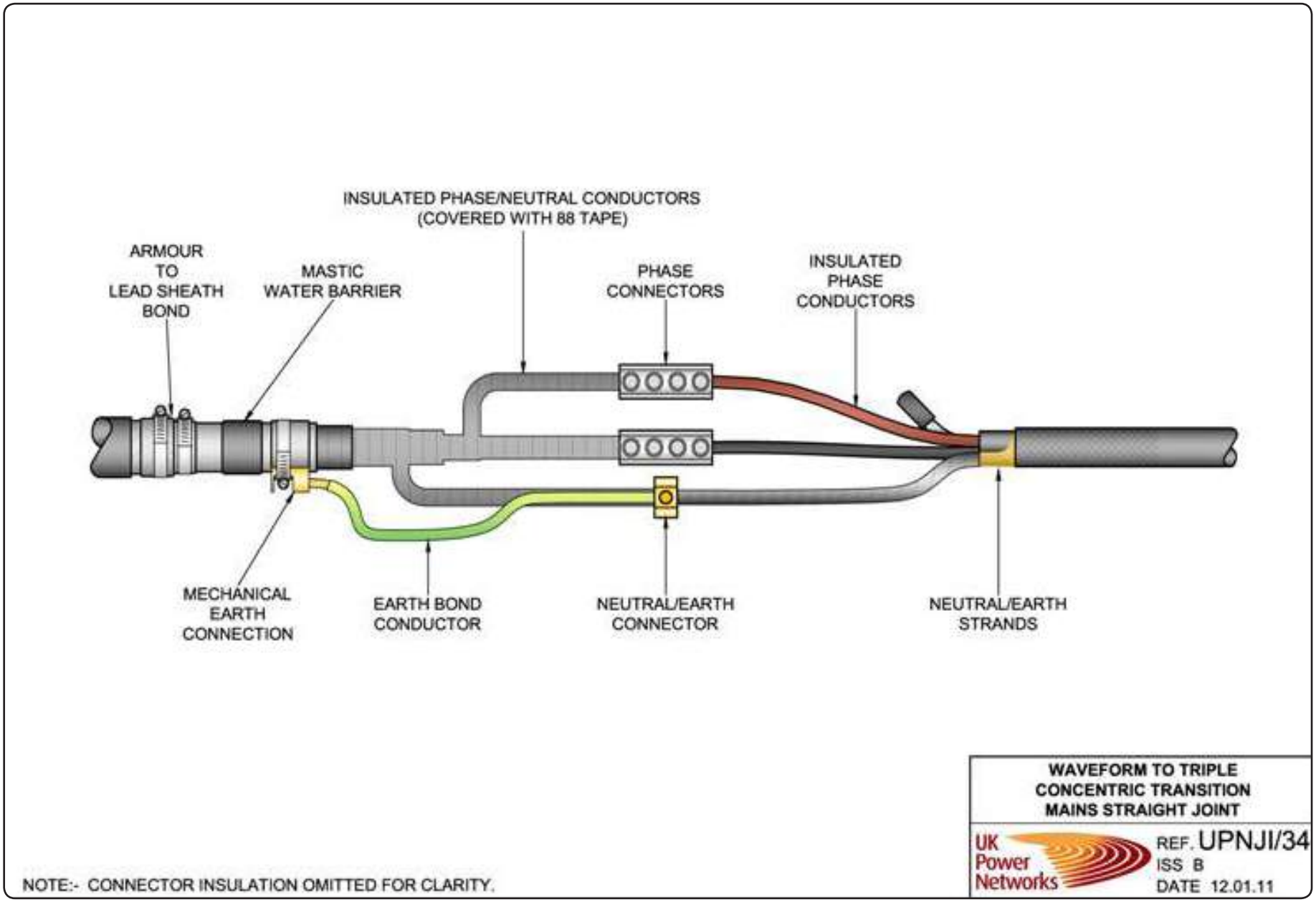
Important Note:

- **To complete this task additional training and experience is required.**
- **Confirm that the concentric cables are 'live' from both directions.**
- **Do not work on any 'live' cable below 0.1 Sq. In.**
- **Confirm the satisfactory condition of the triple concentric mains cable insulation.**
- **Make 'dead' any jute-insulated cables before any jointing work.**
- **If in doubt make dead.**



- Prepare the triple concentric main cable using the joint shell as a guide (Section 3.10).
- Live cut the centre phase and install a temporary insulated end cap on the 'live' end.
- Prepare the waveform cable using the joint shell as a guide (Section 3.4).
- Fit the heat-shrink end cap onto waveform core to be stubbed (4.10.4).
- Form the neutral earth wires of the waveform into a single conductor and insulate with a minimum of four half-lap layers of 88 tape.
- Install the triple concentric neutral and waveform neutral earth conductors into main body of the connector using the US mechanical connector. Use the brass gauze to prevent the copper wires splaying out.
- Remove the temporary shrouding from lead sheath on the triple concentric cable.
- Install the green and yellow earth wire earth continuity bond into the service bridge piece fitted to the neutral earth connector (Section 4.3.2).
- Cut the earth wire to length and then install it into the brass saddle from the earth bond kit (Section 4.7.3).
- Clean and de-grease the lead sheath and fit the brass saddle from the earth bond kit on to the lead sheath (Section 4.7.3).
- Permanently insulate the neutral earth connector with the injection moulded shrouds (Section 4.9.6) and shroud all the exposed metal work and conductors (Sections 4.9.1 and 4.9.3).
- Select the appropriate waveform core to be connected to the centre phase of the triple concentric cable.
- Cut the triple concentric and waveform cores to length using the UM connector as a guide.
- Remove the paper insulation from the triple concentric (Section 3.2.10) and the XLPE insulation from the waveform (Section 3.4.7).
- Install the UM mechanical connector (Section 4.3.1).

- Insulate the inner phase core connection with the injection moulded shrouds (Section 4.9.6).
- Select the remaining waveform cable phase core for connection.
- Cut the cores to length using the double width UM connector as a guide. Remove the required amount of 88 tape insulation from the triple concentric core and XLPE insulation from the waveform core (Section 3.4.7).
- Install the UM mechanical connector (Section 4.3.1).
- Insulate the outer phase core connection with the injection moulded shrouds (Section 4.9.6).
- Rotate the connector as required to ensure that the finished joint fits in to the joint shell.
- Remove all temporary shrouding material.
- Fit the moisture barrier mastic tape to lead sheath between the brass saddle and the armour bond (Section 4.7.3).
- Double-check the tension of all worm drive clips.
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table at the start of the section (Section 4.8.2).


INSULATED PHASE/NEUTRAL CONDUCTORS
(COVERED WITH 88 TAPE)
ARMOUR
TO
LEAD SHEATH
BOND
MASTIC
WATER BARRIER
PHASE
CONNECTORS
INSULATED
PHASE
CONDUCTORS
MECHANICAL
EARTH
CONNECTION
EARTH BOND
CONDUCTOR
NEUTRAL/EARTH
CONNECTOR
NEUTRAL/EARTH
STRANDS
NOTE:- CONNECTOR INSULATION OMITTED FOR CLARITY.
WAVEFORM TO TRIPLE
CONCENTRIC TRANSITION
MAINS STRAIGHT JOINT
UK
Power
Networks
REF. UPNJI/34
ISS B
DATE 12.01.11

2.12 Mains Branch Joints

2.12.1 Waveform to Waveform 95mm² to 300mm²

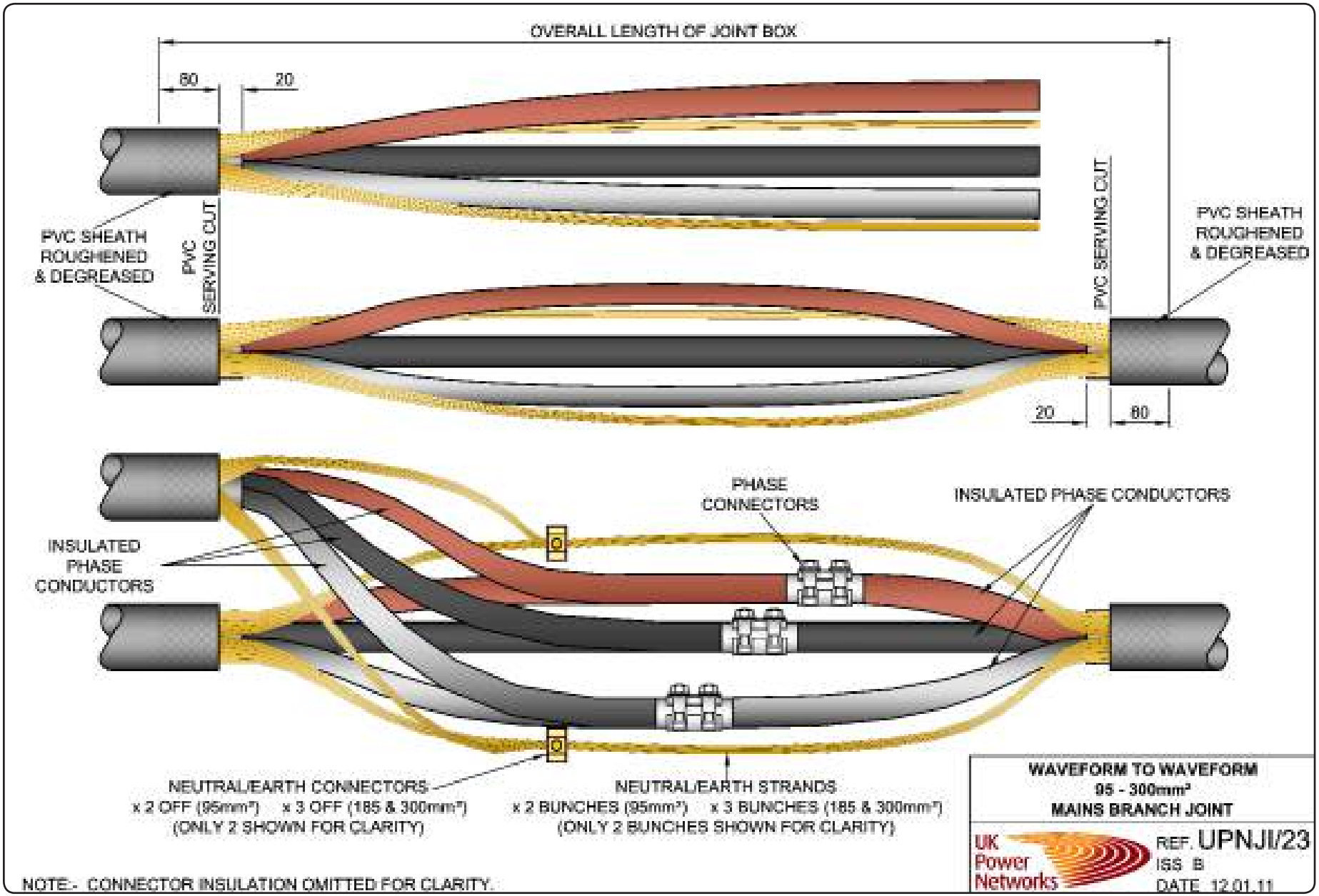
Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
Main	Branch			
70 to 95	70 to 95	02750F	BMJ95W/UPN	9.2 Litres
120 to185	70 to 185	02751Q	BMJ185W/UPN	16.7 Litres
240 to 300	70 to 300	02752A	BMJ300W/UPN	22.8 Litres

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm):

- Set the cables into their final jointing position with a large enough overlap to allow the copper neutral earth wires to be connected together.
- Prepare the waveform cables (Sections 3.3 and 3.4.), using the plastic joint shell as a guide.
- Set the phase cores ready for connection.
- Connect the three bunches of neutral earth wires on the branch to the three bunches of neutral earth wires on the main, using the NE13 neutral earth connectors (Section 4.1.3).
- Shroud all exposed neutral earth wires and connectors (Sections 4.9.1 to 4.9.3).
- Connect each phase together in turn using supplied LVM mechanical phase connectors (Section 4.4.1) and insulate with the dip-moulded shroud (Section 4.9.5).
- Remove the temporary shrouding from the neutral earth wires.
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).


OVERALL LENGTH OF JOINT BOX
80
20
PVC SHEATH ROUGHENED & DEGREASED
PVC SERVING CUT
PVC SERVING CUT
PVC SHEATH ROUGHENED & DEGREASED
20
80
PHASE CONNECTORS
INSULATED PHASE CONDUCTORS
INSULATED PHASE CONDUCTORS
NEUTRAL/EARTH CONNECTORS
x 2 OFF (95mm²) x 3 OFF (185 & 300mm²)
(ONLY 2 SHOWN FOR CLARITY)
NEUTRAL/EARTH STRANDS
x 2 BUNCHES (95mm²) x 3 BUNCHES (185 & 300mm²)
(ONLY 2 BUNCHES SHOWN FOR CLARITY)
NOTE:- CONNECTOR INSULATION OMITTED FOR CLARITY.
WAVEFORM TO WAVEFORM
95 - 300mm²
MAINS BRANCH JOINT
UK Power Networks
REF. UPNJI/23
ISS B
DATE 12.01.11

2.12.2 Waveform to PILC Transition 95mm² to 300mm²

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
Main	Branch			
70 to 95	70 to 95	02756P	BMJ95T/UPN	10.5 Litres
120 to185	70 to 185	02757Y	BMJ185T/UPN	20.2 Litres
240 to 300	70 to 300	02758J	BMJ300T/UPN	31.8 Litres

Additional Van Stock Items

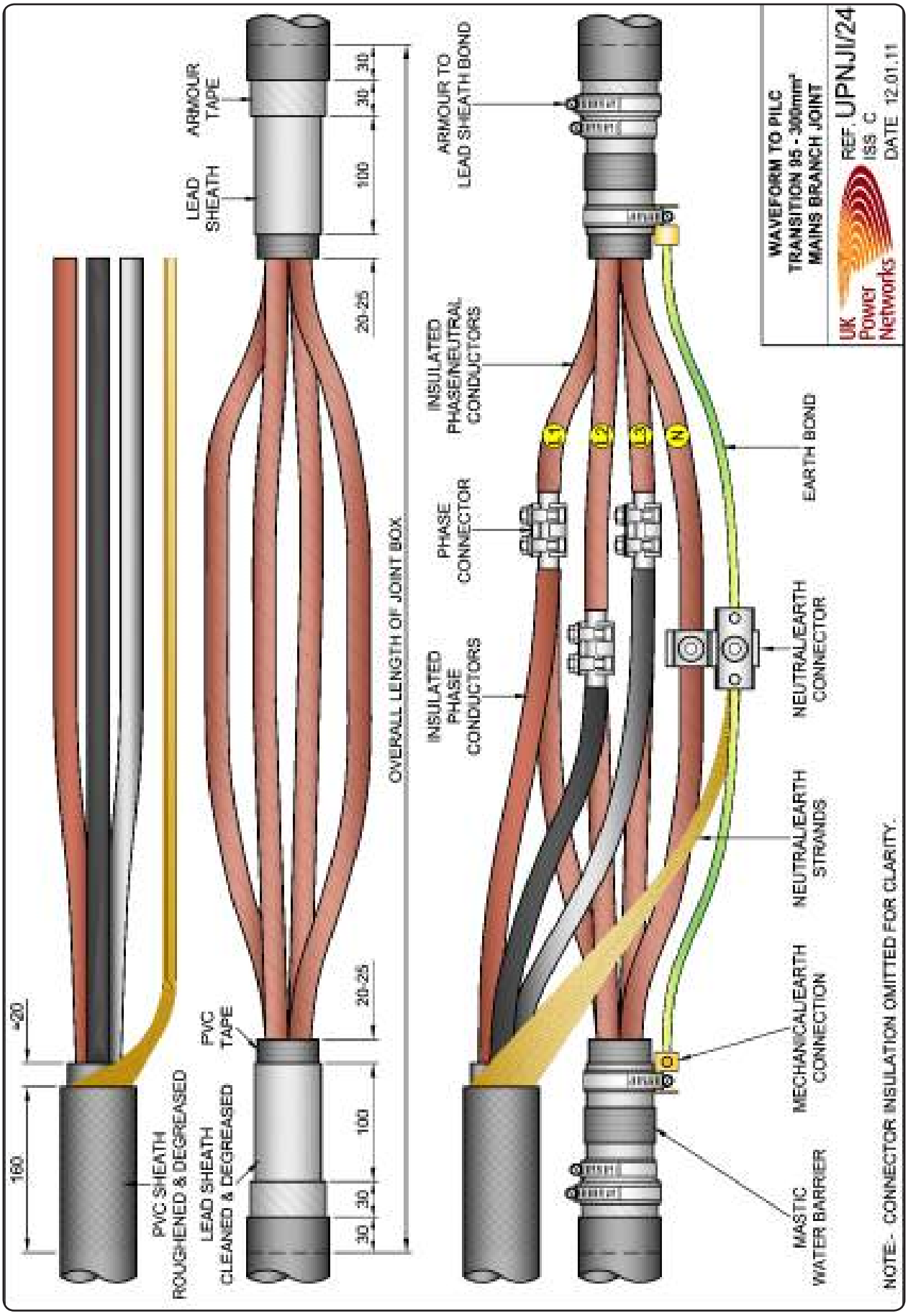
Description	Stores Codes
35mm² Green and Yellow Earth Wire	05864Y
50mm² Green and Yellow Earth Wire	05866T

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Set the cables into their final jointing position with a large enough overlap to allow the copper neutral earth wires to be connected to the main.
- Prepare the PILC Mains Cable (Sections 3.2.1 to 3.2.4), using the plastic joint shell as a guide.
- Connect the armours to the lead sheath at each end of the joint using the mechanical earth bond kits supplied (Section 4.7.3).
- Install the temporary continuity bond onto the lead sheath next to both armour bonds (Section 3.2.5), in a position that allows the lead sheath to be removed and the new cables installed without disturbing it.
- Remove the lead sheath from the cable, 100mm from the armour cut at each end. (Section 3.2.6).
- Remove the belt papers and fillers (Section 3.2.7).
- Install one of the brass saddles on to the lead sheath at one end of the joint (Section 4.7.3).
- Install one end of the green and yellow earth wire into the brass saddle (Section 4.7.3).
- Overlap the prepared PILC mains cable with at least 100mm of the new waveform cable.
- Prepare the waveform cables (Sections 3.4.1 to 3.4.5), using the plastic joint shell as a guide.
- Position the mains cable next to the main, inline with the ports to be used on the joint shell.
- Connect the green and yellow earth wire and waveform neutral earth wires to the neutral conductor of the main using the WB neutral earth connector (Section 4.4.2).
- Insulate the connector with the CR Sheet patch (Section 4.9.4).
- Install the other end of the green and yellow earth wire into the other brass saddle (Section 4.7.3).
- Install the brass saddle onto the lead sheath at the other end of the joint (Section 4.7.3).

- Temporarily shroud all exposed bare metalwork, neutral/earth wires and connectors (Section 4.9).
- Connect together each phase in turn using the LVM mechanical phase connectors, (Section 4.4.1) and insulate them using the dip moulded shroud (Section 4.9.5).
- Remove all temporary shrouding and apply the moisture barrier mastic tape to the lead sheath between the brass saddles and the armour bonds (Section 4.7.3).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table at the start of this section (Section 4.8.2).


WAVEFORM TO PILC
TRANSITION 95 - 300mm²
MAINS BRANCH JOINT
REF. UPNJI/24
ISS C
DATE 12.01.11
UK Power Networks
ARMOUR TAPE
LEAD SHEATH
30
30
100
20-25
OVERALL LENGTH OF JOINT BOX
ARMOUR TO LEAD SHEATH BOND
INSULATED PHASE/NEUTRAL CONDUCTORS
PHASE CONNECTOR
EARTH BOND
INSULATED PHASE CONDUCTORS
NEUTRAL/EARTH CONNECTOR
NEUTRAL/EARTH STRANDS
MECHANICAL/EARTH CONNECTION
MASTIC WATER BARRIER
PVC SHEATH ROUGHENED & DEGREASED
LEAD SHEATH CLEANED & DEGREASED
PVC TAPE
160
20
NOTE:- CONNECTOR INSULATION OMITTED FOR CLARITY.

2.12.3 Waveform to Single or Triple Concentric Transition Mains Branch

Materials

Cable Size (mm^2)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
Triple Concentric Main	Waveform Branch			
70 (0.1") 95 (0.15") 120 (0.2")	95 to 185	04506P	TCB185/UPN	31.8 Litres

Additional Van Stock Items

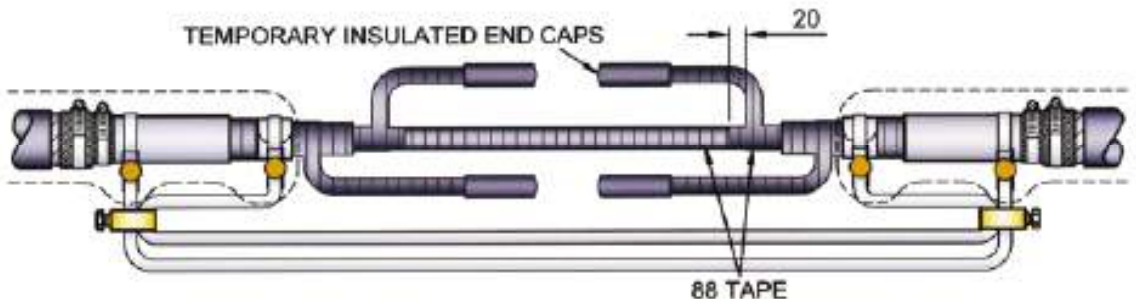
Description	Stores Codes
35mm^2 Green and Yellow Earth Wire	05864Y
50mm^2 Green and Yellow Earth Wire	05866T

Important Note:

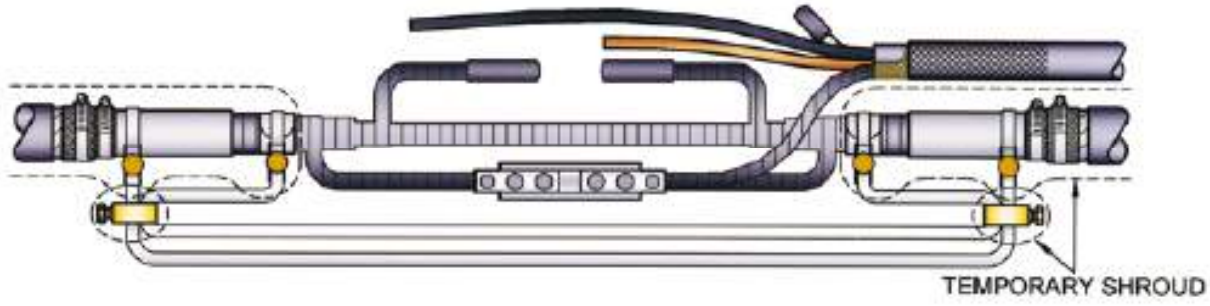
- **To complete this task additional training and/or experience is required.**
- **Confirm that the concentric cables are 'live' from both directions.**
- **Do not work on any 'live' cable below 0.1 Sq. In.**
- **Confirm the satisfactory condition of the triple concentric mains cable insulation.**
- **Make 'dead' any jute-insulated cables before any jointing work.**
- **If in doubt make dead.**

Installation Instructions

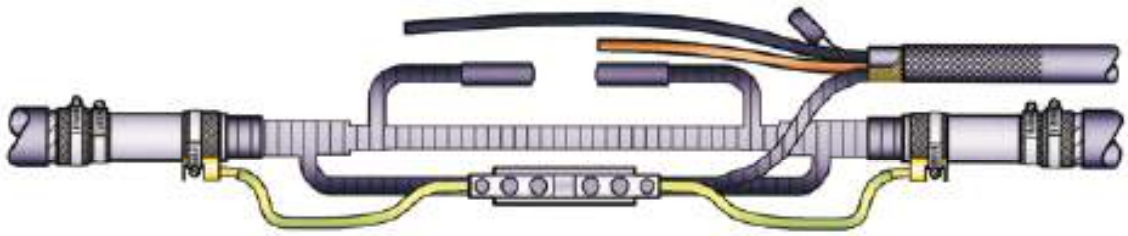
For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).



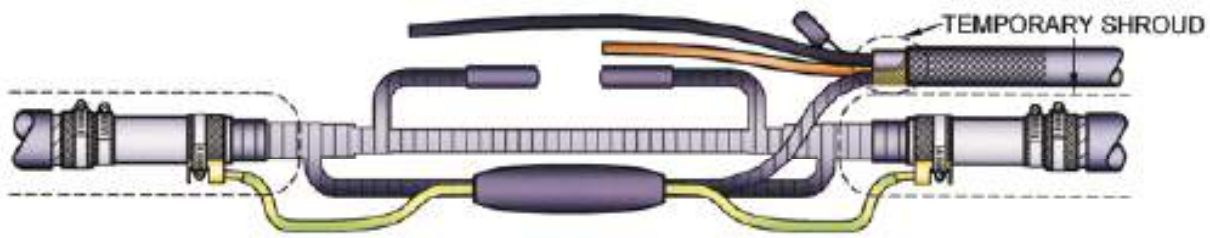
- Prepare the triple concentric main cable using the joint shell as a guide (Section 3.10).



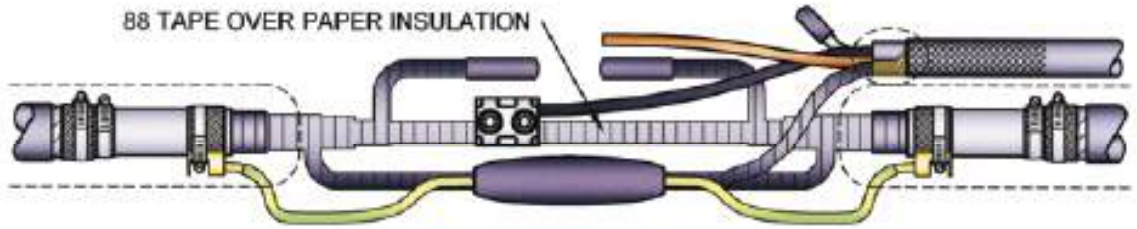
- Prepare the waveform branch cable using the joint shell as a guide (Section 3.4).
- Fit the heat-shrink end cap onto the waveform core to be stubbed (Section 4.10.4).
- Form the neutral earth wires of the waveform into a single conductor and insulate with a minimum of four half-lap layers of 88 tape.
- Use the UM mechanical connector to connect the main-neutral and branch-neutral earth conductors. Use the brass gauze to prevent the copper wires splaying out (Section 4.3.1).



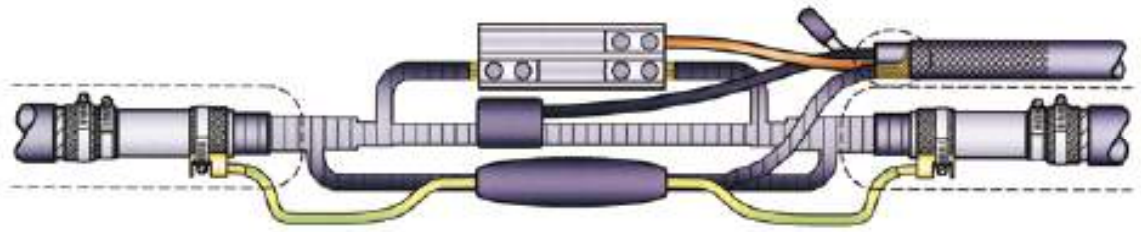
- Remove the temporary shrouding from the lead sheath on the triple concentric main.
- Install the green and yellow earth wire earth continuity bond into the service bridge pieces fitted to the neutral earth connector (Section 4.3.2).
- Cut the earth wires to length and then install them into the brass saddles from the earth bond kits (Section 4.7.3).
- Clean and de-grease the lead sheath and fit the brass saddles from the earth bond kits on to the lead sheath at both ends (Section 4.7.3).
- Remove both temporary earth and neutral continuity bonds (Section 3.2.5).



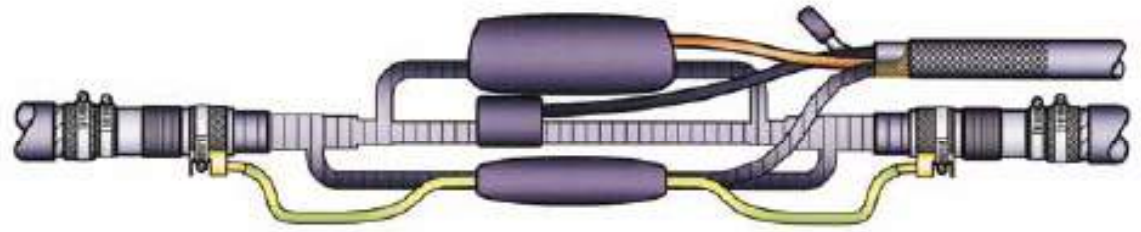
- Permanently insulate the neutral earth connector with the CR sheet patch (Section 4.9.4) and shroud all the exposed metal work and conductors (Sections 4.9.1 and 4.9.3).



- Select the appropriate waveform branch cable core to be connected to the main.
- Cut the cores to length using the LVM connector as a guide. Remove the paper insulation from the triple concentric main (Section 3.2.10) and the XLPE insulation from the waveform branch (Section 3.4.7).
- Install the LVM mechanical connector (Section 4.4.1).
- Insulate the inner phase core connection with the dip moulded shroud supplied (Section 4.9.5).



- Select the remaining waveform branch cable phase core for connection.
- Cut the cores to length using the double width UM connector as a guide. Remove the required amount of 88 tape insulation from the main and XLPE insulation from the waveform branch (Section 3.4.7).
- Install the triple concentric main conductors into the two opposite ends of the connector and the waveform branch into one of the parallel ends (Section 4.3.1).
- Rotate the connector as required to ensure that the finished joint fits in to the joint shell.
- Insulate the outer phase connection with the CR sheet patch (Section 4.9.4).



- Remove all temporary shrouding material.
- Fit the moisture barrier mastic tape to the lead sheaths between the brass saddles and the armour bonds (Section 4.7.3).
- Double check the tension of all worm drive clips.
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table at the start of this section (Section 4.8.2).

2.13 Mains Cut and Test Joints

2.13.1 Waveform Cables 70mm² to 300mm²

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
35 to 185	70 to 95	02721P	SMJ95W/UPN	8.4 Litres
70 to 185	120 to 185	02722Y	SMJ185W/UPN	11.7 Litres
70 to 300	240 to 300	02723J	SMJ300W/UPN	14.8 Litres

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Prepare the waveform cable using the joint shell as guide to (Section 3.3).
- When the cable is ready to be put back together, fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).

2.13.2 PILC Cables 70mm² to 300mm²

Materials

Cable Size (mm²)		Stores Code	Sicame Kit No.	Empty Shell Resin Volume
35 to 185	70 to 95	02726N	SMJ95T/UPN	9.2 Litres
70 to 185	120 to 185	02727X	SMJ185T/UPN	12.8 Litres
70 to 300	240 to 300	02728H	SMJ300T/UPN	18.0 Litres

Additional Van Stock Items

Description	Stores Codes
35mm² Green and Yellow Earth Wire	05864Y
50mm² Green and Yellow Earth Wire	05866T

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Use the joint shell supplied in the kit as guide to prepare the PILC cable (Section 3.2.1 to 3.2.7).
- When the cable is ready to be put back together, install the brass saddle supplied in the joint kit onto the lead sheath at one end of the joint, next to the lead sheath cut (Section 4.7.3).
- Install a piece of appropriately sized green and yellow earth wire into the saddle connected to the lead sheath (Section 4.7.3).

- Cut the green and yellow earth wire to length and install it into the additional brass saddle, connect the brass saddle to the lead next to lead sheath cut (Section 4.7.3).
- Wrap the moisture sealing mastic around the lead sheaths between the brass saddles and the armour bonds (Section 4.7.3).
- Fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table above (Section 4.8.2).

2.14 Temporary LV Joints

2.14.1 Supply Restoration - PILC Mains Cables 95mm² to 300mm²

Materials

Cable Sizes (mm²)	Stores Codes	Sicame Kit Ref.
25 to 70	02143F	TJK35/UPN
70 to 120	02760P	TJK95/UPN
185 to 300	02761Y	TJK300/UPN

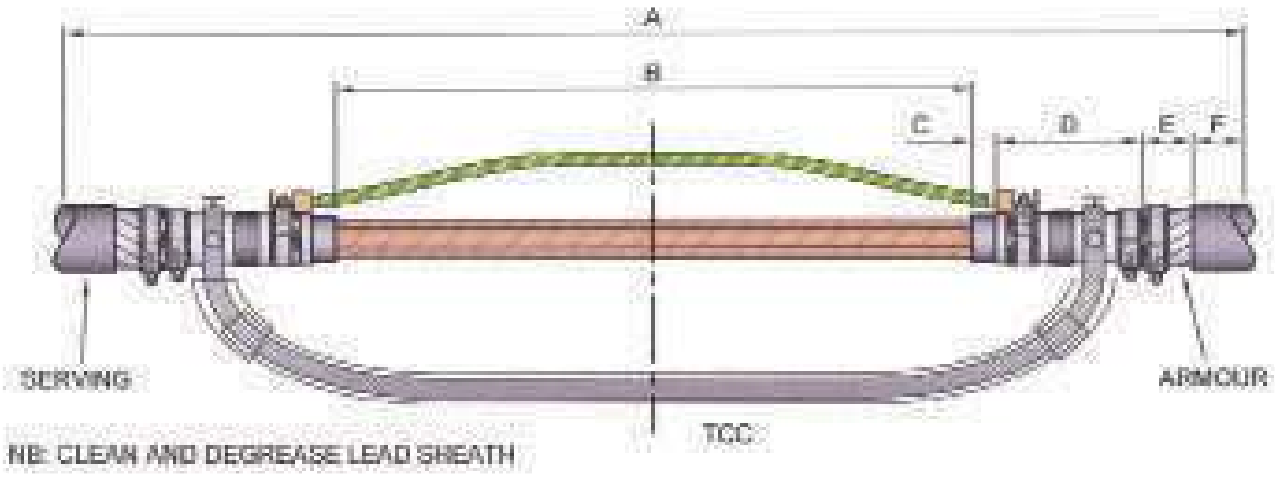
Additional Van Stock Items

Cable Sizes (mm²)	Stores Codes	Sicame Kit Ref.	Installation Instruction Section
185mm² PILC Mechanical Earth Bond Kit	02776G	ME185/UPN	4.7.3
300mm² PILC Mechanical Earth Bond Kit	02777R	ME300/UPN	4.7.3
185mm² LVM1 Connector + Dip Moulded Shroud	02822G	LVM2/UPN	4.4.1
300mm² LVM1 Connector + Dip Moulded Shroud	02823R	LVM3/UPN	4.4.1
50mm² Green and Yellow Earth Wire	05866T	N/A	N/A

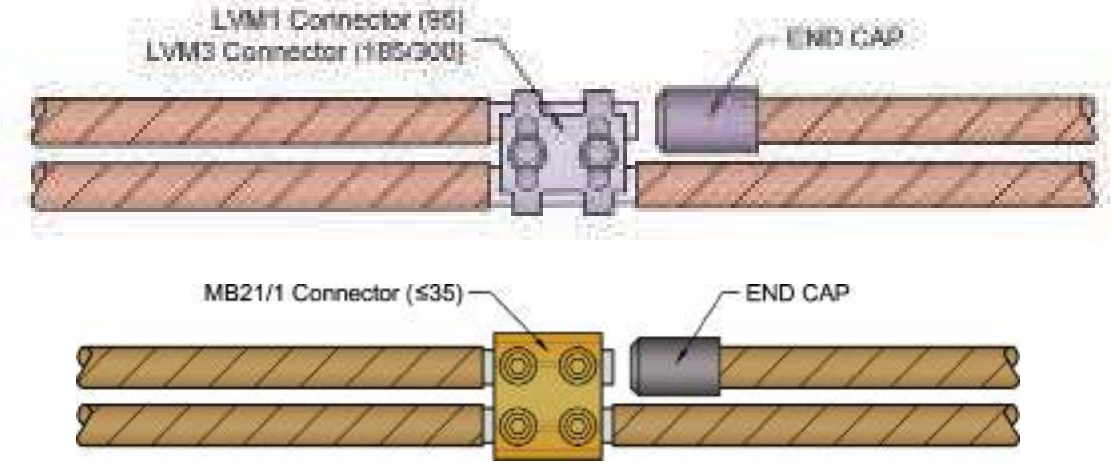
Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of UK Power Networks's LV Jointing Manual. All dimensions in millimetres (mm).

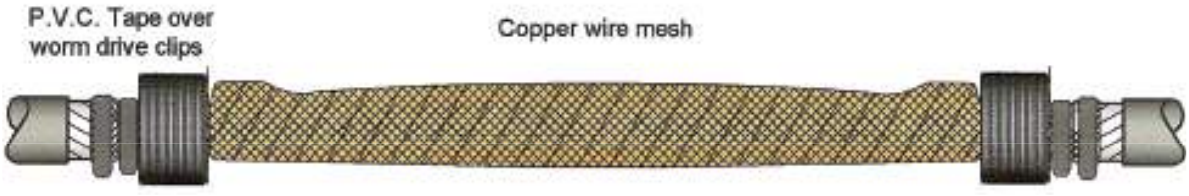
PILC Cable Sizes		Dimensions (mm)								
Imperial (sq.in)	Metric (mm²)	A	B	C	D	E	F	G	H	I
0.06	35	500	280	N/A	60	20	20	300	300	500
0.15	95	620	250	25	100	30	30	580	580	1000
0.3	185	900	530	25	100	30	30	860	860	1000
0.5	300	900	530	25	100	30	30	860	860	1000



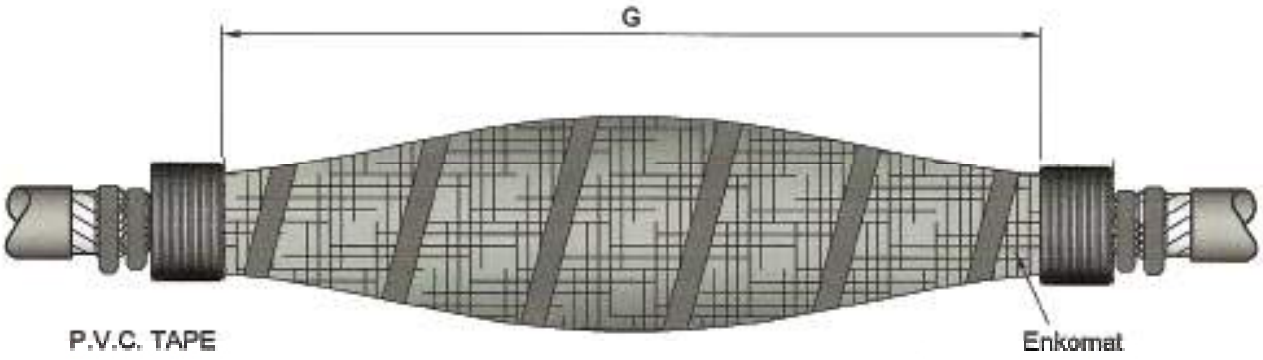
- Prepare the PILC Mains cable to the dimensions in the above drawing (Sections 3.2.1 to 3.2.4).
- Connect the armours to the lead sheath at each end of the joint using the mechanical earth bond kits supplied (Section 4.7.3).
- Install the temporary continuity bond onto the lead sheath next to both armour bonds (Section 3.2.5), in a position that allows the lead sheath to be removed and the necessary jointing to be carried out.
- Remove the lead sheath from the cable, 100mm from the armour cut at each end (Section 3.2.6).
- Remove the belt papers and fillers (Section 3.2.7).
- Install the two brass saddles and the green and yellow earth wire (Section 4.7.3).
- Remove the temporary continuity bond from the lead sheath at both ends of the joint (Section 3.2.5).
- Temporary shroud all exposed bare metalwork, neutral earth wires and connectors (Section 4.9).
- Live cut the appropriate cores one at a time and install the necessary amounts of clear heat shrink tube to protect the core insulation (Section 4.10.1) and apply heat shrink end caps to pot end the core(s) (Section 4.10.4).



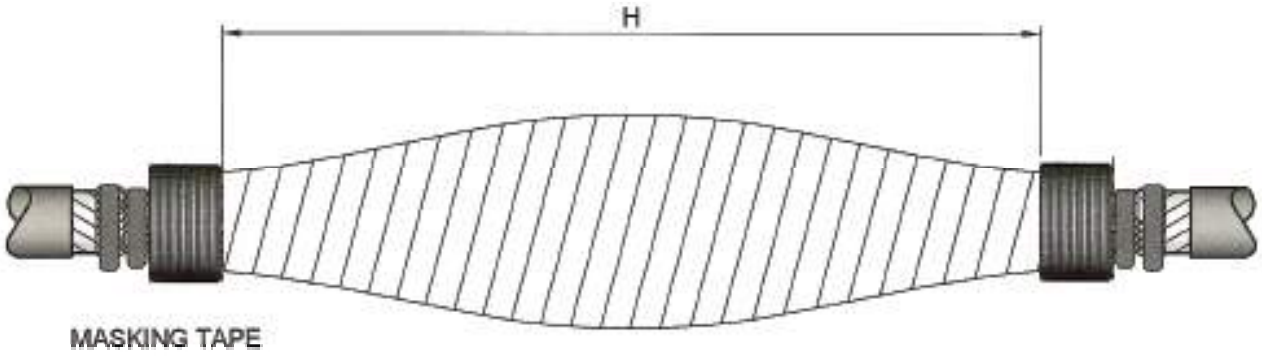
- Make the temporary connections using the supplied LVM connectors (Section 4.4.1) or MB21connectors (Section 4.2.7) and insulate them using either the provided dip moulded shrouds (Section 4.9.5) or the injection moulded insulation provided.



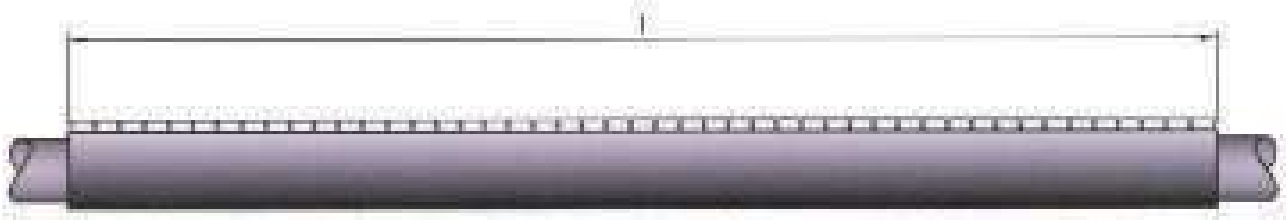
- Wrap the complete joint with a single half-lap layer of tinned cooper mesh tape from one brass saddle to the other (Section 4.7.4).
- Apply the black water sealing mastic tape to the exposed lead sheath at both ends of the joint, ensure that enough tape is applied to fill the gap between the brass saddle and the worm drive clips of the armour to lead sheath bond.



- Wrap the complete joint, cover all exposed components, with the supplied piece of enkomat spacer tape. Secure the Enkomat in place with PVC tape.



- Cover the Enkomat with a 50/50 overlap layer of masking tape to aid removal of the outer heatshrink sleeve at a later date.



- Install the heatshrink zipper sleeve (Section 4.10.5).
- Wrap coloured 'Danger Live' bag around completed joint. Secure in place with PVC tape.
- If the joint is to be backfilled the outer sleeve must be cold before this process starts.

2.14.2 Supply Restoration - Waveform Mains Cables 70mm² to 300mm²

Materials

Cable Sizes (mm²)	Stores Codes	Sicame Kit Ref.
25 to 70	02143F	TJK35/UPN
70 to 120	02760P	TJK95/UPN
185 to 300	02761Y	TJK300/UPN

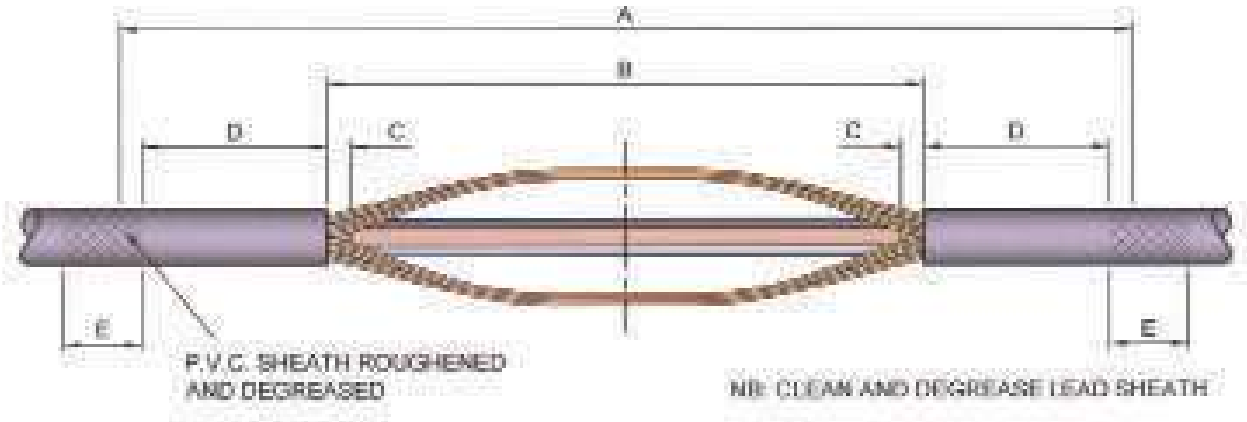
Additional Van Stock Items

Cable Sizes (mm²)	Stores Codes	Sicame Kit Ref.	Installation Instruction Section
185mm² LVM1 Connector + Dip Moulded Shroud	02822G	LVM2/UPN	4.4.1
300mm² LVM1 Connector + Dip Moulded Shroud	02823R	LVM3/UPN	4.4.1

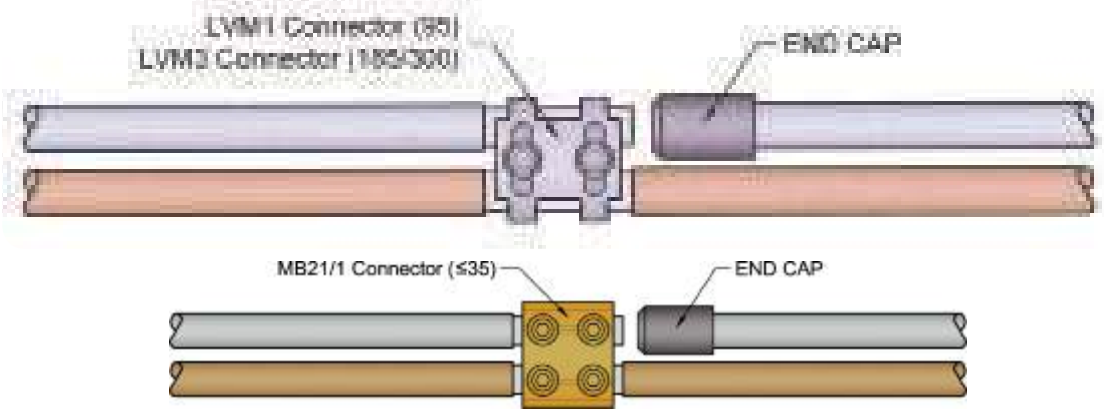
Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual. All dimensions in millimetres (mm).

Cable Size (mm²)	Dimensions (mm)							
Waveform	A	B	C	D	E	F	G	H
35	500	340	20	N/A	80	340	340	500
95	620	250	20	165	70	580	580	1000
185	900	530	20	165	70	860	860	1000
300	900	530	20	165	70	860	860	1000

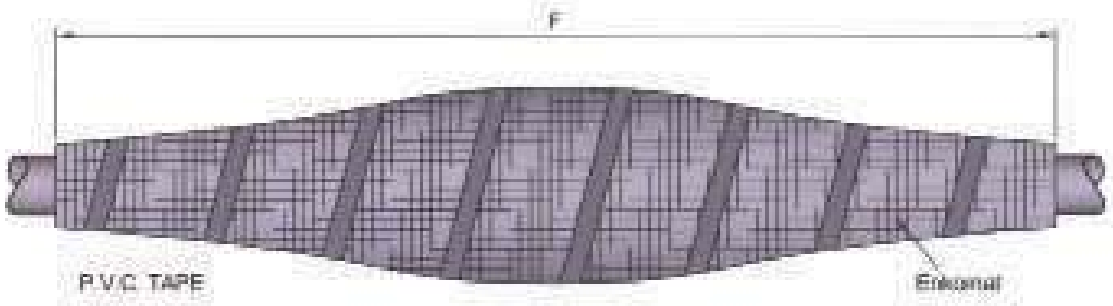


- Prepare the waveform cable (Sections 3.3 and 3.4), using the dimension in the above drawing.
- Temporary shroud all exposed bare metalwork, neutral earth wires and connectors (Sections 4.9.1 to 4.9.3).

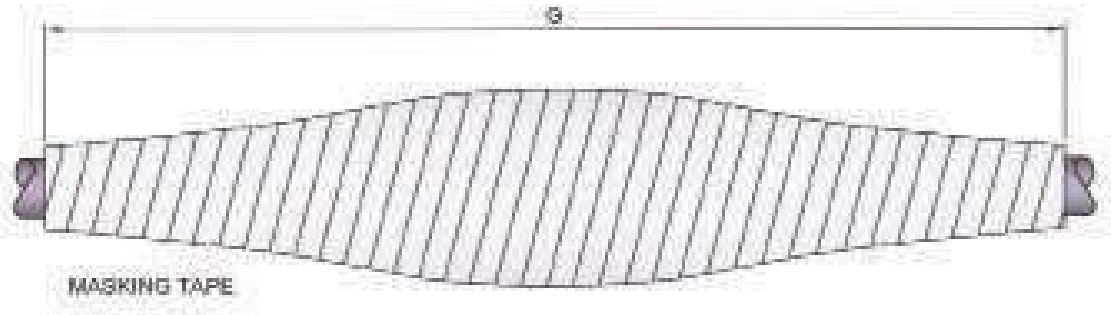


- Live cut the appropriate cores and apply a heat shrink end caps to pot ended the core(s) (Section 4.10.4).
- Make the temporary connections using the supplied LVM connectors (Section 4.4.1) or MB21 connectors (Section 4.2.7) and insulate them using either the provided dip moulded shrouds (Section 4.9.5) or the injection moulded insulation provided.

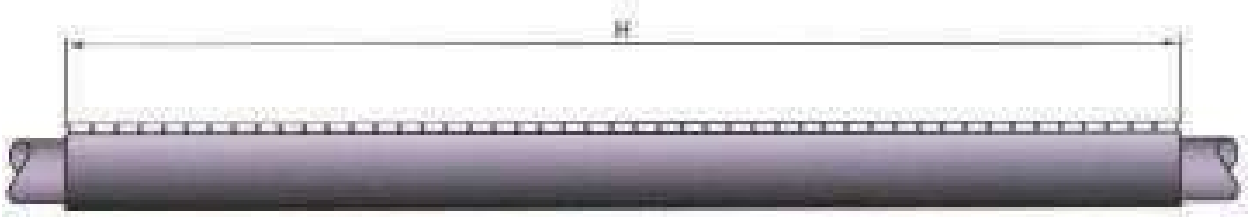
- Wrap the complete joint with a single half-lap layer of tinned cooper mesh tape from the sheath cut on one side of the joint to the other (Section 4.7.4).



- Wrap the complete joint, cover all exposed components, with the supplied piece of Enkomat spacer tape. Secure the Enkomat in place with PVC tape.

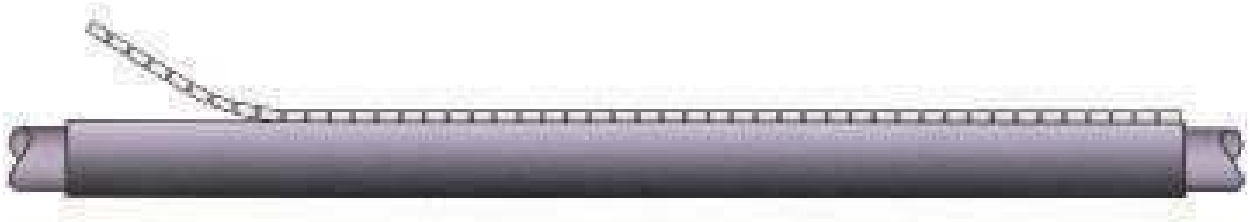


- Cover the Enkomat with a 50/50 overlap layer of masking tape to aid removal of the outer heatshrink sleeve at a later date.

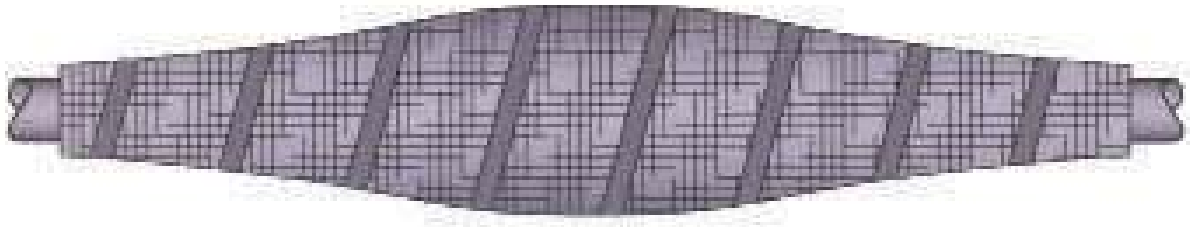


- Install the heatshrink zipper sleeve (Section 4.10.5).
- Wrap coloured 'Danger Live' bag around completed joint. Secure in place with PVC tape.
- If the joint is to be backfilled the outer sleeve must be cold before this process starts.

2.14.3 Temporary LV Joint Removal

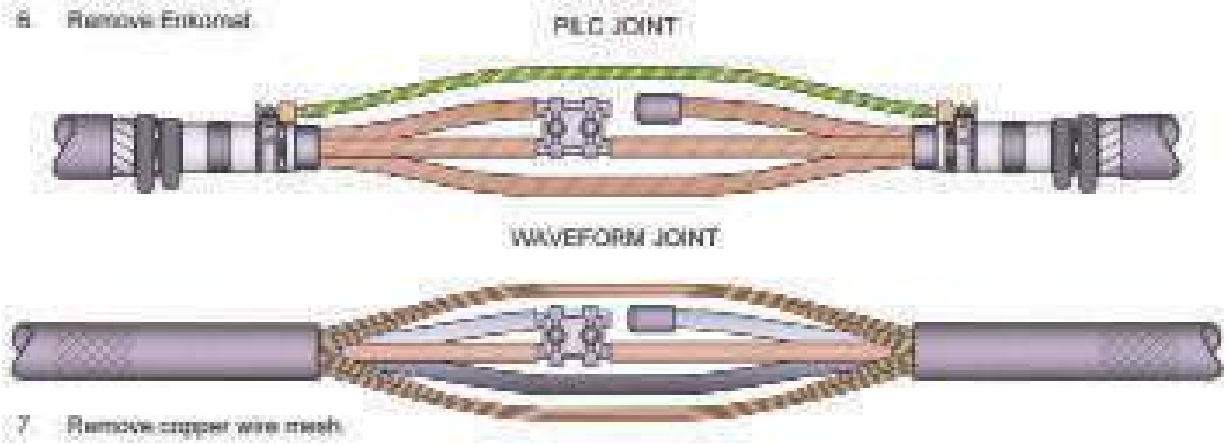


- This process applies to all temporary joints of this type.
- Ensure that approved gloves are worn to complete this task.
- Remove the zipper from the heatshrink sleeve, by applying heat to it and pulling it off with a pair of approved insulated pliers.
- Once the zipper is completely removed apply further heat to the joints so the heatshrink tube begins to shrink and come away from the masking tape layer below.
- Pull the hot sleeve off of the joint completely.



- Completely remove the layer of masking tape.
- Remove the PVC tape used to secure the masking tape in place.

- Carefully remove the Enkomat completely to expose the layer of tinned copper mesh.



- Carefully remove the tinned copper mesh tape.
- Reinstate the cable cores using approved methods and materials and complete the joint.
- When the cable is ready to be put back together, fit the joint shell, checking for a minimum clearance of 10mm between the joint shell and the completed joint (Section 4.8.1).
- Fill the joint shell with the correct amount of JEM resin as shown in the table relating to the joint used (Section 4.8.2).

2.14.4 Temporary Generator Connection - PILC Mains Cables 70mm² to 300mm²

Materials

Cable Sizes (mm²)	Generator Termination Kit		Temporary LV Joint Kit	
	Stores Codes	Sicame Kit Ref.	Stores Codes	Sicame Kit Ref.
70 to 120	01321E	TGJK95	02760P	TJK95/UPN
185 to 300	01315K	TGJK300	02761Y	TJK300/UPN

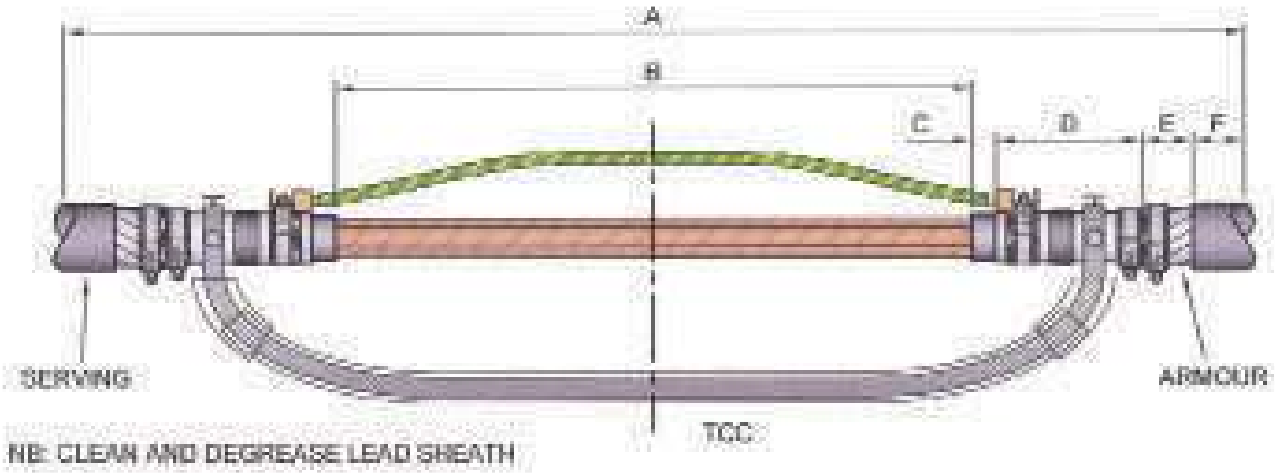
Additional Van Stock Items

Cable Sizes (mm²)	Stores Codes	Sicame Kit Ref.	Installation Instruction Section
185mm² PILC Mechanical Earth Bond Kit	02776G	ME185/UPN	4.7.3
300mm² PILC Mechanical Earth Bond Kit	02777R	ME300/UPN	4.7.3
50mm² Green and Yellow Earth Wire	05866T	N/A	N/A

Installation Instructions

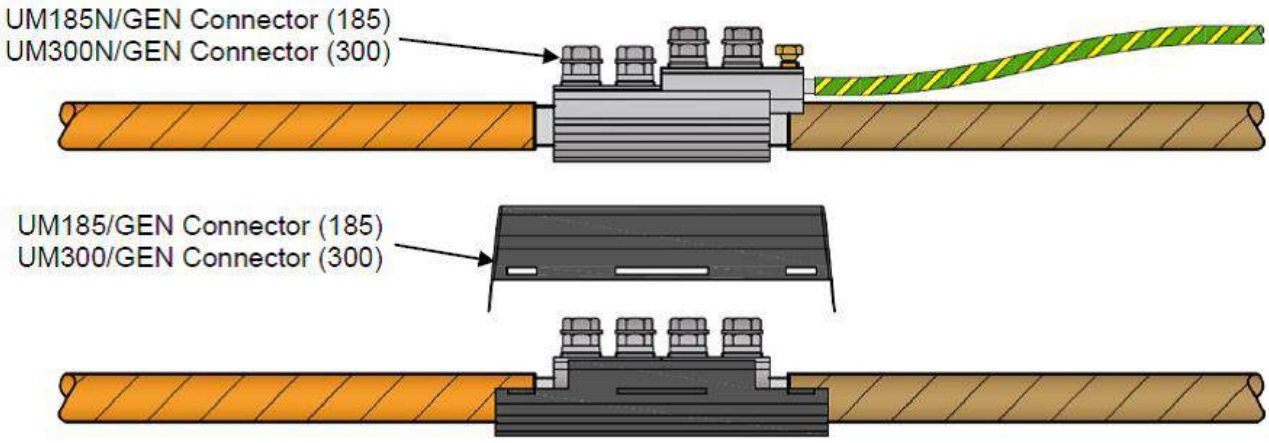
For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual. All dimensions in millimetres (mm).

PILC Cable Sizes		Dimensions (mm)								
Imperial (sq.in)	Metric (mm²)	A	B	C	D	E	F	G	H	I
0.15	95	620	250	25	100	30	30	580	580	1000
0.3	185	900	530	25	100	30	30	860	860	1000
0.5	300	900	530	25	100	30	30	860	860	1000

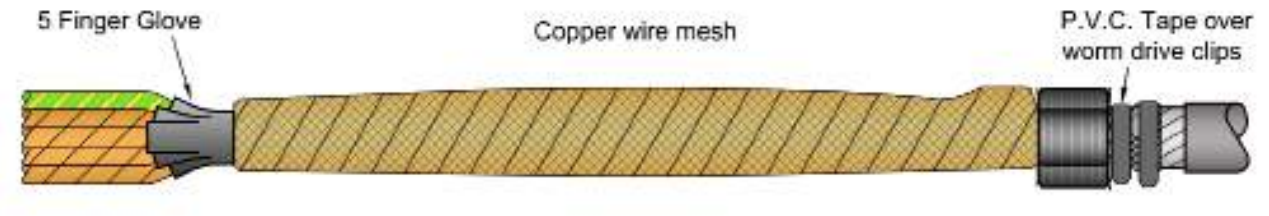


- Prepare the PILC Mains cable to the dimensions in the above drawing (Sections 3.2.1 to 3.2.4).
- Connect the armours to the lead sheath at each end of the joint using the mechanical earth bond kits supplied (Section 4.7.3).
- Install the temporary continuity bond onto the lead sheath next to both armour bonds (Section 3.2.5), in a position that allows the lead sheath to be removed and the necessary jointing to be carried out.

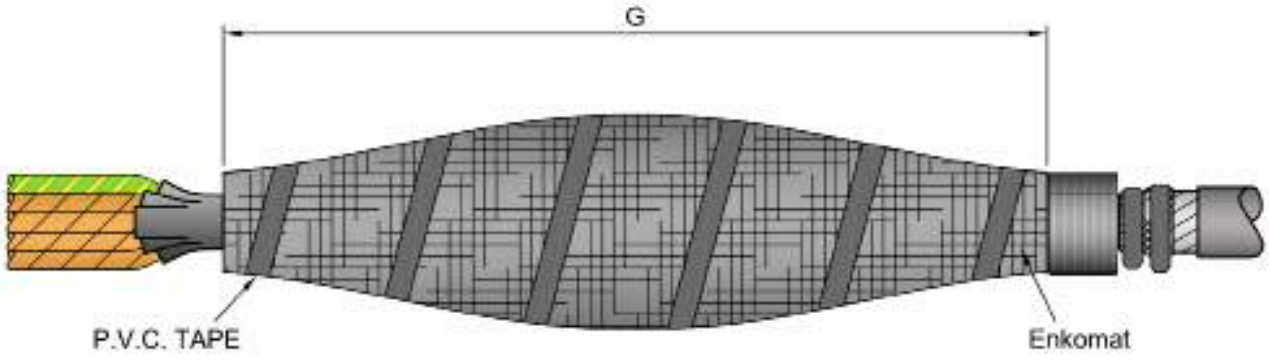
- Remove the lead sheath from the cable, 100mm from the armour cut at each end (Section 3.2.6).
- Remove the belt papers and fillers (Section 3.2.7).
- Install the one brass saddles on the PILC miin and connect a length of green and yellow earth wire in to it (Section 4.7.3). This will be connected to the neutral earth connector when the main connections to the tri-rated cable are made.
- Remove the temporary continuity bond from the lead sheath at both ends of the joint (Section 3.2.5).
- Temporary shroud all exposed bare metalwork, neutral earth wires and connectors (Section 4.9).
- Live cut the appropriate cores one at a time and install the necessary amounts of clear heat shrink tube to protect the core insulation (Section 4.10.1) and apply temporary rubber shrouds to the end of each core.



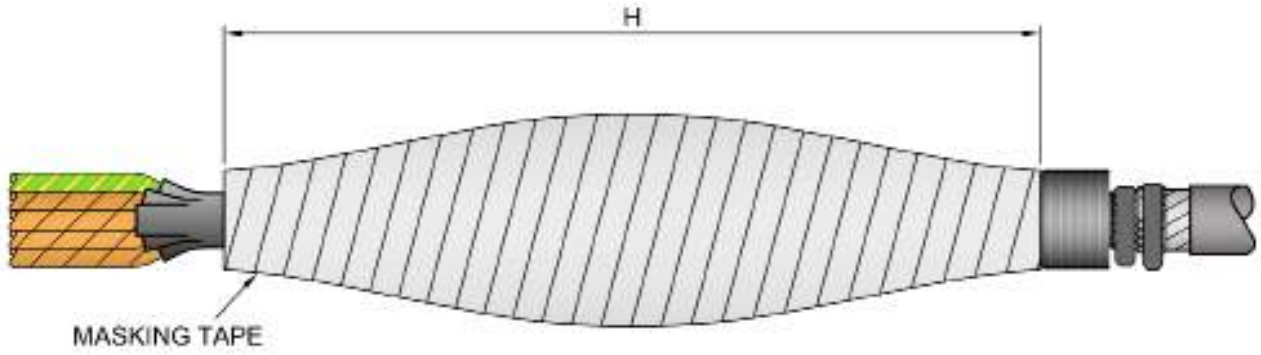
- Pass the supplied five figure break out over the four lengths of generator lead and the sepearte earth cable. Park the break out out of the way temporarily.
- Ensuring the phasing is correct; connect the generator lead to the LV mains cable using the supplied UM mechanical connector containing inner pressure pad which has been designed for tri-rated cable.
- Start with the neutral connector installing the length of green and yellow earth wire into the service bridge piece.
- Insulate each connector with the supplied injection moulded shroud (Section 4.3). Ensure that the double headed bolts and the pressure plate is used on the generator cable end of the Joint.



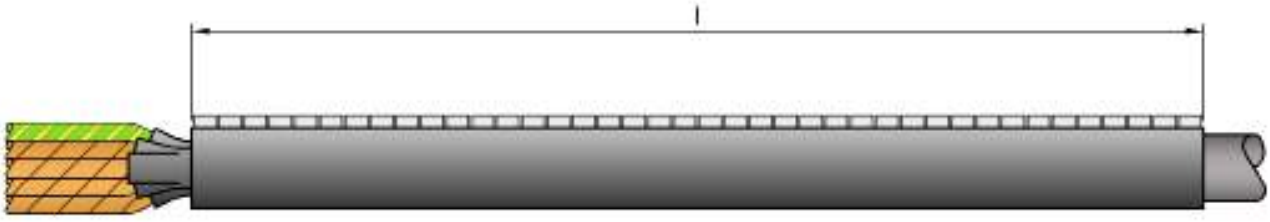
- Wrap the complete joint with a single half-lap layer of tinned cooper mesh tape from the brass saddle to 100mm onto the outer sheaths of the generator cables (Section 4.7.4).
- Apply the black water sealing mastic tape to the exposed lead sheath, ensure that enough tape is applied to fill the gap between the brass saddle and the worm drive clips of the armour to lead sheath bond.



- Wrap the complete joint, cover all exposed components, with the supplied piece of Enkomat spacer tape. Secure the Enkomat in place with PVC tape.



- Cover the Enkomat with a 50/50 overlap layer of masking tape to aid removal of the outer heatshrink sleeve at a later date.



- Install the heatshrink breakout (section 4.10.3).
- Install the heatshrink zipper sleeve 100mm over the heatshrink (Section 4.10.5).
- Wrap coloured 'Danger Live' bag around completed joint. Secure in place with PVC tape.
- If the joint is to be backfilled the outer sleeve must be cold before this process starts.
- For removal of the temporary joint refer to Section 2.14.3 of the LV Jointing Manual.
- The generator leads can be removed for the connectors by un-screwing the bolts securing them in place.

2.14.5 Temporary Generator Connection - Waveform Mains Cables 70mm² to 300mm²

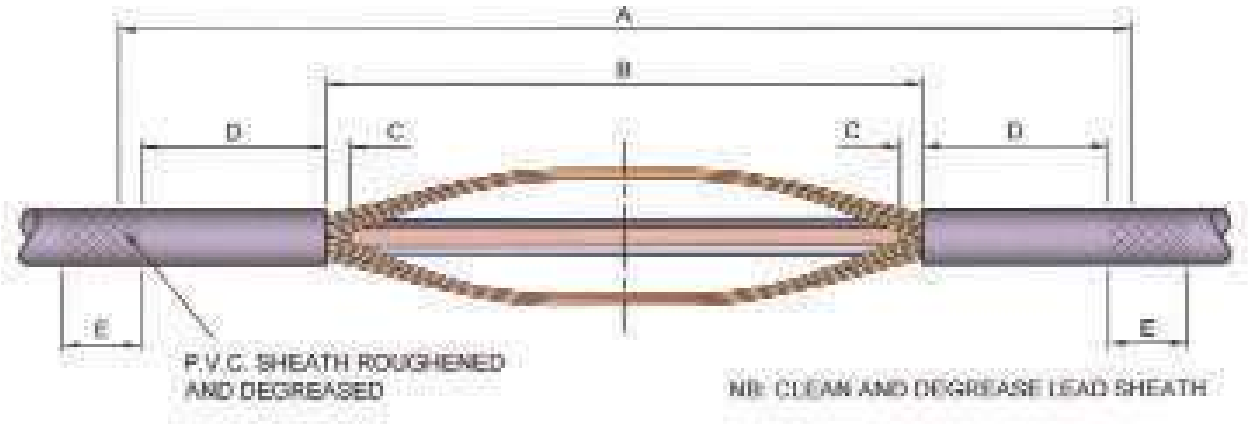
Materials

Cable Sizes (mm²)	Generator Termination Kit		Temporary LV Joint Kit	
	Stores Codes	Sicame Kit Ref.	Stores Codes	Sicame Kit Ref.
70 to 120	01321E	TGJK95	02760P	TJK95/UPN
185 to 300	01315K	TGJK300	02761Y	TJK300/UPN

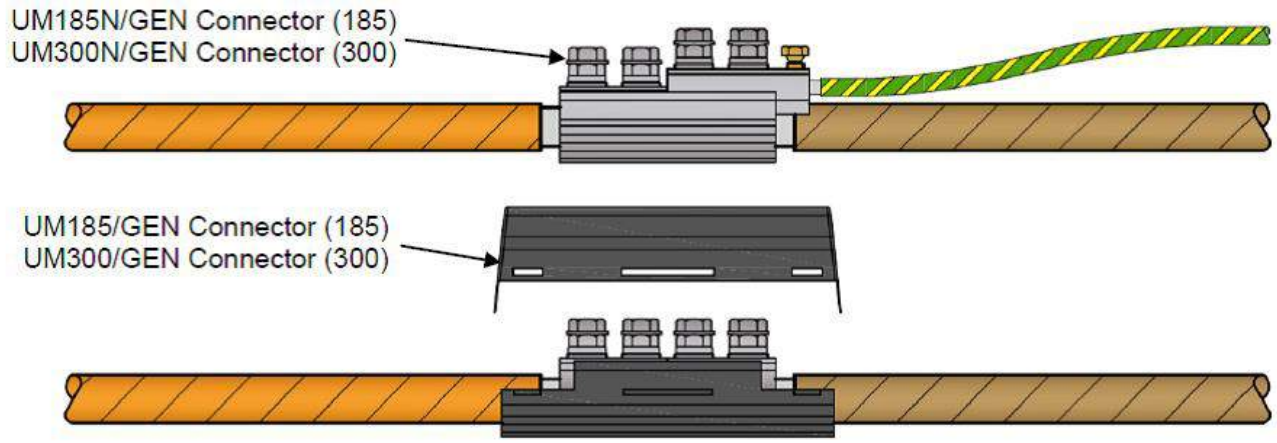
Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks LV Jointing Manual. All dimensions in millimetres (mm).

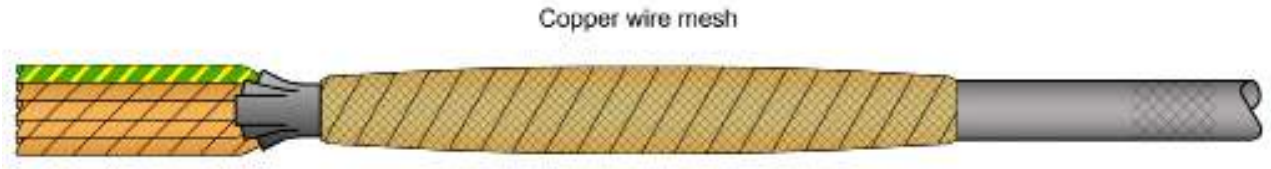
Cable Size (mm²)	Dimensions (mm)							
Waveform	A	B	C	D	E	F	G	H
95	620	250	20	165	70	580	580	1000
185	900	530	20	165	70	860	860	1000
300	900	530	20	165	70	860	860	1000



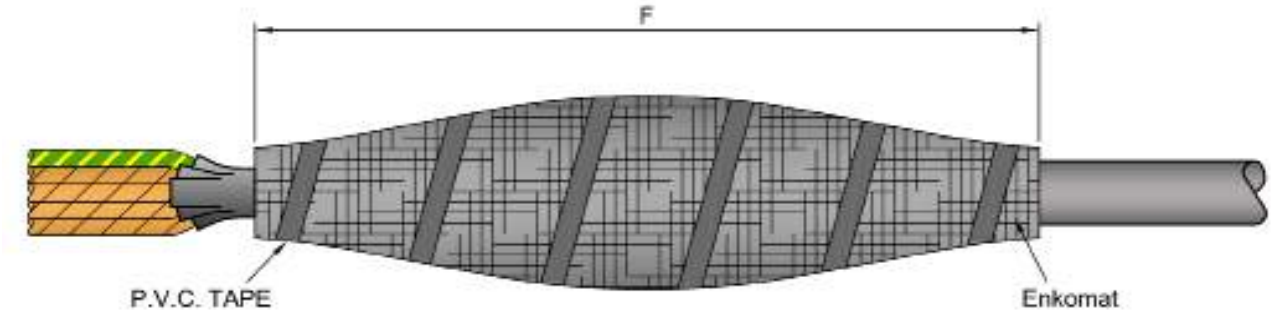
- Prepare the waveform cable (Sections 3.3 and 3.4), using the dimension in the above drawing.
- Temporary shroud all exposed bare metalwork, neutral earth wires and connectors (Sections 4.9.1 to 4.9.3).
- Live cut the appropriate cores one at a time and install the necessary amounts of clear heat shrink tube to protect the core insulation (Section 4.10.1) and apply temporary rubber shrouds to the end of each core.



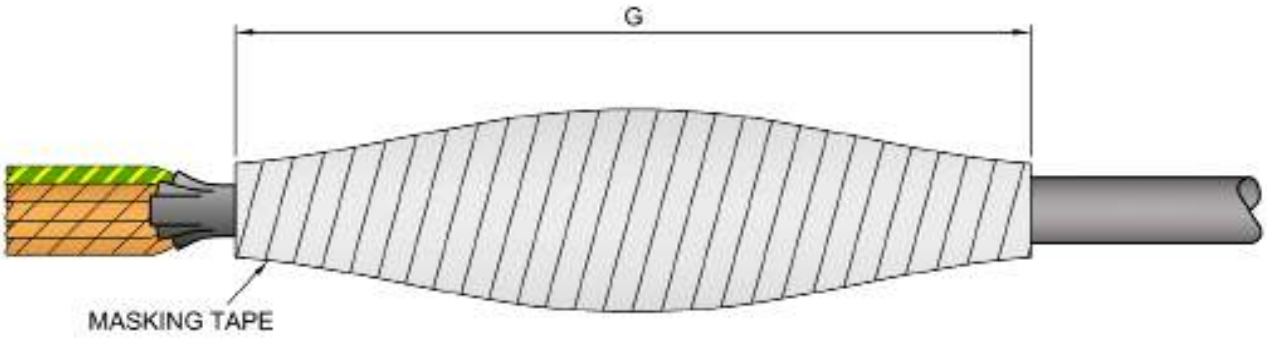
- Pass the supplied five figure break out over the four lengths of generator lead and park out of the way temporarily.
- Ensuring the phasing is correct; connect the generator lead to the LV mains cable using the supplied UM mechanical connector containing inner pressure pad which has been designed for tri-rated cable.
- Start with the neutral connector installing the length of green and yellow earth wire into the service bridge piece.
- Insulate each connector with the supplied injection moulded shroud (Section 4.3). Ensure that the double headed bolts and the pressure plate is used on the generator cable end of the Joint.



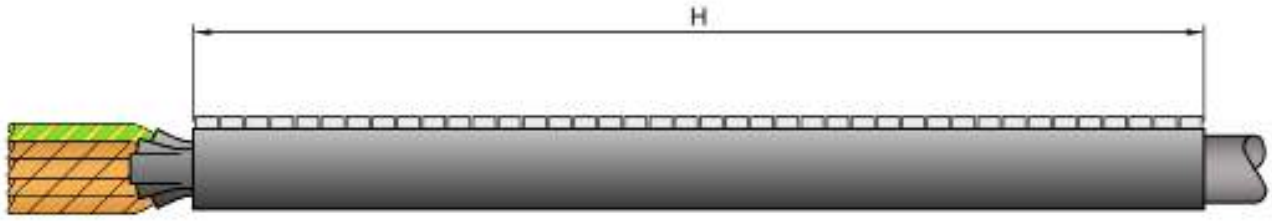
- Wrap the complete joint with a single half-lap layer of tinned cooper mesh tape from the sheath cut on one side of the joint to the other (Section 4.7.4).



- Wrap the complete joint, cover all exposed components, with the supplied piece of Enkomat spacer tape. Secure the Enkomat in place with PVC tape.



- Cover the Enkomat with a 50/50 overlap layer of masking tape to aid removal of the outer heatshrink sleeve at a later date.



- Install the heatshrink breakout (section 4.10.3).
- Install the heatshrink zipper sleeve 100mm over the heatshrink (Section 4.10.5).
- Wrap coloured 'Danger Live' bag around completed joint. Secure in place with PVC tape.
- If the joint is to be backfilled the outer sleeve must be cold before this process starts.
- For removal of the temporary joint refer to Section 2.14.3 of the LV Jointing Manual.
- The generator leads can be removed for the connectors by un-screwing the bolts securing them in place.

2.15 Loose Connectors and Components

The table below lists the individual connectors, temporary insulation and other components which are available from UK Power Networks Supply Chain Stores.

Cable Sizes (mm^2)	Stores Codes	Manufacturers Kit Ref.	Installation Instruction Section
$95mm^2$ PILC Mechanical Earth Bond Kit	02775W	ME95/UPN	4.7.3
$185mm^2$ PILC Mechanical Earth Bond Kit	02776G	ME185/UPN	4.7.3
$300mm^2$ PILC Mechanical Earth Bond Kit	02777R	ME300/UPN	4.7.3
4-$35mm^2$ Insulated Service Connector	02770X	MF428I/UPN	4.2.5
4-$35mm^2$ Insulated Service Branch Connector	01706R	SSM1/UPN	4.2.7
70 to $185mm^2$ Mains Service Branch Connector	02772S	MSM1/UPN	4.2.6
240 to $300mm^2$ Mains Service Branch Connector	02773C	MSM2/UPN	4.2.6
$95mm^2$ Service Bridge Piece	02778B	SMJ1SM/UPN	4.3.2
$185mm^2$ Service Bridge Piece	02779L	SMJ2SM/UPN	4.3.2
$300mm^2$ Service Bridge Piece	02780G	SMJ3SM/UPN	4.3.2
CONSAC Neutral Earth Connector (NET1)	01830R	NET1/UPN	4.1.1
CR Closure Sheet (7.3m x 115mm)	01698G	N/A	4.9.4
$95mm^2$ Waveform 4 finger Breakout	02333M	502K046/S(S5)	4.10.3
185 to $300mm^2$ Waveform 4 finger Breakout	02334W	502K016/S(S5)	4.10.3
$95mm^2$ LVM1 Composite Connector + CR Sheet	02811N	LVM1/C/UPN	4.4.1
$185mm^2$ LVM2 Connector + Dip Moulded Shroud	02812X	LVM2/C/UPN	4.4.1
$300mm^2$ LVM3 Connector + Dip Moulded Shroud	02813H	LVM3/C/UPN	4.4.1
$95mm^2$ LVM1 Connector + Dip Moulded Shroud	02821W	LVM1/UPN	4.4.1
$185mm^2$ LVM2 Connector + Dip Moulded Shroud	02822G	LVM2/UPN	4.4.1
$300mm^2$ LVM3 Connector + Dip Moulded Shroud	02823R	LVM3/UPN	4.4.1
NE13 Waveform Neutral Earth Connector	02829A	NE13	4.1.3
25m roll of 19mm Clear Heatshrink Tube	02325X	EN-CGPT-18/6-X-SP	4.10.1
25m roll of 38mm Clear Heatshrink Tube	02326H	EN-CGPT-39/13-X-SP	4.10.1
25m roll of 9.5mm Clear Heatshrink Tube	01038J	EN-CGPT-9/3-X-S	4.10.1
25m roll of 12.7mm Clear Heatshrink Tube	01039T	EN-CGPT-12/4-X-SP	4.10.1
$35mm^2$ Green and Yellow Earth Wire	05864Y	N/A	N/A
$50mm^2$ Green and Yellow Earth Wire	05866T	N/A	N/A

2.16 Mains Pot End Joints

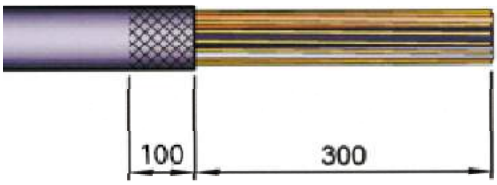
2.16.1 Waveform Cables 70mm² to 300mm²

Materials

Cable Sizes (mm²)	Stores Codes	Tyco Kit Ref.
70 to 120	02795P	BAH-038081488
185 to 300	02796Y	BAH-038081489

Installation Instructions

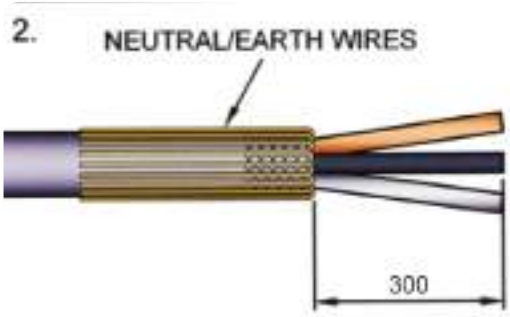
For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).



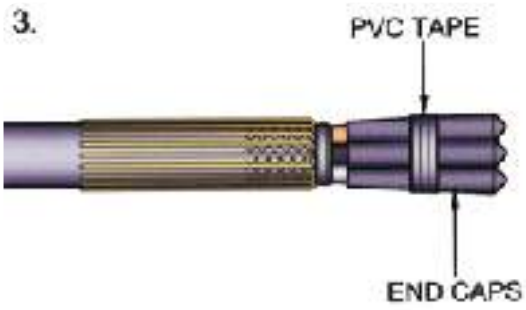
- Prepare the waveform cable as described in Sections 3.3.1 to 3.3.5 for ‘live’ cables or Sections 3.4.1 to 3.4.6 for ‘dead’ cables.
- Clean and abrade the cable oversheath for a distance of 100mm.

- Wrap the tinned copper mesh around the cable sheath next to the sheath cut.

- Open out and clean the neutral/earth wires and fold back over the tinned copper mesh.



- Cut each phase core individually 150mm from the outer sheath cut (Section 3.4.6).



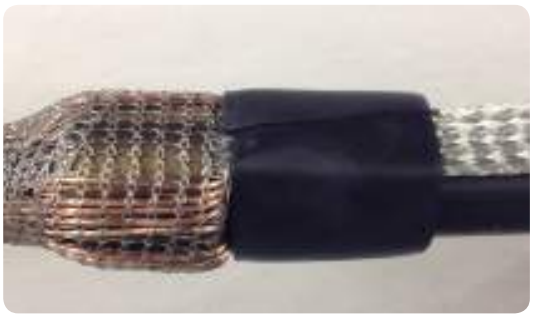
- Position a heat-shrink end cap over the end of each phase core in turn and shrink into place starting at the end and working towards the cable oversheath (Section 4.10.4).
- **Note:** As the caps shrink they may begin to slide off. An insulated core wedge can be used to hold them in position.
- Form the cores back together and secure in place with PVC tape.

- Position the end of the earth braid with the solder block, over the neutral earth wires and the tinned copper mesh and fix in place with one turn of the supplied constant force spring.

- Bend the braid back over constant force spring and then fully install it.
- Check the constant force spring is tight before continuing.

- Form the neutral earth wires back over the phase cores and cut to length if required.

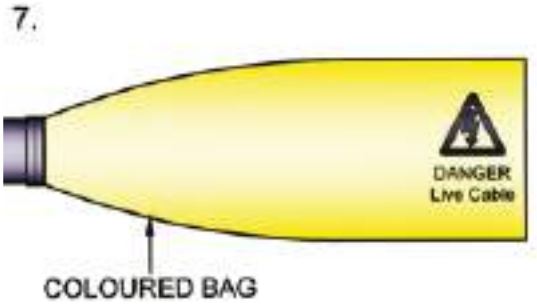
- Apply one half lap layer of tinned copper mesh over the joint from the constatnt force spring to the end of the heatshrink end caps.



- Apply the black mastic tape around the abraded exposed cable sheath behing the constant force spring. Starting underneath the braid before continuing around the braid, ensuring that the braid is completely covered.

- Shrink the large heatshrink tube over the end of the joint, starting from the earth braid and working towards the cable end (Section 4.10.2).

- Shrink the large heat shrink cap, over the end of the joint.
- Allow the pot end to cool before applying any mechanical strain.



- Once the pot end has cooled, place the yellow bag over the joint, pushing the earth wire through the end of the bag. Ensure that the hazard symbol is on the top and fasten it to the cable using PVC tape.

  Note: Connect the external earth braid to an approved earth pin (Section 3.11), as required.

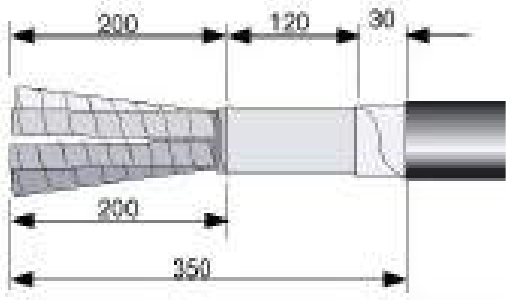
2.16.2 PILC Cables 50mm² to 95mm²

Materials

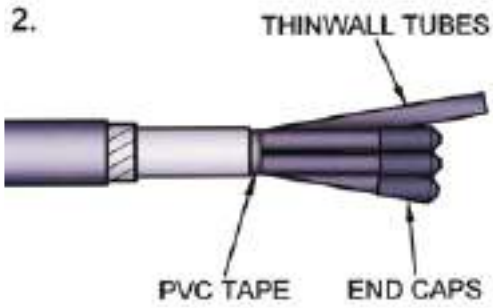
Cable Sizes (mm²)	Stores Codes	Tyco Kit Ref.
50 to 95	02797J	BAH-038081490

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).



- Prepare the PILC as described in Sections 3.2.1 to 3.2.6.
- Ensure that the required 120mm of lead sheath and 30mm of steel wire or tape armours are left prepared on the 'live' end of the cable.
- Remove the belt papers and fillers (Section 3.2.7).
- 'Live' cut each phase core in turn, 200mm from the lead sheath cut (Section 3.2.8).
- Temporarily shroud each cut phase with one of the provided heat-shrink end caps.
- Cut the neutral conductor, 200mm from the lead sheath cut (Section 3.2.8).



- Separate the cores and remove any excess grease or compound.
- Working on one phase core at a time, remove the cap and slide a length of clear heat-shrink tube over the core and shrink it in place starting at the crutch position (Section 4.10.1).
- Position the heat-shrink end cap over the phase conductor and shrink it into place, starting at the end before working towards the cable crutch (Section 4.10.4).
- **Note:** As the caps shrink they may begin to slide off. An insulated core wedge can be used to hold them in position.
- Position a length of thin wall heat-shrink tube over the neutral conductor and shrink into place (Section 4.10.1).

- Strip the insulation from the neutral core to the constant force spring length +5mm, using the constant force spring as a guide.
- Wrap the small roll of tinned copper maesh around the exposed neutral conductor.
- Connect the neutral core to one end of the short piece of tinned copper braid, using the small constant force spring provides.

- Position the opposite end of the earth braid onto the lead sheath and secure in place with one of the constant force springs.
- Apply two layers of PVC tape over the constant force spring; ensure that this tightens the spring by applying the tape in the same direction as the roll of the spring (Section 4.7.4).

- Apply two layers of knit mesh tape over the 30mm length of cleaned armours and down onto the lead sheath for a distance of 20mm (Section 4.7.4).
- Position the long piece of tinned copper braid so that it is parallel with the cable and the end is level with the end of the tinned copper mesh tape on the lead sheath.
- Secure the braid to the mesh covered lead sheath with one of the constant force springs (Section 4.7.4).
- Apply two layers of PVC tape over constant force spring. Ensure that this tightens the spring by applying the tape in the same direction as the roll of the spring (Section 4.7.4).

4.

- Wrap the completed joint with a single half-lap layer of tinned copper mesh, starting from the mechanical connector and working towards the lead sheath. Ensure that the tinned copper mesh covers all the exposed heat-shrink parts of the joint (Section 4.7.4).
- Tape up and over the constant force spring at the end of the lead sheath (Section 4.7.4).
- Apply a half-lap layer of black moisture sealing mastic tape to the lead sheath between the two constant force springs (Section 4.7.4).

5.

- Position the large thin-walled, non-adhesive lined, heat-shrink tube over the tinned copper mesh tape, so that it covers the black mastic moisture sealing tape.
- Shrink the tube starting in the centre, before working out towards each end (Section 4.10.1).

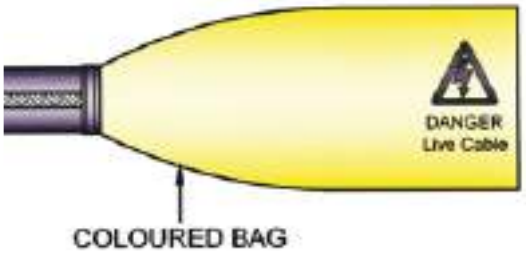
6.

- Position the outer heavy-duty adhesive lined heat-shrink tube centrally over the pot end.
- Shrink the tube starting in the centre, before working out towards each end (Section 4.10.2).
- Secure the earth braid to the cable with a wire binder to prevent any unwanted movement.

7.

- Position the large heat-shrink end cap over the end of the cable and shrink into place, starting at the end, before working towards the cable (Section 4.10.4).
- **Note:** As the cap shrinks it may begin to slide off. An insulated core wedge can be used to hold it in position.
- Allow the pot end to cool before applying any mechanical strain.

8.



- Once the pot end has cooled, place the yellow bag over the joint, ensuring that the hazard symbol is on the top and fasten it to the cable using PVC tape.
- Connect the external earth braid to an approved earth pin (Section 3.11), as required.

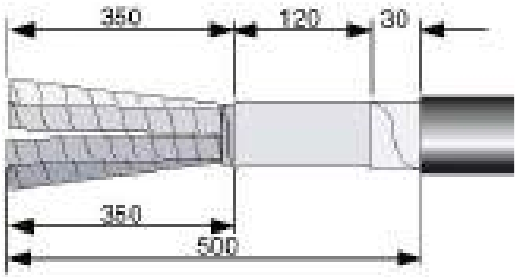
2.16.3 PILC Cables 120mm² to 300mm²

Materials

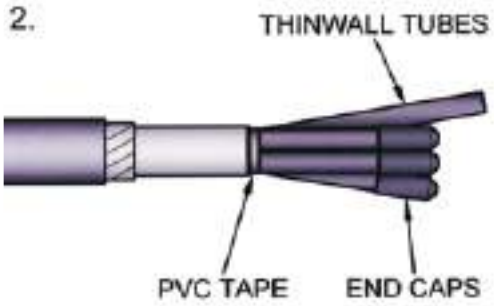
Cable Sizes (mm²)	Stores Codes	Tyco Kit Ref.
120 to 300	02798T	BAH-038081491

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).



- Prepare the PILC as described in Sections 3.2.1 to 3.2.6.
- Ensure that the required 120mm of lead sheath and 30mm of steel wire or tape armours are left prepared on the 'live' end of the cable.
- Remove the belt papers and fillers (Section 3.2.7).
- 'Live' cut each phase core in turn, 350mm from the lead sheath cut (Section 3.2.8).
- Temporarily shroud each cut phase with one of the provided heat-shrink end caps.
- Cut the neutral conductor, 350mm from the lead sheath cut (Section 3.2.8).



- Separate the cores and remove any excess grease or compound.
- Working on one phase core at a time, remove the cap and slide a short length of clear heat-shrink tube over the core and shrink it in place starting at the crutch position (Section 4.10.1).
- Position the heat-shrink end cap over the phase conductor and shrink it into place, starting at the end before working towards the cable crutch (Section 4.10.4).
- **Note:** As the caps shrink they may begin to slide off. An insulated core wedge can be used to hold them in position.
- Position a length of thin wall heat-shrink tube over the neutral conductor and shrink into place (Section 4.10.1).

- Strip the insulation from the neutral core to the constant force spring length +5mm, using the constant force spring as a guide.
- Wrap the small roll of tinned copper maesh around the exposed neutral conductor.
- Connect the neutral core to one end of the short piece of tinned copper braid, using the small constant force spring provides.

- Position the opposite end of the earth braid onto the lead sheath and secure in place with one of the constant force springs.
- Apply two layers of PVC tape over constant force spring. Ensure that this tightens the spring by applying the tape in the same direction as the roll of the spring (Section 4.7.4).

- Apply two layers of knit mesh tape over the 30mm length of cleaned armours and down onto the lead sheath for a distance of 20mm (Section 4.7.4).
- Position the long piece of tinned copper braid, so that it is parallel with the cable and the end is level with the end of the tinned copper mesh tape on the lead sheath.
- Secure the braid to the mesh covered lead sheath with one of the constant force springs (Section 4.7.4).
- Apply two layers of PVC tape over constant force spring, ensure that this tightens the spring by applying the tape in the same direction as the roll of the spring (Section 4.7.4).

4.

- Wrap the completed joint with a single half-lap layer of tinned copper mesh. Start from the mechanical connector and work towards the lead sheath. Ensure that the tinned copper mesh covers all the exposed heat-shrink parts of the joint (Section 4.7.4).
- Tape up and over the constant force spring at the end of the lead sheath (Section 4.7.4).
- Apply a half-lap layer of black moisture sealing mastic tape to the lead sheath between the two constant force springs (Section 4.7.4).

5.

- Position the large thin-walled, non-adhesive lined, heat-shrink tube over the tinned copper mesh tape, so that it covers the black mastic moisture sealing tape.
- Shrink the tube starting in the centre before working out towards each end (Section 4.10.1).

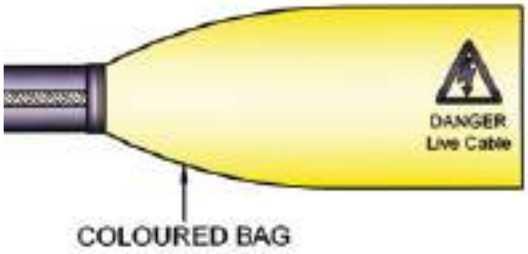
6.

- Position the outer heavy-duty adhesive lined heat-shrink tube centrally over the pot end.
- Shrink the tube starting in the centre before working out towards each end (Section 4.10.2).
- Secure the earth braid to the cable with a wire binder to prevent any unwanted movement.

7.

- Position the large heat-shrink end cap over the end of the cable and shrink into place, starting at the end, before working towards the cable (Section 4.10.4).
- **Note:** As the cap shrinks it may begin to slide off. An insulated core wedge can be used to hold it in position.
- Allow the pot end to cool before applying any mechanical strain.

8.



- Once the pot end has cooled, place the yellow bag over the joint, ensuring that the hazard symbol is on the top and fasten it to the cable using PVC tape.
- Connect the external earth braid to an approved earth pin (Section 3.11), as required.

2.16.4 Breaking Down Heatshrink Pot End Joints on Plastic Cables

- This process applies to all mains heatshrink pot ends joints.
- **The process shown in this section is indicative of the methods required to carry out this task and may vary depending on the manufacturer of the heat shrink pot end involved.**
- Ensure that approved insulating gloves are worn to complete this task.
- With the outer heat shrink sleeve cold score the surface of the tube, with an approved knife, over the area where it overlaps the PVC outer sheath and the CNE wires below.

- There is no need to score the entire length of the outer sleeve.
- Apply sufficient heat to the body of the joint so that the outer heatshrink tube starts to shrink, split and come away from the layers below.

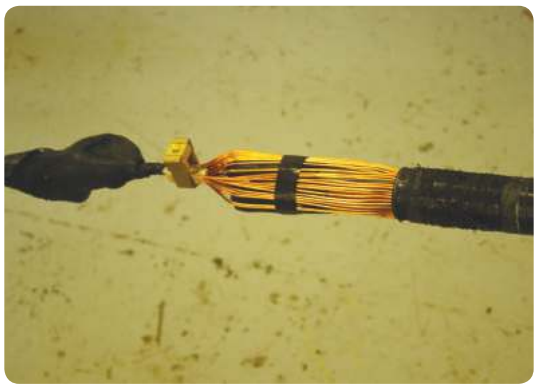
- Pull the hot tube off of the joint completely.

- With the inner heat shrink cap still cold score the surface of the tube, with an approved knife, over the area where it overlaps the PVC outer sheath and the CNE wires below.

- Apply sufficient heat to the cap so that the outer heatshrink tube starts to shrink, split and come away from the layers below.

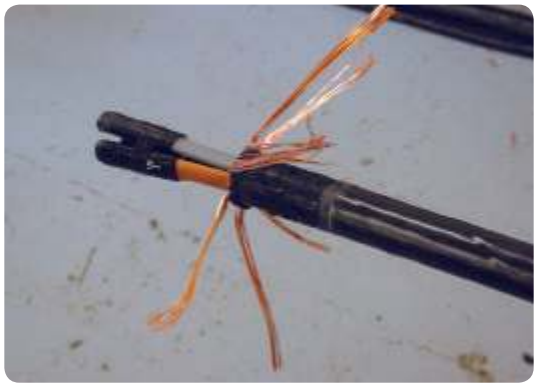
- Pull the hot tube off of the joint completely.

- Remove the section of PVC sheath from the body of the joint.



- Carefully cut the CNE wires next to the mechanical connector connecting them to the external earth wire, if fitted.

- Bend the CNE wires back over the outer sheath of the cable and secure in place with PVC tape.



- The exposed cable is now ready for re-jointing as required.

2.16.5 Breaking Down Heatshrink Pot End Joints on PILC Cables

- This process applies to all service and mains heatshrink pot ends joints.
- **The process shown in this section is indicative of the methods required to carry out this task and may vary depending on the manufacturer of the heat shrink pot end involved.**
- Ensure that approved insulating gloves are worn to complete this task.
- With the outer heat shrink sleeve cold score the surface of the tube, with an approved knife, over the area where it overlaps the armours and lead sheath.

- There is no need to score the entire length of the outer sleeve.

- Apply sufficient heat to the body of the joint so that the outer heatshrink tube starts to shrink, split and come away from the layers below.

- Pull the hot sleeve off of the joint completely.

- Repeat this process for the second inner heatshrink tube layer.

- Carefully unwind and remove the layer of tinned copper mesh tape.

- Unwrap and remove the constant force spring around the external earth braid.

- Unwrap and remove the constant force spring around the neutral earth braid.

- The exposed cable is now ready for re-jointing as required.

2.17 Mains Pole Terminations

2.17.1 Waveform Cables 70mm² to 185mm² for Direct Connection on to the Overhead Line

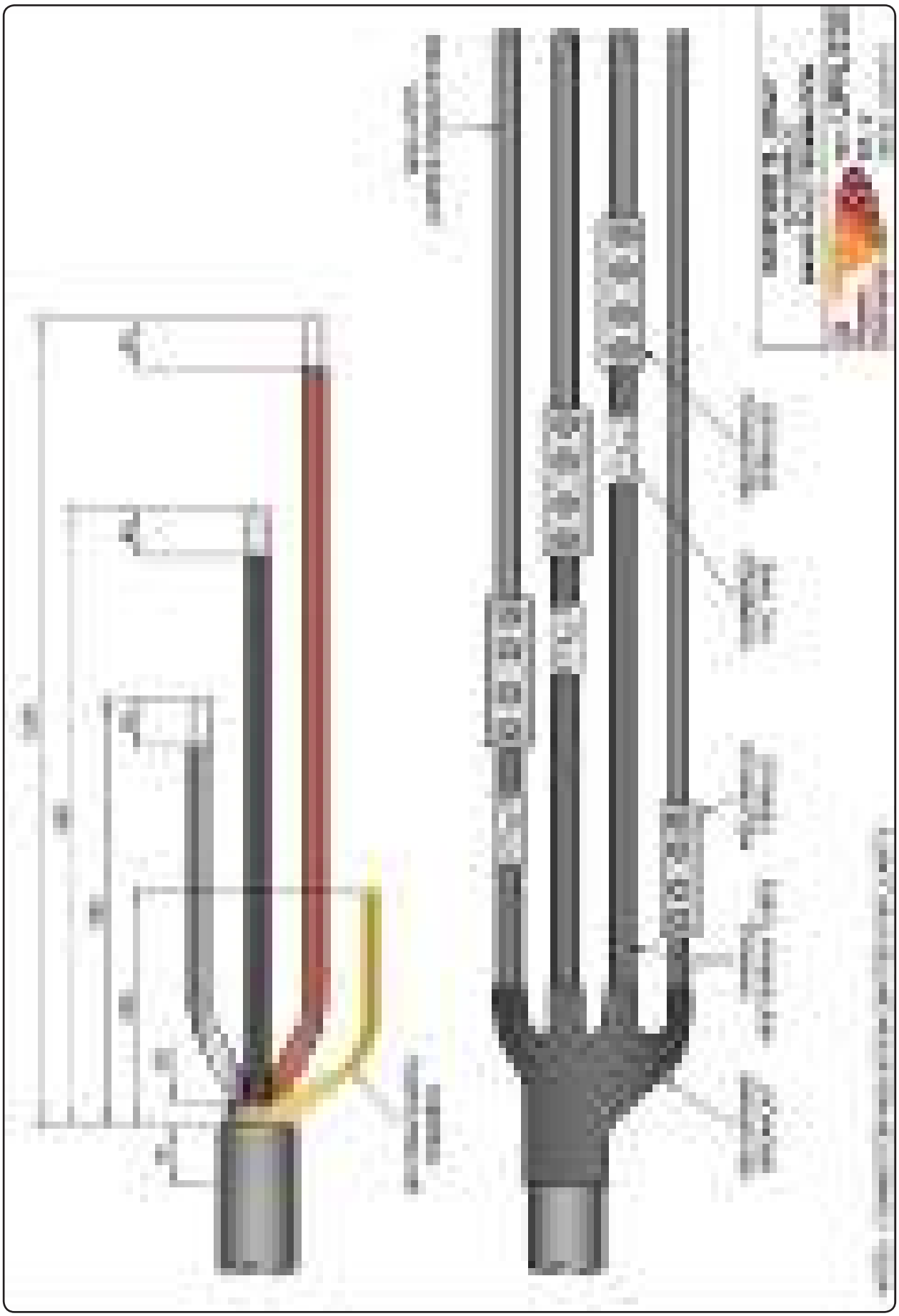
Materials

Cable Sizes (mm²)	Stores Codes	Tyco Kit Ref.
70 to 95	02805T	BAH-038081492
120 to 185	02806D	BAH-38081493

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm):

- Remove the Waveform cable PVC outer sheath for a distance of 1200mm (Section 3.4.1).
- Clean and abrade the PVC outer sheath for a distance of 50mm (Section 3.4.1).
- Remove any outer bedding (Section 3.4.2).
- Prepare the neutral earth wires (Section 3.4.3) and fold them down along the outer sheath of the cable.
- Remove the inner bedding layer (Section 3.4.4).
- Cut the phase cores to the lengths shown on the jointing instruction UPNJI/30 (Section 3.4.6).
- Form the neutral earth strands into a conductor, parallel with the phase core, using PVC tape to keep the strands together.
- Cut the neutral earth conductor to the length shown on the jointing instruction UPNJI/30.
- Using the phase connector as a guide, remove the XLPE insulation to the depth of the connector (Section 3.4.7).
- Cut the thin wall heat-shrink tube to the length of each core, leaving enough bare conductor on each core to install the connector.
- Position the thin-wall tube over each core, so that the end is as close to the crutch of the cable as possible and then shrink the tubes in place, starting at the crutch before working up to the conductor (Section 4.10.1).
- Set the cores so that each one can pass through one of the fingers on the four fingered heat-shrink breakout.
- Slide the breakout over the cores and push it right down into the crutch of the cable. Shrink the breakout in place starting at the fingers before moving on to the main body (Section 4.10.3).
- Park the connector insulation heavy-duty heat-shrink tubes over the jumper conductors being used to connect to the overhead line.
- Apply a phase numbered PVC tape (L1, L2, L3 and N) to the corresponding core to identify each phase.
- Remove the insulation from the jumper conductors to the depth of the connector using the phase connector as a guide (Section 3.4.7).
- Connect each jumper conductor to the cores of the waveform cable using the mechanical connectors (Section 4.5.1). Ensure that any copper conductors are wrapped with the brass gauze sections.
- Position the ‘parked’ heavy-duty heat-shrink tubes centrally over each connector and shrink in place (Section 4.10.2).
- Allow the pole termination to cool before applying any mechanical strain.



2.17.2 Waveform Cables 70mm² to 185mm² for Connection to Pole Mounted Fuses (PC400's)

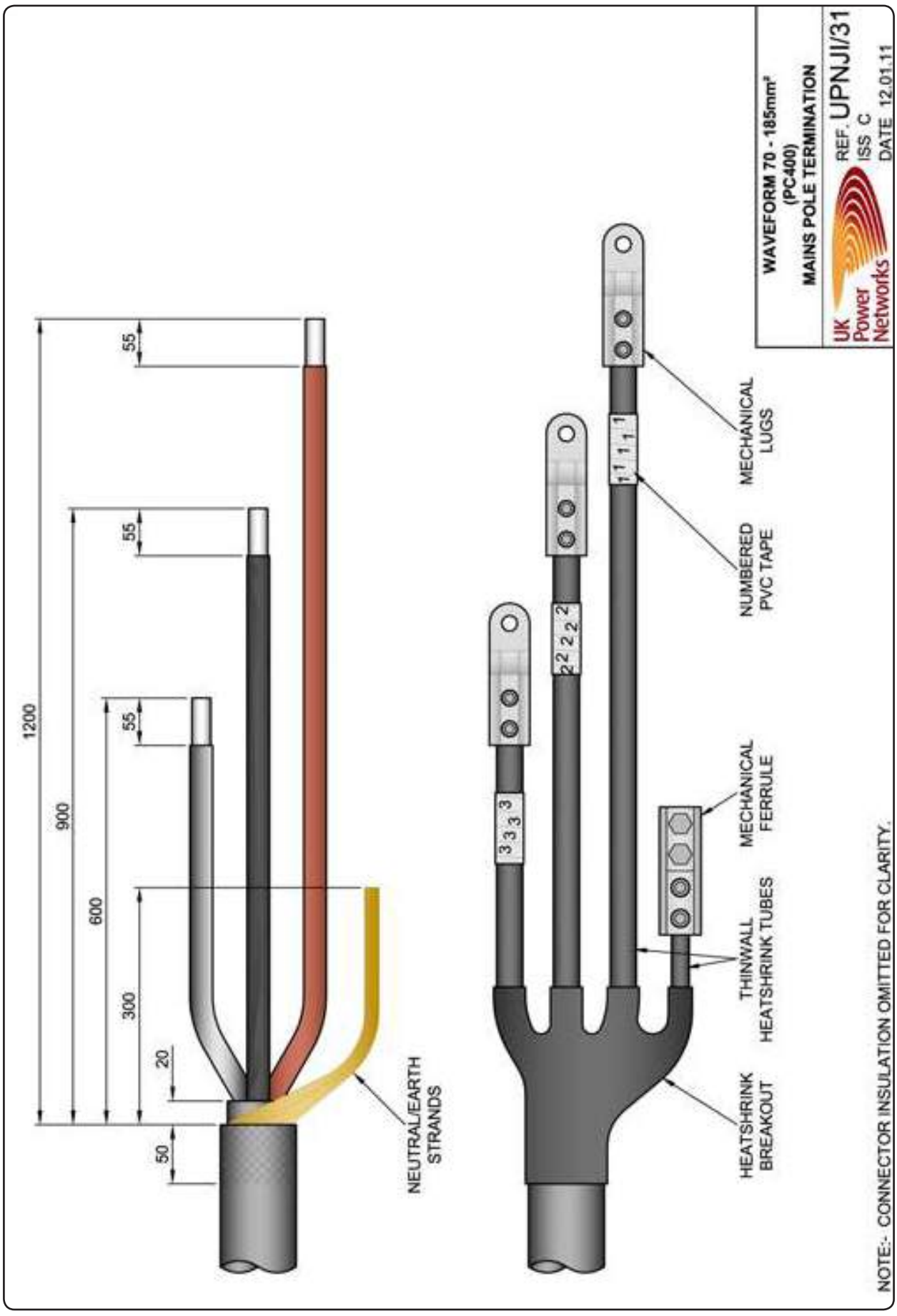
Materials

Cable Sizes (mm²)	Stores Codes	Tyco Kit Ref.
70 to 95	02807N	BAH-038081494
120 to 185	02808X	BAH-038081495

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

- Remove the Waveform cable PVC outer sheath for a distance of 1200mm (Section 3.4.1).
- Clean and abrade the PVC outer sheath for a distance of 50mm (Section 3.4.1).
- Remove any outer bedding (Section 3.4.2).
- Prepare the neutral earth wires (Section 3.4.3) and fold them down along the outer sheath of the cable.
- Remove the inner bedding layer (Section 3.4.4).
- Cut the phase cores to the lengths shown on the jointing instruction UPNJI/31 (Section 3.4.6).
- Form the neutral earth strands into a conductor, parallel with the phase core, using PVC tape to keep the strands together.
- Cut the neutral earth conductor to the length shown on the jointing instruction UPNJI/31.
- Remove the XLPE insulation to the depth of the lug using the phase lugs as a guide (Section 3.4.7).
- Cut the thin wall heat-shrink tube to the length of each core, leaving enough bare conductor on each core to install the phase lugs and the neutral connector.
- Position the thin-wall tube over each core, so that the end is as close to the crutch of the cable as possible and then shrink the tubes in place, starting at the crutch before working up to the conductor (Section 4.10.1).
- Set the cores so that each one can pass through one of the fingers on the four fingered heat-shrink breakout.
- Slide the breakout over the cores and push it right down into the crutch of the cable. Shrink the breakout in place starting at the fingers before moving on to the main body (Section 4.10.3).
- Apply a phase numbered PVC tape (L1, L2, L3 and N) to the corresponding core to identify each phase.
- Connect each phase lug to the cores of the waveform cable using the mechanical lug (Section 4.5.2).
- Position the heat shrink tubes over each lug, so it does NOT cover the lug palm and shrink in place (Section 4.10.2).
- Park the connector insulation heavy-duty heat shrink tube over the neutral earth jumper conductor being used to connect to the overhead line.
- Connect the neutral earth strands of the waveform to neutral earth jumper cable using the mechanical connector (Section 4.3.1).
- Position the 'parked' heavy duty heat-shrink tube centrally over the connector and shrink in place (Section 4.10.2).
- Allow the pole termination to cool before applying any mechanical strain.


WAVEFORM 70 - 185mm²
(PC400)
MAINS POLE TERMINATION
UK Power Networks
REF. UPNJI/31
ISS C
DATE 12.01.11
1200
900
600
300
20
50
55
55
55
55
NEUTRAL/EARTH STRANDS
MECHANICAL LUGS
NUMBERED PVC TAPE
MECHANICAL FERRULE
THINWALL HEATSHRINK TUBES
HEATSHRINK BREAKOUT
NOTE:- CONNECTOR INSULATION OMITTED FOR CLARITY.

2.18 Cut-Outs

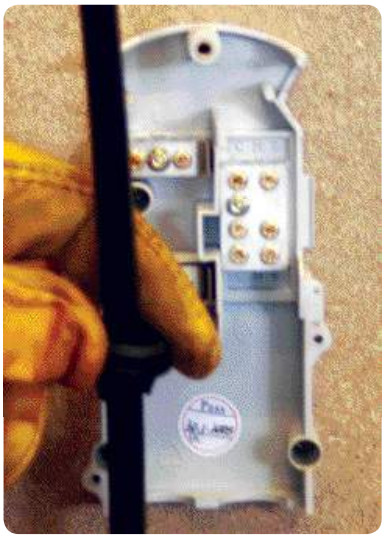
2.18.1 New Single-Phase 25A PME Cut-Outs

Materials

Cable Sizes (mm^2)	Stores Codes	Lucy Product Ref.
4 Cu 16 Al 25 Al	12000K	0260012009

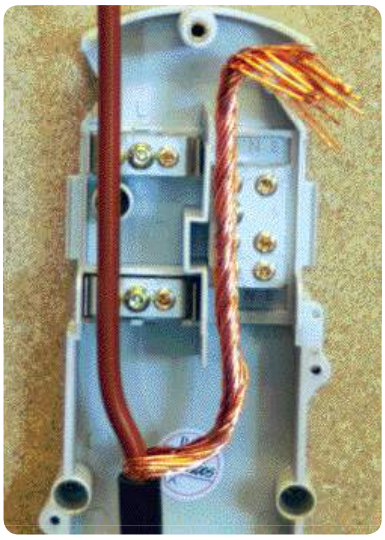
Installation Instructions

- This procedure is for the connection of ‘dead’ concentric service cables only.
- Mount the cut-out on to the board with the screws provided. Offer the cable up against the cutout and cut it to length so that it overlaps the top of the cut-out by approximately 50mm. Pass one of the rubber grommets over the cable and park it below the cut-out.

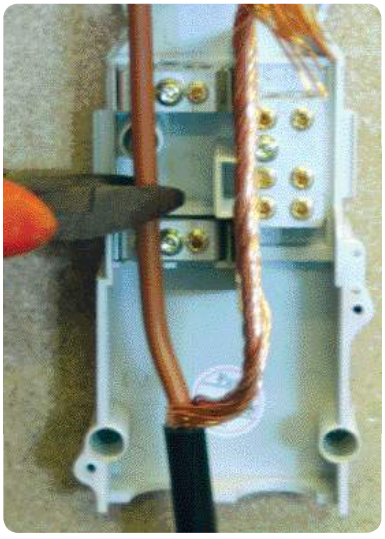


- Mark the removal point of the PVC sheath so that it is at least 20mm inside the cable crutch cover. Remove the PVC sheath (Section 3.5.1).

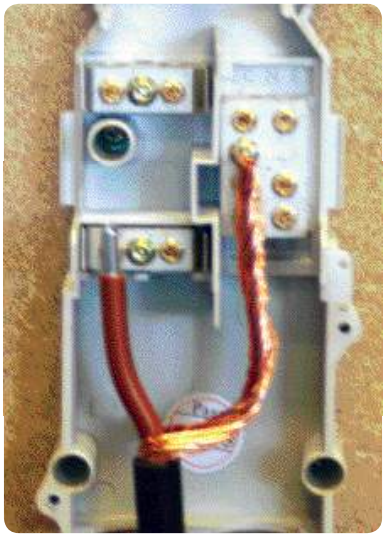
- Prepare the copper neutral earth wires (Section 3.5.2). Set the phase and neutral conductors so that they line up with the terminal in the cut-out to be used.



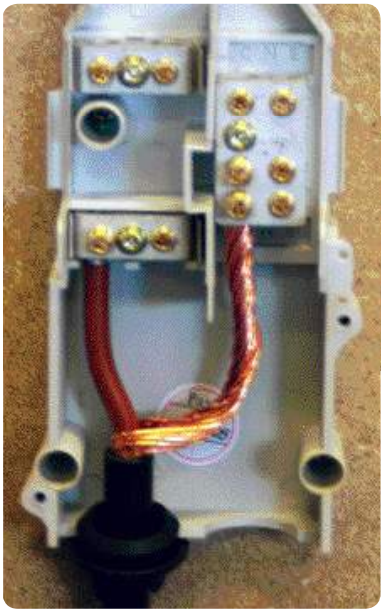
- Cut the phase and neutral conductors to the length required for the terminals to be used in the cut-out.

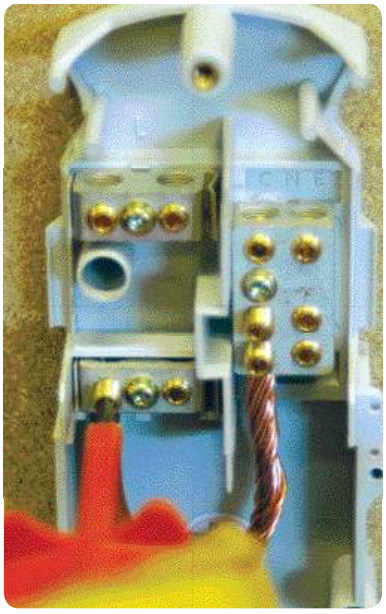


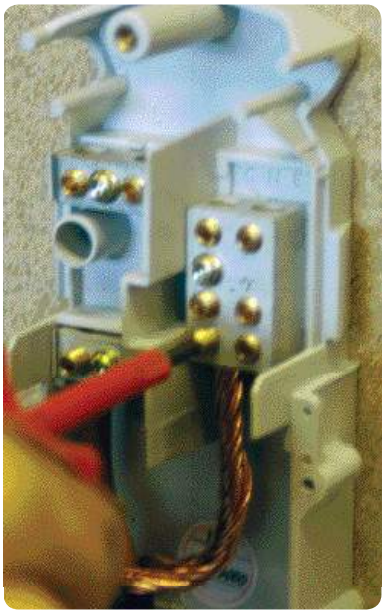
- Remove the insulation from the phase core to the length required by the terminal in the cut-out (Section 3.5.3).



- Insert the correct conductors into the correct terminals of the cut-out and tighten the Allen screws with an approved insulated Allen key tool. Ensure that the conductors are completely installed under both screws of each terminal.







- Install the crutch cover and fix in place with the screws.
- Once energised check the polarity of the cut-out.
- Push the fuse carrier into place and seal with an approved meter sealing device.



- Fix appropriate phase identification (L1, L2, L3 and N) labels to the cut-out.

2.18.2 New Single-Phase 100A PME Cut-Outs

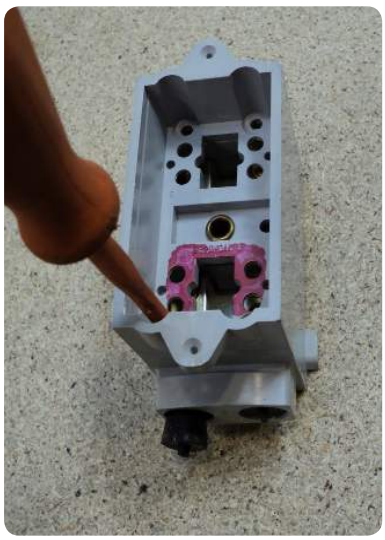
Materials

Cable Sizes (mm^2)	Description	Stores Codes	W.T Henley/ Sicame Product Ref.
25 Al 35 Al	Single-Phase and Neutral 100A Cut-Out Kit	12018W	54367-42
	Single-Phase Service PILC Cable Earth Bond	01761U	CE1/UPN

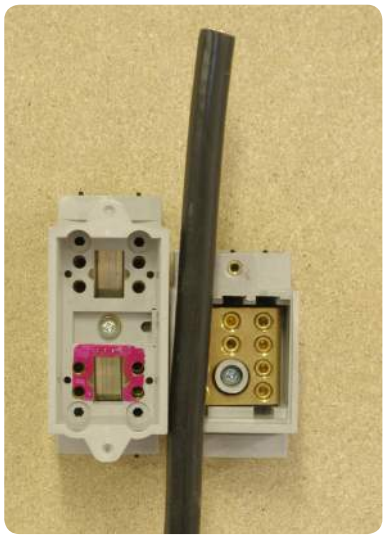
Installation Instructions

- This procedure is meant for the connection of 'dead' concentric service cable only.
- Mount the fuse carrier and neutral block on to the board with the screws provided. The fuse carrier and neutral blocks have a moulded location key to keep them together before they are screwed to the meterboard.

- The blanking plugs in the fuse carrier and neutral earth block are removed by inserting a 3mm insulated Allen key tool into the appropriate hole below the terminal screws.

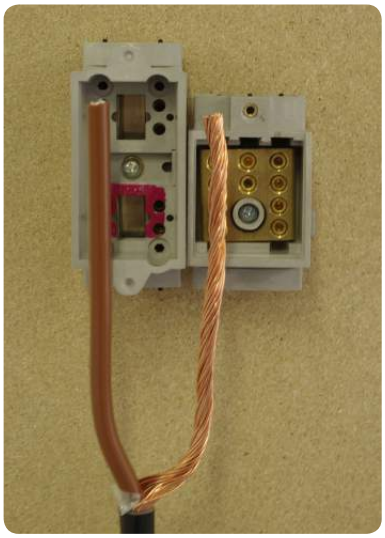


- Offer the cable up against the cutout and cut it to length, so that it overlaps the top of the cut-out by approximately 50mm. Cut one of the rubber grommets to match the outside diameter of the cable, pass it over the cable and park it below the cut-out.

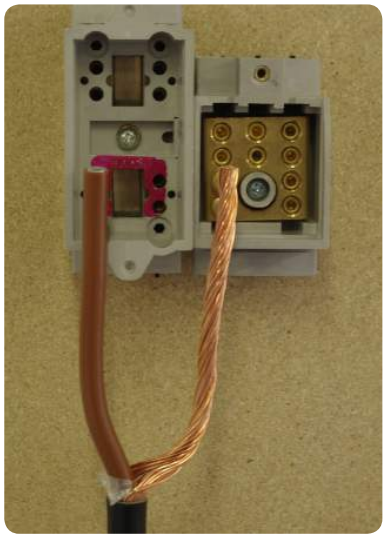


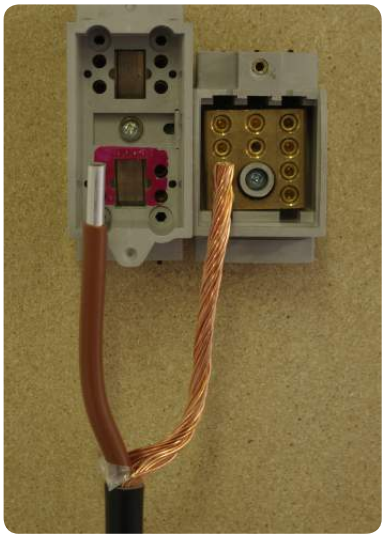
- Mark the removal point of the PVC sheath, so that it is at least 20mm inside the cable crutch cover. Remove the PVC sheath (Section 3.5.1).

- Prepare the copper neutral earth wires (Section 3.5.2). Set the phase and neutral conductors so that they line up with the terminal in the cut-out to be used. Remove any plugs in the cut-out.



- Cut the phase and neutral conductors to the length required for the terminals to be used in the cut-out. Remove the insulation from the phase core to the length required by the terminal in the cut-out (Section 3.5.3).





- Insert the correct conductors into the correct terminals of the cut-out and tighten the Allen screws with an approved insulated Allen key tool. Ensure that the conductors are completely installed under both screws of each terminal.

- Insert one end of the tinned copper braid from the PILC cable earth bond kit into the bottom right hand terminal of the neutral earth block and tighten the Allen screws with an approved insulated Allen key tool. Ensure that the conductors are completely installed under both screws of each terminal.

- Install the crutch cover and fix in place with the screws provided. Ensure that the tinned cooper braid from the neutral earth block is positioned so it comes out of the right hand cable entry in the crutch cover and install the cover using the screws provided.

- Install the "Consumers Earth Connection" label onto the tinned copper braid.

- Install the earth block onto the end of the tinned copper braid and fix the earth block onto the meter board next to the crutch cover of the cut-out.

- Once energised check the polarity of the cut-out.
- Install the plastic cover for the neutral earth block and secure in place with the screw inside the fuse carrier compartment.

- Push the fuse carrier into place and seal with an approved meter sealing device.

- Fix appropriate phase identification (L1, L2, L3 and N) labels to the cut-out and a PME label to the backing board.

2.18.3 New Single-Phase 100A SNE Cut-Outs

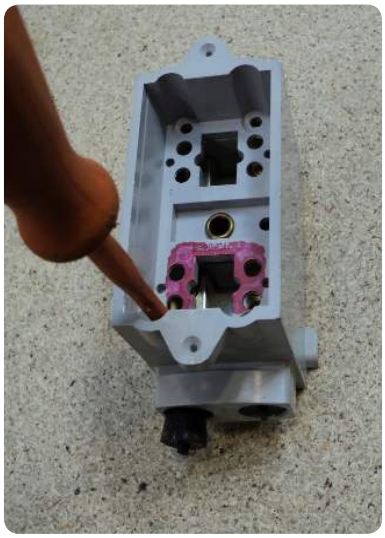
Materials

Cable Sizes (mm^2)	Description	Stores Codes	W.T Henley Product Ref.
25 Al 35 Al	Single-Phase and Neutral 100A Cut-Out Kit	12018W	54367-42
	100A Neutral & Earth Connector Block	12024R	54347-03

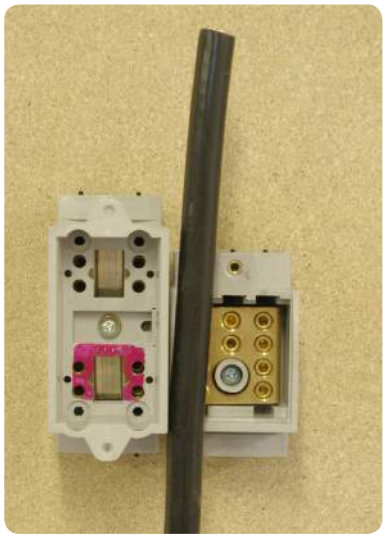
Installation Instructions

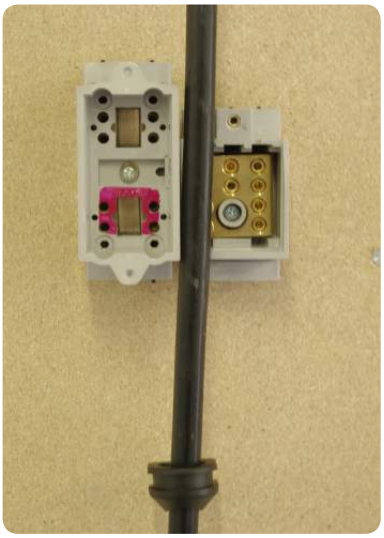
- This procedure is meant for the connection of 'dead' concentric service cable only.
- Mount the fuse carrier and neutral block on to the board with the screws provided. The fuse carrier and neutral blocks have a moulded location key to keep them together before they are screwed to the meterboard.

- The blanking plugs in the fuse carrier and neutral earth block are removed by inserting a 3mm insulated Allen key tool into the appropriate hole below the terminal screws.



- Offer the cable up against the cutout and cut it to length, so that it overlaps the top of the cut-out by approximately 50mm. Cut one of the rubber grommets to match the outside diameter of the cable, pass it over the cable and park it below the cut-out.





- Mark the removal point of the PVC sheath, so that it is at least 20mm inside the cable crutch cover. Remove the PVC sheath (Section 3.5.1).

- Prepare the insulated copper neutral and bare copper earth wires (Section 3.5.2). Set the phase, neutral and earth conductors so that they line up with the terminal in the cut-out and the additional earth block to be used. Remove any plugs in the cut-out.
- Cut the phase, neutral and earth conductors to the length required for the terminals to be used in the cut-out. Remove the insulation from the phase and nautral cores to the length required by the terminal in the cut-out (Section 3.5.3). Install a length of small clear heatshrink tube over the bare earth wires.

- Insert the correct conductors into the correct terminals of the cut-out and tighten the Allen screws with an approved insulated Allen key tool. Ensure that the conductors are completely installed under both screws of each terminal.

- Install the crutch cover and fix in place with the screws provided.

- Once energised check the polarity of the cut-out.
- Install the plastic cover for the neutral earth block and secure in place with the screw inside the fuse carrier compartment.

- Push the fuse carrier into place and seal with an approved meter sealing device.
- Fix appropriate phase identification (L1, L2, L3 and N) labels to the cut-out and ensure that the cover for the earth block is displying the earth symbol.

2.18.4 New 3-Phase 100A PME Cut-Outs

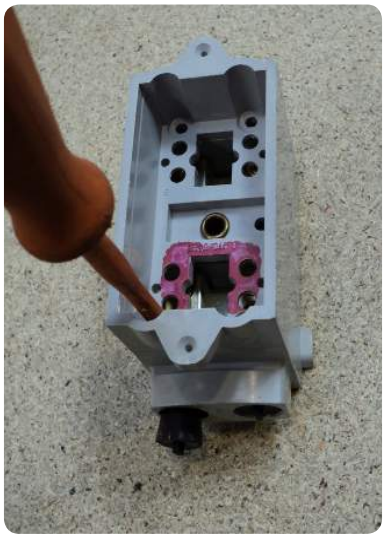
Materials

Cable Sizes (mm^2)	Description	Stores Codes	W.T Henley Product Ref.
25 Al 35 Al	Three-Phase and Neutral 100A Cut-Out Kit	12019G	54367-43
	Single-Phase Service PILC Cable Earth Bond	01761U	CE1/UPN

Installation Instructions

- This procedure is meant for the connection of ‘dead’ concentric service cable only.
- Mount the fuse carrier and neutral block on to the board with the screws provided. The fuse carrier and neutral blocks have a moulded location key to keep them together before they are screwed to the meterboard.

- The blanking plugs in the fuse carrier and neutral earth block are removed by inserting a 3mm insulated Allen key tool into the appropriate hole below the terminal screws.



- Offer the cable up against the cut-out and cut it to length, so that it overlaps the top of the cut-out by approximately 50mm.

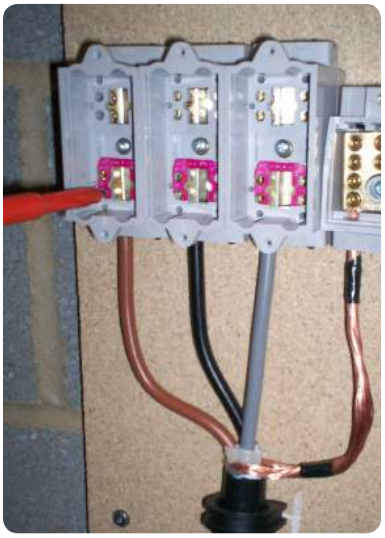
- Mark the removal point of the PVC sheath, so that it is at least 20mm inside the cable crutch cover. Remove the PVC sheath (Section 3.6.1).

- Prepare the copper neutral earth wires (Section 3.6.2).

- Set the phase and neutral conductors so that they line up with the terminal in the cut-out to be used.

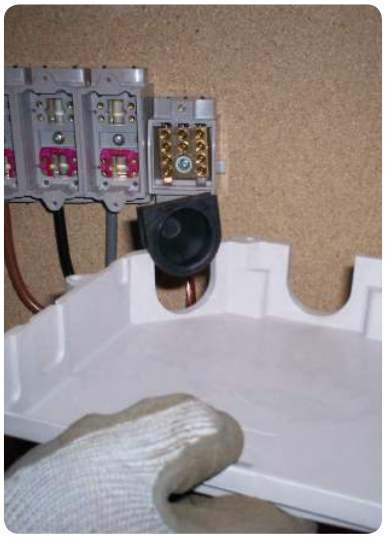
- Cut the phase and neutral conductors to the length required for the terminals to be used in the cut-out. Remove the insulation from the phase cores to the length required by the terminal in the cut-out (Section 3.6.3).

- Insert the correct conductors into the correct terminals of the cut-out and tighten the Allen screws with an approved insulated Allen key tool. Ensure that the conductors are completely installed under both screws of each terminal.

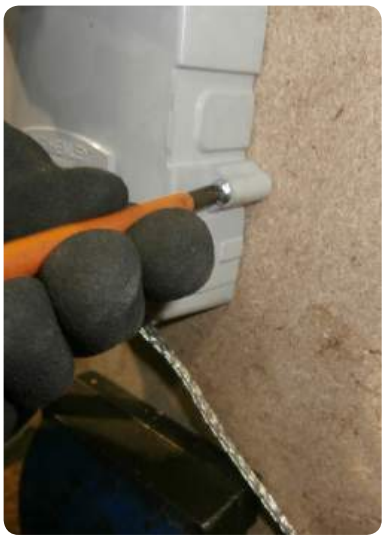


- Insert one end of the tinned copper braid from the PILC cable earth bond kit into the bottom right hand terminal of the neutral earth block and tighten the Allen screws with an approved insulated Allen key tool. Ensure that the conductors are completely installed under both screws of each terminal.

- Install the rubber grommets into the open holes in the crutch cover.



- Install the crutch cover and fix in place with the screws provided. Ensure that the tinned cooper braid from the neutral earth block is positioned so it comes out of the right hand cable entry in the crutch cover.



- Install the "Consumers Earth Connection" label onto the tinned copper braid.

- Install the earth block onto the end of the tinned copper braid and fix the earth block onto the meter board next to the crutch cover of the cut-out.

- Once energised check the polarity of the cut-out.
- Fix appropriate phase identification (L1, L2, L3 and N) labels to the cut-out and a PME label to the backing board.

- Install the plastic cover for the neutral earth block and secure in place with the screw provided.

- Push the fuse carriers into place and seal with an approved meter sealing device.

2.18.5 New 3-Phase 200A PME and SNE Cut-Outs on Waveform Cables

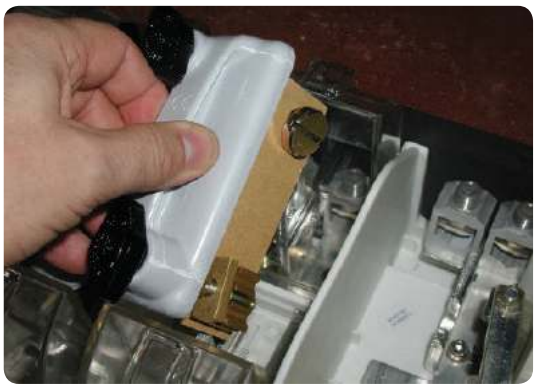
Materials

Cable Sizes (mm^2)	Description	Stores Codes	Lucy Product Ref.
Incoming 50 to 185	Three-Phase and Neutral 200A Heavy Duty Cut-Out Kit	12030L	0610071009
Outgoing 25 to 150			

Installation Instructions

- This procedure is meant for the connection of 'dead' waveform cables only.
- Remove the front cover of the cut-out. The mechanical connectors are supplied connected to relevant terminals.
- All screw fixings are retained and have a universal head requiring a crosshead or flat blade screwdriver. Four screws secure the cover giving access to the connections and fuse carriers.

- Remove the fuse carriers, phase and neutral screening and foam cable access.



- Place screening and internal components in a safe location where they will not be lost or damaged.

- Mount the cut-out on to the required surface with suitably sized screws. The top two fixings are key-holed to allow easy fixing and the mounting dimension are embossed on the cut-out body.

- Position and secure the cable trough using the four screw points provided.

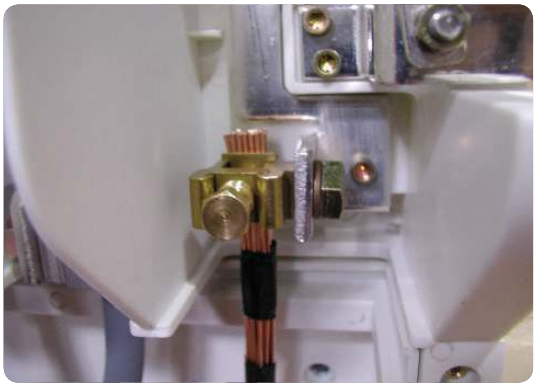
- Once the cut-out is mounted offer the cable up against the cut-out and cut it to length, so it overlaps the top of the cut-out by approximately 50mm.

- Cut out the centre of one of the supplied grommets to match the diameter of the cable to be installed and slide it down over the cable, so it can be easily installed.

- Mark the removal point of the PVC sheath, so that it is at least 20mm inside the cable crutch cover. Remove the PVC sheath using the method described in Section 3.4.1 of the UK Power Networks LV Jointing Manual.
- Prepare the waveform cables as described in Sections 3.4.2 to 3.4.4.
- If the cut-out is installed below the level at which the cable enters the building, install a 4-finger heat-shrink breakout as described in Section 4.10.3.
- Set the phase and neutral conductors so that they line up correctly with the appropriate mechanical connectors in the cut-out.
- Once all the phases are aligned correctly cut each of the cores to the required length for the mechanical connectors, as described in Section 3.4.5.
- Remove the XLPE insulation from the phase core as described in Section 3.4.6.

- Install all 3-Phase conductors into the mechanical phase connectors and shear off, as described in Section 4.6.1.

- Install the neutral conductor into the mechanical neutral earth connector and shear off, as described in Section 4.1.1.

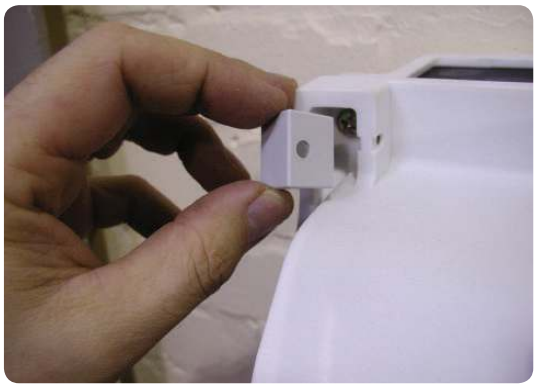


- Reinstall all phase barriers, phase stalk shrouds, rubber grommets and the cable entry board in to the cut-out.

- Install the cable sealing chamber cover and the red incoming phase shrouds.

- Once the cut-out has been made live carry out polarity test and fix phase identification (L1, L2, L3 and N) labels to the cut-out and a PME label close by.
- Install the fuse cover.

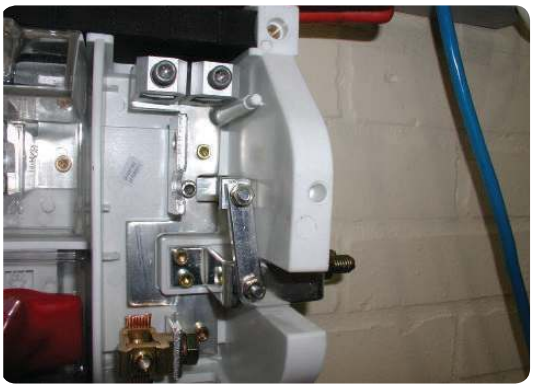
- Install screw guards and seal with an approved meter sealing device. Six screw guards are provided one for each of the screws on the cut-out lid and two for the cable trough.



Adapting a New 3-Phase 200A for Use as an SNE Service

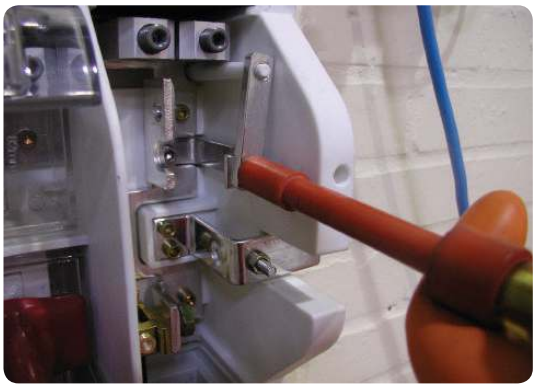
Where the cut-out is used for SNE services such as Temporary Building Supplies the split link can be opened and parked as shown to provide a separate neutral and earth path.

- The PME/SNE split link is located under the neutral screening cover on the right of the cut-out.
- Using an insulated 10mm spinner or insulated spanner undo and remove the retaining nuts.



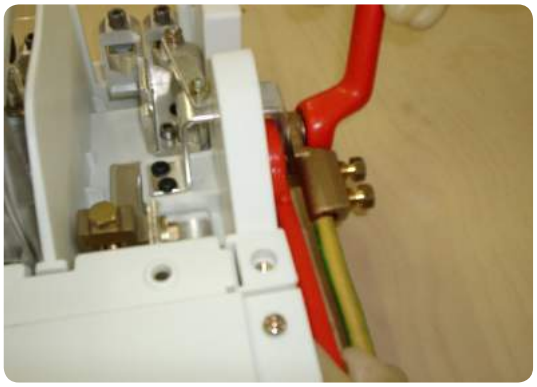
- Remove the split link and reposition in the in the position shown.

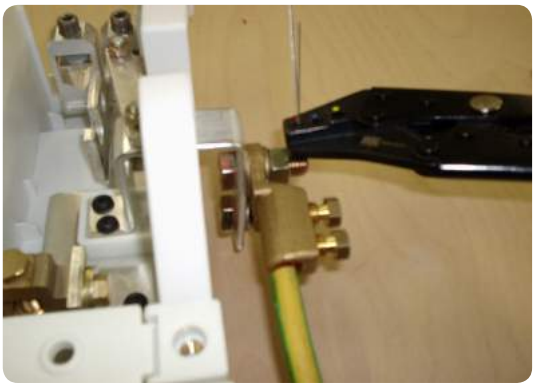
- Re-tighten the two retaining screws in position and replace screening.



Security Sealing of an External PME/SNE Earth Connection

Where the an external earth cable is required to connected to the external earth bar of a heavy duty cutout. The earth cable complete with mechnical lug shall be bolted to the external earth bar uisng the nut and bolt provided and security sealed in place, using a meter sealing wire and crimp, installed through the hole in the thread of the bolt.





2.18.6 New 3-Phase 400 and 600A PME and SNE Cut-Outs on Waveform Cables

Materials

Cable Sizes (mm^2)		Description	Stores Codes	Lucy Product Ref.
Incoming Waveform	Outgoing			
70 to 185	50 to 240	Three-Phase and Neutral 400A Heavy Duty Cut-Out Kit	12033Q	0620073009
70 to 300	50 to 300	Three-Phase and Neutral 630A Heavy Duty Cut-Out Kit	12034A	0630065009

See engineering document for full details of the UK Power Networks SAP codes and W Lucy part codes for spare and additional parts:

- EAS 08-0001 HDC 400A and 600A Heavy-Duty Cut-Outs from W Lucy.

Installation Instructions

- This procedure is meant for the connection of ‘dead’ waveform cables only.
- Remove the front cover of the cut out. The mechanical connectors are supplied connected to relevant terminals.
- All screw fixings are retained and have a universal head requiring a crosshead or flat blade screwdriver. Four screws secure the cover giving access to the connections and fuse carriers.

- Remove the fuse carriers, phase and neutral screening and foam cable access.

- Place screening and internal components in a safe location where they will not be lost or damaged.
- Mount the cut-out on to the required surface with suitably sized screws. The top two fixings are key-holed to allow easy fixing and the mounting dimension are embossed on the cut-out body.

- Position and secure the cable trough using the four screw points provided.

- Once the cut-out is mounted offer the cable up against the cut-out and cut it to length, so it overlaps the top of the cut-out by approximately 50mm.

- Cut out the centre of one of the supplied grommets to match the diameter of the cable to be installed. Slide it down over the cable, so it can be easily installed.

- Mark the removal point of the PVC sheath, so that it is at least 20mm inside the cable crutch cover. Remove the PVC sheath using the method described in Section 3.4.1.
- Prepare the waveform cables as described in Sections 3.4.2 to 3.4.4.
- If the cut-out is installed below the level at which the cable enters the building, install a 4-finger heat-shrink breakout as described in Section 4.10.3.
- Set the phase and neutral conductors so that they line up correctly with the appropriate mechanical connectors in the cut-out. **Note** the conductors can be installed with either the delta up or down.

- Once all the phases are aligned correctly cut each of the cores to the required length for the mechanical connectors, as described in Section 3.4.6.
- Remove the XLPE insulation from the phase core as described in Section 3.4.7.

- Install all three phase conductors into the mechanical phase connectors and shear off, as described in Section 4.6.1.

- Install the neutral conductor into the mechanical neutral earth connector and shear off, as described in Section 4.1.1.

- Re-install all phase barriers, phase stalk shrouds, rubber grommets and the cable entry board in to the cut out.

- Once the cut-out has been made live carry out polarity test and fix phase identification(L1, L2, L3 and N) labels to the cut-out and a PME label close by.
- Install the fuse cover.

- Install screw guards and seal with an approved meter sealing device. Six screw guards are provided one for each of the screws on the cut-out lid and two for the cable trough.

Adapting a New 3-Phase 400 and 600A for Use as an SNE Service

Where the cut-out is used for SNE services such as Temporary Building Supplies the split link can be opened and parked as shown to provide a separate neutral and earth path.

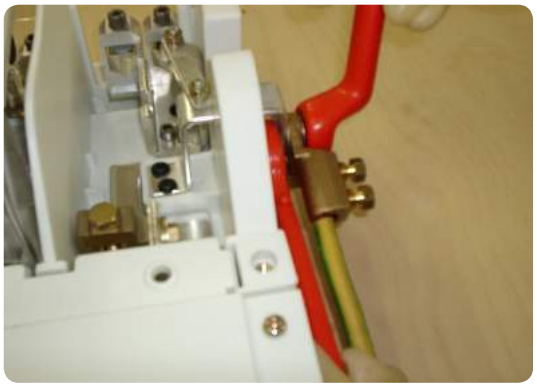
- The PME/SNE split link is located under the neutral screening cover on the right of the cut-out.
- Using an insulated 10mm spinner or insulated spanner undo and remove the retaining nuts.

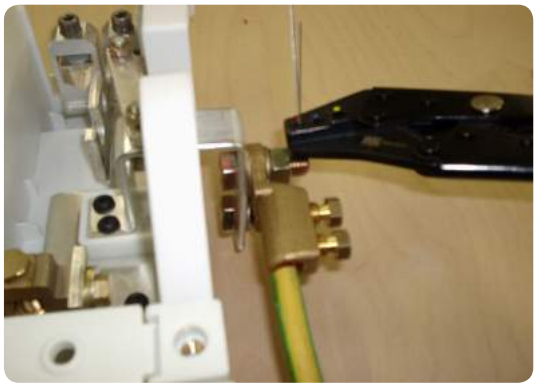
- Remove the split link and reposition in the in the position shown.

- Re-tighten the two retaining screws in position and replace screening.

Security Sealing of an External PME/SNE Earth Connection

Where the an external earth cable is required to connected to the external earth bar of a heavy duty cutout. The earth cable complete with mechnical lug shall be bolted to the external earth bar uisng the nut and bolt provided and security sealed in place, using a meter sealing wire and crimp, installed through the hole in the thread of the bolt.





2.18.7 Multi-service Distribution Boards

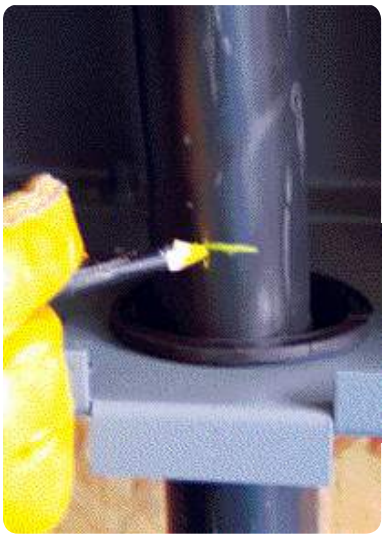
Materials

Cable Sizes (mm^2)	Description	Stores Codes	Suppliers Ref.
300	24-way Multi-Service Distribution Unit	12058G	Lucy - S24 MSDB 100A
	4 finger Heat Shrink Break Out	02334W	Tyco - 502K016/S(S5)

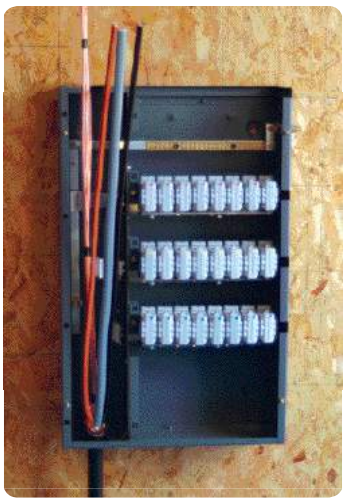
Installation Instructions

- This procedure is meant for the connection of 'dead' waveform cables only.
- Remove the front cover and the front of the cable sealing chamber from the cut-out as supplied in the box. The mechanical connectors are supplied connected to relevant terminals.

- Mount the cut-out onto the required surface with suitably sized wood screws. Offer the cable up against the cut-out and cut it to length, so that it overlaps the top of the cut-out by approximately 50mm.



- Cut out the centre of one of the grommets to match the diameter of the cable to be installed and slide it down over the cable, so it is in the position where it will be installed.
- Mark the removal point of the PVC sheath, so that it is at least 20mm inside the cable crutch cover. Remove the PVC sheath (Section 3.4.1).



- Prepare the waveform cables (Sections 3.4.2 to 3.4.4).
- If the cut-out is installed below the level at which the cable enters the building, install a 4-finger heat-shrink break out (Section 4.10.3).
- Set the phase and neutral conductors so that they line up with the appropriate mechanical connectors in the cut-out.
- Install the neutral conductor into the mechanical neutral earth connector and shear off (Section 4.1.1).
- Cut each of the cores to the required length for the mechanical connectors (Section 3.4.6).
- Remove the XLPE insulation from the phase core (Section 3.4.7).
- Install all 3-Phase conductors into the mechanical phase connectors and shear off (Section 4.6.1).
- Reinstall all phase barriers, rubber grommets and the cable entry board into the cut-out.
- Once the MSDB has been made live carry out polarity test and fix phase identification(L1, L2, L3 and N) labels to the cut-out and a PME label close by.
- Install the front cover and seal with an approved meter sealing device.

2.19 Termination of Waveform Cable into LV Distribution Cabinets and LV Boards

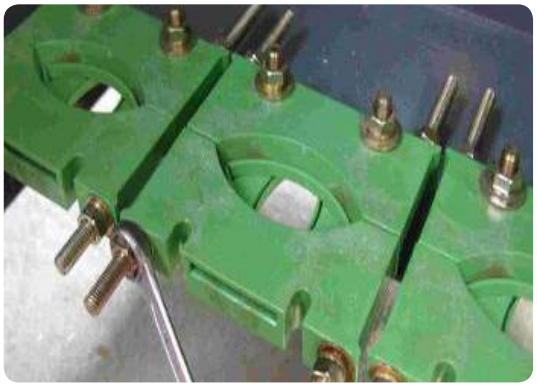
Materials

Cable Sizes (mm^2)	Description	Stores Codes	Sicame Product Ref.
95 to 300	LV Plant Termination Kit	04518S	HMFMC300TK1/UPN

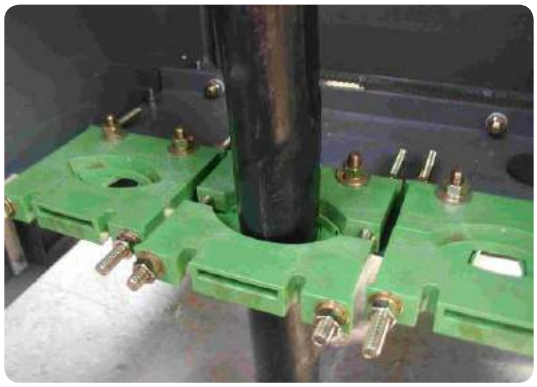
Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

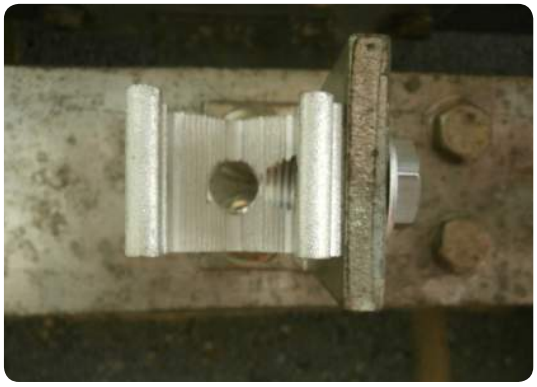
- Remove any screening, then loosen the cable cleat and install the cable.



- Mark the removal point of the PVC sheath, so that it is at least 50mm inside the cable crutch cover. Remove the PVC sheath (Section 3.4.1).
- Install cable and assemble cable cleat and tighten to grip the cable.

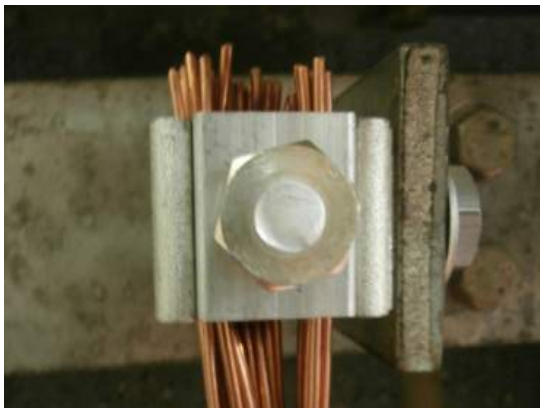


- Mount the UMT300 connector onto the neutral busbar. Secure it to the busbar using the bolt and domed washer provided. Either directly to the bus-bar or using the "L" shaped bracket supplied with LV Board.
- The 40mm washer provided is domed and MUST be installed with the dome outwards to provide the correct torque.

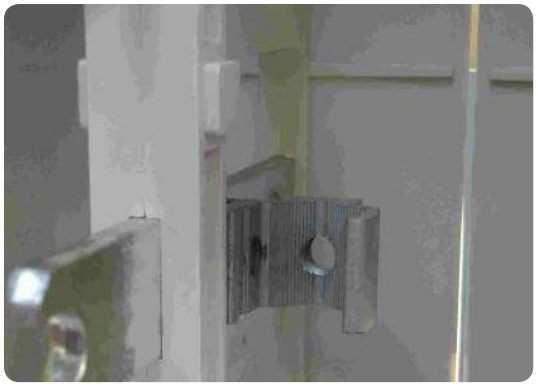


- Set the phase and neutral conductors so that they line up with the appropriate mechanical connectors positions on the LV Board.

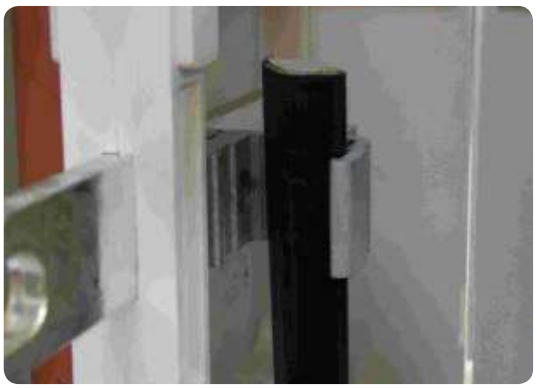
- Install the neutral conductor into the mechanical neutral earth connector and shear off (Section 4.1.1).



- Depending on the lay of the cable cores the UMT300 connectors may be positioned in either the front or rear hole on both sides of the busbar. This prevents the need to cross the cores inside the cabinet.
- Once the lay of the cable has been decided. Install the phase connectors and shear off the bolt securing it to the busbar.
- The 40mm washer provided is domed and MUST be installed with the dome outwards to provide the correct torque.



- Cut each of the cores to the required length for the mechanical connectors (Section 3.4.6).
- Remove the XLPE insulation from the phase core (Section 3.4.7).



- Install all 3-Phase conductors into the mechanical phase connectors and shear off (Section 4.6.1).

- Replace the screening and secure in place.

2.20 2 and 4-Way LV Link Boxes

2.20.1 Tailed Link Boxes

Materials

Cable Sizes (mm^2)	Description	Stores Codes	Prysmian Product Ref.	Resin Volume
95 to 300	2-way Tailed Link Box	04491L	82202T30L	N/A
	4-way Tailed Link Box	04494Q	82402T30L	N/A

Installation Instructions

Preparation of Joint Bay and Link Box

Ensure continuous reliable operation by installing link boxes on a firm level base.

Use the light weight slab supplied to form a firm base in the bottom of the joint hole. The minimum dimensions for these concrete paving slabs are as follows:

2-way tailless link box – 450mm x 450mm x 35mm

2-way tailled link box – 450mm x 450mm x 35mm

4-way tailless link box – 750mm x 600mm x 50mm

4-way tailed link box – 750mm x 600mm x 50mm

- The manufacturer supplies each link box as a complete kit, usually on a wooden pallet.
- Unpack each link box before any jointing takes place. Check each component off against the included packing list and report any damaged or missing items directly to the issuing Logistics Stores.
- Do not install link boxes with damaged link chambers onto the network under any circumstances.

Installation into Joint Hole

- Place the link box onto the previously prepared surface before any jointing work commences.
- Ensure that the link box sits centrally over the paving slabs and is firm and level.
- Joint the link box to the surrounding network using appropriate joints.

2.20.2 Waveform Cable in to an Un-Tailed Box

Materials

Cable Sizes (mm^2)	Description	Stores Codes	Prysmian Product Ref.	Resin Volume
95 to 300	2-way Un-Tailed Link Box	04490B	82202000L	10 litres per joint shell
	4-way Un-Tailed Link Box	04493F	82402000L	10 litres per joint shell

Installation Instructions

Preparation of Joint Bay and Link Box

Ensure continuous reliable operation by installing link boxes on a firm level base.

Use the concrete paving slab supplied to form a firm base in the bottom of the joint hole. The minimum dimensions for these concrete paving slabs are as follows:

2-way tailless link box – 450mm x 450mm x 35mm

2-way tailled link box – 450mm x 450mm x 35mm

4-way tailless link box – 750mm x 600mm x 50mm

4-way tailed link box – 750mm x 600mm x 50mm

- The manufacturer supplies each link box as a complete kit, usually on a wooden pallet.
- Unpack each link box before any jointing takes place. Check each component off against the included packing list and report any damaged or missing items directly to the issuing Logistics Stores.

- Do not install link boxes with damaged link chambers onto the network under any circumstances.

Installation into Joint Hole

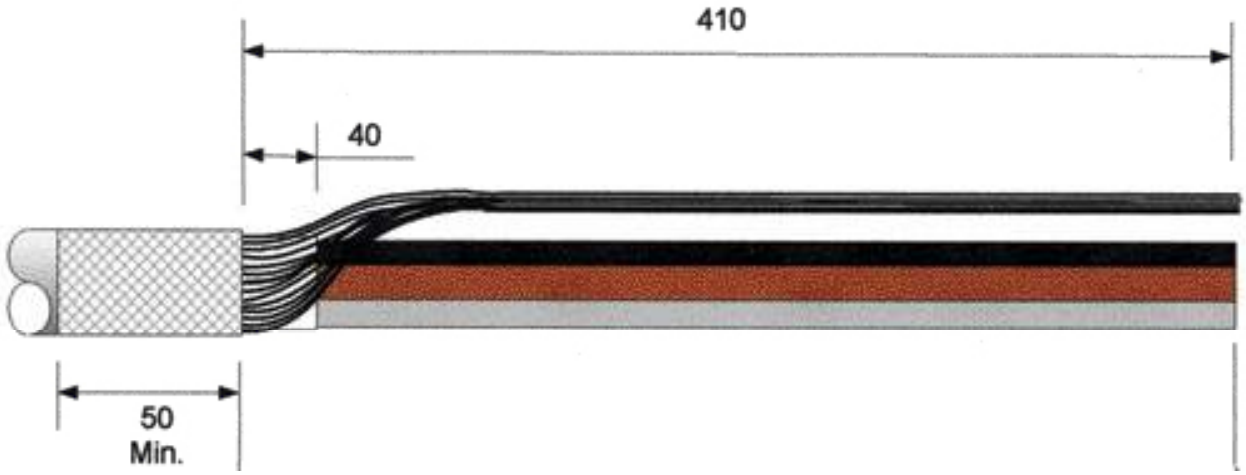
- Place the link box onto the previously prepared surface before any jointing work commences.
- Ensure that the link box sits centrally over the paving slabs and is firm and level.

Jointing Instructions

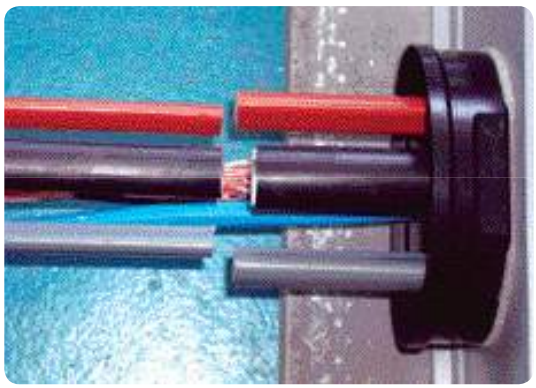
For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

Only 95mm^2, 185mm^2 and 300mm^2 waveform cables can be jointed to this type of link box:

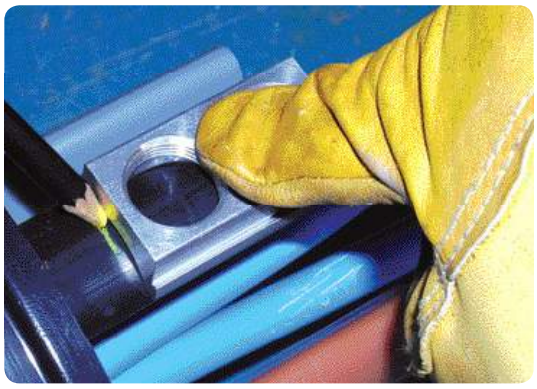
- To avoid crossing the cores of the waveform cable the colour rotation of cores should be chosen to line up with the cable emerging from the centre section of the box.
- Clean, degrease and abrade the outer PVC sheath for a distance of 50mm.
- Each length of waveform cable should be stripped to the dimensions shown below (Sections 3.4.1 to 3.4.6).



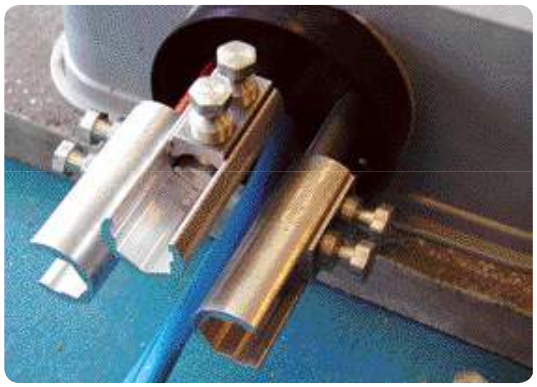
- Set up the waveform cores so that they are in line with the three cores coming out of the centre section of the link box.



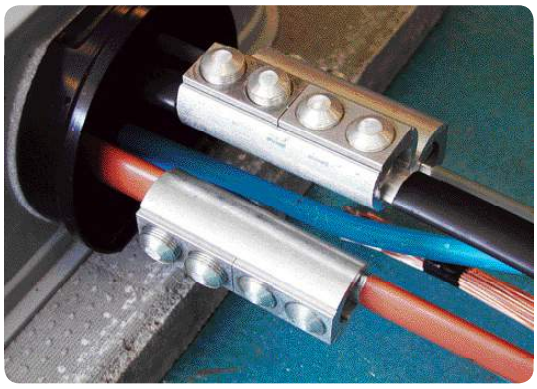
- Remove the XLPE insulation from each of the core ends using the bridge pieces from the mechanical straight connectors as a guide, both on the link box and the cable tail (Section 3.4.7).



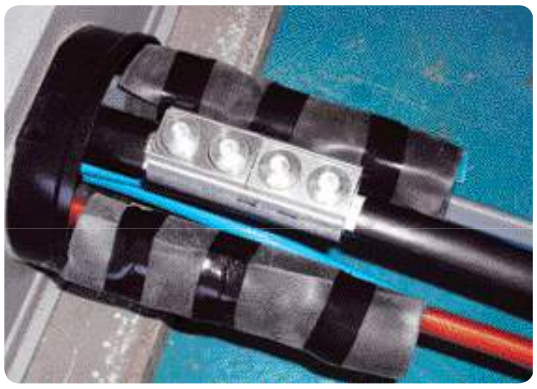
- Install all three mechanical straight connectors on to the cable stubs on the link box (Section 4.3.1).



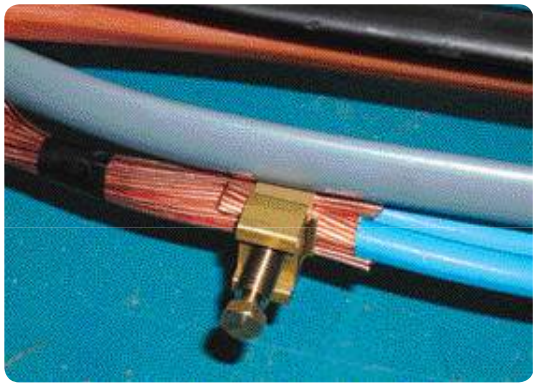
- Install all the prepared cable ends into the mechanical straight connectors and shear off all four bolts (Section 4.3.1). The bolts should be sheared in pairs with each bolt being tightened a few turns at time to ensure that equal torque is applied to the conductor.

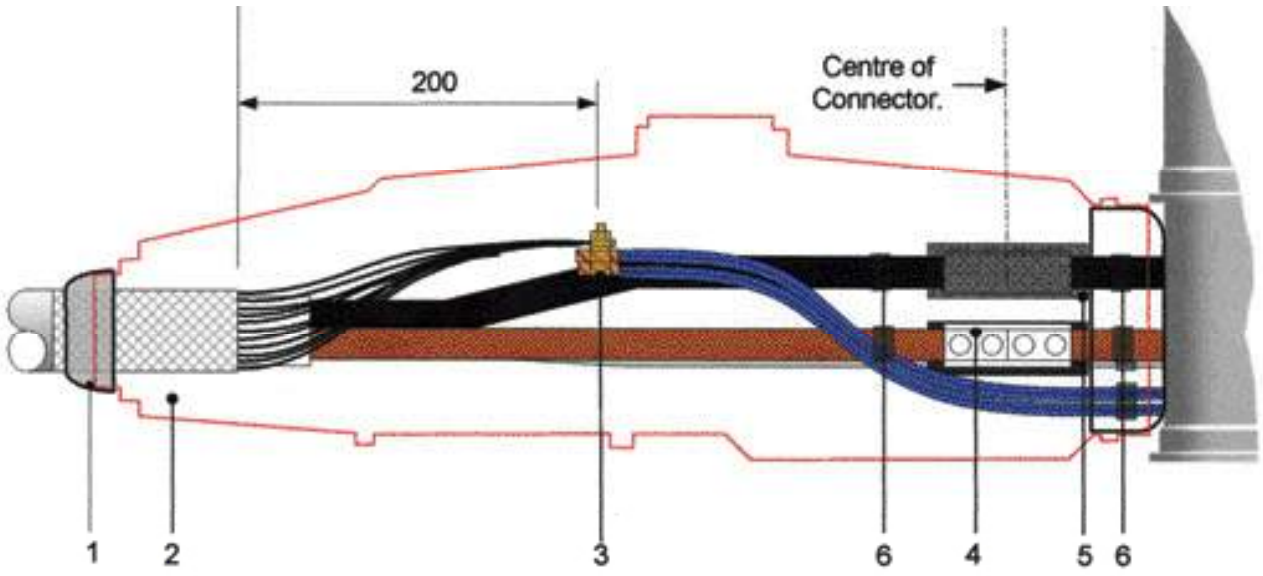


- Install the CR sheet patches around each connector in turn (Section 4.9.4). Use additional PVC tape around each patch to ensure that the patch does not touch the sides of the plastic joint shell.

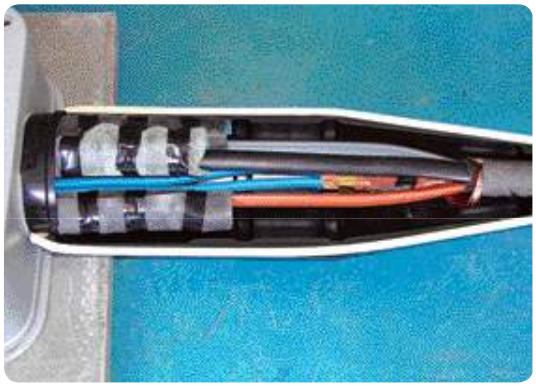


- Cut the neutral earth conductors to length on both the link box and the cable tail, so that they overlap sufficiently to enable the brass CNE shear-bolt connector to be installed, as shown in the diagram below. Install the mechanical brass connector in the position indicated and shear off (Section 4.1.3).





Item No.	Description
1	Joint Shell Sealing Putty
2	PCA84 Joint Shell
3	Neutral Earth Mechanical Connector
4	BM300M Mechanical Phase Connector
5	CR Sheet Insulation Patch



- Fit the two halves of the plastic joint shell (Section 4.8.1). Install metal clips and brown putty to ensure that JEM resin does not leak out when installed.
- Fill each joint shell (two on 2-way box and four on 4-way box) with the required amount of JEM resin as shown in the table at the start of this section (Section 4.8.2).
- Repeat the above procedure for each cable pocket.

2.20.3 PILC Cable into an Un-Tailed Box

Materials

Cable Sizes (mm^2)	Description	Stores Code	Prysmian Product Ref.	Resin Volume
50 to 300	2-Way Un-Tailed Link Box	04490B	82202000L	12 litres per joint shell
50 to 300	4-Way Un-Tailed Link Box	04493F	82402000L	12 litres per joint shell
50 to 300	Pair of larger Joint Shells for PILC Cables	04487L	PCA77	12 litres per joint shell
50 to 95	PILC Cable Neutral Earth Connector Kit	02785F	PLB95/UPN	N/A
120 to 300	PILC Cable Neutral Earth Connector Kit	02786Q	PLB300/UPN	N/A

Additional Van Stock Items

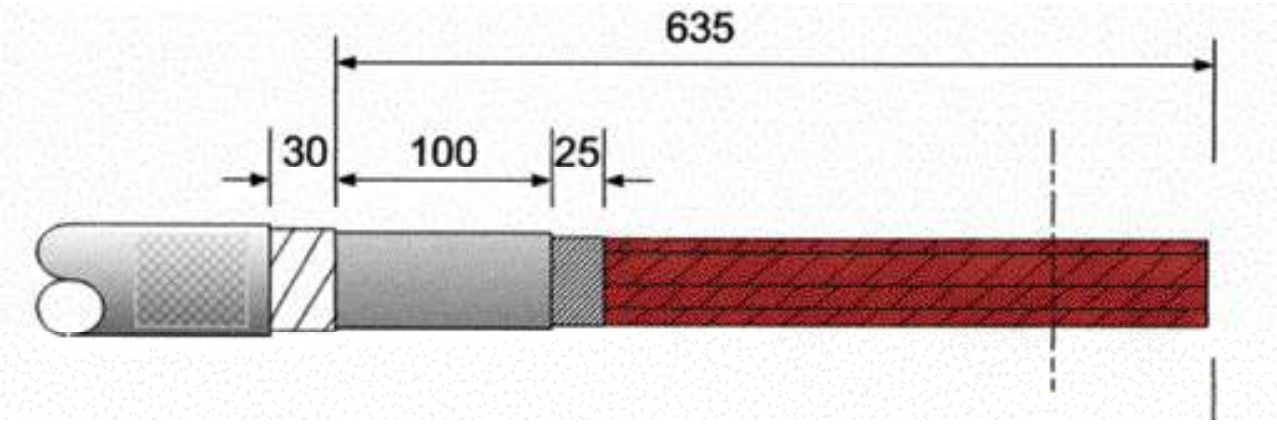
Description	Stores Codes
35mm^2 Green and Yellow Earth Wire	05864Y
50mm^2 Green and Yellow Earth Wire	05866T

Installation Instructions

For details of cable preparation, the installation of mechanical connectors and associated components refer to the relevant sections of the UK Power Networks Jointing Manual shown below. All dimensions in millimetres (mm).

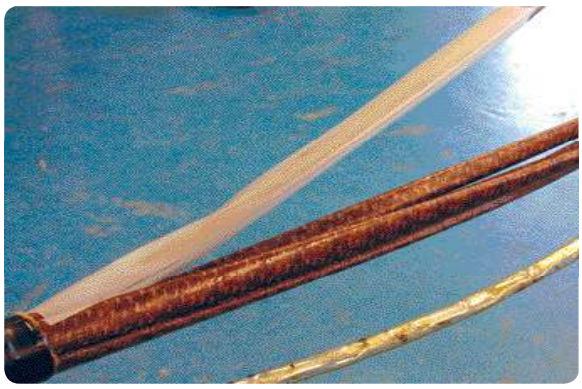
This method can be used to make a ‘live’ connection to a new link box:

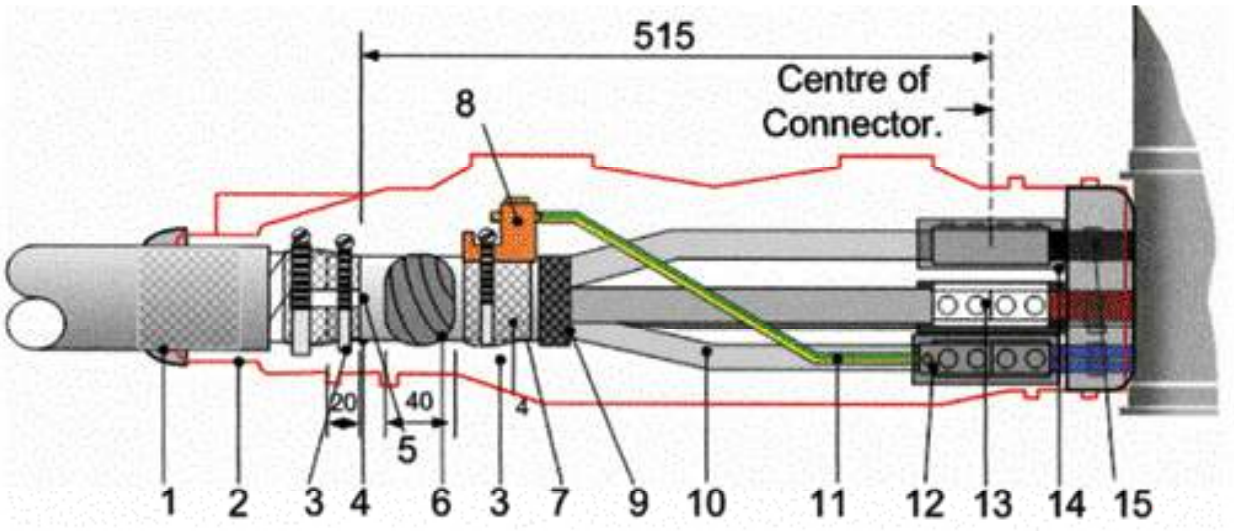
- Prepare the PILC cable (Section 3.2.1 to 3.2.7) to the minimum dimensions in the drawing below, using the link box and half joint shell supplied in the kit as guide.



- Temporarily shroud all exposed metalwork (Section 4.9.3).

- Cut each phase core, install a length of clear heat-shrink tube and permanently shroud the ‘live’ cut end with a heat-shrink cap (Section 3.2.8).
- Cut the neutral core, install a length of clear heat-shrink tube and permanently shroud the ‘live’ cut end with a heat-shrink cap (Section 3.2.8).

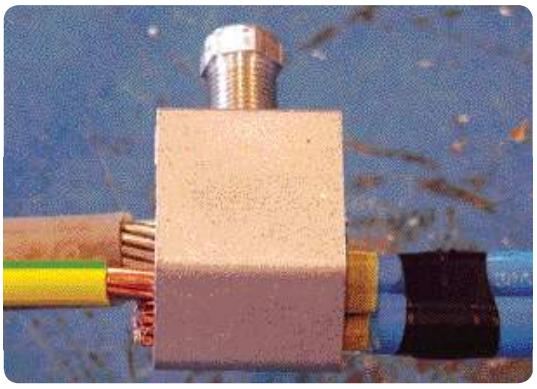


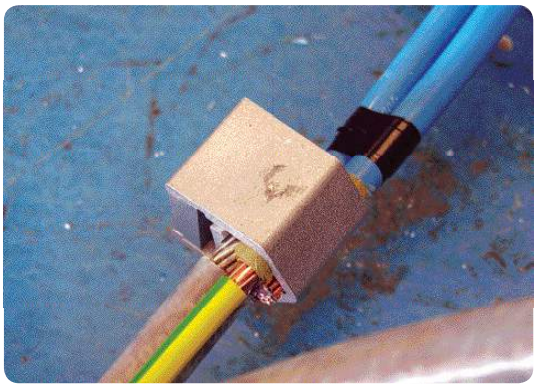


Item No.	Description
1	Joint Shell Sealing Putty
2	PCA77 Joint Shell
3	Worm Drive Clips
4	Tinned Copper Braid
6	Black Moisture Sealing Mastic
7	Tinned Copper Mesh
8	Brass Saddle
9	PVC Tape
10	Clear Heatshrink Tube
11	50mm^2 Green and Yellow Earth Wire
12	CR Sheet Insulation Patch
13	BM300M Mechanical Phase Connector
14	Neutral Earth Mechanical Connector
15	Black Moisture Sealing Mastic

- Remove all temporary shrouding from the lead sheath and armours.
- Cut the neutral core to the required length (Section 3.2.8) and remove the paper insulation (Section 3.2.9).

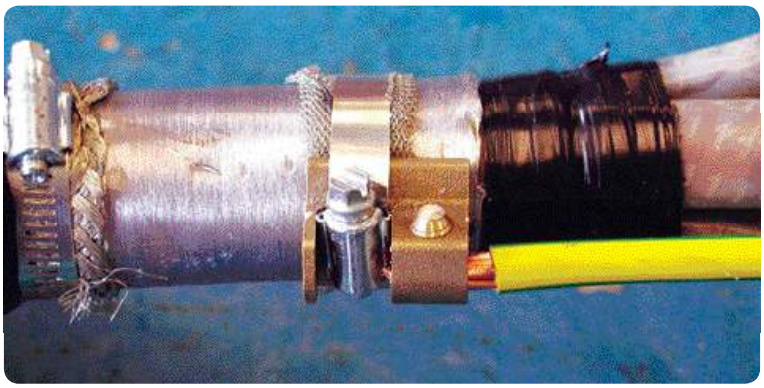
- Install the US3 mechanical neutral earth connector, including an appropriate length of 50mm green and yellow earth wire.





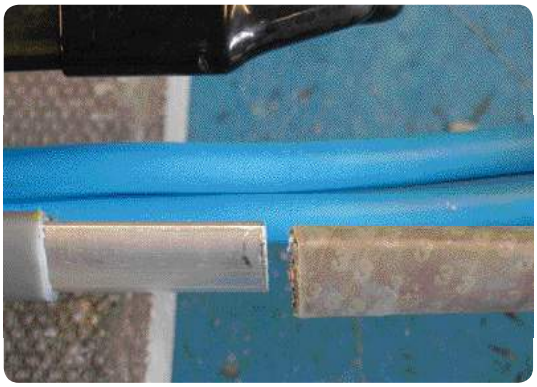
- Insulate the US3 connector with the piece of CR sheet insulation (Section 4.9.4).

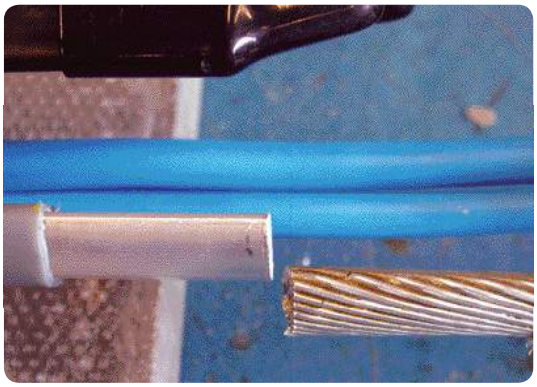
- Install the PILC Main PME bond (Section 4.7.3).



- Temporarily shroud all exposed metalwork (Section 4.9.3).

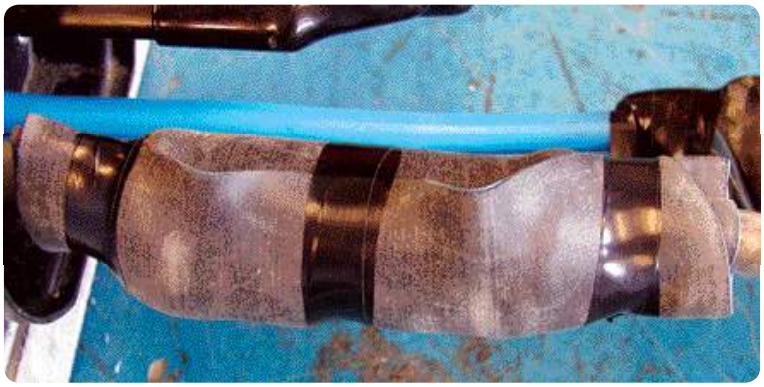
- Cut one of the ‘live’ phase cores to length (Section 3.2.8) and remove the paper insulation (Section 3.2.9).





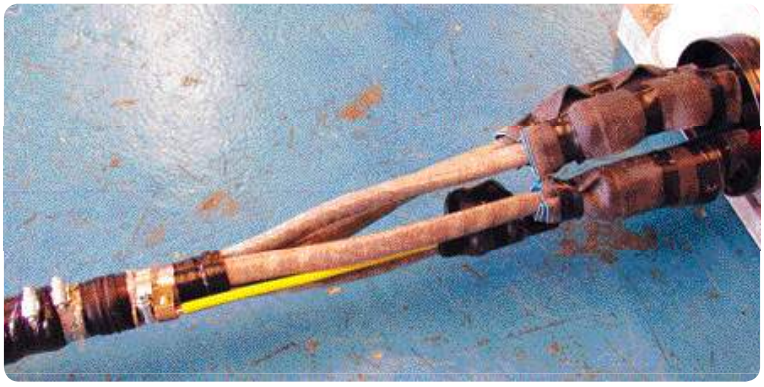
- Install one of the mechanical phase connectors (Section 4.3.1).

- Insulate the mechanical phase connectors with the piece of CR sheet insulation (Section 4.9.4).



- Repeat the last three sections on the two remaining phase cores.

- Remove all temporary shrouding from the lead sheath and armours.



- Fit the two halves of the plastic joint shell (Section 4.8.1). Install metal clips and brown putty to ensure that JEM resin does not leak out when installed.

- Fill each joint shell (two on 2-way box and four on 4-way box) with the required amount of JEM resin as shown in the table at the start of this section (Section 4.8.2).
- Repeat the above procedure for each cable pocket.

2.20.4 Installation of Plastic Pit Frame and Pavement Cover

Each link box comes complete with a purpose built plastic pit and pavement cover designed for a link box to be installed at the normal LV cable minimum installation depth of 450mm.

The supplied plastic pit and concrete cover suit normal installations in footpaths where maximum vehicles weights are below 12.5 tonnes. To install this type of link box in areas where they are likely to be subjected to vehicles heavier than 12.5 tonnes replace the plastic pit and concrete pavement cover with a suitably designed brick built pit and appropriate roadway cover.

Position each section directly onto of the proceeding one. The final section before the metal pavement cover is the one with four bolts installed into threaded insert in the top. This design allows for the pavement cover to be levelled with the surrounding pavement with a maximum height adjustment of 100mm.

2.20.5 Replacement Pit Frames and Pavement Covers

Materials

Description	Stores Code	Prysmian Product Ref.
Replacement 2-Way Frame and Pavement Cover	04479W	LB3077
Replacement 4-Way Frame and Pavemant Cover	04480S	LB2078
Replacement 2-Way Frame	04481C	LN3012
Replacement 4-Way Frame	04482M	LB3038
Replacement 2-Way Pavement Cover	04483W	LB3013
Replacement 4-Way Pavemant Cover	04484G	LB3039
Replacement 2-Way Plastic Pit Section	04485R	LB3011
Replacement 4-Way Plastic Pit Section	04486B	LB3037
Replacement Clear Link Chamber Covers	01535S	ULB3306
Replacement Wedge Type Link	11480F	88010003
Wedge Type Fusemate or Rezap Link Box Adapter	11482A	U8201000

2.21 Service Distribution Units

Materials

Mains Cable Sizes (mm^2)	Service Cable Sizes (mm^2)	Description	Stores Code	Sicame Product Ref.	Resin Volume
95 to 300 Waveform	16 to 35 Al Single and Three Phase	12-Way Unit	02500W	LVD/12S-A	24 litres
		G78 Phone Mast 12-Way Unit	02503B Special Order	LVD/12S-F	24 litres
		18-Way Unit	02501G	LVD/18S-A	24 litres
		24-Way Unit	02502R	LVD/24S-A	24 litres
		Block pavior Pavement Frame and Cover	02507Q	4816	N/A
		Access Chamber	02505V	4038	N/A
		Replacement Concrete Pavement Cover	02506F	4815	N/A

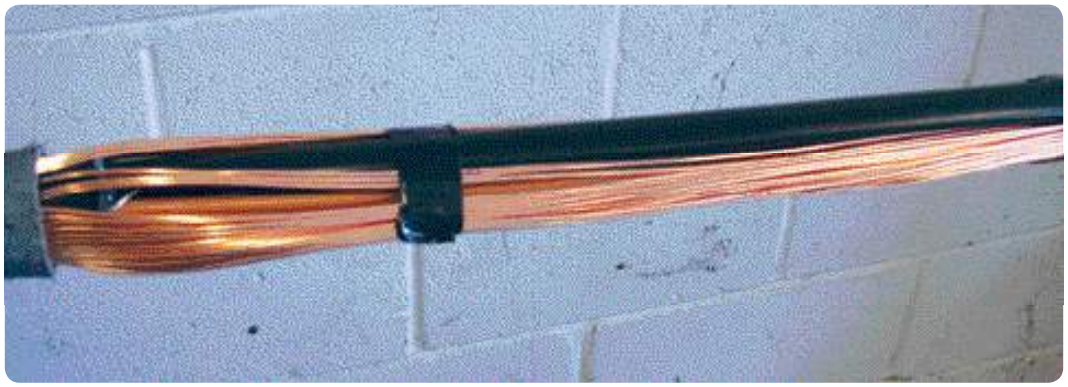
2.21.1 Waveform Mains Cable

Installation Instructions

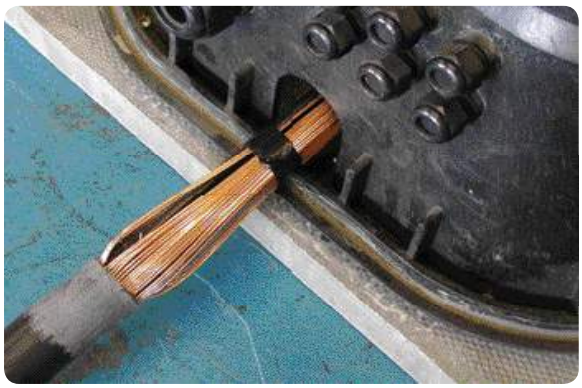
- This procedure is only appropriate for the connection of ‘dead’ waveform cables.
- Unpack each distribution unit before any jointing takes place. Check each component off against the included packing list and report any damaged or missing items directly to the issuing Logistics Stores.

- Place the unit onto the previously prepared flat stable surface before any jointing work commences.
- Make a Chinagraph pencil mark on the outer sheath of the cable 450mm from the cut end.
- Clean, degrease and abrade the outer sheath of the cable for a distance of 50mm in from the sheath cut.
- Strip the waveform cable (Sections 3.4.1 to 3.4.5).

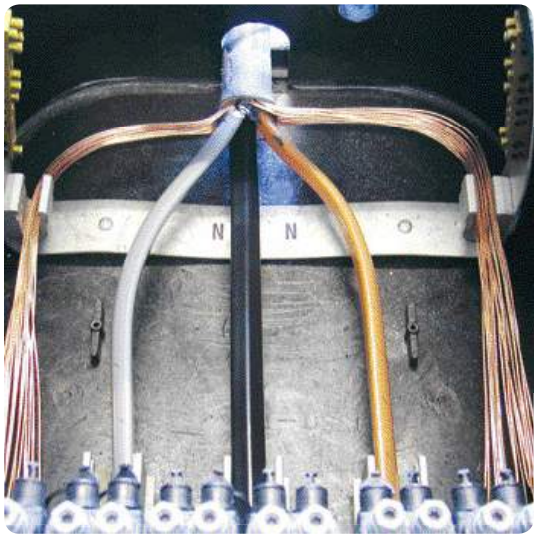
- Temporarily tape all the cores together with PVC tape.



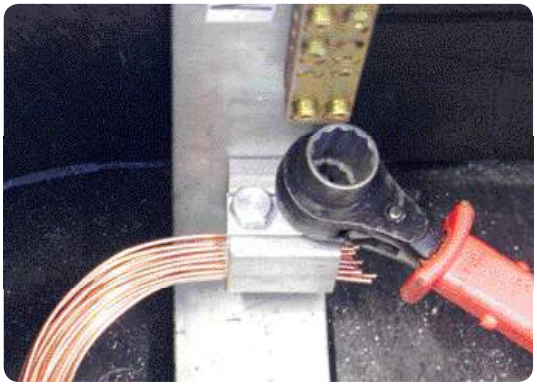
- Position the distribution unit over the cable, by inserting the cable through the hole provided. Ensure that the abraded section of cable oversheath is fully inside the unit.

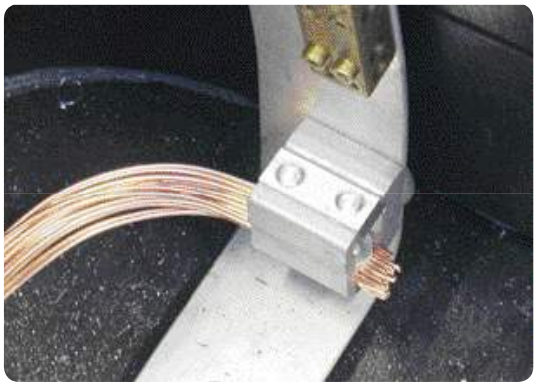


- Set the phase so that they line up with the appropriate mechanical connectors in the unit.
- Separate the copper neutral earth wires into two equal bunches. Set each one so that it lines up with the appropriate mechanical connector.

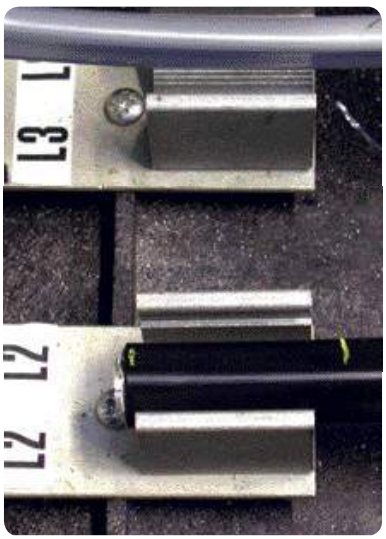


- Install the neutral conductor into the mechanical neutral earth connector and shear off (Section 4.6.1).

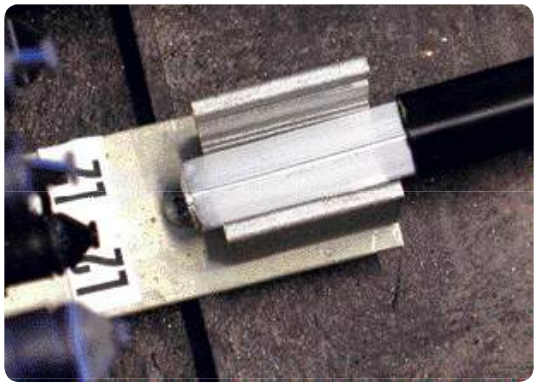




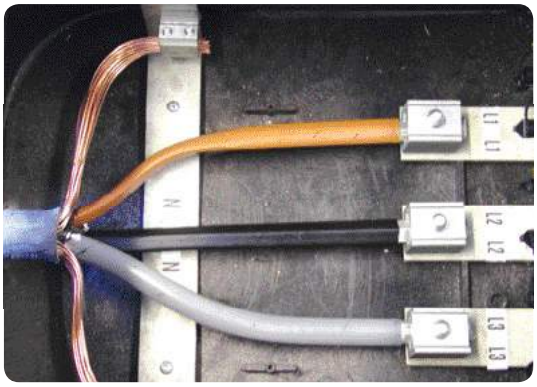
- Cut each of the cores to the required length for the mechanical connectors (Section 3.4.6).



- Remove the XLPE insulation from the phase core (Section 3.4.7).

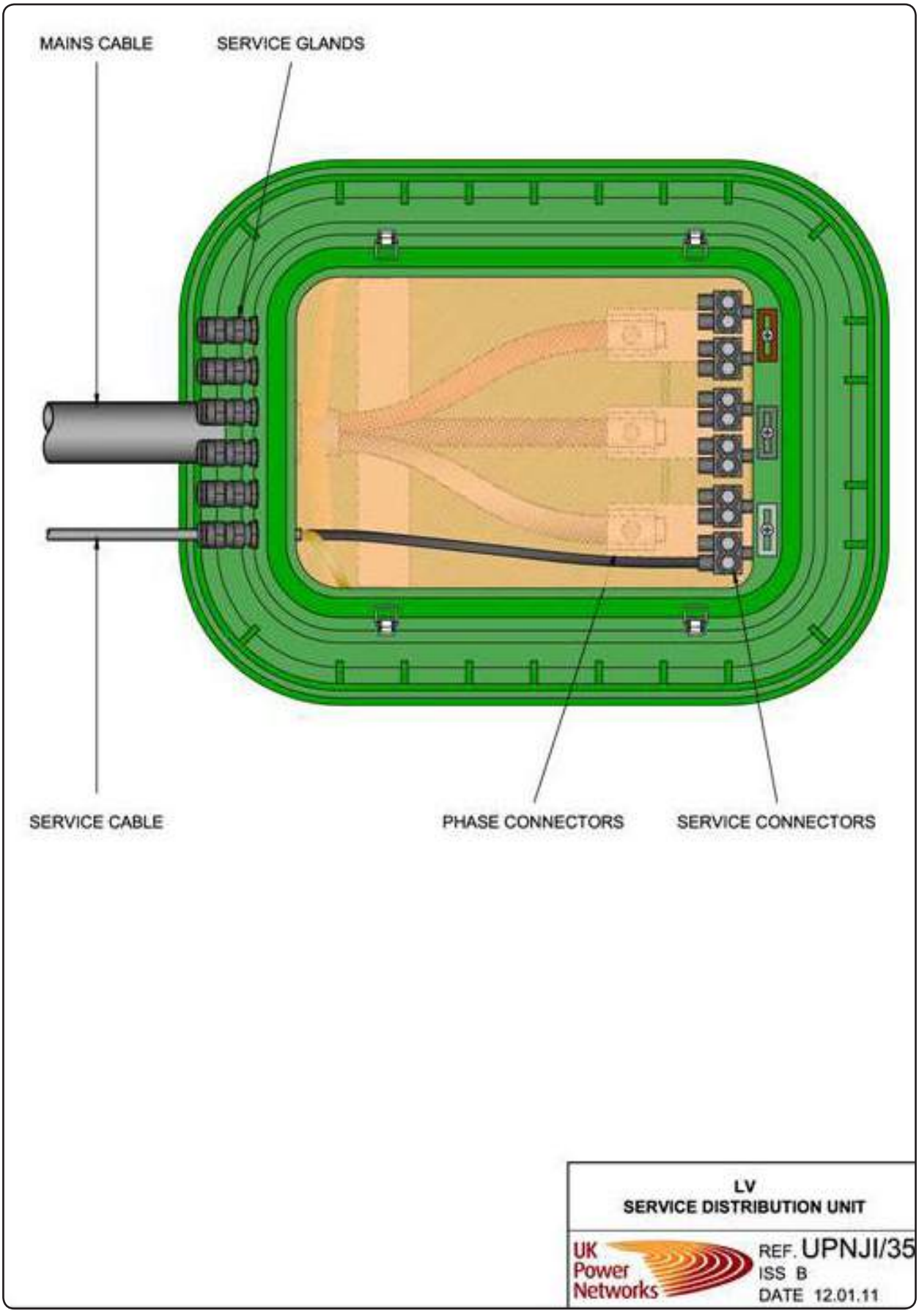


- Install all 3-Phase conductors into the mechanical phase connectors and shear off (Section 4.6.1).



- Build up the diameter of the cable where it enters the unit with tape or mastic putty to ensure that the JEM resin does not leak out.

- Fill the unit with the correct amount of JEM resin as shown in the table at the start of this section, so that there is a minimum of 10mm coverage over all the mains connectors (Section 4.8.2).

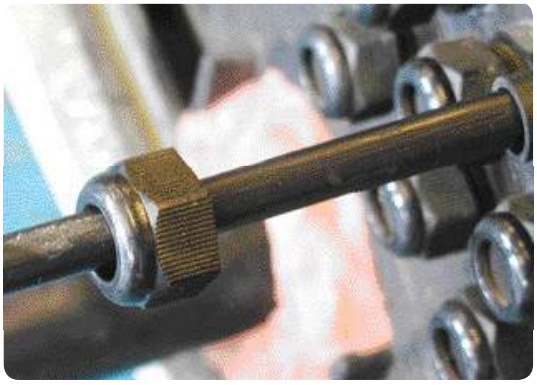

MAINS CABLE
SERVICE GLANDS
SERVICE CABLE
PHASE CONNECTORS
SERVICE CONNECTORS
LV
SERVICE DISTRIBUTION UNIT
UK Power Networks
REF. UPNJI/35
ISS B
DATE 12.01.11

2.21.2 Single-Phase Concentric Service Cables

Installation Instructions

This process is designed to be carried out with the LV mains cable and the distribution unit ‘live’.

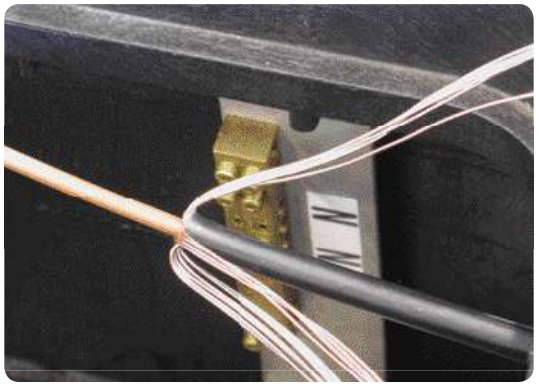
- Remove the service gland cap and blanking plate from the entry to be used on the distribution unit.
- Park the cap on the service cable and fit the 'O' seal into the gland assembly.
- Install the service cable through the gland allowing sufficient cable for connection within the distribution unit.



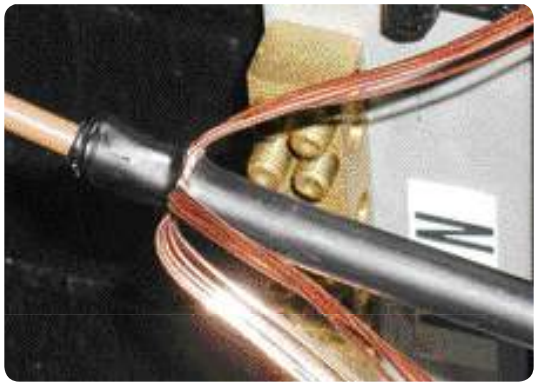
- Screw the gland cap onto the gland and tighten down on to the cable.

- Remove the PVC oversheath from the service cable (Section 3.5.1).

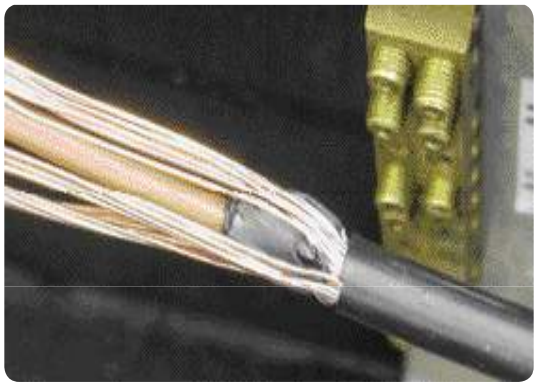
- Unwind the copper neutral earth wires and temporarily fold back along the cable sheath.



- Apply two layers of black moisture sealing mastic around the phase core insulation next to the copper wires.



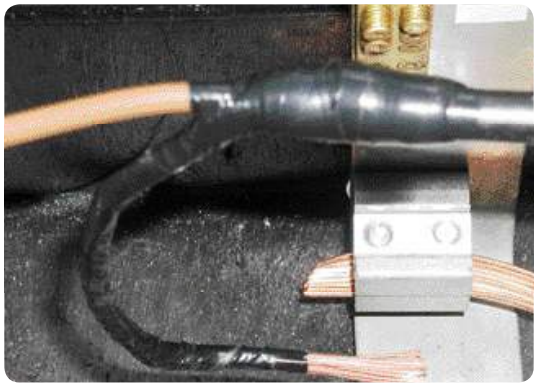
- Neatly lay the copper wires back over the mastic tape, ensuring that the wires do not cross.



- Apply a half-lap layer of black moisture-sealing tape over the copper wires and 10mm onto the cable oversheath.

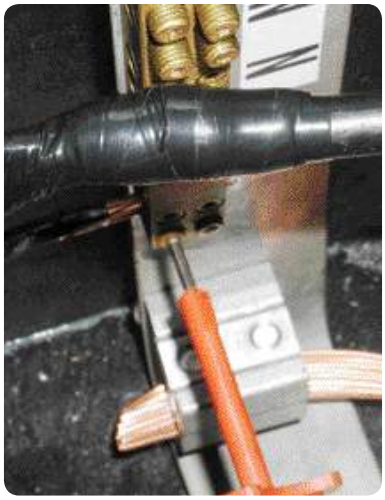
- Apply two half-lap layers of PVC tape over the mastic, under tension. The PVC tape should extend either side of the black moisture sealing mastic tape layer.

- Form the neutral wire wires into a conductor. Set them into position and cut them to length.
- Insulate the bare copper wires with a single half-lap layer of PVC tape, except for the end that will be installed in the neutral earth terminal.



- Perform an insulation resistance test on the service cable.

- Connect the neutral earth conductor to the connector required using an approved insulated 3mm AF Allen key tool.



- Set the phase core in position allowing sufficient space to connect further services in the future.
- Cut the core to length and remove 15mm of core insulation (Section 3.5.3).

- Insert the phase conductor into the required phase connector.

- Tighten the 13mm head of the phase connector (Section 4.2.3).

- Repeat the above procedure for all other service cables to be connected.
- On completion ensure that the rubber seal around the lid is correctly fitted. Fit the inner lid of the distribution unit ensuring all the clasps are fully located and activated.

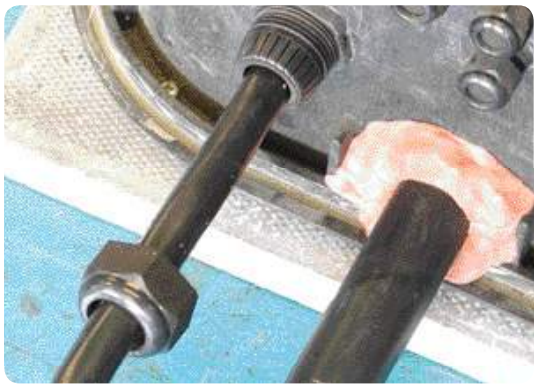
- Install pavement cover ensuring that it sits flush with the pavement surface.

2.21.3 3-Phase Concentric Service Cables

Installation Instructions

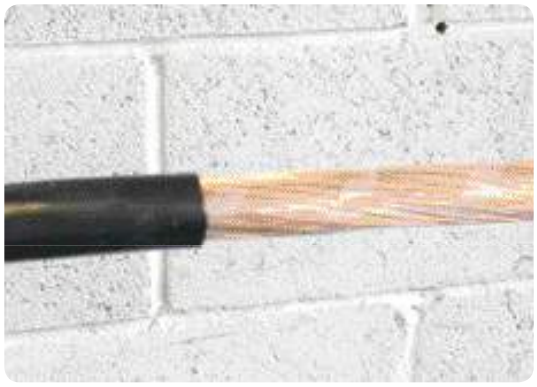
This process is designed to be carried out with the LV mains cable and the distribution unit ‘live’.

- Remove the service gland cap and blanking plate from the entry to be used on the distribution unit.
- Park the cap on the service cable and fit the 'O' seal into the gland assembly.
- Install the service cable through the gland allowing sufficient cable for connection within the distribution unit.

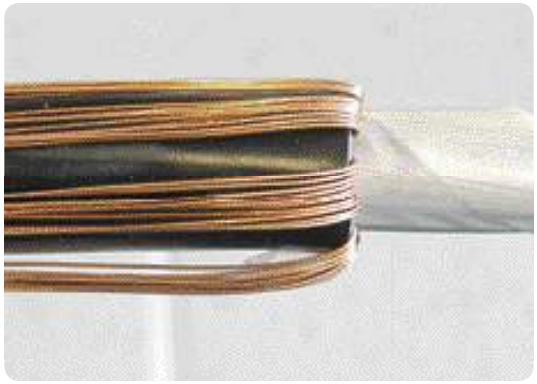


- Screw the gland cap onto the gland and tighten down on to the cable.

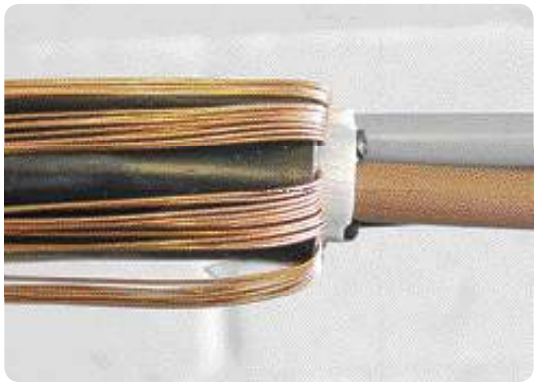
- Remove the PVC oversheath from the service cable (Section 3.6.1).



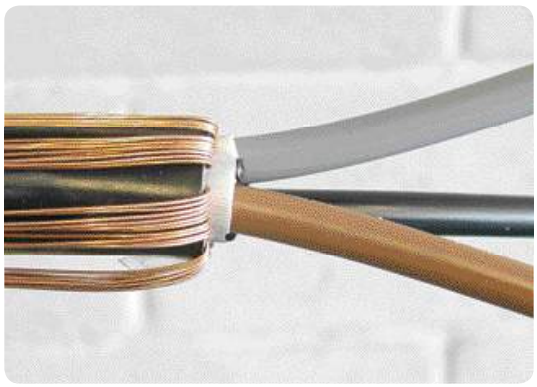
- Unwind the copper neutral earth wires and temporarily fold back along the cable sheath.



- Remove the inner bedding layer and fillers up to copper wires (Section 3.6.3).

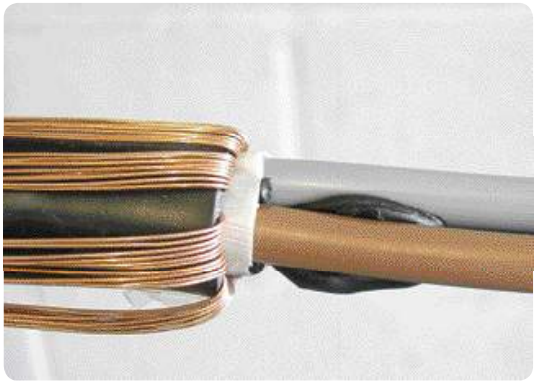


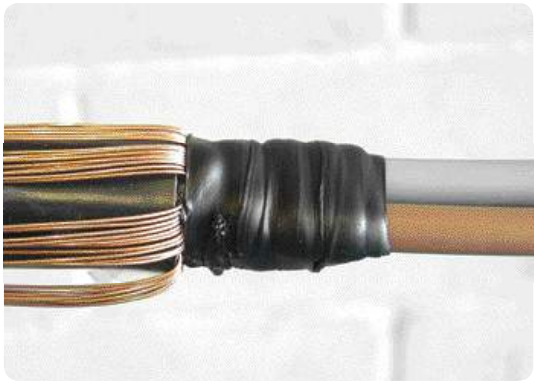
- Separate the 3-Phase conductors allowing sufficient space to insert the black moisture-sealing mastic.



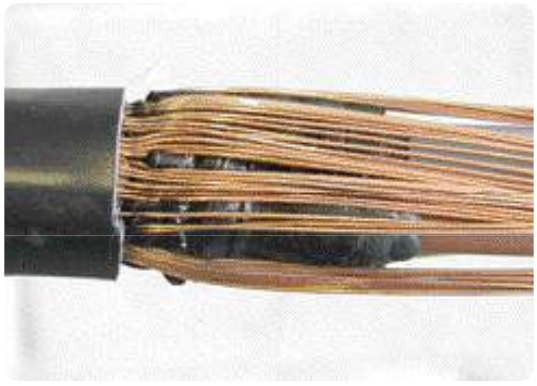
- Roll one of the 50mm long strips of black moisture-sealing mastic into a tube shape and push in to the space between the phase cores at the crutch position.

- Pull the 3-Phase cores back together and apply two layers of black moisture-sealing mastic around them next to the copper wires.





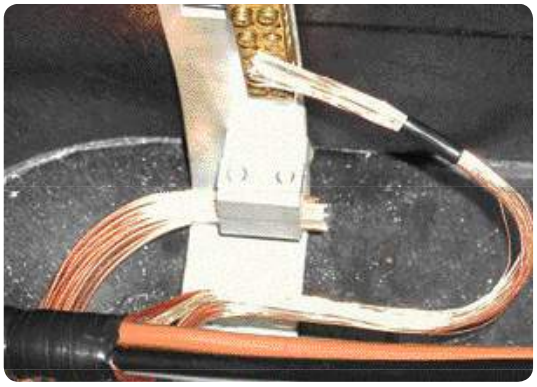
- Neatly lay the copper wires back over the mastic tape, ensuring that the wires do not cross.

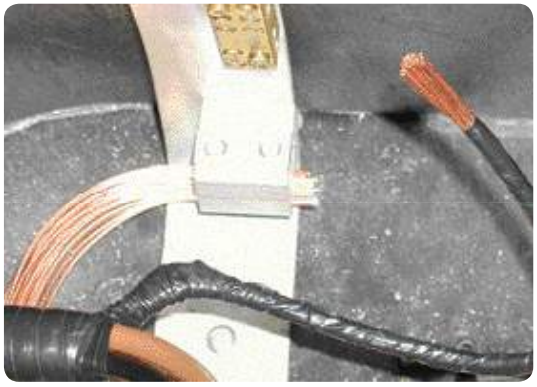


- Apply a half-lap layer of black moisture-sealing tape over the copper wires and 10mm onto the cable oversheath.

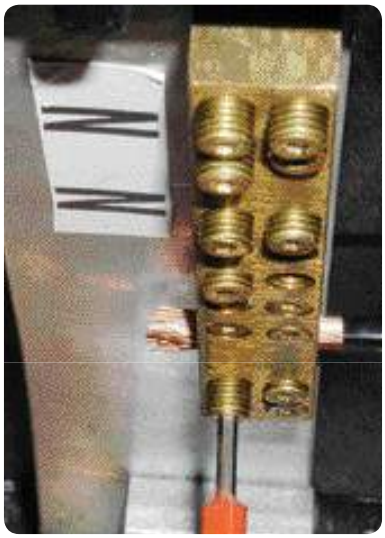
- Apply two half-lap layers of PVC tape over the mastic under tension. The PVC tape should extend either side of the black moisture-sealing mastic tape.

- Form the neutral wire wires into a conductor. Set them into position and cut to length.
- Insulate the bare copper wires with a single half-lap layer of PVC tape, except for the end that will be installed in the neutral earth terminal.

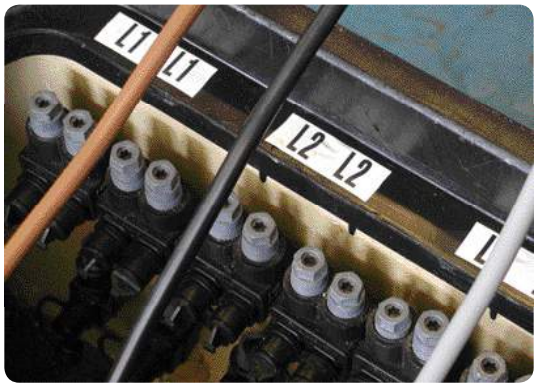




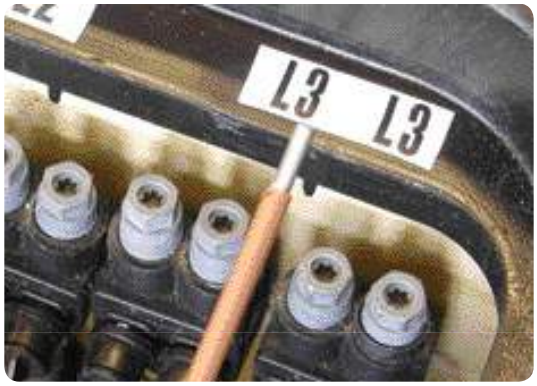
- Perform an insulation resistance test on service cable.
- Connect the neutral earth conductor to the connector required.



- Set the phase core in position allowing sufficient space to connect further services in the future.



- Cut the core to length and remove 15mm or core insulation (Section 3.6.4).



- Insert the phase conductor into the required phase connector.

- Tighten the 13mm head of the phase connector (Section 4.2.3).

- Repeat the above procedure for all other service cables to be connected.

- On completion ensure that the rubber seal around the lid is correctly fitted. Fit the inner lid of the distribution unit ensuring all the clasps are fully located and activated.

- Install pavement cover ensuring that it sits flush with the pavement surface.