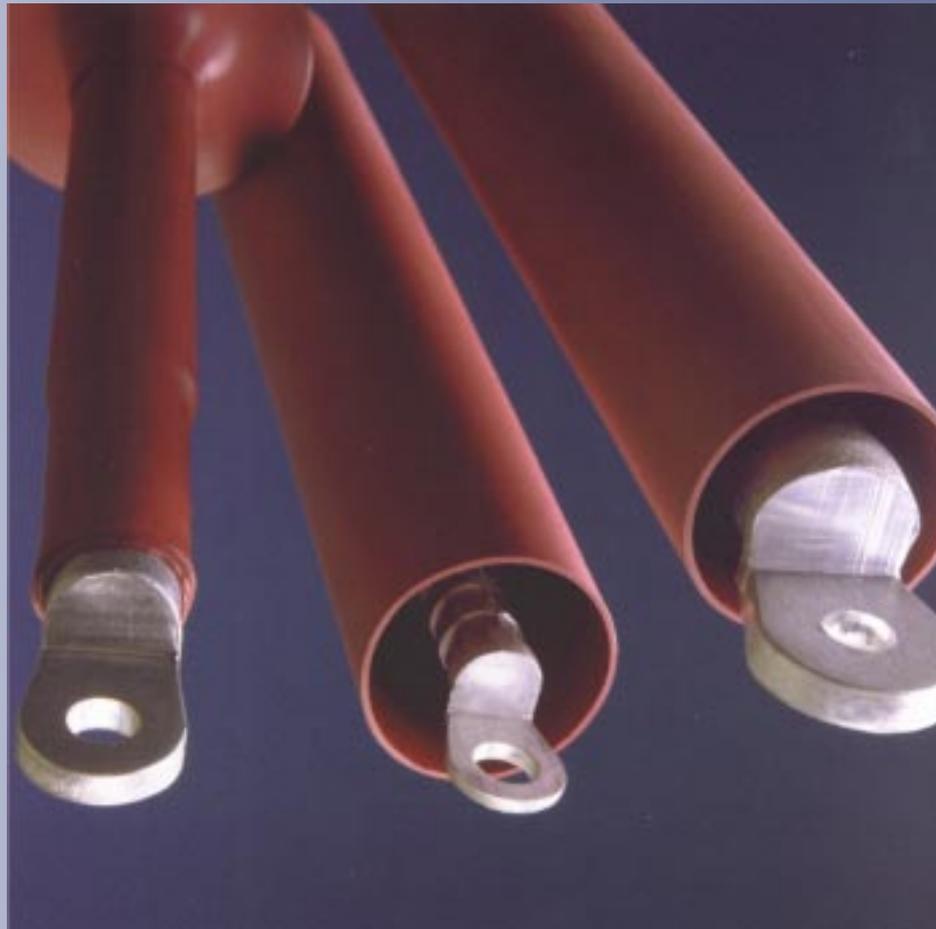


Raychem

IXSU-C/OXSU-C

Heat-shrinkable medium voltage terminations for single core polymeric cables 12 to 24 kV



Raytop heat shrinkable terminations from Raychem

Indoor and outdoor terminations can now be made on a wide range of cable sizes with a single-component system. The Raytop termination from Raychem seals the cable against moisture in the same single installation step.

Like the well-tryed Raychem technique from which it stems, the Raytop system is based on a non-tracking, weather-resistant, heat-shrinkable material. The high shrink ratio of the Raytop material means a wide range of cable sizes is covered by each tubing.

The Raytop termination also features the moisture sealing technique proven in the Raychem cable accessory system. During manufacture, a sealant is pre-installed on the inside of the termination body. When this is heated to shrink it into place, a lasting moisture seal results.

The Raytop programme goes a step further in termination design by taking account of the cable preparation skills required for modern plastic cables. The material properties of the integral stress control layer have been chosen to suit plastic cables prepared with screen stripping tools in the normal way. This simplifies the installer's work significantly.

Ease of Installation

The Raytop termination provides electrical stress control, moisture sealing and non-tracking protection in a single installation step. The pre-fabricated termination body is supplied in an expanded form which is simply positioned over the prepared cable end and shrunk into place.

- range-taking heat-shrinkable system
- space-saving short slim design for modern switchgear
- indoor and outdoor application
- simple cable preparation: no sanding, no silicon grease
- pre-fabricated single-piece termination: sealing, stress control and environmental protection in one installation step.

Moisture sealing

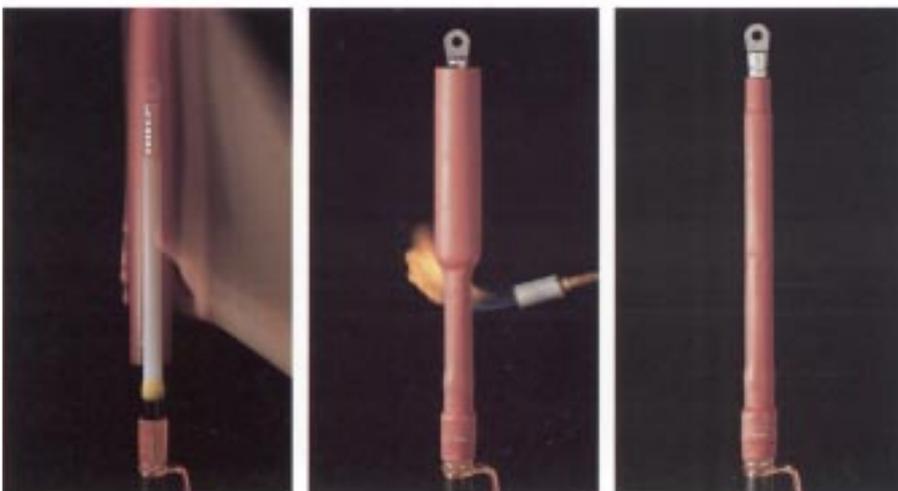
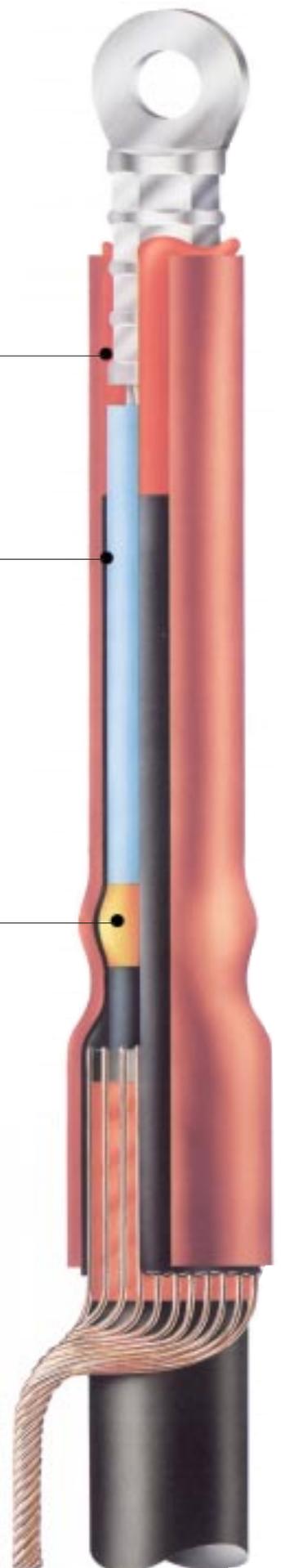
The Raytop termination is a heat-shrinkable component with a sealant pre-installed on the inside of the tubing. During installation the heat used and the shrinking action result in a lasting moisture seal at the cable lug and oversheath end.

Stress control

The increasing acceptance of plastic insulated cables has led to changes in the skills required for cable preparation. Raychem has responded with a stress control material that was specially developed for cables prepared with screen stripping tools. The termination body is supplied with the stress control layer installed inside. Together with the tubing's shrinking action, the layer's permanent plasticity makes it conform tightly to the cable screen and insulation surface.

Cable Preparation

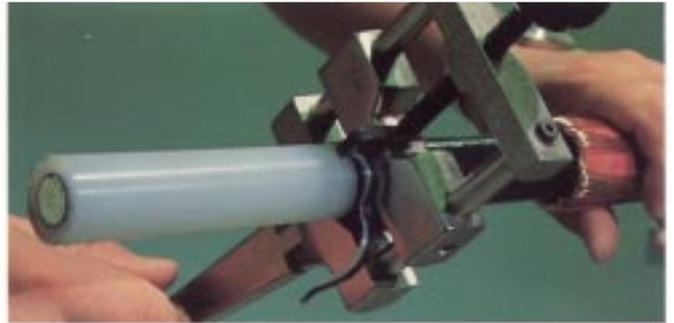
The screen end is smoothed electrically by a stress controlling void filler, which is compressed into place by the shrinking action of the termination body. Sanding and silicone grease are not required on the insulation surface.



Raytop heat-shrink-sealed wide-range terminations for single core plastic cables up to 24 kV



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1 Raytop terminations connecting 24 kV plastic cables to a substation transformer.

2 A 24 kV outdoor termination using the Raytop system together with Raychem stand-off insulators.

3 Raytop terminations as part of a Raychem insulated separable connection to SF₆-switchgear. Raytop terminations are part of the universal Raychem system for plastic and paper insulated cables (at rear).

4 The slim compact Raytop system used to make a 24 kV switchgear termination.

5 Plastic cables with extruded screens prepared with stripping tools. The Raytop stress control system is specially designed for the insulation surface left by proper use of such tools.

6 Outdoor transformer connections for 24 kV made with Raytop terminations.

Minimum performance for Raytop terminations for single core plastic and rubber insulated cables 12 kV to 24 kV

Test Sequence		Test Voltage			Result
		Highest Voltage for Cable U _m [kV]			
		12	17.5	24	
A.C. Voltage Withstand	1 min	35	45	55	no breakdown and no flashover
Partial Discharge		7.5 12	10.9 17.5	15 24	≤ 3 pC ≤ 20 pC
Impulse Voltage Withstand	10 positive and 10 negative, 1.2/50 μs, between each conductor and the grounded screen	indoor: 75 outdoor: 95	95 110	125 150	no breakdown and no flashover
Load Cycling	63 cycles 5 h heating, 3 h cooling Conductor temperature: PE, PVC cables: 75 °C XPE cables: 95 °C	15	22	30	no breakdown and no flashover
Partial Discharge		7.5 12	10.9 17.5	15 24	≤ 3 pC ≤ 20 pC
Thermal Short Circuit	Two 1 s faults with temperature as for cable specification				no visible signs of damage
Load Cycling	repeat	15	22	30	no breakdown and no flashover
Partial Discharge		7.5 12	10.9 17.5	15 24	≤ 3 pC ≤ 20 pC
A.C. Voltage Withstand	4 h	24	36	48	no breakdown and no flashover
Impulse Voltage Withstand	repeat	indoor: 75 outdoor: 95	95 110	125 150	no breakdown and no flashover
D.C. Voltage Withstand	30 min	48	72	96	no breakdown and no flashover
Humidity indoor terminations	conductivity 800 μS/cm, 100 h spray rate: 0.4 l/m ³ /h	7.5	10.9	15	no breakdown, no flashover, no visible tracking and no erosion
Salt-fog outdoor terminations	224 kg/m ³	7.5	10.9	15	no flashover

Notes:

- U_m is the highest phase to phase voltage. All other voltages are stated as phase to ground values.
- Further details are given in Raychem specification PPS 3013.

Raychem terminations are supplied complete with installation instructions.

For further details please contact your local Raychem sales engineer.

All the above information, including drawings, illustrations and graphic displays reflects our present understanding and is to the best of our knowledge and belief correct and reliable. It does, however, under no circumstance constitute an assurance of any particular qualities. Such an assurance is only provided in the context of our product specifications.

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At Raychem we are committed to continuous quality improvement in every aspect of our business.

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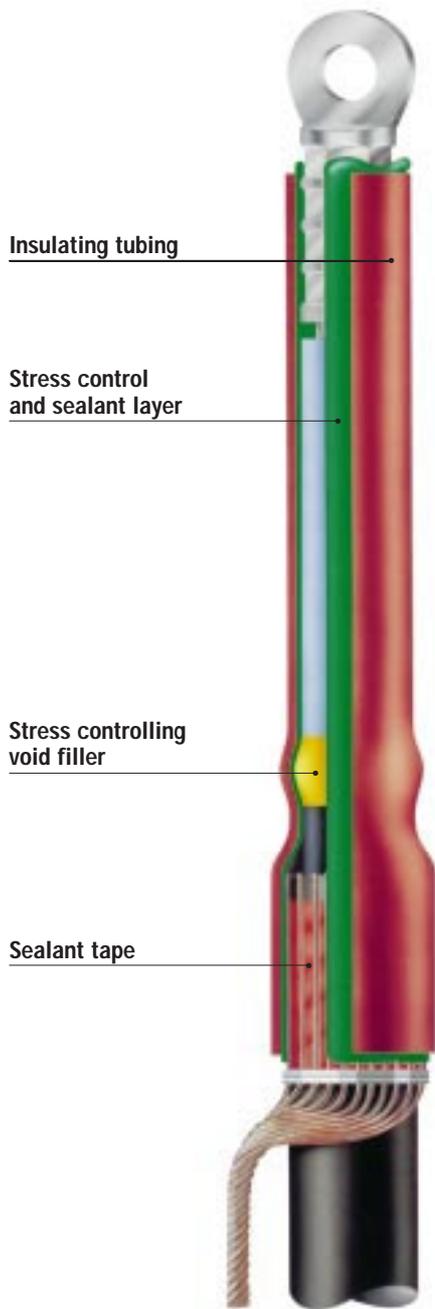
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Heat-shrinkable medium voltage terminations for indoor and outdoor applications for polymeric cables up to 42 kV





IXSU-F indoor termination

The material makes the difference

Key to the performance of Raychem's products is the materials science and technology going into their development. Raychem has displayed excellent performance in heat-shrinkable cable accessories up to 72 kV. Raychem's heat-shrinkable terminations have a proven record of long-term stability, durability, and reliability over many years.

Raychem cable accessories have been used by utilities and industrial companies around the world for more than 25 years. This field experience has enabled Raychem to be a leader in materials technology for high-voltage applications.

Raychem's materials technology is at the core of the development of our new range of heat-shrinkable terminations.

Benefits

- Unlimited shelf life
- Minimal waste for disposal
- Simple installation
- A broad application range

Designed for both indoors and outdoors in all climate conditions, the IXSU-F/OXSU-F range covers applications for polymeric cables up to 42 kV.

The components combine to provide the important functions required for all medium voltage products: electrical performance, stress control and moisture sealing.

The proprietary materials used in Raychem cable accessories have been extensively optimised with respect to product design and function, manufacturing and expected service environments.

Raychem recognises that polymeric and elastomeric insulation materials are not generic. Variations and differences can exist among base polymer grades and additives. Formulations consist not only of polymer but of additives and fillers which greatly influence the material's properties. It is the entire formulation package in combination with compounding procedures, material processing, product design and assembly that all contribute to the overall product performance.

Insulation materials

The materials employed in the IXSU-F/OXSU-F termination generation have similarly undergone many years of development yielding a polymeric material with exceptional electrical and weathering performance properties. The formulation is based on a long history of proven polymer compounds, exhibiting excellent stability and long-term



IXSU-F terminations installed with Raychem bushing boot (RCAB)



IXSU-F terminations installed with Raychem insulated connection system (RICS)

performance over several decades under severe environmental climates to deliver outstanding tracking and erosion resistance, mechanical strength, weatherability and dielectric properties.

Stress control materials

Raychem has formulated a new electrical stress control material, which is coextruded inside a polymer heat-shrink insulating tubing.

The electrical stress control provides physical and electrical properties with excellent performance.

Product range

The product line is designed for polymer cables up to 800 mm² and up to 42 kV. This coverage is completed with a minimum number of designs.

The products are tested in accordance to CENELEC specification HD629 which encompasses international standards such as IEC, British Standards and VDE.

For cable box applications IXSU-F can be combined with either Raychem's bushing boot (RCAB) or Raychem's insulated connection system (RICS) to fit most types of switchgear bushings currently available on today's market.

For pole top applications Raychem can supply OXSU-F along with polymeric insulators (EPBI), Polygarde surge arresters and most fittings required for installation.

All of the IXSU-F/OXSU-F components have full traceability back to the origin of manufacture and raw materials according to ISO 9001 and ISO 14001.

Kit content

Each IXSU-F/OXSU-F kit will consist of the insulation tubings including coextruded stress control, sealant tapes and installation instruction.

For special applications contact your local Raychem sales office.

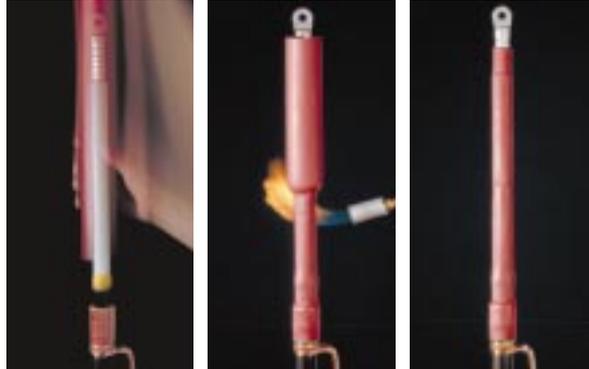
The right kit for your cable range can be selected with the help of the selection guide EPP 0795.

Installation

Each kit contains easy-to-follow installation instructions with excellent visual displays of the installation steps. Installation is both fast and simple.



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1 Plastic cables with extruded screens prepared with stripping tools.

2 Installation of 24 kV termination

3 The slim compact IXSU-F system used to make a 24 kV switchgear termination.

4 IXSU-F terminations connecting 24 kV plastic cables to a substation transformer.

5 Outdoor transformer connections for 24 kV made with OXSU-F terminations.



5



Features and benefits

Features

High-performance termination material

New stress control system

Integrated stress control

Separate mastic tapes for moisture sealing, specially designed for heat-shrinkable applications

Compact design

Application range

Easy application

Benefits

Outstanding UV properties
 Exceptional track and erosion resistance
 Highly hydrophobic
 Excellent high voltage insulation material

Superb high-impulse withstand performance

Ensures stress control system is correctly positioned

Ensures mastic tapes are correctly positioned
 Excellent resistance to moisture ingress

Space saving

Four products cover the total cable range

Time saving and simple to install

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ENERGY DIVISION



AMP - Wedge technology products and electrical connectors
 Raychem - Cable accessories, insulation enhancement, surge arresters and insulators
 Simel - Connectors for high voltage substations, low and medium voltage networks, grounding, railways infrastructure, low voltage industrial applications and associated toolings.

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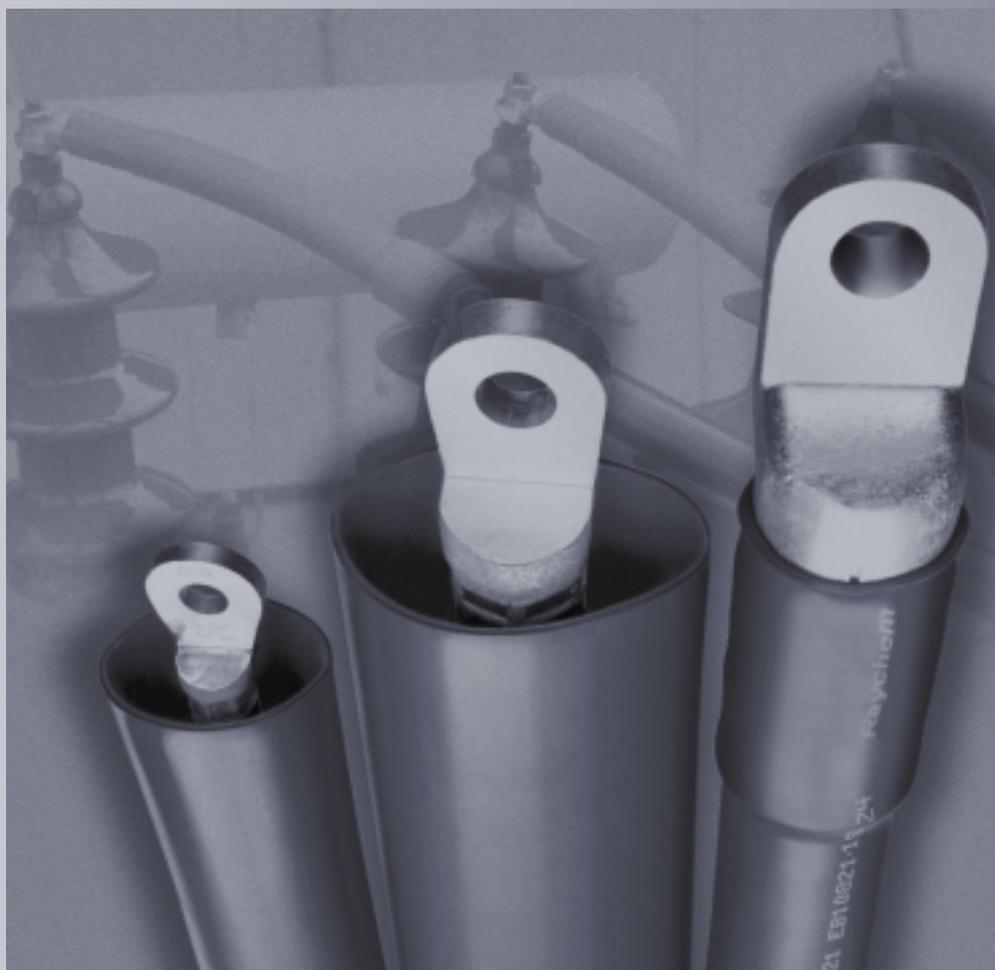
www.AMP.com

Selection guide

IXSU-F/OXSU-F Termination family up to 42 kV

Features

- High-performance termination material
- New ceramic stress control system
- Compact design
- Few components
- Simple to install, high reliability
- Mechanical robustness
- Range taking
- No shelf life limitation



12 kV

IXSU-F/OXSU-F Single Core – Termination family



Indoor



Outdoor

Kit Number	Cross Section	Kit Number	Cross Section
IXSU-F 3111	10 - 35 mm ²	OXSU-F 3111	10 - 35 mm ²
IXSU-F 3121	25 - 95 mm ²	OXSU-F 3121	25 - 95 mm ²
IXSU-F 3131	95 - 240 mm ²	OXSU-F 3131	95 - 240 mm ²
IXSU-F 3141	240 - 500 mm ²	OXSU-F 3141	240 - 500 mm ²
IXSU-F 3151	500 - 800 mm ²	OXSU-F 3151	500 - 800 mm ²

IXSU-F/OXSU-F Screened 3-Core without Armour – Termination family



Indoor



Outdoor

Kit Number	Tail Length	Cross Section	Kit Number	Tail Length	Cross Section
IXSU-F 3301	450 mm	10 - 16 mm ²	OXSU-F 3301	450 mm	10 - 16 mm ²
IXSU-F 3304	1200 mm		OXSU-F 3304	1200 mm	
IXSU-F 3311	450 mm	16 - 35 mm ²	OXSU-F 3311	450 mm	16 - 35 mm ²
IXSU-F 3314	1200 mm		OXSU-F 3314	1200 mm	
IXSU-F 3321	450 mm	25 - 70 mm ²	OXSU-F 3321	450 mm	25 - 70 mm ²
IXSU-F 3324	1200 mm		OXSU-F 3324	1200 mm	
IXSU-F 3331	450 mm	95 - 240 mm ²	OXSU-F 3331	450 mm	95 - 240 mm ²
IXSU-F 3334	1200 mm		OXSU-F 3334	1200 mm	
IXSU-F 3341	450 mm	240 - 500 mm ²	OXSU-F 3341	450 mm	240 - 500 mm ²
IXSU-F 3344	1200 mm		OXSU-F 3344	1200 mm	

17.5 kV

IXSU-F/OXSU-F Single Core – Termination family



Indoor



Outdoor

Kit Number	Cross Section
IXSU-F 4111	16 - 25 mm ²
IXSU-F 4121	35 - 95 mm ²
IXSU-F 4131	95 - 240 mm ²
IXSU-F 4141	240 - 400 mm ²
IXSU-F 4151	400 - 800 mm ²

Kit Number	Cross Section
OXSU-F 4111	16 - 25 mm ²
OXSU-F 4121	35 - 95 mm ²
OXSU-F 4131	95 - 240 mm ²
OXSU-F 4141	240 - 400 mm ²
OXSU-F 4151	400 - 800 mm ²

IXSU-F/OXSU-F Screened 3-Core without Armour – Termination family



Indoor



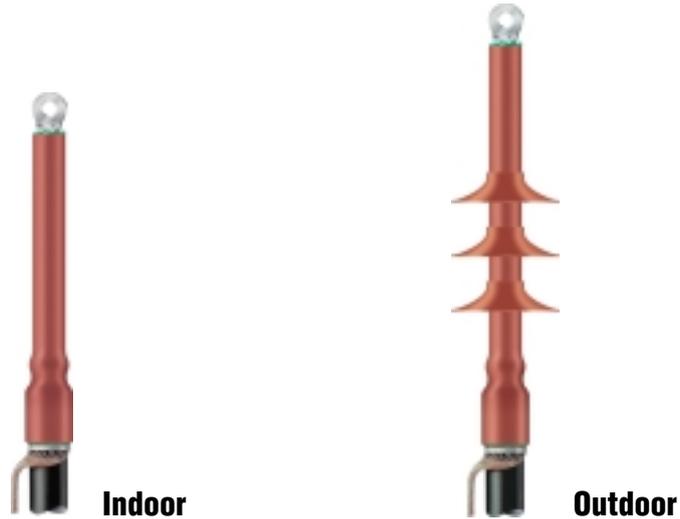
Outdoor

Kit Number	Tail Length	Cross Section
IXSU-F 4321	450 mm	25 - 50 mm ²
IXSU-F 4324	1200 mm	
IXSU-F 4331	450 mm	70 - 185 mm ²
IXSU-F 4334	1200 mm	
IXSU-F 4341	450 mm	185 - 400 mm ²
IXSU-F 4344	1200 mm	

Kit Number	Tail Length	Cross Section
OXSU-F 4321	450 mm	25 - 50 mm ²
OXSU-F 4324	1200 mm	
OXSU-F 4331	450 mm	70 - 185 mm ²
OXSU-F 4334	1200 mm	
OXSU-F 4341	450 mm	185 - 400 mm ²
OXSU-F 4344	1200 mm	

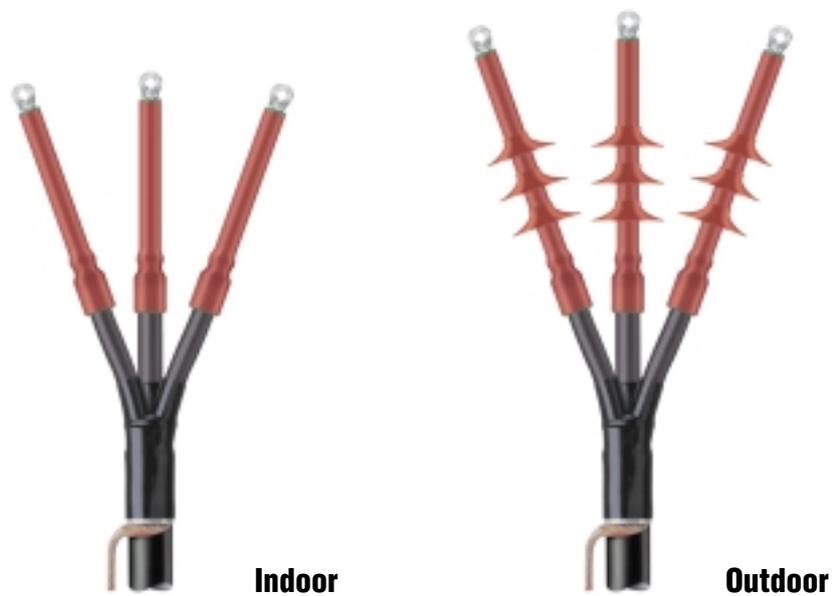
24 kV

IXSU-F/OXSU-F Single Core – Termination family



Kit Number	Cross Section	Kit Number	Cross Section
IXSU-F 5121	25 - 70 mm ²	OXSU-F 5121	25 - 70 mm ²
IXSU-F 5131	70 - 240 mm ²	OXSU-F 5131	70 - 240 mm ²
IXSU-F 5141	185 - 400 mm ²	OXSU-F 5141	185 - 400 mm ²
IXSU-F 5151	400 - 800 mm ²	OXSU-F 5151	400 - 800 mm ²

IXSU-F/OXSU-F Screened 3-Core without Armour – Termination family



Kit Number	Tail Length	Cross Section	Kit Number	Tail Length	Cross Section
IXSU-F 5311	450 mm	10 - 25 mm ²	OXSU-F 5311	450 mm	10 - 25 mm ²
IXSU-F 5314	1200 mm		OXSU-F 5314	1200 mm	
IXSU-F 5321	450 mm	25 - 50 mm ²	OXSU-F 5321	450 mm	25 - 50 mm ²
IXSU-F 5324	1200 mm		OXSU-F 5324	1200 mm	
IXSU-F 5331	450 mm	70 - 185 mm ²	OXSU-F 5331	450 mm	70 - 185 mm ²
IXSU-F 5334	1200 mm		OXSU-F 5334	1200 mm	
IXSU-F 5341	450 mm	185 - 400 mm ²	OXSU-F 5341	450 mm	185 - 400 mm ²
IXSU-F 5344	1200 mm		OXSU-F 5344	1200 mm	

36 kV

IXSU-F/OXSU-F Single Core – Termination family



Indoor



Outdoor

Kit Number	Cross Section
IXSU-F 6131	50 - 120 mm ²
IXSU-F 6141	120 - 300 mm ²
IXSU-F 6151	300 - 500 mm ²

Kit Number	Cross Section
OXSU-F 6131	50 - 120 mm ²
OXSU-F 6141	120 - 300 mm ²
OXSU-F 6151	300 - 500 mm ²

IXSU-F/OXSU-F Screened 3-Core without Armour – Termination family



Indoor



Outdoor

Kit Number	Tail Length	Cross Section
IXSU-F 6332	650 mm	50 - 120 mm ²
IXSU-F 6334	1200 mm	
IXSU-F 6342	650 mm	120 - 300 mm ²
IXSU-F 6344	1200 mm	
IXSU-F 6352	650 mm	300 - 500 mm ²
IXSU-F 6354	1200 mm	

Kit Number	Tail Length	Cross Section
OXSU-F 6332	650 mm	50 - 120 mm ²
OXSU-F 6334	1200 mm	
OXSU-F 6342	650 mm	120 - 300 mm ²
OXSU-F 6344	1200 mm	
OXSU-F 6352	650 mm	300 - 500 mm ²
OXSU-F 6354	1200 mm	

42 kV

IXSU-F/OXSU-F Single Core – Termination family



Indoor



Outdoor

Kit Number	Cross Section	Kit Number	Cross Section
IXSU-F 7131	50 - 120 mm ²	OXSU-F 7131	50 - 120 mm ²
IXSU-F 7141	120 - 300 mm ²	OXSU-F 7141	120 - 300 mm ²
IXSU-F 7151	300 - 500 mm ²	OXSU-F 7151	300 - 500 mm ²

IXSU-F/OXSU-F Screened 3-Core without Armour – Termination family



Indoor



Outdoor

Kit Number	Tail Length	Cross Section	Kit Number	Tail Length	Cross Section
IXSU-F 7334	1200 mm	50 - 120 mm ²	OXSU-F 7334	1200 mm	50 - 120 mm ²
IXSU-F 7344	1200 mm	120 - 300 mm ²	OXSU-F 7344	1200 mm	120 - 300 mm ²

Solderless earthing connection EAKT-16xx for single and 3-core polymeric cables up to 42 kV (set of 3)

Diameter over metal tape shield	Application Range mm ²				Raychem Part Number	Mod. Code Number
	12 kV	17.5 kV	24 kV	36 kV/42 kV		
12 – 18 mm	16 - 50	16 - 25	—	—	EAKT-1655	G55
19 – 24 mm	70 - 150	35 - 95	25 - 70	25 - 35	EAKT-1656	G56
25 – 30 mm	185 - 240	120 - 185	95 - 150	50 - 70	EAKT-1657	G57
31 – 44 mm	300 - 630	240 - 500	185 - 500	95 - 300	EAKT-1658	G58
41 – 65 mm	800 - 1000	630 - 1000	630 - 1000	400 - 1000	EAKT-1659	G59

The accessory kit can be ordered individually by using the Raychem Part Number EAKT-16xx, or in conjunction with the termination kit by adding the Mod. Code Number Gxx to the appropriate Termination Kit Number.

Example:

IXSU-F5331-G58 Termination for 3-core polymeric cables 24 kV with solderless earthing connection.

Armour earthing assemblies (clamping ring) EAKT-16xx for single core polymeric cables up to 42 kV (set of 3)

Diameter over armour	Application Range mm ²				Raychem Part Number	Mod. Code Number
	12 kV	17.5 kV	24 kV	36 kV/42 kV		
21 – 32 mm	16 - 70	16 - 50	16 - 50	—	EAKT-1636	G36
33 – 50 mm	95 - 400	70 - 400	70 - 300	16 - 185	EAKT-1637	G37
51 – 67 mm	500 - 800	500 - 800	400 - 800	240 - 630	EAKT-1638	G38

Armour earthing assemblies (clamping ring) EAKT-16xx for 3-core polymeric cables up to 42 kV

Diameter over armour	Application Range mm ²				Raychem Part Number	Mod. Code Number
	12 kV	17.5 kV	24 kV	36 kV/42 kV		
40 – 67 mm	16 - 120	16 - 95	16 - 35	16 - 25	EAKT-1642	G42
50 – 86 mm	150 - 240	120 - 185	50 - 120	35 - 95	EAKT-1643	G43
60 – 94 mm	300 - 400	240 - 300	150 - 185	120 - 185	EAKT-1644	G44
70 - 110 mm	—	—	240 - 300	240 - 300	EAKT 1645	G45

The accessory kit can be ordered individually by using the Raychem Part Number EAKT-16xx, or in conjunction with the termination kit by adding the Mod. Code Number Gxx to the appropriate Termination Kit Number.

Example:

IXSU-F5331-G43 Termination for 3-core polymeric cables 24 kV with armour earthing assembly.



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