



**CABLE**  
**ACCESSORIES**





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Integrated Energy Solutions



Since our beginnings as a manufacture of electrical components in Egypt 80 years ago, Elsewedy Electric has evolved.

into a global provider of energy, digital and infrastructure solutions, generating revenues of approximately 3.8 Billion USD annually. We operate in five key business sectors: Wire & Cable Electrical Products, Engineering & Construction, Digital Solutions, and Infrastructure Investments. At The heart of our approach is an all-in-one integrated Engineering, procurement & Construction (EPC) service which enables us to deliver even the most complex projects on time and within budget.

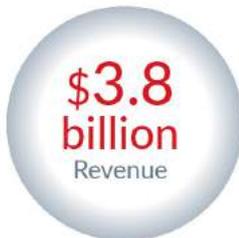
We are pioneers of energy management and efficiency. As part

of our commitment to sustainability we have established green energy and smart metering projects across Africa, the Middle East and Eastern Europe. A vital part of our mission is ensuring that the communities where we operate develop and flourish.

Our growth has been based on sound financials and a commitment to hiring talented individuals. As well as empowering businesses and communities, we have been a major contributor to the Egyptian, African and Middle Eastern economies.

Whichever stage you are at with your project we can help you through to completion and beyond.

## A leader in integrated energy solutions



### Integrated Energy Solutions

- Wire & Cable
- Electrical Products
- Engineering & Construction
- Digital Solutions
- Infrastructure Investment

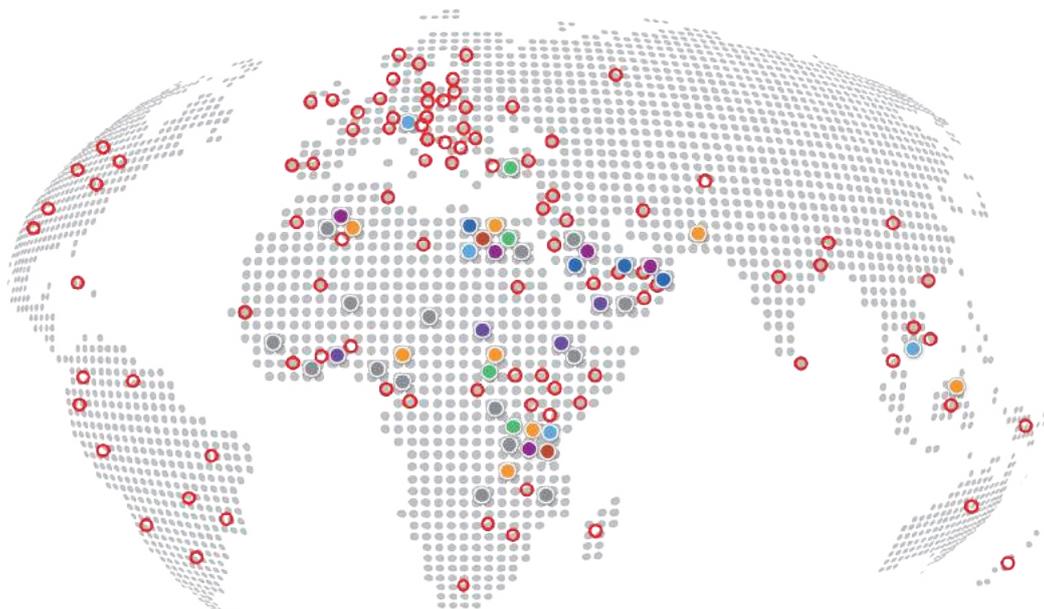


## Wire, Cable & Accessories Business unit



We are a global wire and cable manufacturer with more than 40 years of experience in the industry. We pride ourselves superior product quality, innovative solutions, and numerous certifications. Our manufacturing capacity is close to 350k+ Tons annual total capacity located in several countries. We manufacture a range of power & special cables, winding wires, OHTL & OPGW, steel products, insulators, cable accessories, explosion proof equipment and plastics while offering various cabling solutions, covering more than 100 countries.

## Global Presence



**31** PRODUCTION FACILITIES    **19** OPERATION COUNTRIES    **110** EXPORTING COUNTRIES



Cables & Accessories



Electrical Products



Meters



Transformers



Telecommunication



Renewable energy



Projects & Development



Export

## About **Cable Accesories**



ELSEWEDY ELETRIC, 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.

## Premolded Cable Accessories

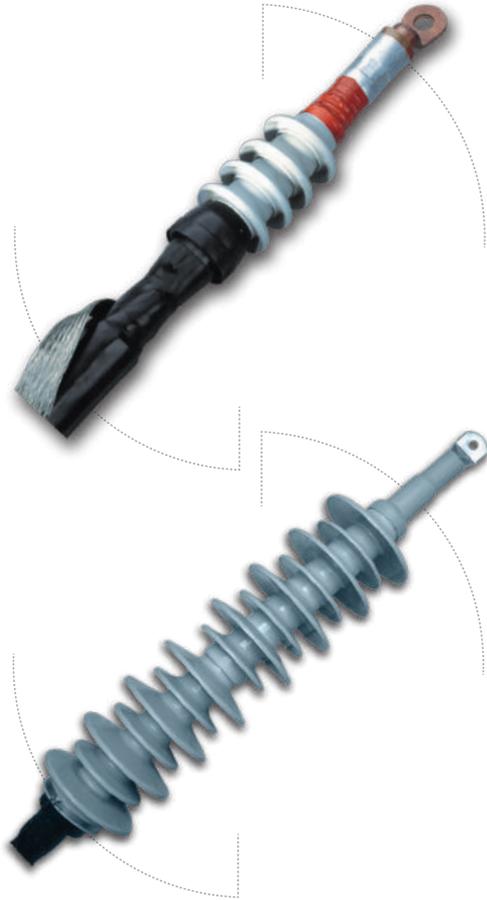
### Premolded Cable Joints

Medium Voltage Power Cable Joints  
High Voltage Power Cable Joints



### Premolded Cable Termination

Medium Voltage Modular Termination  
High Voltage Transmission Termination



### Features of 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

## Premolded Cable Joints

Medium Voltage Power  
Cable Joints



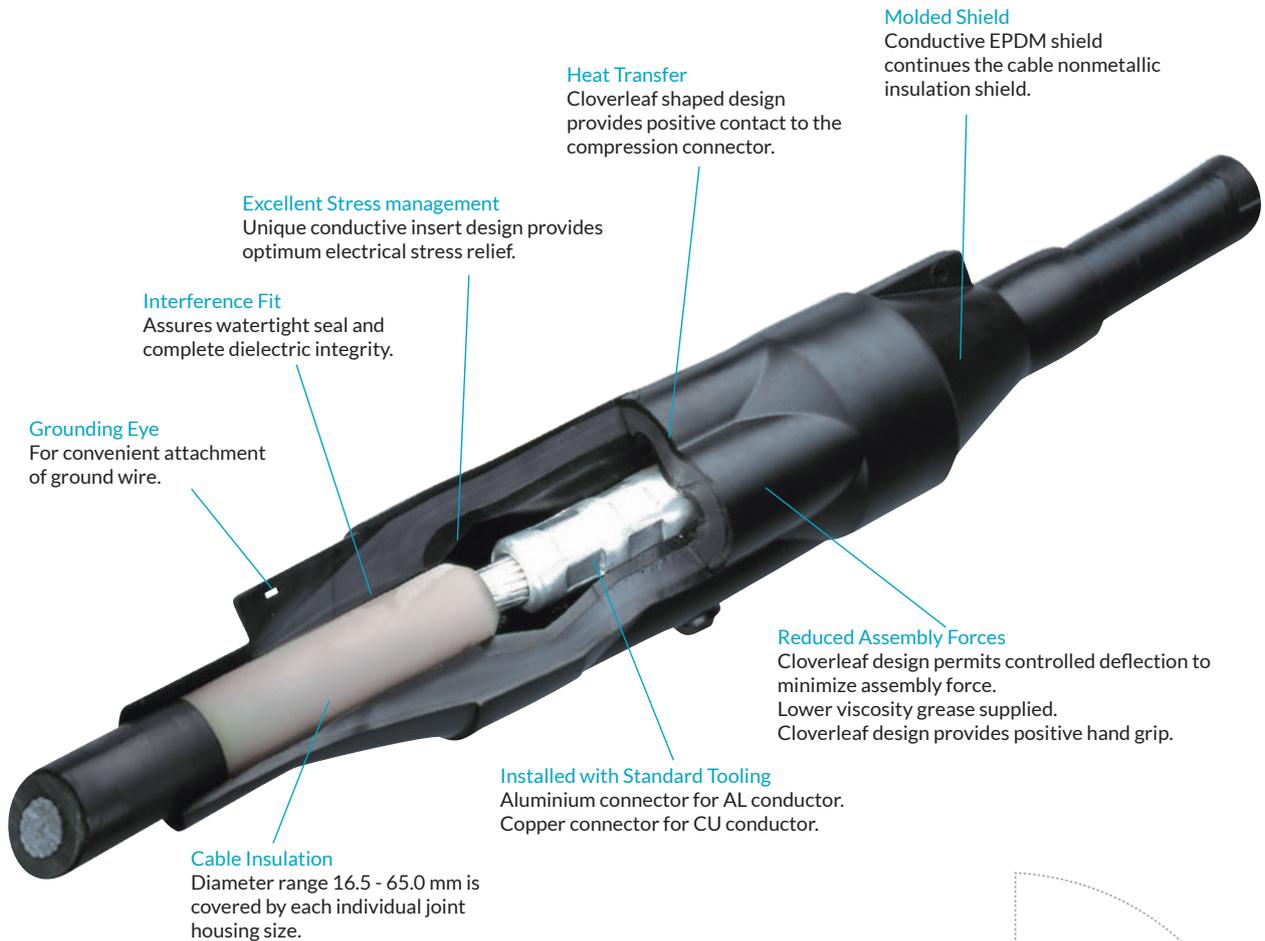
High Voltage Power  
Cable Joints



## Premolded Cable Joints

## Medium Voltage Power Cable Joints

IEC Standard 60502-4 , IEEE Standard 404



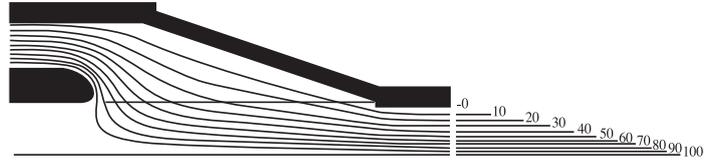
- 1 Joint stored on one side of the cable core.
- 2 Joint in its final position.
- 3 Restoration.



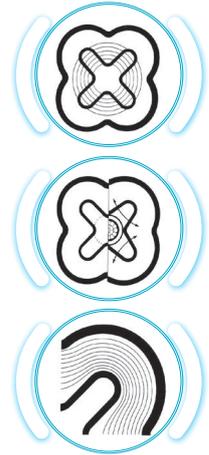
- The power cable joints are highly reliable, factory-molded and tested cable joints for 15kV, 25kV and 35(36)kV class distribution systems. When assembled, they provide permanent, fully shielded, fully submersible cable joints for direct burial or vault applications of solid dielectric single-core and 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

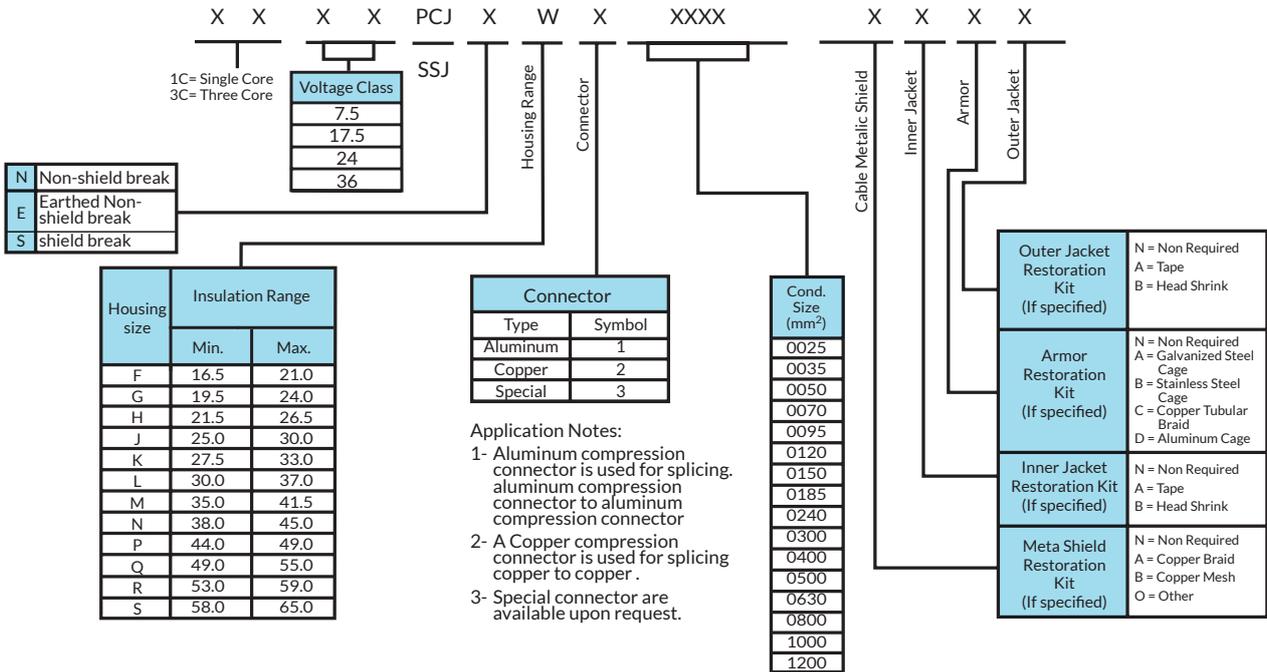
The molded stress control configuration offers excellent stress management through computer-aided definition of shape transitions and state-of-the-art materials science.



- 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).
- 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).
- 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 <sub>0</sub> (kV)	6	8.7	12	18 or 19
U (kV)	10	15	20	30 or 33
U <sub>m</sub> (kV)	12	17.5	24	36
Impulse Test voltage (kV)	75	95	125	170
IEC Standard No.	IEC 60502-4			

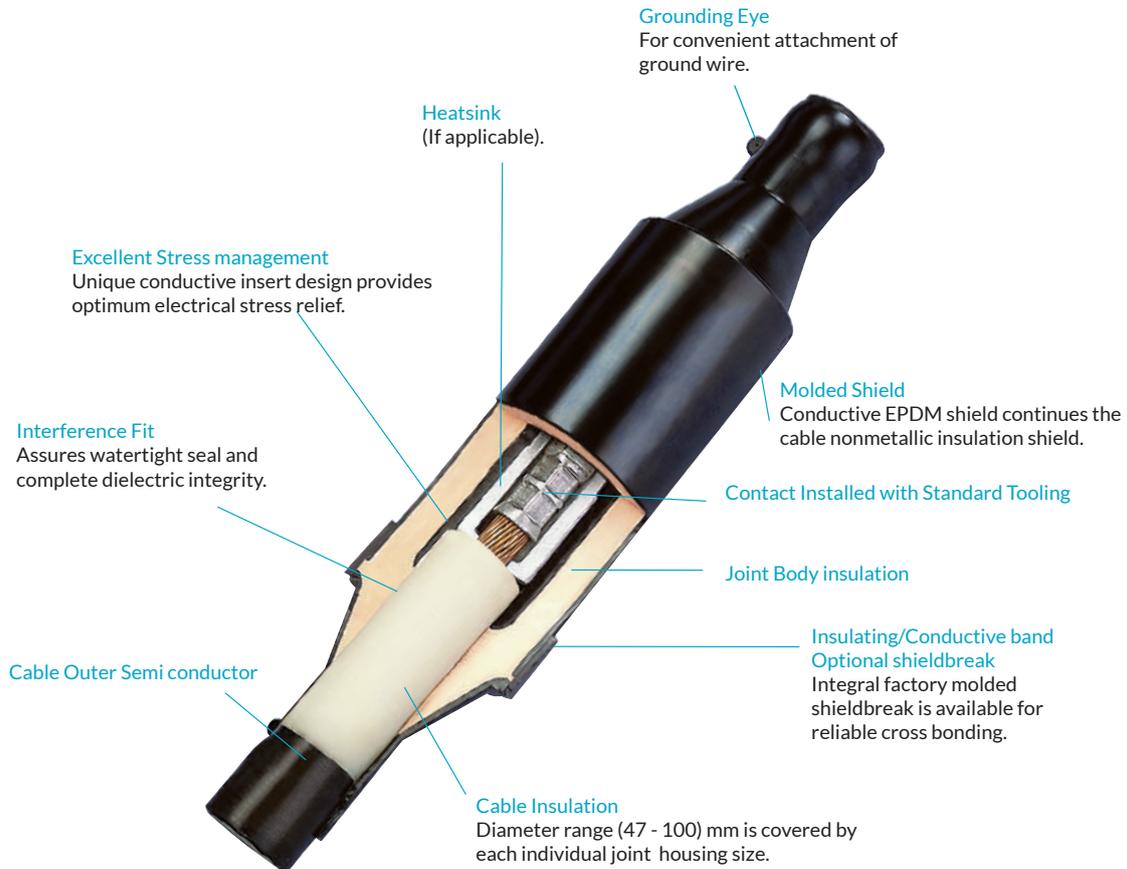
### Note:

**U<sub>0</sub>** : 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<sub>m</sub>** : 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 &amp; Lowest Installed 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.

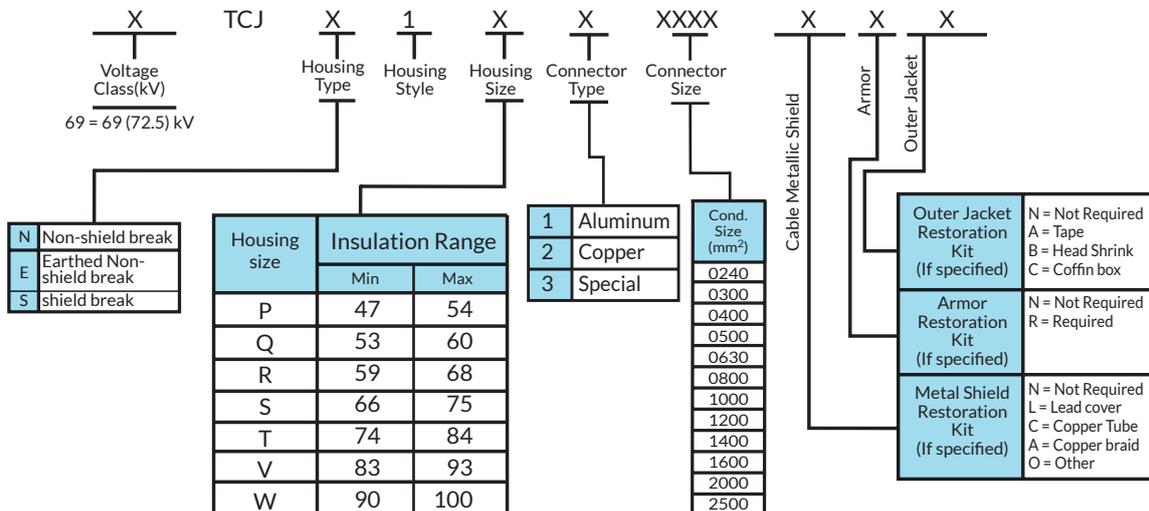


Premolded housing void - free joint housing consists of cured EPDM insulation bonded under pressure to cured molded semiconductive elements.

### Technical Data According to IEC 60840

Ratings	
Nominal system voltage up to U <sub>0</sub> ( kV)	69
Maximum system voltage U <sub>m</sub> ( 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

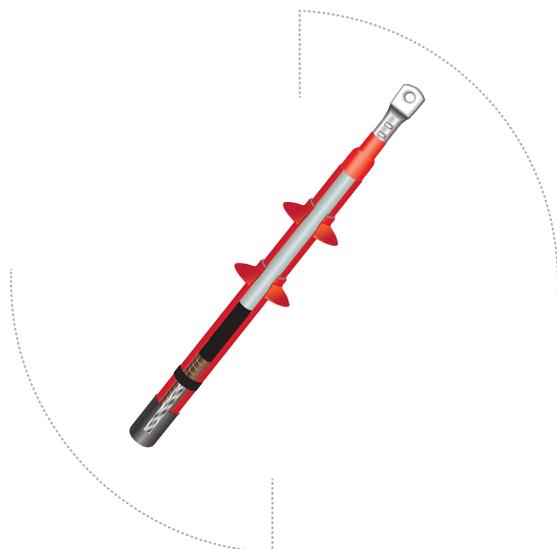
## Cable Termination



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

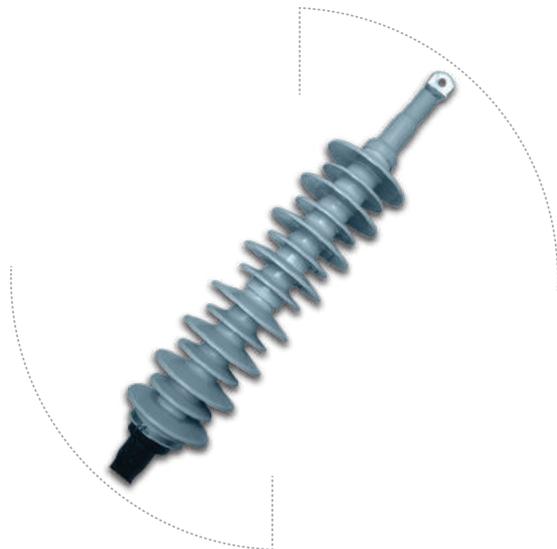
Heat shrink cable termination for cables up to 36 kv indoor & outdoor.



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 mm<sup>2</sup>.



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.

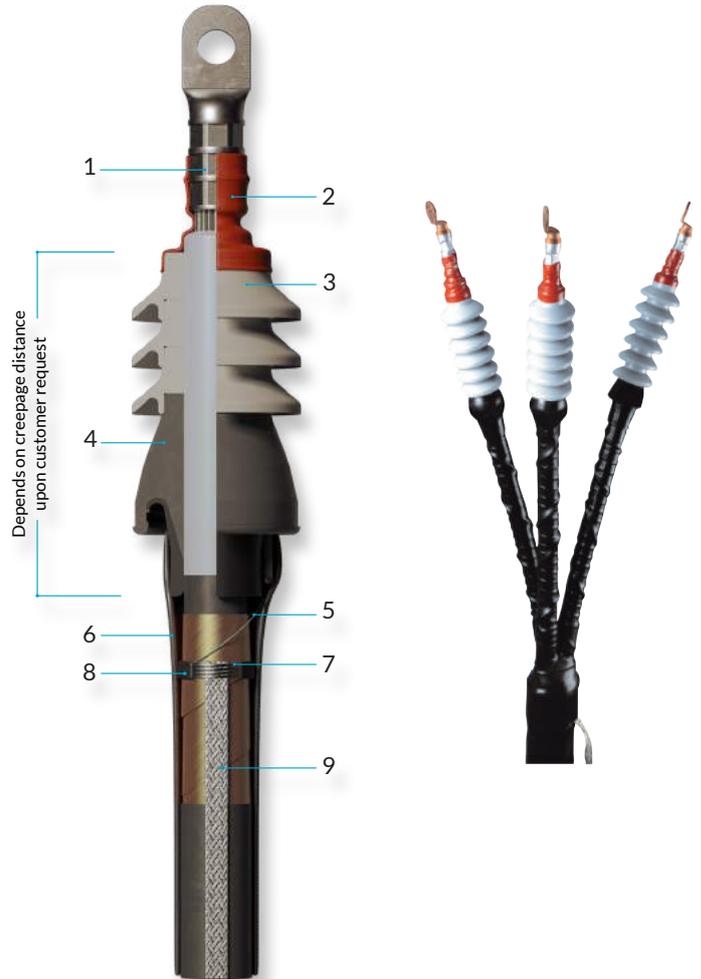
## Cable Termination

# 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 :  $-10^{\circ}\text{C}$  upto  $+60^{\circ}\text{C}$ .
- Reduced Training Requirements : Easily learned installation procedure. Human error totally eliminated.

# Cable Termination

## Electrical Ratings

U <sub>0</sub> (kV)	3.6	6	8.7	12	18 or 19
U (kV)	6	10	15	20	30 or 33
U <sub>m</sub> (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

**U<sub>0</sub>**: 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.

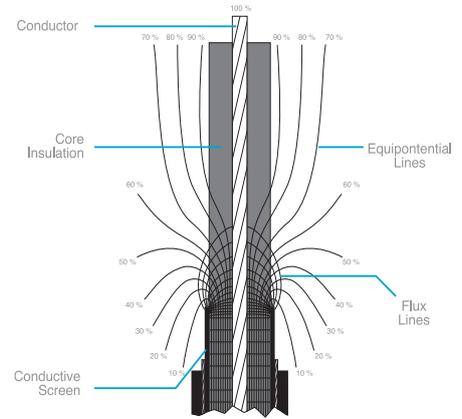
**U<sub>m</sub>**: the maximum value of the "highest system voltage" for which the equipment may be used.

- 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.

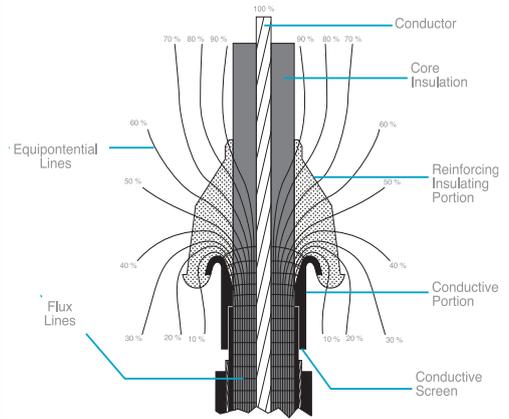
## Creepage distance of the termination

- 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

Insulation Diameter

Conductor Size (mm<sup>2</sup>)

Voltage Class	Stress cone Size	Application Range		MTG Family Size
		min	max	
7.5	EB	12.5	15.0	MTG Size 1
12	EF	13.5	16.0	
17.5	FA	14.5	17.5	
	FAB	16.0	19.0	
24	FB	17.5	20.0	
	FG	18.5	21.5	
36	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	
	S	58.0	67.0	
				MTG Size 3

Number of modules depend on:

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

LUG	
TYPE	SYMBOL
Aluminum	1
Copper	2
Special	3

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

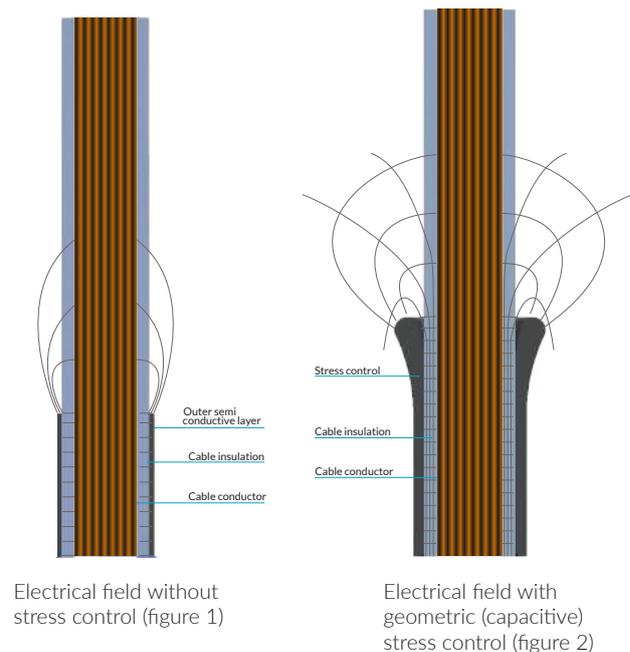
- 1 We depend on silicon material in produce the Medium and High voltage cable accessories due to its excellent mechanical and Electrical properties make silicone rubber a preferred Material for cable accessories.
- 2 Silicone rubber offers high-quality electrical insulation and superior corona and tracking 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 extunguishing, 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.

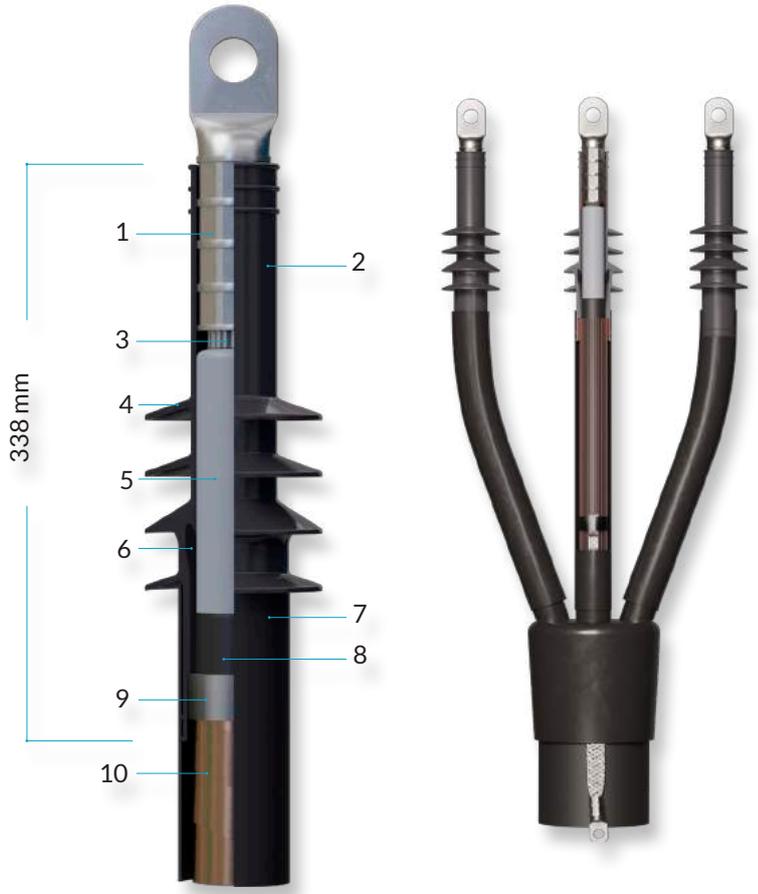


## Cable Termination

### Single Piece Termination

#### Design and Components

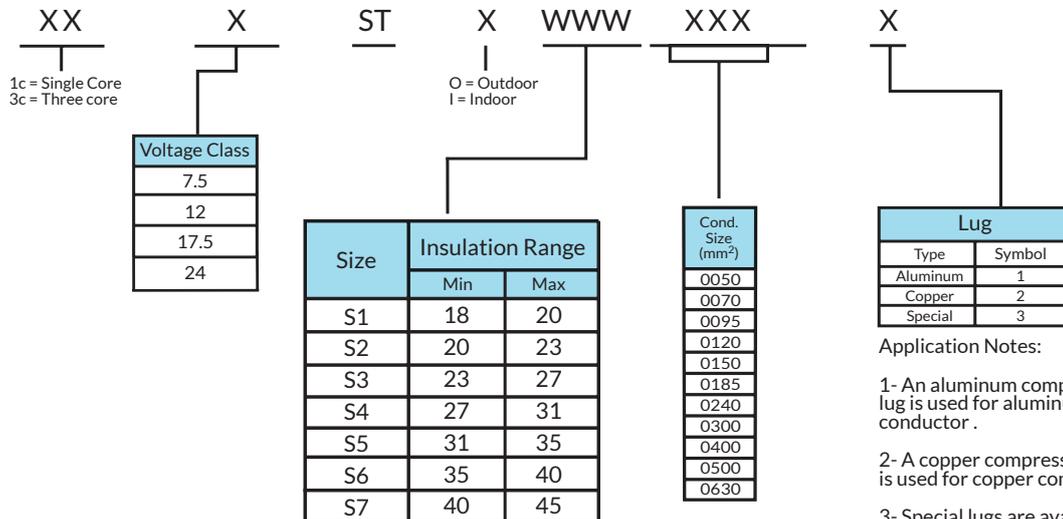
- 1 Cable lug
- 2 Silicon one-piece termination
- 3 Cable conductor
- 4 Non-tracking silicon termination shed
- 5 Cable insulation
- 6 Silicon molded stress cone
- 7 Sealing heat shrink tube
- 8 Cable semi conductive layer
- 9 Constant force spring
- 10 Cable screen layer



#### Electrical Ratings

U <sub>o</sub> (kV)	6	8.7	12
U (kV)	10	15	20
U <sub>m</sub> (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



#### 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

# 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

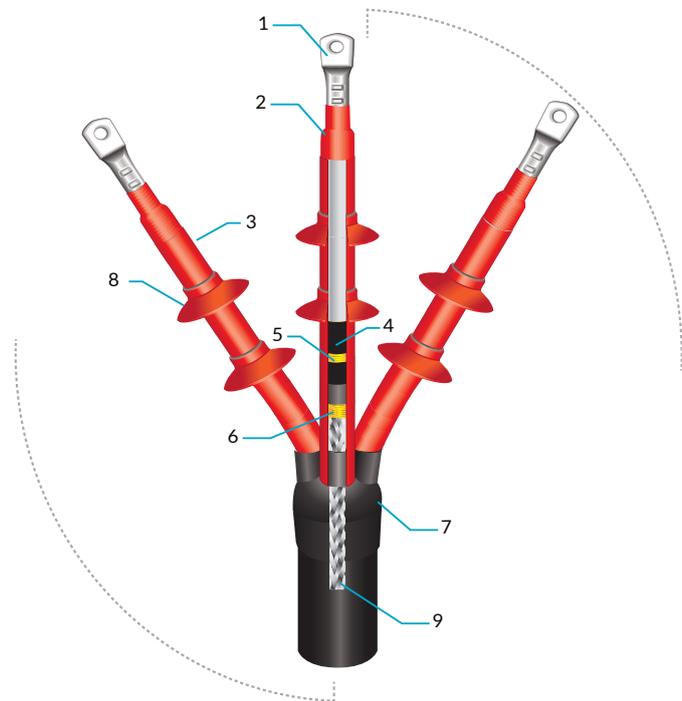
Boot that seals the transition of the three-core cable into three single cores.

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

### Note

**U<sub>0</sub>** : the rated power frequency voltage between conductor and earth or metal screen for which the cable is designed.

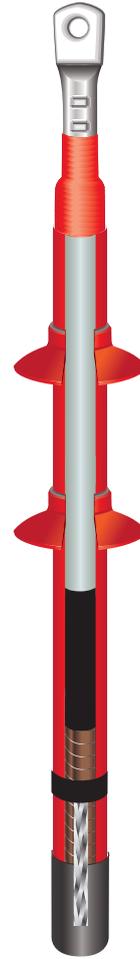
**U** : the rated power frequency voltage between conductors for which the cable is designed.

**U<sub>m</sub>** : the maximum value of the “highest system voltage” for which the equipment may be used.

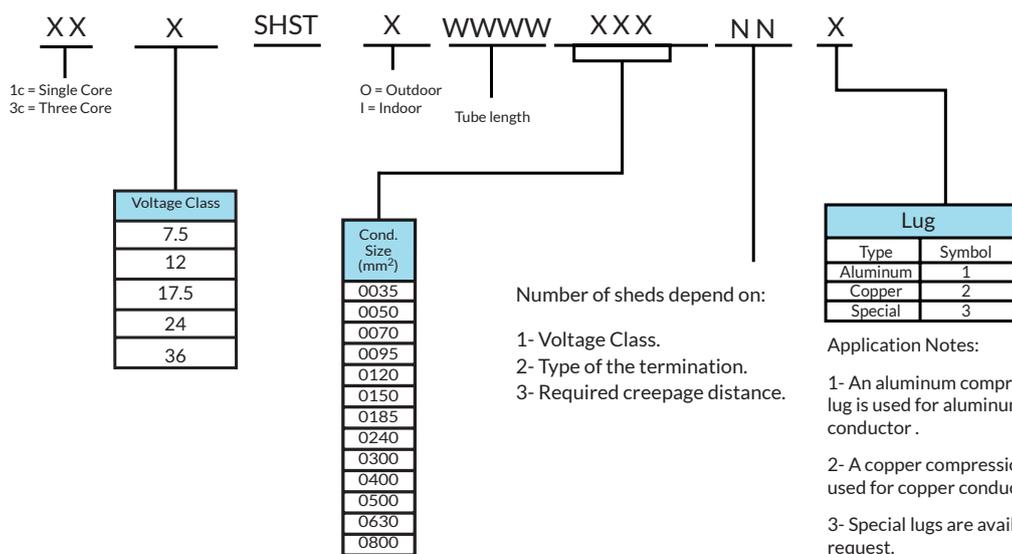
- Current rating is equal to the cable’s rating.
- Ratings based on IEEE (404 & 048) IEC 60502-4, and do not reflect maximum withstand levels. For levels that exceed the above, contact your dealer representative.

### 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.



**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**

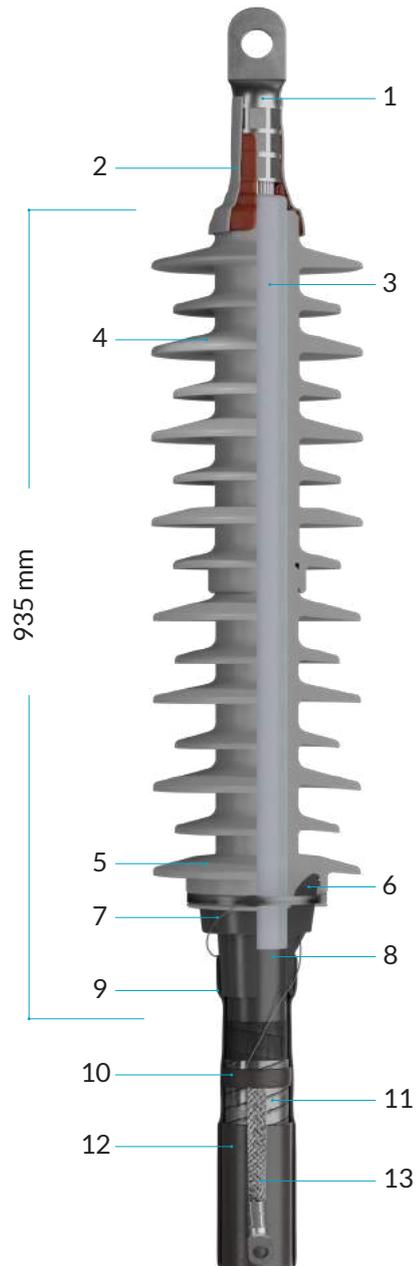
Mastic tape used to seal the jacket and flat braids from the ingress of water

**11 Lead alloy metallic sheath**

**12 HDPE outer sheath**

**13 Grounding Flat Braid**

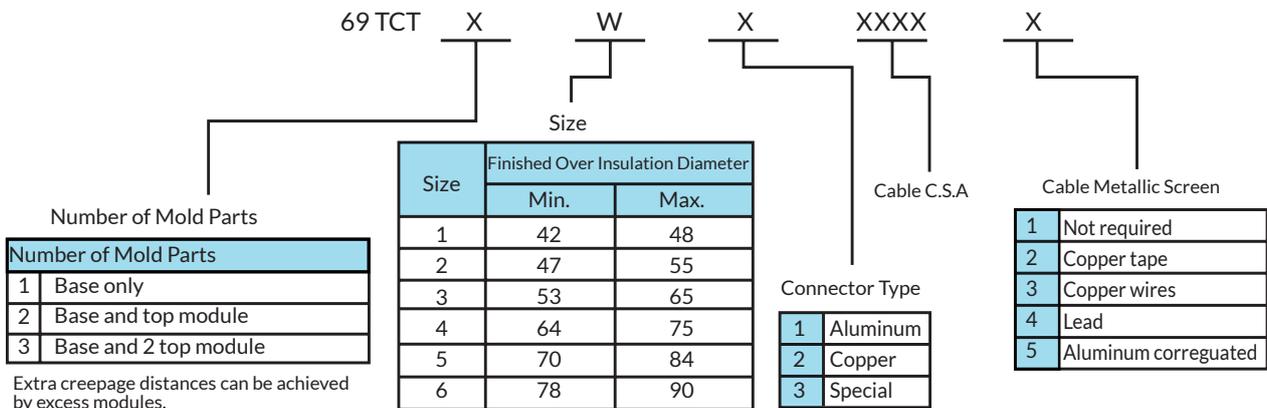
The flat braid makes the electrical connection between the metallic screen and armor to the system ground



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

Ratings	
Nominal system voltage up to Uo ( kV)	69
Maximum system voltage Um ( 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

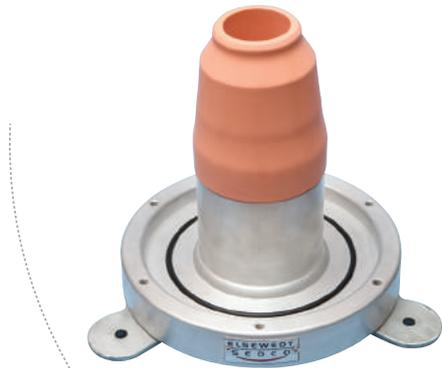




**Porcelain Outdoor  
Sealing End**

## Porcelain Outdoor Sealing End

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



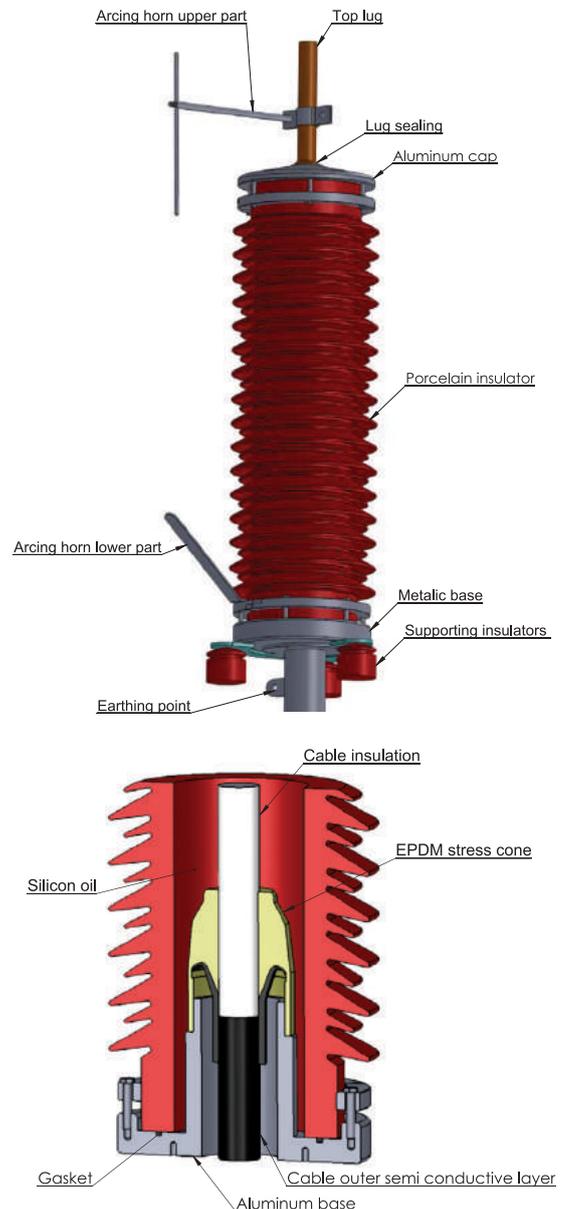
## Porcelain Outdoor Sealing End

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 mm<sup>2</sup> 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.

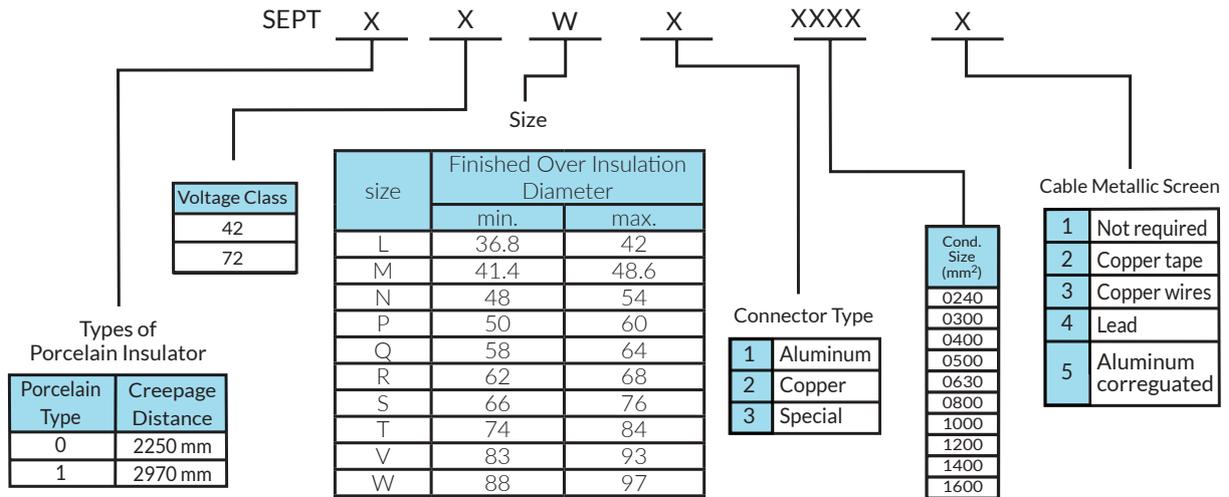
### Technical data

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



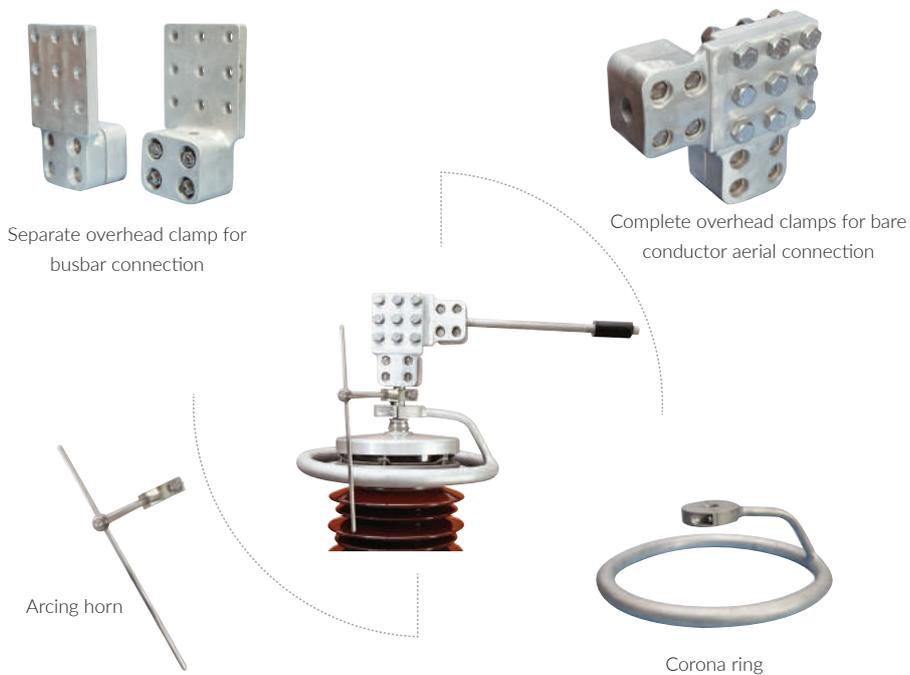
- Extra creepage distances can be achieved.

### Example

- For 66kV, 630mm<sup>2</sup> 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

### The Following Item's Shall Be Ordered Separately





## Dead Break Separable Connectors

## 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

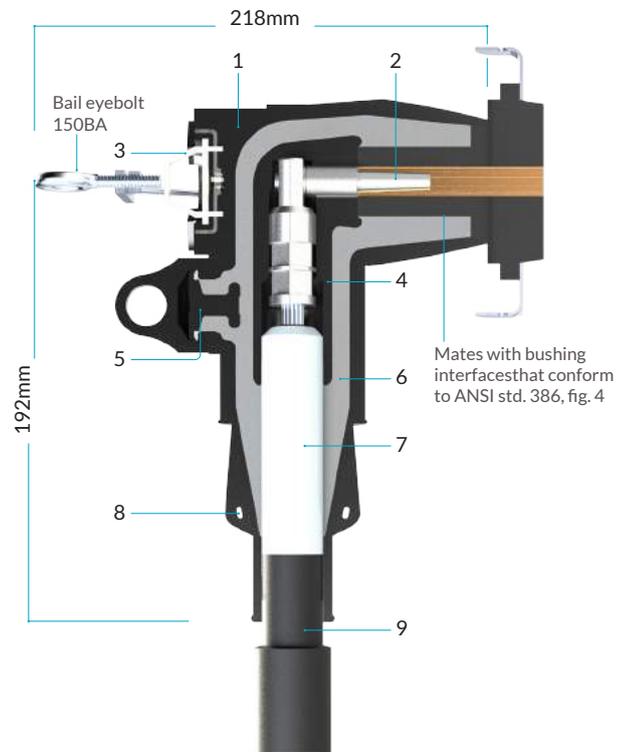
## L-Shape Elbow 156

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.

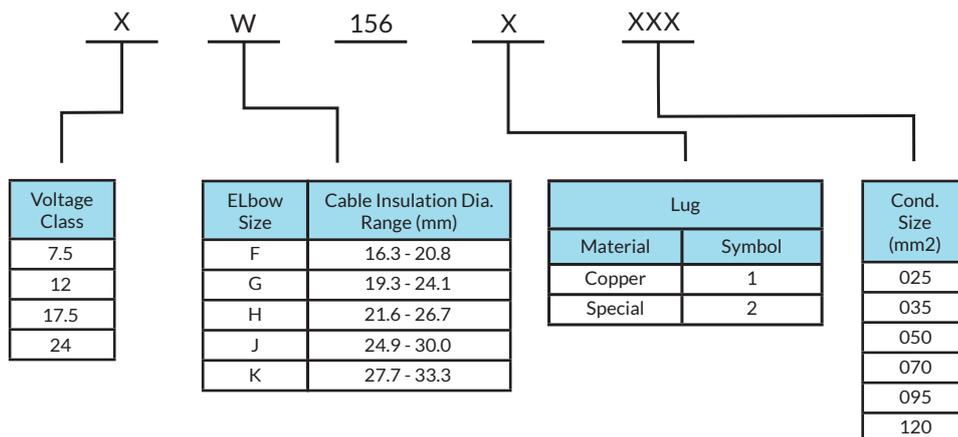


- Semi conductive shield**  
Semi conductive EPDM shield provides ground shield continuity between elbow and cable shield.
- Probe**  
From tin plated copper to insure positive interference fit with the mating bushing.
- Pulling eye**  
Stainless steel pulling eye provides easy hotstick operation.
- Semi conductive insert**  
Molded cured EPDM semi conductive contains electrical stress control.
- Optional capacitive test**  
Point capacitive test point with cap provides a shielded hotstick operation to test if the circuit is energized or not.
- EPDM insulation**  
Molded from high quality special formula EPDM rubber to provide superior insulation characteristics
- Cable insulation**
- Grounding eye**  
Provisioned for ground wire connection.
- Cable's outer semi conductor**



### Ordering Instructions

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



# 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 Connector

### 5 Semi Conductive Insert

Molded cured EPDM semi conductive contains electrical stress control.

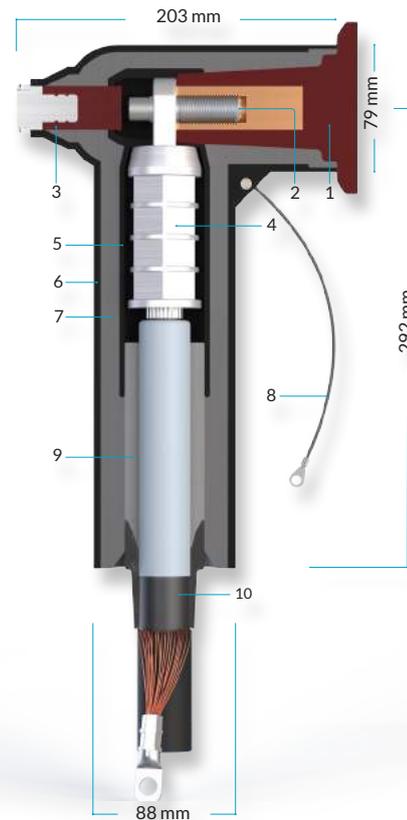
### 6 Elbow Housing

### 7 Elbow Insulation

### 8 Grounding Wire

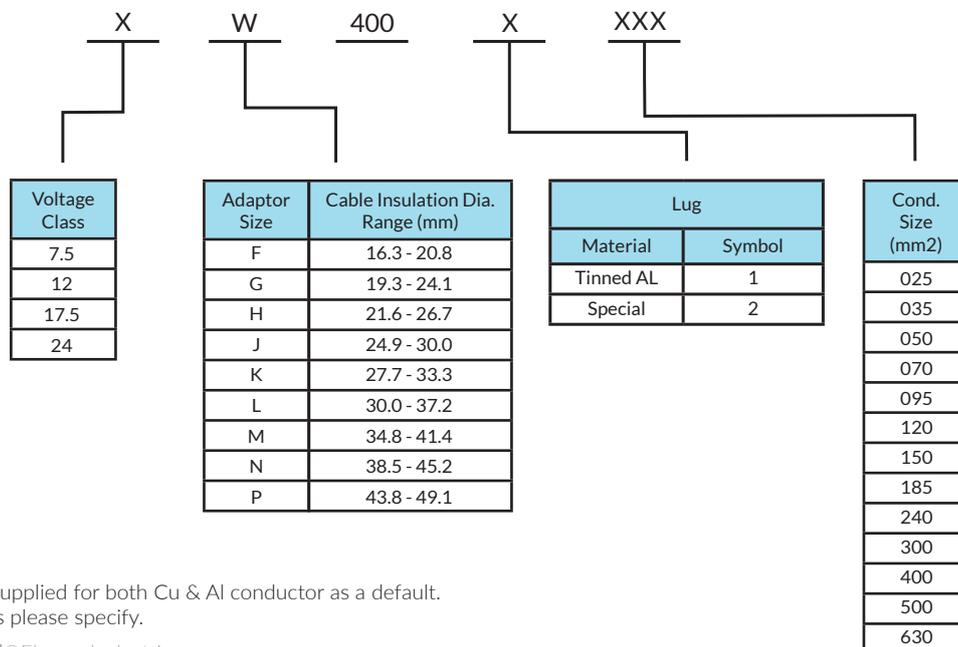
### 9 Cable Adaptor

### 10 Cable's Outer Semi Conductor



## Ordering Instructions

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



### 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 Connector

#### 6 Outer Semi Conductive Layer

#### 7 Elbow insulation

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

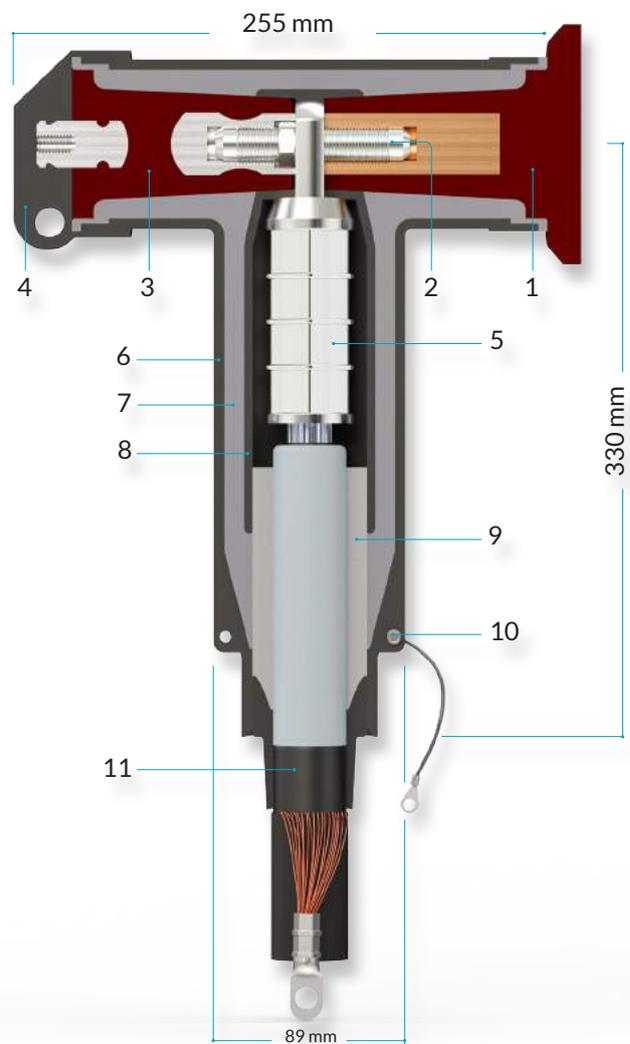
#### 8 Semi Conductive Insert

Molded cured EPDM semi conductive contains electrical stress control.

#### 9 Cable Adaptor

#### 10 Earthing Eye

#### 11 Cable's Outer Semi Conductor



### Ordering Instructions

- 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

### ET-Elbow

- 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 Insulation 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.

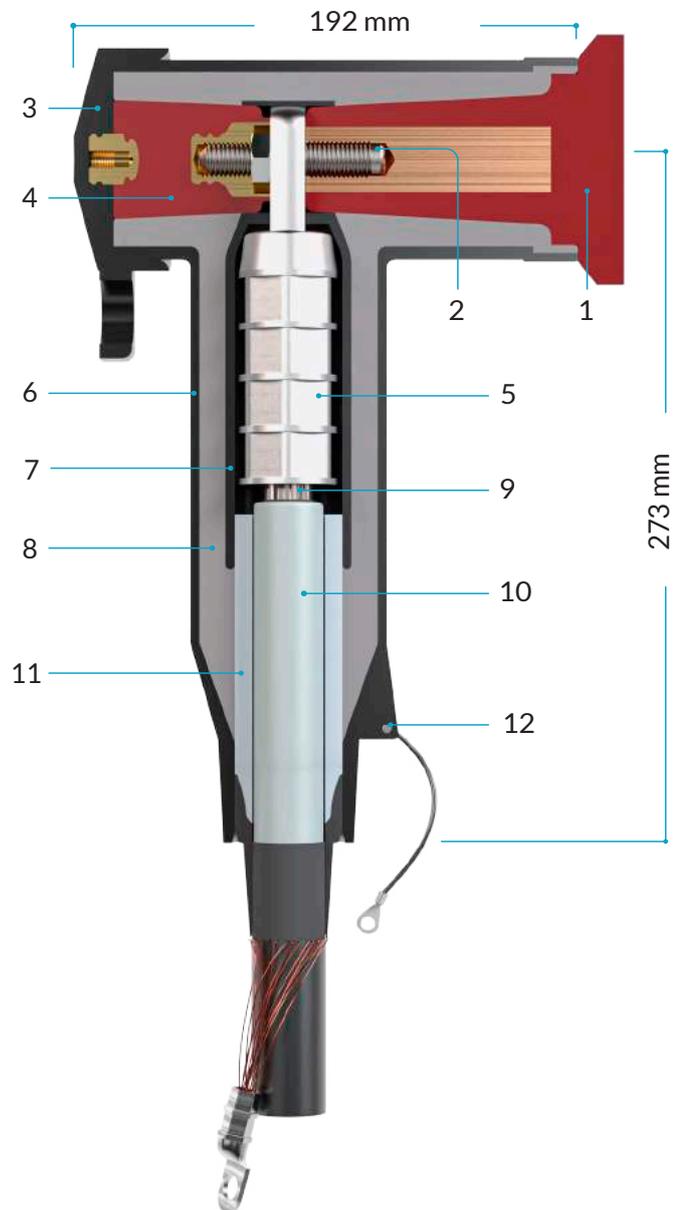
#### 9 Cable conductor

#### 10 Cable insulation

#### 11 Elbow Adaptor

#### 12 Earthing Eye

Provisioned for ground wire connection.



## Dead Break Separable Connectors

### Electrical Ratings

U <sub>0</sub> (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			

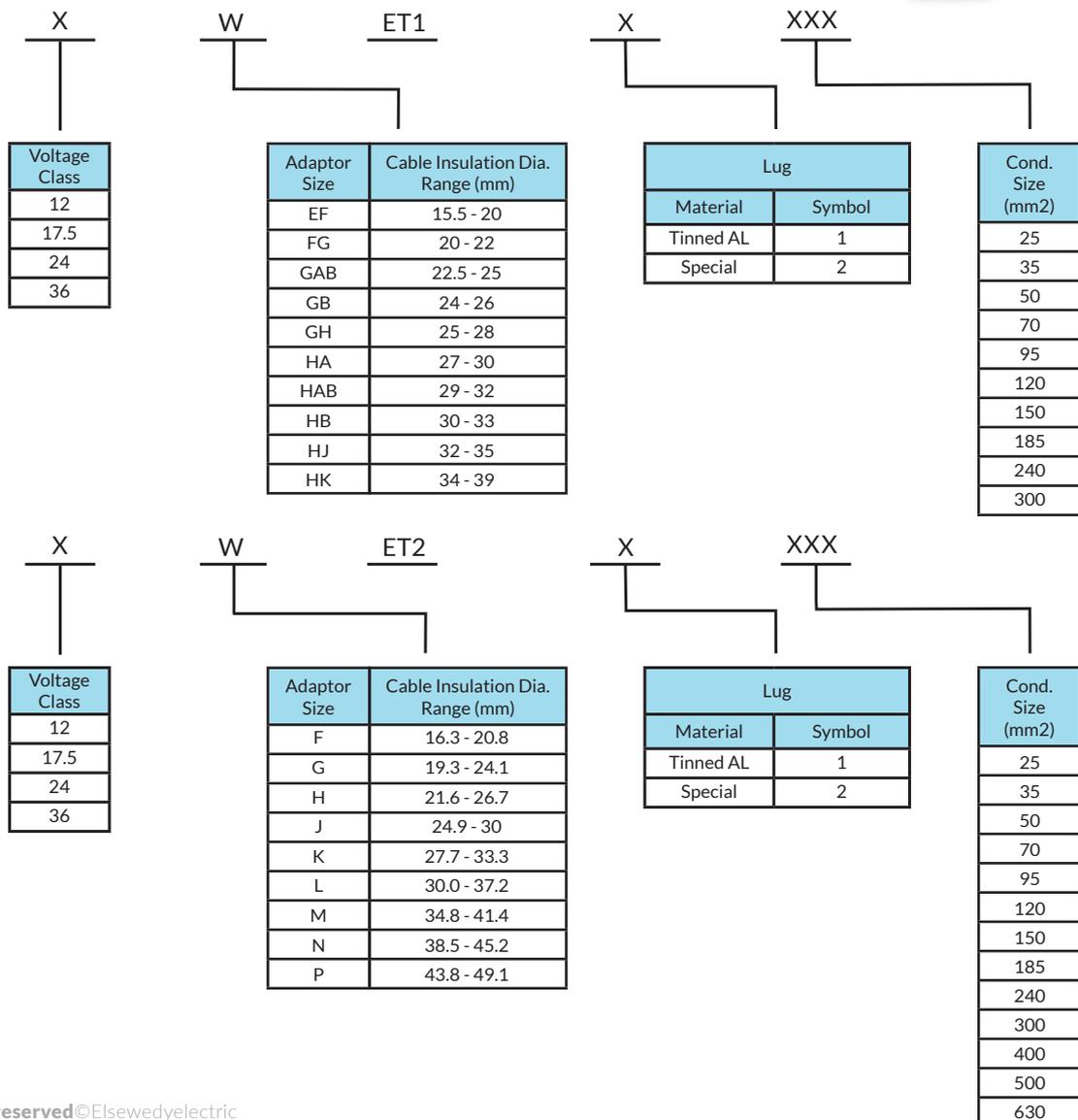


#### Note

**U<sub>0</sub>** : 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.



## Dead Break Separable Connectors

### ETC-Elbow

- 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.



#### 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 Insulation 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.

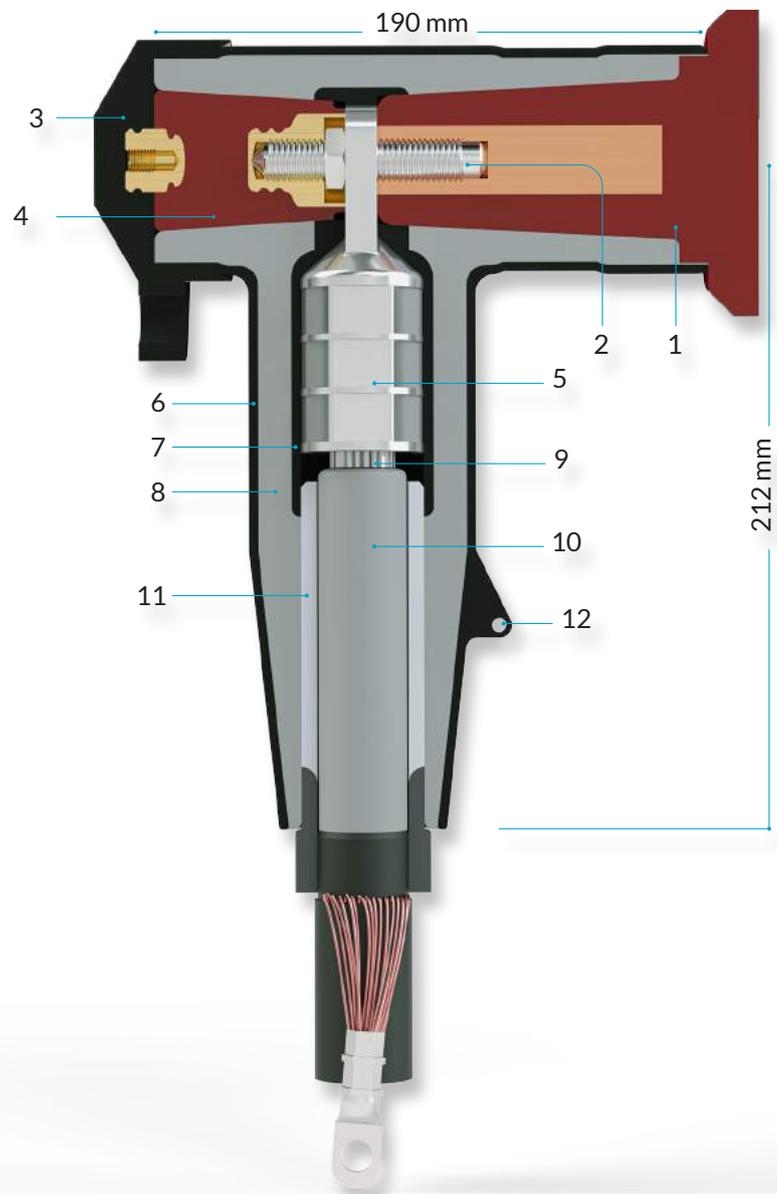
#### 9 Cable conductor

#### 10 Cable insulation

#### 11 Elbow Adaptor

#### 12 Earthing Eye

Provisioned for ground wire connection.



## Dead Break Separable Connectors

### Electrical Ratings

U <sub>0</sub> (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		

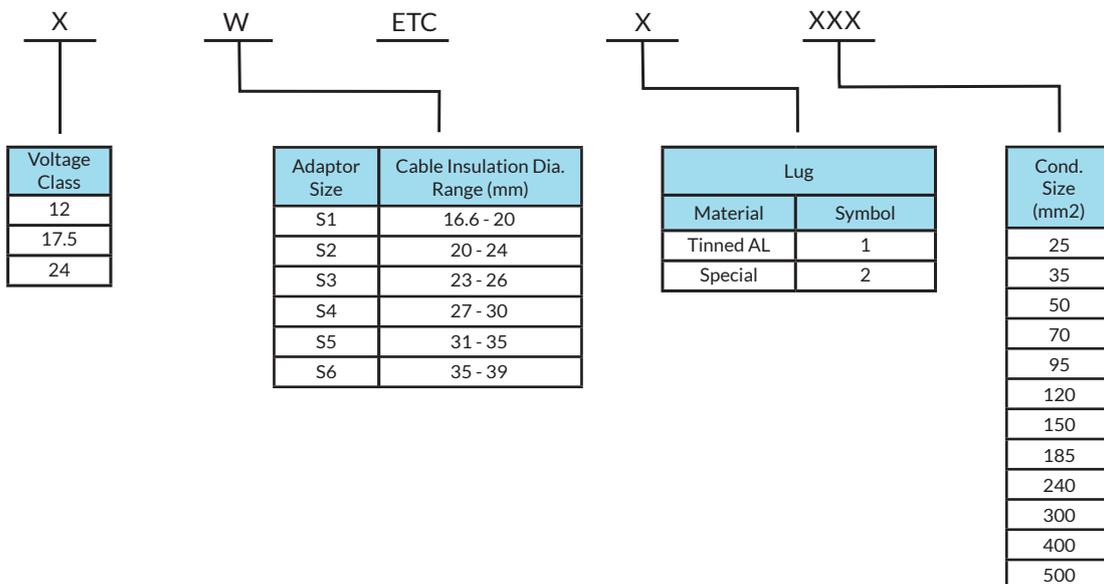


#### Note

**U<sub>0</sub>:** 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.

**U<sub>m</sub>:** The maximum value of the "highest system voltage" for which the equipment may be used.



## ELbow accessories



### 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).

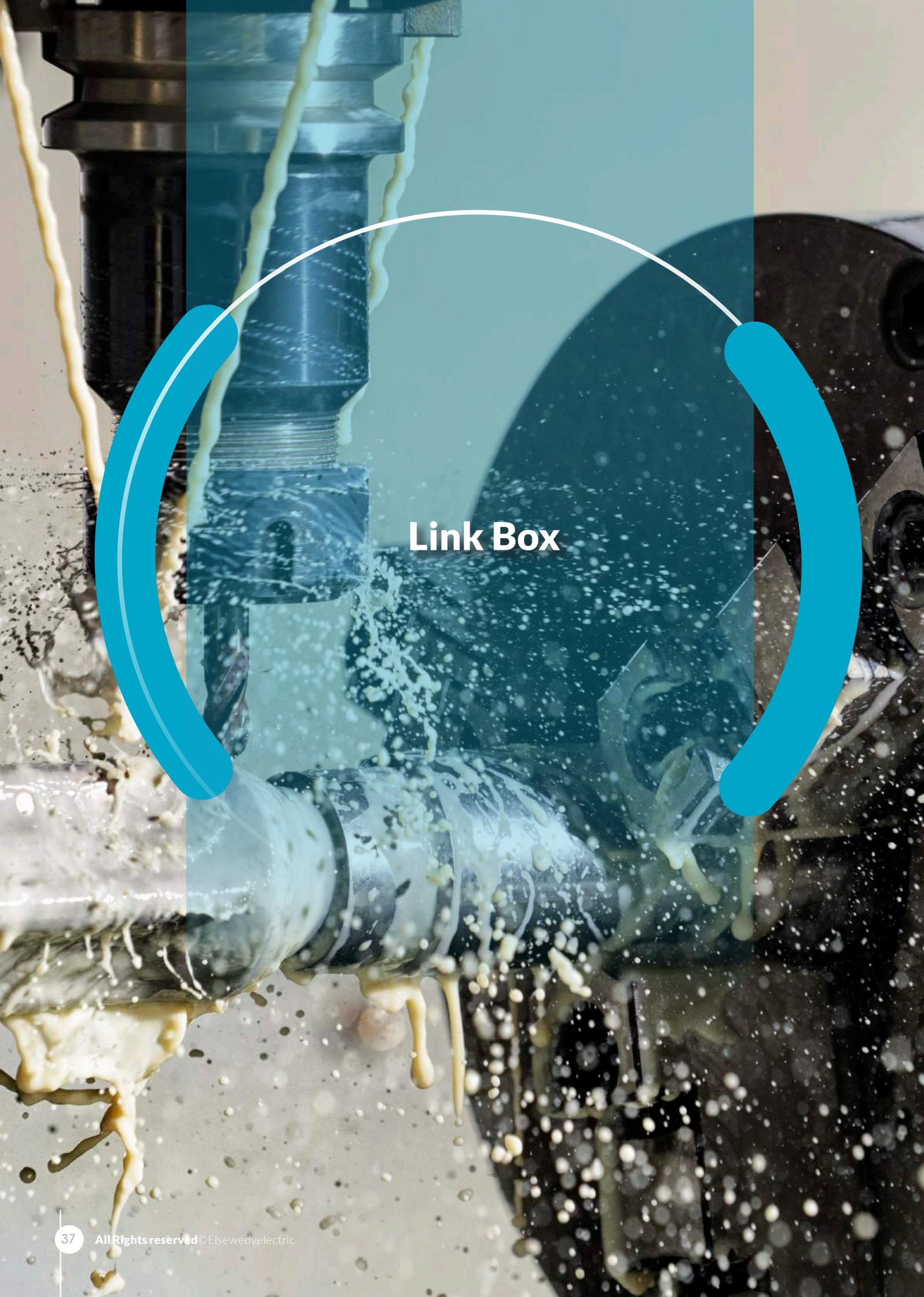


### Pre-assembled Cable Connector (Jumper)

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.

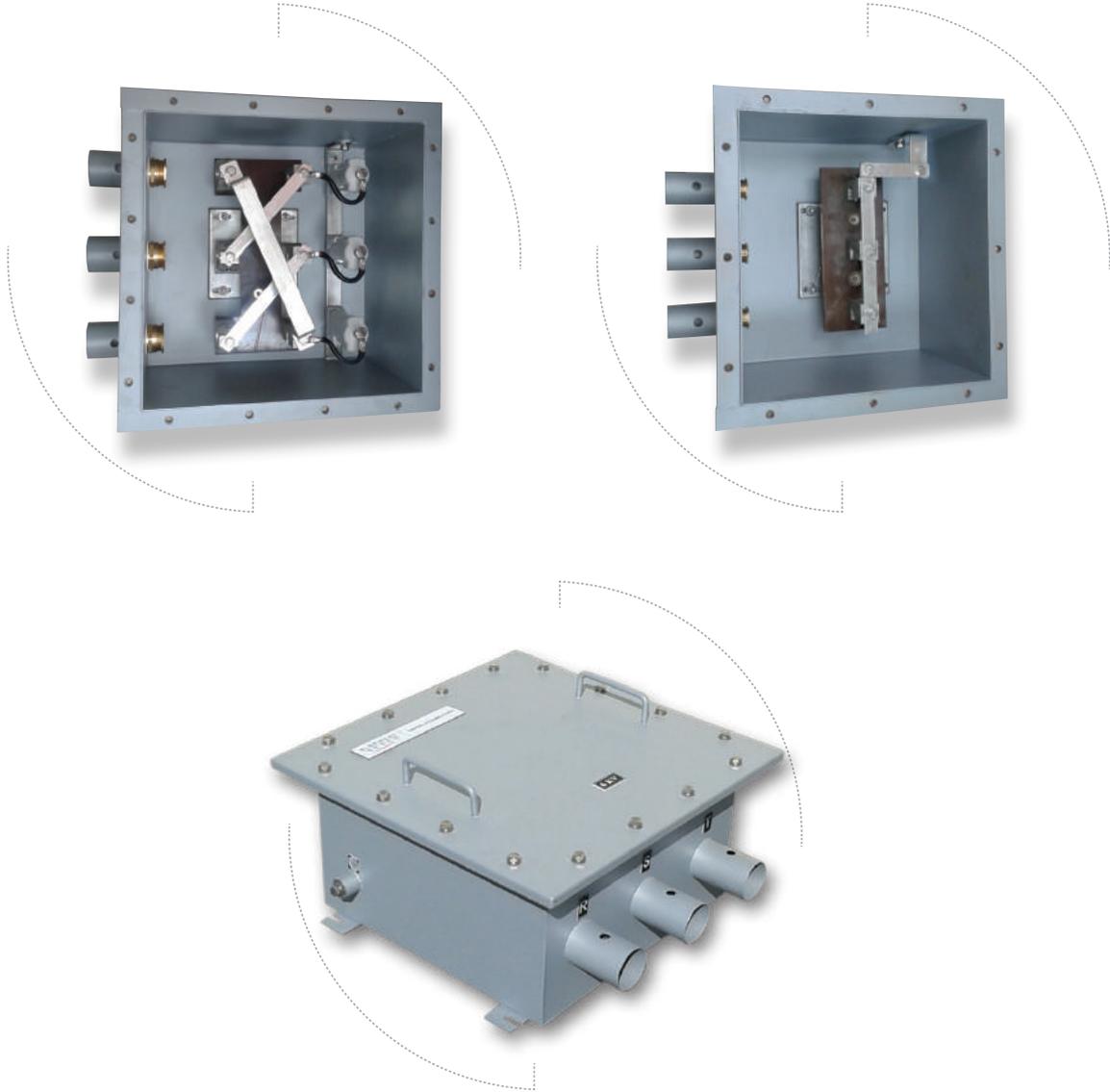
### Connecting Plug

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



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 GCB terminations, 4 joints with screen separation and link boxes

Rated voltage, U <sub>m</sub> /U <sub>n</sub>	180/20 (245) kV	Conductor material	Cu
Conductor cross-section	630/26 mm <sup>2</sup>	Insulation material	XLPE

**MANUFACTURERS** \*)

- Cable: Epsowedy Cables, 10<sup>th</sup> of Ramadan City, Egypt
- Accessories: Epsowedy SECCO, 10<sup>th</sup> of Ramadan City, Egypt and HIL cables GmbH, Calbe/Berlin, Germany

**CLIENT** Epsowedy Cables, 10<sup>th</sup> 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 reference as that tested rests with the manufacturer.

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

Copyright: Only integral reproduction of this Certificate is permitted without written permission from KEMA. Electronic copies in any form or on any medium are prohibited. 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.



J. A. M. Vlietman  
Director, testing, responsible for  
Certification The Netherlands  
Arnhem, 8 December 2015

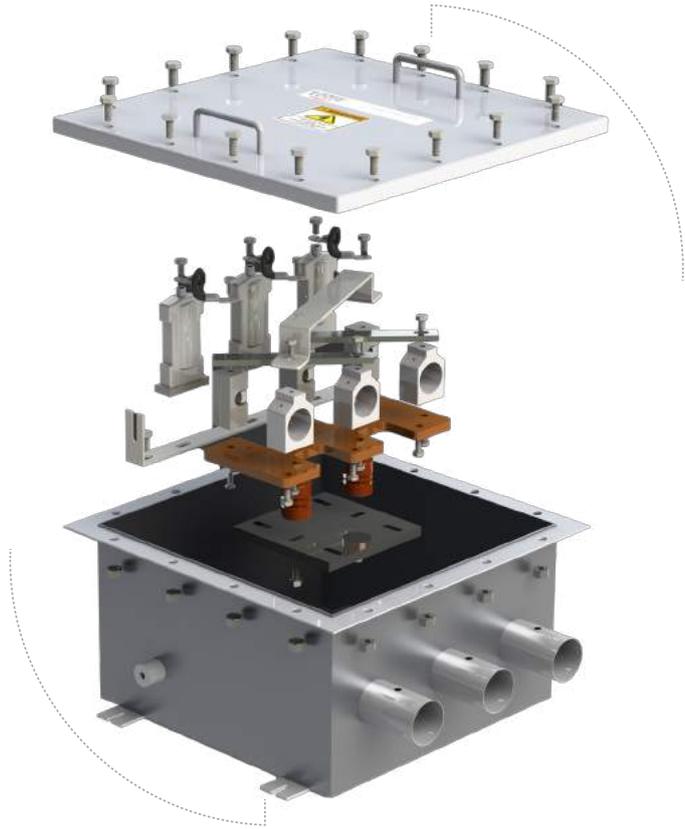
## Link Box

Up to 400 kV

## Features

## Mechanical features

- Enclosure 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.



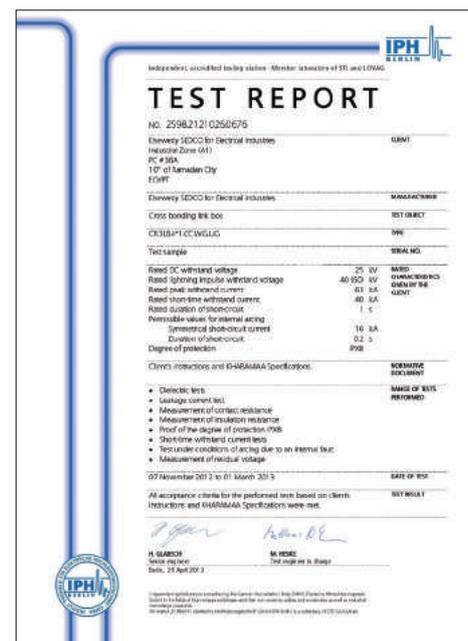
## Electrical features

- Accommodate single core or concentric cables.
- Suitable for earthing cable leads C.S.A up to 400mm<sup>2</sup>.
- 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

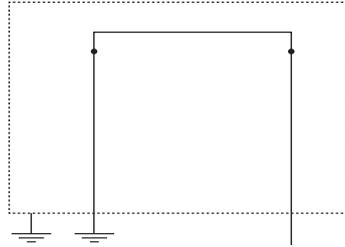
	Item	Parameters
1	DC withstand voltage	25kV/1 min.
2	Impulse withstand voltage	40 kV
3	AC withstand voltage	10 kV/1 min.
4	Insulating resistance	≥100MΩ
5	Contact resistance	≤20μΩ
6	Short circuit test current (as per Cable C.S.A.)	40kA / 1 sec
7	Degree of protection	IP 68
8	SVL leakage current (as applicable)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



## Selection Product

### Single Phase Solid Earthed Link Boxes Without SVL

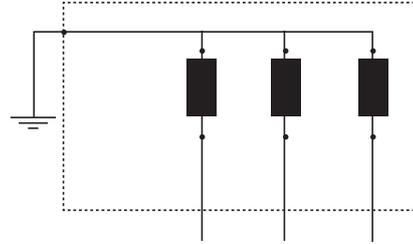
Link Diagram



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

### Three Phase Direct Earthed with SVL

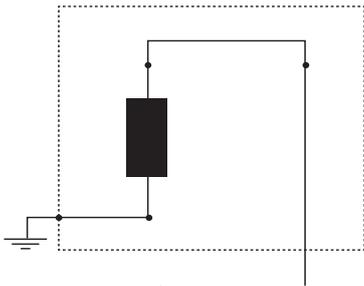
Link Diagram



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

### Single Phase Direct Earthed Link Boxes With SVL

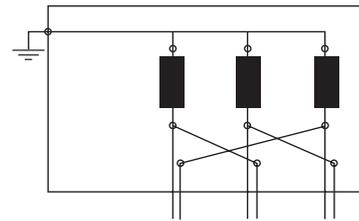
Link Diagram



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

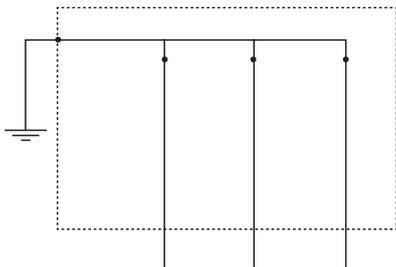
Link Diagram



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

### Three Phase Solid Earthed Link Boxes Without SVL

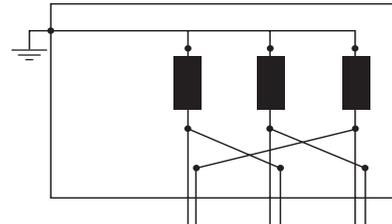
Link Diagram



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 400mm<sup>2</sup>.
- 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.



# Heat Shrink Products

## 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.



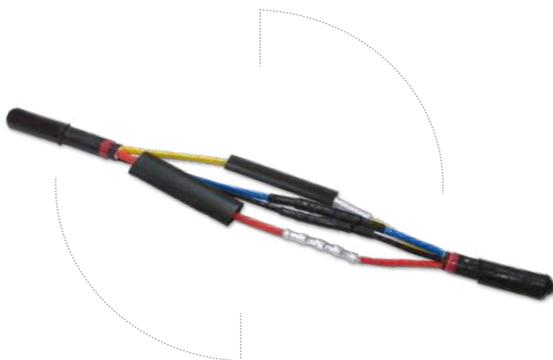
### End Caps

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 joining 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

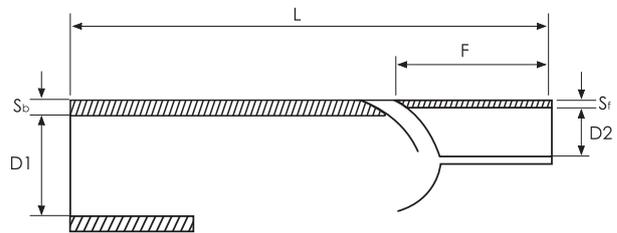
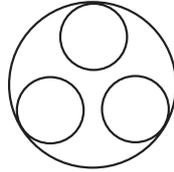
SHST (cable-Termination) are outstandingly suitable for terminating multi-core, polymeric (XLPE, PVC ...) and power cables, Al or Cu, armored or non-armored in the low voltage range (up to 1kV).

## 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 <sup>2</sup>	12 Min	ISO 527
Elongation at Break	%	300 Min	ISO 527
Thermal Ageing	(150 °C for 168H)		ASTM D 573
Tensile Strength	N/mm <sup>2</sup>	10 Min	ISO 527
Elongation at Break	%	250 Min	ISO 527
Water Absorption	%	< 0.5	DIN 53495
Volume Resistivity	Ohm.cm	10 <sup>12</sup> Min	ASTM D 257
Carbon Black Content	%	> 2.5	ASTM D 1603
Density	gm/cm <sup>3</sup>	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

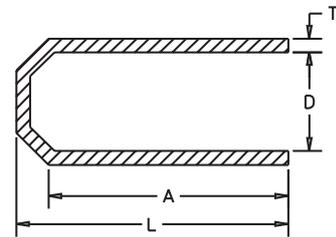
- All dimensions in mm.
- For any other dimensions, please contact us.
- Due to continuous product improvements, some specifications can change without prior notice.

## 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 <sup>2</sup>	12 Min	ISO 527
Elongation at Break	%	300 Min	ISO 527
Water Absorption	%	< 0.5	DIN 53495
Volume Resistivity	Ohm.cm	10 <sup>12</sup> Min	ASTM D 257
Carbon Black Content	%	> 2.5	ASTM D 1603
Density	gm/cm <sup>3</sup>	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

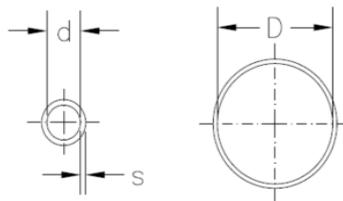
- All dimensions are in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvements, some specifications can change without prior notice.

## 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 <sup>3</sup>	0.95 ± 0.03	ASTM D 792
Hardness Shore D	SH	49± 4	ASTM D 2240
Tensile Strength	N/mm <sup>2</sup>	10 Min	ISO 527
Elongation at Break	%	400 Min	ISO 527
Thermal Ageing	(150 oC for 168H)		ASTM D 573
Tensile Strength	N/mm <sup>2</sup>	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 <sup>12</sup> Min	ASTM D 257/IEC 93
Dielectric Strength	kV/mm	10 Min	ASTM D 149/IEC 243
Heat Shock		Pass	IEC 60811-3-1

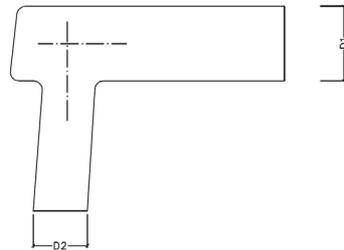
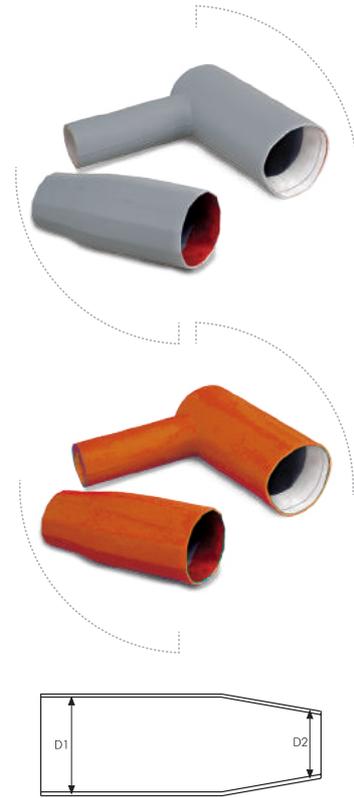
Type	Diameter		(S) mm Wall Thickness After Recovery
	(D) mm as Supplied	(d) mm After Recovery	
12/3	12	3	1.8
22/6	22	6	2.2
33/8	33	8	2.5
40/12	40	12	2.5
55/16	55	16	2.7
101/25	101	25	3.5
124/34	124	34	3.6
160/50	160	50	3.5
180/60	180	60	3.5
225/75	225	75	5
235/65	235	65	3.7
265/75	265	75	4
300/75	300	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 <sup>3</sup>	1.11 ± 0.03	ASTM D 792
Tensile Strength	N/mm <sup>2</sup>	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 <sup>2</sup>	8 Min	ISO 527
Elongation at Break	%	250 Min	ISO 527
Volume Resistivity	Ohm.cm	10 <sup>12</sup> 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

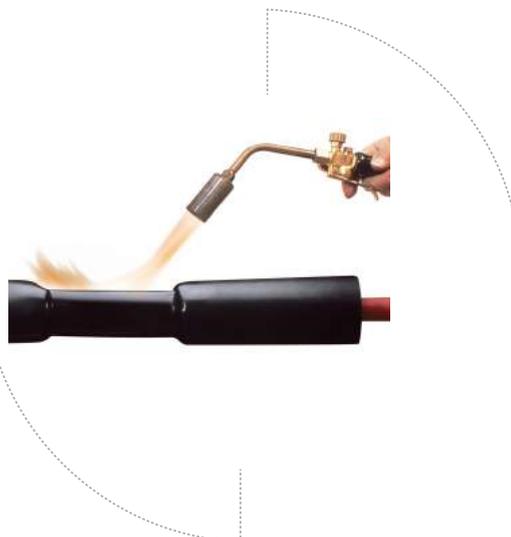


1C = Single Core  
 2C = Two Core  
 3C = Three Core  
 4C = Four Core  
 5C = Five Core

Conductor Size (mm <sup>2</sup> )
0006
0010
0016
0025
0035
0050
0070
0095
0120
0150
0185
0240
0300
0400
0500
0630

Armor Restoration Kit (If specified)	
N	Non Required
A	Galvanized Steel Cage
B	Copper Tubular Braid
C	Aluminum Cage

Connector	
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



1C = Single Core  
2C = Two Core  
3C = Three Core  
4C = Four Core

Conductor Size (mm <sup>2</sup> )
0006
0010
0016
0025
0035
0050
0070
0095
0120
0150
0185
0240
0300
0400
0500
0630

Lug	
Type	Symbol
Aluminum	1
Copper	2

Single Core	20 cm
Four Core	50 cm
Special Tube Length	

**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.



# Metal Accessories

Metal Accessories



Friction Lugs



Copper braid



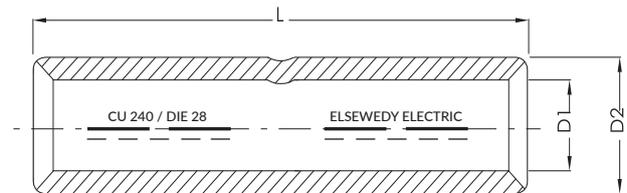
Tubular Copper Connectors

## 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 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 <sup>2</sup>	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)

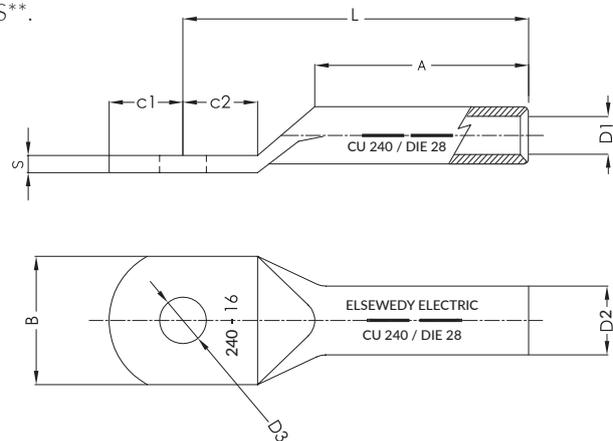
(\*\*\*) IACS: International annealed copper standard.

- 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 <sup>2</sup>	Stud Size	Conn. Die D <sup>(*)</sup>	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.

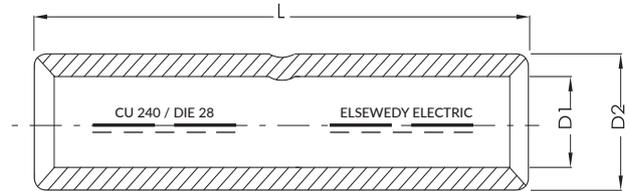
- All dimensions in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, some specifications can change without prior notice.
- Hole size can be changed according to DIN 46235

## 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 <sup>2</sup>	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.

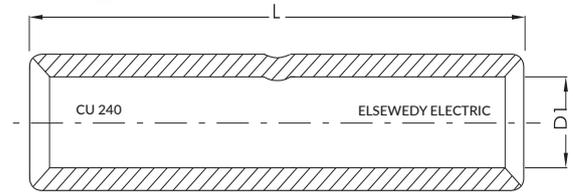
- Recommended crimping die size for hexagonal type with hydraulic crimping tool.
- The crimping area of the connector should not be less than 50% of the connector length (L).
- All dimensions in mm.
- Other dimensions, shapes or sizes are available upon request.
- Due to continuous product improvement, 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 <sup>2</sup>	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

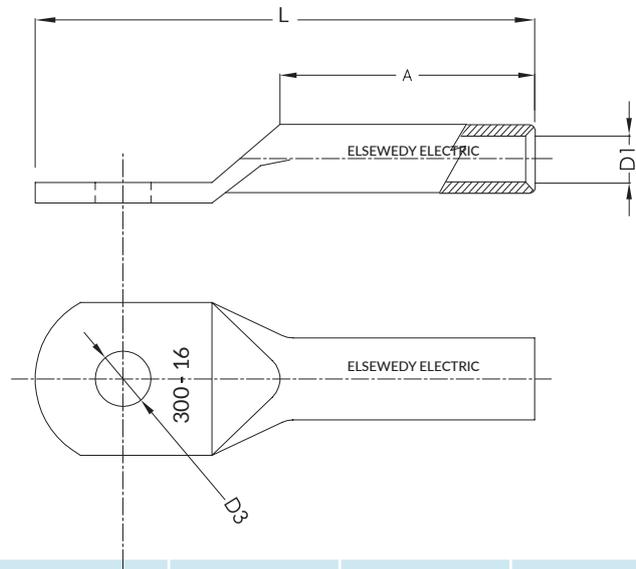
(\*) IACS: International annealed copper standard.

- 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 <sup>2</sup>	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

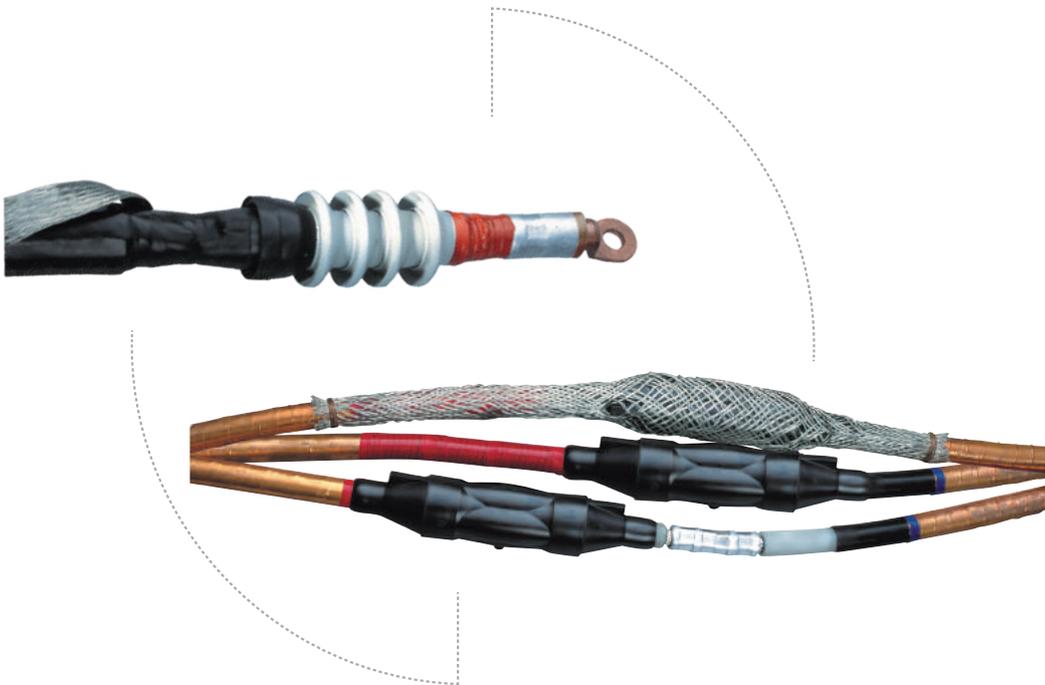
#### Application

- 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 <sup>2</sup>	48	5 : 6	16
Copper braid -25 mm <sup>2</sup>	48	7 : 8	25
Copper braid -35 mm <sup>2</sup>	48	10:11	25
Copper braid -50 mm <sup>2</sup>	48	15	25



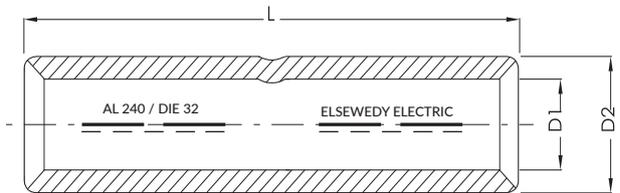
## Metal Accessories

## 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 <sup>2</sup>	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))

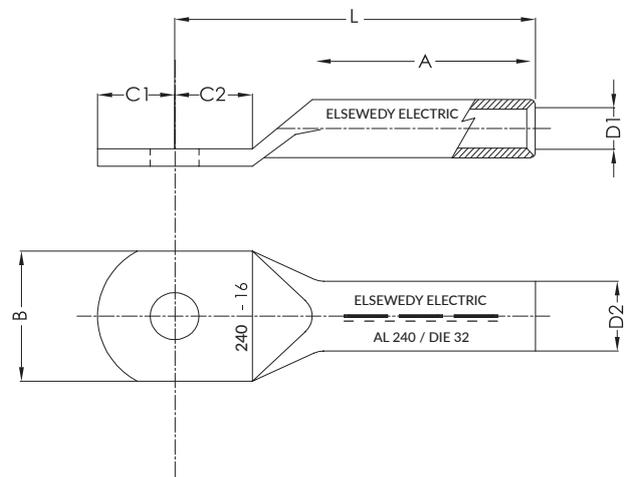
L= 120 mm for ( MV cables joints premolded type PCJ size (N,.....,S))

- 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 <sup>2</sup>	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.

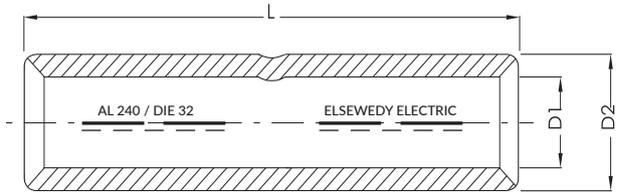
## Metal Accessories

## 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 <sup>2</sup>	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.

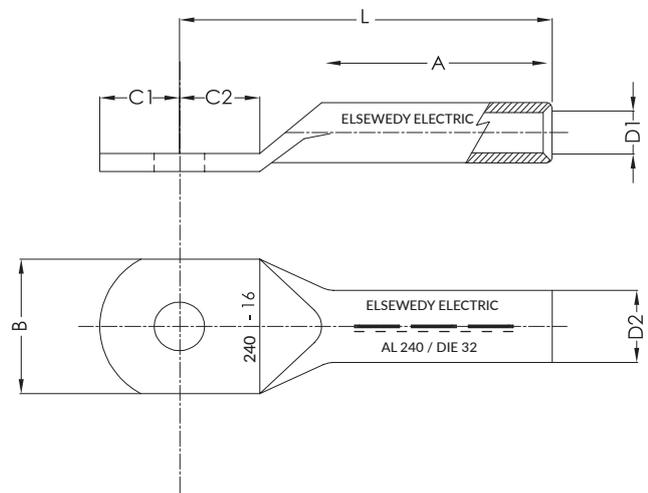
(\*\*\*) IACS: International annealed copper standard.

- 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 <sup>2</sup>	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.

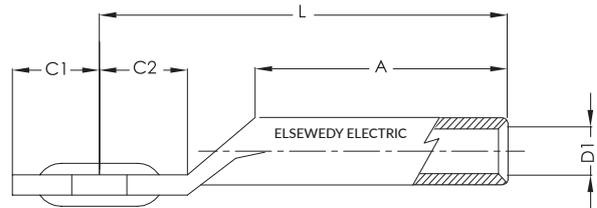
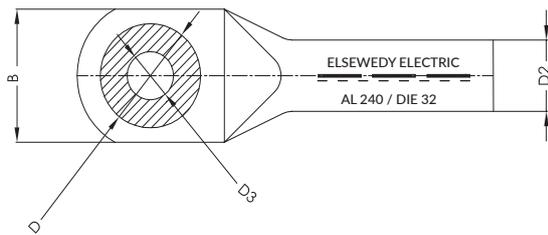
## Metal Accessories

### 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 <sup>2</sup>	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).

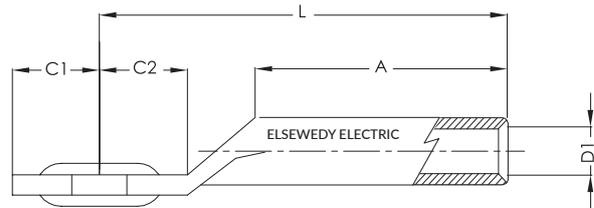
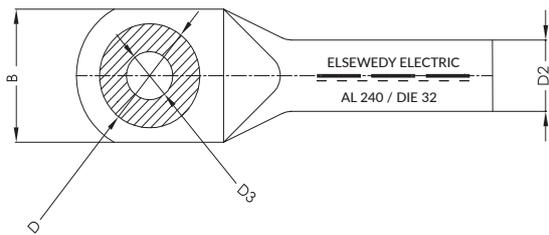
Metal Accessories

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 <sup>2</sup>	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).

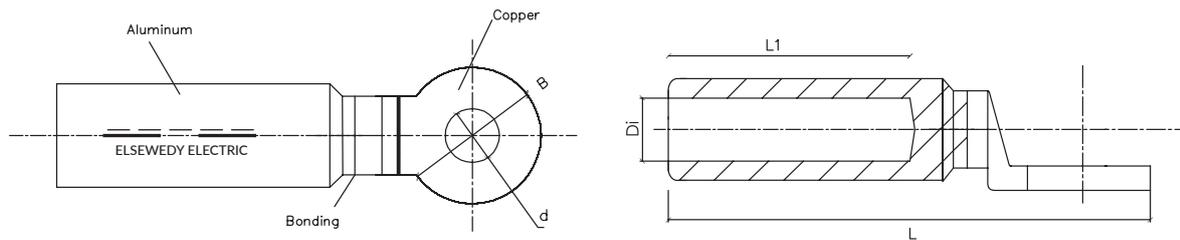
## Metal Accessories

### 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 mm2	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 +/-5mm 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).

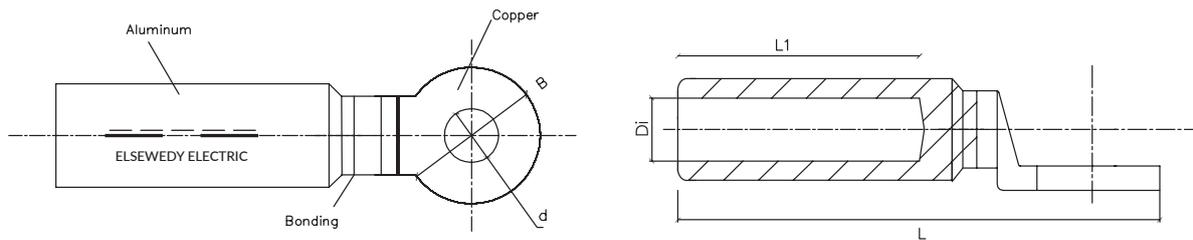
## Metal Accessories

## 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.

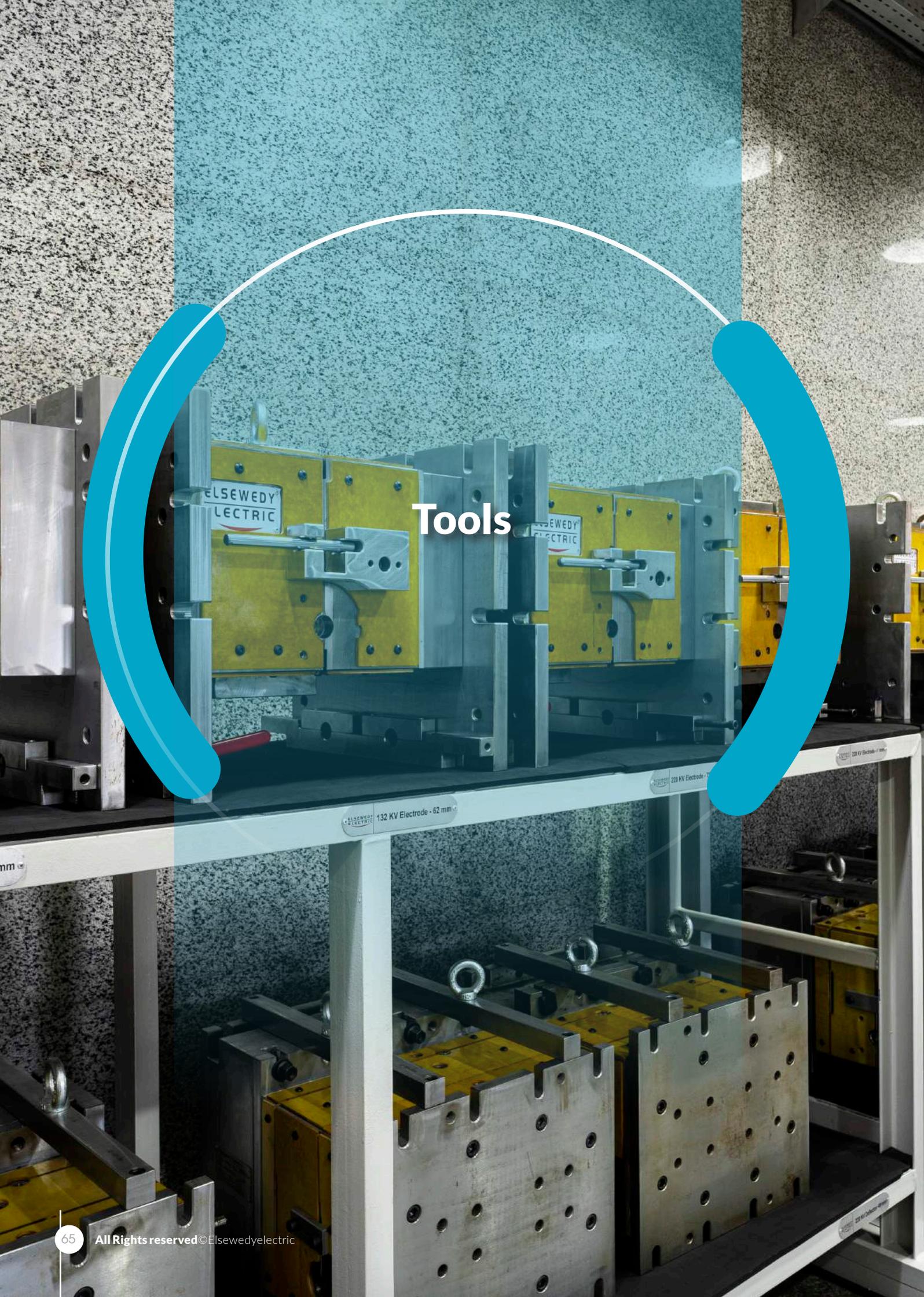


Bi-metallic friction lugs assure a maximum reliability connection of aluminum cables to copper busbars, copper bushings,..etc



Code	Conductor Size mm <sup>2</sup>	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  $\pm 5$ mm and in diameters  $\pm 3$ .
- 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

Tools

Grinding Machine



Insulation Remover



Stroring Set



## 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.



## 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.



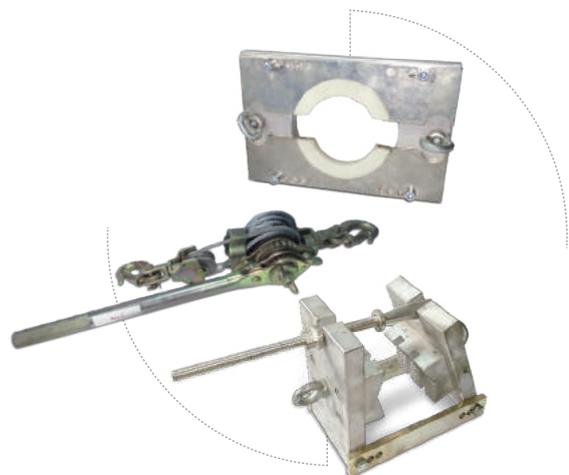
## Stroring Set

### 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

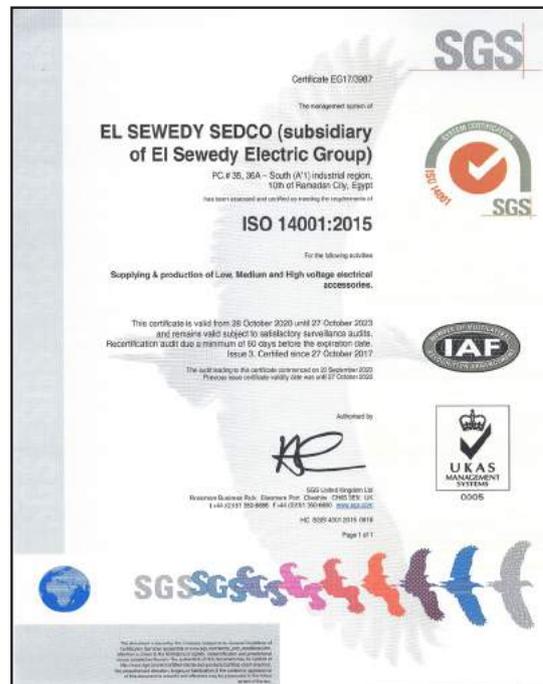
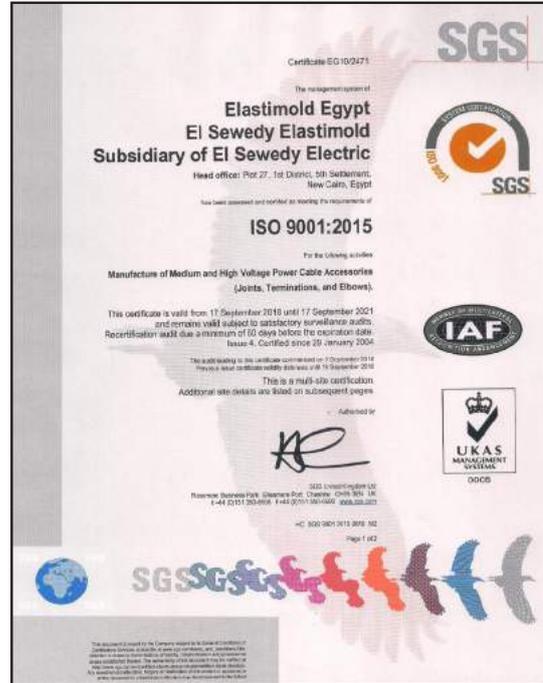
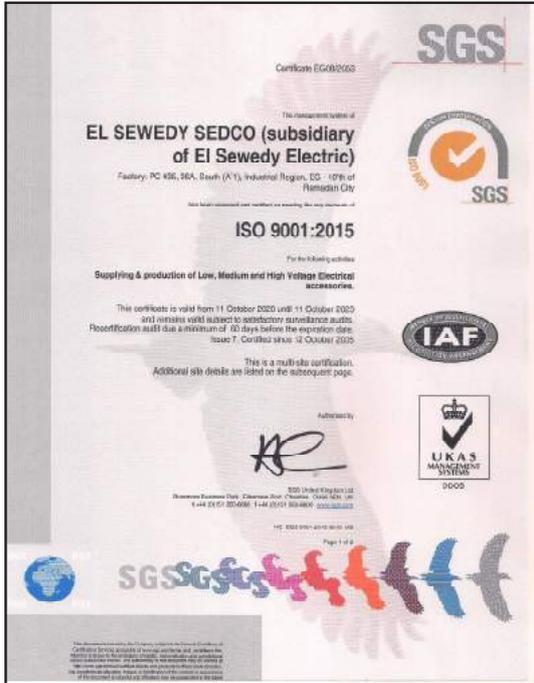
- Can be used over any cable regardless it C.S.A.
- Reduce required time and power.
- Safe and controlled





# Certifications

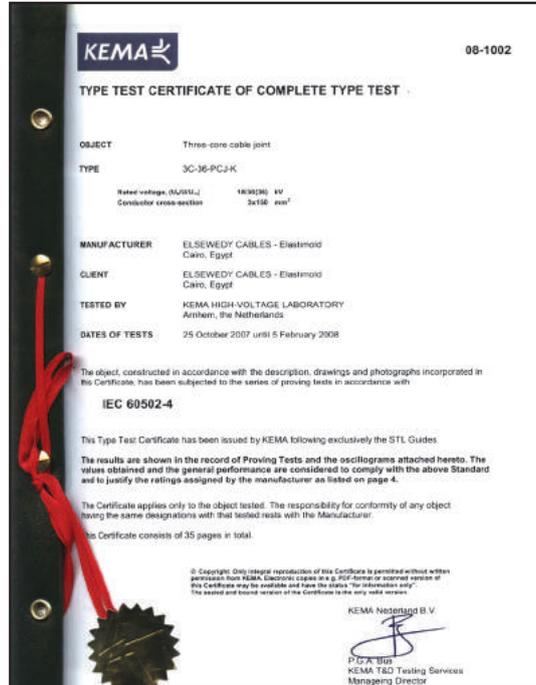
Certifications







# Product Type Testing Certificates and Reports



Product Type Testing Certificates and Reports

**TEST REPORT**  
Report No. (48/2020)

**CLIENT:** EL SEWEDY CABLES,  
10<sup>th</sup> of Ramadan City, Industrial Zone.

**Report Date:** 28 / 1 / 2020

**Place:**  
LABORATORIES OF EXTRA HIGH VOLTAGE RESEARCH CENTER.  
Internal Code: TO-AC-12-11-12-01.

**Standard Specification:**  
- IEC 60849 (2011) "Power cables with extruded insulation and their accessories for rated voltages above 30 kV (Um=36 kV) up to 150 kV (Um=170 kV).

**Requirements:**  
- Type tests according to IEC 60846.

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

**1- Power cable 30/66 kV with the following specifications:**

- Manufacturer : EL SEWEDY CABLES.
- Type : 30/66 KV/CXL/PE/LEAD HDPE - 1x2500 mm<sup>2</sup>.
- Nbs. of Phases : 1
- Insulation : XLPE
- Conductor Material : Copper
- Conductor cross-section : 2500 mm<sup>2</sup>
- Metallic Screen : LEAD
- Sheath Material : HDPE-STs
- Sheath Color : Black
- Rated Frequency : 50 Hz
- Water Penetration Design : A barriers are included which prevents longitudinal water penetration along the conductor (swelling 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 screen (water blocking tape).





**TEST REPORT**  
Report No. (48/2020)

**2- Porcelain outdoor Termination with the following specifications:**

- Manufacturer : Egyptian Company for Advanced Industries ELSEWEDY SEDCO - Subsidiary of ELSEWEDY ELECTRIC
- Type : SEPT72- ELSEWEDY ELECTRIC
- Creepage distance : 2970 mm
- Filling compound : Silicon oil
- Stress control material : EPDM
- Gaskets : O - ring
- Voltage class : 66kV
- Cable SCA : 2500 mm<sup>2</sup>
- Insulator material : porcelain

**3- Outdoor Termination with the following specifications:**

- Manufacturer : Egyptian Company for Advanced industries ELSEWEDY SEDCO - Subsidiary of ELSEWEDY ELECTRIC
- Type : SECT72- ELSEWEDY ELECTRIC
- Creepage distance : 2970mm
- Filling compound : Silicon oil
- Stress control material : EPDM
- Gaskets : O - ring
- Voltage class : 66kV
- Cable SCA : 2500 mm<sup>2</sup>
- 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 : 69 TCI- ELSEWEDY ELECTRIC
- Description : Premolded joint
- Method of ground : Lead Cover
- Type of overall casing : heat shrink tube
- Connector Type : Compression Connector
- Type of insulation : EPDM
- Voltage class : 66kV
- Cable SCA : 2500 mm<sup>2</sup>

**Description of the Equipment:**

- High voltage reactor - 400 kV - 3600 kVA - Type: (RSK) - Serial No. 204322/96
- PD detector - Type: (TE57)
- Tan δ measurement device - Type 254321/02 Serial No. 144281.
- Standard capacitor - Type XK-010 Serial No. 434231
- Impulse voltage generator 2400 kV - 180 kJ - Type SGV 2400/180 SPZ.
- Air oven up to 200 °C - Type BINDER - Serial No. 02-32772
- Testing machine 100 kN - Type LLOYED - Model LK100 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-15-05-28-01.

**Requirements:**  
- Testing according to IEC 60502-4.

**Standard Specification:**  
- IEC 60502-4 "Power cables with extruded insulation and their accessories for rated voltages from 1.0 kV (U<sub>n</sub>=1.2 kV) up to 30 kV (U<sub>n</sub>=36 kV)".  
Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U<sub>n</sub>=7.2 kV) up to 30 kV (U<sub>n</sub>=36 kV).  
- IEC 61442 "Test method for accessories for power cables with rated voltages from 6 kV (U<sub>n</sub>=7.2 kV) up to 30 kV (U<sub>n</sub>=36 kV)".

**Description of the Specimen:**

**1- One 35 kV Premolded Power Cable Outdoor Termination with the following specifications:**

- Manufacturer : Elastimold Elastimold Egypt - Elsewedy SEDCO CO. Subsidiaries of Elsewedy Electric - Egypt.
- Type : MTG 35 kV.
- Leakage path : 830 mm.
- Flash over path : 430 mm.
- Diameter of sheds : 100 mm.
- Number of sheds : 7.
- Terminations Lug : Compression Lugs.

**2- One 35 kV Premolded Power Cable Indoor Termination with the following specifications:**

- Manufacturer : Elastimold Elastimold Egypt - Elsewedy SEDCO CO - subsidiaries of Elsewedy Electric - Egypt.
- Type : MTG 35 kV.
- Leakage path : 625 mm.
- Flash over path : 370 mm.
- Diameter of sheds : 100 mm.
- Number of sheds : 5.
- Terminations Lugs : Compression Lugs.





**TEST REPORT**  
REPORT NO. (236/2010)

**CLIENT:** Elastimold Egypt - Elsewedy cables CO.

**Report Date:** 7 / 11 / 2010.

**Place:**  
Laboratories of Extra High Voltage Research Center.  
Internal code: TO-AC-10-10-03-01.

**Requirements:**  
- Testing according to IEC (60502-4) Table (10).

**Standard Specification:**  
- IEC 60502-4 "Power cables with extruded insulation and their accessories for rated voltages from 1.0 kV (U<sub>n</sub>=1.2 kV) up to 30 kV (U<sub>n</sub>=36 kV)".  
Part 4: Test requirements on accessories for cables with rated voltages from 6 kV (U<sub>n</sub>=7.2 kV) up to 30 kV (U<sub>n</sub>=36 kV).  
- IEC 61442 "Test method for accessories for power cables with rated voltages from 6 kV (U<sub>n</sub>=7.2 kV) up to 30 kV (U<sub>n</sub>=36 kV)".

**Description of the Specimen :**

**1- One 35 kV Premolded Power Cable Outdoor Termination with the following specifications:**

- Manufacturer : Elastimold Egypt.
- Type : MTG 35 kV.
- Size : B.
- Module & Stress Cone : PA.
- Leakage path : 620 mm.
- Diameter of sheds : 90 mm.
- Number of sheds : 7.
- Terminations Lugs : Copper lugs made by EL-Sewedy SEDCO.

**2- One 35 kV Premolded Power Cable Indoor Termination with the following specifications:**

- Manufacturer : Elastimold Egypt.
- Type : MTG 35 kV.
- Size : B.
- Module & Stress Cone : PA.
- Leakage path : 470 mm.
- Diameter of sheds : 90 mm.
- Number of sheds : 5.
- Terminations Lugs : Copper lugs made by EL-Sewedy SEDCO.





**TEST REPORT**

MINISTRY OF HIGHER EDUCATION  
King Fahd University of Petroleum & Minerals  
RESEARCH INSTITUTE  
Center for Engineering Research

**TEST REPORT**

Test report No.:	CER4904-0037	Date:	March 5, 2017
Report on:	Power Frequency Voltage Withstand test for 33 kV Elastomold separable elbow cable termination.		
Client request:	E-mail dated July 17, 2016, and September 28, 2016		
Client:	Saudi Electricity Company, Riyadh- Saudi Arabia Attn: Eng. Muhammad A. Al-Nadhary Senior Distribution Engineering Expert Technical Improvements & Standards, Distribution Services - SEC HQ, Tel. #: +966 118579524		
KFLPM Quotation:	E-mail dated July 17, 2016, and September 28, 2016, and KFLPM laboratory service contract No. CER4904-0037, dated December 7, 2016.		
Test samples:	<ol style="list-style-type: none"> <li>Elastomold, 3C-M465-M1-400, interface C, 33 kV pre-mold termination, dead-break separable connector elbow, manufactured by Elsewedy SEDCO / Elastomold Egypt-Subsidiaries of Elsewedy Electric- Egypt and supplied locally by Al Abdulkarim Holding Company (A.H.U), Jeddah, Saudi Arabia.</li> <li>Outdoor, SEL, 8MU 33 kV, Type TPR6-HP as per SEC's specification 32-NDMS-07, manufactured by SEL Company from Italy.</li> <li>A/Bare cable of 36 kV, AL 3X400 mm<sup>2</sup>, as per SEC Specifications 11-S2MS-03.</li> </ol>		
Test purpose:	To conduct power frequency voltage withstand test for the Elastomold, 3C-M465-M1-400, interface C, 33 kV cable separable elbow 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:	IEC 62271-1		
Conclusion:	The tested Separable Elbow Connector, Elastomold part # 3C-M465-M1-400, passed the test of the applied voltage of 70 kV for each core as per IEC 62271-1.		

Eng. Khaled Y. Al-Saifi  
Supervisor, KFLPM-High Voltage Laboratory

Dr. Esai M. Althems  
Director, Center for Engineering Research

Dhahran 31261, Saudi Arabia  
Telephone: (91) 80-2988  
Fax: (91) 80-2996  
ce@kfupm.edu.sa

Form No. HV&SC Lab/HV-063  
**HIGH VOLTAGE AND SHORT CIRCUIT LABORATORY, NTDC, RAWAT-ISLAMABAD**

No. HVISCLABTR000341-044  
Date: 19.12.2016

**TEST REPORT**

**TYPE TESTS PERFORMED ON AN 11 KV TERMINATION KIT**

- Client: M/S Associated Commercial Agencies (Pvt.) Ltd., (ACA) Lahore
- Specimen Identification:
  - Type: Indoor/Outdoor Pre-Molded Termination Kit 600 mm<sup>2</sup>, 1-Core (1000 MCM)
  - Make: M/S Elastomold, Egypt (Sedco Elsewedy, Egypt)
  - Rating: 8.715 kV
  - Serial No.: 1-C-20MTG-JB-500-02-1
  - Purchase: Prototype
  - Purchase order/date: N/A
  - Supplied by (other than manufacturer): N/A
  - Required by (other than manufacturer): N/A
- Relevant test standard(s)/spec.: P-184-06, IEEE-48-2009
- Tests performed on: Nov 21 to Dec 09, 2016
- Test outcome: Given in Table below:

Table: The tests performed and the outcome.

S. No.	Tests performed	Requirements	Results	Remarks
1.	Power frequency voltage 10 sec (dry) withstand test.	No breakdown or flashover shall occur at 50 kV.	Withstood	Pass
2.	Power frequency voltage 10 sec (wet) 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 8 hour (dry) withstand test.	No breakdown or flashover shall occur at 55 kV.	Withstood	Pass
4.	Partial discharge measurement test.	The magnitude of partial discharge shall not exceed 5 pC at 13 kV.	PD free	Pass (Test was performed at HQ SCSCL Lahore on 18.11.2016).
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 50 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 32.5 kA should flow for 2s through the termination (2-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 breakdown nor flashover. Moreover, the sample will have no sign of visible tracking or erosion.	Qualified	Pass (Applicable only for indoor termination).
10.	Tracking resistance test.	A voltage of 11.3 kV shall be applied on the termination in a humid chamber. The leakage current through the surface of termination should not exceed 500 mA during 101 operations of rain ON/OFF.	Qualified	Pass (Applicable only for outdoor termination).
11.	Salt fog test.	Six-flashovers through the surface of termination are obtained with rain of high salinity. After washing 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 termination).

Remarks: On the basis of above test results, the indoor/outdoor termination kit is declared to have successfully "QUALIFIED" the requisite type test.

Tested/supervised by:  
1. Engr. Sajeev Zulfkar Deputy Manager (Tech.), High Voltage Division

Tested/witnessed by:  
1. Engr. Ameer Ali Additional CE (S&S) NTDC, % CE (S&S), NTDC, Lahore  
2. Engr. Amir Shauzeed Deputy Manager (D&S) NTDC, % CE (S&S) NTDC, Lahore  
3. Mr. Tauqeer-ul-Haq Abbasi Senior Manager (Marketing and Sales), M/A ACA (Pvt.) Ltd., Lahore.

Engr. Umar Farooq  
Chief Engineer

Product Type Testing Certificates and Reports

**ELASTIMOLD EGYPT**

**Type Test Report**

Test Object: Premolded cable joint and Terminations  
 Cable Size: 1 core 500 mm<sup>2</sup> CU/XLPE, 36 kV  
 Test loop: 75m of cable, has one joint in the middle, Premolded terminations at both ends, the cable is a non-test object  
 Configuration: 19/35 (36 kV)  
 Voltage Class: 19/35 (36 kV)  
 Installed by: ELASTIMOLD EGYPT / ELSEWEDY SEDCO certified joiners  
 Manufactured by: ELASTIMOLD EGYPT - ELSEWEDY SEDCO - Subsidiaries of ELSEWEDY ELECTRIC  
 Test location: Elsewedy Cables Egypt Factory Laboratory  
 Test witnessed by: BV - Egypt - Dr. Ahmed Mohammed Ahmed Hal  
 Ref. Standards: IEC 60502-4, and test method as per IEC 61442

S. NO.	Type of test	Test procedures / method As per IEC 61442	Requirements and Acceptance Criteria
1	AC withstand voltage	Clause 4	test voltage : 81 KV test time duration : 5 min test criteria : no breakdown test voltage : at 22.5 kv and 30 KV
2	Partial Discharge test at ambient temperature	Clause 7	test time duration : 10 Sec test criteria : < 10 pC test voltage : 75 KV
3	Impulse voltage test at ambient	Clause 5	no. of impulses : 10 impulses +ve and 10 -ve temperature : ambient temp. test criteria : no breakdown
4	Heating Cycle test in air	Clause 9.2 and 9.3	no. of cycles : 30 cycles each cycle time : 8 hrs. (8hr heating + 2hr cooling) test criteria : no breakdown test voltage : 45 KV
5	Heating Cycle test in water	Clause 9.2 and 9.3	no. of cycles : 30 cycles each cycle time : 8 hrs. (8hr heating + 2hr cooling) test criteria : no breakdown test voltage : 30 KV
6	Partial Discharge test at ambient temperature	Clause 7	test time duration : 10 sec test criteria : < 10 pC
7	Visual examination	-	for information only

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**ELASTIMOLD EGYPT**

**Identification of the test object:**

1. **36 KV Premolded power cable joint with the following specifications:**

Manufacturer: ELASTIMOLD EGYPT - ELSEWEDY SEDCO Subsidiaries of ELSEWEDY ELECTRIC  
 Type: PCJ 36 KV  
 Material: EPDM Rubber  
 Description: Premolded Straight Joint, PCJ 36 KV, 1x500 mm<sup>2</sup>  
 Joint connector: Compression lined copper conductor  
 Year of Manufacturing: 2020

2. **36 KV Premolded power cable Terminations with the following specifications:**

Manufacturer: ELASTIMOLD EGYPT - ELSEWEDY SEDCO Subsidiaries of ELSEWEDY ELECTRIC  
 Type: MTG 36 KV  
 Material: EPDM Rubber  
 Description: Premolded termination, MTG 36 KV, 1x500 mm<sup>2</sup>  
 Termination lug: compression lined copper lug  
 Year of Manufacturing: 2020

**Present at the test:**

Mr. Ahmed Mohamed Ahmed Hal	BV Egypt - 3 <sup>rd</sup> party inspector
Mr. Sayed Abd Elattar	ELSEWEDY CABLE
Mr. Ahmed El Arousy	ELSEWEDY CABLE
Mr. Wael Mohamed	ELASTIMOLD EGYPT
Mr. Mohamed Foda	ELASTIMOLD EGYPT
Mr. Ahmed Ebead	ELASTIMOLD EGYPT
Mr. Ahmed Farag	ELSEWEDY Cables UAE
Ms. Abla Abdalla Alnagbi	Eihad Water and Electricity
Mr. Abdulgasim Elzaki	Eihad Water and Electricity
Mr. Mubarak Hussain	Scan Electromechanical Cont. Co. L.L.C
Mr. AbuThahir Yousof	Elsewedy Power Electrical Contracting L.L.C

Page 2 of 27

**TEST REPORT**  
 REPORT NO. (550/2020)

**CLIENT:** CRYPTON COMPANY FOR ADVANCED INDUSTRIES (ELSEWEDY SEDCO) - SUBSIDIARY OF ELSEWEDY ELECTRIC

**Report Date:** 14/09/2020

**Place:** LABORATORIES OF EXTRA HIGH VOLTAGE RESEARCH CENTER, 40722 Cairo, Egypt  
 Internal code: TCA-AC-36-09-29-01

**Requirements:**  
 - Type test on outdoor, before premolded termination and joint for power cable 1R/30 kV, 3x400mm<sup>2</sup> according to IEC 60502-4.

**Standard Specification:**  
 - IEC 60502-4: Three cables with insulated termination and their accessories for rated voltages from 1.0 kV (U<sub>n</sub> = 1.2 kV) up to 30 kV (U<sub>n</sub> = 36 kV). Part 4: Test requirements on accessories for cables with rated voltages from 5 kV (U<sub>n</sub> = 7.2 kV) up to 30 kV (U<sub>n</sub> = 36 kV).  
 - IEC 61442: Test method for accessories for power cables with rated voltages from 5 kV (U<sub>n</sub> = 7.2 kV) up to 30 kV (U<sub>n</sub> = 36 kV).

**Description of the Specimens:**  
 The specimens consist of two samples. The sample consists of two premolded indoor termination and premolded joint, second sample consists of two premolded outdoor termination and joint. Each sample installed on a separate cable. The specification of the samples as follows:

**1- 36 kV three core premolded outdoor termination with the following specifications:**  
 - Manufacturer: ELSEWEDY SEDCO / ELASTIMOLD EGYPT Subsidiaries of ELSEWEDY ELECTRIC.  
 - Type: MTG 36KV.  
 - Material: EPDM Rubber.  
 - Leakage path: 100 mm.  
 - Flank over path: 445 mm.  
 - Diameter of sheds: 100 mm.  
 - Number of sheds: 10.  
 - Termination Lugs: Compression Lugs.

**2- 36 kV three core premolded indoor termination with the following specifications:**  
 - Manufacturer: ELSEWEDY SEDCO / ELASTIMOLD EGYPT Subsidiaries of ELSEWEDY ELECTRIC.  
 - Type: MTG 36KV.  
 - Material: EPDM Rubber.

Page 1 of 14

**TEST REPORT**  
 REPORT NO. (550/2020)

**CLIENT:** CRYPTON COMPANY FOR ADVANCED INDUSTRIES (ELSEWEDY SEDCO) - SUBSIDIARY OF ELSEWEDY ELECTRIC

**Report Date:** 14/09/2020

**Place:** LABORATORIES OF EXTRA HIGH VOLTAGE RESEARCH CENTER, 40722 Cairo, Egypt  
 Internal code: TCA-AC-36-09-29-01

**Requirements:**  
 - Type test on outdoor, before premolded termination and joint for power cable 1R/30 kV, 3x400mm<sup>2</sup> according to IEC 60502-4.

**Standard Specification:**  
 - IEC 60502-4: Three cables with insulated termination and their accessories for rated voltages from 1.0 kV (U<sub>n</sub> = 1.2 kV) up to 30 kV (U<sub>n</sub> = 36 kV). Part 4: Test requirements on accessories for cables with rated voltages from 5 kV (U<sub>n</sub> = 7.2 kV) up to 30 kV (U<sub>n</sub> = 36 kV).  
 - IEC 61442: Test method for accessories for power cables with rated voltages from 5 kV (U<sub>n</sub> = 7.2 kV) up to 30 kV (U<sub>n</sub> = 36 kV).

**Description of the Specimens:**  
 The specimens consist of two samples. The sample consists of two premolded indoor termination and premolded joint, second sample consists of two premolded outdoor termination and joint. Each sample installed on a separate cable. The specification of the samples as follows:

**1- 36 kV three core premolded outdoor termination with the following specifications:**  
 - Manufacturer: ELSEWEDY SEDCO / ELASTIMOLD EGYPT Subsidiaries of ELSEWEDY ELECTRIC.  
 - Type: MTG 36KV.  
 - Material: EPDM Rubber.  
 - Leakage path: 100 mm.  
 - Flank over path: 445 mm.  
 - Diameter of sheds: 100 mm.  
 - Number of sheds: 10.  
 - Termination Lugs: Compression Lugs.

**2- 36 kV three core premolded indoor termination with the following specifications:**  
 - Manufacturer: ELSEWEDY SEDCO / ELASTIMOLD EGYPT Subsidiaries of ELSEWEDY ELECTRIC.  
 - Type: MTG 36KV.  
 - Material: EPDM Rubber.

**Test Results:**  
 - Leakage path: 810 mm.  
 - Flank over path: 445 mm.  
 - Diameter of sheds: 100 mm.  
 - Number of sheds: 17.  
 - Termination Lugs: Compression Lugs.

**3- 36 kV three core premolded joint with the following specifications:**  
 - Manufacturer: ELSEWEDY SEDCO / ELASTIMOLD EGYPT Subsidiaries of ELSEWEDY ELECTRIC.  
 - Type: PCJ 36KV.  
 - Material: EPDM Rubber.  
 - Joint Connector: Compression AL connector.

**Description of the Equipment:**  
 - High voltage source: 400 kV - 5000 kVA - 50 Hz - Type (HSE) - Serial No. (00432970), Certificate No. (11623/0020)  
 - PD Detector - Type (IE 57), Certificate No. (1272/2018)  
 - Impulse voltage generator 800 kV - 40 kJ - Type LP40800M, Certificate No. (00929/2009)

**Test Samples:**  
 - Test samples were chosen under the responsibility of the client.

**Test:**  
 1. Dry AC voltage test and DC voltage test.  
 2. Wet AC voltage test for outdoor termination.  
 3. Partial discharge test at ambient temperature.  
 4. Impulse voltage test at elevated temperature.  
 5. Thermal cycle voltage test in air and thermal cycle voltage test under water.  
 6. Immersion test for outdoor termination only.  
 7. Partial discharge test:  
 7.1. at elevated temperature.  
 7.2. at ambient temperature.  
 8. Impulse voltage test at ambient temperature.  
 9. Dry AC voltage test.  
 10. Examination.

**Test Method and Results:**  
 1- Dry AC voltage test and DC voltage test.  
 Testing Engineer: Mohamed Shawk  
 Testing Date: 24/11/2020  
 - The test samples were subjected to a dry AC voltage test and DC voltage test in accordance with test No. 4 in subclause 5.9 of IEC 60502-4.  
 - The dry AC voltage was raised gradually to and held at 4.5 U<sub>n</sub> for 5 min.  
 - The DC voltage was raised gradually to and held at 4 U<sub>n</sub> for 15 min.  
 - The result of the voltage tests is shown in the following table:

Page 1 of 14

# Product Type Testing Certificates and Reports



**LABORATORY FOR EXTRA HIGH VOLTAGE RESEARCH CENTER**  
146 21 El-Dokki, Abu-El-Dokki, Giza  
Report No. (166/2021)  
Page 1 of 11

## TEST REPORT

REPORT No. (166/2021)

**CLIENT:** EGYPTIAN COMPANY FOR ADVANCED INDUSTRIES (ELSEWEDY SEDCO) - SUBSIDIARY OF ELSEWEDY ELECTRIC

**Report Date:** 28/04/2021.

**Place:**  
- Extra High Voltage Research Center Laboratories  
- Informed code: (EV) AC-21-01-07-92

**Requirements:**  
- Tests for screened deadbreak separable connectors elbow according to IEC 60502-4.

**Standard Specifications:**  
- IEC 60502-4: Power cables with extruded insulation and their accessories for rated voltages from 1.0 kV ( $U_n = 1.2$  kV) up to 30 kV ( $U_n = 36$  kV) Part 4: Test requirements on accessories for cables with rated voltages from 6 kV ( $U_n = 7.2$  kV) up to 30 kV ( $U_n = 36$  kV).  
- IEC 61442: Test method for accessories for power cables with rated voltages from 6 kV ( $U_n = 7.2$  kV) up to 30 kV ( $U_n = 36$  kV).

**Description of equipment:**  
- Screened deadbreak separable connector (T-shape Elbow) innulmed on a power cable 18/30 kV, 3x400mm<sup>2</sup> with the following specifications:  
- Manufacturer: ELSEWEDY SEDCO/ELASTIMOLD EGYPT Subsidiary of ELSEWEDY ELECTRIC.  
- Model: 455  
- Lug type: Compressed type Elbow lug  
- Material: EPDM Rubber.  
- Rated voltage (U<sub>n</sub>): 18/30 kV.  
- Maximum voltage (U<sub>m</sub>): 36 kV.

**Description of the Equipment:**  
- High voltage reactor: 400 kV – 5000 kVA – 50 Hz – Type 4 (RSK) – Serial No. (204322/99). Certificate No. (216/23/2020)  
- PD Detector – Type: (TE 57). Certificate No. (72/23/2020)  
- Immune voltage generator 800 kV – 40 kJ – Type 2B40/800M. Certificate No. (269/23/2020) – Open up to 300 °C. Type BINDER. Serial No. (S-32772. Certificate No. (9/1812/2017)

**Test Samples:**  
- Test sample was chosen under the responsibility of the client.


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## Test Report

Document No.	16135-21-0206-1	Copy No.	1	Number of pages	41
Apparatus	3x single-core glass-enclosed straight joints for 300 mm <sup>2</sup> CU polymer's power cable with a rated voltage of 19/33 (36) kV				
Description	36 PVC				
Serial Number	6 test sample				
Manufacturer	Elastimold Egypt / Elsewedy SEDCO - Subsidiaries of Elsewedy Electric Industrial Region 10th of Ramadan City, EGYPT				
Client	Egyptian Company for Advanced Industries Elsewedy SEDCO Plot No. 27, 1st District, 5th Settlement, P.O. Box 311, New Cairo 11835, EGYPT				
Date(s) of test(s)	26 April to 07 May 2021				
Tested by	IPI Institut „Puffel“ für elektrische Hochleistungstechnik“ GmbH Landsberger Allee 278A, 12581 Berlin, GERMANY				
	IPI GmbH is one of KEMA Labs, a CESI brand				
Test(s) performed	Table 6 - Test sequence 2.2: Thermal short circuit screen and conductor - Test sequence 2.3: Thermal short circuit screen and conductor, and dynamic short circuit				

The apparatus, constructed 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, IEC 61442: 2005-03 and client's Instructions.

The test objects meet the requirements defined in the specified normative document IEC 60502-4 and the client's instructions according to the performed tests.

The results are documented in this report. The reports prepared by the manufacturer are filed on the same date as the test objects with the apparatus under the apparatus code. The responsibility for conformity of the apparatus with the test code rests with the manufacturer.

Date: 12 July 2021

  
 Jürgen W. Hoyer  
 Test Engineer in charge

  
 Hans-Joachim  
 Approved by





  
 Trust the Power of Experience



## Test Report

Document No.	14136-21-0204	Copy No.	1	Number of pages	45
Apparatus	3x glass-enclosed indoor and outdoor terminations for 300 mm <sup>2</sup> CU polymer's power cable with a rated voltage of 19/33 (36) kV				
Description	Indoor termination: 36 PVC Outdoor termination: 36 PVC				
Serial Number	6 test loops, each consisting of 1 indoor and outdoor terminations				
Manufacturer	Elastimold Egypt / Elsewedy SEDCO - Subsidiaries of Elsewedy Electric Industrial Region 10th of Ramadan City, EGYPT				
Client	Egyptian Company for Advanced Industries Elsewedy SEDCO Plot No. 27, 1st District, 5th Settlement, P.O. Box 311, New Cairo 11835, EGYPT				
Date(s) of test(s)	26 April to 07 May 2021				
Tested by	IPI Institut „Puffel“ für elektrische Hochleistungstechnik“ GmbH Landsberger Allee 278A, 12581 Berlin, GERMANY				
	IPI GmbH is one of KEMA Labs, a CESI brand				
Test(s) performed	Table 6 - Test sequence 1.2: Thermal short circuit screen and conductor - Test sequence 1.3: Thermal short circuit screen and conductor, and dynamic short circuit				

The apparatus, constructed 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, IEC 61442: 2005-03 and client's Instructions.

The test objects meet the requirements defined in the specified normative document.

The results are documented in this report. The reports prepared by the manufacturer are filed on the same date as the test objects with the apparatus under the apparatus code. The responsibility for conformity of the apparatus with the test code rests with the manufacturer.

Date: 07 June 2021

  
 Sal Duran Gerdila  
 Test Engineer in charge

  
 Hans-Joachim  
 Approved by





  
 Trust the Power of Experience



## Test Report

Document No.	13885-21-0226	Copy No.	1	Number of pages	52
Apparatus	Three-core glass-enclosed indoor and outdoor terminations for 400 mm <sup>2</sup> Al-polymer's power cable with a rated voltage of 18/30 (36) kV				
Description	Indoor termination: 36 PVC Outdoor termination: 36 PVC				
Serial Number	2 test loops, each consisting of 1 indoor and outdoor terminations 1 test loop with 2 indoor terminations 1 test loop with 2 outdoor terminations				
Manufacturer	Elastimold Egypt / Elsewedy SEDCO - Subsidiaries of Elsewedy Electric Industrial Region 10th of Ramadan City, EGYPT				
Client	Egyptian Company for Advanced Industries Elsewedy SEDCO Plot No. 27, 1st District, 5th Settlement, P.O. Box 311, New Cairo 11835, EGYPT				
Date(s) of test(s)	31 March to 28 May 2021				
Tested by	IPI Institut „Puffel“ für elektrische Hochleistungstechnik“ GmbH Landsberger Allee 278A, 12581 Berlin, GERMANY				
	IPI GmbH is one of KEMA Labs, a CESI brand				
Test(s) performed	Table 6 - Test sequence 1.2: Thermal short circuit screen and conductor - Test sequence 1.3: Thermal short circuit screen and conductor, and dynamic short circuit - Test sequence 1.4: Humidity - Test sequence 1.5: Salt fog				

The apparatus, constructed 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, IEC 61442: 2005-03 and client's Instructions.

The test objects meet the requirements defined in the specified normative document.

The results are documented in this report. The reports prepared by the manufacturer are filed on the same date as the test objects with the apparatus under the apparatus code. The responsibility for conformity of the apparatus with the test code rests with the manufacturer.

Date: 07 June 2021

  
 Sal Duran Gerdila  
 Test Engineer in charge

  
 Hans-Joachim  
 Approved by





  
 Trust the Power of Experience

17-05-11 10:13 Pg: 1/1

**KAHRA MAA** الهيئة العامة للكهرباء والمياه  
Qatar General Electricity & Water Corporation

**الشؤون الفنية**  
**TECHNICAL AFFAIRS**

TELEFAX MESSAGE DATE: 16 MAY 2011 TOTAL PAGES: 1

To: Mr. SIEMENS AG & SIEMENS WLL Consortium Fax No. 445 60 378

For the Attention of: Mr. Uwe Lingmann Project Manager Our Ref: TADOTE/FX/11/ 583

Contract No: GTC/240D/2008  
QPTS EXPANSION - PHASE IX SUBSTATIONS (PACKAGE S-3)

Subject: General  
Vendor Approval - Elastimold Egypt

With reference to your letter Ref No PH9-SQ-0D-COM-1-0150 dated 20.04.2011 regarding the subject matter, please be informed that Elastimold Egypt, a joint venture between [E] Seweby Egypt and Elastimold USA is approved for the supply of 11kV cable accessories for the above project.

Regards,

  
Saad A. Al-Mohannadi  
Director - Technical Affairs

SIEMENS WLL - SIEMENS AG  
Energy Distribution & Transmission  
19 MAY 2011

445 60 378  
TE, TTP, PM  
EPE (Fax: 444 8372)

TI  
TTP  
PM  
EPE  
MAF

110-096-00-COS-11-0018  
Tel: (974) 4484 3303 - Fax: (974) 44945901  
P O BOX 41, DOHA - QATAR

الهيئة العامة للكهرباء والمياه  
General Electricity & Water Authority

**Material Prequalification Approval Certificate**  
with Approval Reference No.: EA/10101/MAQ/2020  
for  
**Elastimold Egypt, Elbeweby Elastimold**

Sr. NO.	PRODUCT DESCRIPTION / RATING	Type/Model	PLANT LOCATION CITY & COUNTRY OF ORIGIN	SUPPLIER
1	11 KV Pre-molded Cable Accessories (Joints)	Promolded Type	Ramadan City, Egypt	Energy Solutions (Vendor Reg. No. 1002211)

This certificate is issued on **2nd February 2020** as per FENWA Procedures & Guidelines for Material / Equipment Pre-Qualification ver. 1.0 of 2015 and will expire on **2nd February 2023**.

**REMARKS:**

- Quantity shall be defined during engineering design stage of contract by FENWA. Moreover, further approvals will be based on satisfactory service performance of the material / equipment in FENWA network.
- Detailed technical evaluation of each type and model is subject to detailed review and approval during engineering design stage of contracts to ensure compliance with FENWA project specification and requirements.
- FENWA 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 same shall be communicated to the manufacturer / supplier.
- FENWA has all the right to accept or reject any offer and may take small quantity for trial or ask the vendor to re-test the type test etc.
- Manufacturer / Supplier should contact FENWA Purchase Dept. three (3) months prior to the expiry date of this certificate, for renewal process.
- FENWA reserves the accuracy of the details in this certificate until the date of issuance listed above only and does not assume any responsibility under this certificate in the event of any change in the approval details & status after the issuance of this certificate. This certificate shall be deemed invalid on the expiry date mentioned above.
- This certificate must be validated by visiting FENWA website and enter the Approval Reference Number or by contacting PCS Dept. through email to purchase@fenwa.gov.qa to confirm the validity of this certificate. FENWA does not assume any responsibility in case of using this certificate without validation. Misuse, misuse or misrepresentation of this certificate is not FENWA's responsibility. Any correction or alterations will recover the certificate null & void.

  
Shafiq B. Salema  
Manager Contracts  
Shared Services - PCS-Contract

www.fenwa.gov.qa P.O. Box 1672 Tel: +974 4 201 1551  
email: purchase@fenwa.gov.qa Doha, U.A.E. Fax: +974 4 2000977

مجلس مراجعة الرمز التوزيعي  
DISTRIBUTION CODE REVIEW PANEL

**Product Approval Certificate**

Certificate No: DCRP/FA/CDR/2019/09 Issue Date: 14<sup>th</sup> May 2019 First Registration: 14<sup>th</sup> May 2019

Distribution Code Review Panel  
Certifies That:

Electrical Product: 11 KV Pre-molded Cable Joints & Terminations  
Manufacturer: Elastimold Egypt  
Country of Origin: Egypt  
Local Representative: Thilal Al Kathheeb Trad. & Cont. Co. LLC  
Address: P.O. Box 62, P.C. 317  
Awabi / Sultanate of Oman  
Tel: (+ 968) 24503123

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:  
13<sup>th</sup> May 2020

Please Refer Overleaf for Approval Conditions

Total Page Number: 40 Pages

**ELSEWEDY  
ELECTRIC**

**CABLE  
ACCESSORIES**

**Office:**

Plot 27, 1<sup>st</sup> District, 5<sup>th</sup> settlement,  
New Cairo 11835, Egypt.  
Tel. : (+202) 27 599 750 - 751  
Fax : (+202) 27 599 752

**Factory:**

PC.#36A South (A'1), Industrial Region, 10<sup>th</sup> of Ramadan City  
Tel. : +2 0554 411141  
Fax : +2 0554 411142  
E-mail : cable-accessories@elsewedy.com



Due to continuous product improvements, some specifications can change without prior notice.

[www.elsewedyelectric.com](http://www.elsewedyelectric.com)