



CABLE ACCESSORIES



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Integrated Energy Solutions



A global leader that has evolved from a local manufacturer of electrical products into an integrated infrastructure solutions provider; with over 17,000 employees and more than USD 3.8 billion market capitalization. We Operate in five key business sectors: Wire, Cables & Accessories, Electrical Products, Engineering & Construction, Digital Solutions, and Infrastructure Investments. With a strong presence in 19 different countries, 31 production facilities spread across African and Asian countries including Egypt, Algeria, KSA, Qatar, Indonesia, Pakistan, and Tanzania. We export a wide range of high-end products to over 110 countries worldwide. At the heart of our approach is an all-in-one integrated Engineering, Procurement & Construction (EPC) service, enabling us to deliver the most complex turnkey projects on time and with the highest efficiency.

A vital part of our mission is ensuring that the communities where we operate develop and flourish. We work to facilitate the global transition toward a sustainable energy future, whereby we established green energy projects and smart cities across Africa, the Middle East, and Eastern Europe. In alignment with our 2030 sustainability strategy, we aim to extend and enhance our positive impact, provide energy services to a growing customer base, and drive decarbonization, digitalization, and sustainable transition in Egypt and beyond.

Group strategy and market opportunities

FINANCIAL
STRENGTH

PRODUCT
DIVERSITY

SECTOR
EXPERTISE

GEOGRAPHICAL
REACH

Our growth has been driven by hiring talents and empowering businesses and communities where we operate. We enable customers to digitize and meet the challenges of an ever-changing world.

Our extensive range of digital solutions allows them to become smarter, faster, and more agile. We are committed to doing our best to serve our customers while caring for the environment. We aim to use our knowledge of our environmental impact to better develop more sustainable business scenarios and evaluate our future policies.

3.8
Billion USD
Revenue annually

4k+
KiloMeters
Overhead
Transmission
Lines

95+
Substations
Indoor & Outdoor
Substations

23
Giga Watts
Total number
of delivered
power

25M
Square Meters
Sustainable
Industrial
Communities

23K+
KiloMeters
Distribution
Networks

Corporate Business lines



Wire, Cable
and Accessories



Electrical
Products



Engineering &
Construction



Digital
Solutions



Infrastructure
Investments

Wire, Cable & Accessories



14
Factories
Worldwide

350^{k+}
Tons
Annual Total
Capacity

UP TO
500^{kV}
According to
International
Standards

With over 40 years of experience in the manufacturing industry, Elsewedy Electric's product portfolio provides a comprehensive range of wires, cables, and accessories that comply with international standards and are recognized locally and globally. We pride ourselves on our ability to provide the most reliable, cost-effective, high-quality products and innovative solutions for our customers. With a reach to more than 100 countries and an annual production capacity of approximately 350,000 tons, we offer power, special and telecom cables, winding wires, OHTL & OPGW, steel products, insulators, cable accessories, explosion-proof equipment, and plastics.

Global Presence



Cable Accessories Factory



ELSEWEDY ELECTRIC Cable Accessories Factory, has been setting the standard for the production of superior Under Ground Cable Accessories (Joints, Terminations & Separable Elbows Connectors and Metal Products) in Egypt for the past 25 years, while providing value added services to the cabling industry through being specialized in cable accessories production.

Our collaboration with reputable international companies and the quality of our products have been recognized both locally and internationally for high quality and efficiency.

Our product range includes din lugs and connectors, heat shrink shapes, low voltage cable accessories, medium voltage cable accessories, high voltage cable accessories, as well as training for engineers and technicians at our advanced training center.

Our products are ISO certified and tested by KEMA, CESI and IPH.

We utilize state of the art production equipment while adhering to the highest quality standards to ensure premium quality and cost optimization.

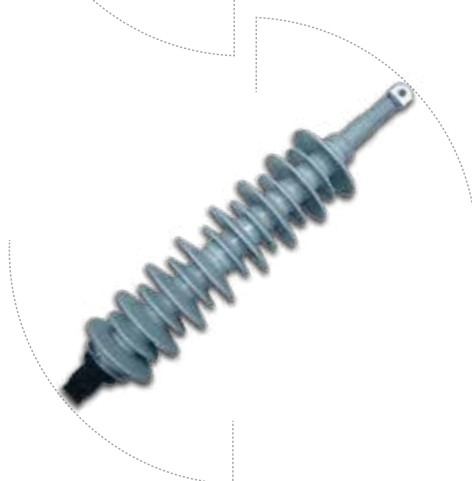
We are able to accommodate and adapt our facilities to give our clients the best possible solution for their needs.

Offering pre-molded technology, which is considered the most efficient method for cable jointing and termination, implemented by our experienced R&D Team and through utilizing our group resources.

This method is not dependent on labor skill, as each product is factory tested before delivery, with annual production capacity of over 500,000 units, we are confident to fulfill our client's needs.

Unique Features of our Premolded Accessories

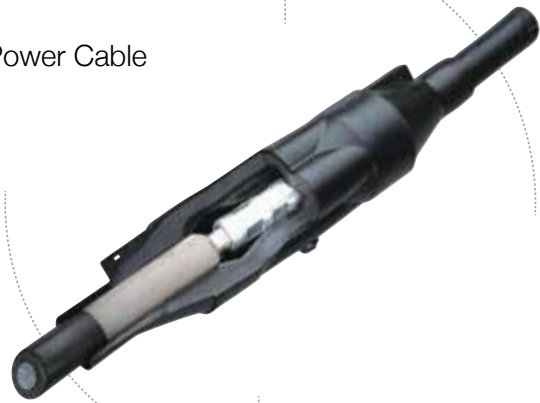
- Factory molded
- Longest shelf life
- Factory tested 100%
- Fast and easy to install
- High mechanical strength
- Positive heat transfer interface
- Provide permanent, fully shield, fully submersible
- Easily learned installation procedure, no special skills required
- Unique conductive insert provides optimum electrical stress relief
- Assure watertight seal and complete dielectric integrity
- Meet or exceed the international standards
- No assembly tools required
- Applicable for hazard area
- Dismantling availability
- No weather effect
- Easy to specify



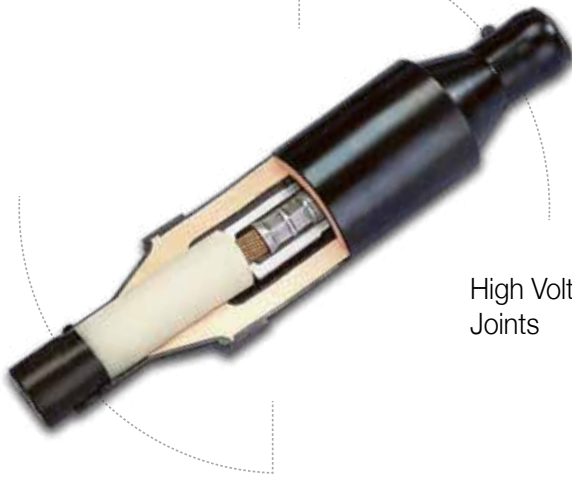


Premolded Cable Joints

Medium Voltage Power Cable Joints



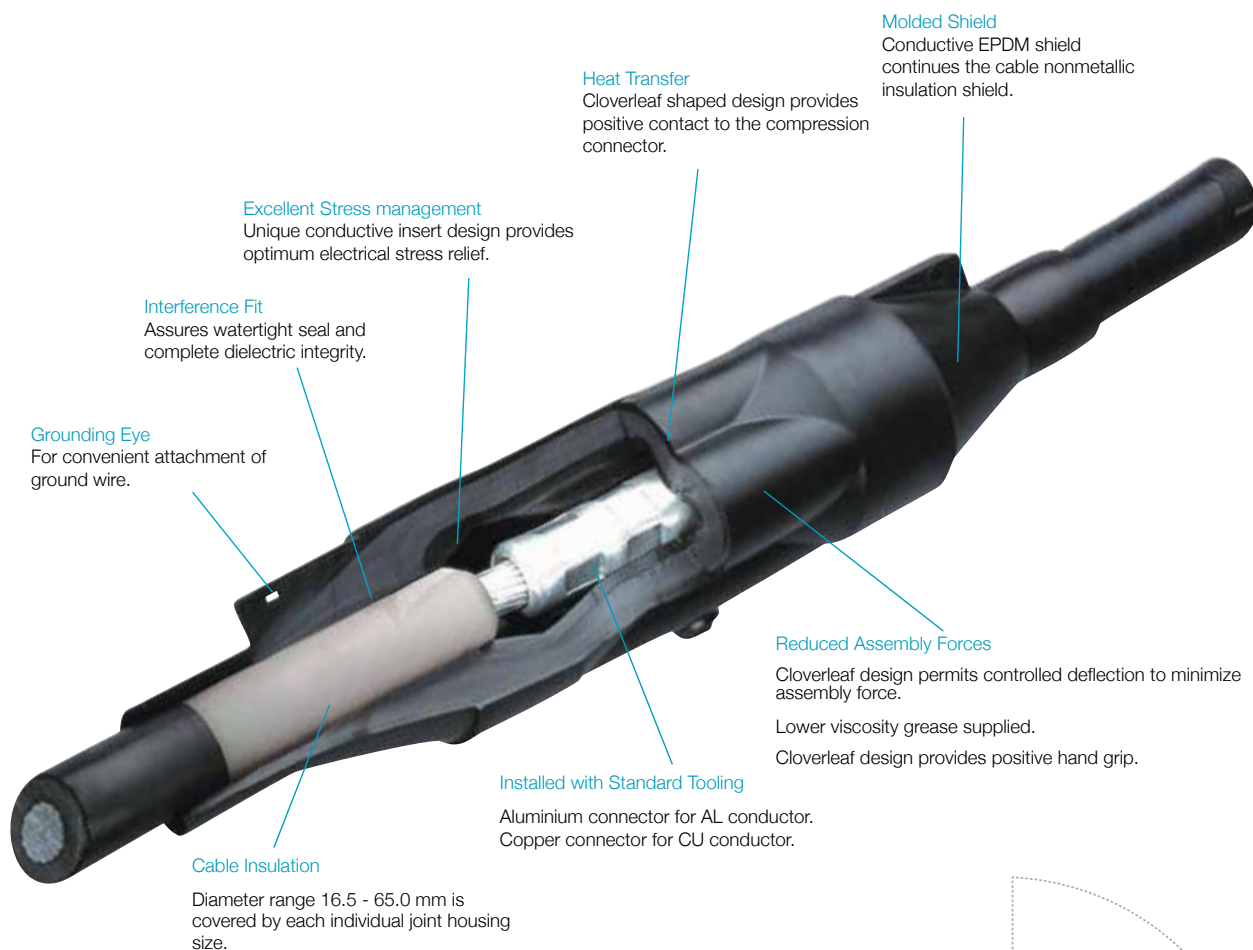
High Voltage Power Cable Joints



Premolded Cable Joints

Medium Voltage Power Cable Joints

IEC Standard 60502-4, IEEE Standard 404



- 1 Joint stored on one side of the cable core.
- 2 Joint in its final position.
- 3 Restoration.



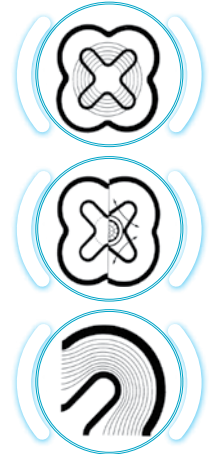
- The power cable joints are highly reliable, factory-molded and tested cable joints for 15kV, 25kV and 35(36)kV class distribution systems. When assembled, they provide permanent, fully shielded, fully submersible cable joints for direct burial or vault applications of solid dielectric single-core and three-core cables.
- The power cable joints are designed to meet or exceed the IEC 60502-4 standard as well as the rigid IEEE 404 standard.
- The power cable joints offer the benefits of an optimum design for electrical stress control, they are factory molded for consistent high quality and are factory tested before field installation to insure maximum reliability. They are easy to install without special tools and they are easy to specify for various cable types.

Premolded Cable Joints

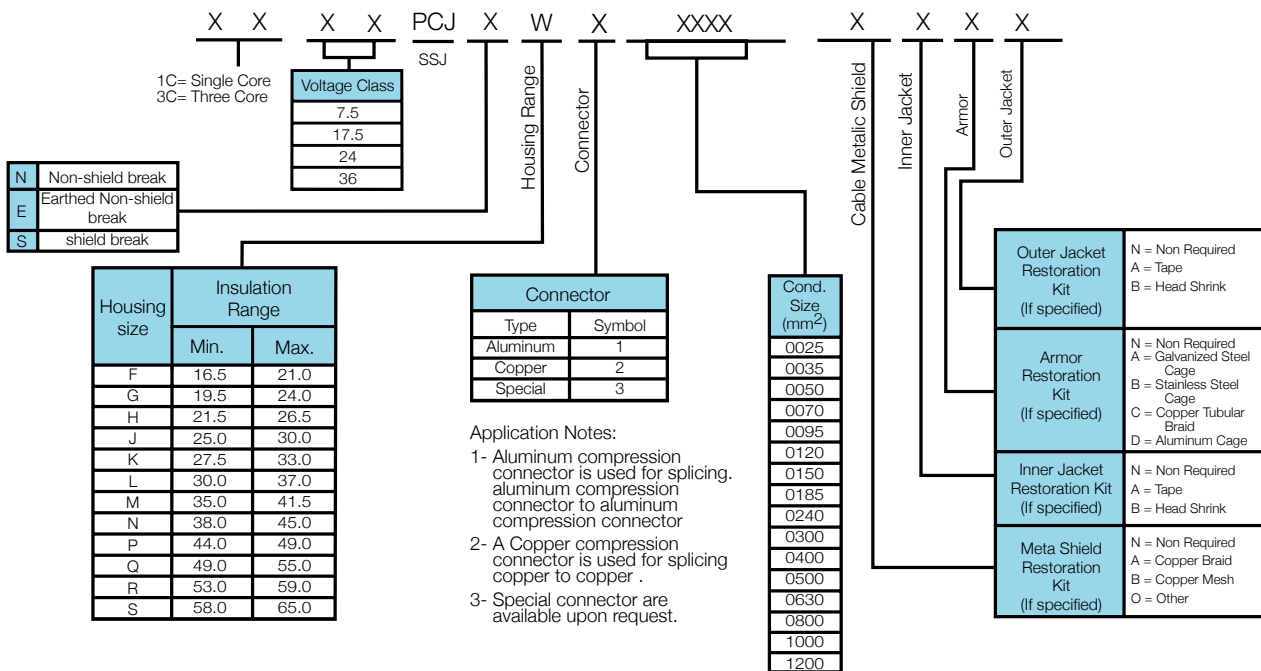
The molded stress control configuration offers excellent stress management through computer-aided definition of shape transitions and state-of-the-art materials science.



- 1 Heat transfer from the cable contact is enhanced by maintaining a positive interference to fit with the conductive insert, and the electrical insulation shaping to provide minimal thermal resistance to ambient and an increased external surface area (relative to a cylindrical design of equal insulation thickness).
- 2 The cloverleaf design reduces assembly forces by allowing the housing wall section to flex rather than stretch during assembly (A basic cylindrical design would require the circumference to expand).
- 3 The cloverleaf design, with benefits of positive heat transfer interface, and reduced assembly force is made possible by exact proportioning of the changing cross section. The resulting equipotential lines have a smooth transition without areas of stress concentration.



Ordering Formula



*SSJ : Special Joint housing upon request

U _o (kV)	6	8.7	12	18 or 19
U (kV)	10	15	20	30 or 33
U _m (kV)	12	17.5	24	36
Impulse Test voltage (kV)	75	95	125	170
IEC Standard No.	IEC 60502-4			

Note:

U_o : is the rated power frequency voltage between conductor and earth or metal screen for which the cable is designed.

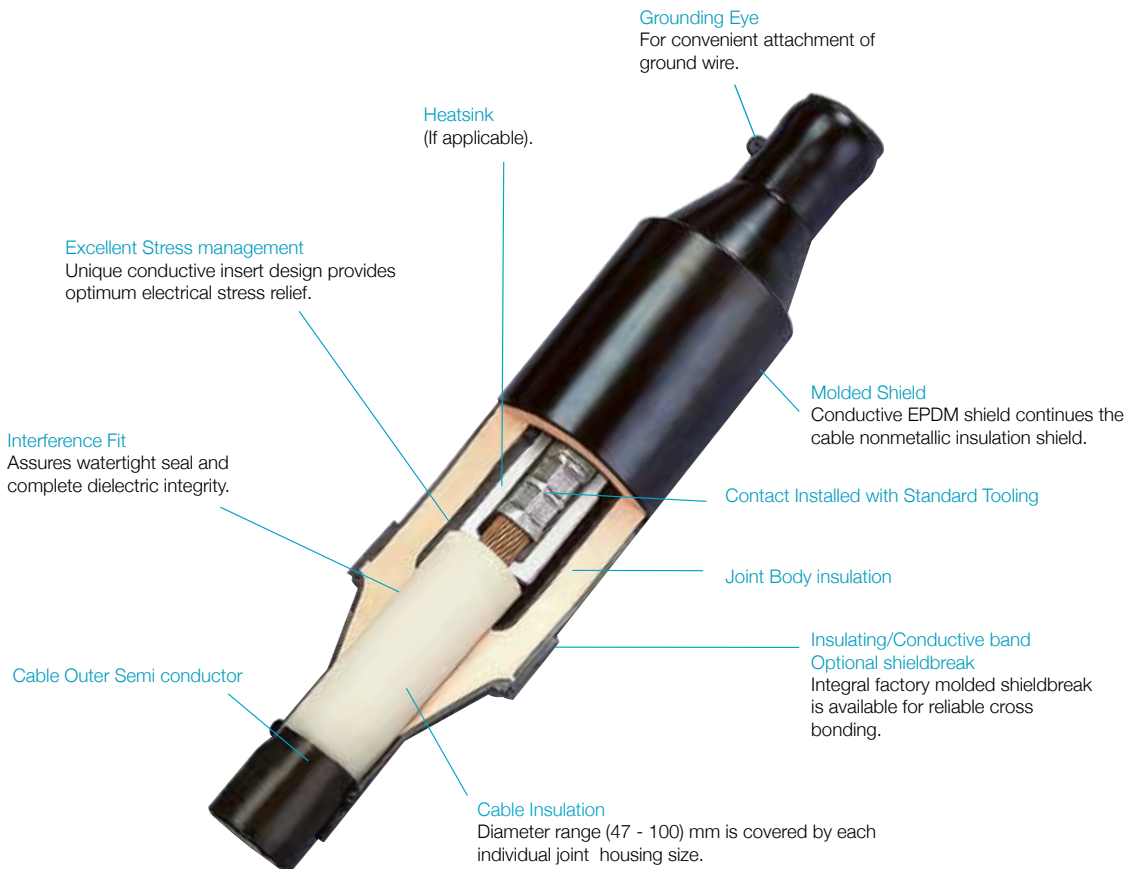
U : is the rated power frequency voltage between conductors for which the cable is designed.

U_m : is the maximum value of the "highest system voltage" for which the equipment may be used.

Premolded Cable Joints

High Voltage Power Cable Joints

IEC 60840 , IEEE Standard 404



Maximum Reliability & Lowest Installation Cost

- **Faster Installation.**

The molding is done in the factory, reducing on-site time. No penciling of cable insulation is required.

- **Reduced Training Requirements.**

Easily -learned installation procedure.

- **No Costly Installation Machinery Required**

Field molds or wrapping machines are not required. A low-cost assembly tool is available.

- **No Special Environmental Equipment Requirements**

- **Unlimited Shelf Life**

Allows for instant availability

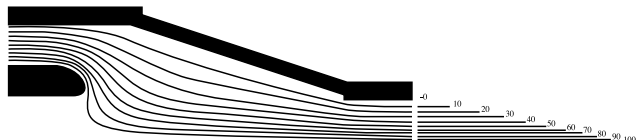
- **Factory-Molded Quality**

You can be sure each cable joint in the field is produced exactly per design. Each unit is molded a micro- processor controlled screw injection press to produce a level of quality not possible with field molding equipment or tape.

- **Factory- 100% factory Tested**

Each unit is electrically tested in the factory to insure consistent quality.

All Transmission Cable Joints are designed with optimized stress control and heat transfer capabilities. You do not have to rely on the expertise of a field installer to fabricate a reliable joint.



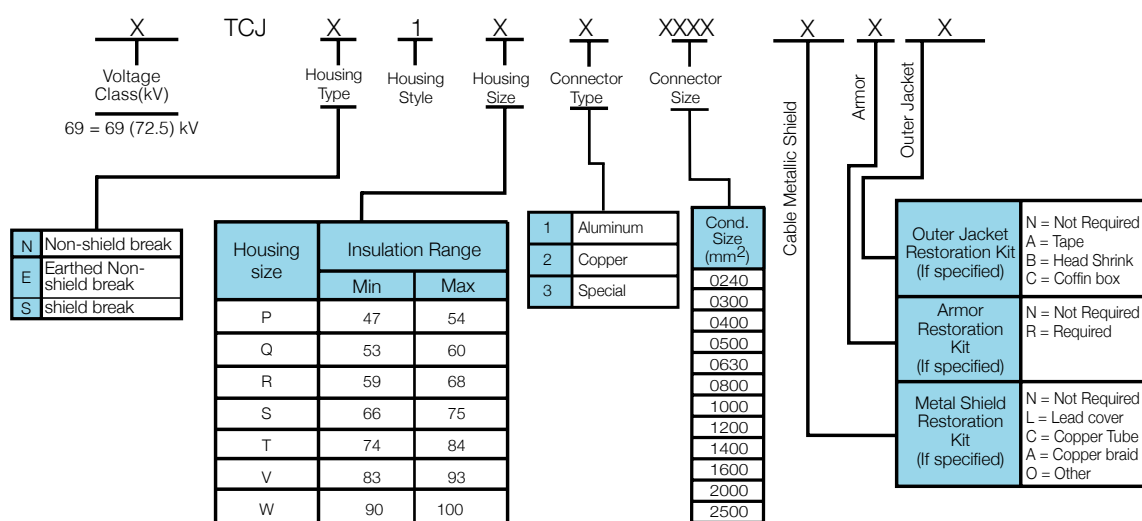
Premolded housing void - free joint housing consists of cured EPDM insulation bonded under pressure to cured molded semiconductive elements.

Premolded Cable Joints

Technical Data According to IEC 60840

Ratings	
Nominal system voltage up to U ₀ (kV)	69
Maximum system voltage U _m (kV)	72.5
Maximum continuous conductor temperature	90°C
Type test (IEC 60840)	
Partial discharge test voltage	
- Partial discharge level determined at (kV)	54
- Maximum allowable Partial discharge level (PC)	5
- Conductor temperature	Ambient
Load cycle	
- Test voltage (kV)	72
- No of cycles,each cycle 24 hrs	20
- Heating duration	8 hrs.
- Cooling duration	16 hrs.
- Conductor temperature	(95 °C)
Basic impulse level (10 pos., 10 Neg., 50 Hz)	
- Impulse voltage (kV)	325
- Conductor temperature	(95 °C)
AC withstand voltage	
- Test voltage (kV) for 15min.	90
- Conductor temperature	Ambient
Routine test	
AC withstand voltage (kV) for 30min.	90
Partial discharge test voltage	
- Partial discharge level determined at (kV)	54
- Maximum allowable Partial discharge level (PC)	5
Other technical data as per (IEEE)	
AC line to ground to withstand (kV)	
- 6 hrs. dry	100
- 15 min. dry	120

Ordering Formula





Cable Termination



Medium Voltage

Modular Termination

Premolded Cable Termination for XLPE, EPR and any Polymeric Insulation Cable up to 36 kV Indoor & Outdoor.



Medium Voltage

Heat Shrink Termination

Heat shrink cable termination for cables up to 36 kv indoor & outdoor.



Medium Voltage

Single Piece Termination

Single piece termination (ST) with geometrical stress control is a compact design in restricted spaces .it can be used up to 25KV for cables cross section up to 630 mm².



High Voltage

Transmission Termination

The 69 TCT Termination is lightweight and easy to handle. It can be assembled horizontally. Installation can be accomplished without special training using a normal assembly / tension device.

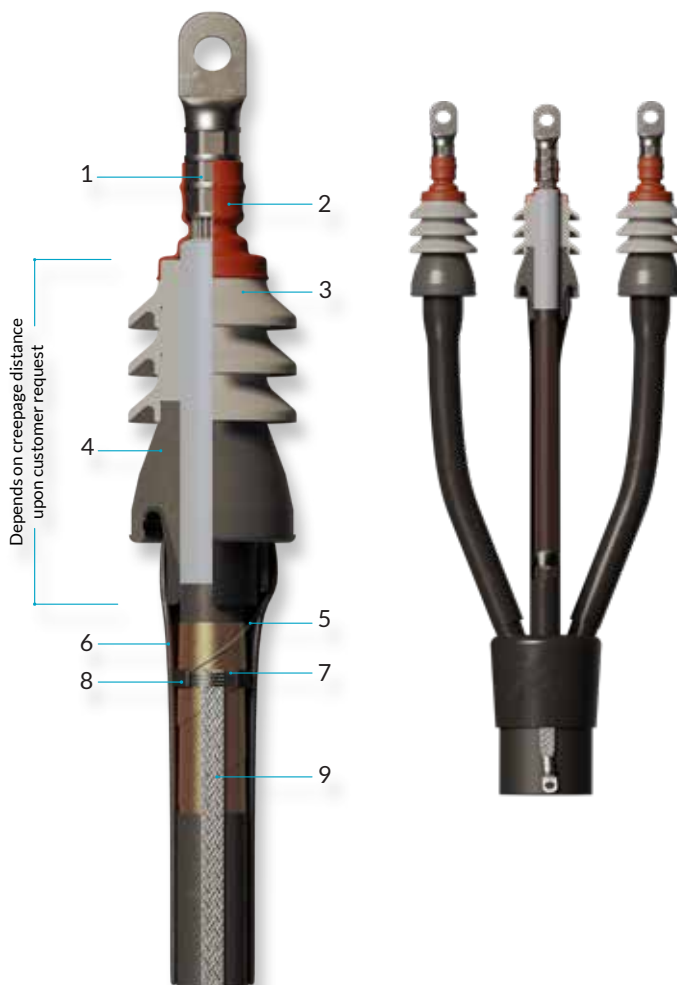
Cable Termination

Medium Voltage Modular Termination

IEC standard 60502-4, IEEE standard (404 & 048)

Design and Components

- 1 Cable Lug**
- 2 Sealant Cover**
To seal between the contact and the terminator.
- 3 Non-tracking Rubber Modules**
Molded of special EPDM compound for functional reliability and long life.
- 4 Molded Stress Cone**
Molded stress relief assures proper stress relief for terminating cables.
- 5 Ground Wire**
Makes the connection between the stress cone and the copper tape shield.
- 6 Sealing Heat Shrink Tube**
To protect the screen.
- 7 Ground Connection Point**
Secures the grounding braid to the metallic screen.
- 8 Sealant Tape**
Mastic tape used to seal the jacket and flat braids from the ingress of water.
- 9 Grounding Braid**
The flat braid makes the electrical connection between the metallic screen and armor to the system ground.



Features

- Maximum Reliability : Computer designed and manufactured for superior temperature and stress management. Maximum reliability with control of known factors.
- Superior Stress Management and Temperature profile : Computer designed and manufactured using a microprocessor - controlled screw injection press to ensure a constant stress control configuration. Operates cooler than the cable conductor.
- Tests : Meets the requirements of international standards, IEEE (404 & 048), IEC 60502-4, and CENELEC HD 629.1.
- Factory Molded : For constant stress control configuration.
- Factory Pretested : Assuring field installations meet design standards. Stress cone undergoes partial discharge tests.
- Fast Fitting : Stress cone fits directly over semiconductor of cables. Earthing provision available for stress cone.
- Faster installation : Lower installation cost, requiring no special skills.
- Extra Creepage Distance : This is achieved by adding extra modular skirts.
- Ambient Temperature : -10°C upto $+60^{\circ}\text{C}$.
- Reduced Training Requirements : Easily learned installation procedure. Human error totally eliminated.

Electrical Ratings

U ₀ (kV)	3.6	6	8.7	12	18 or 19
U (kV)	6	10	15	20	30 or 33
U _m (kV)	7.2	12	17.5	24	36
Impulse Test Voltage (kV)	60	75	95	125	170-200
IEC Standard No.	IEC 60502-4				
MTG Size1, Range (12.5 : 39.5) mm	MTG- Size 1				
MTG Size2, Range (21 : 50) mm	MTG- Size 2				
MTG Size3, Range (48 : 67) mm	MTG- Size 3				
Min. No. of modules for indoor termination	1	2	2	3	5
Min. No. of modules for outdoor termination	2	3	4	5	7

Note

U₀ : the rated power frequency voltage between conductor and earth or metal screen for which the cable is designed.

U : the rated power frequency voltage between conductors for which the cable is designed.

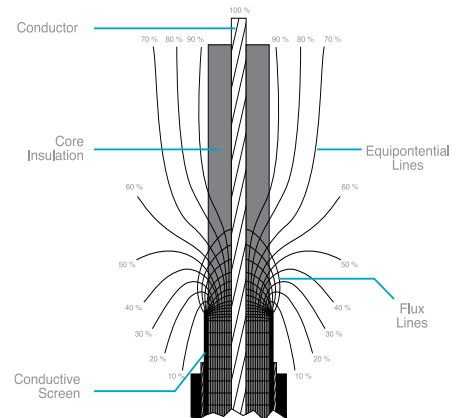
U_m : the maximum value of the "highest system voltage" for which the equipment may be used.

- Current Rating is equal to the cable's rating.
- Ratings based on IEEE (404 & 048) IEC 60502-4, CENELEC HD 629.1 and don't reflect maximum withstand levels. For levels that exceed the above, contact your dealer representative.

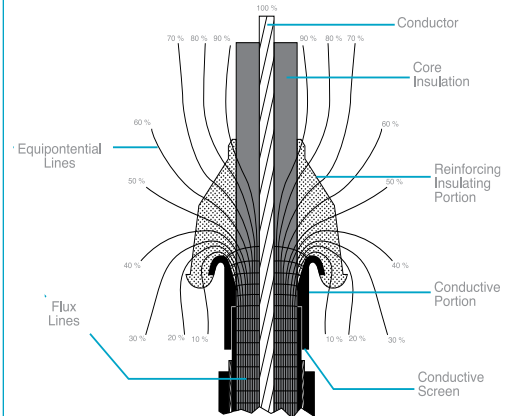
Creepage distance of the termination

- Creepage distance is the shortest distance along the surface of the termination between the two conductive parts.
- For the dimensioning of the creepage distance, the tracking formation of the insulating material has to be considered.
- Creepage distance depends on the voltage class, pollution level and the type of termination.
- Creepage distance is met by number of antitracking modules used. Any value of creepage distance can be achieved by adding excess modules.

Stress Control Configuration



Electric field distribution without stress cone



Electric field distribution after adding the stress cone

Ordering Formula

XX	X	MTG	X	WWW	XXX	NN	X
1C = Single Core 3C = Three core			O = Outdoor I = Indoor		Conductor Size (mm ²)		
			Insulation Diameter				
Voltage Class	Stress cone Size	Application Range	MTG Family Size				LUG
7.5		min. max.					TYPE SYMBOL
12	EB	12.5 15.0	MTG Size 1				Aluminum 1
17.5	EF	13.5 16.0					Copper 2
24	FA	14.5 17.5					Special 3
36	FAB	16.0 19.0	MTG Size 2				
	FB	17.5 20.0					
	FG	18.5 21.5					
	GA	20.0 25.0					
	GAB	21.0 26.0					
	GB	22.5 27.5					
	GH	23.5 28.5					
	HA	25.5 30.0					
	HAB	26.5 31.5					
	HB	28.0 33.0					
	HJ	29.5 34.5					
	JA	31.0 36.0					
	JAB	32.5 37.5					
	JB	34.5 39.5					
	KA	38.0 41.0					
	KAB	39.0 42.5					
	KB	40.0 43.5					
	PA	42.0 48.0					
	PB	44.5 50.0					
	Q	48.0 55.0					
	R	53.0 60.0	MTG Size 3				
	S	58.0 67.0					

Number of modules depend on:

- 1- Voltage Class.
- 2- Type of the termination.
- 3- Required creepage distance.

Application Notes:

- 1- An aluminum compression lug is used for aluminum conductor .
- 2- A copper compression lug is used for copper conductor.
- 3- Special lugs are available on request.

Cable Termination

Silicon Rubber Material

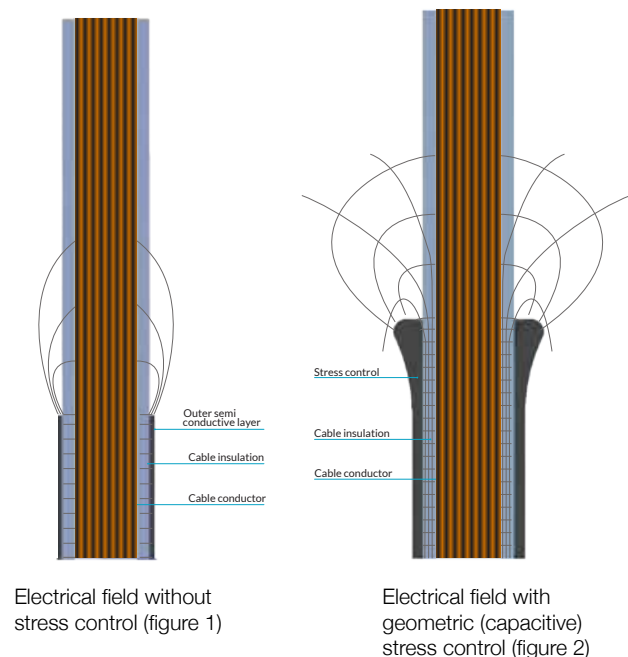
- 1 We depend on silicon material in produce the Medium and High voltage cable accessories due to its excellent mechanical and Electrical properties make silicone rubber a preferred Material for cable accessories.
- 2 Silicone rubber offers high-quality electrical insulation and superior corona and tracking resistance, combined with a high elasticity.
- 3 **The silicon insulation material has many features like :**
 - UV and ozone resistance.
 - Durable water rejection.
 - Weather and aging resistance.
 - Non-flammable, self extingushing, heat resistant.
 - Applicable for use at temperatures between 50 C and 180 C.
 - High elasticity.
 - High tracking resistance.
 - Unlimited storage life.
 - Friendly to the environment.



Electrical Stress Control in Cables Accessories

In order to achieve sufficient insulating clearance between the high-grade solid electrical insulation of the cable and the gaseous insulation air which has a significantly lower dielectric strength, the outer conductive layer of the cable must be stripped to below the end of the core. This causes unacceptably high field intensities at the end of the outer conductive layer (figure 1) which must be eliminated by means of special measures.

Figure 2 shows the field of the cable termination controlled capacitively by a funnel shaped electrode. It is dimensioned in such a way that field intensities do not exceed at any point. This prevents harmful corona or partial discharge.



Electrical field without stress control (figure 1)

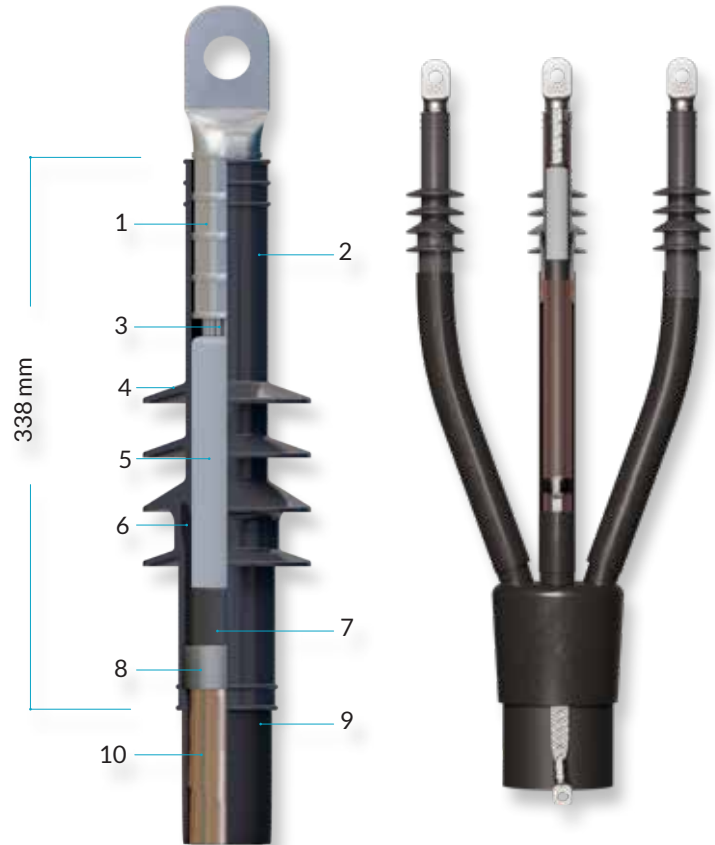
Electrical field with geometric (capacitive) stress control (figure 2)

Cable Termination

Single Piece Termination

Design and Components

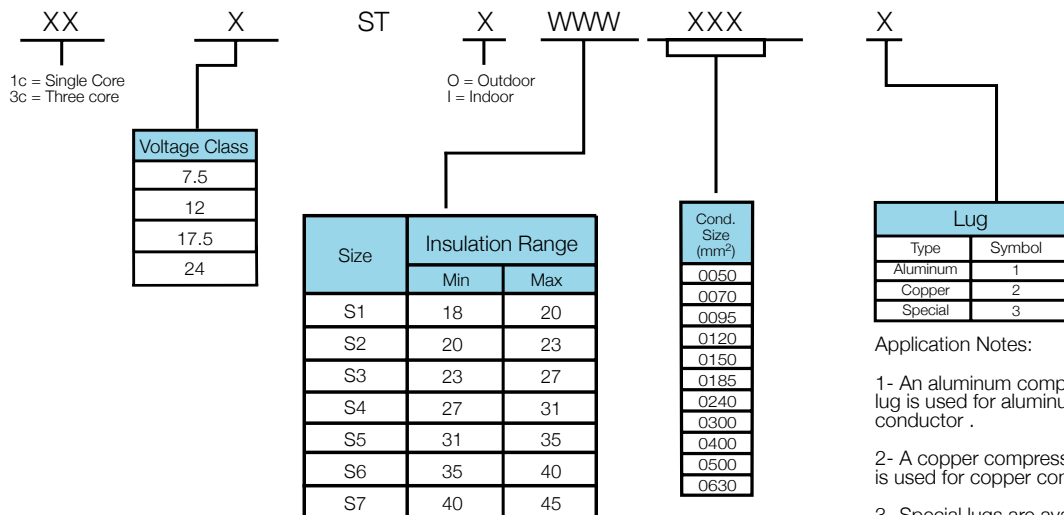
- 1 Cable lug
- 2 Silicon one-piece termination
- 3 Cable conductor
- 4 Non-tracking silicon termination shed
- 5 Cable insulation
- 6 Silicon molded stress cone
- 7 Cable semi conductive layer
- 8 Constant force spring
- 9 Sealing heat shrink tube
- 10 Cable screen layer



Electrical Ratings

U ₀ (kV)	6	8.7	12
U (kV)	10	15	20
U _m (kV)	12	17.5	24
Impulse Test Voltage (kV)	75	95	125
Alternating withstand voltage (AC, 5 min)	21	30	42
IEC Standard No.	IEC 60502-4		

Ordering Formula



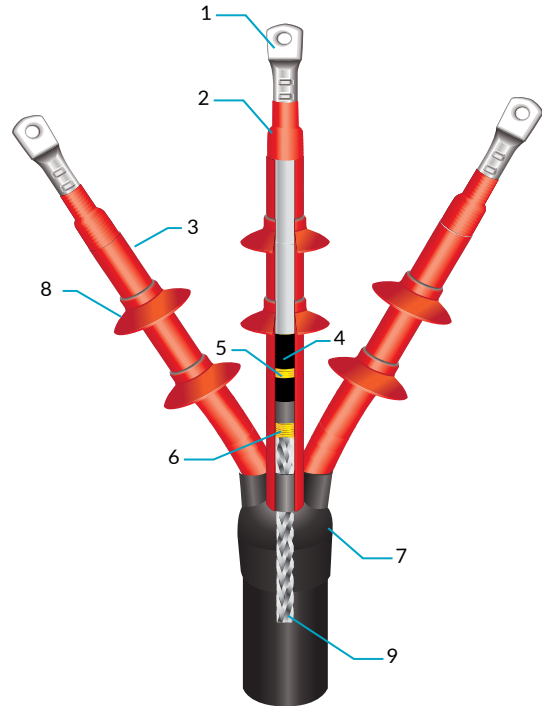
Cable Termination

Medium Voltage Heat Shrink Termination

IEC standard 60502-4, IEEE standard (404 & 048)

Design and Components

- 1 Cable Lug**
- 2 Anti-tracking Sealant Tape**
Anti-tracking tape used to seal the top end of the tubing from the ingress of water.
- 3 Anti-tracking Heat Shrink Tube**
Made of cross-linked polyolefin for functional reliability and long life.
- 4 Stress Control Tube**
Assures proper stress damping for terminating cables.
- 5 Stress control Mastic**
Used to enhance the stress damping and PD value.
- 6 Ground Connection Point**
Connects the grounding braid to the metallic screen
- 7 Trifurcating Boot**
Boot that seals the transition of the three-core cable into three single cores.
- 8 Anti-track heat shrink sheds**
Used to increase the creepage distance.
- 9 Grounding Braid**
The braid makes the electrical connection between the metallic screen and armor to the system ground.



Features

- The heat shrink termination is designed for single and three core cable up to 36 kV. This coverage is completed with minimum number of designs.
- The heat shrinkable termination has a proven record of long term stability, durability and reliability over many years. It's designed for both indoor and out-door in all climate conditions.
- The heat shrink termination is designed to meet or exceed the IEC 60502-4 standards, IEEE (404 & 048).
- Faster installation as there's no special tools or skills needed to install, it's fast fitting and can apply extra creepage distance by adding extra sheds.

Cable Termination

Electrical Ratings

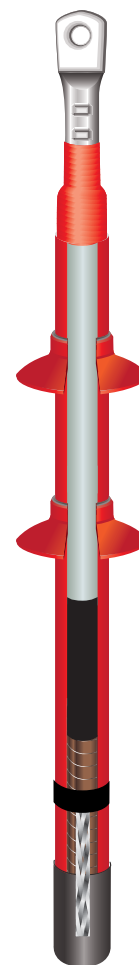
U ₀ (kV)	3.6	6	8.7	12	18 or 19
U (kV)	6	10	15	20	30 or 33
U _m (kV)	7.2	12	17.5	24	36
Impulse Test Voltage (kV)	60	75	95	125	170
IEC Standard No.	IEC 60502-4				

Note

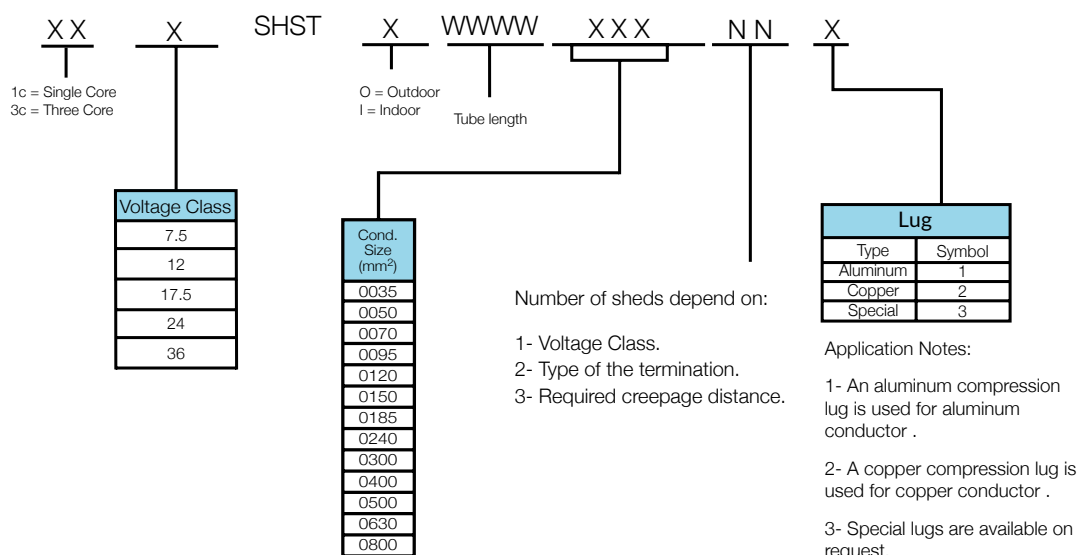
- U₀:** The rated power frequency voltage between conductor and earth or metal screen for which the cable is designed.
- U:** The rated power frequency voltage between conductors for which the cable is designed.
- U_m:** The maximum value of the “highest system voltage” for which the equipment may be used.
- Current rating is equal to the cable's rating.
 - Ratings based on IEEE (404 & 048) IEC 60502-4, and do not reflect maximum withstand levels. For levels that exceed the above, contact your dealer representative.

Creepage distance of the termination

- Creepage distance is the shortest distance along the surface of the termination between the two conductive parts.
- For the dimensioning of the creepage distance, the tracking formation of the insulating material has to be considered.
- Creepage distance depends on the voltage class, pollution level and the type of termination.



Ordering Formula



Cable Termination

High Voltage Transmission Termination

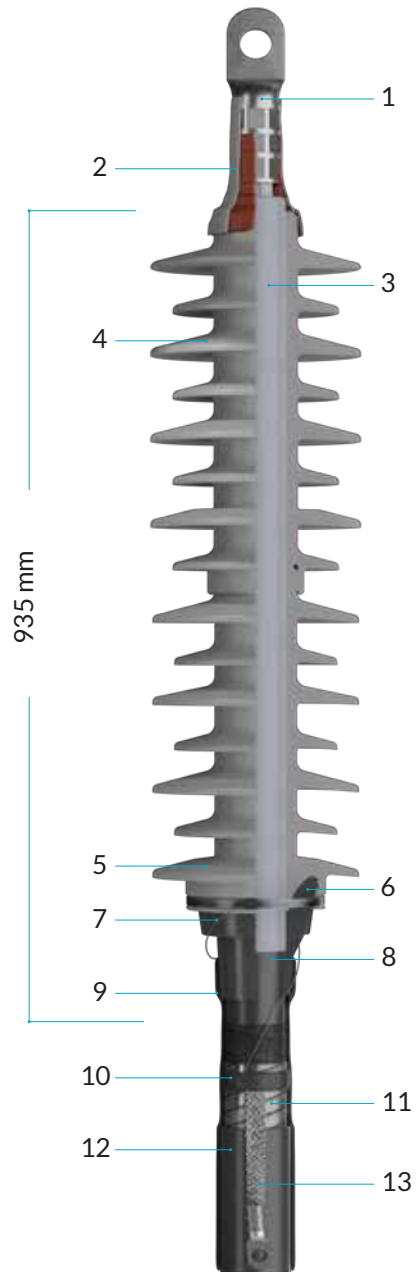
IEC 60840, IEEE (048&404)

- The 69 TCT Termination provides a termination for cable systems rated up to 72.5 kV class.
- It conforms to IEC 60840. This terminator is designed for solid dielectric cables with insulation diameters from 37 mm to 84mm.
- Various lugs are available for the conductor connection.
- The durable elastomer construction eliminates glaze damage failures associated with porcelain.
- A state-of-the-art shed design ensures a non continuous drip path and the non tracking polymer requires no surface oil or grease.



Design and Components

- 1 Cable lug**
- 2 Sealant Tape**
Anti-tracking tape used to seal the top end of the termination from the ingress of water
- 3 Cable insulation**
- 4 Premolded module**
Molded of special EPDM compound for functional reliability and long life
- 5 Termination base**
- 6 Integrated stress control part**
Molded stress relief assures proper stress relief for terminating cables
- 7 Grounding wire**
- 8 Cable semi conductive layer**
- 9 Sealing heat shrink tube**
To protect the screen
- 10 Mastic seal**
Mastic tape used to seal the jacket and flat braids from the ingress of water
- 11 Lead alloy metallic sheath**
- 12 HDPE outer sheath**
- 13 Grounding Flat Braid**
The flat braid makes the electrical connection between the metallic screen and armor to the system ground

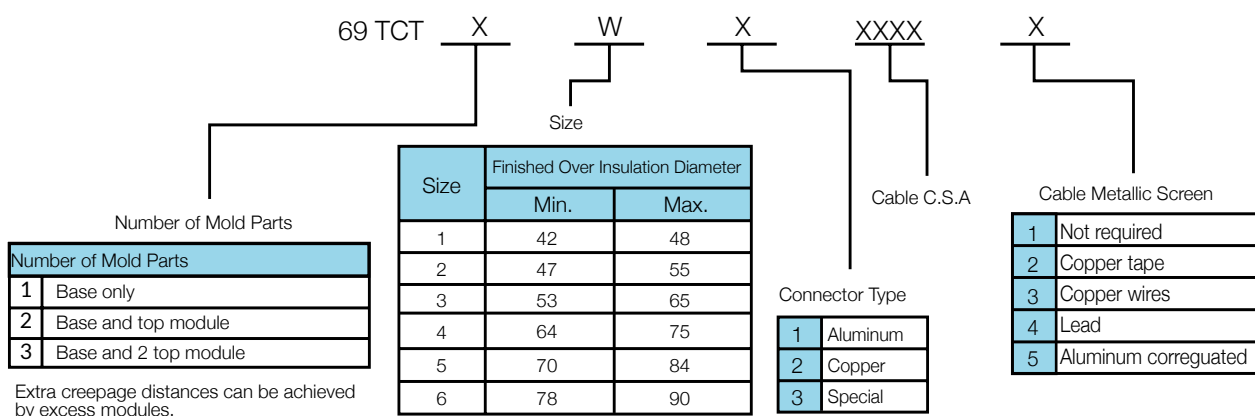


Cable Termination

Electrical Data for 69TCT Transmission Rating Data According to IEC 60840

Ratings	
Nominal system voltage up to U_0 (kV)	69
Maximum system voltage U_m (kV)	72.5
Maximum continuous conductor temperature	90°C
Type test (IEC 60840)	
Partial discharge test voltage	
- Partial discharge level determined at (kV)	54
- Maximum allowable Partial discharge level (PC)	5
- Conductor temperature	Ambient
Load cycle	
- Test voltage (kV)	72
- No of cycles, each cycle 24 hrs	20
- Heating duration	8 hrs.
- Cooling duration	16 hrs.
- Conductor temperature	(95 °C)
Basic impulse level (10 pos., 10 Neg., 50 Hz)	
- Impulse voltage (kV)	325
- Conductor temperature	(95 °C)
AC withstand voltage	
- Test voltage (kV) for 15min.	90
- Conductor temperature	Ambient
Routine test	
AC withstand voltage (kV) for 30min.	
90	
Partial discharge test voltage	
- Partial discharge level determined at (kV)	54
- Maximum allowable Partial discharge level (PC)	5
Other technical data as per (IEEE)	
AC line to ground to withstand (kV)	
- 10 sec. wet	145
- 1 min. dry	175
- 6 hrs. dry	100
- 15 min. dry	120

Ordering Formula

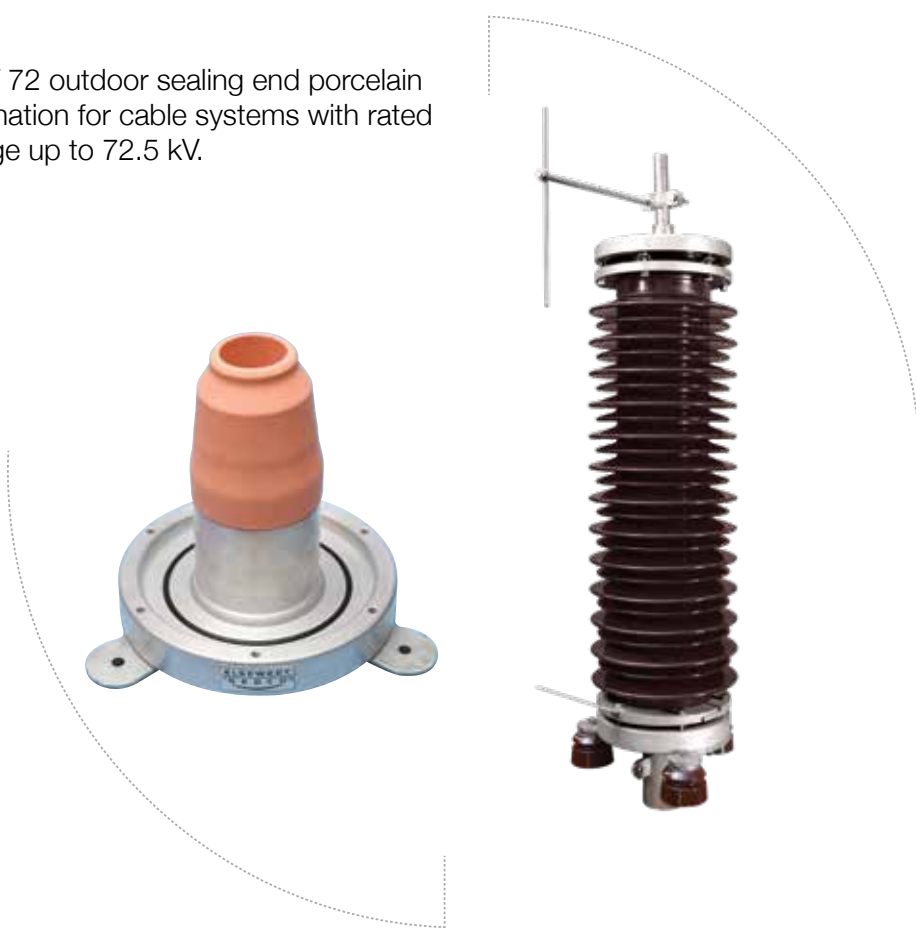


The background image shows a complex industrial machine used for processing cable components. On the left, a large blue cylindrical container holds several clear plastic bags. Above it, a metal frame with vertical rods and a black hose is visible. To the right, a tall, light blue metal cabinet stands, featuring a control panel with various knobs, buttons, and a pressure gauge. Further right, a red machine with blue coiled hoses is partially visible. The scene is set in a factory or workshop with overhead lighting.

Porcelain Outdoor Sealing End

Porcelain Outdoor Sealing End

SEPT 72 outdoor sealing end porcelain termination for cable systems with rated voltage up to 72.5 kV.



Porcelain Outdoor Sealing End

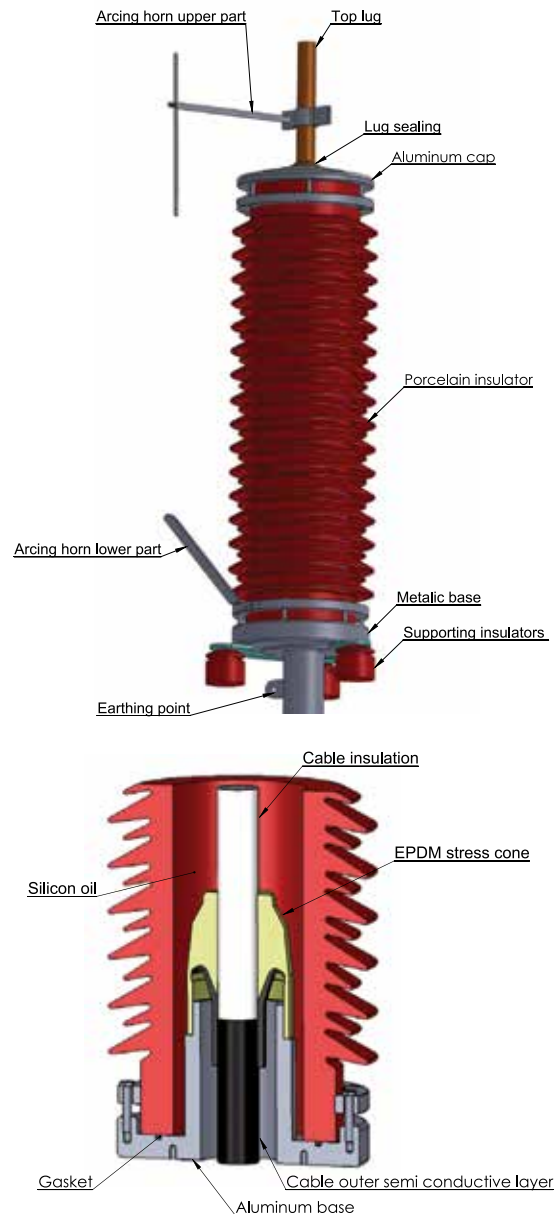
High Voltage Termination

IEC 60840, IEEE (048&404)

- The SEPT 72 conforms and type tested according to IEC 60840.
- Pre-molded stress control system made of EPDM rubber.
- Termination's stress cone covers cable cross section area up to 2000 mm² with diameter over insulation up to 97 mm.
- Termination is filled with an insulating compound up to a level where the electric field is substantially reduced.
- Terminations base plates and the cables metallic screen are electrically insulated from the supporting structure by means of stand-off insulators, designed to withstand both mechanical and electrical operating stresses.
- Termination designed for operation under severe outdoor conditions.
- Main components of the termination are the porcelain hollow insulator, upper metal cap, top bolt , metal base plate , supporting insulators , silicon oil filling compound , O-Ring gaskets and pre-molded stress cone for electrical field control.
- Arcing horn , corona ring and overhead clamps are available upon customer request and to be ordered separately.

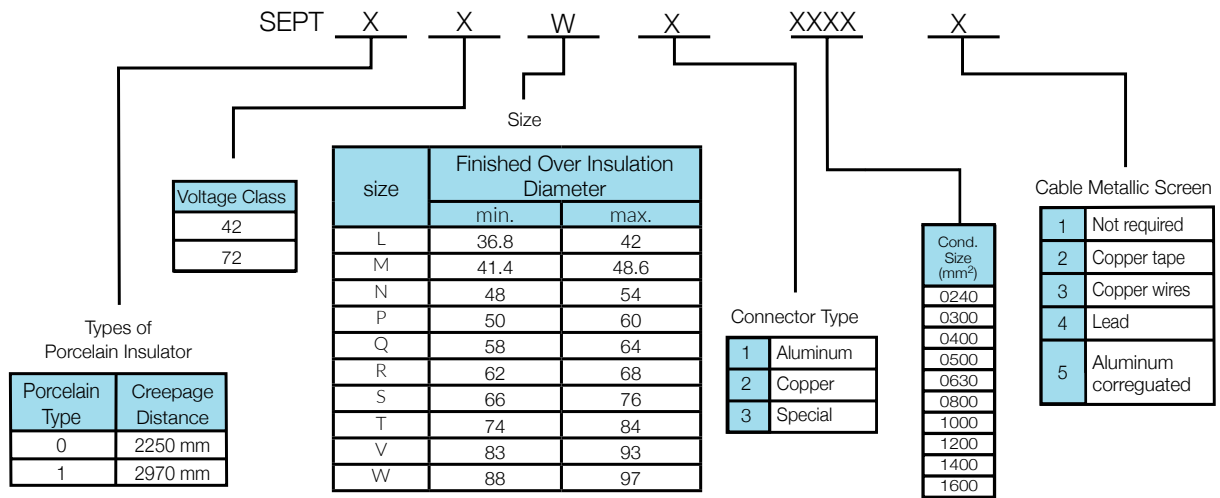
Technical data

Ratings	
Nominal system voltage up to U_0 (kV)	69
Maximum system voltage U_m (kV)	72.5
Maximum continuous conductor temperature	90°C
Type Test (IEC 60840):	
Partial discharge test voltage	
- Partial discharge level determined at (kV)	54
- Maximum allowable partial discharge level (PC)	5
- Conductor Temperature	Ambient
Load cycle	
- Test voltage (kV)	72
- No of cycles, each cycle 24 hrs	20
- Heating duration	8 hrs.
- Cooling duration	16 hrs.
- Conductor temperature	(95 °C)
Basic impulse level (10pos., 10Neg., 50 Hz)	
- Impulse voltage (kV)	325
- Conductor temperature	(95 °C)
AC withstand voltage	
- Test voltage (kV) for 15min.	90
- Conductor temperature	Ambient
Routine Test:	
AC withstand voltage (kV) for 30min.	90
Partial discharge test voltage	
- Partial discharge level determined at (kV)	54
- Maximum allowable Partial discharge level (PC)	5
Other Technical Data as per (IEEE):	
AC line to ground to withstand (kV)	
- 6 hrs. dry	100
- 15 min. dry	120
- 1 min. dry	175
- 10 sec. Wet	145



Porcelain Outdoor Sealing End

Ordering Formula



- Extra creepage distances can be achieved.

Example

- For 66kV, 630mm² CU cable with dia. over insulation of 66 mm, the cable metallic screen is lead with minimum creepage distance 2970mm.
- Order SEPT-1-72-R-2-630-4

Following Items Can Be Ordered Separately



Separate overhead clamp for busbar connection



Complete overhead clamps for bare conductor aerial connection



Arcing horn



A technician wearing a cap and gloves is working on a cable connector in a data center. The technician is using a tool to work on a black cable connector. The background shows server racks and other equipment. The image is overlaid with a large blue circular graphic.

Dead Break Separable Connectors



L-Shape Elbow 156

156 Elbow Connector is a fully-rated 15/25kV, 250A Class deadbreak connector. The 156 is equipped with an integral voltage test point.



L-Shape Elbow 400

The K400 is designed to provide fully-shielded, dead-front submersible cable connections. The K400 can be used up to 25 kV, 400/630A for aluminum and copper conductors.



T-Shape Elbow

The T - body is designed to provide fully-shielded, dead-front submersible cable connections. It can be used through 36 kV, 630/1250A for aluminum and copper conductors.



T-Shape Elbow ET

The ET unsymmetric elbow is designed to be suitable for compact panels, which can be used up to 36 kV, 630/1250A for aluminum and copper conductors.

Dead Break Separable Connectors

L-Shape Elbow 156

IEC Standard 60502-4, IEEE Standard 386

- 15/25kV, 250 Amp Deadbreak plug in Elbow.
- Fully shielded and fully submersible molded rubber housing.
- 100% peroxide-cured construction includes insulation and conductive EPDM materials.
- Optionally, non-corrosive, capacitively coupled voltage test point with removable protective cap.
- Provision for hot stick operation.
- Provision for ground wire connection.
- Wide cable range with minimum number of sizes.
- No special tool, heating, taping or potting are required.



1 Semi conductive shield

Semi conductive EPDM shield provides ground shield continuity between elbow and cable shield.

2 Probe

From tin plated copper to insure positive interference fit with the mating bushing.

3 Pulling eye

Stainless steel pulling eye provides easy hotstick operation.

4 Semi conductive insert

Molded cured EPDM semi conductive contains electrical stress control.

5 Optional capacitive test

Point capacitive test point with cap provides a shielded hotstick operation to test if the circuit is energized or not.

6 EPDM insulation

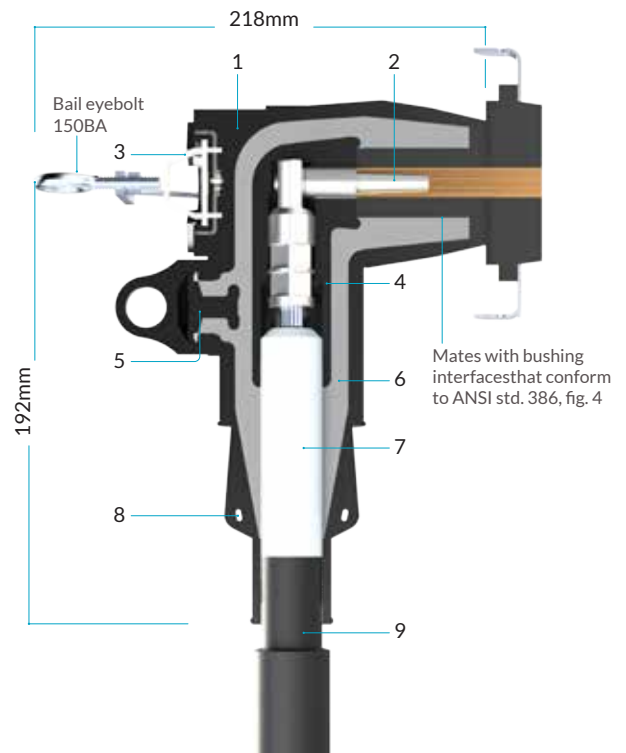
Molded from high quality special formula EPDM rubber to provide superior insulation characteristics

7 Cable insulation

8 Grounding eye

Provisioned for ground wire connection.

9 Cable's outer semi conductor



Ordering Formula

- Determine the insulation diameter of the cable.
- Select the corresponding elbow size that straddles the insulation diameter.

X		W		156		X		XXX	
Voltage Class		ELbow Size		Cable Insulation Dia. Range (mm)		Lug		Cond. Size (mm ²)	
7.5		F		16.3 - 20.8		Material	Symbol	025	
12		G		19.3 - 24.1		Copper	1	035	
17.5		H		21.6 - 26.7		Special	2	050	
24		J		24.9 - 30.0				070	
		K		27.7 - 33.3				095	
								120	

Dead Break Separable Connectors

L-Shape Elbow 400

IEC Standard 60502-4, IEEE Standard 386

- The bushing interface conforms to CENELEC EN 50181 for using with standard 400/630A European switchgear C interface. A ground wire is attached for easy shield grounding after installation.
- The product for using with standard 400 A European switchgear B interface is available upon request.



1 Bushing Interface

The elbow mates with bushing interface conform to CENELEC EN 50181 customized from both sides as per client requests.

2 Stud

Brass stud using for connection between the cable and the panel bushing.

3 Insulating Plug

4 Compression Lug

5 Semi-Conductive Shield

Semi-conductive EPDM shield provides ground shield continuity between elbow and cable shield.

6 semi-Conductive Insert

Molded cured EPDM semi conductive contains electrical stress control.

7 EPDM Insulation

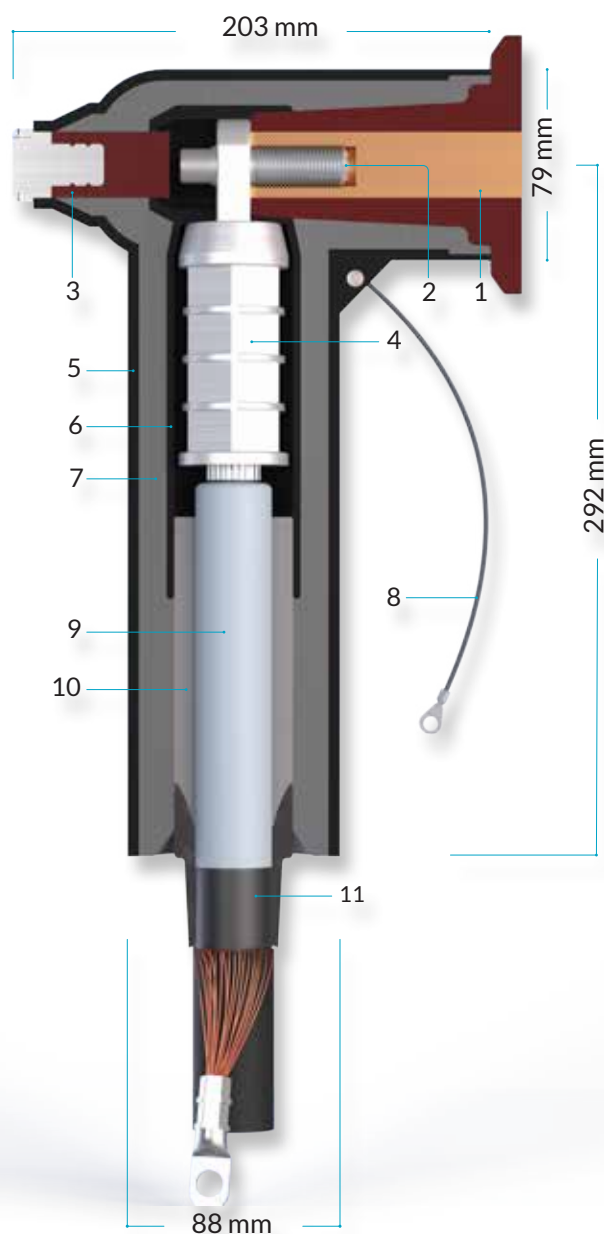
Molded from high quality special formula EPDM rubber to provide superior insulation characteristics.

8 Grounding Wire

9 Cable Insulation

10 Cable Adaptor

11 Cable's Outer Semi Conductor



Dead Break Separable Connectors

Electrical Ratings

U ₀ (kV)	3.6	6	8.7	12
U (kV)	6	10	15	20
U _M (kV)	7.2	12	17.5	24
Impulse test voltage (kV)	60	75	95	125
Continuous nominal current	630 A			
IEC Standard No.	IEC 60502-4			

Note

U_o: The rated power frequency voltage between conductor and earth screen for which the cable is designed.

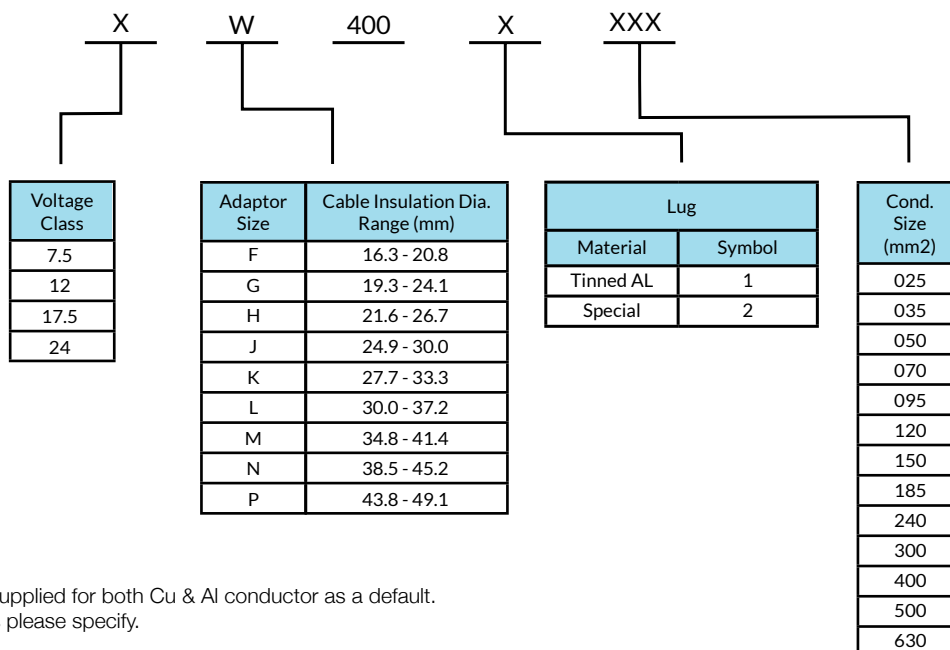
U: The rated power frequency voltage between conductors for which the cable is designed.

Um: The maximum value of the “highest system voltage” for which the equipment may be used.



Ordering Formula

- Determine the insulation diameter of the cable.
- Select the corresponding adaptor size that straddles the insulation diameter .



Note

Note
Tinned Al lug is supplied for both Cu & Al conductor as a default.
For other options please specify.

Dead Break Separable Connectors

T-Shape Elbow

IEC Standard 60502-4, IEEE Standard 386

- The product mates with bushing interface conform to CENELEC EN 50181.
- B, C & D interface customized from both side as per client requests.



1 Bushing Interface

The Elbow Mates with Bushing interface conform to CENELEC EN 50181 customized from both sides as per client requests.

2 Stud

Brass stud using for connection between the cable and the panel bushing.

3 Insulating Plug

4 Protective Cap

5 Compression Lug

6 Semi-Conductive Shield

7 EPDM Insulation

Molded from high quality special formula EPDM rubber to provide superior insulation characteristics.

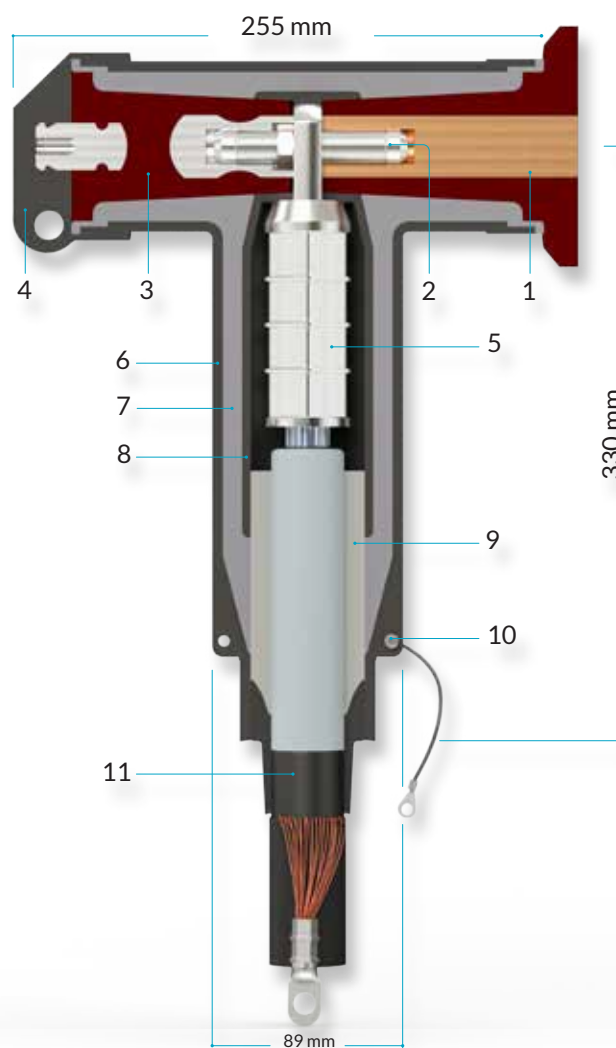
8 Semi-Conductive Insert

Molded cured EPDM semi conductive contains electrical stress control.

9 Cable Adaptor

10 Earthing Eye

11 Cable's Outer Semi Conductor



Ordering Formula

- Specify interface symbol according to your switch gear interface.
- Determine the insulation diameter of the cable.
- Select the corresponding adaptor size that straddles the insulation diameter.

Dead Break Separable Connectors

Voltage Class		Type of Interface	Adaptor Size	Cable Insulation Dia. Range (mm)	Lug		Cond. Size (mm ²)
KV	Symbol				Material	Symbol	
7.5	-	C/D	F	16.3 - 20.8	Tinned AL	1	025
12	-	D/D	G	19.3 - 24.1	Special	2	035
17.5	-	C/C	H	21.6 - 26.7			050
24	K	B/D	J	24.9 - 30.0			070
36	M		K	27.7 - 33.3			095
			L	30.0 - 37.2			120
			M	34.8 - 41.4			150
			N	38.5 - 45.2			185
			P	43.8 - 49.1			240
							300
							400
							500
							630

Example

For 24kV ,185mm² stranded AL cable with a dia.

Over insulation of 28.5mm and the required ELBOW interface C/D. Order K-465-J-1-185

Note

Tinned Al lug is supplied for both Cu&Al conductor as a default.

For other options, please specify.

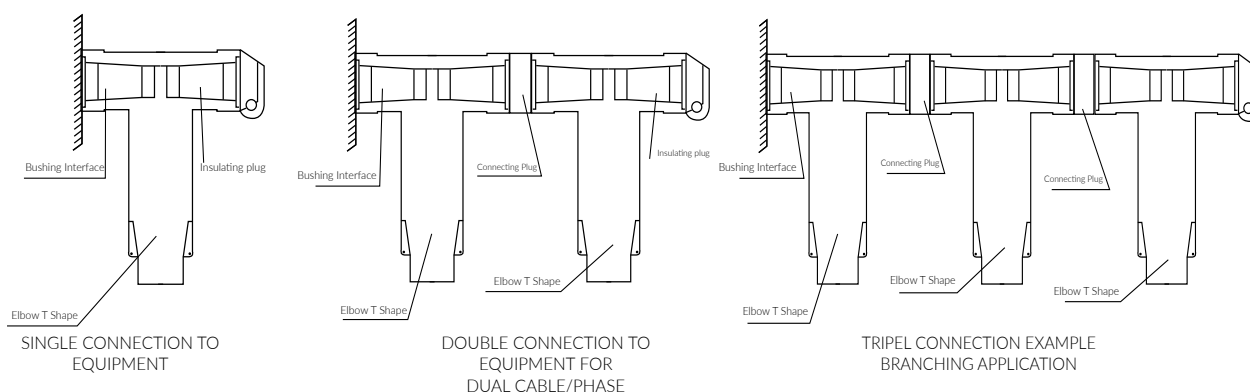
Possible Arrangements

- Various possibilities could be achieved using the correct mating parts, which enables providing innovative solutions as per customers needs.
- Other combinations can be achieved.

Separable Connectors

Elbows types and Bushing Interfaces

Bushing Interface Type	Elbow Shape	Rated Voltage (um)	Rated Current	Connection Type
A	L- Shape only	15,25 kV	250 A	Plug in
B	L or T- Shape	15,25 kV	400 A	Plug in
	T - Shape only	35 kV		
C	L or T- Shape	15,25 kV	630 A	Screw (metric)
	T - Shape only	35 kv	1250 A	
D	T - Shape only	15,25,35 kV	630 A 1250 A	Screw (inch)



Dead Break Separable Connectors

ET-Elbow

IEC Standard 60502-4, IEEE Standard 386

- ET-Unsymmetrical T-shape deadbreak elbow is 630/1250A, 15/24/36 kV made of EPDM material fully shielded, fully submersible.
- The bushing interface according to CENELEC EN 50181 for using with standard switch gear interface C.
- Capacitive measuring point.
- Provision for grounding wire connection.
- No special tools are required, wide table range with minimum of adaptor.



1 Bushing Interface

The elbow mates with bushing interface conform to CENELEC EN 50181 customized from both sides as per client requests.

2 Stud

Brass stud using for connection between the cable and the panel bushing.

3 Protective Cap

EPDM cap provides sealing for elbow housing from inside and easy to remove for maintenance purpose.

4 Insulating Plug

5 Compression Lug

6 Semi-Conductive Shield

Semi-conductive EPDM shield provides ground shield continuity between elbow and cable shield.

7 Semi-Conductive Insert

Molded cured EPDM semi conductive contains electrical stress control.

8 EPDM Insulation

Molded from high quality special formula EPDM rubber to provide superior insulation characteristics.

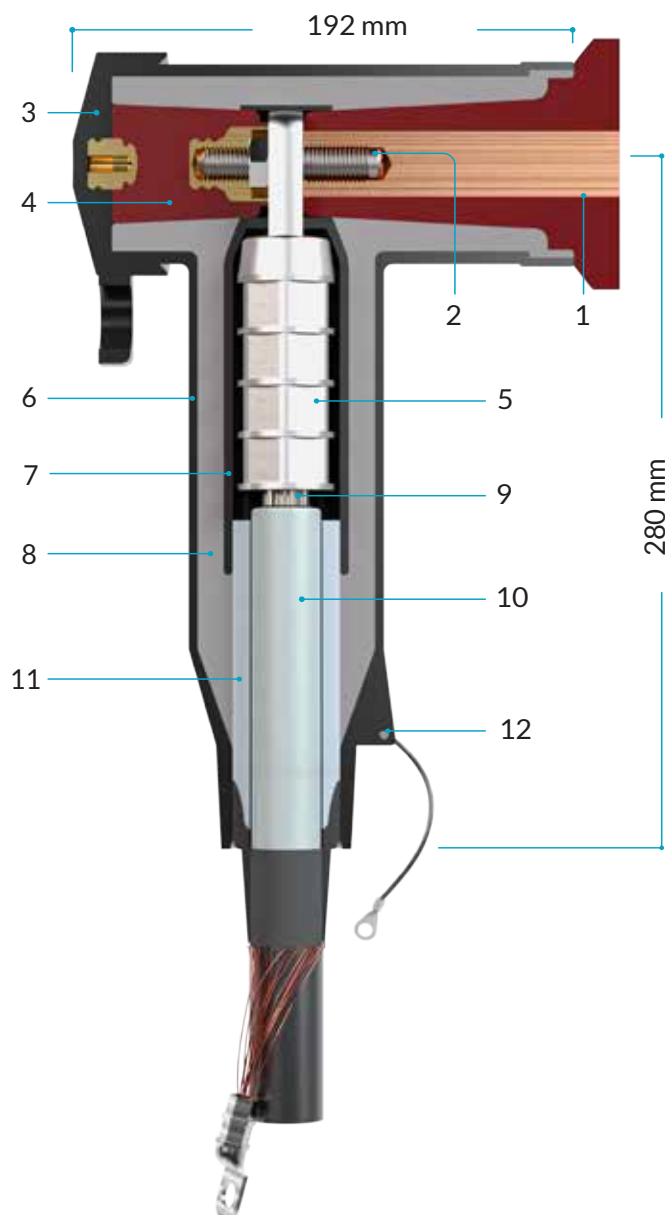
9 Cable Conductor

10 Cable Insulation

11 Cable Adaptor

12 Earthling Eye

Provisioned for ground wire connection.



Dead Break Separable Connectors

Electrical Ratings

U ₀ (kV)	6	8.7	12	18
U (kV)	10	15	20	30
UM (kV)	12	17.5	24	36
Impulse test voltage (kV)	75	95	125	170
Continuous nominal current	630 A - 1250 A			

IEC Standard No.

IEC 60502-4

Note

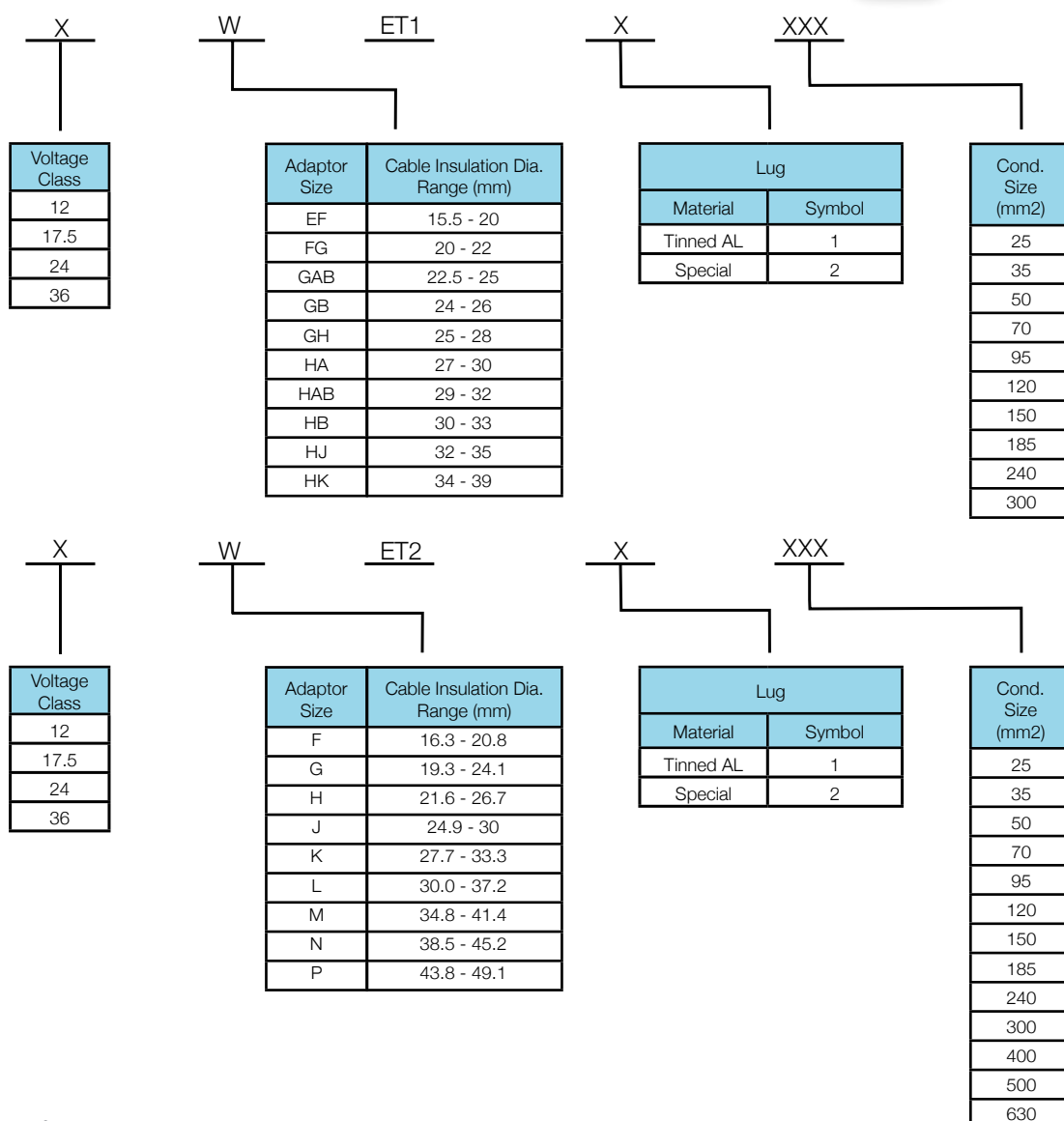
U₀: The rated power frequency voltage between conductor and earth screen for which the cable is designed.

U: The rated power frequency voltage between conductors for which the cable is designed.

Um: The maximum value of the “highest system voltage” for which the equipment may be used.



Ordering Formula



Dead Break Separable Connectors

ETC-Elbow

IEC Standard 60502-4, IEEE Standard 386

- ETC-Unsymmetrical T-shape Deadbreak elbow is 630A, 15/24 KV Made of EPDM material fully shielded, fully submersible.
- The Bushing interface According to CENELEC EN 50181 for using with standard switch gear interface C.
- Capacitive measuring point.
- Provision for grounding wire connection.
- No special tools are required, wide table range with minimum of adaptor.



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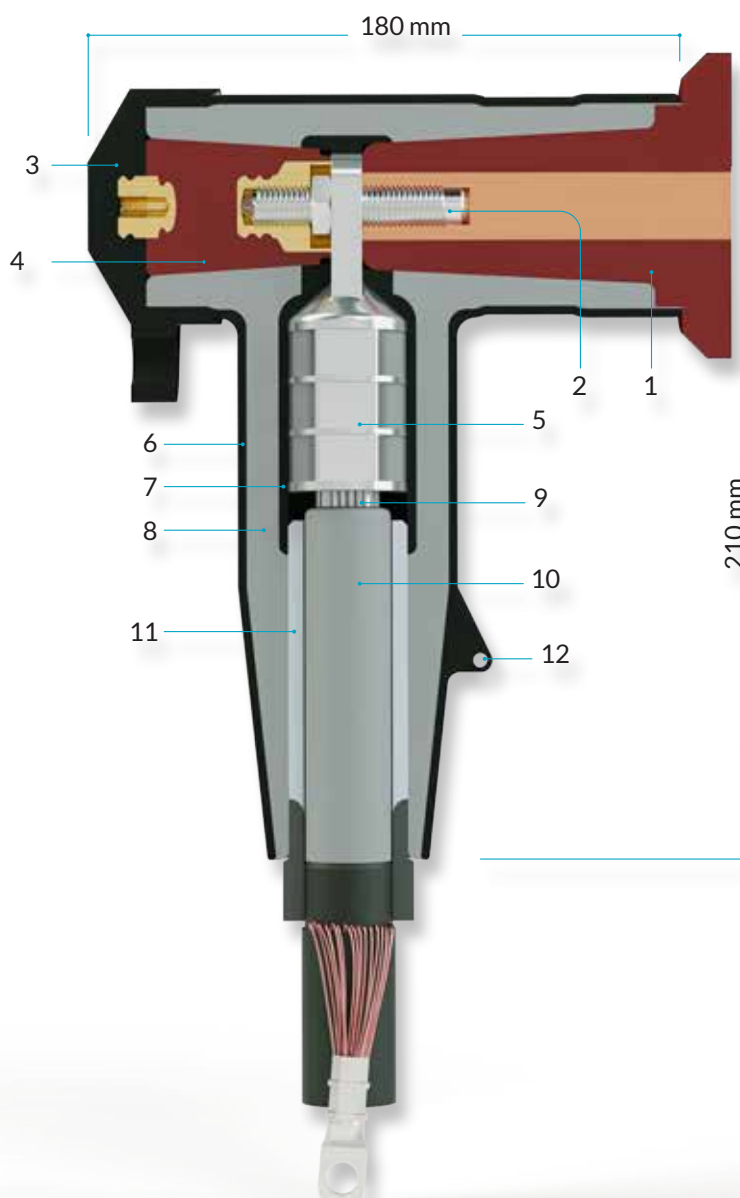
9 Cable Conductor

10 Cable insulation

11 Cable Adaptor

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Provisioned for ground wire connection.



Dead Break Separable Connectors

Electrical Ratings

U ₀ (kV)	6	8.7	12
U (kV)	10	15	20
UM (kV)	12	17.5	24
Impulse test voltage (kV)	75	95	125
Continuous nominal current	630 A		
IEC Standard No.	IEC 60502-4		

Note

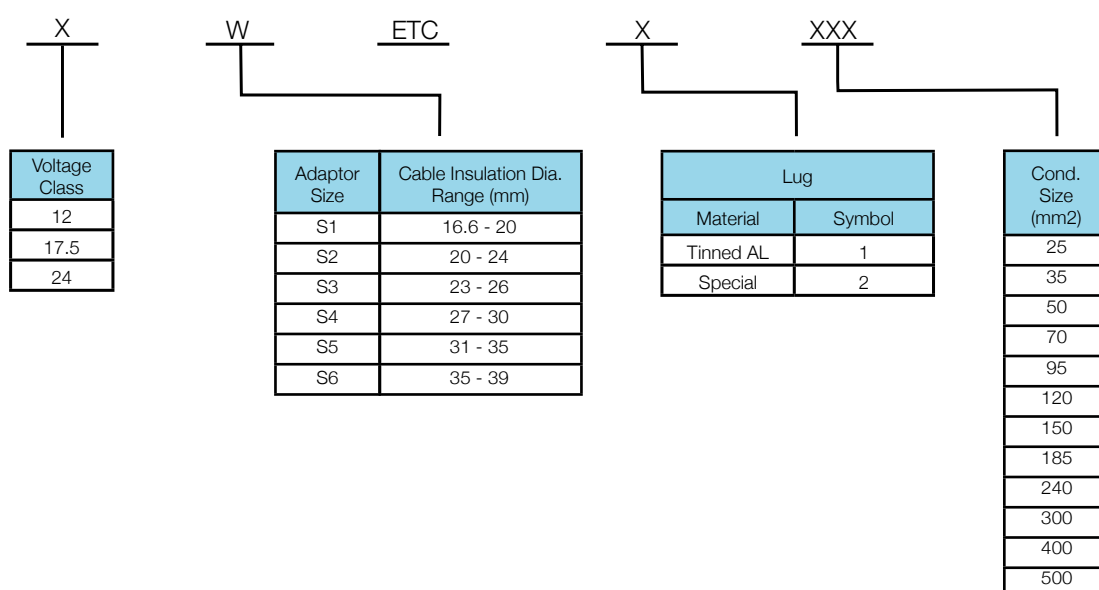
U₀: The rated power frequency voltage between conductor and earth screen for which the cable is designed.

U: The rated power frequency voltage between conductors for which the cable is designed.

Um: The maximum value of the "highest system voltage" for which the equipment may be used.



Ordering Formula





Pre-assembled Cable Connector (Test Rod)

The test rod is designed to test the elbow inside the panel (testing the elbow and panel) and outside the panel in the air (testing the elbow only).



Pre-assembled Cable Connector (Jumper)

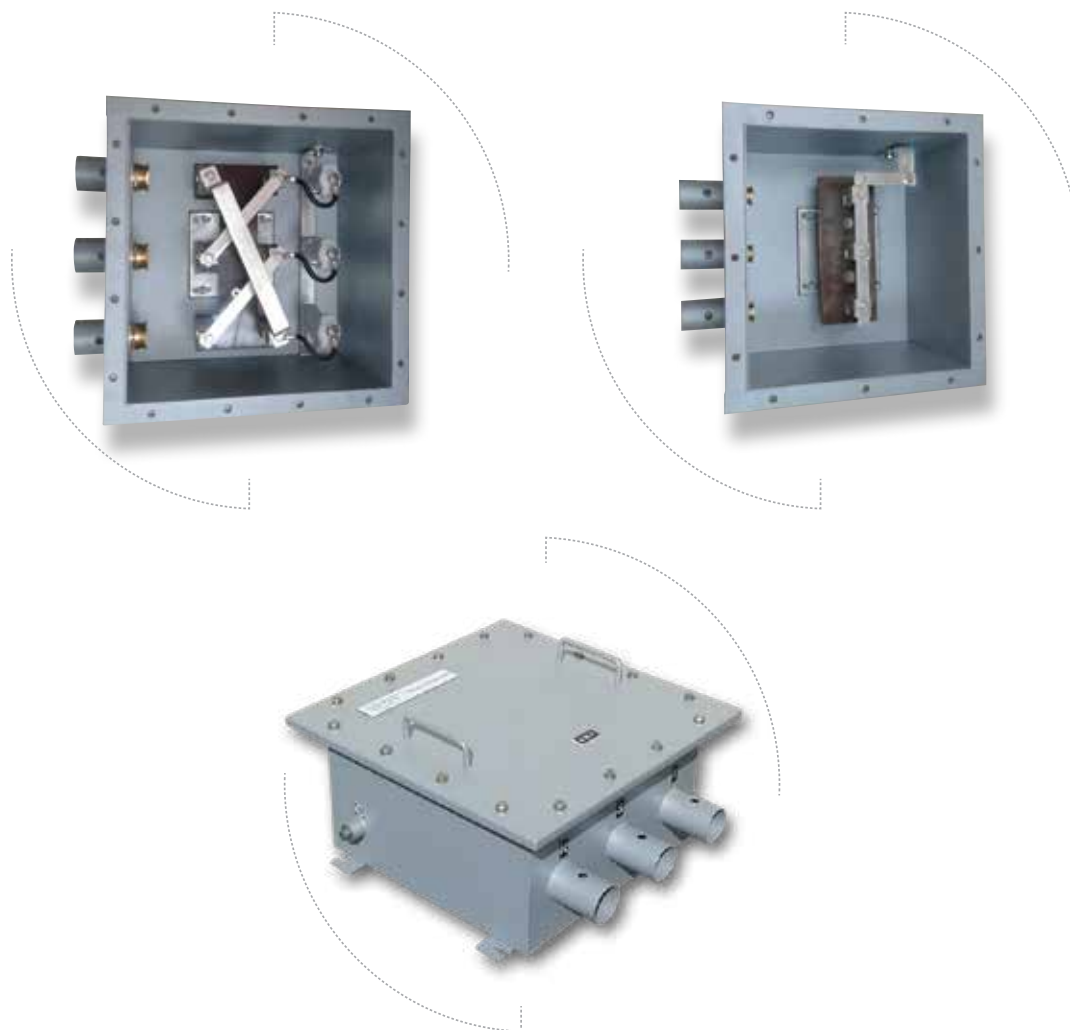
The jumper simplifies the assembly and commissioning of medium voltage compact stations, switch gear and termination depending on the required termination. Connector is installed on the cable according to customer requirement.

Connecting Plug

Used for connecting two or more elbows together, thus creating a separable cable joint or multiple cable connection to the equipment.




Link Box



Link Box is electrically and mechanically one of the integral accessories of HV underground and above ground cable bonding system, associated with HV XLPE power cable systems.

We offer an array of product disconnecting link boxes to complete the desired sheath grounding arrangement. We provide a sealed dry environment for cable metal sheath earthing connections (links). These links may be removed to facilitate cable sheath inspection and testing.



1194-15

TYPE TEST CERTIFICATE OF PRE-QUALIFICATION

OBJECT Power cable system consisting of a single-core power cable, 2 outdoor terminations, 2 GIS terminations, 4 pins with screen separation and link boxes

Rated voltage, kV (S/L)	Conductor material	Insulation material	Cu
10/20 (S/L)	Al	XLPE	

MANUFACTURERS (*) Cable: Elwanadi Cables, 107 of Rotterdam City, Egypt
Accessories: Elwanadi SEDCO, 107 of Rotterdam City, Egypt and 161 Cables GmbH, Cologne, Germany

CLIENT Elwanadi Cables, 107 of Rotterdam City, Egypt

TESTED BY KEMA Nederland B.V., Amstelveen, The Netherlands

DATE OF TESTS 18 March 2014 to 18 June 2015

The object, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with:

IEC 62067 (2011) subclause 13


This Pre-qualification Certificate has been issued by KEMA following exclusively the STL Guideline.

The results are shown in this document. The values obtained and the general performance are considered to comply with the above Standard and to justify the ratings assigned by the manufacturer as listed on page 4 to 12.

This Certificate applies only to the object tested. The responsibility for conformity of any object having the same type references as that tested rests with the manufacturer.

This Certificate consists of 62 pages in total.

Copyright: Only integral reproduction of this Certificate is permitted without written permission from KEMA Electronic copies in e.g. PDF-format or scanned version of the Certificate may be available and have the status "for information only". The model and brand version of the Certificate is the only valid version.


 KEMA Electronic
 Division Testing, Inspection & Certification The Netherlands
 Amstelveen, 8 December 2015

Up to 400 kV

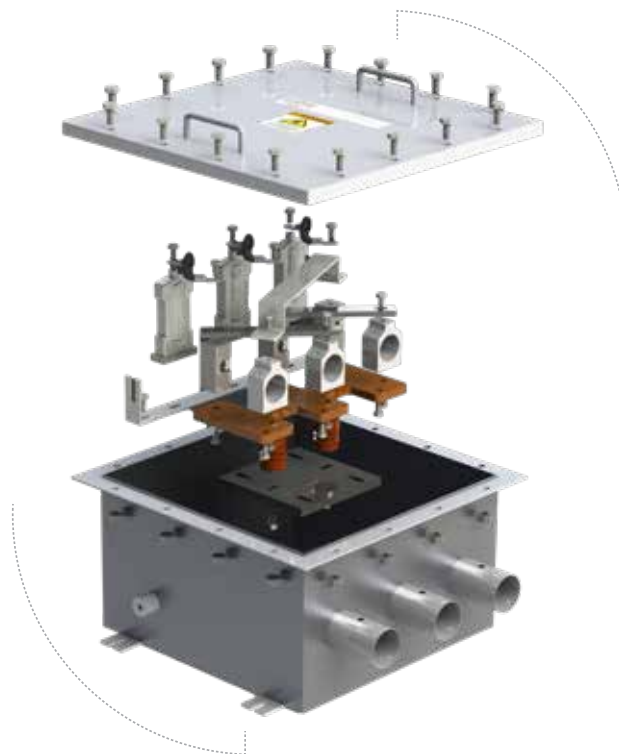
Features

Mechanical features

- Enclousure from stainless steel, electrostatic painting for long term corrosion resistance.
- Great sealing and waterproof performance.
- Designs for indoor, outdoor and underground applications.
- Different mechanical protection levels up to IP 68.
- All connections and links are tin plated.

Electrical features

- Accommodate single core or concentric cables.
- Suitable for earthing cable leads C.S.A up to 400mm².
- Different designs available : single point, cross bonding and direct grounding versions available with or without removable links.
- With or without SVL: Zinc oxide sheath voltage limiters (SVL) can be used. The rated voltage of SVL is designed as per client specifications/bonding system design.
- Arrangement fulfilled all electrical requirements for the voltage class up to 400 kV.



Certification

Our link boxes are type tested to comply with engineering recommendation C55/4 and IEC 60840

	Item	Parameters
1	DC withstand voltage	25kV/1 min.
2	Impulse withstand voltage	40 kV
3	AC withstand voltage	10 kV/1 min.
4	Insulating resistance	≥100MΩ
5	Contact resistance	≤20μΩ
6	Short circuit test current (as per Cable C.S.A.)	40kA / 1 sec
7	Degree of protection	IP 68
8	SVL leakage current (as applicable)	≤ 0.1 mA

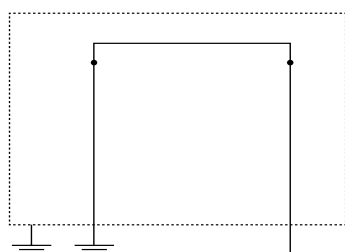


Link Box

Selection Product

Single Phase Solid Earthed Link Boxes Without SVL

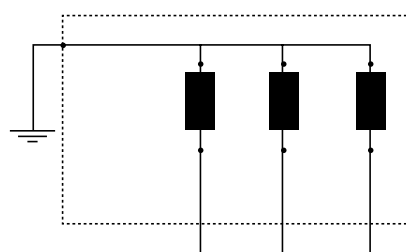
Link Diagram



Type : SE.1LB.WOS.1*1.SC.XX
XX : AG (IP65) or UG (IP68)

Three Phase Direct Earthed with SVL

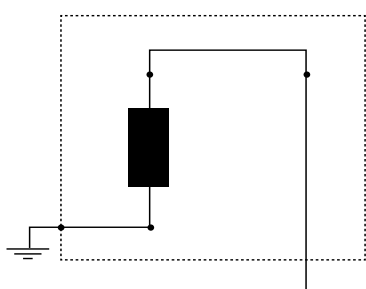
Link Diagram



Type : DE.3LB.WIS.3*1.SC.XX
XX : AG (IP65) or UG (IP68)

Single Phase Direct Earthed Link Boxes With SVL

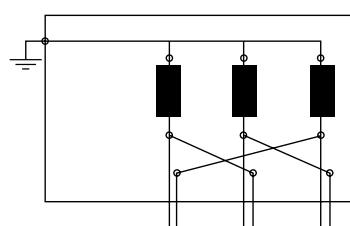
Link Diagram



Type : DE.1LB.WIS.1*1.SC.XX
XX : AG (IP65) or UG (IP68)

Three Phase Cross Bonding Link Boxes With SVL Using Concentric Cables

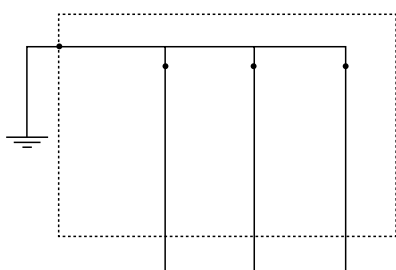
Link Diagram



Type : CB.3LB.WIS.3*1.CC.XX
XX : AG (IP65) or UG (IP68)

Three Phase Solid Earthed Link Boxes Without SVL

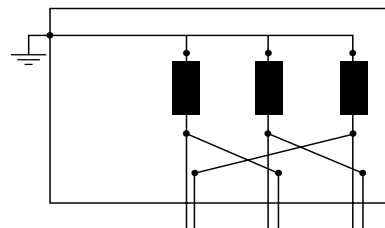
Link Diagram



Type : SE.3LB.WOS.3*1.SC.XX
XX : AG (IP65) or UG (IP68)

Three Phase Cross Bonding Link Boxes with SVL Using Single Phase Cable

Link Diagram



Type : CB.3LB.WIS.3*2.SC.XX
XX : AG(IP65) or ug (IP68)

AG : Above Ground	CB : Cross Bonding
UG : Underground	SC : Single Core Cable
DE : Direct Earthed	CC : Concentric Cable
SE : Solid Earthed	W/O : Without

NOTES

- Outer dimensions are related to the earthing cable dimensions, rated voltage and SVL value (if available).
- 4 ways design are also available upon request.
- All designs can be used for bonding cable C.S.A up to 400mm².
- Complete kit is supplied with all heat shrinks, resins and tapes (if needed).
- When requesting a quotation please include:
 - Link box type.
 - Cable size of bonding and earthing cable.
 - SVL values if required.
 - Any special requirements or modifications required by customers can be met.

The background is a blurred industrial scene, likely a manufacturing plant, with various metal components and machinery. A large, semi-transparent blue circle is centered over the image, with a white outline. The text "Heat Shrink Products" is written in white, bold, sans-serif font across the middle of the circle.

Heat Shrink Products



Cable Breakouts

Cable breakouts are designed for cable sealing crutches and to provide resistance to abrasion, weathering and chemical attack. It's applicable for indoor and outdoor applications for all types of polymeric and paper insulated cables.



Boots

Heat shrinkable stabilized cross-linked polyolefin anti tracking boots, in red or grey color, designed to provide protection to cable ends, bushing insulation and sealing against ingress of moisture and contamination. Providing insulation and resistance to abrasion, weathering and chemical attack.



End Caps

Heat shrinkable stabilized cross linked polyolefin sealing caps (SC), in black color are ideal for protecting cable ends. SC are designed to seal the end of cables against ingress of moisture and contamination, and provide insulation and resistance to abrasion, weathering and chemical attack. Such sealing caps are required for cable transport, storage and installation.



Heat Shrink Tubes

SHSI is an excellent product for sealing and insulating cable splices connections, terminations and jacket repairs. The tubing is designed to withstand direct buried installations.



Low Voltage Heat Shrink Joint

SHSJ (cable Joint) are outstandingly suitable for jointing two single or multi-core, polymeric (XLPE, PVC ...), Al or Cu, armored or non-armored in the low voltage range (up to 1kV).



Low Voltage Heat Shrink Termination

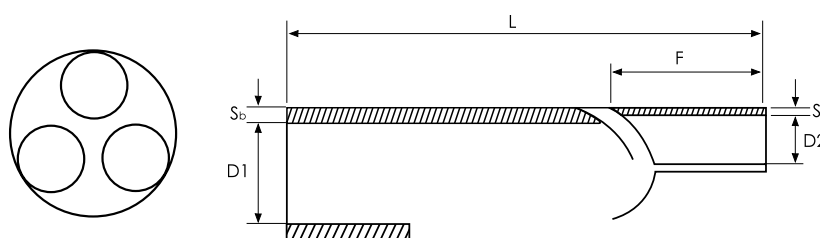
SHST (cable-Termination) are outstandingly suitable for terminating multi-core, polymeric (XLPE, PVC ...) and power cables, Al or Cu, armored or non-armored in the low voltage range (up to 1kV).

Heat Shrink Products

Cable Breakouts

Main Features

- Resistance against abrasion, corrosion, chemicals, solvents, and common fluids.
- Resistance against weather, UV and oxidation.
- Compatible with nearly all cable types.
- Unlimited shelf life.
- Easy and fast installation.
- Available with adhesive or mastic if required.



Material Specification

Properties	Unit	Value	Standrad
Application Temperature	°C	-40 : + 150	
Shrinking Temperature	°C	> 120	
Tensile Strength	N/mm ²	12 Min	ISO 527
Elongation at Break	%	300 Min	ISO 527
Thermal Ageing	(150 °C for 168H)		ASTM D 573
Tensile Strength	N/mm ²	10 Min	ISO 527
Elongation at Break	%	250 Min	ISO 527
Water Absorption	%	< 0.5	DIN 53495
Volume Resistivity	Ohm.cm	10 ¹² Min	ASTM D 257
Carbon Black Content	%	> 2.5	ASTM D 1603
Density	gm/cm ³	1.07 ± 0.03	ASTM D 792

Dimensions

Type	Cable Side			(L) mm Total Length After Free Recovery	Finger Side			
	Diameter		(Sb) mm Standard Thickness After Free Recovery		Diameter		(Sf) mm Standard Thickness After Free Recovery	(F) mm Finger Length After Free Recovery
	(D1) mm as Supplied	(d1) mm After Free Recovery			(D2) mm as Supplied	(d2) mm After Free Recovery		
STFB0	50	20	3.5	170	22	8	2.2	50
STFB1	75	30	3.5	215	32	13	2.2	75
STFB2	110	45	5	290	52	21	4	110
STFB3	135	55	5	310	64	27	4	135

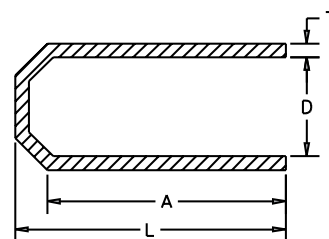
- All dimensions in mm.
- For any other dimensions, please contact us.
- Due to continuous product improvements, some specifications can change without prior notice.

Heat Shrink Products

End Caps

Main Features

- Resistance against abrasion, corrosion, chemicals, solvents and common fluids.
- Resistance against weather, UV and oxidation.
- Compatible with nearly all types of cables.
- Rated up to 600/1000 V energized cable.
- Unlimited shelf life.
- Easy and fast installation.
- Available with adhesive, mastic, or valve if required.



Material Specification

Properties	Unit	Value	Standrad
Application Temperature	°C	-40 : + 150	
Shrinking Temperature	°C	> 120	
Tensile Strength	N/mm ²	12 Min	ISO 527
Elongation at Break	%	300 Min	ISO 527
Water Absorption	%	< 0.5	DIN 53495
Volume Resistivity	Ohm.cm	10 ¹² Min	ASTM D 257
Carbon Black Content	%	> 2.5	ASTM D 1603
Density	gm/cm ³	1.07 ± 0.03	ASTM D 792

Dimensions

Type	As Supplied			After Free Recovery	
	(L)	(A)	(D)	(T)	(D) Max.
SC 14	50	45	14	3	4
SC 20	65	60	20	3	9
SC 35	90	80	35	3	15
SC 55	110	88	55	3.7	24
SC 80	120	105	80	4	35
SC 100	140	110	100	4.8	55
SC 115	150	110	115	4.8	55

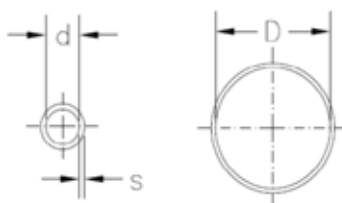
- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvements, some specifications can change without prior notice.

Heat Shrink Products

Heat Shrink Tubes

Main Features

- Continuous operating temperature range of -40°C to +120°C (Jacket Only) 3:1 shrink ratio.
- High resistance to abrasion,
- corrosion, and chemicals.
- Excellent weather ability.
- Excellent insulating performance.
- Excellent mechanical stability.
- Easy and fast installation.
- Available with adhesive:
 - for adhesive tube (X = A),
 - for non-adhesive tube (X = N)..



Ordering formula:

SHSI D / d - X - S / L

N	Non Adhesive
A	Adhesive

- For any other dimensions, please contact us.
- Due to continuous product improvements, some specification can change without prior notice.

Technical Data

Properties	Unit	Value	Standrad
Application Temperature	°C	-40 : + 150	
Shrinking Temperature	°C	> 120	
Shrink Ratio		3:1	
Density	gm/cm ³	0.95 ± 0.03	ASTM D 792
Hardness Shore D	SH	49± 4	ASTM D 2240
Tensile Strength	N/mm ²	10 Min	ISO 527
Elongation at Break	%	400 Min	ISO 527
Thermal Ageing	(150 oC for 168H)		ASTM D 573
Tensile Strength	N/mm ²	8 Min	ISO 527
Elongation at Break	%	350 Min	ISO 527
Water Absorption	%	< 0.2	DIN 53495
Carbon Black Content	%	> 2.5	ASTM D 1603
Brittleness Temperature	°C	-40	DIN 59546
Volume Resistivity	Ohm.cm	10 ¹² Min	ASTM D 257/IEC 93
Dielectric Strength	kV/mm	10 Min	ASTM D 149/IEC 243
Heat Shock		Pass	IEC 60811-3-1

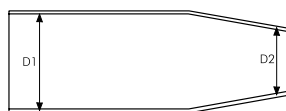
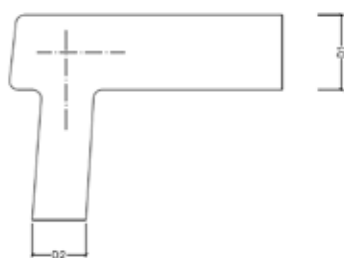
Type	Diameter		(S) mm Wall Thickness After Recovery
	(D) mm as Supplied	(d) mm After Recovery	
12/3	12	3	1.8
22/6	22	6	2.2
33/8	33	8	2.5
40/12	40	12	2.5
55/16	55	16	2.7
101/25	101	25	3.5
124/34	124	34	3.6
160/50	160	50	3.5
180/60	180	60	3.5
225/75	225	75	5
235/65	235	65	3.7
265/75	265	75	4
300/75	300	75	4

Heat Shrink Products

Boots

Main Features

- Resistance against abrasion, corrosion, chemicals, solvents and common fluids.
- Resistance against weather, UV and oxidation.
- High tracking resistant.
- Compatible with nearly all types of cables.
- Unlimited shelf life.
- Easy and fast installation.
- Available with adhesive or mastic if required.



Material Specification

Properties	Unit	Value	Standrad
Density	gm/cm ³	1.11 ± 0.03	ASTM D 792
Tensile Strength	N/mm ²	10 Min	ISO 527
Elongation at Break	%	300 Min	ISO 527
Hardness Shore D	SH	35± 4	ASTM D 2240
Water Absorption	%	1% Max	DIN 53495
Thermal Ageing	(150 oC for 168H)		ASTM D 573
Tensile Strength	N/mm ²	8 Min	ISO 527
Elongation at Break	%	250 Min	ISO 527
Volume Resistivity	Ohm.cm	10 ¹² Min	ASTM D 257/IEC 93
Dielectric Strength	kV/mm	10 Min	ASTM D 149/IEC 243
Dielectric Constant		5 Max	ASTM D 150/IEC 250
resistance to Track		No failure by tracking	ASTM D 2303

Type	Bushing Side		Cable Side	
	D1	d1	D2	d2
Straight Boot SB1	81	30	48	15
Straight Boot SB2	95	35	70	25
Right Angle Boot RAB1	81	35	48	15
Right Angle Boot RAB2	95	35	70	25

- All dimensions are in mm.
- For any other dimensions, please contact us.
- D1 and D2 are the dimensions as supplied.
- d1 and d2 are the dimensions after free recovery.
- Due to continuous product improvements, some specifications can change without prior notice.

Heat Shrink Products

Low Voltage Heat Shrink Joint

Main Features

- Quick & simple installation.
- Superior insulation.
- Good mechanical load-bearing ability.
- Unrestricted shelf life.
- Easy customization.
- Outstanding environment resistance.
- Long service time.



Ordering Formula

SHSJ		XC		- XXX		- X		- X																																		
No. of Cores		Conductor Size		Armoring		Connector Type																																				
1C = Single Core 2C = Two Core 3C = Three Core 4C = Four Core 5C = Five Core		<table><tr><th>Conductor Size (mm²)</th></tr><tr><td>0006</td></tr><tr><td>0010</td></tr><tr><td>0016</td></tr><tr><td>0025</td></tr><tr><td>0035</td></tr><tr><td>0050</td></tr><tr><td>0070</td></tr><tr><td>0095</td></tr><tr><td>0120</td></tr><tr><td>0150</td></tr><tr><td>0185</td></tr><tr><td>0240</td></tr><tr><td>0300</td></tr><tr><td>0400</td></tr><tr><td>0500</td></tr><tr><td>0630</td></tr></table>		Conductor Size (mm ²)	0006	0010	0016	0025	0035	0050	0070	0095	0120	0150	0185	0240	0300	0400	0500	0630	<table><tr><th colspan="2">Armor Restoration Kit (If specified)</th></tr><tr><td>N</td><td>Non Required</td></tr><tr><td>A</td><td>Galvanized Steel Cage</td></tr><tr><td>B</td><td>Copper Tubular Braid</td></tr><tr><td>C</td><td>Aluminum Cage</td></tr></table>		Armor Restoration Kit (If specified)		N	Non Required	A	Galvanized Steel Cage	B	Copper Tubular Braid	C	Aluminum Cage	<table><tr><th colspan="2">Connector</th></tr><tr><td>Type</td><td>Symbol</td></tr><tr><td>Aluminum</td><td>1</td></tr><tr><td>Copper</td><td>2</td></tr></table>		Connector		Type	Symbol	Aluminum	1	Copper	2
Conductor Size (mm ²)																																										
0006																																										
0010																																										
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Type	Symbol																																									
Aluminum	1																																									
Copper	2																																									



Heat Shrink Products

Low Voltage Heat Shrink Termination

Main Features

- Quick & simple installation.
- Superior insulation.
- Good mechanical load-bearing ability.
- Long service life.
- Reliable seal.
- Consistent performance.
- Easy customization.



Ordering Formula

SHST	X C	-	X X X	-	X	-	X
	No. of Cores		Conductor Size		Lug Type		Tube Length
	1C = Single Core 2C = Two Core 3C = Three Core 4C = Four Core		Conductor Size (mm ²)		Lug		Single Core 20 cm Four Core 50 cm Special Tube Length
			0006		Type	Symbol	
			0010		Aluminum	1	
			0016		Copper	2	
			0025				
			0035				
			0050				
			0070				
			0095				
			0120				
			0150				
			0185				
			0240				
			0300				
			0400				
			0500				
			0630				

Application Notes:

1- An aluminum compression lug is used for aluminum conductor .

2- A copper compression lug is used for copper conductor.

3- Special lugs are available on request.

Application Notes:

1- An aluminum compression lug is used for aluminum conductor .

2- A copper compression lug is used for copper conductor.

3- Special lugs are available on request.

A photograph of an industrial manufacturing environment. In the foreground, a large black plastic bin is filled with numerous small, copper-colored metal components, likely cable connectors or terminals. A worker wearing a red hard hat and a light-colored shirt is visible on the right side of the frame, working with the machinery. The background shows various industrial machines, including a large vertical press or extruder, and a worker in a blue shirt and gloves is operating one of the machines. The scene is brightly lit with overhead industrial lights. A large, semi-transparent blue circle with a white outline is centered over the image, containing the text "Metal Accessories".

Metal Accessories



Friction Lugs



Copper braid



Tubular Copper
Connectors

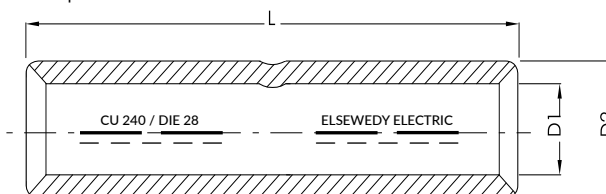
Metal Accessories

Tubular Copper Connectors for MV Joints

Tube	: Seamless, one piece tube.
Material	: Electrolytic tough pitch copper.
Purity	: High purity (Chemical composition min. copper ratio 99.9 %).
Finish	: Tin plated to assure maximum conductivity.
Identification	: Conductor size , connector die size, number of crimping and crimping positions are marked on every piece.
Manufacturing Standard	: DIN 46267 part 1.
Tube Manufacturing	: In compliance with DIN EN 13600.
Conductivity	: High conductivity > 96.6 % IACS***.



Positive cable stops ensure proper insertion of conductors to full depth
 (**) connectors are for cable joints only.



Code	Conductor Size mm ²	Connector Die D3(*)	D1	D2	L(**)
MV STCC 25/100	25	10	7.0	10	100
MV STCC 35/100	35	12	8.2	12.5	100
MV STCC 50/100	50	14	10	14.5	100
MV STCC 70/100	70	16	11.5	16.5	100
MV STCC 95/100	95	18	13.5	19	100
MV STCC 120/100	120	20	15.5	21	100
MV STCC 150/100	150	22	17	23.5	100
MV STCC 185/100	185	25	19	25.5	100
MV STCC 240/100	240	28	21.5	29	100
MV STCC 300/100	300	32	24.5	32	100
MV STCC 400/100	400	38	27.5	38.5	100
MV STCC 400/120	400	38	27.5	38.5	120
MV STCC 500/100	500	42	31	42	100
MV STCC 500/120	500	42	31	42	120
MV STCC 630/100	630	44	34.5	44	100
MV STCC 630/120	630	44	34.5	44	120
MV STCC 800/120	800	52	38	52	120
MV STCC 1000/120	1000	58	44	58	120

(*) D3= Recommended die size for hexagonal crimping 

(**) L= 100 mm for MV premolded cables joints type PCJ size (F,G ...M)

L= 120 mm for (MV premolded cables joints type PCJ size (N,.....,S)

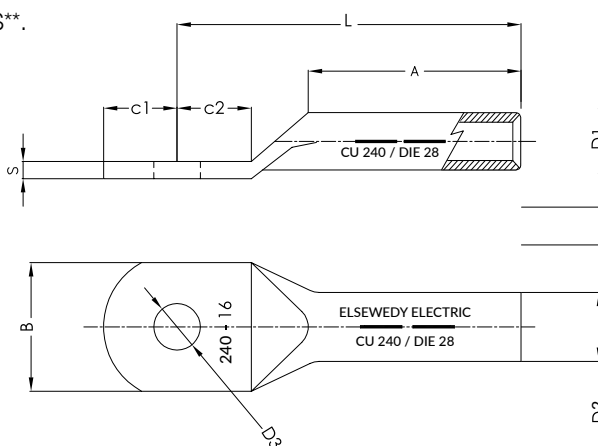
(***) IACS: International annealed copper standard.

- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the connector should not be less than 50% of the connector length (L).
- All dimensions in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.

Metal Accessories

Tubular Copper Lugs For LV & MV Terminations

Tube	: Seamless, one piece tube.
Material	: Electrolytic tough pitch copper.
Purity	: High purity (Chemical composition min. copper ratio 99.9 %).
Finish	: Tin plated to assure maximum conductivity.
Identification	: Conductor size ,stud size, connector die size, number of crimping and crimping positions are marked on every piece.
Manufacturing standard	: DIN 46235.
Tube manufacturing	: In compliance with DIN EN 13600.
Conductivity	: High conductivity > 96.6 % IACS**.



Code	Conductor Size mm ²	Stud Size	Conn. Die D(*)	A	B	C1	C2	D1	D2	D3	L	S
STCL 6/6	6	M 6	5	10	8.5	7.5	8	3.8	5.5	6.4	24	1.5
STCL 10/6	10	M 6	6	10	9	7.5	8	4.5	6	6.4	27	1.5
STCL 16/8	16	M 8	8	20	13	10	10	5.5	8.5	8.4	36	2.5
STCL 25/8	25	M 8	10	20	16	10	10	7	10	8.4	38	3
STCL 35/10	35	M 10	12	20	19	12	12	8.2	12.5	10.5	42	3.5
STCL 50/10	50	M 10	14	28	22	12	12	10	14.5	10.5	52	4
STCL 70/12	70	M 12	16	28	24	12	12	11.5	16.5	13	55	4.5
STCL 95/12	95	M 12	18	35	28	13	13	13.5	19	13	65	5
STCL 120/12	120	M 12	20	35	32	16	13	15.5	21	13	70	5.5
STCL 150/12	150	M 12	22	35	34	16	17	17	23.5	13	78	6
STCL 185/16	185	M 16	25	40	37	19	20	19	25.5	17	82	6
STCL 240/16	240	M 16	28	40	42	19	20	21.5	29	17	92	7
STCL 300/16	300	M 16	32	50	46	19	22	24.5	32	17	100	7
STCL 400/20	400	M 20	38	70	54	25	22	27.5	38.5	21	115	10
STCL 500/20	500	M 20	42	70	60	25	22	31	42	21	125	10
STCL 630/20	630	M 20	44	80	63	25	20	34.5	44	21	135	10
STCL 800/20	800	M 20	52	100	75	25	20	38	52	21	165	12
STCL 1000/20	1000	M20	58	100	85	25	20	44	58	21	165	14

(*) D= Recommended crimping die size for hexagonal type with hydraulic crimping tool
The crimping area of the lug should not be less than 70% of the lug barrel length (A)

(**) IACS: International annealed copper standard.

- All dimensions in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.
- Hole size can be changed according to DIN 46235

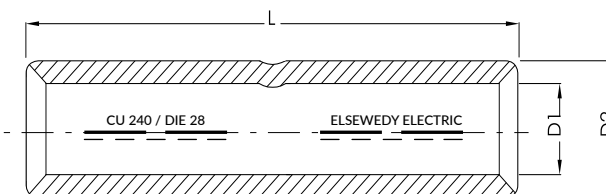
Metal Accessories

Tubular Copper Connectors for LV Joints

Tube	: Seamless, one piece tube.
Material	: Electrolytic tough pitch copper.
Purity	: High purity (Chemical composition min copper ratio 99.9 %).
Finish	: Tin plated to assure maximum conductivity.
Identification	: Conductor size , connector die size, number of crimping and crimping positions are marked on every piece.
Manufacturing Standard	: DIN 46267 part 1.
Tube Manufacturing	: In compliance with DIN EN 13600.
Conductivity	: High conductivity > 96.6 % IACS***.



Positive cable stops ensure proper insertion of conductors to full depth.



Code	Conductor Size mm ²	Connector Die (*)D3	D1	D2	(**)L
STCC 6/30	6	5	3.8	5.5	30
STCC 10/30	10	6	4.5	6	30
STCC 16/50	16	8	5.5	8.5	50
STCC 25/50	25	10	7	10	50
STCC 35/50	35	12	8.2	12.5	50
STCC 50/56	50	14	10	14.5	56
STCC 70/56	70	16	11.5	16.5	56
STCC 95/70	95	18	13.5	19	70
STCC 120/70	120	20	15.5	21	70
STCC 150/80	150	22	17	23.5	80
STCC 185/85	185	25	19	25.5	85
STCC 240/90	240	28	21.5	29	90
STCC 300/100	300	32	24.5	32	100
STCC 400/150	400	38	27.5	38.5	150
STCC 500/160	500	42	31	42	160
STCC 630/160	630	44	34.5	44	160
STCC 800/200	800	52	38	52	200
STCC 1000/200	1000	58	44	58	200

(*) D3= Recommended die size for hexagonal crimping 

L (**) = Indicted Length for low Voltage Only

(***) IACS: International annealed copper standard.

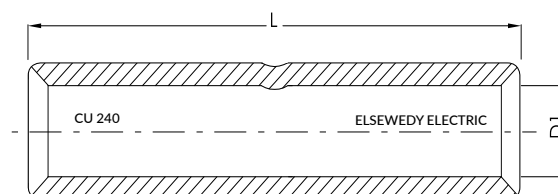
- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the connector should not be less than 50% of the connector length (L).
- All dimensions in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.

Metal Accessories

Standard Copper Connectors

Tube	: Seamless, one piece tube.
Material	: Electrolytic tough pitch copper.
Purity	: High purity (Chemical composition min. copper ratio 99.9 %).
Finish	: Tin plated to assure maximum conductivity.
Identification	: Conductor size is marked on every piece.
Conductivity	: High conductivity > 96.6 % IACS*.

Positive cable stops ensure proper insertion of conductors to full depth.



Code	Conductor Size mm ²	D1	L
SSCC 6/25	6	3.8	25
SSCC 10/30	10	4.5	30
SSCC 16/35	16	5.5	35
SSCC 25/40	25	6.8	40
SSCC 35/45	35	8.2	45
SSCC 50/50	50	9.5	50
SSCC 70/55	70	11.2	55
SSCC 95/60	95	13.4	60
SSCC 120/65	120	15.0	65
SSCC 150/70	150	16.5	70
SSCC 185/80	185	19.0	80
SSCC 240/90	240	21.0	90
SSCC 300/100	300	23.5	100
SSCC 400/110	400	27.0	110
SSCC 500/140	500	31.0	140
SSCC 630/160	630	34.0	160

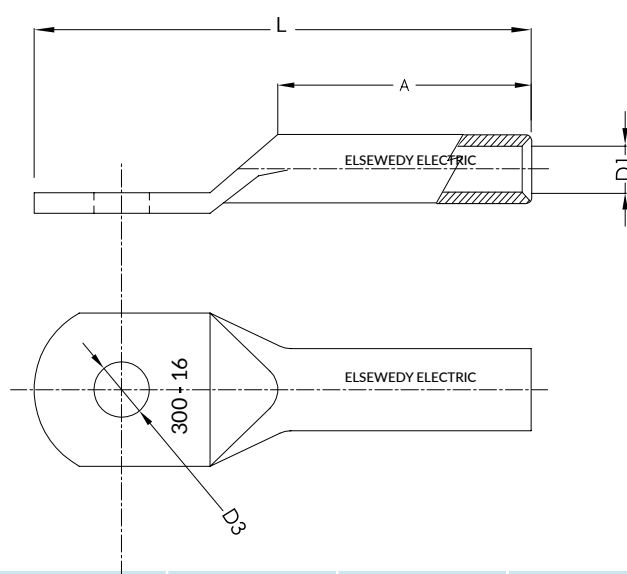
(*) IACS: International annealed copper standard.

- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.
- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the connector should not be less than 50% of the connector length (L).

Metal Accessories

Standard Copper Lugs

Tube	: Seamless, one piece tube.
Material	: Electrolytic tough pitch copper.
Purity	: High purity (Chemical composition min. copper ratio 99.9 %).
Finish	: Tin plated to assure maximum conductivity.
Identification	: Conductor size and stud size are marked on every piece.
Conductivity	: High conductivity > 96.6 % IACS*.



Code	Conductor Size mm ²	Stud Size	A	D1	D3	L
SSCL 6/6	6	M 6	10	3.8	6.5	31.5
SSCL 10/6	10	M 6	10	4.5	6.5	34.5
SSCL 16/8	16	M 8	11	5.5	8.5	35
SSCL 25/8	25	M 8	12	6.8	8.5	38
SSCL 35/8	35	M 8	15	8.2	8.5	45
SSCL 50/10	50	M 10	18	9.5	10.5	50
SSCL 70/10	70	M 10	20	11.2	10.5	53
SSCL 95/12	95	M 12	22	13.4	13.0	60
SSCL 120/12	120	M 12	26	15.0	13.0	65
SSCL 150/12	150	M 12	30	16.5	13.0	72
SSCL 185/16	185	M 16	30	19.0	17.0	83
SSCL 240/16	240	M 16	35	21.0	17.0	94
SSCL 300/16	300	M 16	44	23.5	17.0	111
SSCL 400/20	400	M 20	44	27.0	21.0	114
SSCL 500/20	500	M 20	68	31.0	21.0	144
SSCL 630/20	630	M 20	68	34.0	21.0	144

(*) IACS: International annealed copper standard.

- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.
- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the lug should not be less than 70% of the Lug barrel length (A).

Metal Accessories

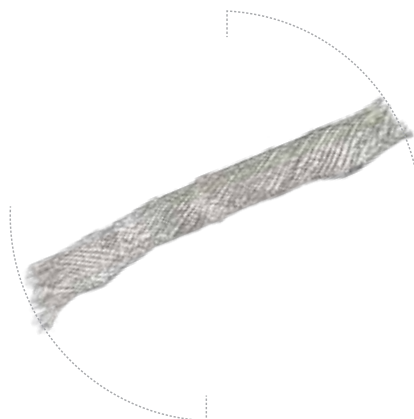
Copper Braid

Material

- Tinned Copper wire 0.3 mm

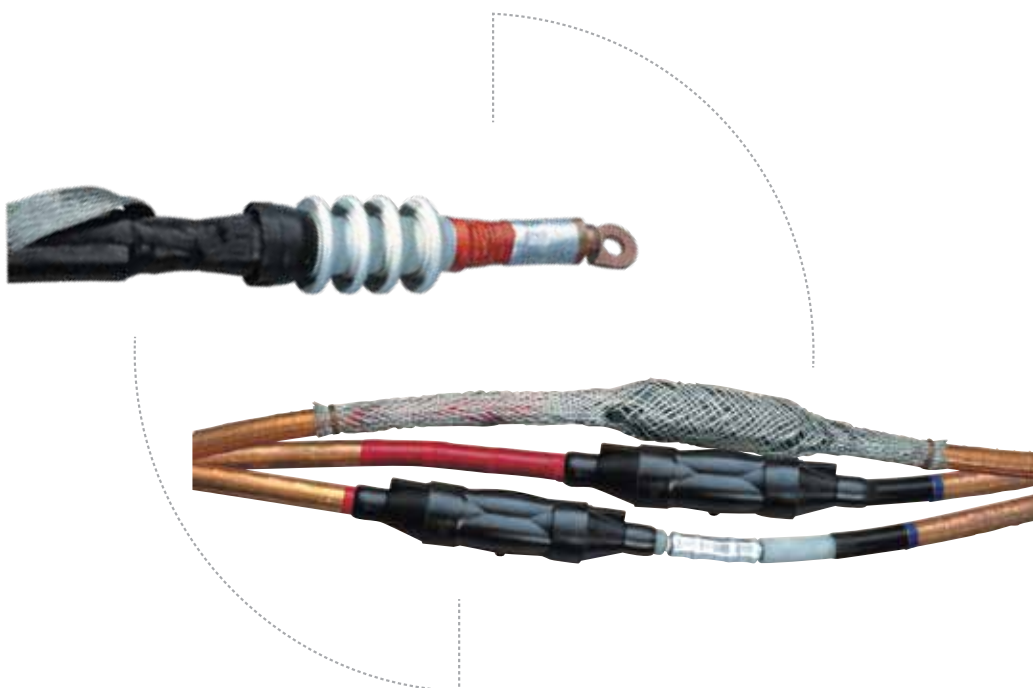
Application

- Screen restoration for copper screen cables.
- Connect the cable metallic screen to earth in case of termination.



Properties

Type	No. of Bundle	No. of Wires/ Bundle	Width (mm)
Copper braid -16mm ²	48	5 : 6	16
Copper braid -25 mm ²	48	7 : 8	25
Copper braid -35 mm ²	48	10:11	25
Copper braid -50 mm ²	48	15	25



Metal Accessories

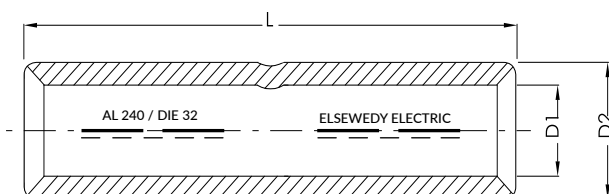
Tubular Aluminum Connectors for MV Joints

Tube	: Seamless, one piece tube.
Material	: Pure aluminum.
Conductivity	: High conductivity > 58 % IACS.
IACS	: international annealed copper standard.
Purity	: High purity 99.5%.
Finish	: Chemically treatment.
Identification	: Conductor size , connector die size, number of crimping and crimping position are marked on every piece.


Tube manufacturing : According to DIN EN 755-7.

Positive cable stops ensure proper insertion of conductors to full depth.

(**) connectors are for cable joints only.



Code	Conductor Size mm ²	Connector Die D3 (*)	D1	D2	L(**)
STAC 25/100	25	12	6.8	12	100
STAC 35/100	35	14	8	14	100
STAC 50/100	50	16	10	16	100
STAC 70/100	70	18	10.8	18	100
STAC 95/100	95	22	13.2	22	100
STAC 120/100	120	22	14.7	22	100
STAC 150/100	150	25	15.5	25	100
STAC 185/100	185	28	18.5	28	100
STAC 240/100	240	32	20	32	100
STAC 300/100	300	34	22.2	34	100
STAC 400/100	400	38	25	38	100
STAC 400/120	400	38	25	38	120
STAC 500/100	500	44	29	44	100
STAC 500/120	500	44	29	44	120
STAC 630/120	630	44	32	44	120

(*) D3= Recommended die size for hexagonal crimping 

(**) L= 100 mm for (MV cables joints premolded type PCJ size (F,G ...M))

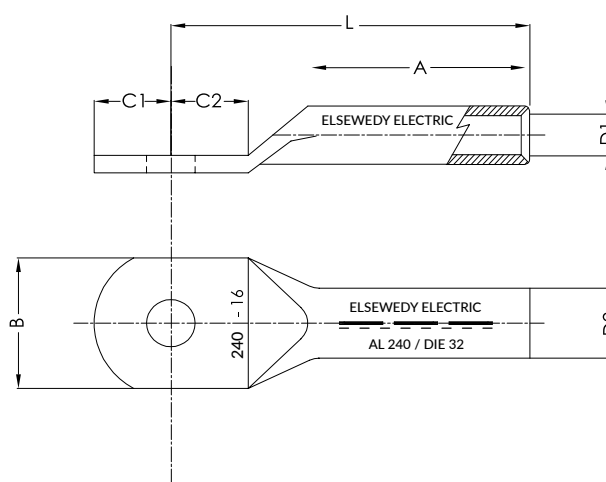
L= 120 mm for (MV cables joints premolded type PCJ size (N,.....,S))

- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the connector should not be less than 50% of the connector length (L).
- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.

Metal Accessories

Tubular Aluminum Lugs for MV Terminations

Tube	: Seamless, one piece tube.
Material	: Pure aluminum.
Purity	: High purity 99.5%.
Finish	: Chemical treatment.
Conductivity	: High conductivity > 58% IACS.
Identification	: Conductor size ,stud size, connector die size, number of crimping and crimping positions are marked on every piece.
Tube manufacturing	: According to DIN EN 755-7.
Conductivity	: High conductivity > 58% IACS**.



Code	Conductor Size mm ²	Stud Size	Conn. Die D(*)	A	B	C1	C2	D1	D2	L
STAL 16/8	16	M8	12	32	18	9.5	12	6.5	12	52
STAL 25/8	25	M8	12	38	18	9.5	12	6.8	12	60
STAL 35/10	35	M10	14	42	21	12	14	8	14	67
STAL 50/10	50	M10	16	42	25	14	14.5	9.8	16	72
STAL 70/12	70	M12	18	52	28	15	17.5	10.8	18	86
STAL 95/12	95	M12	22	52	32	16	18	13.2	22	90
STAL 120/12	120	M12	22	52	32	16	18	14.7	22	91
STAL 150/12	150	M12	25	60	35	17.5	21.5	15.5	25	103
STAL 185/16	185	M16	28	60	40	21.5	25	18.3	28	106
STAL 240/16	240	M16	32	65	45	24	26	20	32	116
STAL 300/16	300	M16	34	75	49	24	26	22.2	34	124
STAL 400/20	400	M20	38	100	58	30.5	32	25	38	165
STAL 500/20	500	M20	44	120	62	31	32	29	44	185
STAL 630/20	630	M20	44	120	62	31	32	32	44	185

*D= Recommended crimping die size for hexagonal type with hydraulic crimping tool
The crimping area of the lug should not be less than 70% of the lug barrel length (A)

(**) IACS: International annealed copper standard.

- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.

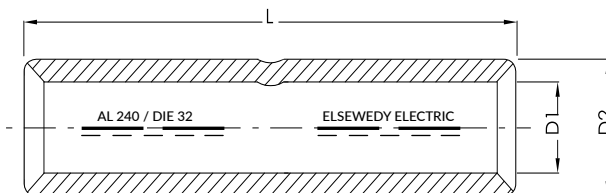
Metal Accessories

Tubular Aluminum Connectors for LV Joints

Tube	: Seamless, one piece tube.
Material	: Pure aluminum.
Purity	: High purity 99.5%.
Finish	: Chemical treatment.
Identification	: Conductor size , connector die size, number of crimping and crimping positions are marked on every piece.
Tube manufacturing	: According to DIN EN 755-7.
Conductivity	: High conductivity > 58 % IACS***.



Positive cable stops ensure proper insertion of conductors to full depth.



Code	Conductor Size mm ²	Connector Die D3(*)	D1	D2	L(**)
STAC 10/55	10	10	5	10	55
STAC 16/55	16	12	6.5	12	55
STAC 25/70	25	12	6.8	12	70
STAC 35/85	35	14	8	14	85
STAC 50/85	50	16	9.8	16	85
STAC 70/105	70	18	11.2	18	105
STAC 95/105	95	22	13.2	22	105
STAC 120/105	120	22	14.7	22	105
STAC 150/125	150	25	16.3	25	125
STAC 185/125	185	28	18.3	28	125
STAC 240/145	240	32	21	32	145
STAC 300/145	300	34	23.3	34	145
STAC 400/210	400	38	26	38	210
STAC 500/210	500	44	29	44	210

(*) D3= Recommended die size for hexagonal crimping 

L (**)= Indicted Length for low Voltage Only.

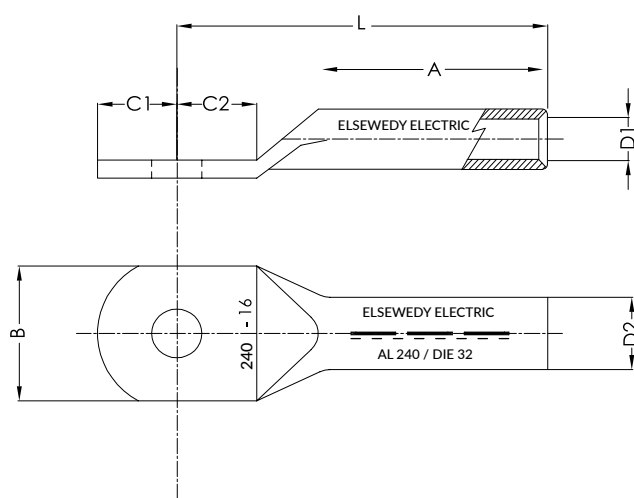
(***) IACS: International annealed copper standard.

- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the lug should not be less than 50% of the connector length (L).
- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.

Metal Accessories

Tubular Aluminum Lugs for LV Termination

Tube	: Seamless, one piece tube.
Material	: Pure aluminum.
Purity	: High purity 99.5%.
Finish	: Chemical treatment.
Identification	: Conductor size ,stud size, connector die size, number of crimping and crimping positions are marked on every piece.
Tube manufacturing	: According to DIN EN 755-7.
Conductivity	: High conductivity > 58% IACS**.



Code	Conductor Size mm ²	Stud Size	Conn. Die D(*)	A	B	C1	C2	D1	D2	L
STAL 16/8	16	M8	12	32	18	9.5	12	6.5	12	52
STAL 25/8	25	M8	12	38	18	9.5	12	6.8	12	60
STAL 35/10	35	M10	14	42	21	12	14	8	14	67
STAL 50/10	50	M10	16	42	25	14	14.5	9.8	16	72
STAL 70/12	70	M12	18	52	28	15	17.5	11.2	18	86
STAL 95/12	95	M12	22	52	32	16	18	13.2	22	90
STAL 120/12	120	M12	22	52	32	16	18	14.7	22	91
STAL 150/12	150	M12	25	60	35	17.5	21.5	16.3	25	103
STAL 185/16	185	M16	28	60	40	21.5	25	18.3	28	106
STAL 240/16	240	M16	32	65	45	24	26	21	32	116
STAL 300/16	300	M16	34	75	49	24	26	23.3	34	124
STAL 400/20	400	M20	38	100	58	30.5	32	26	38	165
STAL 500/20	500	M20	44	120	62	31	32	29	44	185
STAL 630/20	630	M20	44	120	62	31	32	32	44	185

*D= Recommended crimping die size for hexagonal type with hydraulic crimping tool
 The crimping area of the lug should not be less than 70% of the lug barrel length (A)
 (***) IACS: International annealed copper standard.

- All dimensions in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.

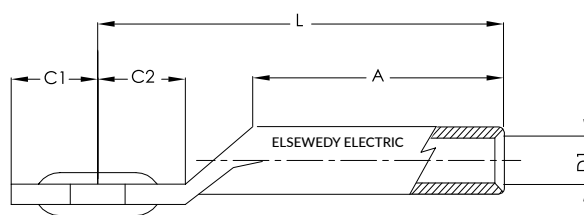
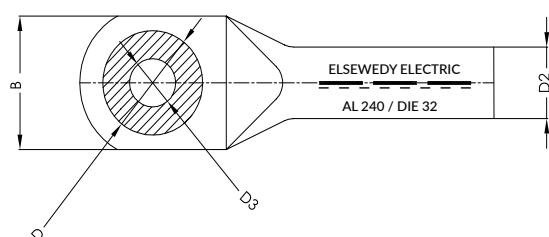
Metal Accessories

Bi-Metallic Insert Lugs for MV Terminations


Tube	: Seamless, one piece tube.
Material	: Pure aluminum 99.5 %.
Finish	: Chemical treatment.
Ring Material	: High purity 99.9 % E.T.P copper.
Ring Finish	: Plain copper.
Identification	: Conductor size ,stud size, connector die size, number of crimping and crimping positions are marked on every piece.
Tube Manufacturing	: According to DIN EN 755-7.
Manufacturing	: Copper ring is inserted in the Al palm and excellent connection is assured.



Bi-metallic insert (ring) lugs assure a maximum reliability connection of aluminum cables to copper busbars, copper bushings, ..etc.



Code	Conductor Size mm ²	Stud Size	Conn. Die D(*)	A	B	C1	C2	D1	D2	D3	D	L
SBIL 35/10	35	M10	14	42	25	14	16	8	14	10.5	19.5	67.5
SBIL 50/10	50	M10	16	42	26	14	16	9.8	16	10.5	19.5	72
SBIL 70/12	70	M12	18	52	31.5	17	17.5	10.8	18	13	24.5	86
SBIL 95/12	95	M12	22	52	33.5	17.5	17	13.2	22	13	26	90
SBIL 120/12	120	M12	22	52	35	17.5	17	14.7	22	13	26	90
SBIL 150/12	150	M12	25	60	37	18.8	21.5	15.5	25	13	26	103
SBIL 185/12	185	M12	28	60	42.5	22.3	25	18.3	28	13	28	107
SBIL 240/16	240	M16	32	65	48	25	26	20	32	17	33	116
SBIL 300/16	300	M16	34	75	50.5	25	26	22.2	34	17	34	124
SBIL 400/16	400	M16	38	100	56	31.3	32	25	38	17	35	165
SBIL 500/16	500	M16	44	120	63	30.5	32	29	44	17	35	185
SBIL 630/16	630	M16	44	120	63	30.5	32	32	44	17	35	185

(*) D= recommended die size for hexagonal crimping 

- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.
- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the lug should not be less than 70% of the lug barrel length (A).

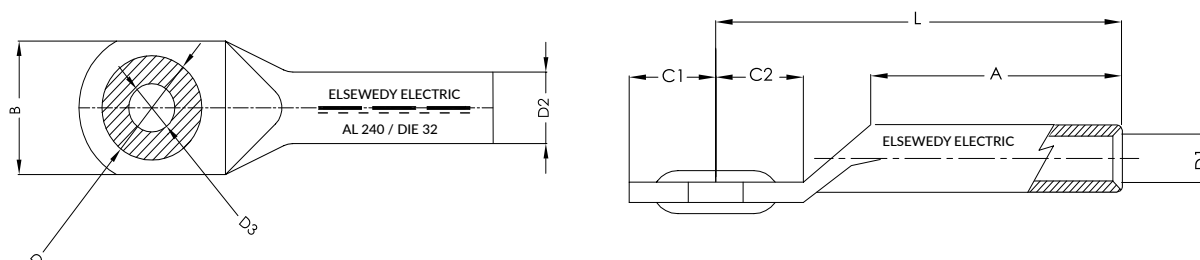
Metal Accessories

Bi-Metallic Insert Lugs for LV Termination


Tube	: Seamless, one piece tube.
Material	: Pure aluminum 99.5%.
Finish	: Chemical treatment.
Ring Material	: High purity 99.9% E.T.P copper.
Ring Finish	: Plain copper.
Identification	: Conductor size ,stud size, connector die size, number of crimping and crimping positions are marked on every piece.
Tube Manufacturing	: According to DIN EN 755-7.
Manufacturing	: Copper ring is inserted in the Al palm and excellent connection is assured.



Bi-metallic insert (ring) lugs assure a maximum reliability connection of aluminum cables to copper busbars, copper bushings, ..etc.



Code	Conductor Size mm ²	Stud Size	Conn. Die D(*)	A	B	C1	C2	D1	D2	D3	D	L
SBIL 35/10	35	M10	14	42	25	14	16	8	14	10.5	19.5	67.5
SBIL 50/10	50	M10	16	42	26	14	16	9.8	16	10.5	19.5	72
SBIL 70/12	70	M12	18	52	31.5	17	17.5	11.2	18	13	24.5	86
SBIL 95/12	95	M12	22	52	33.5	17.5	17	13.2	22	13	26	90
SBIL 120/12	120	M12	22	52	35	17.5	17	14.7	22	13	26	90
SBIL 150/12	150	M12	25	60	37	18.8	21.5	16.3	25	13	26	103
SBIL 185/12	185	M12	28	60	42.5	22.3	25	18.3	28	13	28	107
SBIL 240/16	240	M16	32	65	48	25	26	21	32	17	33	116
SBIL 300/16	300	M16	34	75	50.5	25	26	23.3	34	17	34	124
SBIL 400/16	400	M16	38	100	56	31.3	32	26	38	17	35	165
SBIL 500/16	500	M16	44	120	63	30.5	32	29	44	17	35	185
SBIL 630/16	630	M16	44	120	63	30.5	32	32	44	17	35	185

(*) D= recommended die size for hexagonal crimping 

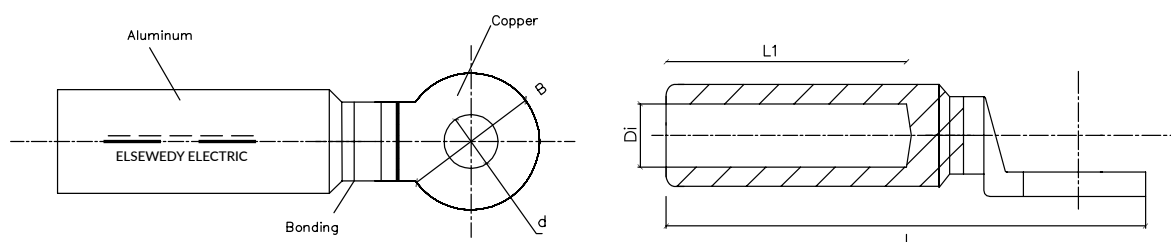
- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.
- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the lug should not be less than 70% of the lug barrel length (A).

Metal Accessories

Bi-Metallic Friction Lugs for MV Termination

Palm Material	: Pure electrolytic copper.
Palm Finish	: Plain copper.
Barrel Material	: Pure aluminum.
Barrel Finish	: Chemical treatment.
Identification	: Conductor size ,stud size, connector die size, number of crimping and crimping positions are marked on every piece.
Manufacturing	: Copper palm is welded to Al barrel by cutting edge friction welding technology.

Bi-metallic friction lugs assure a maximum reliability connection of aluminum cables to copper busbars, copper bushings,..etc



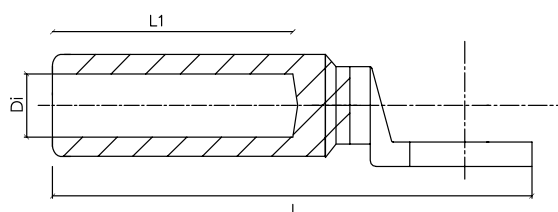
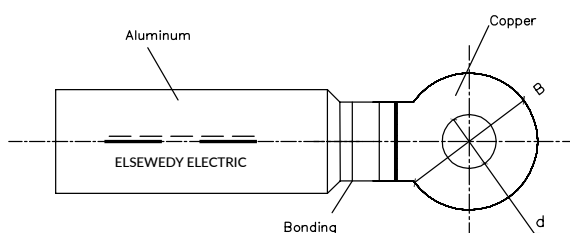
Code	Conductor Size mm ²	d	Di	B	L1	L
SBFL 16/10	16	10.5	6.5	25	43	72.5
SBFL 25/10	25	10.5	6.8	25	43	72.5
SBFL 35/10	35	10.5	8	25	43	72.5
SBFL 50/12	50	13	10	25	43	72.5
SBFL 70/12	70	13	10.8	25	43	72.5
SBFL 95/12	95	13	13.2	25	43	72.5
SBFL 120/12	120	13	14.7	30	59	97
SBFL 150/12	150	13	15.5	30	59	97
SBFL 185/12	185	13	18.5	35	59	100
SBFL 240/16	240	17	20	35	59	100
SBFL 300/16	300	17	22.2	36	73	128

- All dimensions are in mm.
- Tolerance in lengths ± 5 mm and in diameters ± 3 .
- For any other dimensions, please contact us.
- Due to continuous product improvements, some specifications can change without prior notice.
- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the lug should not be less than 70% of the lug barrel length (L1).

Metal Accessories

Bi-Metallic Friction Lugs for LV Termination

- Palm Material** : Pure electrolytic copper.
- Palm Finish** : Plain copper.
- Barrel Material** : Pure aluminum.
- Barrel Finish** : Chemical treatment.
- Identification** : Conductor size ,stud size, connector die size, number of crimping and crimping positions are marked on every piece.
- Manufacturing** : Copper palm is welded to Al barrel by cutting edge friction welding technology.



Code	Conductor Size mm ²	d	Di	B	L1	L
SBFL 16/10	16	10.5	6.5	25	43	72.5
SBFL 25/10	25	10.5	6.8	25	43	72.5
SBFL 35/10	35	10.5	8	25	43	72.5
SBFL 50/12	50	13	10	25	43	72.5
SBFL 70/12	70	13	11.2	25	43	72.5
SBFL 95/12	95	13	13.2	25	43	72.5
SBFL 120/12	120	13	14.7	30	59	97
SBFL 150/12	150	13	16.3	30	59	97
SBFL 185/12	185	13	18.5	35	59	100
SBFL 240/16	240	17	21	35	59	100
SBFL 300/16	300	17	23.3	36	73	128

- All dimensions are in mm.
- Tolerance in lengths ± 5 mm and in diameters ± 3 .
- For any other dimensions, please contact us.
- Due to continuous product improvements, some specifications can change without prior notice.
- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the lug should not be less than 70% of the lug barrel length (L1).



Tools

Grinding Machine



Insulation Remover



Stripping Set



Tools

Grinding Machine

Application

The grinding machine is used to grind cable insulation surface and make it smooth free of any edges.

Features

- Various working speed .
- Can be used with all sandpaper grades .
- Efficient and time saver.



Peeling Tool

Application

The peeling tool is applied to remove the outer semi-conductive layer of the cable

Features

- Available with wide range suitable for MV and HV cables.
- Can be adjusted to fit different cables C.S.A
- Light weight which make it easier to be controlled.



Heating Mat

Application

Heating mat is used to raise the temperature of the cable before removing its layers in order to easier the way of straightened the cable.

Features

- Can be used over any cable regardless its C.S.A.
- Adjustable temperature.
- Offered with temperature controller to avoid overheating.



Tools

Semi-conductive Remover

Application

Semi-conductive remover is used to remove semi-conductive layer in certain parts, as well to create the slope of the semi-conductive and the stress cone area .

Features

- Can be used over any cable regardless its C.S.A



Insulation Remover

Application

Insulation remover is used to remove the insulation of the cable and expose the conductor.

Features

- Adjustable blade.
- Light weight.



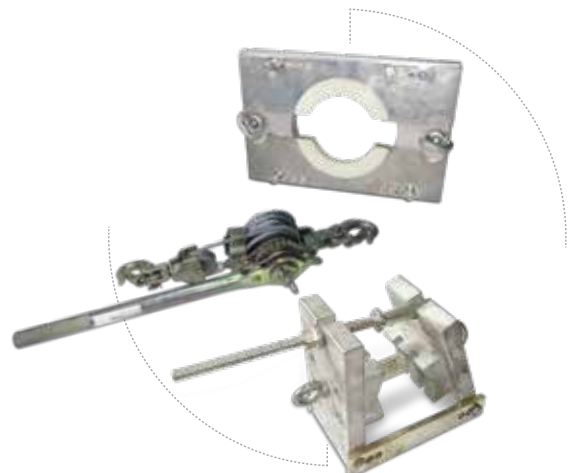
Storing Set

Application

It consists of 3 parts , combined together to form a complete set to be used for joints and terminations storing and centering over the cables .

Features

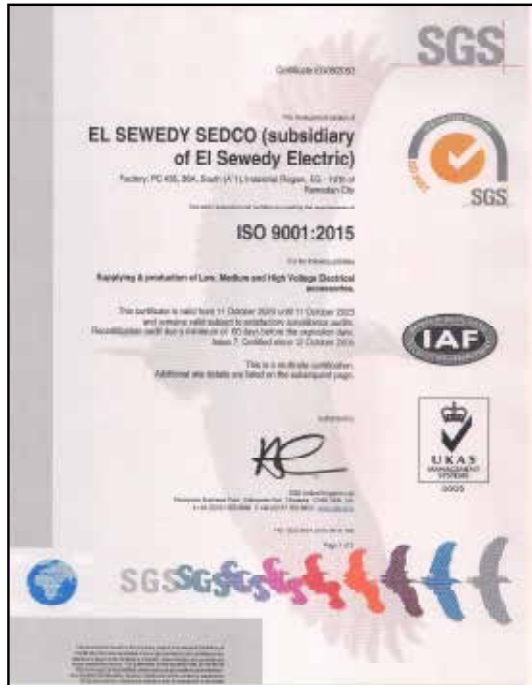
- Can be used over any cable regardless it C.S.A.
- Reduce required time and power.
- Safe and controlled





Certifications

Certifications



Product Type Testing Certificates and Reports

Type Test Report

Report No.: 2508/21/0002 **Class No.:** 2 **Number of pages:** 24

Requester: Three-core outdoor powercable termination for 10kV cables
polyester power cable with rated voltage 8.5/15 (15/10 kV)

Designation: PC 400A

Test sample: 10KV

Manufacturer: Easternmost Egypt - Subsidiary of Easternmost Electric
PC 400A, South (SIT), Industrial Region
10th of Ramadan City

Client: Egyptian Company for Advanced Insulation Systems (EASIS)
Easternmost Egypt - Subsidiary of Easternmost Electric
Plot 25, 1st District, 1st Settlement
New Cairo 11835

Details of tests: 04 Months to 18 May 2018

Tested by: IPE Institut „Ingelheim für elektrische Hochspannungstechnik“ GmbH
Ludwigstraße 104a 53644
12589 Ingelheim
GERMANY

Tested performance: Test sequences of table 5, sequences 1.1, 1.2 and 1.4

The type test has been finished successfully.
All type test requirements were met based on IEC 60502-4 and IEC specifications 12-0204/01 Rev. 04-2010.

The apparatus, specified in accordance with the description, drawings and photographs incorporated in this document has been subjected to the series of proving tests in accordance with IEC 60502-4:2010-12, table 5 and IEC specification 12-0204/01 Rev. 04-2010-01.

On 04 July 2018

[Signature]
Test Engineer in charge

[Signature]
Test Engineer in charge

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TEST REPORT

Report No.: 2508/21/00430/0003

Electrical type: 10KV/10KV Substation of Easternmost Electric

Plot 25, 1st District, 1st Settlement, New Cairo 11835, Egypt

Client: Easternmost Egypt - Subsidiary of Easternmost Electric
PC 400A, South (SIT), Industrial Region
10th of Ramadan City

Test sample: 10KV/10KV

Tested by: IPE Institut „Ingelheim für elektrische Hochspannungstechnik“ GmbH
Ludwigstraße 104a 53644
12589 Ingelheim
GERMANY

Tested performance: Test sequences of table 5, sequences 1.1, 1.2 and 1.4

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On 04 July 2018

[Signature]
Test Engineer in charge

[Signature]
Test Engineer in charge

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TEST REPORT

Report No.: 2508/21/00437/0004

Electrical type: 10KV/10KV Substation of Easternmost Electric

Plot 25, 1st District, 1st Settlement, New Cairo 11835, Egypt

Client: Easternmost Egypt - Subsidiary of Easternmost Electric
PC 400A, South (SIT), Industrial Region
10th of Ramadan City

Test sample: 10KV/10KV

Tested by: IPE Institut „Ingelheim für elektrische Hochspannungstechnik“ GmbH
Ludwigstraße 104a 53644
12589 Ingelheim
GERMANY

Tested performance: Test sequences of table 5, sequences 1.1, 1.2 and 1.4

The type test has been finished successfully.
All type test requirements were met based on IEC 60502-4 and IEC specifications 12-0204/01 Rev. 04-2010.

The apparatus, specified in accordance with the description, drawings and photographs incorporated in this document has been subjected to the series of proving tests in accordance with IEC 60502-4:2010-12, table 5 and IEC specification 12-0204/01 Rev. 04-2010-01.

On 04 July 2018

[Signature]
Test Engineer in charge

[Signature]
Test Engineer in charge

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TEST REPORT

Report No.: 2508/21/00438/0005

Electrical type: 10KV/10KV Substation of Easternmost Electric

Plot 25, 1st District, 1st Settlement, New Cairo 11835, Egypt

Client: Easternmost Egypt - Subsidiary of Easternmost Electric
PC 400A, South (SIT), Industrial Region
10th of Ramadan City

Test sample: 10KV/10KV

Tested by: IPE Institut „Ingelheim für elektrische Hochspannungstechnik“ GmbH
Ludwigstraße 104a 53644
12589 Ingelheim
GERMANY

Tested performance: Test sequences of table 5, sequences 1.1, 1.2 and 1.4

The type test has been finished successfully.
All type test requirements were met based on IEC 60502-4 and IEC specifications 12-0204/01 Rev. 04-2010.

The apparatus, specified in accordance with the description, drawings and photographs incorporated in this document has been subjected to the series of proving tests in accordance with IEC 60502-4:2010-12, table 5 and IEC specification 12-0204/01 Rev. 04-2010-01.

On 04 July 2018

[Signature]
Test Engineer in charge

[Signature]
Test Engineer in charge

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Product Type Testing Certificates and Reports

KEMA 08-1002

TYPE TEST CERTIFICATE OF COMPLETE TYPE TEST

OBJECT Three-core cable joint

TYPE 3C-30-FC-4

Rated voltage (U _N) Conductor cross-section	TESTING kV 3x10 mm ²

MANUFACTURER ELSEWEDY CABLES - Elasmol
Cairo, Egypt

CLIENT ELSEWEDY CABLES - Elasmol
Cairo, Egypt

TESTED BY KEMA HIGH-VOLTAGE LABORATORY
Arnhem, the Netherlands

DATES OF TESTS 25 October 2007 until 5 February 2008

The object, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 60502-4

This Type Test Certificate has been issued by KEMA following exclusively the STL Guides.

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard and to justify the ratings assigned by the manufacturer as listed on page 6.

The Certificate applies only to the object tested. The responsibility for conformity of any object having the same designations with that tested rests with the Manufacturer.

The Certificate consists of 10 pages in total.

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KEMA Nederland B.V.
P.O. Box 800
KEMA T&D Testing Services
Managing Director

KEMA 1194-15

TYPE TEST CERTIFICATE OF PRE-QUALIFICATION

OBJECT Power cable system consisting of a single-core power cable, 2 outdoor terminations, 2 GIS terminations, 4 joints with screen separation and link boxes

Rated voltage (U _N) Conductor cross-section	130/220 (240 kV) 1x2500 mm ²	Conductor material Insulation material	Cu XLPE

MANUFACTURERS *) Cable Elsewedy Cables,
10th of Ramadan City, Egypt
Accessories Elsewedy SEDCO,
10th of Ramadan City, Egypt
and rkt cables GmbH,
Cologne, Germany

CLIENT Elsewedy Cables
10th of Ramadan City, Egypt

TESTED BY KEMA Nederland B.V.,
Arnhem, The Netherlands

DATE OF TESTS 18 March 2014 to 18 June 2015

The object, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 62067 (2011) subclause 13

This Pre-qualification Certificate has been issued by KEMA following exclusively the STL Guides.

The results are shown in this document, the values obtained and the general performance are considered to comply with the above Standard and to justify the ratings assigned by the manufacturer as listed on page 4 to 12.

This Certificate applies only to the object tested. The responsibility for conformity of any object having the same type references as that tested rests with the manufacturer.

This Certificate consists of 62 pages in total,
) as stated by the manufacturer.

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KEMA Nederland B.V.
J.A.M. Verhoeven
Director Testing, Inspection &
Certification The Netherlands
Arnhem, 8 December 2015

Version: 1

KEMA 03-1123

TYPE TEST CERTIFICATE OF COMPLETE TYPE TEST

OBJECT 80 kV pre-insulated straight through joint

DESIGNATION single-core 80 TC-4/NER

Rated voltage (U _N) Rated frequency	0.5/50 Hz 50 Hz

MANUFACTURER ELASTIMOLD PQVPT
PC 4 TC 4 - 1000 (4/1) - Industrial Region - 10th of Ramadan City - Egypt

TESTED FOR EL SEWEDY
Cairo Buildings No. 13 - Baiti Saem St. - Near City - Egypt

DATE OF TESTS 8 May 2003 until 8 June 2003

TESTED BY KEMA HIGH-VOLTAGE LABORATORY
Utrechtseweg 310 - 3812 AR Arnhem - the Netherlands

The object, constructed in accordance with the description, drawings and photographs incorporated in this Certificate, has been subjected to the series of proving tests in accordance with

IEC 60840

The results are shown in the record of Proving Tests and the oscillograms attached hereto. The values obtained and the general performance are considered to comply with the above Standard and to justify the ratings assigned by the manufacturer as listed on page 5.

The Certificate applies only to the object tested. The responsibility for conformity of any object having the same designations with that tested rests with the manufacturer.

The Certificate comprises 16 sheets in total.

© Copyright: Only integral reproduction of this Certificate, or reproductions of this page accompanied by any pages on which are stated the expected ratings of the object tested, are permitted without written permission from KEMA. Electronic copies in e.g. PDF-format or scanned version of this Certificate may be available and have the status "for information only". The sealed and bound version of the Certificate is the only valid version.

KEMA Nederland B.V.
J.A.M. Verhoeven
Arnhem, 9 July 2003

TEST REPORT
Report No. 148 /2010

CLIENT: EL SEWEDY CABLES
1P of Ramses City, Industrial Zone

Report Date: 26 / 1 / 2010

Place:
- LABORATORIES OF EXTRA HIGH VOLTAGE RESEARCH CENTER
- Internal Code: TO - AC - 12 - II - 12 - 41

Standard Specification:
- IEC 60840 (2010) "Power cables with extruded insulation and their accessories for rated voltages above 10 kV (U_m = 36 kV) up to 150 kV (U_m = 170 kV)"

Requirements:
- Type test according to IEC 60840

Description of the Specimen:
- Loop System consist of power cable, cable straight joint, outdoor porcelain sealing end and insulator composite sealing end with the following specifications:

1- Power cable 30/36 kV with the following specifications:

Manufacturer	EL SEWEDY CABLES
Type	30/36 MVCL/POL/LEAD/SEPI - 1x700 mm ²
Insulation	XLPE
Conductor Material	Copper
Conductor cross-section	2500 mm ²
Shielding Screen	LEAD
Shielding Material	HDPE - ST
Shielding Color	Black
Rated Frequency	50 Hz

- A barrier are included which prevents longitudinal water penetration along the conductor (insulating powder), the outer surface of the conductor (water blocking tape), the gap between the outer surface of the insulation screen and the metallic screen and over the metallic screening (blocking tape)

TEST REPORT
Report No. 148 /2010

CLIENT: EL SEWEDY CABLES
1P of Ramses City, Industrial Zone

Report Date: 26 / 1 / 2010

Place:
- LABORATORIES OF EXTRA HIGH VOLTAGE RESEARCH CENTER
- Internal Code: TO - AC - 12 - II - 12 - 41

Standard Specification:
- IEC 60840 (2010) "Power cables with extruded insulation and their accessories for rated voltages above 10 kV (U_m = 36 kV) up to 150 kV (U_m = 170 kV)"

Requirements:
- Type test according to IEC 60840

Description of the Specimen:
- Loop System consist of power cable, cable straight joint, outdoor porcelain sealing end and insulator composite sealing end with the following specifications:

2- Outdoor Termination with the following specifications:

Manufacturer	Egyptian Company for Advanced Industries ELSEWEDY SEDCO - Subsidiary of ELSEWEDY ELECTRIC
Type	SEPTT - ELSEWEDY ELECTRIC
Core size	2970 mm
Filling compound	Silicon oil
Screen control material	EPDM
Gaskets	O-ring
Voltage class	66kV
Cable SCA	2500 mm ²
Insulator material	porcelain

3- Outdoor Termination with the following specifications:

Manufacturer	Egyptian Company for Advanced Industries ELSEWEDY SEDCO - Subsidiary of ELSEWEDY ELECTRIC
Type	SEPTT - ELSEWEDY ELECTRIC
Core size	2970mm
Filling compound	Silicon oil
Screen control material	EPDM
Gaskets	O-ring
Voltage class	66kV
Cable SCA	2500 mm ²
Insulator material	composite insulator

4- Pre-molded straight Cable joint with the following specifications:

Manufacturer	Egyptian Company for Advanced Industries ELSEWEDY SEDCO - Subsidiary of ELSEWEDY ELECTRIC
Type	94 TCD - ELSEWEDY ELECTRIC
Description	Pre-molded joint
Method of ground	Lead/Cover
Type of overall casing	bus duct tube
Connector Type	Compression Connector
Type of insulation	EPDM
Voltage class	66kV
Cable SCA	2500 mm ²

Description of the Equipment:

- High voltage insulator - 400 kV - 3000 kVA - Type (RSG) - Serial No. 28422204
- PD detector - Type (TE17)
- Tan delta measurement device - Type 25432/02 Serial No. 144181
- Standard capacitor - Type N4000 Serial No. 43131
- Impulse voltage generator 2400 kV - (46 kJ) - Type NGV 2400/40 MPZ
- Air oven up to 300 °C - Type BINDER - Serial No. 10-32772
- Testing machine 100 kN - Type LLOYD - Model LK110 PLUS

TEST REPORT
Report No. 154 /2015

CLIENT: ELASTIMOLD EGYPT - ELSEWEDY SEDCO CO. - SUBSIDIARIES OF ELSEWEDY ELECTRIC

Report Date: 30 / 07 / 2015

Place:
- LABORATORIES OF EXTRA HIGH VOLTAGE RESEARCH CENTER
- Internal code: TO - AC - 12 - II - 12 - 41

Requirements:
- Testing according to IEC 60060-4

Standard Specification:
- IEC 60060-4 "Power cables with extruded insulation and their accessories for rated voltages from 1.0 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV)"
Part 4: Test requirements on accessories for cables with rated voltages from 0.1 kV (U_m = 0.14 kV) up to 30 kV (U_m = 36 kV)
- IEC 61442 "Test method for accessories for power cables with rated voltages from 0.1 kV (U_m = 0.14 kV) up to 30 kV (U_m = 36 kV)"

Description of the Specimen:

1- One 33 kV Pre-molded Power Cable Outdoor Termination with the following specifications:

Manufacturer	Elastimold Electric - Egypt
Type	MTG 33 kV
Leakage path	830 mm
Flask cover path	830 mm
Diameter of sheds	100 mm
Number of sheds	7
Termination Lug	Compression Lug

2- One 33 kV Pre-molded Power Cable Indoor Termination with the following specifications:

Manufacturer	Elastimold Electric - Egypt
Type	MTG 33 kV
Leakage path	830 mm
Flask cover path	830 mm
Diameter of sheds	100 mm
Number of sheds	7
Termination Lug	Compression Lug

TEST REPORT
Report No. 234 /2010

CLIENT: Elastimold Egypt - Elsewedy cables CO.

Report Date: 7 / 11 / 2010

Place:
- Laboratories of Extra High Voltage Research Center
- Internal code: TO - AC - 12 - II - 12 - 41

Requirements:
- Testing according to IEC 60060-4 Table (10)

Standard Specification:
- IEC 60060-4 "Power cables with extruded insulation and their accessories for rated voltages from 1.0 kV (U_m = 1.2 kV) up to 30 kV (U_m = 36 kV)"
Part 4: Test requirements on accessories for cables with rated voltages from 0.1 kV (U_m = 0.14 kV) up to 30 kV (U_m = 36 kV)
- IEC 61442 "Test method for accessories for power cables with rated voltages from 0.1 kV (U_m = 0.14 kV) up to 30 kV (U_m = 36 kV)"

Description of the Specimen:

1- One 33 kV Pre-molded Power Cable Outdoor Termination with the following specifications:

Manufacturer	Elastimold Egypt
Type	MTG 33 kV
Size	IL
Module & Stress Cone	PA
Leakage path	620 mm
Diameter of sheds	90 mm
Number of sheds	7
Termination Lug	Copper bags made by EL-SEWEDY SEDCO

2- One 33 kV Pre-molded Power Cable Indoor Termination with the following specifications:

Manufacturer	Elastimold Egypt
Type	MTG 33 kV
Size	IL
Module & Stress Cone	PA
Leakage path	470 mm
Diameter of sheds	90 mm
Number of sheds	8
Termination Lug	Copper bags made by EL-SEWEDY SEDCO

RESEARCH INSTITUTE
King Fahd University of Petroleum & Minerals
 RESEARCH INSTITUTE
 Center for Engineering Research

TEST REPORT

Test report No.: E.CER004-001	Date: March 5, 2017
Report on:	Power Frequency Voltage Withstand test for 33 kV Ethimold separable ethox cable termination.
Client request:	E-mail dated July 15, 2016, and September 28, 2016
Client:	Saudi Electricity Company, Riyadh- Saudi Arabia Attn: Eng. Mohammed A. Al-Nahary Senior Distribution Engineering Expert Technical Improvements & Standards, Distribution Services - SEC HQ Tel. +9661 5807814
REFERENCE Question:	E-mail dated July 17, 2016, and September 28, 2016, and ECT/PM laboratory service contract No. E.CER004-0007, dated December 1, 2016.
Test samples:	<ol style="list-style-type: none"> 1. Ethimold, 3C, MMS-M3-400, interface C: 33 kV per-unit termination, dual block separable connector ethox, manufactured by Ethimold ESDCO (Ethimold Egypt-Subsidiaries of Ethimold Electric, Egypt and capital locally by Al Adhikar Holding Company (AAHC), Jeddah, Saudi Arabia). 2. Oilstone, M3, MMS, 33 kV; Type TPR8-10P as per SEC's specifications 32-APR04-07, manufactured by MSA Company Ltd (Italy). 3. A three cable of 38 kV, AL 33k03 used, as per SEC Specifications (1-EDP08-02)

Test purpose: To conduct power frequency voltage withstand test for the Ethimold, MMS-M3-400, interface C: 33 kV cable separable ethox connector

Tested at: The High Voltage Laboratory, Research Institute King Fahd University of Petroleum & Minerals, Dhahran, Saudi Arabia

Test date: February 9, 2017

Test reference: SEC 02271-1

Conclusion: The tested Separable Ethox Connector, Ethimold part # 3C-MMS-M3-400, passed the test of the applied voltage of 38 kV for each case as per SEC 02271-1.

Eng. Khalid Y. Al-Nahary
 Supervisor, ECT/PM-High Voltage Laboratory

Dr. Clint M. Albrown
 Director, Center for Engineering Research

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HIGH VOLTAGE AND SHORT CIRCUIT LABORATORY, NTOC, RA'WAT - ISLAMIAF

No. **NYSCG** / **NYSCG-24**

Form No. **NYSCG Lab/FF-003**

Date: **10.12.2019**

TEST REPORT

TYPE TESTS PERFORMED ON AN 11 kV TERMINATION KIT

5.	Client	[BSC Associated Commercial Agencies (Pvt.) Ltd., (BSC) Lahore
6.	Specimen identification	• Type : Indoor/Outdoor Pre-Molded Termination Kit 900 mm", 5-Core (1009 IECM) • Make : MBS Elmadinet, Egypt (Radio Elsewedy, Egypt) • Rating : 8.7/10 kV • Serial No. : 1-G-36870-1-JS-000-03-1 • Purchase : Prototype • Purchase orderdate : REA • Supplied by (other than manufacturer) : REA • Requested by (other than manufacturer) : REA • Relevant test standard(s)/spec. : P-104-06, IEEE-48-2009 • Tests performed on : New 21 to Dec 08, 2019 • Test outcome : Given in Table below:

Table: The tests performed and the outcome.

S. No.	Tests performed	Parameters	Results	Remarks
1.	Power frequency voltage one min. (10%) withstand test.	No breakdown or flashover shall occur at 50 kV.	Withstood	Pass
2.	Power frequency voltage 10 sec (10%) withstand test.	No breakdown or flashover shall occur at 45 kV for 10 s.	Withstood	Pass (Applicable only for outdoor termination)
3.	Power frequency voltage 6 hour (10%) withstand test.	No breakdown or flashover shall occur at 35 kV.	Withstood	Pass
4.	Partial discharge measurement test.	The magnitude of partial discharge shall not exceed 5 pC at 12 kV.	PD free	Pass (Test was performed at MBS Elmadinet on 16.11.2019).
5.	Lightning impulse voltage withstand test.	No breakdown or flashover shall occur during 10 applications each of positive and negative polarity impulses at 110 kV.	Withstood	Pass
6.	Direct Voltage 15 min. dry withstand test.	No breakdown or flashover shall occur at 75 kV.	Withstood	Pass
7.	Radio influence voltage (RIV) measurement test.	The value of RIV should not exceed 80 µV when the sample is energized at 10 kV.	Within specified limits	Pass

S. No	Tests performed	Requirements	Results	Remarks
8.	Thermal short circuit test.	A current of 32.6 kA should flow for 2s through the termination (D-applications). The termination shall not have any sign of damage.	Qualified	Pass
9.	Humidity test.	A voltage of 10.1 KV shall be applied on the termination for 100 hours in a humid chamber. There shall be neither corrosion nor leakage. Moreover, the sample will have no sign of visible tracking or erosion.	Qualified	Pass (Applicable only for indoor terminations).
10.	Tracking resistance test.	A voltage of 17.5 KV shall be applied on the termination in a humid chamber. The wattage current flowing from the surface of termination should not exceed 500 mA during IETI operations of rain ON/OFF.	Qualified	Pass (Applicable only for outdoor terminations).
11.	Salt fog test	Six-fashours' through the surface of termination are consumed with rate of High salinity. After ensuring the termination, it is subjected to a voltage of 10.1 KV for 1 hour. There shall be no visible tracking or damage in the termination.	Qualified	Pass (Applicable only for outdoor terminations).

Remarks:- On the basis of above test results, the Indoor/outdoor termination kit is declared to have satisfactory "QUALIFIED" requisite type test,

Certified authorized by:
 1. Engr. Sagar Zulfikar
Certified authorized by:
 1. Engr. Anilad Ash
 2. Engr. Raj Branshad
 3.Mr. Trupten-singha Adithan

Deputy Manager (Tech.), High Voltage Division


 Additional CE (S&R) MTDG, % CE (S&R), MTDG, Lahore
 Deputy Manager (S&R) MTDG, % CE (S&R) MTDG, Lahore
 Senior Manager (Manufacturing & Sales), MRCA (PVT.) Ltd., Lahore.



Engr. Umar Farooq
Chief Engineer

	 ELSEWEDY ELECTRIC GROUP HOLDING EL-DOKKI, HELWAN GOV., EGYPT Website : www.elsewedyelectric.com
TEST REPORT REPORT No. (166 /2021)	
* CLIENT : EGYPTIAN COMPANY FOR ADVANCED INDUSTRIES (ELSEWEDY) SECUR - SUBSIDIARY OF ELSEWEDY ELECTRIC .	
* Request Date : 20/04 /2021.	
* Place : - Future High Voltage Research Center Laboratories - National code : TO – AC – 21 – 03 – 07 – BQ	
* Requirements: - Tests for external dielectric withstand capabilities according to IEC 60502-4.	
* Standard Specification: - IEC 60502-4: Power cables with cross insulation and their accessories for rated voltages from 1 kV ($U_{m}/U_0 = 1.8 \text{ kV} / 1.6 \text{ kV}$) Part 4: Test requirements on accessories for cables with rated voltages from 6 kV ($U_m = 7.2 \text{ kV}$) up to 30 kV ($U_m = 36 \text{ kV}$). - IEC 61442: Test method for accessories for power cables with rated voltages from 6 kV ($U_m = 7.2 \text{ kV}$) up to 30 kV ($U_m = 36 \text{ kV}$).	
* Description of specimen: - Several deadbreak removable arrester (I shape ERMov) installed on a power cable 18/30 KV, 3x-core with the following specifications: - Manufacturer : ELSEWEDY ELECTRIC/ELASTIMOLD EGYPT Subsidiary of ELSEWEDY ELECTRIC. - Model : H35 - Lig type : Compression type ERMov kg - Material : EPDM Rubber. - Rated voltage (U _m /U ₀) : 18/30 kV. - Minimum voltage (U _{min}): 36 kV.	
* Description of the Equipment: - High voltage generator 400 kV – 2000 kVA – 50 Hz - Type (HSEK) - Serial No. (20222/66). Certificate No (216/23/0920) TPO Discharger - Type: (TE ST), Certificate No(772/23/0230) Insulation voltage generator 800 kV – 40 kA – Type IP40/WQM, Certificate No(366/23/0930) -Over up to 899 kV -Type RBNIGR- Serial No.G2-S2772.Certificate No(91442/2017)	
* Test Results: - Test sample was shown under the responsibility of the client.	
<i>Cao</i>	<i>Mohabey</i>
	

01-01-00-05

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<div style="text-align: right;">  </div>		
<h1 style="text-align: center;">Test Report</h1>		
Document No.	02971-22-0439	Copy No. 1 Number of pages: 62
Apparatus	Straight joint for three core power cables with extruded insulation with rated voltage 8.7/10.5 kV 3x V	
Designation	EC - 17.55M	
Serial Number	4 test samples	
Manufacturer	Electromet Egypt / Elwanemy MEDCO subsidiaries of Elwanemy Electric Industrial Region 1006 of Kamarian City EGYPT	
Client	Egyptian Company for Advanced Industries Elwanemy MEDCO Plot No. 27, 1st District, 5th Settlement P.O. Box 311, New Cairo 11835, EGYPT	
Validity of tests	11 May 2022 to 16 September 2022	
Tested by	IPH Institut „Prüfplatz für elektrische Hochspannungstechnik“ GmbH Lamellenberg Allee 3/5A 12483 Berlin GERMANY	
Tested/performed	Test sequences 2.1, 2.2 & 2.3 according to table 6 of document IEC 60502-4: 2010-12	
<p>The apparatus, serial used in accordance with the description, drawings and photographs incorporated in this document has been subjected to the series of proving tests in accordance with According to client's specification and based on IEC 60502-4: 2010-12 IEC 61442: 2005-03</p>		
<p>The results are documented in this test report. The values assigned to the manufacturer are taken on the basis from the document again only on the apparatus tested. The responsibility for correct data of any apparatus being the client's responsibility with their consent with the manufacturer.</p>		
14 November 2022	 Uwe Fischer Test Engineer in Charge	 Klaus Valeriu Approved by
Date	<p>For information of the client a preliminary report is available on request. The responsibility of any document is the responsibility of the client. The responsibility of any document is the responsibility of the client.</p>	
<div style="display: flex; justify-content: space-around; align-items: center;">   <div style="text-align: center;"> <p>an official "Prüfplatz für elektrische Hochspannungstechnik" (approved) testing laboratory in accordance with the requirements of the German VDE standard VDE 0105-1-01 for the certification of test sites for the use and the approval of the construction of electrical test sites.</p> </div> </div>		
<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div>		
<p>Trust the Power of Experience</p>		

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Ministry of Planning, Economic Development & Trade, Republic of Egypt



Material Prequalification Approval Certificate

with Approval Reference No.: EA/1001/MQ/2020

for

Distinbold Egypt, Towards Electrical

Material Details

Sl. No.	PRODUCT DESCRIPTION / MATERIAL	Type/Model	PLANT LOCATION CITY & COUNTRY OF ORIGIN	Supplier Name
1	11 KV Promulded Cable Accessories (Joints)	Promulded Type	Egyptian City: Egypt	Energy Solutions (Vendor Reg. No. 1000000)

This certification is issued on **2nd February 2020** as per FENA Procedures & Guidelines for Material / Equipment Pre-Qualification as of 1.2.2015 and will expire on **2nd February 2023**.

TERMS:

- Quantity shall be defined during engineering design stage of contract by FENA. Moreover, further approval is required to extend quantity or performance of the material / equipment in FENAs contract.
- Detailed technical evaluation of each type and model is subject to detailed review and approval during engineering design stage of contract, to ensure compliance with FENA project specification and requirements.
- FENA will be re-evaluating the material performance at any time it deemed necessary. This certificate will become invalid and will be cancelled if the performance is found unsatisfactory. The latest shall be communicated to the manufacturer / supplier.
- FENA has all the right to accept or reject any offer and may take small quantity for trial as and the supplier to remove the type used etc.
- Manufacturer / Supplier should contact FENA Purchase Dept. Three (3) month prior to the expiry date of this certificate, for renewal process.
- FENA reserves the authority of the design in this certificate until the date of issuance latest notice and does not assume any responsibility under this certificate in the event of any change in the approval details, it shall alter the issuance of this certificate. This certificate shall be deemed invalid on the expiry date mentioned above.
- This certificate must be obtained by visiting FENA website and enter the Approval Reference Number or by contacting PCS Dept. Through email to purchase@fena.gov.eg to confirm the validity of this certificate. FENA does not assume any responsibility in case of using this certificate without evaluation. However, misuse or overrepresentation of this certificate is not FENA's responsibility. Any correction or alteration will render this certificate null & void.



Sherif S. Ismail
Manager Contracts
Material Services – PCS Dept.



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مجلس إدارة البنية التحتية
DISTRIBUTION CODE REVIEW BOARD

Product Approval Certificate

Certificate No: DCRP/PA/CTR/0012/08 Issue Date: 14th May 2013 First Expiration: 14th May 2015

Distribution Code Review Panel

Certifies That:

<p>Electrical Product:</p> <p>Manufacturer:</p> <p>Country of Origin:</p> <p>Local Representative:</p> <p>Address:</p>	<p>11 KV Pre-molded Cable Joints & Terminations</p> <p>Elastimold Egypt</p> <p>Egypt</p> <p>Thalal Al Kathoob Trnd. & Cont. Co. LLC</p> <p>P.O. Box 62, P.C. 317</p> <p>Asahi / Sultanate of Oman</p> <p>Tel: (+ 968) 24503121</p>
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Is registered with the panel as an Approved Product with the effect from the date of issuing this certificate



DCRP CHAIRMAN

This Certificate is valid until

13th May 2020



Please Refer Checklist for Approval Conditions

Total Page Number: 40 Page