

Section 5: Medium Voltage Joints - up to 42kV

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Cold Shrinkable Straight Joints for Polymeric Insulated Cables up to 36kV

CSJR / CSJH

Features

- Pre-expanded, single piece silicone rubber joint body with high mechanical expansion capability allows a wide application range
- Electrical stress control of the screen cut area by integrated conductive geometrical stress cones
- Electrical stress control of the connector area by an integrated screened connection area (Faraday cage)
- Pre-expansion on a well-known and easy-to-install holdout system
- Choice of outer sealing and protection systems
- Easy to install joint system with short installation time
- Exceeds CENELEC HD 629.1, requirements which include IEC, BS, VDE and other international specifications
- Mechanical shear bolt connectors to IEC 61238-1 with wide application range for conductor and wire shield can be supplied with the kit
- Proven shield continuity concept

Mechanical shear bolt connectors

CSJR/CSJH joints are available with TE Connectivity's BSM mechanical connectors fitted with shear head bolts to ensure a reliable connection for different conductor materials, shapes and types used in today's network. The pre-set shear torque of the bolts ensures that the correct contact pressure is always achieved.

Pre-expanded silicone joint body

The silicone rubber joint body is delivered in a pre-expanded condition on a spiral holdout system. Silicone materials with excellent mechanical properties allow high expansion forces and therefore guarantee a wide application range. Integrated stress control mechanism and conductive outer layer provide

exceptional electrical performance. The joint body can be easily removed from the spiral holdout with low release forces, particularly designed for joint applications.

Electrical stress control

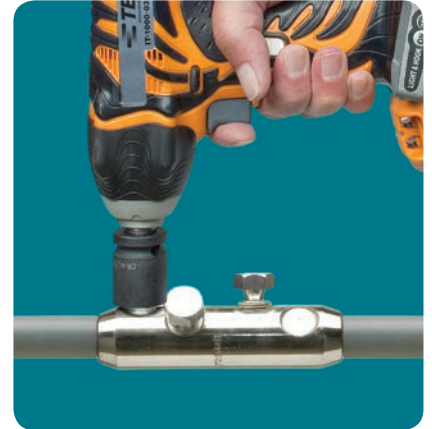
Electrical stress control is fully integrated in the silicone joint body by well defined conductive areas. Conductive cones with an exactly defined geometrical design over the screen cut area provide excellent electrical stress control. The electrical stress control of the connector area is made with an integrated conductive screen performing as a Faraday cage. The coverage of voids and edges at the connection area with void fillers is not necessary.

Shield continuity

Typical shield wire cross sections up to 35 mm² can easily be connected by either mechanical or compression connectors. Positioned at the oversheath cut-back, the connection provides a smooth profile resistant to mechanical damage. Additional layers of copper mesh are applied around the joint to provide shielding and protection.

Outer sealing and protection

CSJx joints are available with alternative re-jacketing methods. CSJR joints include a dual-wall Rayvolve sleeve with entrapped lubricant. The elastomeric sleeve rolls onto the cable and over the joint area. The gripping force of the specially formulated EPDM elastomer combined with a high performance sealant forms a reliable moisture seal and corrosion protection for the joint system. On CSJH joints the outer sealing and protection is provided by a thick-wall, heat shrinkable tubing. Effective moisture seal and corrosion protection for the joint is ensured by the co-extruded hot melt adhesive. When installed, the heat shrinkable tubing provides a similar level of protection as the PE oversheath of modern cables.



Cold Shrinkable Inline Joints with Rayvolve EPDM Sleeve as Outer Protection

Catalogue Reference	Voltage	Applicable Range*	Diameter Over Core Insulation	Diameter Over Outer Sheath	Diameter Over Conductor **
	kV	(mm)	(mm)	(mm)	(mm)
CSJR-12B/1XU-1XU-M	12	95 - 240	18.6 - 28.4	26.0 - 39.0	11.0 - 19.2
CSJR-12C/1XU-1XU-M	12	185 - 300	23.2 - 32.6	30.0 - 44.0	15.5 - 23.1
CSJR-12D/1XU-1XU-M	12	240 - 400	25.7 - 33.6	33.0 - 45.0	17.8 - 24.6
CSJR-12E/1XU-1XU-M1	12	500	34.4 - 36.2	43.0 - 48.0	25.7 - 27.6
CSJR-12E/1XU-1XU-M2	12	630	38.0 - 40.0	47.0 - 52.0	29.3 - 32.5
CSJR-24B/1XU-1XU-M	24	35 - 150	18.9 - 28.5	26.0 - 39.0	6.8 - 19.2
CSJR-24C/1XU-1XU-M1	24	95 - 240	23.5 - 32.6	30.0 - 44.0	11.0 - 19.2
CSJR-24C/1XU-1XU-M2	24	120 - 300	24.3 - 34.6	32.0 - 46.0	12.5 - 21.6
CSJR-24D/1XU-1XU-M	24	185 - 400	27.4 - 37.8	35.0 - 49.0	15.5 - 24.6
CSJR-24E/1XU-1XU-M1	24	500	37.9 - 40.6	46.0 - 52.0	25.7 - 27.6
CSJR-24E/1XU-1XU-M2	24	630	41.0 - 44.0	56.0 - 57.0	29.3 - 32.5
CSJR-36D/1XU-1XU-M	36	95 - 240	27.8 - 37.6	35.0 - 48.0	11.0 - 19.2
CSJR-36E/1XU-1XU-M1	36	240 - 400	34.9 - 42.8	42.0 - 54.0	17.8 - 24.6
CSJR-36E/1XU-1XU-M2	36	500	42.6 - 45.6	51.0 - 57.0	25.7 - 27.6
CSJR-36E/1XU-1XU-M3	36	630	45.8 - 49.2	56.0 - 61.0	29.3 - 32.5

Cold Shrinkable Inline Joints with WCSM Heat Shrinkable Sleeve as Outer Protection

Catalogue Reference	Voltage	Applicable Range*	Diameter Over Core Insulation	Diameter Over Outer Sheath	Diameter Over Conductor **
	kV	(mm)	(mm)	(mm)	(mm)
CSJH-12B/1XU-1XU-M	12	95 - 240	18.6 - 28.4	26.0 - 39.0	11.0 - 19.2
CSJH-12C/1XU-1XU-M	12	185 - 300	23.2 - 32.6	30.0 - 44.0	15.5 - 23.1
CSJH-12D/1XU-1XU-M	12	240 - 400	25.7 - 33.6	33.0 - 45.0	17.8 - 24.6
CSJH-12E/1XU-1XU-M1	12	500	34.4 - 36.2	43.0 - 48.0	25.7 - 27.6
CSJH-12E/1XU-1XU-M2	12	630	38.0 - 40.0	47.0 - 52.0	29.3 - 32.5
CSJH-24B/1XU-1XU-M	24	35 - 150	18.9 - 28.5	26.0 - 39.0	6.8 - 19.2
CSJH-24C/1XU-1XU-M1	24	95 - 240	23.5 - 32.6	30.0 - 44.0	11.0 - 19.2
CSJH-24C/1XU-1XU-M2	24	120 - 300	24.3 - 34.6	32.0 - 46.0	12.5 - 21.6
CSJH-24D/1XU-1XU-M	24	185 - 400	27.4 - 37.8	35.0 - 49.0	15.5 - 24.6
CSJH-24E/1XU-1XU-M1	24	500	37.9 - 40.6	46.0 - 52.0	25.7 - 27.6
CSJH-24E/1XU-1XU-M2	24	630	41.0 - 44.0	56.0 - 57.0	29.3 - 32.5
CSJH-36D/1XU-1XU-M	36	95 - 240	27.8 - 37.6	35.0 - 48.0	11.0 - 19.2
CSJH-36E/1XU-1XU-M1	36	240 - 400	34.9 - 42.8	42.0 - 54.0	17.8 - 24.6
CSJH-36E/1XU-1XU-M2	36	500	42.6 - 45.6	51.0 - 57.0	25.7 - 27.6
CSJH-36E/1XU-1XU-M3	36	630	45.8 - 49.2	56.0 - 61.0	29.3 - 32.5

* The application range given in the table is based on polymeric insulated cables according to IEC 60502 with stranded circular conductors.

Due to different conductor dimensions and/or cable constructions the minimum and maximum application range may be extendable. Please contact your local sales representative.

** The diameter over conductor is needed only for kits including TE BSM connectors. The values given in the selection table refer to aluminium circular conductors and may change for other materials and shapes.

Cold Shrinkable “All in One” Straight Joint for Polymeric Insulated Cables up to 42kV

CSJA

Features

- Joint body, earthing system and re-jacketing pre-expanded on one holdout system
- Single piece silicone rubber joint body with high mechanical expansion capability allows a wide application range
- Electrical stress control of the screen cut area by integrated conductive geometrical stress cones
- Electrical stress control of the connector area by an integrated screened connection area (Faraday cage)
- Well-known and easy-to-install holdout system • Short parking distance required
- Easy-to-install joint system with short installation time
- Exceeds CENELEC HD 629.1, requirements which include IEC, BS, VDE and other international specifications
- Mechanical shear bolt connector to IEC 61238-1 is supplied with the kit
- Proven shield continuity concept

Mechanical shear bolt connectors

CSJA joints are provided with TE's BSM mechanical connectors fitted with shear head bolts to ensure a reliable connection for different conductor materials, shapes and types used in today's network. The pre-set shear torque of the bolts ensures that the correct contact pressure is always achieved. The specially designed contact surface on the inside of the connector breaks up any oxide layer and ensures reliable service over the entire life of the joint. Different sizes of mechanical connectors with wide application ranges are available. The connectors have been tested in accordance with IEC-61238-1 class A.

Pre-expanded silicone joint body

The silicone rubber joint body is delivered in a pre-expanded condition on a spiral holdout system. Silicone materials with excellent mechanical properties allow high expansion forces and therefore guarantee a wide application range. Integrated stress control mechanism and conductive outer layer provide exceptional electrical performance. The joint body can be easily removed from the spiral holdout with low release forces, particularly designed for joint applications.

Electrical stress control

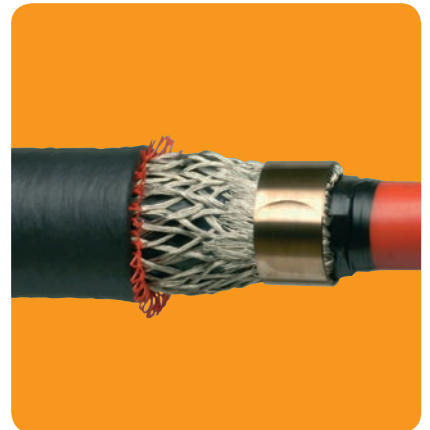
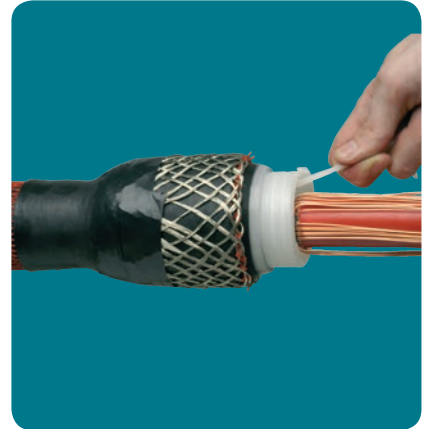
Electrical stress control is fully integrated in the silicone joint body by well defined conductive areas. Conductive cones with an exactly defined geometrical design over the screen cut area provide excellent electrical stress control. The electrical stress control of the connector area is made with an integrated conductive screen performing as a Faraday cage. The coverage of voids and edges at the connection area with void fillers is not necessary.

Shield continuity

The integrated pre-expanded copper mesh is connected to the cable screens by constant force roll springs. This connection method reliably operates during load-cycling and thermal short circuits of the conductors on all cable types regardless of whether the oversheath is PVC or PE. It provides a smooth profile which is resistant to mechanical impacts. The solderless earth connection has more than 25 years service experience in Raychem joint systems used worldwide.

Outer sealing and protection

The CSJA joint has an integrated outer protection system which is already expanded onto the joint body and requires no additional parking distance. The EPDM sleeve combined with a high performance sealant forms a reliable moisture seal and corrosion protection. It is easy to install by just rolling out the flipped back re-jacketing.



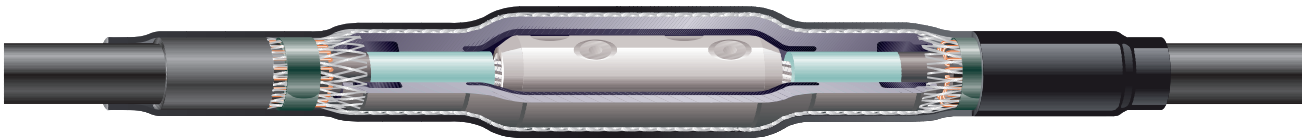
CSJA Joint with Mechanical Connector

Catalogue Reference	Voltage	Applicable Range*	Diameter Over Core Insulation	Diameter Over Outer Sheath	Diameter Over Conductor **
	kV	(mm)	(mm)	(mm)	(mm)
CSJA-12B/1XU-1XU-M	12	95 - 240	18.6 - 28.4	26.0 - 39.0	11.0 - 19.2
CSJA-12C/1XU-1XU-M	12	185 - 300	23.2 - 32.6	30.0 - 44.0	15.5 - 23.1
CSJA-12D/1XU-1XU-M	12	240 - 400	25.7 - 33.6	33.0 - 45.0	17.8 - 24.6
CSJA-12E/1XU-1XU-M1	12	500	34.4 - 36.2	43.0 - 48.0	25.7 - 27.6
CSJA-12E/1XU-1XU-M2	12	630	38.0 - 40.0	47.0 - 52.0	29.3 - 32.5
CSJA-24B/1XU-1XU-M	24	35 - 150	18.9 - 28.5	26.0 - 39.0	6.8 - 19.2
CSJA-24C/1XU-1XU-M1	24	95 - 240	23.5 - 32.6	30.0 - 44.0	11.0 - 19.2
CSJA-24C/1XU-1XU-M2	24	120 - 300	24.3 - 34.6	32.0 - 46.0	12.5 - 21.6
CSJA-24D/1XU-1XU-M	24	185 - 400	27.4 - 37.8	35.0 - 49.0	15.5 - 24.6
CSJA-24E/1XU-1XU-M1	24	500	37.9 - 40.6	46.0 - 52.0	25.7 - 27.6
CSJA-24E/1XU-1XU-M2	24	630	41.0 - 44.0	56.0 - 57.0	29.3 - 32.5
CSJA-36D/1XU-1XU-M	36	95 - 240	27.8 - 37.6	35.0 - 48.0	11.0 - 19.2
CSJA-36E/1XU-1XU-M1	36	240 - 400	34.9 - 42.8	42.0 - 54.0	17.8 - 24.6
CSJA-36E/1XU-1XU-M2	36	500	42.6 - 45.6	51.0 - 57.0	25.7 - 27.6
CSJA-36E/1XU-1XU-M3	36	630	45.8 - 49.2	56.0 - 61.0	29.3 - 32.5

* The application range given in the table is based on polymeric insulated cables according to IEC 60502 with stranded circular conductors.

Due to different conductor dimensions and/or cable constructions the minimum and maximum application range may be extendable. Please contact your local sales representative.

** The diameter over conductor is needed only for kits including TE's BSM connectors. The values given in the selection table refer to aluminium circular conductors and may change for other materials and shapes.



MV Cold Shrinkable Joint for 3 Core Cables with Resin Encapsulation

CSJT-H

Features

- Pre-expanded, single piece silicone rubber joint body with high mechanical expansion capability allows a wide application range
- Electrical stress control of the screen cut area by integrated conductive geometrical stress cones
- Electrical stress control of the connector area by an integrated screened connection area (Faraday cage)
- Pre-expansion on a well-known and easy-to-install holdout system
- Proven shield continuity concept
- Fast and easily filled resin outer sealing and protection system providing effective impact resistance
- Hard-elastic polyurethane-type encapsulation with excellent insulation properties, hydrolytic stability and hydrophobic characteristics
- Exceeds CENELEC HD 629.1, requirements which include IEC, BS, VDE and other international specifications



CSJA Joint with Mechanical Connector

Catalogue Reference	Voltage	Applicable Range*	Diameter Over Core Insulation	Diameter Over Outer Sheath	Admissible Connector Dimensions	
	kV	(mm)	(mm)	(mm)	Max Length (mm)	Max Dia (mm)
CSJT-12B/3XU-3XU-H	12	95 - 240	18.6 - 28.4	50.0 - 100.0	145.0	33.0
CSJT-12C/3XU-3XU-H	12	185 - 300	23.2 - 32.6	50.0 - 100.0	145.0	37.0
CSJT-24B/3XU-3XU-H	24	35 - 185	18.9 - 30.1	50.0 - 100.0	145.0	33.0
CSJT-24C/3XU-3XU-H	24	95 - 300	23.5 - 34.6	50.0 - 100.0	145.0	37.0

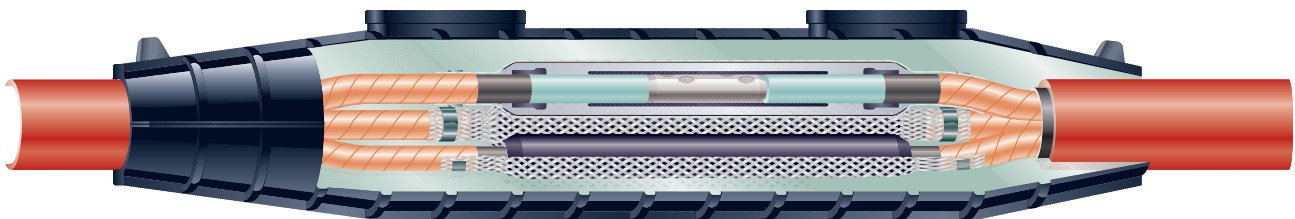
* The application range given in the table is based on polymeric insulated cables according to IEC 60502 with stranded circular conductors.

Due to different conductor dimensions and/or cable constructions the minimum and maximum application range may be extendable. Please contact your local sales representative.

Note: CSJT-H 3-core joints can be supplied with compression connectors or TE's mechanical BSM connectors.

CSJT-H 3-core joints can be modified for different armour types and/or wire shield cables.

Please contact your local sales representative.

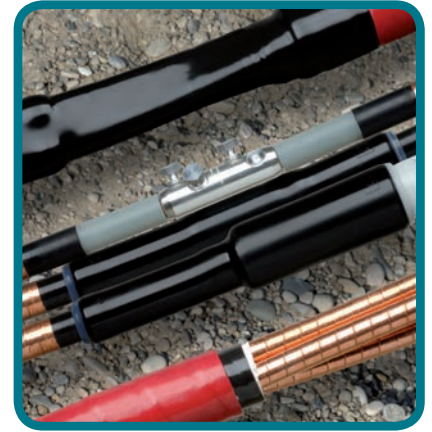


MV Cold Shrinkable Joint for 3 Core Cables with Heat Shrinkable Protection

CSJH

Features

- Pre-expanded, single piece silicone rubber joint body with high mechanical expansion capability allows a wide application range
- Electrical stress control of the screen cut area by integrated conductive geometrical stress cones
- Electrical stress control of the connector area by an integrated screened connection area (Faraday cage)
- Pre-expansion on a well-known and easy-to-install holdout system
- Proven shield continuity concept
- The WCSM heat shrinkable outer protection provides effective impact resistance.
- Hot melt adhesive ensures an effective moisture seal and corrosion protection
- Exceeds CENELEC HD 629.1, requirements which include IEC, BS, VDE and other international specifications



CSJH 3 Core Joint without Connector

Catalogue Reference	Voltage	Applicable Range*	Diameter Over Core Insulation	Diameter Over Outer Sheath	Admissible Connector Dimensions	
	kV	(mm)	(mm)	(mm)	Max Length (mm)	Max Dia (mm)
CSJH-12B/3XU-3XU	12	95 - 240	18.6 - 28.4	50.0 - 120.0	145.0	33.0
CSJH-12C/3XU-3XU	12	185 - 300	23.2 - 32.6	50.0 - 120.0	145.0	37.0
CSJH-24B/3XU-3XU	24	35 - 185	18.9 - 30.1	50.0 - 120.0	145.0	33.0
CSJH-24C/3XU-3XU	24	95 - 300	23.5 - 34.6	50.0 - 120.0	145.0	37.0

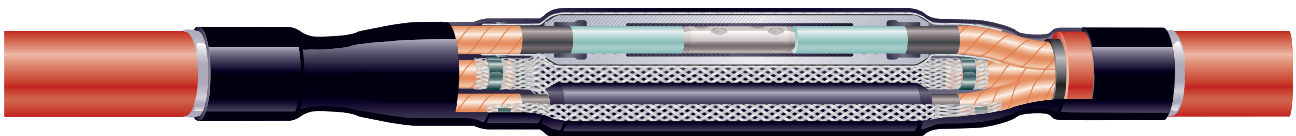
* The application range given in the table is based on polymeric insulated cables according to IEC 60502 with stranded circular conductors.

Due to different conductor dimensions and/or cable constructions the minimum and maximum application range may be extendable. Please contact your local sales representative.

Note: CSJH 3-core joints can be supplied with compression connectors or TE mechanical BSM connectors.

CSJH 3-core joints can be modified for armoured and/or wire shield cables.

Please contact your local sales representative.



MV Cold Applied Transition Joint for 3 Core Paper Insulated Cables to Polymeric Insulated Cables

CATJ

Features

- Entirely cold-applied solution with cold shrinkable silicone joint body and oil blocking materials
- Novel crutch filling and core sealing materials providing high quality oil blocking properties
- Electrical stress control of the screen cut area by integrated conductive geometrical stress cones
- Electrical stress control of the connector area by an integrated screened connection area (Faraday cage)
- Well known and easy to install holdout system • Proven solderless shield continuity concept
- Exceeds CENELEC HD 629.2 requirements which include IEC, BS, VDE and other international standards like IEEE-404
- Mechanical shear bolt connector to IEC 61238-1 supplied with the kit

Paper core sealing

The cold shrinkable silicone tubing provides excellent oil-sealing property. Non-spiral holdouts over the paper cores prevent damage to paper insulation layers. Screening is provided as conductive outer layer on the oil-blocking tubing. The paper cable is thus sealed and free from electrical stress between the phases independent from the voltage level.

Cable crutch filling

Oil-barrier material in the crutch and novel sealing tapes create an improved oil barrier. On top of the sealing, the red pressure tape forces air out to prevent discharge and ensures proper filling of the crutch. After installation, the pressure tape holds the oil-blocking filler in place to resist internal cable pressure.

Connector seal

In the connector area additional oil-blocking double-layer tapes are used to keep oil in the paper insulated cable. In combination with TE's BSM mechanical connectors reliable connection for different conductor shapes and types is ensured.

Pre-expanded silicone joint body

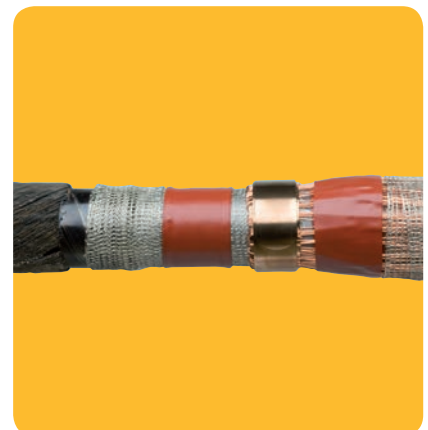
The silicone rubber joint body is delivered in a pre-expanded condition on a spiral holdout system. Silicone materials with excellent mechanical properties allow high expansion forces and therefore provide a wide application range. Integrated stress control mechanism and conductive outer layer provide high electrical performance. The joint body can be easily removed from the spiral holdout with low release forces, particularly designed for joint applications.

Shield continuity

Positioned at the lead sheath the cables screens are connected by a constant force roll spring. The roll spring ensures a tool free installation and provides a reliable contact force for excellent performance during load cycle and short circuit conditions. This solderless earth connection is a proven concept and has more than 25 years service experience

Resin encapsulation

The fast and easily filled resin outer sealing and protection system provides effective impact resistance. The hard-elastic polyurethane-type encapsulation has excellent insulation properties, hydrolytic stability and hydrophobic characteristics. The resin encapsulation provides a reliable moisture seal and corrosion protection.



3 Core Paper to Single Core Polymeric

Catalogue Reference	Voltage	Applicable Range*	Diameter Over Core Insulation Polymeric Cable	Dimensions Over Core Insulation Paper Cable	Diameter Over Conductor **
	kV	(mm)	(mm)	(mm)	(mm)
CATJ-12B/1XU-3SB	12	95-240	18.6 - 28.4	17.1 - 29.5	11.0 - 19.2
CATJ-12C/1XU-3SB	12	185-300	23.2 - 32.6	29.5 - 33.6	15.5 - 23.1
CATJ-24C/1XU-3SB	24	95-240	23.5 - 32.6	21.3 - 34.5	11.0 - 19.2
CATJ-36D/1XU-3SB	36 (42)	95-240	27.8 - 37.6	29.3 - 36.1	11.0 - 19.2

3 Core Paper to 3 Core Polymeric

Catalogue Reference	Voltage	Applicable Range*	Diameter Over Core Insulation Polymeric Cable	Dimensions Over Core Insulation Paper Cable	Diameter Over Conductor **
	kV	(mm)	(mm)	(mm)	(mm)
CATJ-12B/3XU-3SB	12	95-240	18.6 - 28.4	17.1 - 29.5	11.0 - 19.2
CATJ-12C/3XU-3SB	12	185-300	23.2 - 32.6	29.5 - 33.6	15.5 - 23.1
CATJ-24C/3XU-3SB	24	95-240	23.5 - 32.6	21.3 - 34.5	11.0 - 19.2
CATJ-36D/3XU-3SB	36 (42)	95-240	27.8 - 37.6	29.3 - 36.1	11.0 - 19.2

For all applications the diameter of the outer sheath should be within 50 mm to 120 mm

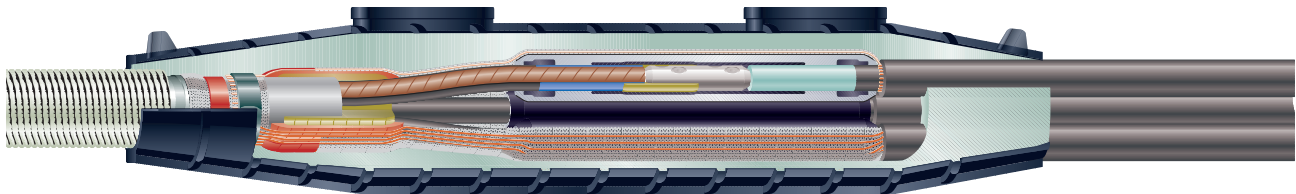
* The application range given in the table is based on polymeric insulated cables according to IEC 60502 with stranded circular conductors. Due to different conductor dimensions and/or cable constructions the minimum and maximum application range may be extendable. Please contact your local sales representative.

**The values given in the selection table refer to aluminium circular conductors and may change for other materials and shapes.

Possible adaptations of Raychem CATJ MV cold applied transition joints

- Applications for other cross sections and system voltages are available on request.
- CATJ cold applied transition joints can be modified for armoured and/or for tape shielded cables.
- CATJ cold applied transition joint system is also available for single core applications.
- CATJ cold applied transition joints can be adopted for paper-paper connections.

Please contact your local sales representative.



MV Cold Shrinkable Branch Joint for Polymeric Insulated Cable

CSBJ

Features

- Single piece silicon rubber push-on adaptors for easy installation
- Joint body, earthing system and re-jacketing pre-expanded on one holdout system.
- Well-known and easy-to-install holdout system
- Short parking distance required
- Electrical stress control of the screen cut area by integrated conductive geometrical stress cones
- Electrical stress control of the connector area by an integrated screened connection area (Faraday cage)
- Mechanical shear bolt connector is supplied with the kit
- Exceeds CENELEC HD 629.1, requirements which include IEC, BS, VDE and other international specifications

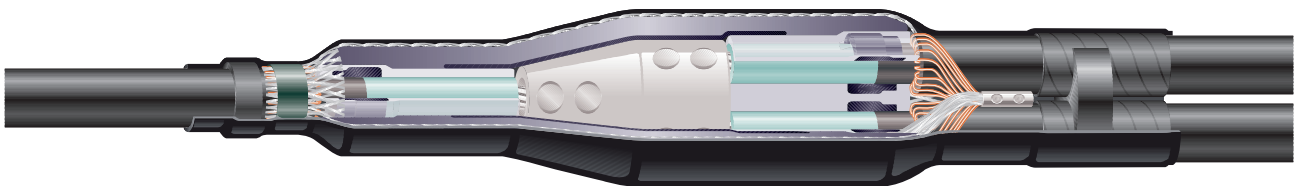


CSJB with Mechanical Connector

Catalogue Reference	Voltage	Applicable Range*	Diameter Over Core Insulation	Diameter Over Outer Sheath	Diameter Over Conductor
	kV	(mm)	(mm)	(mm)	(mm)
CSBJ-12F/1XU-2XU-M	12	95 - 240	18.6 - 28.4	26.0 - 39.0	11.0 - 19.2
CSBJ-24F/1XU-2XU-M	24	95 - 240	23.5 - 32.6	30.0 - 44.0	11.0 - 19.2

* The application range given in the table is based on polymeric insulated cables according to IEC 60502 with stranded circular conductors.

Due to different conductor dimensions and/or cable constructions the minimum and maximum application range may be extendable. Please contact your local sales representative.



Filled Joint for Belted or Screened, MI or MIND, 3 Core, Paper Insulated Cables up to 12kV

EFSJ

The Raychem EFSJ series of filled joints are problem solving products based on materials science expertise. The main features of the joints are:

- Heat shrink compound box
- No pouring of hot compounds
- Lightweight and low profile
- Versatile and easy to install

Many utilities today are installing polymeric cables as standard. Nevertheless, much of the existing network, and a substantial proportion of new installations are 12 kV paper insulated, MIND or MI cable. It is widely recognised that heat shrinkable cable accessories are the answer to jointing the new polymeric cables due to their ease of installation and reliability.

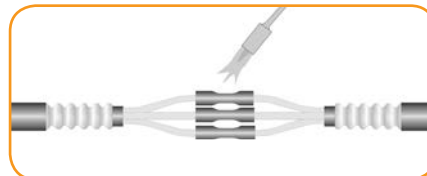
For paper cables, the Raychem EFSJ system offers joints that:

- Simplify installation
- Accommodate transitions to polymeric cables
- Are compatible with proven jointing practices

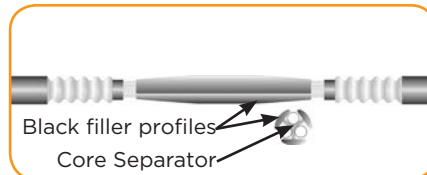
Primary insulation over the connectors is provided with proven heat shrinkable insulating sleeves. The bulk filling medium is a cold applied mastic compound, fully compatible with the materials that are used to impregnate paper cables. The compound is contained in a low profile, heat shrinkable casing - a shrinkable compound box. During installation of the heat shrinkable casing the compound flows and fills, ensuring a fully blocked joint. The result is a joint that can be made quickly and reliably without the need to handle heavy, metal joint cases and without the requirement to pour hot compounds and oils.

The EFSJ is versatile. It is factory engineered for use on belted or screened, three-core, paper insulated, MI and MIND cables. Each basic joint kit can accommodate several cable sizes, so only four kits are required for the range of cross sections from 16 to 300 mm².

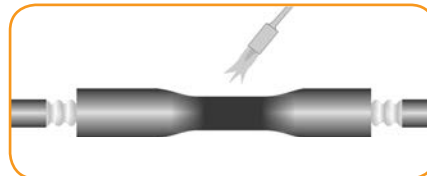
Transitions between paper cables of different cross sections and from paper to polymeric cables are achieved simply by the use of add on transition modules. Mechanical kits are available that eliminate the requirement for plumbing in connecting cable sheaths.



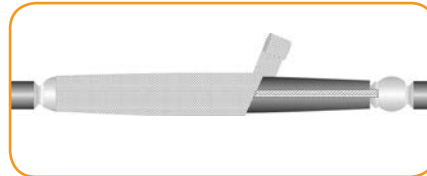
1. Insulating sleeves are shrunk over the connectors.



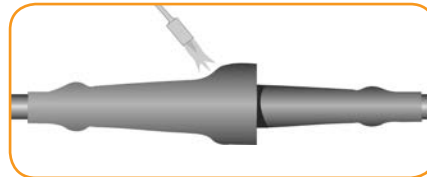
2. The cold-applied mastic compound is placed over the insulated cores.



3. The heavy, dual walled, insulating/conducting sleeve is shrunk down.



4. The copper earth braid and steel armour wrap are installed.



5. The outer sealing sleeves are shrunk down. The cable can be energised at once.

Joint System Designer

This worksheet enables you to arrive at a part number for an EFSJ straight or transition joint. Choose one figure from the left-hand column of each table.

Typical part number:

EFSJ- 11 C T1-T9 G6-G9 L1-L3/A1



Voltage in kV	
11	for 6.6 - 11kV

Base Modules - always choose the module to suit the largest cable size

Size in mm ²	7.2 kV	12 kV & 17.5 kV
EFSJ-A	25 - 50	16 - 50
EFSJ-B	70 - 120	50 - 95
EFSJ-C	120 - 240	95 - 185
EFSJ-D	240 - 300	185 - 300

For transition joints only

Transition Modules - 3 core paper to single core polymeric

Size in mm ²	6.6 kV	11 kV
EFSJ-T1	25 - 70	16 - 50
EFSJ-T2	70 - 120	50 - 95
EFSJ-T3	120 - 185	95 - 185
EFSJ-T4	185 - 300	185 - 300

Transition Modules - 3 core paper to 3 core polymeric

Size in mm ²	6.6 kV	11 kV
EFSJ-T6	25 - 70	16 - 50
EFSJ-T7	70 - 120	50 - 95
EFSJ-T8	120 - 185	95 - 185
EFSJ-T9	185 - 300	185 - 300

Steel Wire Armour Modules for 3 core polymeric

Size in mm ²	6.6 kV	11 kV
EFSJ-G6	25 - 70	16 - 50
EFSJ-G7	95 - 120	70 - 95
EFSJ-G8	150 - 185	120 - 185
EFSJ-G9	240 - 300	240 - 300

Mechanical Earth Kits for Lead Sheath (Max 10kA Earth Fault Level)

Size in mm ²	6.6 kV	11 kV
EFSJ-L1	25 - 50	16
EFSJ-L2	70 - 120	25 - 70
EFSJ-L3	150 - 300	95 - 300

Mechanical Earth Kits for Aluminium Sheath

Size in mm ²		11 kV
EFSJ-A1		50 - 300

Paper Insulated Cables Inline and Transitions

Module	3 Core Paper or 1/3 Core Plastic	3 Core Paper	to	3 Core Paper	1 Core Plastic	3 Core Plastic with Armour	3 Core Plastic without Armour
	(mm ²)	(mm ²)		(mm ²)	(mm ²)	(mm ²)	(mm ²)
EFSJ-SP1	70 - 95		to	16 - 35			
EFSJ-SP2	120 - 185		to	16 - 70			
EFSJ-SP3	240 - 300		to	16 - 50			
EFSJ-SP4	240 - 300		to	70 - 95			
EFSJ-SP5	240 - 300		to	120 - 150			
EFSJ-SY1		70 - 95	to		16 - 35		
EFSJ-SY1		120 - 185	to		16 - 70		
EFSJ-SY2		240 - 300	to		16 - 50		
EFSJ-SY3		240 - 300	to		70 - 95		
EFSJ-SY4		240 - 300	to		120 - 150		
EFSJ-SX1		70 - 95	to			16 - 35	
EFSJ-SX1		120 - 185	to			16 - 70	
EFSJ-SX2		240 - 300	to			16 - 50	
EFSJ-SX3		240 - 300	to			70 - 95	
EFSJ-SX4		240 - 300	to			120 - 150	
EFSJ-SX1		70 - 95	to				16 - 35
EFSJ-SX5		120 - 185	to				16 - 70
EFSJ-SX6		240 - 300	to				16 - 50
EFSJ-SX7		240 - 300	to				70 - 95
EFSJ-SX8		240 - 300	to				120 - 150

Example: EFSJ-11-A

11kV 3 core paper cable inline joint 16 - 50mm²

Example: EFSJ-11-B and EFSJ-T2

11kV 3 core paper cable to 3 single core XLPE transition joint 50 - 95mm²

Example: EFSJ-11-C and EFSJ-T8 and EFSJ-G8

11kV 3 core paper cable to 3 core XLPE with steel wire armours transition joint 120 - 185mm²

Example: EFSJ-11-D and EFSJ-T9 and EFSJ-SP4

11kV 3 core paper cable 70mm² to 3 core XLPE cable 300mm²

Heat Shrinkable Joints for Screened Plastic and Rubber Insulated Cables up to 36kV

EPKJ

For jointing plastic insulated cables for up to 36 kV we offer a system based on heat shrinkable materials which are fast and simple to install, eliminates shelf life limitations even in severe climates and permits immediate back-filling of the trench and re-energise.

Reliability in installation

The insulating, screening and electrical field control layers of the joint are made of cross-linked polymeric materials with precisely defined electrical characteristics. The cross-linking process results in an “elastic memory”, activated simply by heating. The memory then causes the components to shrink to a predetermined diameter; the correct insulation thickness is thus achieved in one step automatically.

A simple fast jointing technique

The joint components are supplied as a pre-engineered set of heat shrinkable tubings, which means the cable fitter does not have to check the thickness or length of the system. Our system thus ensures accurate installation work while enabling the joint to be installed in significantly less time than many alternative techniques.

Proven technology

The long term performance of Raychem heat shrinkable materials has been demonstrated by well proven Raychem termination system. Millions of cable accessory installations for up to 36 kV in some

of the severest service conditions have confirmed their reliability under high electrical, thermal and environmental stress.

A universal system

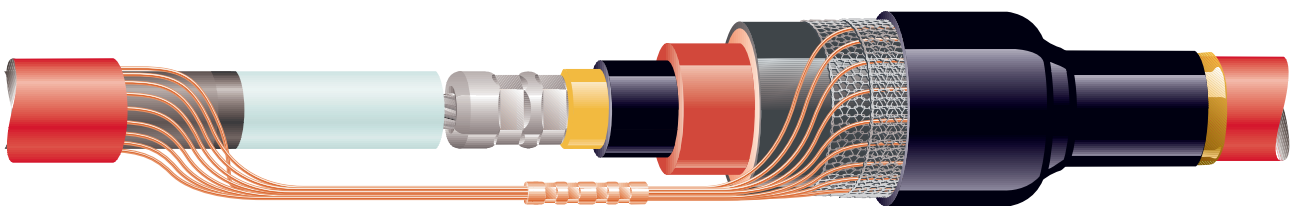
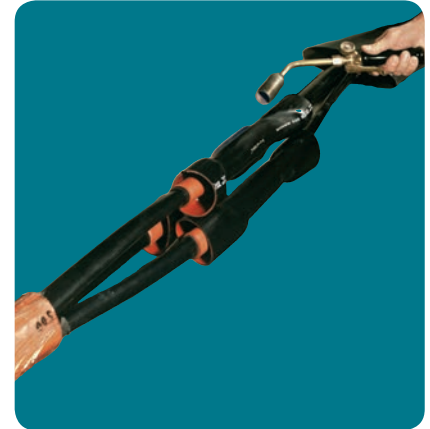
Cable preparation and installation techniques for Raychem medium voltage joints are identical to those for Raychem heat shrinkable terminations. The same basic design is also shared by Raychem joints for MIND paper insulated cables for up to 36 kV. In this respect, again, the heat shrinkable system sets new standards of efficiency and simplicity for the cable fitter's work.

Rational stock keeping

The performance and ease of installation of Raychem high voltage heat shrinkable materials are not sensitive to storage time or normal storage conditions. A few kits cover the standard size range of cables, including single core cables for 36 kV up to 630 mm², allow the use of various types of connectors and shrink to fit either round or sector-shaped cores and different constructions.

Mechanical strength

For steel wire or tape armoured cables Raychem joints incorporate a lightweight impact resistant galvanised steel joint case which is quick to install and provides earth fault current capacity. Heat shrinkable sleeves provide outer sealing and corrosion protection of the joint.

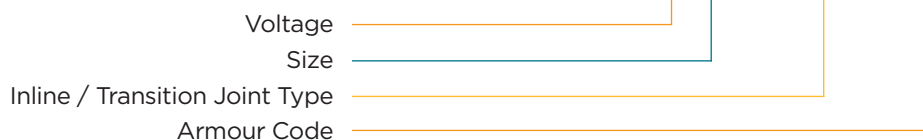


Joint System Designer

This worksheet enables you to arrive at a part number for an EPKJ straight or transition joint. Choose one figure from the left-hand column of each table.

Typical part number:

EPKJ- 17 A / 1XU-1XU - T



Voltage in kV	
17	up to 17.5 kV
24	24 kV
36	36 kV

Size

Size in mm ²	12 kV	17.5 kV	24 kV	36 kV
A	35 - 70	25 - 50	25	50 - 70
B	95 - 185	70 - 150	35 - 70	95 - 150
C	240 - 400	185 - 300	95 - 240	185 - 400
D	500 - 630	400 - 500	300 - 400	500 - 630

Inline Joint Type

1XU - 1XU	Single Core Plastic without Armour
1XU - 3XU	Single Core to 3 Core Plastic without Armour
3XU - 3XU	3 Core Plastic without Armour
1HL - 1HL	Single Core HSL Paper
1HL - 3HL	Single Core HSL to 3 Core HSL Paper
1HL - 3SB	Single Core HSL Paper to 3 Core S/B Paper
3HL - 3HL	3 Core HSL Paper
3HL - 3SB	3 Core HSL Paper to 3 Core S/B Paper
3SB - 3SB	3 Core Screened / Belted

Transition Joint Type

1XU - 1HL	Single Core Plastic to Single Core HSL Paper
1XU - 3HL	Single Core Plastic to 3 Core HSL Paper
1XU - 3SB	Single Core Plastic to 3 Core S/B Paper
3XU - 1HL	3 Core Plastic to 1 Core HSL Paper
3XU - 3HL	3 Core Plastic to 3 Core HSL Paper
3XU - 3SB	3 Core Plastic to 3 Core S/B Paper

Armour Code

T	Tape Armour
W	Wire Armour

MXSU
MXAW
MXSW

Jointing System up to 36kV Complete with Mechanical Connectors

MXSU is based on a joint design using mechanical connectors

- Mechanical connectors for conductor and wire shield are supplied with the kit
- Kits are widely range taking and cover most conductor constructions including their tolerances
- No crimping tools or tool maintenance required
- Short and space saving design for installation
- Improves installation reliability
- Has unlimited shelf life, simplifies material logistics and reduces cost
- Avoids bulky waste and costly waste disposal
- Exceeds international performance standards including CENELEC HD 629 or IEC 60502-4 for joints

Modern jointing

Today's jointing technology must achieve higher levels of reliability and flexibility to meet the demand of operators who are under increasing pressure to improve network efficiency. In an environment with less engineering resources for product selection, outsourced services, emphasis on repair time and a variety of cable and conductor types in the network, a universal joint including range taking screw connectors ensures reliable application and service.

Mechanical shear bolt connectors

All joint kits incorporate a Raychem designed screw connector with shear head bolts to ensure a reliable pre-engineered electrical connection for the different conductor materials, shapes and types used in today's network. The connectors have been tested in accordance with IEC 61238-1 class A.

Electrical stress control

The stress control tubing at each cable end in combination with the yellow stress grading mastic at

the screen cut provide a precisely defined impedance characteristic which smooths the electrical field. For ease of installation, a stress control patch is applied around the mechanical connector to provide a similar function.

Shield continuity

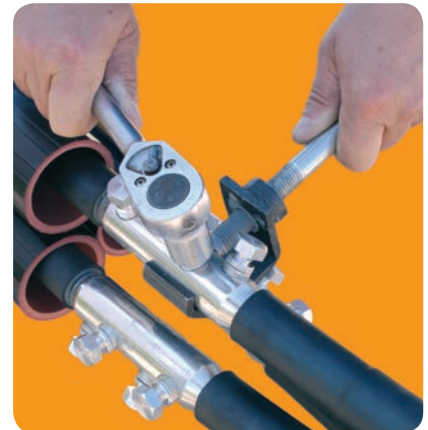
Typical shield wire cross sections up to 35mm² can easily be connected with the mechanical connector supplied in the kit. Positioned at the oversheath cut back, the connection provides a smooth profile and resists mechanical damage. There is no need for a crimping tool and its maintenance. Two shear bolts provide the required contact force in order to ensure safe installation and reliable performance during load cycling in service as well as during short circuit conditions.

Rayfit joint body

The conductive outer layer together with the insulating middle layer represent the heat shrinkable hold out for the inner elastomeric layer of the joint body. During the shrinking process the stored recovery force of the elastomeric layer is released and adds up to the recovery force generated by the heat shrinkable outer layers of the joint body.

Robust outer sealing and protection

Modern cable laying techniques require a robust oversheath replacement capable of withstanding high mechanical stresses during conventional cable laying as well as mechanical impact occurring during the entire cable life time. The thick wall heat shrinkable tubing is internally coated with a hot melt adhesive to ensure an effective moisture seal and corrosion protection for the joint. When installed, the joints provide the similar level of protection and thickness as modern cables with PE oversheath. All voltage sheath testing commonly used today after cable laying or as control test methods have easily been passed.



11kV MXSU-3

Single Core Cable with Wire Shield without Armour

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSU-3111	11	25 - 95	5.2 - 12.0	13.2 - 21.8	23 - 32
MXSU-3121	11	70 - 150	8.7 - 15.0	17.6 - 24.3	25 - 38
MXSU-3131	11	95 - 240	10.3 - 19.2	17.6 - 29.4	26 - 40
MXSU-3132	11	150 - 300	12.9 - 21.6	21.6 - 30.4	29 - 43
MXSU-3141	11	240 - 400	17.8 - 24.6	25.7 - 32.6	33 - 47
MXSU-3151	11	500	25.5 - 27.6	33.8 - 37.2	44 - 50
MXSU-3161	11	630	29.0 - 32.5	37.5 - 40.0	47 - 54
MXSU-3171	11	800	32.0 - 33.8	39.5 - 42.6	52 - 57
MXSU-3181	11	1000	38.5 - 39.2	45.0 - 47.6	59 - 64

Size Transition Joints including Dual Range Mechanical Connectors

Catalogue Reference	Voltage	Size Range	Lower Range		Upper Range		Min. Diameter Cable Over Sheath
			Diameter Conductor	Diameter Over Core Insulation	Diameter Conductor	Diameter Over Core Insulation	
			(mm)	(mm)	(mm)	(mm)	
MXSU-3131-T2	11	25/95 - 95/240	5.2 - 12.0	13.2 - 21.8	10.3 - 19.2	17.6 - 29.4	23
MXSU-3141-T4	11	95/240 - 185/400	10.3 - 19.2	17.6 - 29.4	15.5 - 24.6	23.2 - 32.6	26
MXSU-3151-T6	11	185/400 - 500	15.5 - 24.6	23.2 - 32.6	25.5 - 27.6	33.8 - 37.2	33
MXSU-3161-T6	11	185/400 - 630	15.5 - 24.6	23.2 - 32.6	29.0 - 32.5	37.5 - 40.0	33
MXSU-3161-T7	11	500 - 630	25.5 - 27.6	33.8 - 37.2	29.0 - 32.5	37.5 - 40.0	44

3 Core Cable with Wire Shield without Armour

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSU-3311	11	25 - 95	5.2 - 12.0	13.2 - 21.8	40 - 61
MXSU-3321	11	70 - 150	8.7 - 15.0	17.6 - 24.3	45 - 68
MXSU-3331	11	95 - 240	10.3 - 19.2	18.5 - 29.4	53 - 77
MXSU-3332	11	150 - 300	12.9 - 21.6	21.6 - 31.4	59 - 85
MXSU-3341	11	185 - 400	14.8 - 24.6	21.6 - 34.6	59 - 85

Screened 1 Core to 3 Core Plastic Insulated Cables without Armour 12kV

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm ²)	(mm)	(mm)
MXSU-3311-1C	11	25 - 95	5.2 - 12.0	13.2 - 21.8	42.5 - 61.0
MXSU-3321-1C	11	70 - 150	8.7 - 15.0	17.6 - 24.3	45.0 - 68.0
MXSU-3331-1C	11	95 - 240	10.3 - 19.2	18.5 - 29.4	53.0 - 77.0
MXSU-3332-1C	11	150 - 300	12.9 - 21.6	21.6 - 31.4	59.0 - 85.0
MXSU-3341-1C	11	240 - 400	15.5 - 24.6	23.9 - 34.6	70.0 - 105.0

11kV MXSU-12

Transition Joints from 1 Core Polymeric Cable without Armour to 3 Core Belted or Screened Paper Cable

Catalogue Reference	Voltage	Single Core Polymeric Cable	Three Core Belted/ Screened Paper Cable
		Size Range	Size Range
	kV	(mm ²)	(mm ²)
MXSU-12A/1XU-3SB	11	25 - 95	25 - 70
MXSU-12B/1XU-3SB	11	70 - 150	70 - 120
MXSU-12C/1XU-3SB	11	95 - 240	95 - 185
MXSU-12D/1XU-3SB	11	150 - 300	150 - 240
MXSU-12E/1XU-3SB	11	240 - 400	240 - 300

Catalogue Reference	Single Core Polymeric Cable		Three Core Belted/ Screened Paper Cable		
	Diameter over Core insulation	Diameter Cable Oversheath	Diameter over Core insulation	Diameter over Lead sheath	Diameter Cable overshooth
	(mm)	(mm)	(mm)	(mm)	(mm)
MXSU-12A/1XU-3SB	13.2 - 21.8	23 - 32	12.6 - 17.2	30 - 36	36 - 46
MXSU-12B/1XU-3SB	17.6 - 24.5	26 - 37	16.0 - 20.4	33 - 43	41 - 53
MXSU-12C/1XU-3SB	17.6 - 29.4	26 - 41	17.9 - 23.7	39 - 48	49 - 58
MXSU-12D/1XU-3SB	21.6 - 31.4	29 - 43	20.0 - 26.1	43 - 53	52 - 64
MXSU-12E/1XU-3SB	25.0 - 34.6	33 - 47	24.7 - 28.6	48 - 64	58 - 72

Transition Joints from 1 Core Polymeric Cable without Armour to 3 Core H.S.L. Type Paper Cable

Catalogue Reference	Voltage	Single Core Polymeric Cable	Three Core HSL Type Paper Insulated Cable
		Size Range	Size Range
	kV	(mm ²)	(mm ²)
MXSU-12A/1XU-3HL	11	25 - 95	25 - 95
MXSU-12B/1XU-3HL	11	70 - 150	70 - 150
MXSU-12C/1XU-3HL	11	95 - 240	95 - 240
MXSU-12D/1XU-3HL	11	150 - 300	150 - 300
MXSU-12E/1XU-3HL	11	240 - 400	240 - 400

Catalogue Reference	Single Core Polymeric Cable		Three Core HSL Type Paper Insulated Cable		
	Diameter over Core insulation	Diameter Cable Oversheath	Diameter over Core insulation	Diameter over Lead sheath	Diameter Cable overshooth
	(mm)	(mm)	(mm)	(mm)	(mm)
MXSU-12A/1XU-3HL	13.2 - 21.8	23 - 32	12.6 - 18.9	17 - 24	46 - 58
MXSU-12B/1XU-3HL	17.6 - 24.5	26 - 37	16.0 - 21.9	21 - 27	55 - 70
MXSU-12C/1XU-3HL	17.6 - 29.4	26 - 41	17.9 - 26.1	22 - 29	57 - 76
MXSU-12D/1XU-3HL	21.6 - 31.4	29 - 43	20.0 - 28.5	25 - 31	70 - 80
MXSU-12E/1XU-3HL	25.0 - 34.6	33 - 47	24.7 - 31.5	27 - 34	73 - 86

22kV MXSU-5

Single Core Cable with Wire Shield without Armour

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSU-5101	22	10 - 35	3.7 - 7.5	15.0 - 22.0	17 - 33
MXSU-5111	22	25 - 95	5.2 - 12.0	17.9 - 26.0	25 - 38
MXSU-5121	22	50 - 150	7.2 - 15.0	20.2 - 29.5	28 - 41
MXSU-5131	22	95 - 240	10.3 - 19.2	23.0 - 33.6	30 - 43
MXSU-5132	22	150 - 300	12.9 - 21.6	25.0 - 35.5	33 - 48
MXSU-5141	22	240 - 400	17.8 - 24.6	29.9 - 38.8	35 - 49
MXSU-5151	22	500	25.5 - 27.6	37.2 - 41.6	48 - 54
MXSU-5161	22	630	29.0 - 32.5	39.2 - 44.7	50 - 58
MXSU-5171	22	800	32.0 - 33.8	44.8 - 46.9	58 - 61
MXSU-5181	22	1000	38.5 - 39.2	49.4 - 53.2	64 - 67

Size Transition Joints including Dual Range Mechanical Connectors

Catalogue Reference	Voltage	Size Range	Lower Range		Upper Range		Min. Diameter Cable Over Sheath
			Diameter Conductor	Diameter Over Core Insulation	Diameter Conductor	Diameter Over Core Insulation	
			(mm)	(mm)	(mm)	(mm)	
MXSU-5131-T2	22	25/95 - 95/240	5.2 - 12.0	17.9 - 26.0	10.3 - 19.2	23.0 - 33.6	25
MXSU-5141-T4	22	95/240 - 240/400	10.3 - 19.2	23.0 - 33.6	17.8 - 24.6	29.9 - 38.8	30
MXSU-5151-T6	22	185/400 - 500	15.5 - 24.6	27.4 - 38.8	25.5 - 27.6	37.2 - 41.6	35
MXSU-5161-T6	22	185/400 - 630	15.5 - 24.6	27.4 - 38.8	29.0 - 32.5	39.2 - 44.7	35
MXSU-5161-T7	22	500 - 630	25.5 - 27.6	37.2 - 41.6	29.0 - 32.5	39.2 - 44.7	48
MXSU-5171-T8	22	630 - 800	29.0 - 32.5	39.2 - 44.7	32.0 - 33.8	44.8 - 46.9	50
MXSU-5181-T8	22	630 - 1000	29.0 - 32.5	39.2 - 44.7	38.5 - 39.2	49.4 - 53.2	50

3 Core Cable with Wire Shield without Armour

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSU-5311	22	25 - 95	5.2 - 12.0	17.9 - 26.0	48 - 72
MXSU-5321	22	50 - 150	7.2 - 15.0	20.2 - 29.5	55 - 80
MXSU-5331	22	95 - 240	10.3 - 19.2	23.0 - 33.6	62 - 89
MXSU-5332	22	150 - 300	12.9 - 21.6	25.0 - 35.5	70 - 96
MXSU-5341	22	185 - 400	14.8 - 24.6	27.0 - 38.8	76 - 105

Screened 1 Core to 3 Core Plastic Insulated Cables without Armour 12 & 24kV

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm ²)	(mm)	(mm)
MXSU-5311-1C	22	25 - 95	6 - 12.0	18.5 - 26.0	52.5 - 71.5
MXSU-5321-1C	22	50 - 150	7.2 - 15.0	20.2 - 29.5	55.0 - 80.0
MXSU-5331-1C	22	95 - 240	10.3 - 19.2	23 - 33.6	62.5 - 89.0
MXSU-5332-1C	22	150 - 300	12.9 - 21.6	25 - 35.5	70.0 - 96.0
MXSU-5341-1C	22	240 - 400	15.5 - 24.6	28.1 - 38.8	76.0 - 105.0

22kV MXSU-24

Transition Joints from 1 Core Polymeric Cable without Armour to 3 Core H.S.L. Type Paper Cable

Catalogue Reference	Voltage	Single core Polymeric Cable	Three core HSL Type Paper Insulated Cable
		Size Range	Size Range
	12kV	(mm ²)	(mm ²)
MXSU-24A/1XU-3HL	22	25 - 95	25 - 95
MXSU-24B/1XU-3HL	22	50 - 150	50 - 150
MXSU-24C/1XU-3HL	22	95 - 240	95 - 240
MXSU-24D/1XU-3HL	22	150 - 300	150 - 300
MXSU-24E/1XU-3HL	22	240 - 400	240 - 400

Catalogue Reference	Single core Polymeric Cable		Three core HSL Type Paper Insulated Cable		
	Diameter over Core insulation	Diameter Cable Oversheath	Diameter over Core insulation	Diameter over Lead sheath	Diameter Cable overshooth
	(mm)	(mm)	(mm)	(mm)	(mm)
MXSU-24A/1XU-3HL	17.6 - 26.0	24 - 38	17.0 - 23.5	20 - 27	52 - 69
MXSU-24B/1XU-3HL	19.5 - 28.5	27 - 41	18.5 - 26.5	22 - 32	58 - 77
MXSU-24C/1XU-3HL	22.5 - 33.0	31 - 44	22.5 - 31.0	25 - 35	68 - 86
MXSU-24D/1XU-3HL	25.0 - 34.6	33 - 46	25.0 - 33.1	28 - 37	72 - 91
MXSU-24E/1XU-3HL	29.4 - 38.8	38 - 50	29.4 - 36.1	34 - 39	84 - 94

Transition Joints from 1 Core Polymeric Cable without Armour to 3 Core Belted or Screened Paper Cable

Catalogue Reference	Voltage	Single core Polymeric Cable	Three core Belted/ Screened Paper Cable
		Size Range	Size Range
	12kV	(mm ²)	(mm ²)
MXSU-24A/1XU-3SB	22	25 - 95	25 - 70
MXSU-24B/1XU-3SB	22	50 - 150	70 - 120
MXSU-24C/1XU-3SB	22	95 - 240	95 - 185
MXSU-24D/1XU-3SB	22	150 - 300	150 - 240
MXSU-24E/1XU-3SB	22	240 - 400	240 - 300

Catalogue Reference	Single core Polymeric Cable		Three core Belted/ Screened Paper Cable		
	Diameter over Core insulation	Diameter Cable Oversheath	Diameter over Core insulation	Diameter over Lead sheath	Diameter Cable overshooth
	(mm)	(mm)	(mm)	(mm)	(mm)
MXSU-24A/1XU-3SB	17.6 - 26.0	24 - 38	17.0 - 21.9	39 - 49	48 - 60
MXSU-24B/1XU-3SB	19.5 - 28.5	27 - 41	18.5 - 26.5	39 - 53	49 - 62
MXSU-24C/1XU-3SB	22.5 - 33.0	31 - 44	22.5 - 28.5	48 - 62	55 - 70
MXSU-24D/1XU-3SB	25.0 - 34.6	33 - 46	25.4 - 31.7	52 - 64	60 - 75
MXSU-24E/1XU-3SB	29.4 - 38.8	38 - 50	29.4 - 33.1	60 - 70	70 - 84

33kV MXSU-6

Single Core Cable with Wire Shield without Armour

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSU-6111	33	35 - 95	6.0 - 12.0	24.0 - 30.0	32 - 43
MXSU-6121	33	70 - 150	8.7 - 15.0	26.2 - 34.5	34 - 44
MXSU-6131	33	150 - 300	13.9 - 21.6	31.1 - 39.6	38 - 53
MXSU-6141	33	240 - 400	17.8 - 24.6	36.2 - 42.8	40 - 54
MXSU-6151	33	500	25.5 - 29.2	40.1 - 46.6	52 - 60
MXSU-6161	33	630	29.0 - 32.5	45.8 - 50.5	55 - 68
MXSU-6171	33	800	32.0 - 33.8	50.1 - 53.4	62 - 66
MXSU-6181	33	1000	38.5 - 39.2	55.7 - 58.8	69 - 73

Size Transition Joints including Dual Range Mechanical Connectors

Catalogue Reference	Voltage	Size Range	Lower Range		Upper Range		Min. Diameter Cable Over Sheath
			Diameter Conductor	Diameter Over Core Insulation	Diameter Conductor	Diameter Over Core Insulation	
			(mm)	(mm)	(mm)	(mm)	
MXSU-6141-T4	33	95/240 - 240/400	10.3 - 19.2	27.8 - 37.6	17.8 - 24.6	36.2 - 42.8	35
MXSU-6151-T6	33	185/400 - 500	15.5 - 24.6	32.4 - 42.8	25.5 - 27.6	40.1 - 46.6	40
MXSU-6161-T6	33	185/400 - 630	15.5 - 24.6	32.4 - 42.8	29.0 - 32.5	45.8 - 50.5	40
MXSU-6161-T7	33	500 - 630	25.5 - 27.6	40.1 - 46.6	29.0 - 32.5	45.8 - 50.5	52
MXSU-6171-T8	33	630 - 800	29.0 - 32.5	45.8 - 50.5	32.0 - 33.8	50.1 - 53.4	55
MXSU-6181-T8	33	630 - 1000	29.0 - 32.5	45.8 - 50.5	38.5 - 39.2	55.7 - 58.8	55

3 Core Cable with Wire Shield without Armour

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSU-6311	33	35 - 95	6.0 - 12.0	24.0 - 30.0	59.0 - 77.2
MXSU-6321	33	70 - 150	8.7 - 15	26.2 - 34.5	73.0 - 85.0
MXSU-6331	33	150 - 300	13.9 - 21.6	31.1 - 39.6	83.0 - 100.0
MXSU-6341	33	240 - 400	17.8 - 24.6	36.2 - 42.8	92.0 - 110.0
MXSU-6351	33	500	25.5 - 29.2	40.1 - 46.6	100.0 - 120.0

Screened 1 Core to 3 Core Plastic Insulated Cables without Armour 24kV

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm ²)	(mm)	(mm)
MXSU-6311-1C	33	35 - 95	6.0 - 12.0	24.0 - 30.0	59.0 - 77.2
MXSU-6331-1C	33	150 - 300	13.9 - 21.6	31.1 - 39.6	83.0 - 100.0
MXSU-6341-1C	33	185 - 400	15.9 - 24.6	32.0 - 42.8	85.0 - 110.0

MXAW & MXSW

Joints for Polymeric Insulated Cable with Aluminium Wire Armour Including Mechanical Connectors

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXAW-5131	22	95 - 185	10.3 - 17.6	23.0 - 31.2	37 - 43
MXAW-5132	22	150 - 300	12.9 - 21.6	25.8 - 34.6	40 - 48
MXAW-5141	22	240 - 400	17.8 - 24.6	29.4 - 38.8	44 - 54
MXAW-5151	22	500	25.5 - 27.6	37.2 - 41.6	48 - 56
MXAW-5161	22	630	29.0 - 32.5	39.2 - 44.7	50 - 60

Three Core Screened Polymeric Insulated Cable with Steel Wire Armour and Copper Tape Shield

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSW-3331	11	95 - 240	10.3 - 19.2	17.6 - 29.4	62 - 80
MXSW-3332	11	150 - 300	12.9 - 21.6	22.0 - 31.4	68 - 85

Catalogue Reference	Voltage	Size Range	Diameter Conductor	Diameter Over Core Insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSW-5331	22	95 - 240	10.3 - 19.2	23.0 - 33.6	72 - 90
MXSW-5332	22	150 - 300	12.9 - 21.6	25.0 - 35.5	80 - 95

Heat Shrinkable Airfield Lighting Cable Joints for Screened and Unscreened Cables

EAKJ

Features

- High performance joint material
- Compact design
- Connector included

Features

- Applicable for 4 kV and 7 kV lighting systems
- Easy and safe installation
- Unlimited shelf life

A simple fast jointing technique

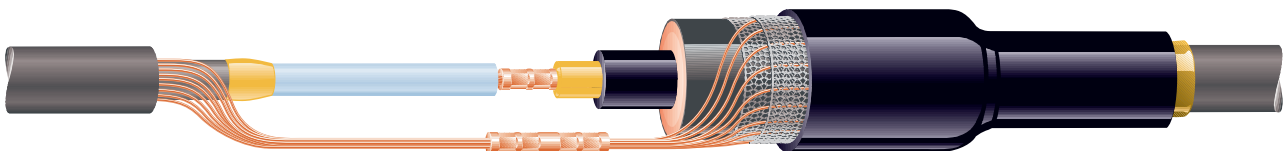
The joint components are supplied as a pre-engineered set of heat shrinkable tubings. Cable preparation and installation techniques on the EAKJ are identical with medium voltage jointing systems.

The cross-linked polymeric materials provide highest performance also on smallest cross sections. The long-term performance of Raychem's heat shrinkable materials has been well proven by millions of jointing systems up to 72 kV.



EAKJ Airfield Lighting Cable Joints

Catalogue Reference	Voltage	Cross Section	Cable
	kV	(mm ²)	
EAKJ-12A/1XU-1XU	6/10 (12) kV	6	Single Core Screened
EAKJ-2257	3.6/6 (7.2) kV	6	Single Core Unscreened



Heat Shrinkable Medium Voltage Branch Joints for Single Core Polymeric Cables up to 24kV

MXSB

Features

- Shear bolt connector
- Connector and insulation in one kit
- Range taking kit
- Compact, robust and buriable

Features

- No special installation tools or dies needed
- No other engineering required
- Wide range of application
- Space saving, low total costs

MXSB joints use shear bolt connectors to simplify the interconnection of conductors. Heat shrinkable insulating components supply pre-engineered thicknesses of insulation and stress control material. This is a major step forward in comparison with traditional taping solutions.



MXSB Branch Joints

Catalogue Reference	Voltage	Conductor Cross Section	Diameter Conductor	Diameter over Core insulation	Diameter Cable Oversheath
	kV	(mm ²)	(mm)	(mm)	(mm)
MXSB-12B/1XU-2XU	12	70 - 185	8.7 - 16.8	17.6 - 25.9	25 - 39
MXSB-12C/1XU-2XU	12	150 - 300	13.9 - 23.1	22.3 - 30.4	28 - 43
MXSB-24B/1XU-2XU	24	70 - 185	8.7 - 16.8	21.9 - 30.1	30 - 39
MXSB-24C/1XU-2XU	24	120 - 300	12.7 - 23.1	25.0 - 34.6	32 - 48

For other combinations of cable sizes or information for 36 kV cables, please contact your local sales representative.

