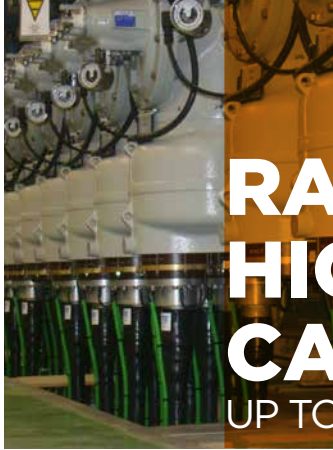




# RAYCHEM HIGH VOLTAGE CABLE ACCESSORIES

UP TO 245 KV



# Content

|                                     |   |
|-------------------------------------|---|
| TE Connectivity.....                | 4 |
| High Voltage Cable Accessories..... | 5 |
| Our core Competencies.....          | 6 |
| Services.....                       | 7 |

## I. High Voltage Cable Terminations



|                                                               |    |
|---------------------------------------------------------------|----|
| Heat-Shrinkable Terminations (IHVT-H/ OHVT-H/ LHVT-H) .....   | 10 |
| Heat-Shrinkable Terminations for DC Filter Cables (FCEV)..... | 14 |
| Outdoor Terminations Composite (OHVT-C).....                  | 17 |
| Outdoor Terminations Porcelain (OHVT-P).....                  | 22 |
| Outdoor Terminations Dry-type (OHVT-D) .....                  | 27 |
| Add-On Kits for Outdoor Terminations .....                    | 28 |

## II. High Voltage Dry Plug-In Terminations



|                                                                          |    |
|--------------------------------------------------------------------------|----|
| Dry Plug-In Switchgear and Transformer Terminations (PHVS & PHVT).....   | 32 |
| Add-On Kits for Dry Plug In-Switchgear and Transformer Terminations..... | 42 |

## III. High Voltage Cable joints



|                                                  |    |
|--------------------------------------------------|----|
| Heat-Shrinkable Joints (EHVS-H).....             | 46 |
| One Piece Joints (EHVS-S) .....                  | 48 |
| Three Piece Joints (EHVS-T).....                 | 51 |
| Fibre-Optic Add-On Kit for HV Cable Joints ..... | 54 |

## IV. High Voltage Connectors



|                                                       |    |
|-------------------------------------------------------|----|
| High Voltage Connectors for Outdoor Terminations..... | 58 |
|-------------------------------------------------------|----|

## V. Link Boxes



|                                  |    |
|----------------------------------|----|
| Link Boxes.....                  | 64 |
| Link Boxes Selection Tables..... | 66 |

High Voltage  
Cable  
Terminations

High Voltage  
Dry Plug-In  
Terminations

High Voltage  
Cable joints

High Voltage  
Connectors

Link Boxes

## TE Connectivity

TE Connectivity (TE) unites world-leading high voltage component brands under a single company. Individually, each has forged a reputation for innovation, reliable performance and ease of installation. Collectively, they assure you that TE delivers uncompromising performance for components throughout your substation project.

- Bowthorpe EMP – Surge Arresters and Surge Counters
- Raychem – MV and HV Cable Accessories, Insulators, Wildlife and Asset Protection
- AXICOM – MV and HV Insulators and Bushings
- SIMEL – Substation Connectors, Grounding Connectors and Earthing Material



### Bowthorpe EMP surge protection

Choose from a family of surge arrester products from 3 kV – 800 kV, IEEE or IEC qualified, in porcelain or polymeric housings.

- Intermediate class arresters
- Station class arresters
- Transmission line arresters
- Surge counters
- Cable sheath surge arresters - CSPA range



### SIMEL substation connectors

Draw upon our years of field experience in HV substations worldwide. Our engineers are here to help you specify the ideal product package.

- Clamps, connectors and insulators strings for HVAC and HVDC applications up to 1200 kV
- Earthing and grounding connections
- Bare Conductors



### AXICOM insulators

Turn to us to help you define needs and specify products to meet your application requirements, or to design highly customized solutions to meet specific mechanical requirements or environmental demands.

- Hollow-core composite insulators
- Suspension-tension insulators
- Disc insulators: glass and porcelain
- Station-post composite insulator



### Raychem cable accessories

Well known as a worldwide leader in heatshrink polymer based materials, TE is also a center of excellence for cold-applied and resin technologies. Network owners know they are getting products with proven electrical and mechanical performance, while installers benefit from faster, safer and more cost-effective installation.

- Terminations and joints
- Link boxes
- Elbows
- Earthing and grounding systems
- Casting and potting resins
- And much more



## High Voltage Cable Accessories



Energy business unit headquarters situated in Ottobrunn (close to Munich), Germany

The brands that make up TE's portfolio of high voltage components represent more than 5 decades of product line experience in the power transmission business. This long-term track record, with projects all over the world, is united under a single company to provide you with a single source of supply. Our global network of technical and sales representatives provides expert application and engineering assistance, hands-on field training and continuous after-sales support to help our customers successfully master the challenges of today's businesses.

Expertise in materials science, product design and process engineering go into the invention, development, manufacture and marketing of our high-performance products. Our competitive advantages are well recognized in the market:

- Customer focused organization
- Innovation and technology driven
- Extensive product offering
- Multiple market segments presence
- Industry leadership and expertise
- Structural and financial strength

Our wide range of reliable and cost-effective solutions is continuously expanded through research-driven product development.

The most innovative utilities and industries around the world use our high voltage cable accessories. Designed to withstand environmental extremes and high pollution levels over long operating lifetimes, they help maintain service reliability in both overhead and underground installations.

All Raychem high voltage cable accessories products are subjected to extensive testing from the time they enter our plants as raw material until they leave as finished products. Requalification testing is carried out on a regular basis with installed components. Customers can therefore have full confidence in the products, services and data supplied. In many cases, this saves the cost and inconvenience of any further downstream verification. All our electrical power products meet international specifications, such as IEC, CENELEC, IEEE, ANSI, and virtually all national standards.

With manufacturing facilities across five continents, we can react promptly to customer requirements and keep lead times and shipping distances to a minimum. An effective product supply chain ensures products move from origin to installation efficiently. Local customer service centers offer a single point of contact with staff that can provide country-specific support based on the needs of each region. By combining local knowledge with world-class research, product development and manufacturing capabilities, we set high standards of performance and user convenience.

ISO 9000 series and ISO 14001 certifications for almost all locations underline our continuing commitment to quality and the environment.

## Our core competencies



### **Understanding the value of high voltage cable accessories as essential elements in a cable system**

Since the foundation of Raychem in 1957, we have specialized in the development, design, manufacture and installation of cable accessory products. Our experience and involvement in all of these key areas has positioned us as experts within electrical power engineering. Our expertise in this field means that we can offer safe and reliable products that will form part of your complete cable system.

### **Manufacturing and quality assurance of high voltage insulation systems**

With latest manufacturing technology and quality management processes we maximise efficiencies and thereby offer competitive high voltage cable accessories. We have material expertise as well as test facilities for all related fluid, gaseous and solid insulation material developments, which will be used in our complete range of high voltage cable accessories resulting in maximum product lifetime for our customers. In addition we are producing and using our own raw material which will allow us to optimize the material properties perfectly based on our customer needs.



### **Electrical, mechanical and thermal design of high voltage cable accessories and respective connectors**

The design of our high voltage accessories are based on knowledge within electrical, mechanical and thermal performance. It is essential to understand the interaction between these physical parameters since all of them have major impact on the reliability of high voltage cable accessories. We have extensive experience and use modern software that allows us to simulate the physical environments which our accessories are going to face. Furthermore we are the only cable accessories manufacturer worldwide which have all existing stress control systems (geometrical, resistive, refractive and non-linear) in either heat shrink or cold applied technology in our portfolio.



### **Realize the importance of all other components being used in high voltage cable accessories on the performance**

For the successful operation of high voltage cable accessories it is essential to understand the influence of other related components which are used in high voltage cable accessories such as hollow core insulators and mechanical connectors. Based on this fact we design, produce and test all these components in-house and minimize negative influence on the performance of the final product. With this strategy we can ensure that the product will deliver what we promise.



## Services



### Training

As a supplier of high voltage accessories TE also offers training services. In our training centers around the world we conduct customized training courses in small training groups. Experienced supervisors show the general assembly of high voltage accessories as well as the detailed installation of TE high voltage products. Depending on the experience of the trainees the training can be organized individually. Every training course includes:

- Theoretical product training
- Individual HV cable preparation session
- Complete installation of TE HV cable accessories

A certificate is issued to each trainee after a successful completion of the training course.



### Supervision

Additionally to our training courses in our labs we also offer supervision for installations on-site. This is for jointers who have been trained by TE supervisors prior to an installation but haven't yet had sufficient on-site experience in installing TE accessories and may need the help of a supervisor.

We recommend this service for jointers who install TE accessories on site the first time. This service ensures the accessories are installed according to the installation instruction.



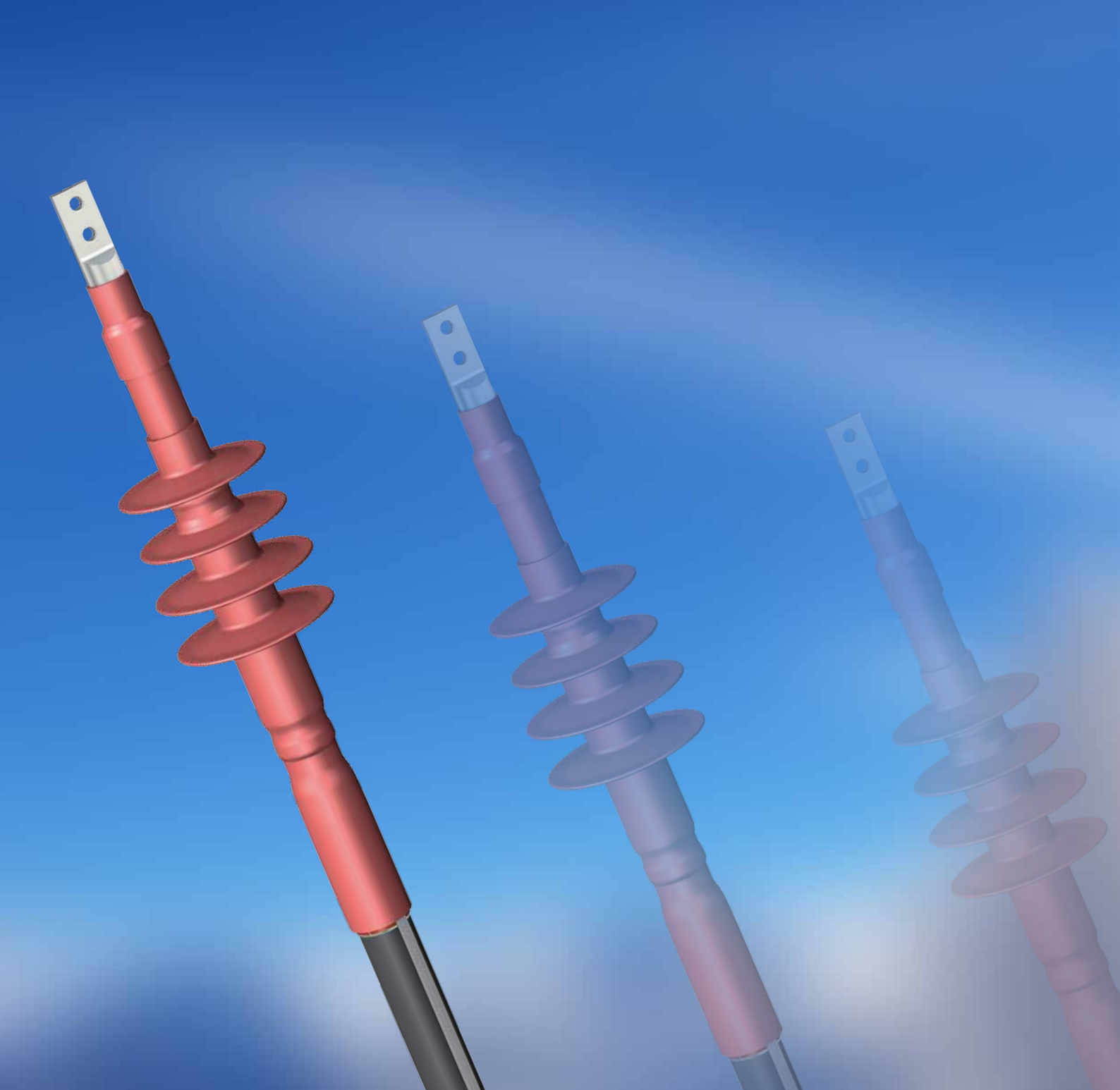
### Installation

TE has well-trained and experienced jointers who are able to carry out installation at construction sites. Usually they are supported by local assistance provided by the contractor or the local utility. If there are no trained jointers available locally, ordering installation services from us is the first choice.



### Tools

We provide the full range of tools which are necessary to install high voltage cable accessories. Our fully equipped tool box contains not only the tools for preparation of the cable but also components required for a safe and efficient installation on-site.





## Chapter I

# High voltage terminations

|                                                                |    |
|----------------------------------------------------------------|----|
| Heat-Shrinkable Terminations (IHVT-H/ OHVT-H/ LHVT-H) .....    | 10 |
| Heat-Shrinkable Terminations for DC Filter Cables (FCEV) ..... | 14 |
| Outdoor Terminations Composite (OHVT-C) .....                  | 18 |
| Outdoor Terminations Porcelain (OHVT-P) .....                  | 21 |
| Outdoor Terminations Dry-type (OHVT-D) .....                   | 26 |
| Add-On Kits for Outdoor Terminations .....                     | 28 |



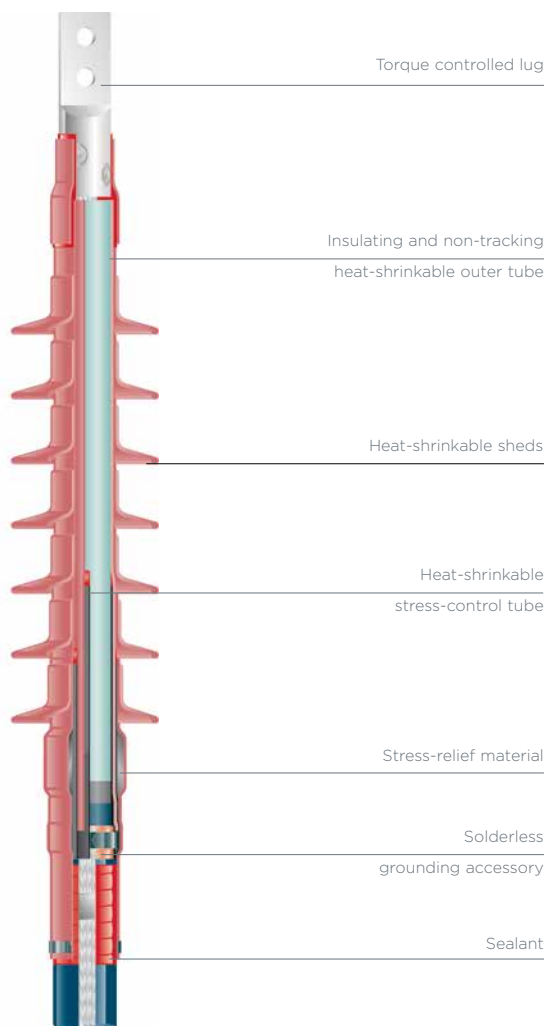
## Heat-Shrinkable Terminations (IHVT-H/ OHVT-H/ LHVT-H)

### APPLICATION

- The TE Connectivity Raychem heat-shrinkable terminations are suitable for all climates, areas, and environments, even severely polluted areas, as well as for all installation conditions, including top feed installation
- Our heat shrink accessories have been used by utilities and industrial companies around the world for more than 50 years

### FEATURES

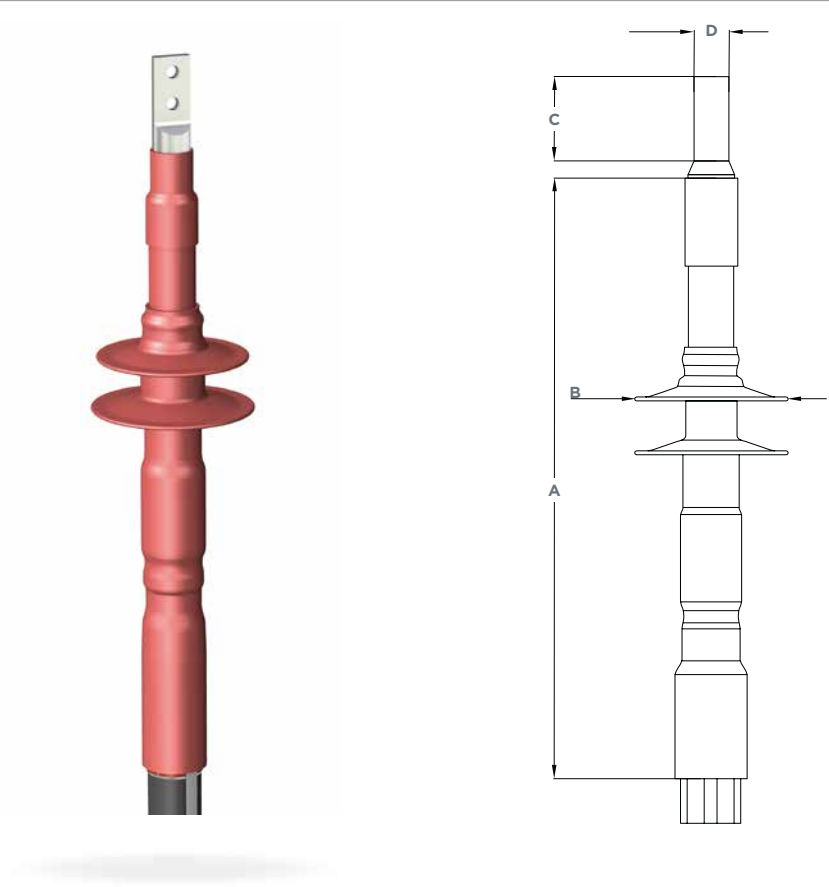
- Compact and modular design
- Heat-shrinkable stress control sleeves
- Non-tracking, heat-shrinkable outer insulation
- Water- and corrosion-resistant
- Different creepage distances available
- Easy to install
- Suitable for compression and mechanical lugs
- No special or expensive tools
- Lightweight components
- Unlimited shelf life under normal storage conditions
- No oil or compound filling
- Reduced waste for disposal



| Max. operating voltage $U_m$ (kV)                    | 52                     | 72.5                   | 123                    |
|------------------------------------------------------|------------------------|------------------------|------------------------|
| Standards                                            | IEC 60840<br>IEC 60815 | IEC 60840<br>IEC 60815 | IEC 60840<br>IEC 60815 |
| Rated voltage $U$ (kV)                               | 45 - 47                | 60 - 69                | 110 - 115              |
| Rated lightning impulse withstand voltage (BIL) (kV) | 250                    | 325                    | 325*                   |

\* Reduced level compared to IEC 60840

Heat-Shrinkable Terminations (IHVT-52H/ OHVT-52H)



High Voltage Terminations

Technical data

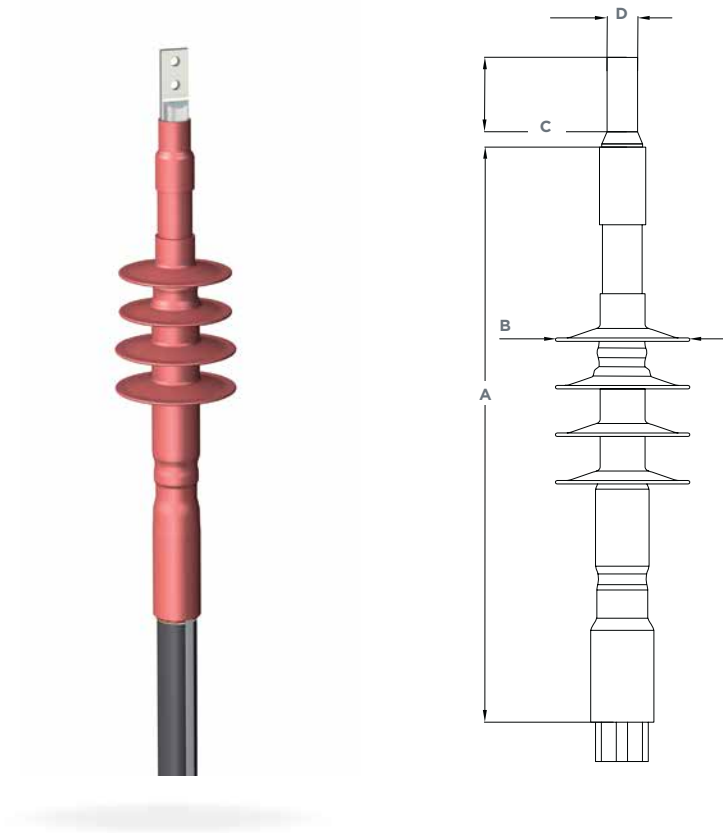
| Product description | Conductor cross section (mm²) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Creepage distance approx. (mm) |
|---------------------|-------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| IHVT-52H            | 95 - 2500                     | 30 - 77                                        | 100                                        | 1100                           |
| OHVT-52H            | 95 - 2500                     | 30 - 77                                        | 100                                        | 1540                           |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D* (mm)  |
|---------------------|--------|--------|--------|----------|
| IHVT-52H            | 800    | 220    | 125    | 30/40/50 |
| OHVT-52H            | 920    | 220    | 125    | 30/40/50 |

\* Different studs and pads are available on request

Heat-Shrinkable Terminations (IHVT-72H/ OHVT-72H/ LHVT-72H)



Technical data

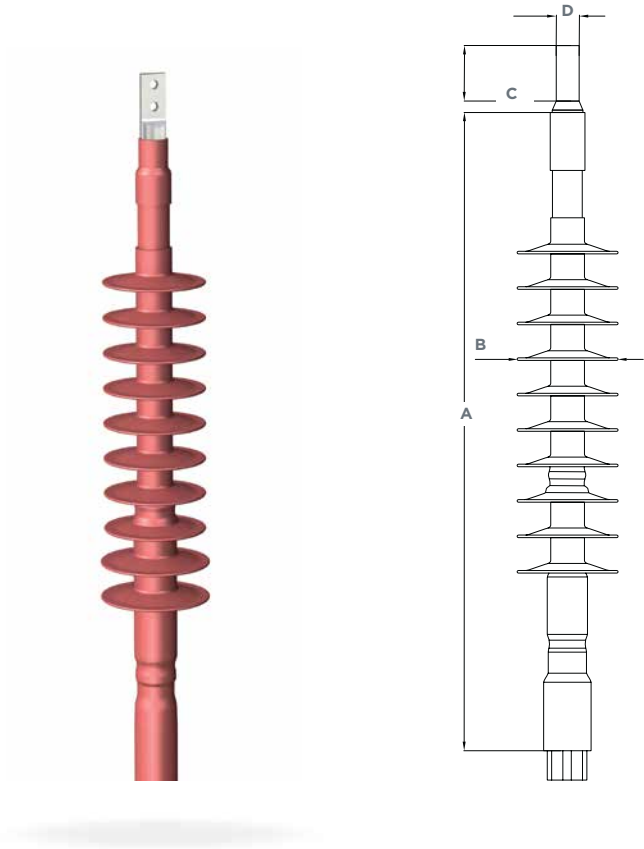
| Product description | Conductor cross section (mm²) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Creepage distance approx. (mm) |
|---------------------|-------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| IHVT-72H            | 95 - 2500                     | 30 - 86                                        | 110                                        | 1600                           |
| OHVT-72H            | 95 - 2500                     | 30 - 86                                        | 110                                        | 2300                           |
| LHVT-72H            | 300 - 2500                    | 38 - 86                                        | 110                                        | 3100                           |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D* (mm)  |
|---------------------|--------|--------|--------|----------|
| IHVT-72H            | 960    | 220    | 125    | 30/40/50 |
| OHVT-72H            | 1200   | 220    | 125    | 30/40/50 |
| LHVT-72H            | 1560   | 220    | 125    | 30/40/50 |

\* Different studs and pads are available on request

## Heat-Shrinkable Terminations (OHVT-123H)



### Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Creepage distance approx. (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-123H           | 95 - 1600                                  | 30 - 86                                        | 110                                        | 3100                           |

### Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D* (mm)  |
|---------------------|--------|--------|--------|----------|
| OHVT-123H           | 1560   | 220    | 125    | 30/40/50 |

|      |                                                   |
|------|---------------------------------------------------|
| *    | Different studs and pads are available on request |
| NOTE | To be used as a temporary solution only           |

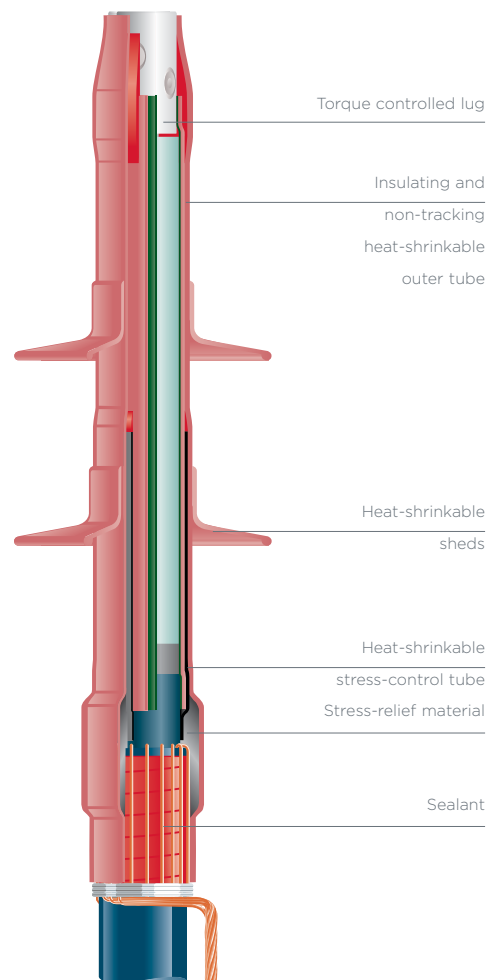
## Heat-Shrinkable Terminations for DC Filter Cables (FCEV)

### APPLICATION

- The cable is prepared in the same simple and easy way as for Raychem medium voltage terminations without sanding or pencilling. Based on the design of Raychem high voltage terminations, the filter cable termination consists of a staggered layer of stress control tubings and patches. A heat-shrinkable non-tracking insulation tubing and shed are shrunk over the stress control system and ensure a reliable seal to the lug and the oversheath. A mechanical lug is supplied with the kit. The mechanical lug has an M10 thread on the top for easy connection to connecting busbars. The termination is supplied as a single phase termination. A solderless earth connection for cables with metal sheath is included in the termination kit

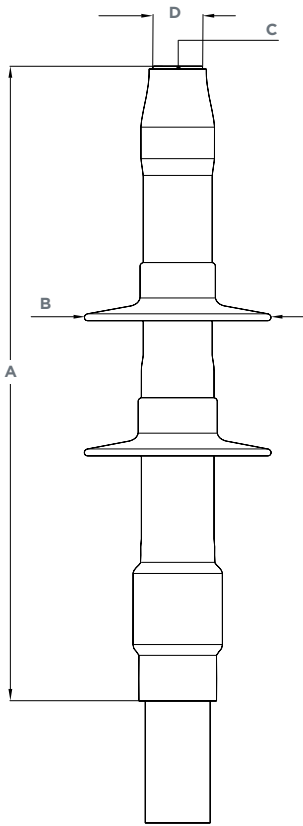
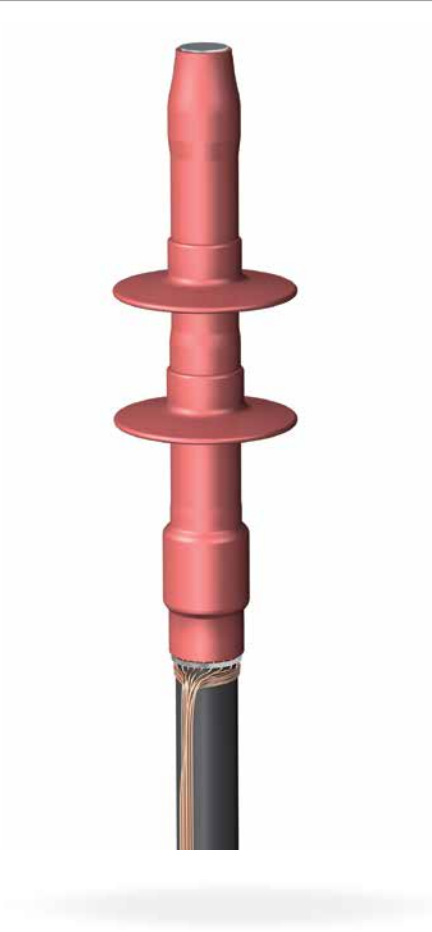
### FEATURES

- Compact and modular design
- Heat-shrinkable stress control sleeves
- Non-tracking, heat-shrinkable outer insulation
- Easy to install
- No special or expensive tools
- Lightweight components
- Unlimited shelf life under normal storage conditions
- No oil or compound filling
- Reduced waste for disposal



|                                                      |     |     |
|------------------------------------------------------|-----|-----|
| Max. operating voltage $U_m$ (kV)                    | 111 | 150 |
| DC withstand test (kV)                               | 200 | 300 |
| Rated lightning impulse withstand voltage (BIL) (kV) | 240 | 325 |

Heat-Shrinkable Terminations for DC Filter Cables (FCEV)



High Voltage Terminations

Technical data

| Product description | No Load voltage $U_L$ | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (mm) |
|---------------------|-----------------------|--------------------------------------------|-------------------------------------|
| FCEV-111            | 111                   | 35 - 95                                    | 26 - 38                             |
| FCEV-150            | 150                   | 35 - 95                                    | 26 - 38                             |
| FCEV-150-1          | 150                   | 95 - 240                                   | 38 - 52                             |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm) |
|---------------------|--------|--------|--------|--------|
| FCEV-111            | 500    | 155    | M10    | 32     |
| FCEV-150            | 700    | 155    | M10    | 32     |
| FCEV-150-1          | 700    | 155    | M10    | 32     |



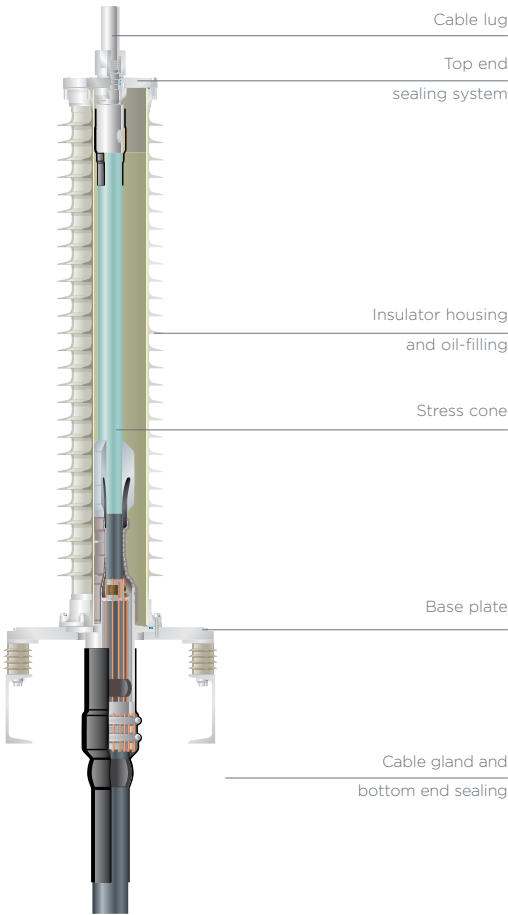
# Outdoor Terminations Composite (OHVT-C)

### APPLICATION

- The termination is designed for voltage classes up to 245 kV and to operate under severe environmental conditions. Polymeric insulated cables of various designs can be adopted with respect to shielding and metal sheath. Composite housings with different creepage lengths up to 50 mm/kV are available for the most common and also extreme pollution levels according to IEC 60071-1 and IEC 60071-2

### FEATURES

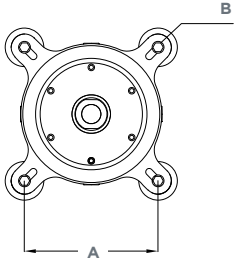
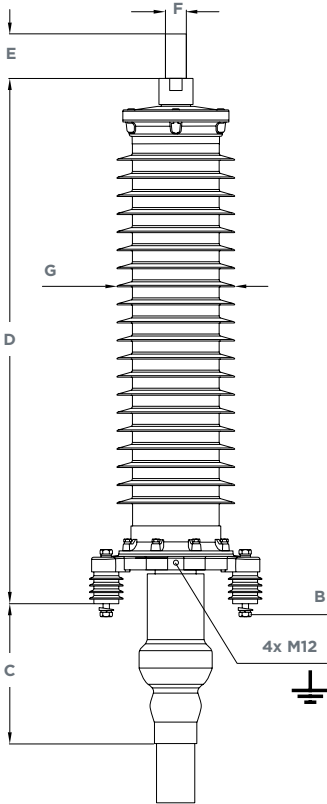
- Pressure-tight and light weight composite housing
- Pre-fabricated and factory-tested Silicone-rubber stress cone
- Torque-controlled conductor bolt
- No special tools required to install the termination
- Silicone-oil filling without preheating
- Insulated base plate for sectionalization
- Fittings made of corrosion-resistant alloy
- Type tested according to IEC 60840 and IEC 62067 standards



| Max. operating voltage $U_m$ (kV)                    | 72.5                   | 123                    | 145                    | 170                    | 245                    |
|------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| Standards                                            | IEC 60840<br>IEC 60815 | IEC 60840<br>IEC 60815 | IEC 60840<br>IEC 60815 | IEC 60840<br>IEC 60815 | IEC 62067<br>IEC 60815 |
| Rated voltage $U$ (kV)                               | 60 - 69                | 110 - 115              | 132 - 138              | 150 - 161              | 220 - 230              |
| Rated lightning impulse withstand voltage (BIL) (kV) | 325                    | 550                    | 650                    | 750                    | 1050                   |

Outdoor Terminations (OHVT-72C)

High Voltage  
Terminations



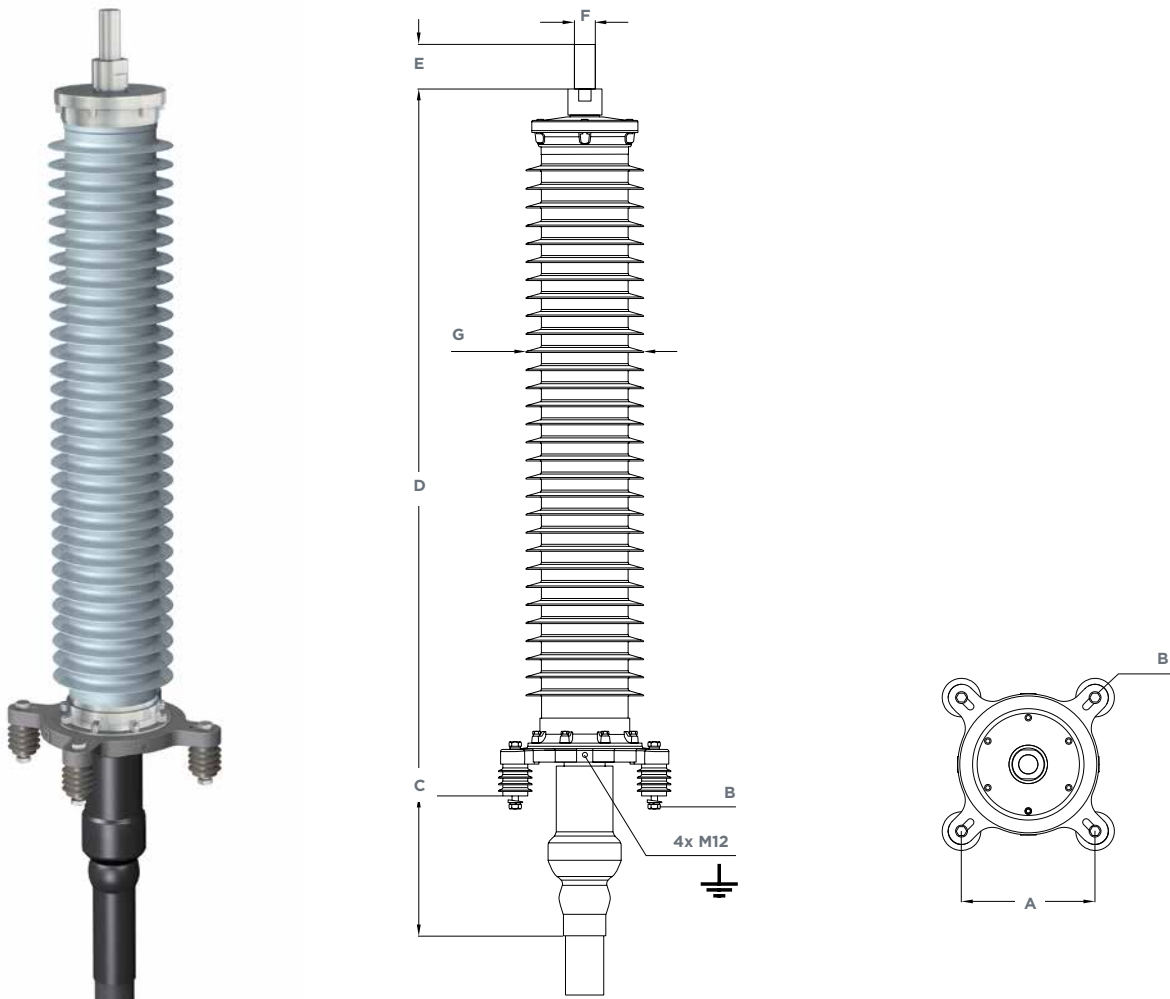
Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm <sup>2</sup> ) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|--------------------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-72C (-2A)      | 95 - 2500                                  | 34 - 97                                                      | 110                                        | 2164                           |
| OHVT-72C (-2B)      | 95 - 2500                                  | 34 - 97                                                      | 110                                        | 2383                           |
| OHVT-72C (-2C)      | 95 - 2500                                  | 34 - 97                                                      | 110                                        | 3089                           |

Dimensions

| Product description | A (mm)    | B (mm) | C (mm) | D (mm) | E (mm)  | F (mm)   | G (mm) |
|---------------------|-----------|--------|--------|--------|---------|----------|--------|
| OHVT-72C (-2A)      | 300 - 345 | M16    | 350    | 1276   | 100/130 | 30/40/50 | 294    |
| OHVT-72C (-2B)      | 300 - 345 | M16    | 350    | 1072   | 100/130 | 30/40/50 | 304    |
| OHVT-72C (-2C)      | 300 - 345 | M16    | 350    | 1262   | 100/130 | 30/40/50 | 308    |

Outdoor Terminations (OHVT-145C)



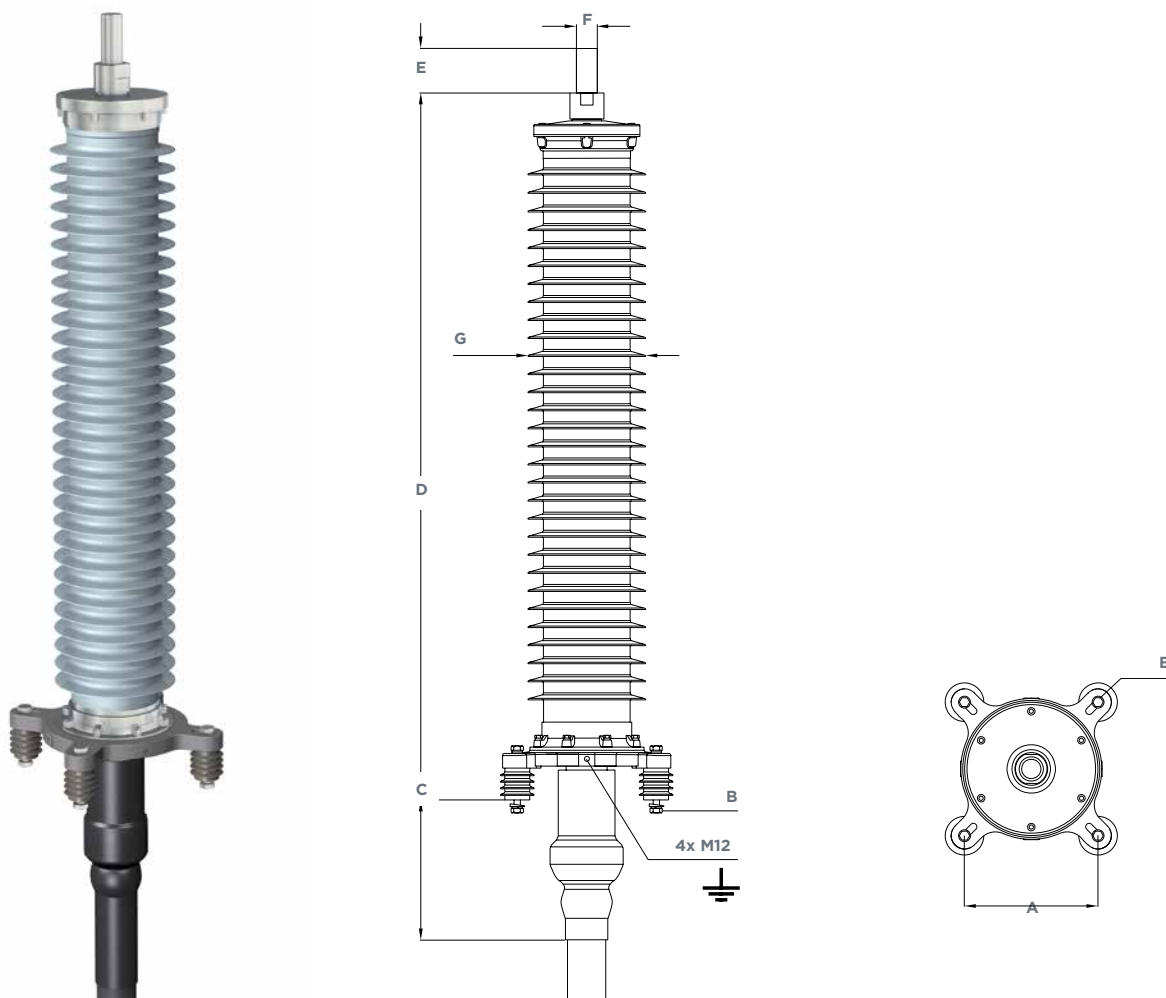
Technical data

| Product description | Conductor cross section (mm²) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|-------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-145C (-2A)     | 95 - 2500                     | 34 - 97                                        | 110                                        | 3392                           |
| OHVT-145C (-3A)     | 95 - 2500                     | 34 - 97                                        | 110                                        | 3829                           |
| OHVT-145C (-4A)     | 95 - 2500                     | 34 - 97                                        | 110                                        | 4684                           |
| OHVT-145C (-4B)     | 95 - 2500                     | 34 - 97                                        | 110                                        | 6100                           |
| OHVT-145C (-4C)     | 95 - 2500                     | 34 - 97                                        | 110                                        | 8047                           |

Dimensions

| Product description | A (mm)    | B (mm) | C (mm) | D (mm) | E (mm)  | F (mm)   | G (mm) |
|---------------------|-----------|--------|--------|--------|---------|----------|--------|
| OHVT-145C (-2A)     | 300 - 345 | M16    | 350    | 1771   | 100/130 | 30/40/50 | 294    |
| OHVT-145C (-3A)     | 300 - 345 | M16    | 350    | 1951   | 100/130 | 30/40/50 | 294    |
| OHVT-145C (-4A)     | 300 - 345 | M16    | 350    | 1696   | 100/130 | 30/40/50 | 304    |
| OHVT-145C (-4B)     | 300 - 345 | M16    | 350    | 2080   | 100/130 | 30/40/50 | 304    |
| OHVT-145C (-4C)     | 300 - 345 | M16    | 350    | 2608   | 100/130 | 30/40/50 | 304    |

## Outdoor Terminations (OHVT-170C)



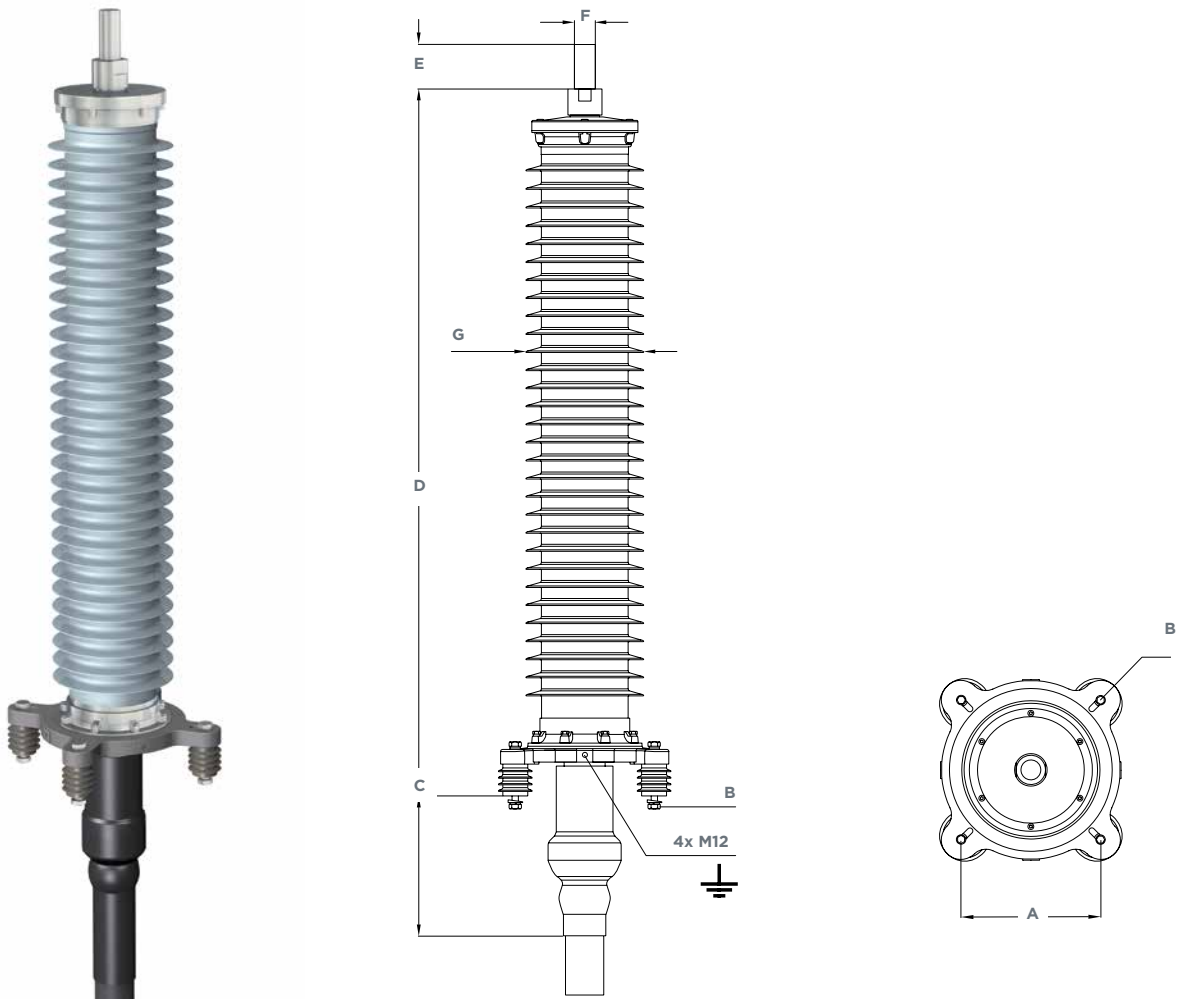
### Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-170C (-1A)     | 95 - 2500                                  | 43 - 108                                       | 135                                        | 3829                           |
| OHVT-170C (-3A)     | 95 - 2500                                  | 43 - 108                                       | 135                                        | 4273                           |
| OHVT-170C (-4A)     | 95 - 2500                                  | 43 - 108                                       | 135                                        | 5373                           |
| OHVT-170C (-4B)     | 95 - 2500                                  | 43 - 108                                       | 135                                        | 5746                           |
| OHVT-170C (-4C)     | 95 - 2500                                  | 43 - 108                                       | 135                                        | 9436                           |

### Dimensions

| Product description | A (mm)    | B (mm) | C (mm) | D (mm) | E (mm)  | F (mm)   | G (mm) |
|---------------------|-----------|--------|--------|--------|---------|----------|--------|
| OHVT-170C (-1A)     | 300 - 345 | M16    | 350    | 2028   | 100/130 | 30/40/50 | 345    |
| OHVT-170C (-3A)     | 300 - 345 | M16    | 350    | 2224   | 100/130 | 30/40/50 | 345    |
| OHVT-170C (-4A)     | 300 - 345 | M16    | 350    | 2614   | 100/130 | 30/40/50 | 345    |
| OHVT-170C (-4B)     | 300 - 345 | M16    | 350    | 2056   | 100/130 | 30/40/50 | 345    |
| OHVT-170C (-4C)     | 300 - 345 | M16    | 350    | 2856   | 100/130 | 30/40/50 | 345    |

Outdoor Terminations (OHVT-245C)



Technical data

| Product description | Conductor cross section (mm²) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|-------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-245C (-2A)     | 300 - 2500                    | 77 - 119                                       | 150                                        | 5161                           |
| OHVT-245C (-3A)     | 300 - 2500                    | 77 - 119                                       | 150                                        | 5605                           |
| OHVT-245C (-4A)     | 300 - 2500                    | 77 - 119                                       | 150                                        | 6160                           |
| OHVT-245C (-4B)     | 300 - 2500                    | 77 - 119                                       | 150                                        | 8401                           |
| OHVT-245C (-4C)     | 300 - 2500                    | 77 - 119                                       | 150                                        | 10171                          |

Dimensions

| Product description | A (mm)    | B (mm) | C (mm) | D (mm) | E (mm)  | F (mm) | G (mm) |
|---------------------|-----------|--------|--------|--------|---------|--------|--------|
| OHVT-245C (-2A)     | 430 - 550 | M16    | 350    | 2564   | 100/130 | 50/60  | 402    |
| OHVT-245C (-3A)     | 430 - 550 | M16    | 350    | 2744   | 100/130 | 50/60  | 402    |
| OHVT-245C (-4A)     | 430 - 550 | M16    | 350    | 2969   | 100/130 | 50/60  | 402    |
| OHVT-245C (-4B)     | 430 - 550 | M16    | 350    | 2777   | 100/130 | 50/60  | 402    |
| OHVT-245C (-4C)     | 430 - 550 | M16    | 350    | 3257   | 100/130 | 50/60  | 402    |

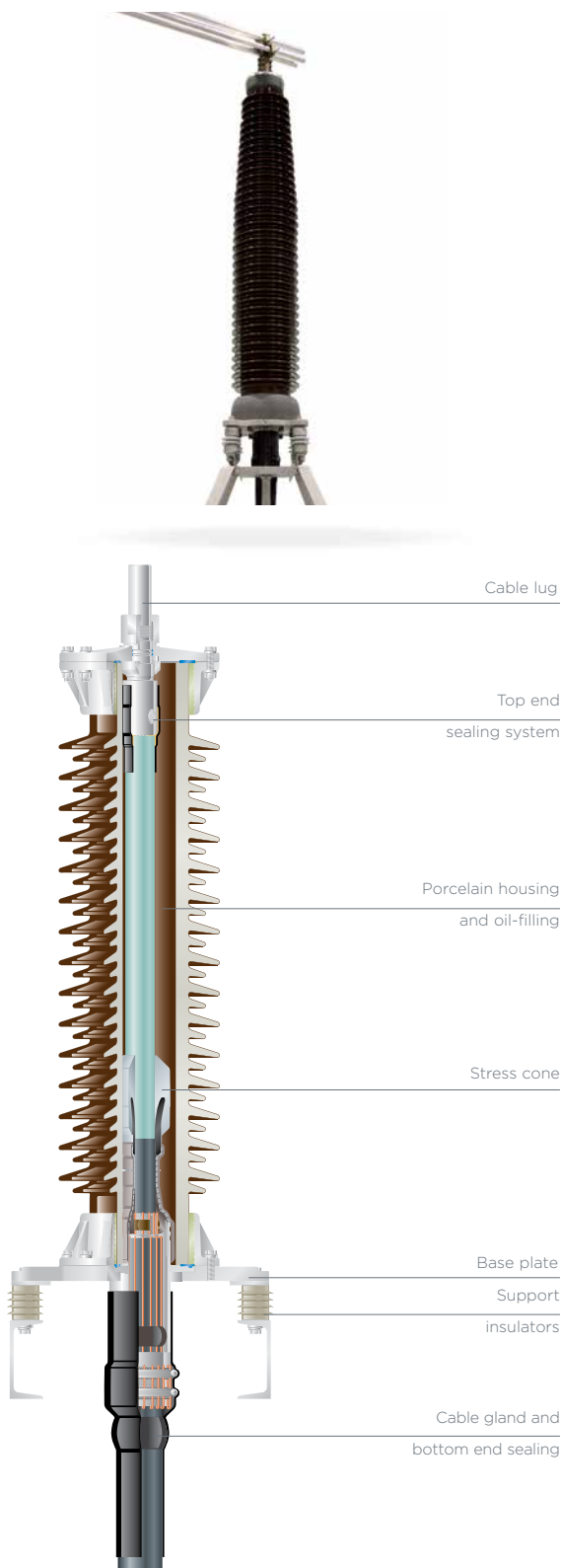
## Outdoor Terminations Porcelain (OHVT-P)

### APPLICATION

- The termination is designed for voltage classes up to 245 kV and to operate under severe environmental conditions. Polymeric insulated cables of various designs can be adopted with respect to shielding and metal sheath

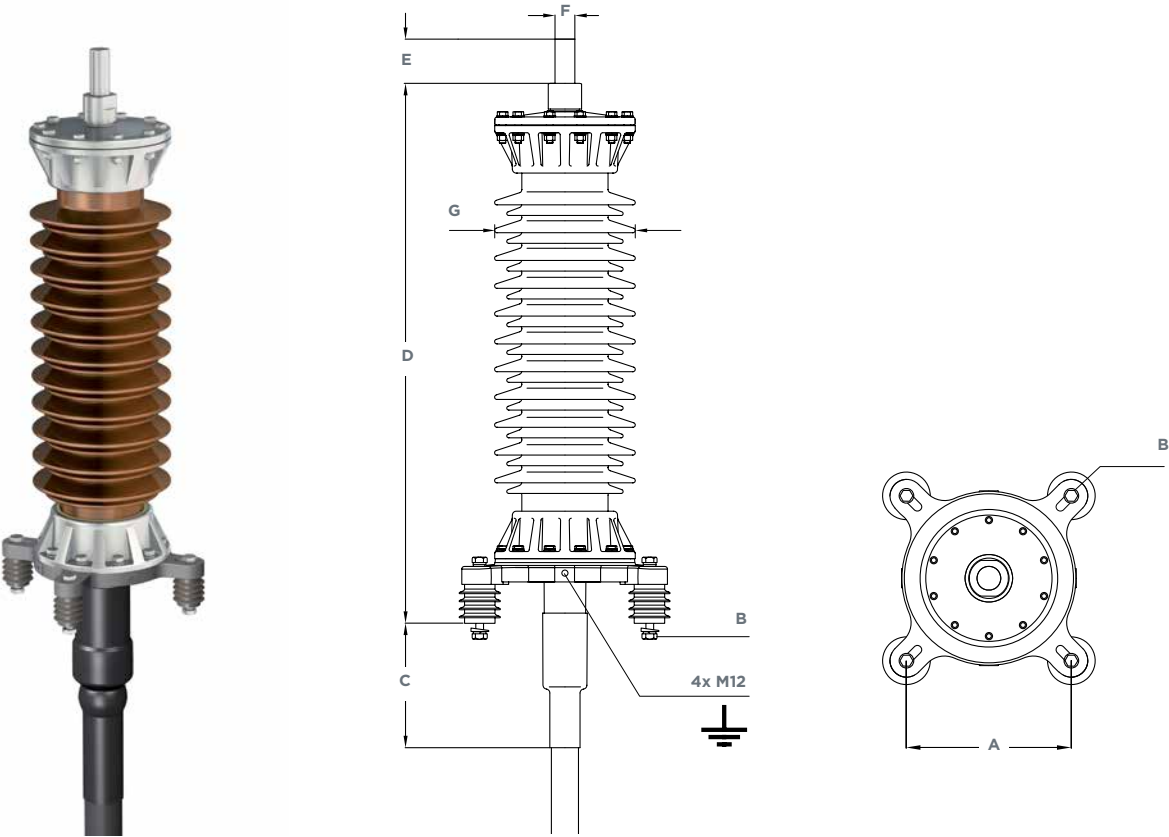
### FEATURES

- Well-proven porcelain housing
- Pre-fabricated and factory-tested Silicone-rubber stress cone
- Torque-controlled conductor bolt
- H/S components used for sealing the termination
- Silicone-oil filling without preheating
- Insulated base plate for sectionalization
- Fittings made of corrosion resistant alloy
- Type tested according to IEC 60840 and IEC 62067 standards



| Max. operating voltage $U_m$ (kV)                    | 72.5                   | 123                    | 145                    | 245                    |
|------------------------------------------------------|------------------------|------------------------|------------------------|------------------------|
| Standards                                            | IEC 60840<br>IEC 60815 | IEC 60840<br>IEC 60815 | IEC 60840<br>IEC 60815 | IEC 62067<br>IEC 60815 |
| Rated voltage $U$ (kV)                               | 60 - 69                | 110 - 115              | 132 - 138              | 220 - 230              |
| Rated lightning impulse withstand voltage (BIL) (kV) | 325                    | 550                    | 650                    | 1050                   |

Outdoor Terminations (OHVT-72P)



Technical data

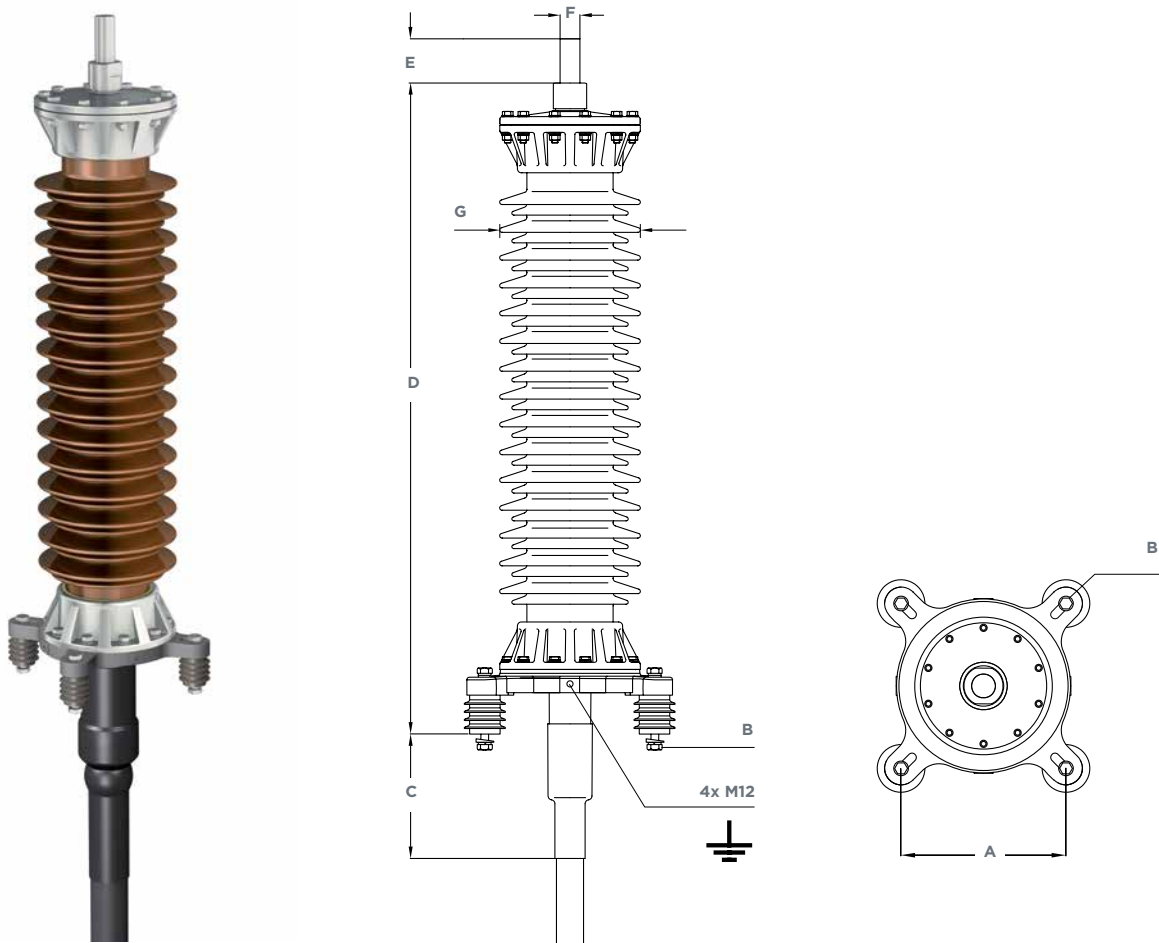
| Product description | Conductor cross section (mm²) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|-------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-72P (-2A)      | 95 - 1200                     | 34 - 74                                        | 110                                        | 2350                           |

Dimensions

| Product description | A (mm)    | B (mm) | C (mm) | D (mm) | E (mm)  | F (mm)   | G (mm) |
|---------------------|-----------|--------|--------|--------|---------|----------|--------|
| OHVT-72P (-2A)      | 300 - 345 | M16    | 350    | 1245   | 100/130 | 30/40/50 | 360    |

Outdoor Terminations (OHVT-123P)

High Voltage  
Terminations



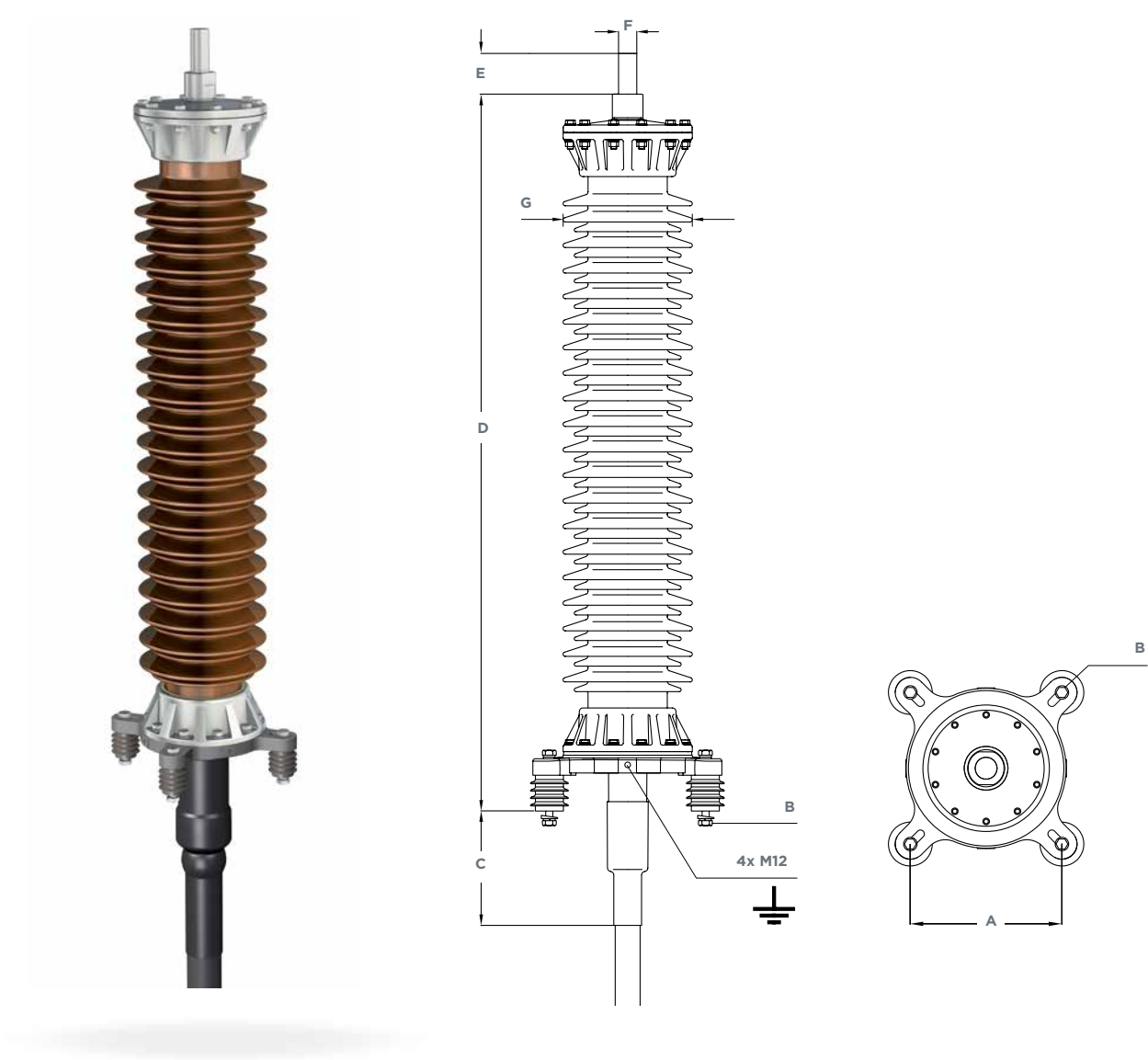
Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-123P (-4B)     | 95 - 1200                                  | 34 - 74                                        | 110                                        | 3910                           |

Dimensions

| Product description | A (mm)    | B (mm) | C (mm) | D (mm) | E (mm)  | F (mm)   | G (mm) |
|---------------------|-----------|--------|--------|--------|---------|----------|--------|
| OHVT-123P (-4B)     | 300 - 345 | M16    | 350    | 1615   | 100/130 | 30/40/50 | 360    |

Outdoor Terminations (OHVT-145P)



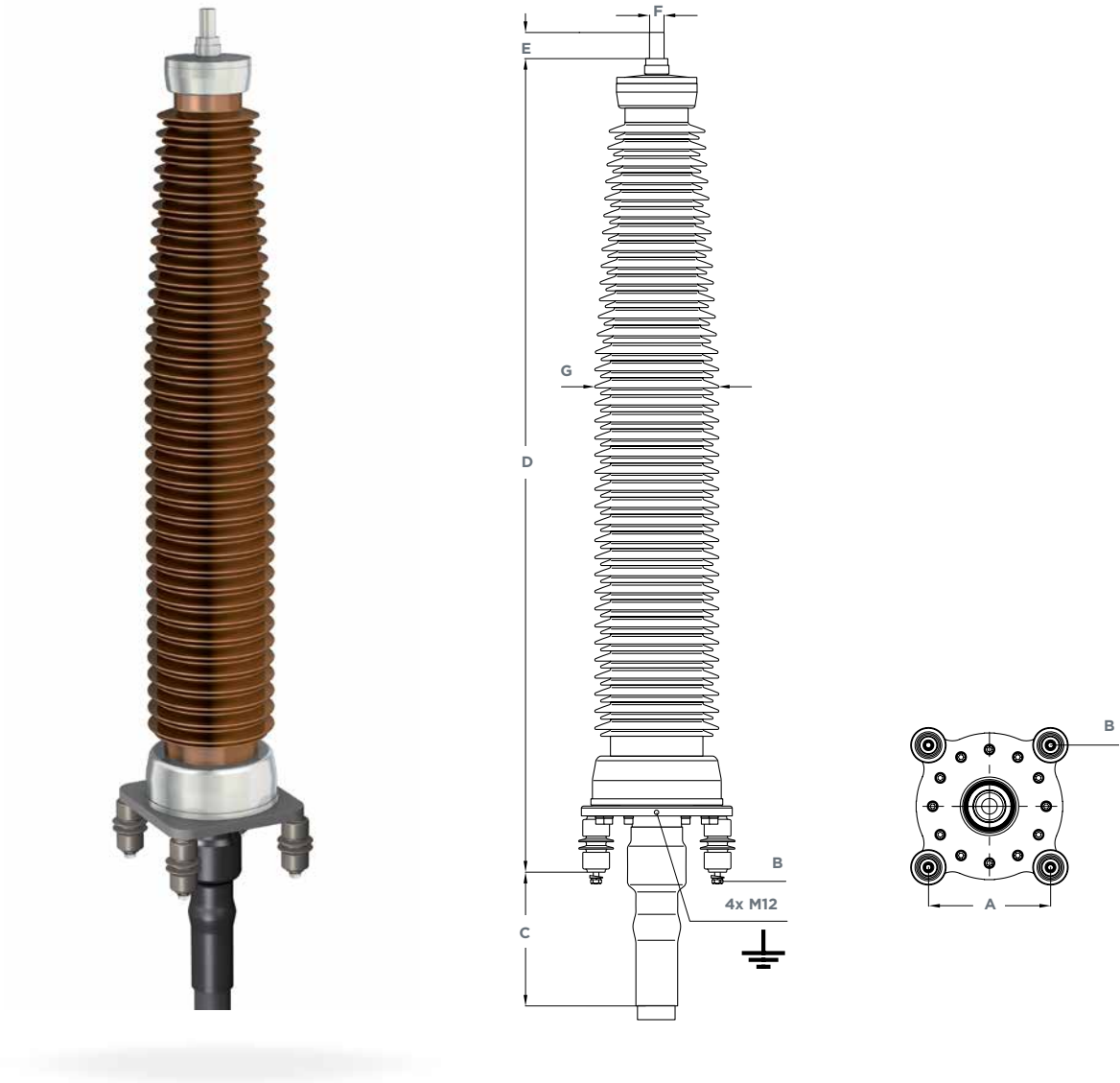
Technical data

| Product description | Conductor cross section (mm²) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|-------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-145P (-4A)     | 95 - 1200                     | 34 - 74                                        | 110                                        | 4300                           |

Dimensions

| Product description | A (mm)    | B (mm) | C (mm) | D (mm) | E (mm)  | F (mm)   | G (mm) |
|---------------------|-----------|--------|--------|--------|---------|----------|--------|
| OHVT-145P (-4A)     | 300 - 345 | M16    | 350    | 1785   | 100/130 | 30/40/50 | 360    |

Outdoor Terminations (OHVT-245P)



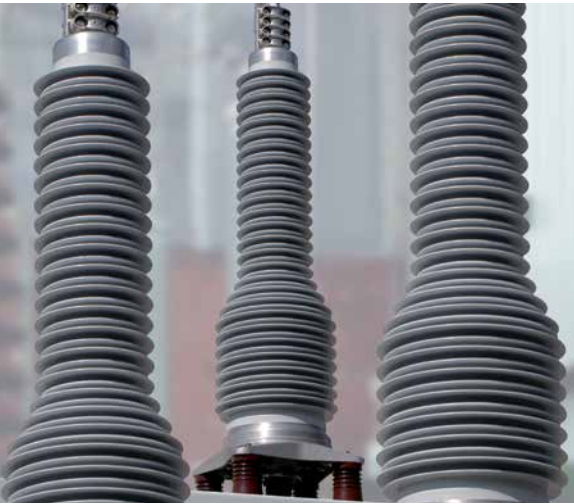
High Voltage  
Terminations

Technical data

| Product description | Conductor cross section (mm²) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|-------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-245P (-4A)     | 300 - 2500                    | 71 - 119                                       | 170                                        | 9100                           |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm) | E (mm)  | F (mm) | G (mm) |
|---------------------|--------|--------|--------|--------|---------|--------|--------|
| OHVT-245P (-4A)     | 500    | M24    | 550    | 3356   | 100/130 | 50/60  | 514    |



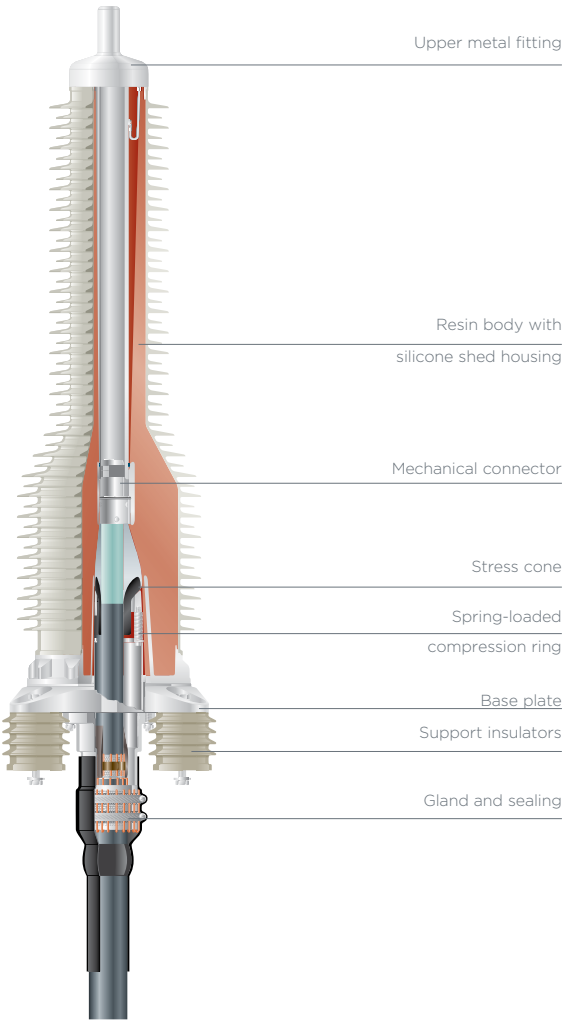
## Outdoor Terminations Dry-type (OHVT-D)

**APPLICATION**

- The dry self-supporting termination is designed for voltage class 145 kV and operation under severe environmental conditions. It is free from any insulating liquid or gel. Polymeric insulated cables of various designs can be adopted with respect to shielding and metal sheath. The termination is easily separable and consists of a plug-in part and an epoxy resin insulator protected with a directly moulded silicone shed housing. Due to the short cable cut-back dimensions of the plug-in, the time required to install the termination is very short and can be further reduced by pre-installing the plug-in on the shop floor. The plug-in is similar to the plug-in used with our dry switchgear/transformer termination

**FEATURES**

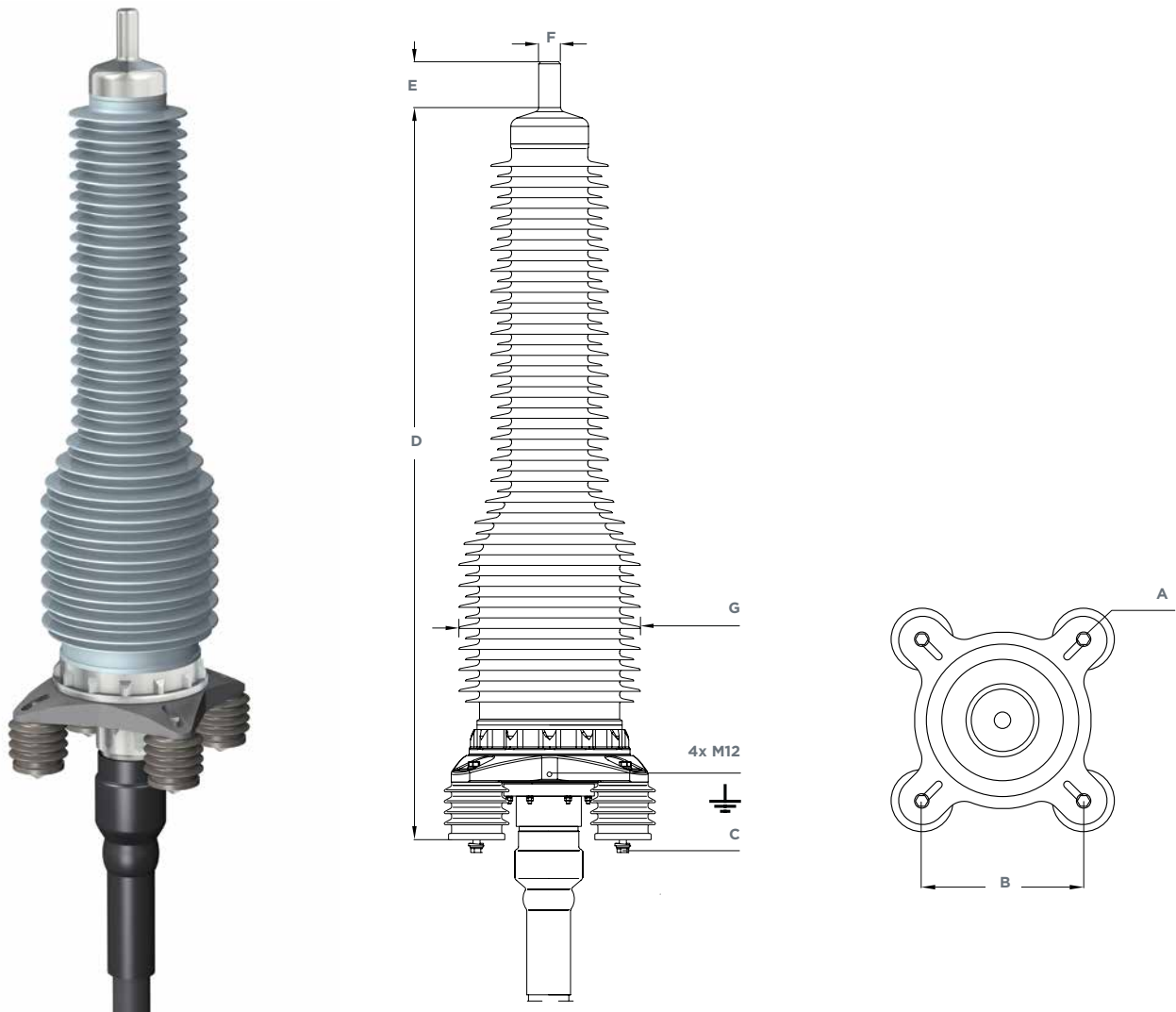
- Dry interface, no oil-filling
- Self-supporting
- Pre-fabricated and factory tested silicone-rubber stress cone
- Torque-controlled multi-contact conductor bolt
- Fast and simple installation combining GIS plug-in technology with polymeric insulators
- No special tools required to install the termination
- Insulated cable gland for sectionalization
- Type tested according to IEC 60840



|                                                      |                        |                        |
|------------------------------------------------------|------------------------|------------------------|
| Max. operating voltage $U_m$ (kV)                    | 123                    | 145                    |
| Standards                                            | IEC 60840<br>IEC 60815 | IEC 60840<br>IEC 60815 |
| Rated voltage $U$ (kV)                               | 110 - 115              | 132 - 138              |
| Rated lightning impulse withstand voltage (BIL) (kV) | 550                    | 650                    |

Outdoor Terminations Dry-type (OHVT-D)

High Voltage  
Terminations



Technical data

| Product description | Conductor cross section (mm²) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|-------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| OHVT-145D           | 95 - 1200                     | 34 - 78                                        | 120                                        | 4680                           |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) | F (mm) | G (mm) |
|---------------------|--------|--------|--------|--------|--------|--------|--------|
| OHVT-145D           | 450    | 345    | M16    | 1783   | 100    | 50     | 410    |



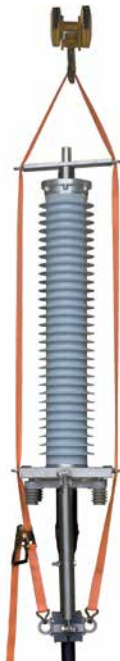
## Arcing Horn for Outdoor Terminations (OHVT)

### APPLICATION

- The arcing horns are made to protect the insulators from damage during a flashover. In case of overvoltages, the horns provide a separate breakdown path through the air and keep the flashover away from the insulator surface. As a result of this, the probability of insulator damage by overvoltage is reduced dramatically. The gap length can be adjusted so that the overvoltage withstand-level is variable

### FEATURES

- Easy installation
- Various flashover lengths available
- No contact to the grounding system of the termination and power cable for isolated operation
- May be used for porcelain and composite insulators
- Special designs on request



## Lifting Device for Outdoor Terminations (OHVT)

### APPLICATION

- This lifting device is designed for lifting the installed termination, including the cable, to high positioned installation sites

### FEATURES

- Comfortable and safe installation of the termination on the ground
- Designed to lift the complete installed and oil filled termination with cable
- Easy placement and mounting onto the rack on the pylon
- Applicable for all TE Connectivity terminations up to 170 kV
- Adjustable to all common cable sizes up to a diameter over cable sheath of 110 mm
- Easy assembling and handling
- Entire pulling force is applied to the cable only; no mechanical stress is applied to the termination
- Lifting slings and shackles are not included in the kit, because of their yearly safety check regulations
- Maximum lifting weight 500 kg



## Oil Drain Flange for Outdoor Terminations

### APPLICATION

- The oil drain flange is being used for easy access to the oil inside of the terminations after installation. This part allows to release some oil for quality check of the oil (e.g. moisture content, dielectric breakdown strength, etc.) if needed. But also in case of a temporary use of an oil filled termination, the incorporated oil can be released through this component so that a disassembling of the termination can be done in a clean way. The oil drain flange is installed between hollow core insulator and base plate



## Fibre-Optic Add-On Kit for Outdoor Terminations

### APPLICATION

- The Raychem fibre-optic add-on kit is designed to connect the glass fibres integrated in HV cables. The kit includes all components required to seal the cable jacket and the fibre-optic outlet securely and to protect the sensitive optical fibres that are housed inside the steel pipes
- The standard add-on kit is suitable for connecting two individual steel pipes each with a maximum of 24 optical fibres

### FEATURES

- Gel-sealing technology ensures reliable outdoor operation
- Enhanced fibre management
- The splice box is easy to open and close without the use of special tools
- The kits are available for Raychem outdoor terminations

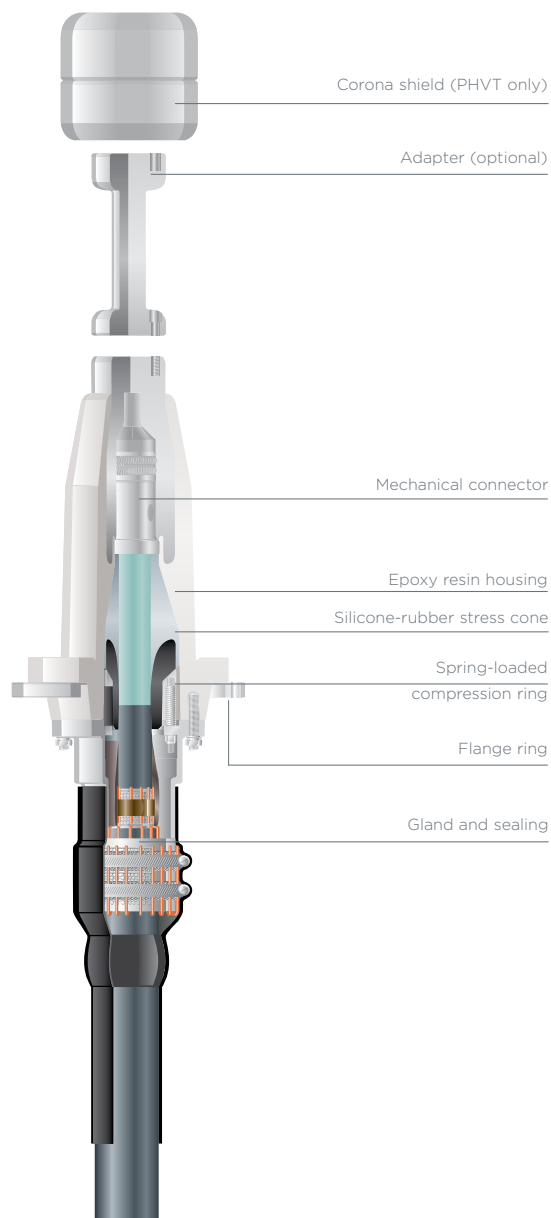




## Chapter II

# High Voltage Dry Plug-In Terminations

|                                                                             |    |
|-----------------------------------------------------------------------------|----|
| Dry Plug-In Switchgear<br>and Transformer Terminations (PHVS & PHVT).....   | 32 |
| Add-On Kits for Dry Plug-In Switchgear<br>and Transformer Terminations..... | 41 |



## Dry Plug-In Switchgear and Transformer Terminations (PHVS & PHVT)

### APPLICATION

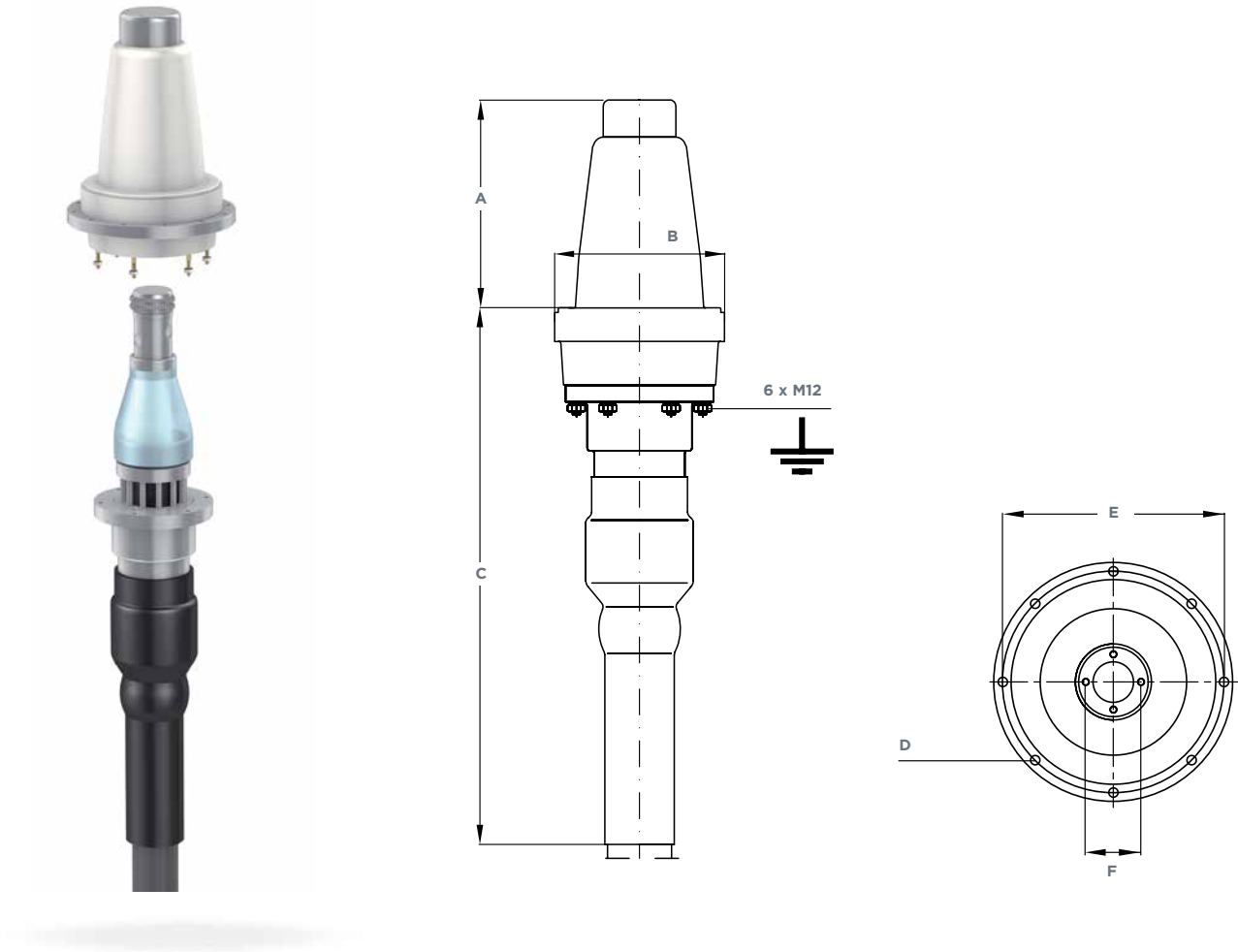
- The dry compact switchgear termination for voltage classes up to 245 kV is designed to be installed in cable entry housings of gas-insulated switchgear (GIS). It complies with IEC 62271-209 standard, which essentially specifies the interfaces between the termination and the switchgear. Therefore, the termination will fit into all GIS that comply with IEC 62271-209. Adapters are available to match the dimensions of wet (oil-filled) type terminations, and older designs specified in IEC 60859. The termination operates in SF<sub>6</sub> but also in insulating liquids like transformer oil. A corona shield at the top of the termination then provides the necessary shielding for the terminal. The termination is easily separable and consists of a plug-in part and an epoxy resin insulator. The insulator can be installed by the GIS or transformer manufacturer directly at the factory, saving installation time on-site and reducing the risk of contamination of the cable entry housing

### FEATURES

- Dry interfaces, no oil-filling
- Dimensions comply with IEC 62271-209
- Pressure-tight resin housing
- Operates in SF<sub>6</sub> and insulating liquids
- Pre-fabricated and factory-tested silicone-rubber stress cone
- Torque-controlled or wedge-type multi-contact conductor bolt
- No special tools required to install the termination
- Insulated cable gland for sectionalization
- Type tested according to IEC 60840, IEC 62067 and IEC 62271-209 standards

| Max. operating voltage $U_m$ (kV)                    | 72.5                       | 123                        | 145                        | 170                        | 245                        |
|------------------------------------------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|
| Standards                                            | IEC 60840<br>IEC 62271-209 | IEC 60840<br>IEC 62271-209 | IEC 60840<br>IEC 62271-209 | IEC 60840<br>IEC 62271-209 | IEC 62067<br>IEC 62271-209 |
| Rated voltage $U$ (kV)                               | 60 - 69                    | 110 - 115                  | 132 - 138                  | 150 - 161                  | 220 - 230                  |
| Rated lightning impulse withstand voltage (BIL) (kV) | 325                        | 550                        | 650                        | 750                        | 1050                       |

Dry Plug-In Switchgear Terminations (PHVS-72)



High Voltage  
Dry Plug-In  
Terminations

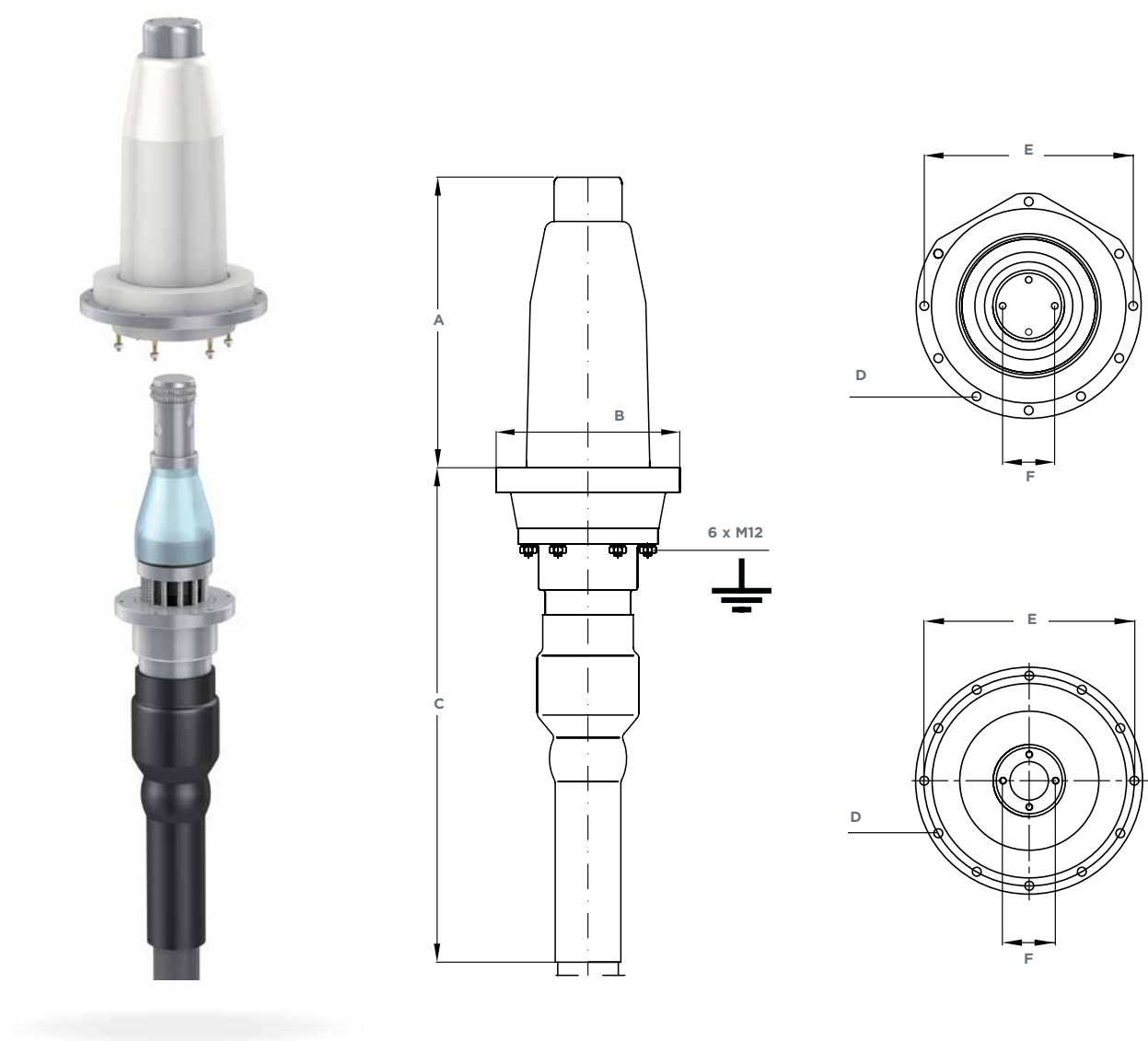
Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| PHVS-72             | 95 - 2000                                  | 34 - 78                                        | 120                                        | 255                            |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) | F (mm) |
|---------------------|--------|--------|--------|--------|--------|--------|
| PHVS-72             | 310    | 255    | 800    | 8 x 12 | 270    | 80     |

Dry Plug-In Switchgear Terminations (PHVS-145)



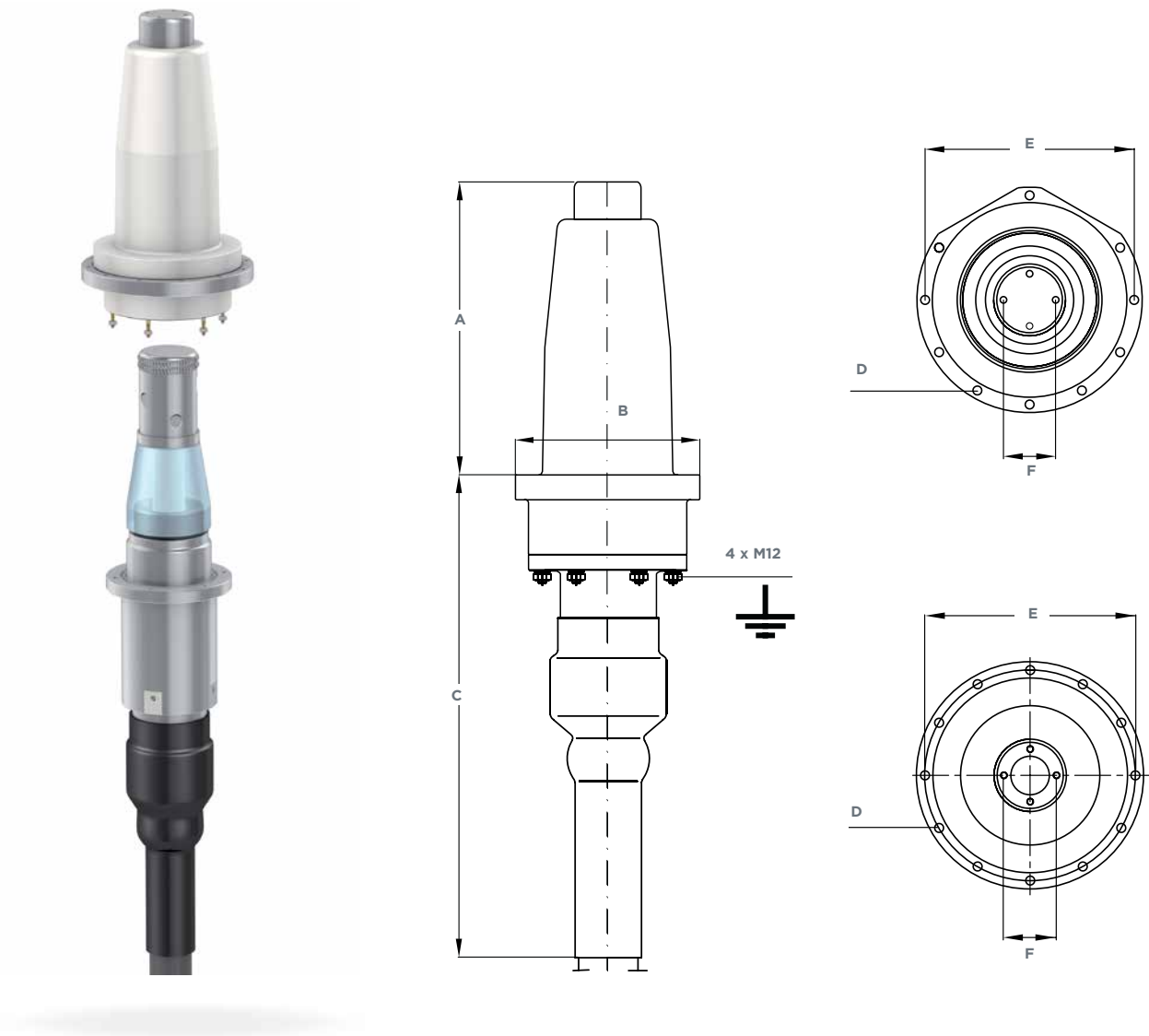
Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| PHVS-145            | 95 - 1200                                  | 34 - 78                                        | 120                                        | 414                            |
| PHVS-145            | 1200 - 2500                                | 73 - 108                                       | 135                                        | 414                            |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm)    | E (mm) | F (mm) |
|---------------------|--------|--------|--------|-----------|--------|--------|
| PHVS-145            | 470    | 297    | 800    | 12 x 13.5 | 320    | 80     |

Dry Plug-In Switchgear Terminations (PHVS-170)



High Voltage  
Dry Plug-In  
Terminations

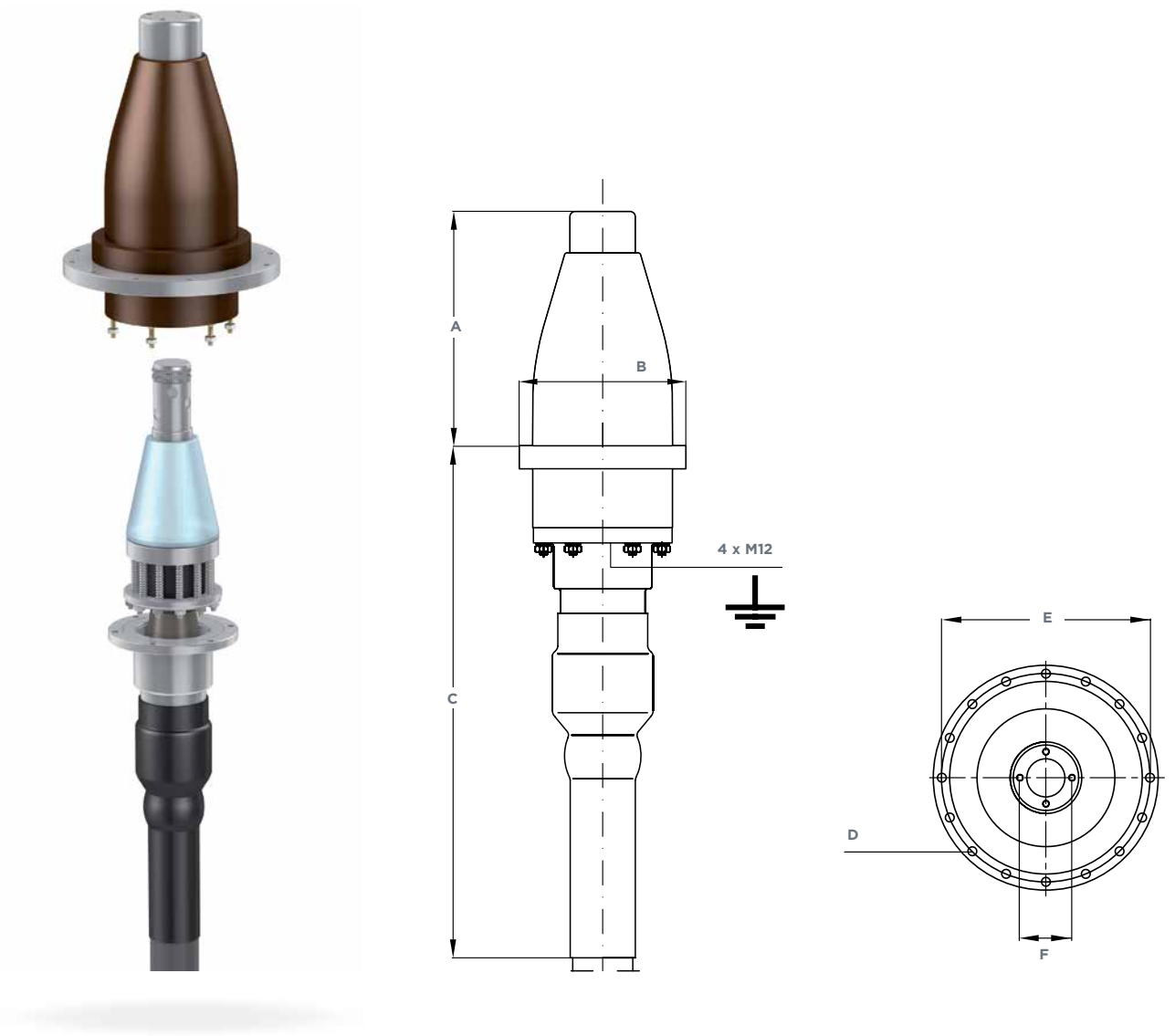
Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| PHVS-170            | 1000 - 2500                                | 73 - 108                                       | 135                                        | 414                            |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm)    | E (mm) | F (mm) |
|---------------------|--------|--------|--------|-----------|--------|--------|
| PHVS-170            | 470    | 298    | 800    | 12 x 13.5 | 320    | 80     |

Dry Plug-In Switchgear Terminations (PHVS-245)



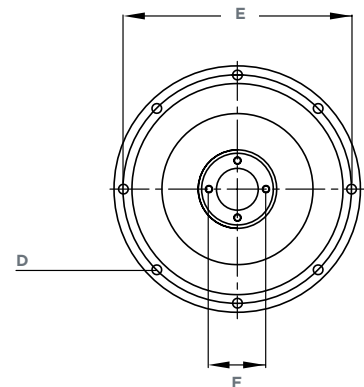
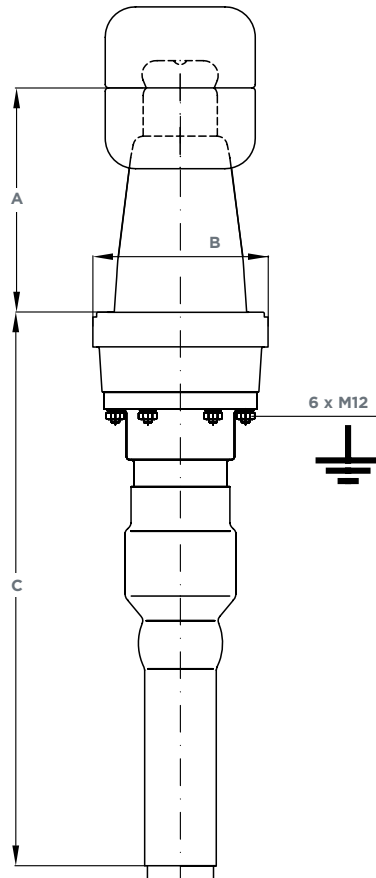
Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| PHVS-245            | 300 - 2500                                 | 77 - 119                                       | 150                                        | 519                            |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm)    | E (mm) | F (mm) |
|---------------------|--------|--------|--------|-----------|--------|--------|
| PHVS-245            | 620    | 454    | 860    | 16 x 13.5 | 475    | 110    |

# Dry Plug-In Switchgear Terminations (PHVT-72)



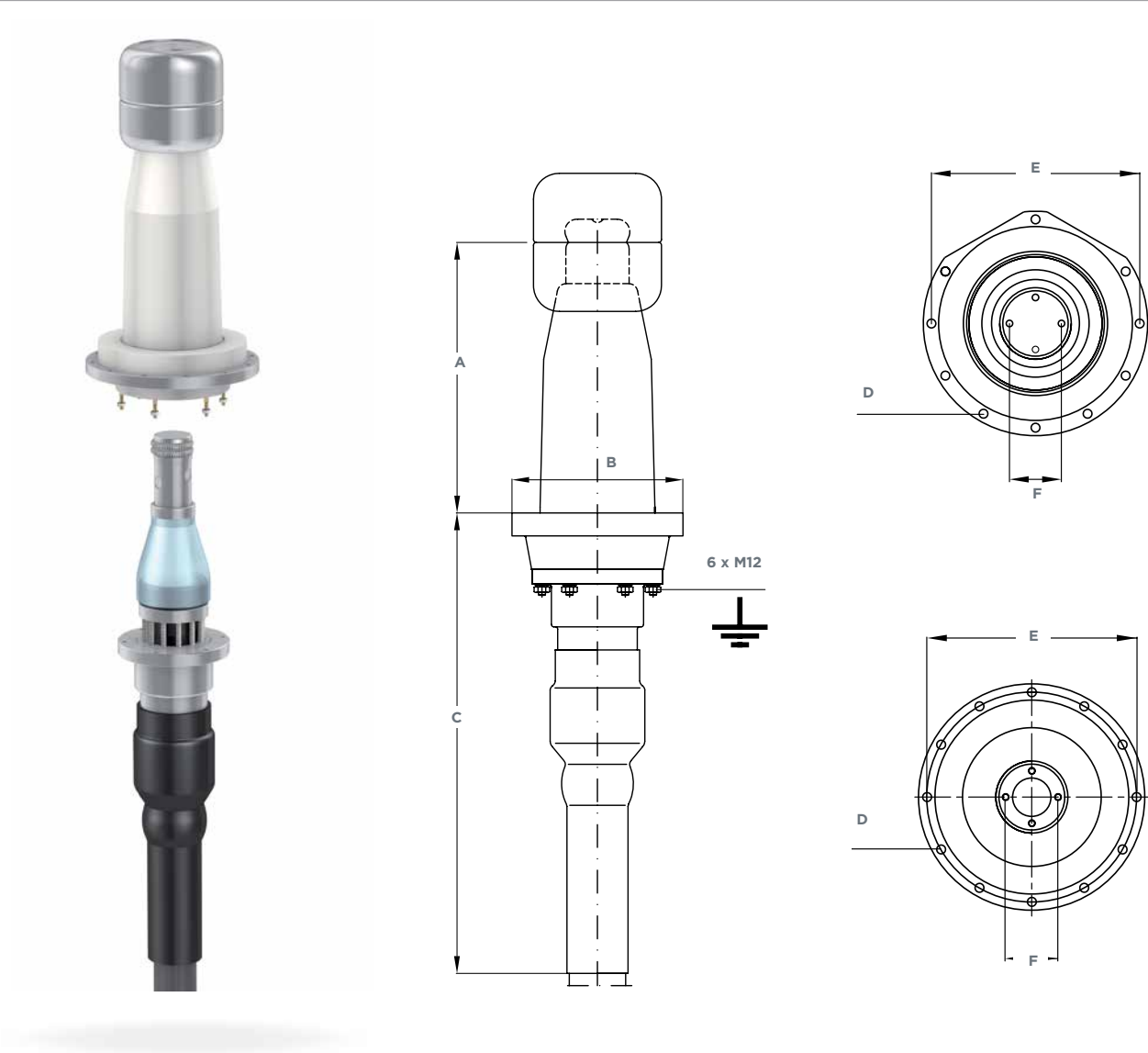
## Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| PHVT-72             | 95 - 2000                                  | 34 - 78                                        | 120                                        | 255                            |

## Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm) | E (mm) | F (mm) |
|---------------------|--------|--------|--------|--------|--------|--------|
| PHVT-72             | 310    | 255    | 800    | 8 x 12 | 270    | 80     |

Dry Plug-In Switchgear Terminations (PHVT-145)



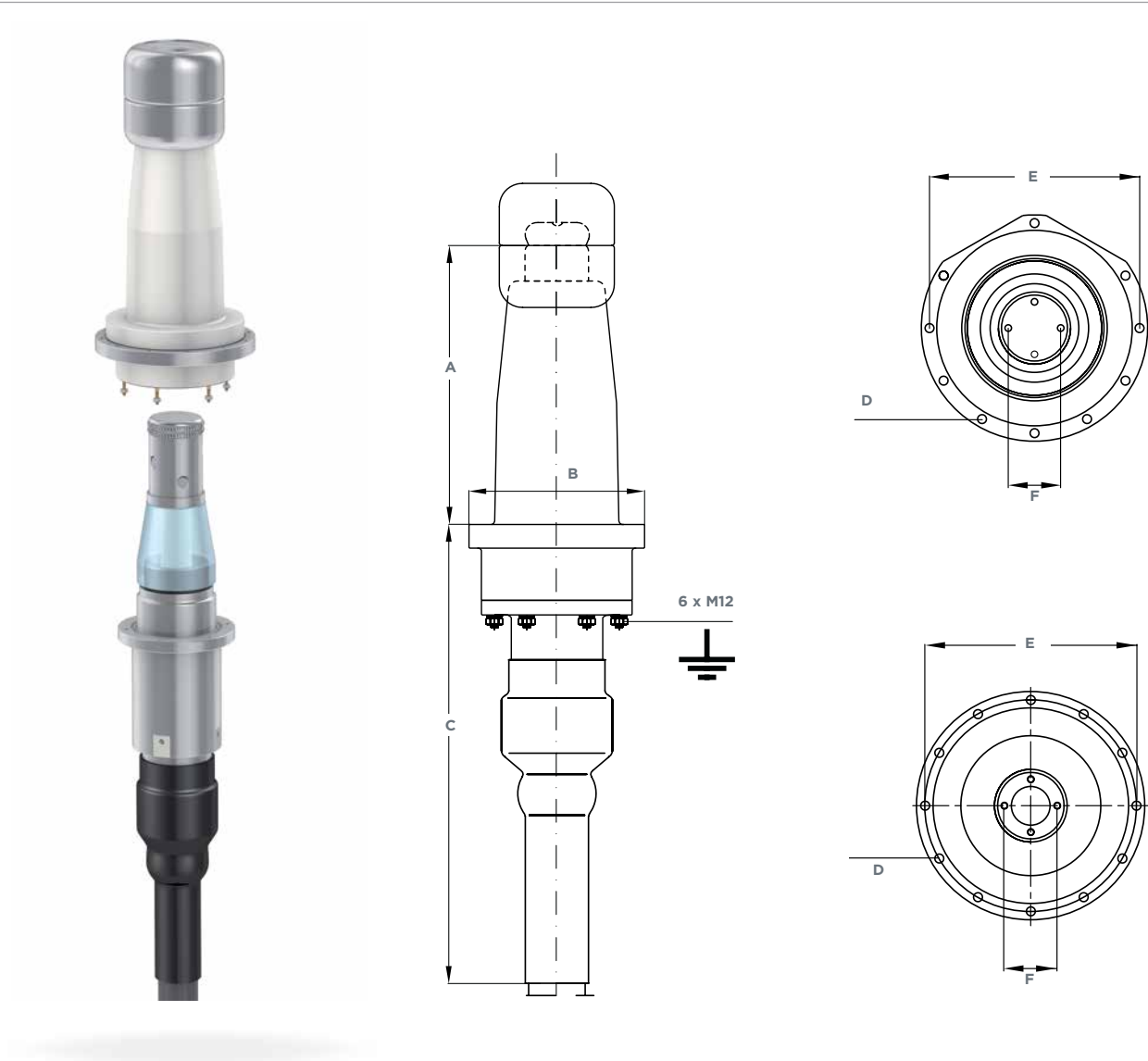
Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| PHVT-145            | 95 - 1200                                  | 34 - 78                                        | 120                                        | 414                            |
| PHVT-145            | 1200 - 2500                                | 73 - 108                                       | 135                                        | 414                            |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm)    | E (mm) | F (mm) |
|---------------------|--------|--------|--------|-----------|--------|--------|
| PHVT-145            | 470    | 297    | 800    | 12 x 13.5 | 320    | 80     |

# Dry Plug-In Switchgear Terminations (PHVT-170)



High Voltage  
Dry Plug-In  
Terminations

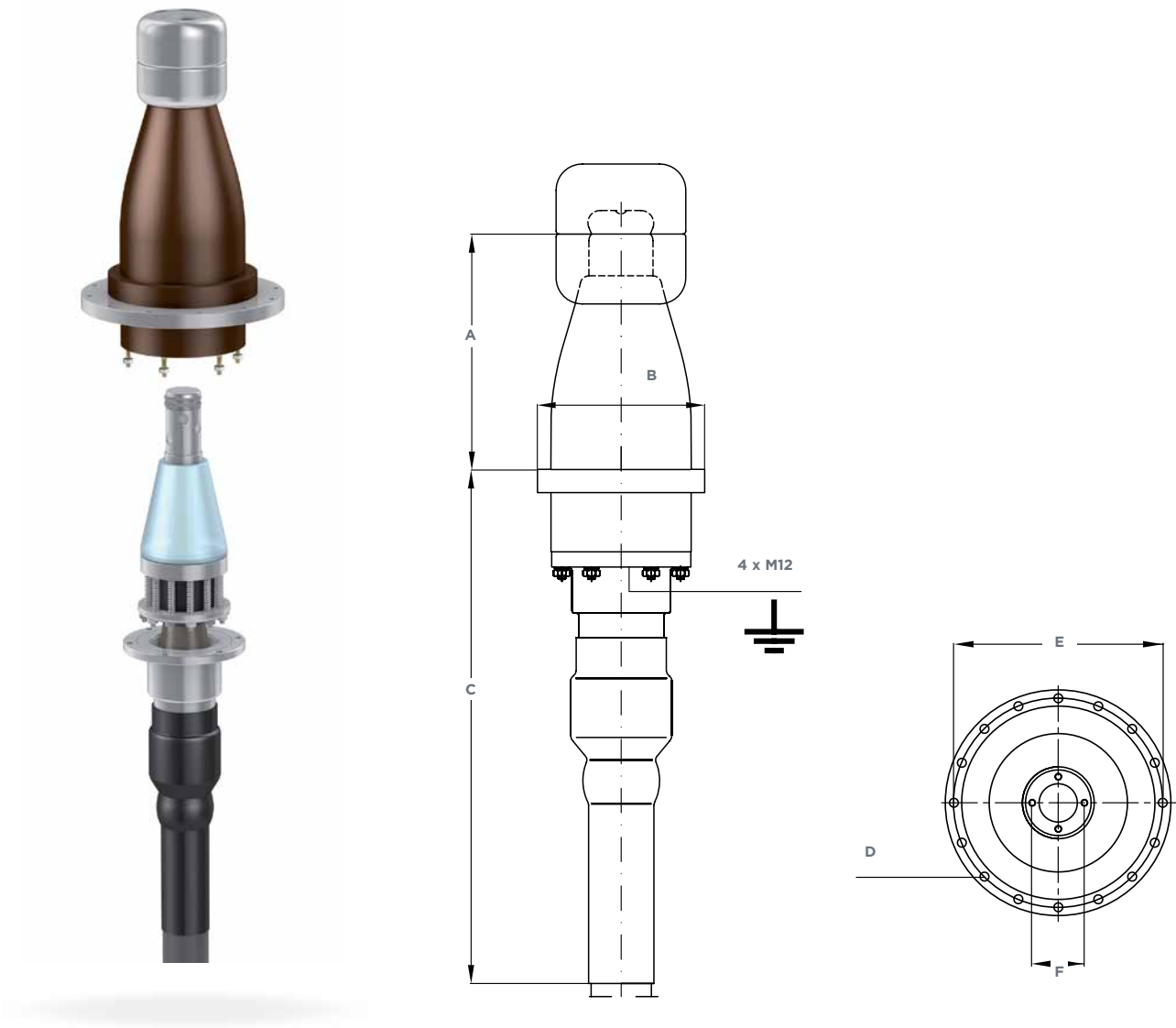
## Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| PHVT-170            | 1000 - 2500                                | 73 - 108                                       | 135                                        | 414                            |

## Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm)    | E (mm) | F (mm) |
|---------------------|--------|--------|--------|-----------|--------|--------|
| PHVT-170            | 470    | 298    | 800    | 12 x 13.5 | 320    | 80     |

Dry Plug-In Switchgear Terminations (PHVT-245)



Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Minimal creepage distance (mm) |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|--------------------------------|
| PHVT-245            | 300 - 2500                                 | 77 - 119                                       | 150                                        | 519                            |

Dimensions

| Product description | A (mm) | B (mm) | C (mm) | D (mm)    | E (mm) | F (mm) |
|---------------------|--------|--------|--------|-----------|--------|--------|
| PHVT-245            | 620    | 454    | 860    | 16 x 13.5 | 475    | 110    |



## Blind Plug for Dry Plug-In Switchgear and Transformer Terminations

### APPLICATION

- Suitable for use when the switchgear is under operation without a cable connection. The blind plug (also known as dead end plug or dummy plug) is used to close the socket of the cable entry housing

### FEATURES

- Voltage proof and can be used for continuous operation at nominal voltage
- Easy installation - similar to standard plug in
- Blind plug is removable and can be used as a temporary solution until the cable is connected
- Blind plug is re-usable
- Type tested according to the IEC 60840 standard

High Voltage  
Dry Plug-In  
Terminations



## Test Plate for Dry Plug-In Switchgear and Transformer Terminations

### APPLICATION

- Suitable for use where the switchgear needs to be tested. The plate is an adapter to pressurize the inner part of the insulator with SF<sub>6</sub>.

### FEATURES

- Pressure tested
- Suitable manometer available
- Re-useable

## Accessories for Dry Plug-In Switchgear and Transformer Terminations

Our product portfolio includes not only the high voltage cable accessories but also their add-on accessories. The range shown below doesn't cover all available accessories. Special components can be made on request.

### Portfolio:

- Protection cover
- Adapter
- Cable reel
- Special connectors



### Fibre-Optic Add-On Kit for Plug-In Terminations

#### APPLICATION

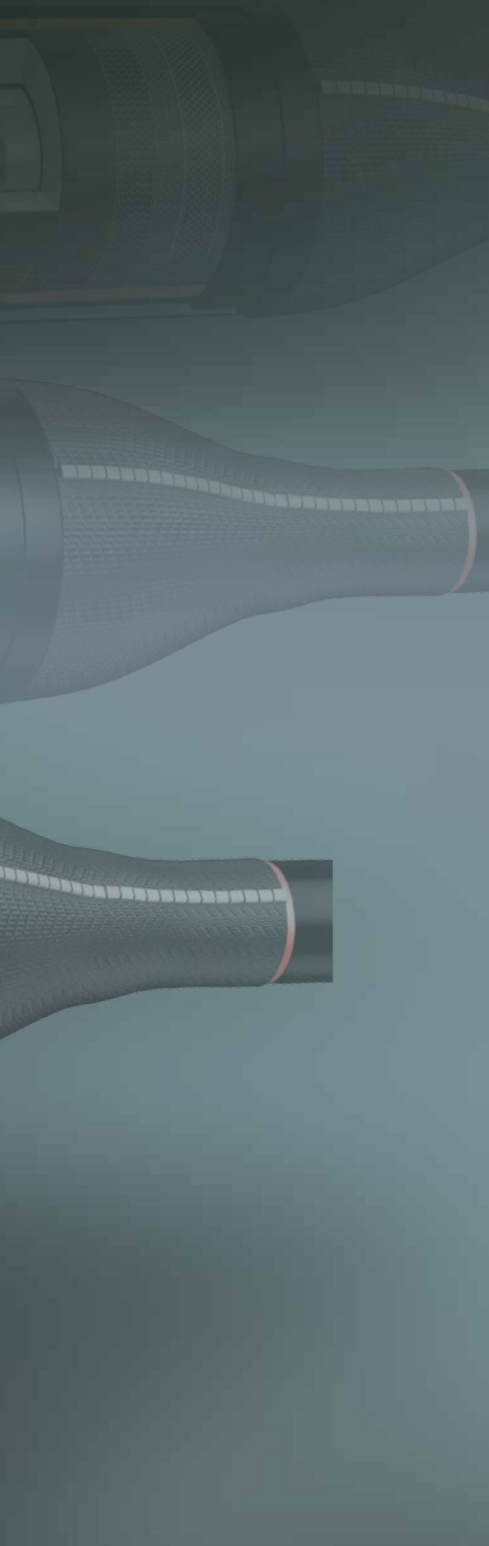
- The Raychem fibre-optic add-on kit is designed to connect the glass fibres integrated in HV cables. The kit includes all components required to seal the cable jacket and the fibre-optic outlet securely and to protect the sensitive optical fibres that are housed inside the steel pipes
- The standard add-on kit is suitable for connecting two individual steel pipes each with a maximum of 24 optical fibres

#### FEATURES

- Gel-sealing technology ensures reliable outdoor operation
- Enhanced fibre management
- The splice box is easy to open and close without the use of special tools
- The kits are available for Raychem equipment terminations







# Chapter III

## High voltage cable joints

|                                                  |    |
|--------------------------------------------------|----|
| Heat-Shrinkable Joints (EHVS-H) .....            | 46 |
| One Piece Joints (EHVS-S) .....                  | 49 |
| Three Piece Joints (EHVS-T) .....                | 52 |
| Fibre-Optic Add-On Kit for HV Cable Joints ..... | 55 |

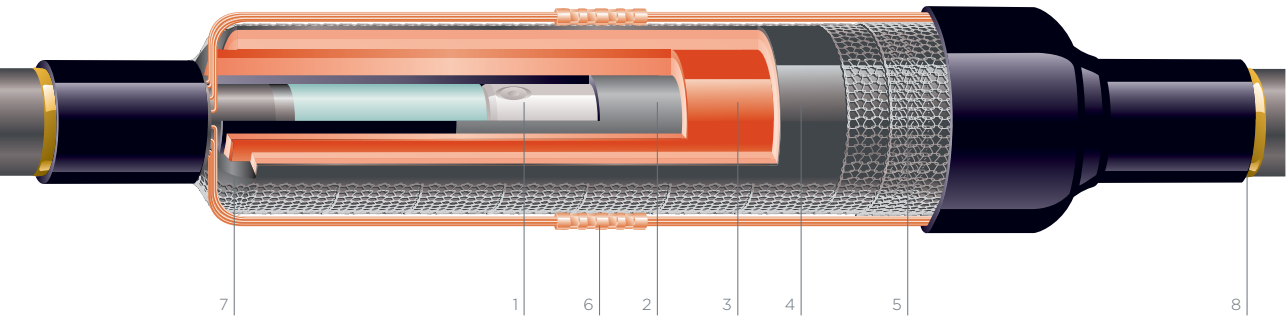
# Heat-Shrinkable Joints (EHVS-H)

APPLICATION

▪ Polymeric insulated cables of various designs can be adapted with respect to shielding and metal sheath. Our heat shrink accessories have been used by utilities and industrial companies around the world for more than 50 years. This ongoing field experience has us a leader in materials science and technology for high voltage applications. Our materials technology is at the core of the development of our heat-shrinkable joints. The materials, used in TE Connectivity Raychem cable accessories, have been extensively optimized with respect to product design and function, manufacturing, and expected service environments

FEATURES

- Compact and modular design
- Heat-shrinkable stress control sleeves
- Torque-controlled connector
- Joint fits on all polymeric cable constructions
- Proven shield continuity concept
- Short cut-back dimension
- Cable size transition possible
- Water and corrosion-resistant
- Easy and fast to install
- No special or expensive tools required
- Lightweight components
- Unlimited storage life-time under normal conditions
- Reduced waste for disposal
- Wide installed base at international customers



- 1 Mechanical connector
- 2 Electrical stress control tube
- 3 Insulating tubing
- 4 Screened insulating tubing
- 5 Copper mesh
- 6 Solderless shield connection
- 7 Sealant/mastic
- 8 Outer protection with integrated moisture barrier

|                                                      |           |           |
|------------------------------------------------------|-----------|-----------|
| Max. operating voltage $U_m$ (kV)                    | 52        | 72.5      |
| Standards                                            | IEC 60840 | IEC 60840 |
| Rated voltage $U$ (kV)                               | 45 - 47   | 60 - 69   |
| Rated lightning impulse withstand voltage (BIL) (kV) | 250       | 325       |



EHVS-52H



EHVS-72H

High Voltage  
Cable joints

### Technical data

| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-52H            | 95 - 2500                                  | 30 - 86                                        | 100                                        | 1350        | 130           | Inline / shield break / grounded |
| EHVS-72H            | 95 - 2500                                  | 30 - 86                                        | 100                                        | 1350        | 130           | Inline / shield break / grounded |

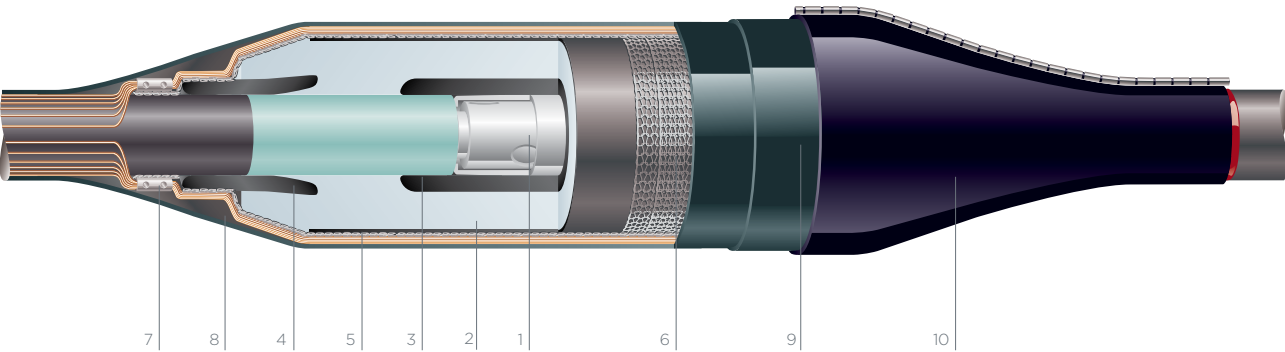
# One Piece Joints (EHVS-S)

**APPLICATION**

- The joint is a pre-fabricated one-piece design for voltage classes up to 245 kV. Polymeric insulated cables of various designs can be adapted with respect to shielding and metal sheath. The silicone rubber joint body with integrated geometrical stress control, provides proven electrical function. The joint components combine electrical performance, stress control and moisture sealing to provide the important functions required for all high voltage products

**FEATURES**

- Premoulded one-piece joint body
- Torque-controlled connector
- Choice of outer sealing and protection systems
- Joint fits on all polymeric cable constructions
- Proven shield continuity concept
- Factory-tested silicone-rubber body
- Special silicone rubber provides perfect compression force for optimised electrical performance
- Simple assembly
- No tension set of joint body
- Moulded thick outer conductive screen
- Geometrical electrical stress control by moulded conductive deflectors
- Type tested according to IEC 60840, IEC 62067 standards



- 1 Mechanical connector
- 2 Silicone rubber body
- 3 Inner electrode/Faraday cage
- 4 Deflector
- 5 Outer screen
- 6 Copper mesh
- 7 Solderless shield connection
- 8 Sealant/mastic
- 9 Insulating tubes
- 10 Outer protection with integrated moisture barrier

|                                                      |           |           |
|------------------------------------------------------|-----------|-----------|
| Max. operating voltage $U_m$ (kV)                    | 145       | 245       |
| Standards                                            | IEC 60840 | IEC 62067 |
| Rated voltage $U$ (kV)                               | 132 - 138 | 220 - 230 |
| Rated lightning impulse withstand voltage (BIL) (kV) | 650       | 1050      |

## One Piece Joints 145 kV

### Heat-shrink Rejacketing



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-145SW          | 500 - 2500                                 | 60 - 112                                       | 130                                        | 2400        | 220           | Inline / shield break / grounded |

### Copper Casing



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-145SC          | 500 - 2500                                 | 60 - 112                                       | 130                                        | 2400        | 280           | Inline / shield break / grounded |

### Coffin Box



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-145SB          | 500 - 2500                                 | 60 - 112                                       | 130                                        | 3000        | 350           | Inline / shield break / grounded |

### Heavy Duty (Copper Casing and Coffin Box)



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-145SH          | 500 - 2500                                 | 60 - 112                                       | 130                                        | 3000        | 350           | Inline / shield break / grounded |

## One Piece Joints 245 kV

### Heat-shrink Rejacketing



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-245SW          | 300 - 2500                                 | 71 - 119                                       | 150                                        | 2500        | 310           | Inline / shield break / grounded |

### Copper Casing



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-245SC          | 300 - 2500                                 | 71 - 119                                       | 150                                        | 2500        | 350           | Inline / shield break / grounded |

### Coffin Box



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-245SB          | 300 - 2500                                 | 71 - 119                                       | 150                                        | 3500        | 550           | Inline / shield break / grounded |

### Heavy Duty (Copper Casing and Coffin Box)



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-245SH          | 300 - 2500                                 | 71 - 119                                       | 150                                        | 3500        | 550           | Inline / shield break / grounded |

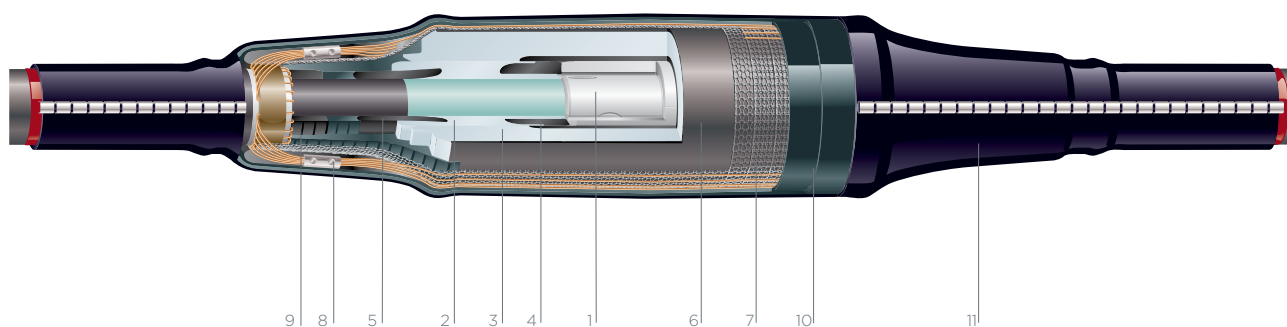
## Three Piece Joints (EHVS-T)

### APPLICATION

- The joint is a pre-fabricated three piece design for voltage classes up to 170 kV. Polymeric insulated cables of various designs can be adapted with respect to shielding and metal sheath. The silicone rubber joint parts with integrated geometrical stress control provides proven electrical function. The joint components combine electrical performance, stress control, and moisture sealing to provide the important functions required for all high voltage products

### FEATURES

- Premoulded three piece joint design
- Torque-controlled connector
- Joint fits on all polymeric cable constructions
- Proven shield continuity concept
- Factory-tested silicone rubber bodies
- Special silicone rubber provides perfect compression force for optimized electrical performance
- Short cut-back dimensions
- No special tools required to install the joint
- Cable size transition possible
- No tension set of joint body
- Moulded outer conductive screen
- Geometrical electrical stress control by moulded conductive deflectors
- Type tested according to IEC60840 standards



- 1 Mechanical connector
- 2 Silicone rubber adapter body
- 3 Silicone rubber main body
- 4 Inner electrode/Faraday cage
- 5 Deflector
- 6 Outer screen (moulded)
- 7 Copper mesh
- 8 Solderless shield continuity
- 9 Sealant/mastic
- 10 Insulating tubes
- 11 Outer protection with integrated moisture barrier

|                                                      |           |           |
|------------------------------------------------------|-----------|-----------|
| Max. operating voltage $U_m$ (kV)                    | 145       | 170       |
| Standards                                            | IEC 60840 | IEC 60840 |
| Rated voltage $U$ (kV)                               | 132 - 138 | 150 - 161 |
| Rated lightning impulse withstand voltage (BIL) (kV) | 650       | 750       |

## Three Piece Joints 145 kV

### Heat-shrink Rejacketing



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-145TW          | 185 - 1600                                 | 43 - 83                                        | 105                                        | 2000        | 200           | Inline / shield break / grounded |
| EHVS-145TW          | 1600 - 2500                                | 60 - 112                                       | 130                                        | 2000        | 250           | Inline / shield break / grounded |

### Copper Casing



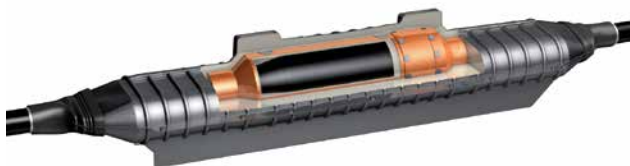
| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-145TC          | 185 - 1600                                 | 43 - 83                                        | 105                                        | 2500        | 250           | Inline / shield break / grounded |
| EHVS-145TC          | 1600 - 2500                                | 60 - 112                                       | 130                                        | 2500        | 250           | Inline / shield break / grounded |

### Coffin Box



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-145TB          | 185 - 1600                                 | 43 - 83                                        | 105                                        | 3000        | 350           | Inline / shield break / grounded |
| EHVS-145TB          | 1600 - 2500                                | 60 - 112                                       | 130                                        | 3000        | 450           | Inline / shield break / grounded |

### Heavy Duty (Copper Casing and Coffin Box)



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-145TH          | 185 - 1600                                 | 43 - 83                                        | 105                                        | 3000        | 350           | Inline / shield break / grounded |
| EHVS-145TH          | 1600 - 2500                                | 60 - 112                                       | 130                                        | 3000        | 450           | Inline / shield break / grounded |

## Three Piece Joints 170 kV

### Heat-shrink Rejacketing



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-170TW          | 240 - 2500                                 | 60 - 112                                       | 130                                        | 2000        | 250           | Inline / shield break / grounded |

### Copper Casing



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-170TC          | 240 - 2500                                 | 60 - 112                                       | 130                                        | 2500        | 300           | Inline / shield break / grounded |

### Coffin Box



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-170TB          | 240 - 2500                                 | 60 - 112                                       | 130                                        | 3000        | 450           | Inline / shield break / grounded |

### Heavy Duty (Copper Casing and Coffin Box)



| Product description | Conductor cross section (mm <sup>2</sup> ) | Diameter over cable insulation (prepared) (mm) | Max. diameter over outer cable sheath (mm) | Length (mm) | Diameter (mm) | Screen treatment                 |
|---------------------|--------------------------------------------|------------------------------------------------|--------------------------------------------|-------------|---------------|----------------------------------|
| EHVS-170TH          | 240 - 2500                                 | 60 - 112                                       | 130                                        | 3000        | 450           | Inline / shield break / grounded |



## Fibre-Optic Add-On Kit for HV Cable Joints

### APPLICATION

- The Raychem fibre-optic add-on kit is designed to connect the glass fibres integrated in HV cables. The kit includes all components required to seal the cable jacket and the fibre-optic outlet securely and to protect the sensitive optical fibres that are housed inside the steel pipes
- The standard add-on kit is suitable for connecting two individual steel pipes each with a maximum of 24 optical fibres

### FEATURES

- The splice box is suitable for cross-bonding and straight-through joints
- Gel-sealing technology ensures reliable operation even when buried joints are used
- Enhanced fibre management
- The splice box is easy to open and close without the use of special tools
- The kits are available for all Raychem joints







## Chapter IV

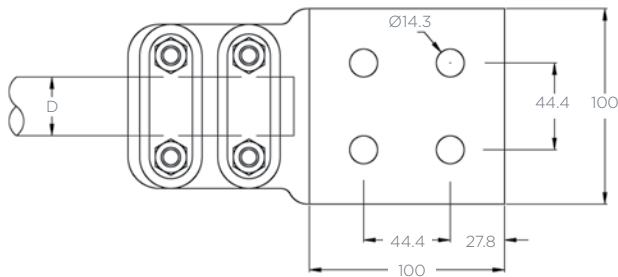
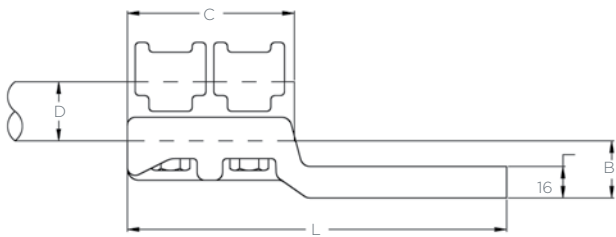
# High voltage connectors

|                                                        |    |
|--------------------------------------------------------|----|
| High Voltage Connectors for Outdoor Terminations ..... | 58 |
|--------------------------------------------------------|----|



## High Voltage Connectors for Outdoor Terminations

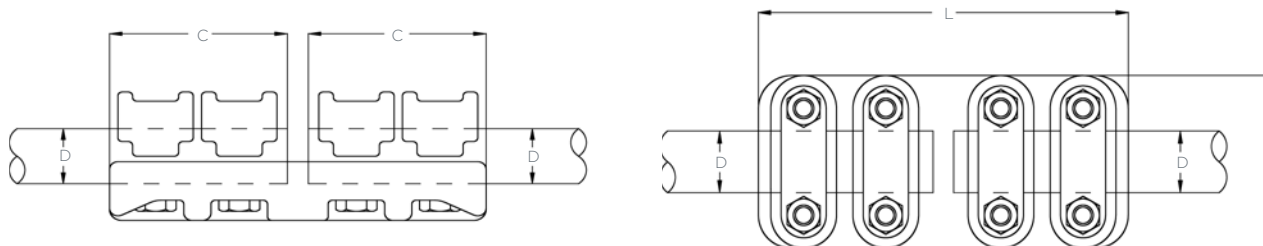
- APPLICATION
- Our full line of connectors and accessories for high voltage cable accessories covers most applications in an electrical network. These connectors are typically used for the connection of outdoor terminations to bus bars or overhead lines. Industry leading Raychem high voltage cable accessories are combined with in-house engineered high- voltage connectors to make assemblies that are easy to install and completely reliable in the energy environment.
- FEATURES
- High-strength aluminium alloy
  - Various sizes available
  - Individual solutions and special designs are available upon request
  - High reliability and operates under extreme environmental conditions
  - Fast and safe installation
  - Excellent electrical and mechanical performance
  - Easy installation with socket wrench



### Terminal Pad (NEMA)

| Description       | D       | B  | C  | L   | RPN      |
|-------------------|---------|----|----|-----|----------|
| CD 82 30 100 C290 | 26 - 31 | 29 | 85 | 193 | 707021-1 |
| CD 82 40 100 C290 | 36 - 41 | 32 | 92 | 200 | 707127-1 |
| CD 82 50 100 C290 | 46 - 51 | 25 | 94 | 207 | 718671-1 |

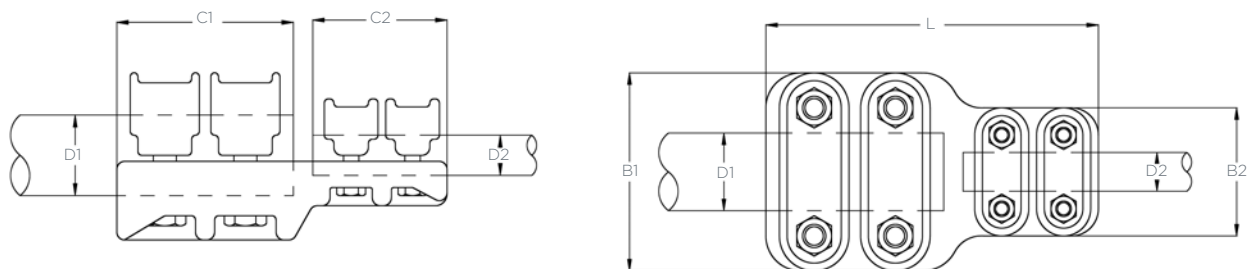
NOTE Dimensions in mm



### Straight Rod

| Description | D       | C  | L   | RPN       |
|-------------|---------|----|-----|-----------|
| RD 82 30    | 26 - 31 | 85 | 180 | 706684-1  |
| RD 82 40    | 36 - 41 | 92 | 195 | 706685-1  |
| RD 82 50    | 46 - 51 | 94 | 200 | 1510395-1 |
| 4TG82T60    | 56 - 61 | 92 | 200 | 707216-1  |

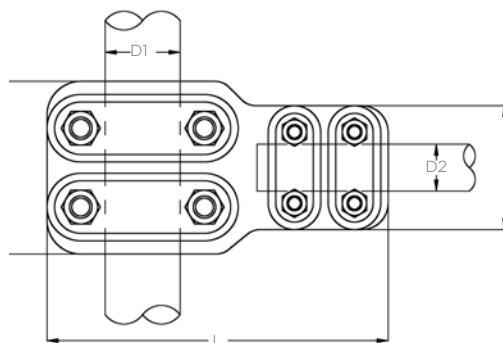
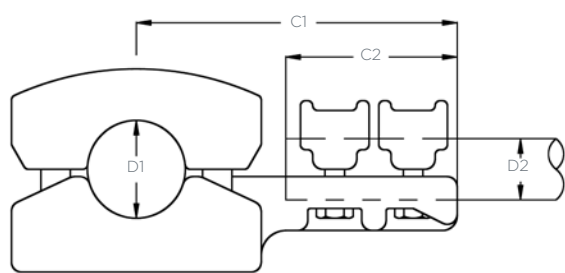
**NOTE** Dimensions in mm



### Straight Transition Rod

| Description | D1      | D2      | B1  | B2  | C1 | C2 | L   | RPN      |
|-------------|---------|---------|-----|-----|----|----|-----|----------|
| RD 82 30 20 | 26 - 31 | 16 - 21 | 84  | 66  | 85 | 70 | 165 | 706948-1 |
| RD 82 30 25 | 26 - 31 | 21 - 26 | 84  | 66  | 85 | 70 | 165 | 706636-1 |
| RD 82 35 30 | 26 - 31 | 31 - 36 | 84  | 84  | 85 | 85 | 180 | 706949-1 |
| RD 82 40 20 | 26 - 31 | 16 - 21 | 102 | 66  | 92 | 70 | 172 | 706700-1 |
| RD 82 40 25 | 36 - 41 | 21 - 26 | 102 | 66  | 92 | 70 | 172 | 706635-1 |
| RD 82 40 30 | 36 - 41 | 26 - 31 | 102 | 84  | 92 | 85 | 187 | 706655-1 |
| RD 82 40 35 | 36 - 41 | 31 - 36 | 102 | 84  | 92 | 85 | 187 | 706663-1 |
| RD 82 35 30 | 36 - 41 | 16 - 21 | 112 | 66  | 92 | 70 | 174 | 712016-1 |
| RD 82 35 30 | 46 - 51 | 21 - 26 | 112 | 66  | 92 | 70 | 174 | 716341-1 |
| RD 82 35 30 | 46 - 51 | 26 - 31 | 112 | 84  | 92 | 85 | 189 | 711000-1 |
| RD 82 35 30 | 46 - 51 | 31 - 36 | 112 | 84  | 92 | 85 | 189 | 711002-1 |
| RD 82 35 30 | 46 - 51 | 36 - 41 | 112 | 102 | 92 | 92 | 196 | 711001-1 |

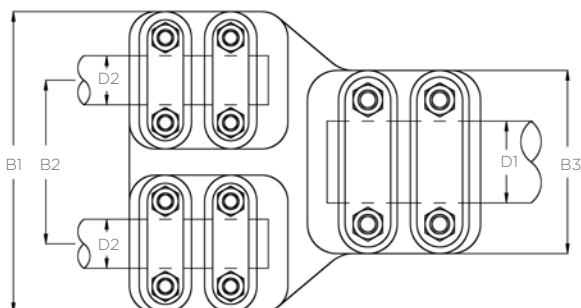
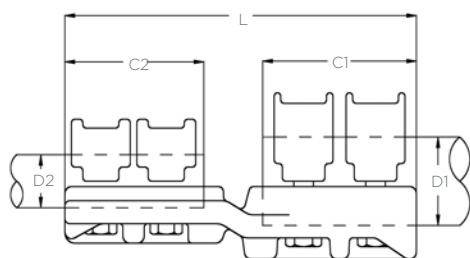
**NOTE** Dimensions in mm



### T - Rod

| Description | D1      | D2      | B1  | B2 | C1  | C2       | L   | RPN      |
|-------------|---------|---------|-----|----|-----|----------|-----|----------|
| T 82 30 20  | 26 - 31 | 16 - 21 | 124 | 70 | 166 | 716192-1 | 165 | 706948-1 |
| T 82 30 25  | 26 - 31 | 21 - 26 | 124 | 70 | 166 | 706686-1 | 165 | 706636-1 |
| T 82 30     | 26 - 31 | 26 - 31 | 140 | 85 | 182 | 706627-1 | 180 | 706949-1 |
| T 82 30 35  | 26 - 31 | 31 - 36 | 140 | 85 | 182 | 706683-1 | 172 | 706700-1 |
| T 82 30 40  | 26 - 31 | 36 - 41 | 143 | 92 | 195 | 706667-1 | 172 | 706635-1 |
| T 82 40 20  | 36 - 41 | 16 - 21 | 131 | 70 | 182 | 716198-1 | 187 | 706655-1 |
| T 82 40 25  | 36 - 41 | 21 - 26 | 131 | 70 | 182 | 716106-1 | 187 | 706663-1 |
| T 82 40 30  | 36 - 41 | 26 - 31 | 146 | 85 | 197 | 706624-1 | 174 | 712016-1 |
| T 82 40 35  | 36 - 41 | 31 - 36 | 146 | 85 | 207 | 706623-1 | 174 | 716341-1 |
| T 82 40     | 36 - 41 | 36 - 41 | 151 | 92 | 207 | 711001-1 | 189 | 711000-1 |
| T 82 50 20  | 46 - 51 | 16 - 21 | 135 | 70 | 191 | 716203-1 | 189 | 711002-1 |
| T 82 50 25  | 46 - 51 | 21 - 26 | 135 | 70 | 191 | 718670-1 | 196 | 711001-1 |
| T 82 50 30  | 46 - 51 | 26 - 31 | 151 | 85 | 207 | 716342-1 | 180 | 706949-1 |
| T 82 50 35  | 46 - 51 | 31 - 36 | 151 | 85 | 207 | 716204-1 | 172 | 706700-1 |
| T 82 50 40  | 46 - 51 | 36 - 41 | 158 | 92 | 214 | 706664-1 | 172 | 706635-1 |
| T 82 60 20  | 56 - 61 | 16 - 21 | 143 | 70 | 176 | 706778-1 | 187 | 706655-1 |
| T 82 60 25  | 56 - 61 | 21 - 26 | 143 | 70 | 176 | 716206-1 | 187 | 706663-1 |
| T 82 60 30  | 56 - 61 | 26 - 31 | 153 | 85 | 190 | 706633-1 | 174 | 712016-1 |
| T 82 60 35  | 56 - 61 | 31 - 36 | 153 | 85 | 190 | 716207-1 | 174 | 716341-1 |
| T 82 60 40  | 56 - 61 | 36 - 41 | 160 | 92 | 196 | 716208-1 | 189 | 711000-1 |
| T 82 60 45  | 56 - 61 | 41 - 46 | 160 | 92 | 196 | 716209-1 | 189 | 711002-1 |

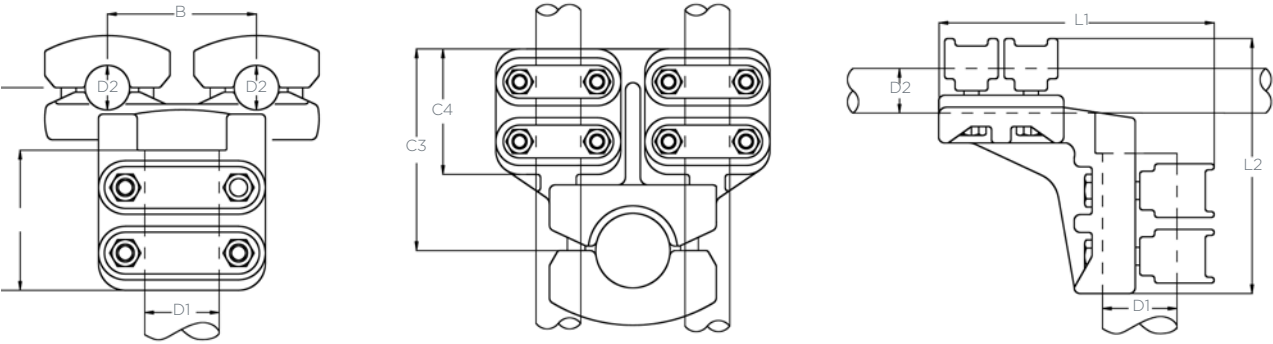
NOTE Dimensions in mm



### Twin Straight Rod

| Description        | D1      | D2      | B1  | B2  | B3  | C1 | C2 | L   | RPN      |
|--------------------|---------|---------|-----|-----|-----|----|----|-----|----------|
| RD 82 F 30 E100 50 | 46 - 51 | 36 - 41 | 184 | 100 | 112 | 94 | 85 | 214 | 789025-1 |
| RD 82 F 35 E100 50 | 46 - 51 | 31 - 36 | 184 | 100 | 122 | 94 | 85 | 214 | 717157-1 |
| RD 82 F 40 E105 50 | 46 - 51 | 36 - 41 | 207 | 105 | 112 | 94 | 85 | 230 | 714766-2 |

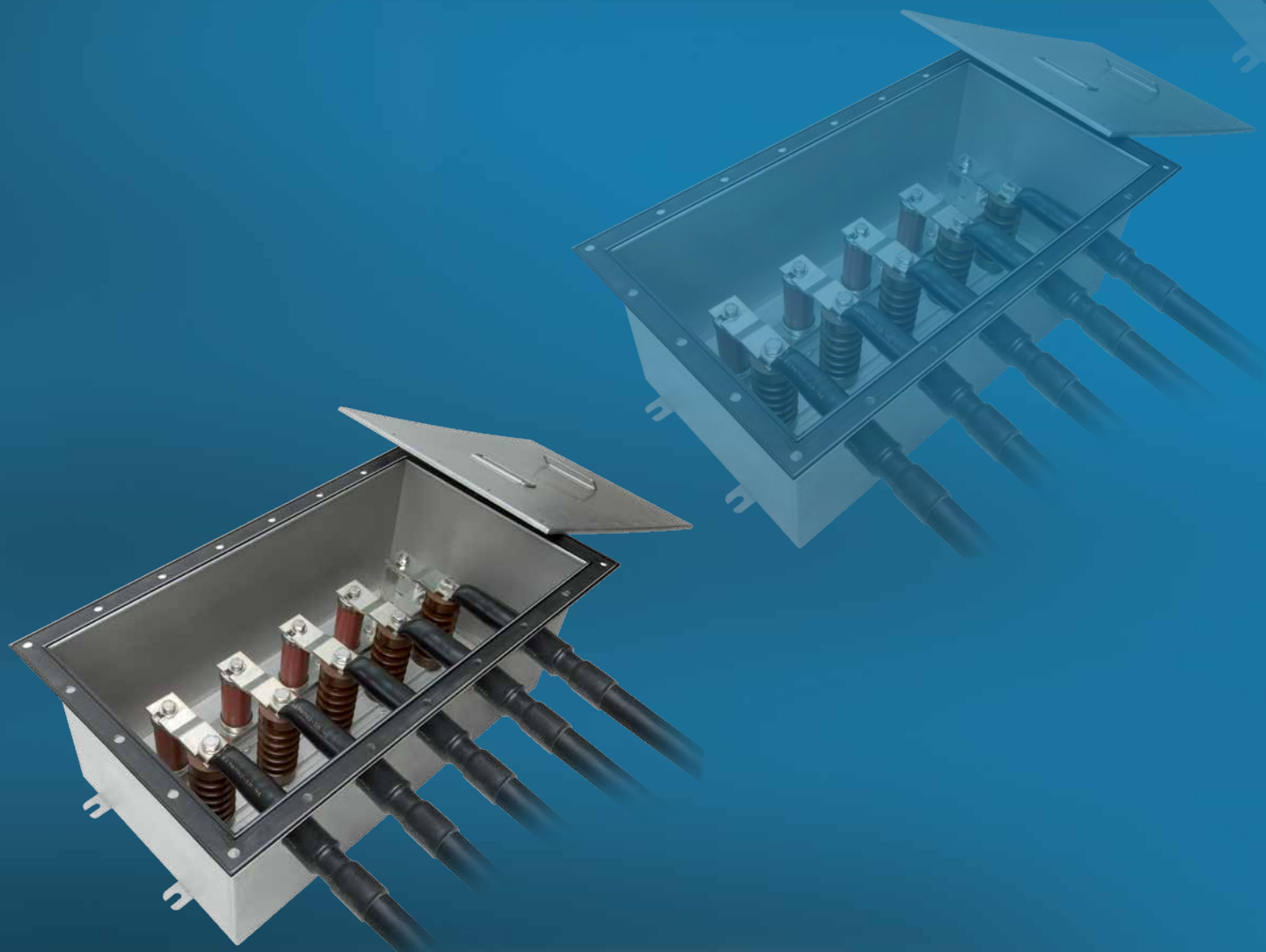
NOTE Dimensions in mm



Twin T-Rod

| Description       | D1      | D2      | B   | C3  | C4 | L1  | L2  | RPN       |
|-------------------|---------|---------|-----|-----|----|-----|-----|-----------|
| T 82 F 30 E100 50 | 46 - 51 | 26 - 31 | 100 | 134 | 84 | 135 | 136 | 793423-1  |
| T 82 F 35 E100 50 | 46 - 51 | 31 - 36 | 100 | 134 | 84 | 135 | 136 | 0793337-1 |
| T 82 F 40 E100 50 | 46 - 51 | 36 - 41 | 105 | 145 | 92 | 145 | 145 | 1306071-1 |
| T 82 F 30 E100 60 | 56 - 61 | 26 - 31 | 100 | 131 | 94 | 140 | 131 | 1830731-1 |
| T 82 F 35 E100 60 | 56 - 61 | 31 - 36 | 100 | 131 | 94 | 140 | 131 | 792694-1  |
| T 82 F 40 E105 60 | 56 - 61 | 36 - 41 | 105 | 145 | 92 | 140 | 131 | 718666-1  |

NOTE    Dimensions in mm





## Chapter V

# Link boxes

|                                  |    |
|----------------------------------|----|
| Link Boxes.....                  | 64 |
| Link Boxes Selection Tables..... | 66 |



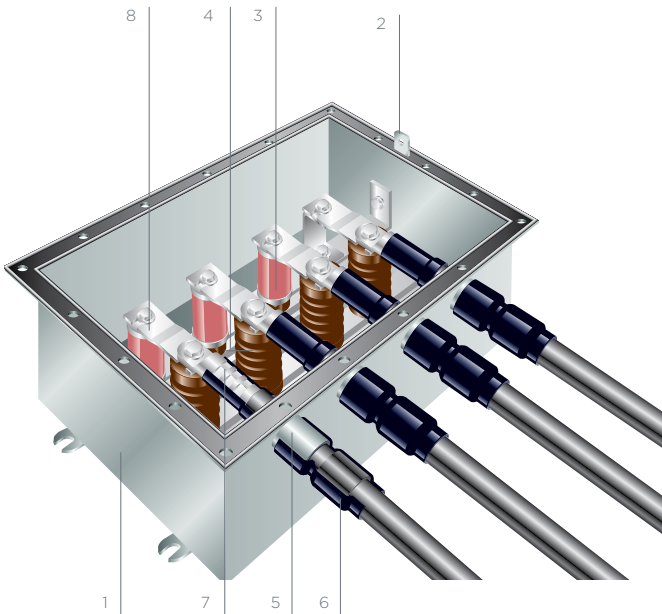
## Link Boxes

### APPLICATION

- Single-core cables in operation carry alternating currents and induced voltages in the metallic sheath of the cable. Depending on the sheath bonding, these currents may lead to circulating currents flowing in the cable sheath, which reduces the transmission capacity of the cable and causes additional heating
- Link boxes are used for earthing and bonding cable sheaths of single-core cables so that the induced voltages and circulating currents are eliminated or reduced

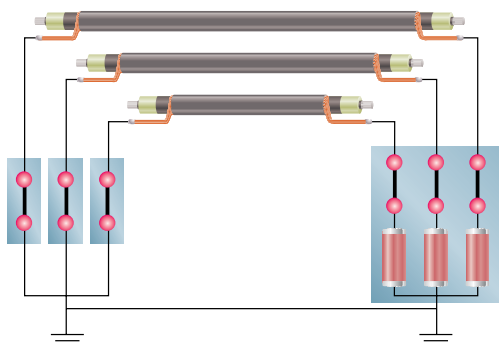
### FEATURES

- Various designs available
- Stainless steel box
- Various mechanical protection levels up to IP68
- Electrically and mechanically type tested
- 1-phase and 3-phase boxes
- With or without surge arresters
- With or without removable links
- For concentric cables or single-core cables
- Cross sections up to 300 mm<sup>2</sup>
- ZnO sheath voltage limiter for up to 7 kV protection levels, larger protection levels upon request
- Short circuit current up to 40 kA 1 sec



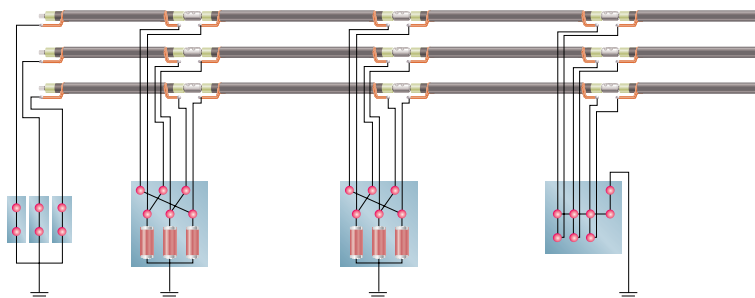
- 1 Stainless steel housing
- 2 Lockable lid
- 3 Sheath voltage limiters (optional)
- 4 Epoxy resin post-insulators
- 5 Cable entries
- 6 Outer sealing
- 7 Compression lugs
- 8 Tinned copper links

## Most Popular Cable Sheath Grounding Options



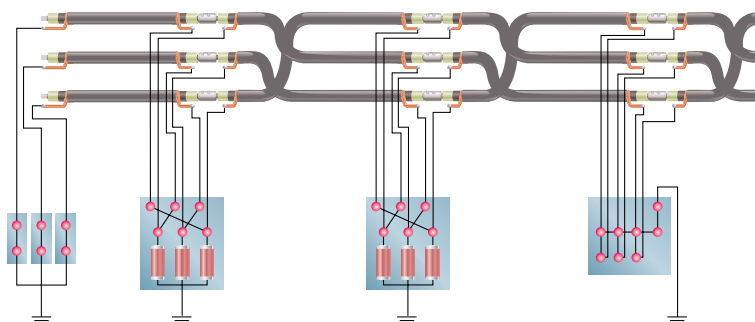
### Single point earthing

On relatively short cable sections, the cable sheaths are solidly bonded together and earthed at one position. The sheaths of the three cable sections are connected and grounded at one point only. At all other points, there is a voltage between sheath and ground that is at its maximum at the farthest point from the ground bond. Since there is no closed sheath circuit, current does not flow along the sheaths and no sheath circulation current loss occurs.



### Cross bonding

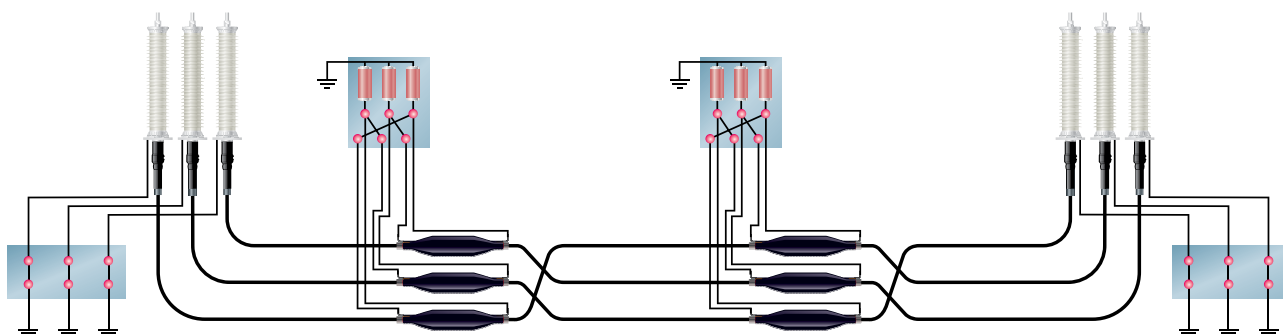
The cable route is sectionalized into equal lengths. The sections are cross-connected to neutralize the induced voltages. The phase sum of the introduced voltages is zero and, therefore, there is no circulating currents when the cable laying is symmetrical.



### Cross bonding and transposition

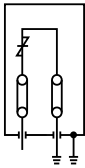
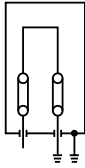
For cable laying in unsymmetrical formations, the induced voltages are not equal at each phase and, therefore, the phase sum of the voltages is not zero despite cross-bonding. The cables are transposed at each joint position and the cable sheaths are cross-connected, with each cable occupying the same relative position in the cable formation. By this means, the phase sum of the induced voltage sheaths is the same over three sections.

### Typical application example



Selection Tables for Raychem Link Boxes for Single Core Cables

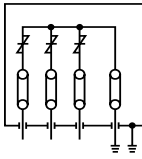
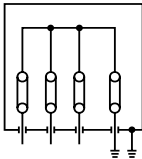
Link Diagram



|                                |                                 |                                 |
|--------------------------------|---------------------------------|---------------------------------|
| Bonding lead (type)            | Single-core                     | Single-core                     |
| Bonding lead (mm²)             | 70 - 300                        | 70 - 300                        |
| Protection class               | IP 68                           | IP 68                           |
| Application                    | Buried                          | Buried                          |
| Sheath voltage limiters        | N/A                             | 1 kV - 6 kV                     |
| Box size (LxHxW) (mm)          | 496x322x451                     | 496x322x451                     |
| Material                       | Stainless steel                 | Stainless steel                 |
| Total weight                   | Approx. 35 kg                   | Approx. 35 kg                   |
| Connection links               | Removable tinned copper 300 mm² | Removable tinned copper 300 mm² |
| Cable connection               | Compression lug                 | Compression lug                 |
| Impulse withstand voltage (kV) | 55                              | 55                              |
| AC withstand voltage (kV)      | 25                              | 25                              |
| DC withstand voltage (kV)      | 25                              | 25                              |
| Short circuit current (kA/1s)  | 40                              | 40                              |
| Description                    | HVLB-E-S-0-1-2-U-IP68           | HVLB-E-S-x*-1-2-U-IP68          |

\* Indicates voltage class of sheath voltage limiter (SVL)

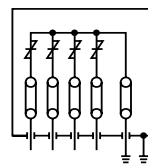
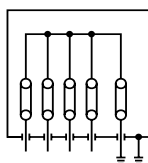
Link Diagram



|                                |                                 |                                 |
|--------------------------------|---------------------------------|---------------------------------|
| Bonding lead (type)            | Single-core                     | Single-core                     |
| Bonding lead (mm²)             | 70 - 300                        | 70 - 300                        |
| Protection class               | IP 68                           | IP 68                           |
| Application                    | Buried                          | Buried                          |
| Sheath voltage limiters        | N/A                             | 1 kV - 6 kV                     |
| Box size (LxHxW) (mm)          | 496x322x725                     | 496x322x725                     |
| Material                       | Stainless steel                 | Stainless steel                 |
| Total weight                   | Approx. 65 kg                   | Approx. 65 kg                   |
| Connection links               | Removable tinned copper 300 mm² | Removable tinned copper 300 mm² |
| Cable connection               | Compression lug                 | Compression lug                 |
| Impulse withstand voltage (kV) | 55                              | 55                              |
| AC withstand voltage (kV)      | 25                              | 25                              |
| DC withstand voltage (kV)      | 25                              | 25                              |
| Short circuit current (kA/1s)  | 40                              | 40                              |
| Description                    | HVLB-E-S-0-3-2-U-IP68           | HVLB-E-S-x*-3-2-U-IP68          |

\* Indicates voltage class of sheath voltage limiter (SVL)

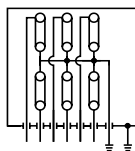
## Link Diagram



|                                 |                                             |                                             |
|---------------------------------|---------------------------------------------|---------------------------------------------|
| Bonding lead (type)             | Single-core                                 | Single-core                                 |
| Bonding lead (mm <sup>2</sup> ) | 70 - 300                                    | 70 - 300                                    |
| Protection class                | IP 68                                       | IP 68                                       |
| Application                     | Buried                                      | Buried                                      |
| Sheath voltage limiters         | N/A                                         | 1 kV-6 kV                                   |
| Box size (LxHxW) (mm)           | 496x322x862                                 | 496x322x862                                 |
| Material                        | Stainless steel                             | Stainless steel                             |
| Total weight                    | Approx. 75 kg                               | Approx. 75 kg                               |
| Connection links                | Removable tinned copper 300 mm <sup>2</sup> | Removable tinned copper 300 mm <sup>2</sup> |
| Cable connection                | Compression lug                             | Compression lug                             |
| Impulse withstand voltage (kV)  | 55                                          | 55                                          |
| AC withstand voltage (kV)       | 25                                          | 25                                          |
| DC withstand voltage (kV)       | 25                                          | 25                                          |
| Short circuit current (kA/1s)   | 40                                          | 40                                          |
| Description                     | HVLB-E-S-0-3-2-U-IP68                       | HVLB-E-S-x*-3-2-U-IP68                      |

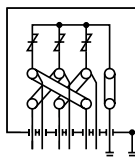
\* Indicates voltage class of sheath voltage limiter (SVL)

## Link Diagram



|                                 |                                             |
|---------------------------------|---------------------------------------------|
| Bonding lead (type)             | Single-core                                 |
| Bonding lead (mm <sup>2</sup> ) | 70 - 300                                    |
| Protection class                | IP 68                                       |
| Application                     | Buried                                      |
| Sheath voltage limiters         | N/A                                         |
| Box size (LxHxW) (mm)           | 496x322x995                                 |
| Material                        | Stainless steel                             |
| Total weight                    | Approx. 85 kg                               |
| Connection links                | Removable tinned copper 300 mm <sup>2</sup> |
| Cable connection                | Compression lug                             |
| Impulse withstand voltage (kV)  | 55                                          |
| AC withstand voltage (kV)       | 25                                          |
| DC withstand voltage (kV)       | 25                                          |
| Short circuit current (kA/1s)   | 40                                          |
| Description                     | HVLB-E-S-0-6-2-U-IP68                       |

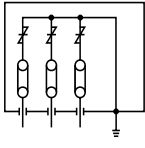
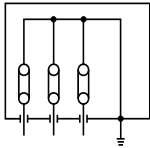
## Link Diagram



|                                 |                                             |
|---------------------------------|---------------------------------------------|
| Bonding lead (type)             | Single-core                                 |
| Bonding lead (mm <sup>2</sup> ) | 70 - 300                                    |
| Protection class                | IP 68                                       |
| Application                     | Buried                                      |
| Sheath voltage limiters         | 1 kV - 6 kV                                 |
| Box size (LxHxW) (mm)           | 665x395x665                                 |
| Material                        | Stainless steel                             |
| Total weight                    | Approx. 65 kg                               |
| Connection links                | Removable tinned copper 300 mm <sup>2</sup> |
| Cable connection                | Clamping ring                               |
| Impulse withstand voltage (kV)  | 55                                          |
| AC withstand voltage (kV)       | 25                                          |
| DC withstand voltage (kV)       | 25                                          |
| Short circuit current (kA/1s)   | 40                                          |
| Description                     | HVLB-C-S-x*-6-2-U-IP68                      |

\* Indicates voltage class of sheath voltage limiter (SVL)

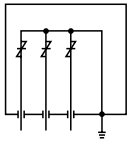
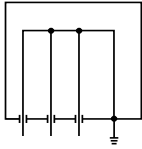
Link Diagram



|                                |                          |                          |
|--------------------------------|--------------------------|--------------------------|
| Bonding lead (type)            | Single-core              | Single-core              |
| Bonding lead (mm²)             | 95 - 300                 | 95 - 300                 |
| Protection class               | IP 56                    | IP 56                    |
| Application                    | Non buried               | Non buried               |
| Sheath voltage limiters        | N/A                      | 1 kV - 6 kV              |
| Box size (LxHxW) (mm)          | 310x255x310              | 310x255x310              |
| Material                       | Stainless steel          | Stainless steel          |
| Total weight                   | Approx. 16 kg            | Approx. 16 k             |
| Connection links               | Removable copper 240 mm² | Removable copper 240 mm² |
| Cable connection               | Compression lug          | Compression lug          |
| Impulse withstand voltage (kV) | 35                       | 35                       |
| AC withstand voltage (kV)      | 24                       | 24                       |
| DC withstand voltage (kV)      | 40                       | 40                       |
| Short circuit current (kA/1s)  | -                        | -                        |
| Description                    | HVLB-GND-0-3             | HVLB-GND-x*-3            |

\* Indicates voltage class of sheath voltage limiter (SVL)

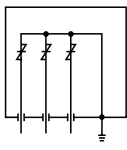
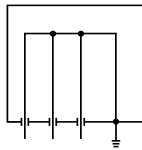
Link Diagram



|                                |                 |                 |
|--------------------------------|-----------------|-----------------|
| Bonding lead (type)            | Single-core     | Single-core     |
| Bonding lead (mm²)             | 95 - 300        | 95 - 300        |
| Protection class               | IP 56 or IP 68  | IP 56 or IP 68  |
| Application                    | Non buried      | Non buried      |
| Sheath voltage limiters        | N/A             | 1 kV - 6 kV     |
| Box size (LxHxW) (mm)          | 310x255x310     | 310x255x310     |
| Material                       | Stainless steel | Stainless steel |
| Total weight                   | Approx. 16 kg   | Approx. 16 kg   |
| Connection links               | Copper 120 mm²  | Copper 120 mm²  |
| Cable connection               | Compression lug | Compression lug |
| Impulse withstand voltage (kV) | 35              | 35              |
| AC withstand voltage (kV)      | 24              | 24              |
| DC withstand voltage (kV)      | 40              | 40              |
| Short circuit current (kA/1s)  | -               | -               |
| Description                    | EPPA-055-0-3    | EPPA-055-x*-3   |

\* Indicates voltage class of sheath voltage limiter (SVL)

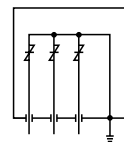
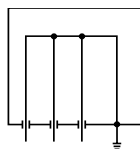
Link Diagram



|                                |                 |                 |
|--------------------------------|-----------------|-----------------|
| Bonding lead (type)            | Single-core     | Single-core     |
| Bonding lead (mm²)             | 95 - 300        | 95 - 300        |
| Protection class               | IP 56 or IP 68  | IP 56 or IP 68  |
| Application                    | Non buried      | Non buried      |
| Sheath voltage limiters        | N/A             | 1 kV - 6 kV     |
| Box size (LxHxW) (mm)          | 310x255x310     | 310x255x310     |
| Material                       | Stainless steel | Stainless steel |
| Total weight                   | Approx. 16 kg   | Approx. 16 kg   |
| Connection links               | Copper 120 mm²  | Copper 120 mm²  |
| Cable connection               | Compression lug | Compression lug |
| Impulse withstand voltage (kV) | 35              | 35              |
| AC withstand voltage (kV)      | 24              | 24              |
| DC withstand voltage (kV)      | 40              | 40              |
| Short circuit current (kA/1s)  | -               | -               |
| Description                    | EPPA-055-0-3    | EPPA-055-x*-3   |

\* Indicates voltage class of sheath voltage limiter (SVL)

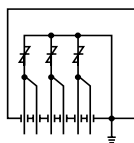
## Link Diagram



|                                 |                            |                            |
|---------------------------------|----------------------------|----------------------------|
| Bonding lead (type)             | Single-core                | Single-core                |
| Bonding lead (mm <sup>2</sup> ) | 95 - 300                   | 95 - 300                   |
| Protection class                | IP 56 or IP 68             | IP 56 or IP 68             |
| Application                     | Non buried                 | Non buried                 |
| Sheath voltage limiters         | N/A                        | 1 kV - 6 kV                |
| Box size (LxHxW) (mm)           | 310x255x310                | 310x255x310                |
| Material                        | Stainless steel            | Stainless steel            |
| Total weight                    | Approx. 16 kg              | Approx. 16 kg              |
| Connection links                | Copper 120 mm <sup>2</sup> | Copper 120 mm <sup>2</sup> |
| Cable connection                | Compression lug            | Compression lug            |
| Impulse withstand voltage (kV)  | 35                         | 35                         |
| AC withstand voltage (kV)       | 24                         | 24                         |
| DC withstand voltage (kV)       | 40                         | 40                         |
| Short circuit current (kA/1s)   | -                          | -                          |
| Description                     | EPPA-055-0-3               | EPPA-055-x*-3              |

\* Indicates voltage class of sheath voltage limiter (SVL)

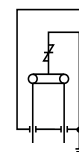
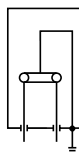
## Link Diagram



|                                 |                            |
|---------------------------------|----------------------------|
| Bonding lead (type)             | Single-core                |
| Bonding lead (mm <sup>2</sup> ) | 95 - 300                   |
| Protection class                | IP 56 or IP 68             |
| Application                     | Non buried                 |
| Sheath voltage limiters         | 1 kV - 6 kV                |
| Box size (LxHxW) (mm)           | 310x255x310                |
| Material                        | Stainless steel            |
| Total weight                    | Approx. 16 kg              |
| Connection links                | Copper 120 mm <sup>2</sup> |
| Cable connection                | Compression lug            |
| Impulse withstand voltage (kV)  | 35                         |
| AC withstand voltage (kV)       | 24                         |
| DC withstand voltage (kV)       | 40                         |
| Short circuit current (kA/1s)   | -                          |
| Description                     | EPPA-055-x*-3              |

\* Indicates voltage class of sheath voltage limiter (SVL)

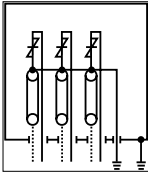
## Link Diagram



|                                 |                                      |                                      |
|---------------------------------|--------------------------------------|--------------------------------------|
| Bonding lead (type)             | Single-core                          | Single-core                          |
| Bonding lead (mm <sup>2</sup> ) | 95 - 300                             | 95 - 300                             |
| Protection class                | IP 56                                | IP 56                                |
| Application                     | Non buried                           | Non buried                           |
| Sheath voltage limiters         | N/A                                  | 1 kV - 6 kV                          |
| Box size (LxHxW) (mm)           | 300x165x190                          | 300x165x190                          |
| Material                        | Stainless steel                      | Stainless steel                      |
| Total weight                    | Approx. 10 kg                        | Approx. 11 kg                        |
| Connection links                | Removable copper 120 mm <sup>2</sup> | Removable copper 120 mm <sup>2</sup> |
| Cable connection                | Compression lug                      | Compression lug                      |
| Impulse withstand voltage (kV)  | 35                                   | 35                                   |
| AC withstand voltage (kV)       | 24                                   | 24                                   |
| DC withstand voltage (kV)       | 40                                   | 40                                   |
| Short circuit current (kA/1s)   | -                                    | -                                    |
| Description                     | EPPA-055-0-1                         | EPPA-055-x*-1                        |

\* Indicates voltage class of sheath voltage limiter (SVL)

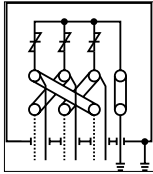
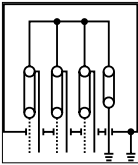
Link Diagram



|                                |                                 |
|--------------------------------|---------------------------------|
| Bonding lead (type)            | Concentric (coaxial)            |
| Bonding lead (mm²)             | 70 - 300                        |
| Protection class               | IP 68                           |
| Application                    | Buried                          |
| Sheath voltage limiters        | 1 kV - 6 kV                     |
| Box size (LxHxW) (mm)          | 665x395x665                     |
| Material                       | Stainless steel                 |
| Total weight                   | Approx. 68 kg                   |
| Connection links               | Removable tinned copper 300 mm² |
| Cable connection               | Clamping ring                   |
| Impulse withstand voltage (kV) | 55                              |
| AC withstand voltage (kV)      | 25                              |
| DC withstand voltage (kV)      | 25                              |
| Short circuit current (kA/1s)  | 40                              |
| Description                    | HVLB-E-C-x*-3-2-U-IP68          |

\* Indicates voltage class of sheath voltage limiter (SVL)

Link Diagram



|                                |                                 |                                 |
|--------------------------------|---------------------------------|---------------------------------|
| Bonding lead (type)            | Concentric (coaxial)            | Concentric (coaxial)            |
| Bonding lead (mm²)             | 70 - 300                        | 70 - 300                        |
| Protection class               | IP 68                           | IP 68                           |
| Application                    | Buried                          | Buried                          |
| Sheath voltage limiters        | N/A                             | 1 kV - 10 kV                    |
| Box size (LxHxW) (mm)          | 621x356x883                     | 621x356x883                     |
| Material                       | Stainless steel                 | Stainless steel                 |
| Total weight                   | Approx. 100 kg                  | Approx. 100 kg                  |
| Connection links               | Removable tinned copper 300 mm² | Removable tinned copper 300 mm² |
| Cable connection               | Clamping ring                   | Clamping ring                   |
| Impulse withstand voltage (kV) | 55                              | 55                              |
| AC withstand voltage (kV)      | 25                              | 25                              |
| DC withstand voltage (kV)      | 25                              | 25                              |
| Short circuit current (kA/1s)  | 25                              | 25                              |
| Description                    | HVLB-E-C-0-3-2-68               | HVLB-C-C-x*-3-2-68              |

\* Indicates voltage class of sheath voltage limiter (SVL)

## Notes

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