nkt cables

Member of the NKT Group

# High-voltage cable accessories 72 kV up to 245 kV

Completing the picture

www.nktcables.com

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# nkt cables: The Profile

**nkt cables** is a global front-line supplier to the energy sector and as such **nkt cables** develops, manufactures and markets high-quality cables and solutions for power grid infrastructure, construction sites, railways and the automotive industry. **nkt cables** supplies creative, high-tech and sustainable products.

**nkt cables'** manufacturing plants are among the most modern, flexible and cost-effective facilities worldwide. At **nkt cables** we work tirelessly to reduce our carbon footprint; neutral production and waste prevention are high priorities. **nkt cables** invests heavily to ensure that the company maintains leading-edge capability.

The brand-new state-of-the-art factory in Cologne is an example of this commitment. Being among the most modern factories in the world, it is at the forefront of technological developments.

**nkt cables** is part of NKT Holding A/S, which is listed on the Danish Stock Exchange. NKT Holding owns a number of companies, which are active in different industries, and has production facilities on four continents.

# The product range

## High-voltage cable accessories

All high-voltage cable accessories from **nkt cables** are developed by their R&D department, who take into account specific customer requirements as well as national and international standards in designing and producing customer defined solutions.

All materials are subjected to intensive quality control procedures. The production- and process-testing equipment from **nkt cables** can guarantee the highest level of quality in all the products. The complete product range has been type-tested by reputable international testing institutes.

The product range from **nkt cables** includes accessories for all applications in the 50 kV up to 550 kV voltage range, also as a modular component system.

**nkt cables** offers various technical versions of accessory systems like plug-in technology, dry-type technology and conventional technology with insulating oil.

The range of accessories covers the following applications:

- Self-supporting outdoor terminations, porcelain or composite
- Non-self-supporting outdoor terminations, silicone
- Terminations for gas-insulated switchgears
- Transformer terminations
- Straight-through joints
- Insulating joints/cross-bonding joints
- Transition joints, XLPE-insulated/oil-filled cables
- Complete range for the connection/installation of
- low-pressure oil-filled cables, 50 kV – 170 kV
- CabSnap® accessories for preassembled cable connection systems

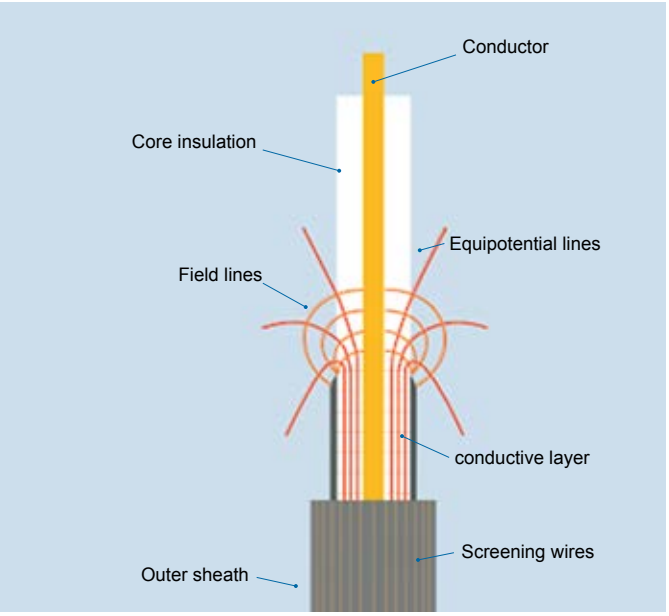

# Silicone rubber and Stress control

Silicone rubber is a preferred material for cable accessories due to its excellent mechanical and electrical properties. For more than 40 years silicone has been used successfully as high-quality electrical insulation for voltages up to 400 kV. Silicone rubber features high quality electrical insulation, superior corona and tracking resistance, combined with high elasticity. It facilitates multi range application, where one silicone rubber body can be used for various conductor cross sections. Optimal flexibility ensures easy assembly of the accessories.

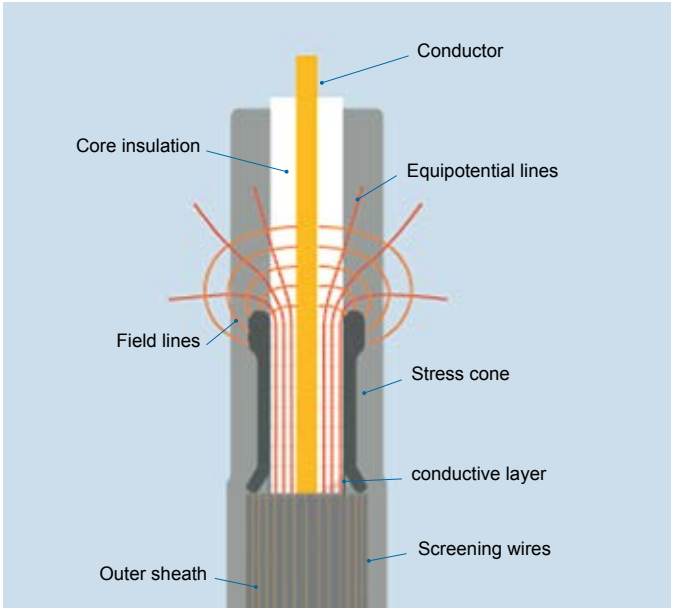
Outstanding features of the silicone rubber insulation material are:

- UV and ozone resistance
- Durable water rejection
- Weather and aging resistance
- Non-flammable, self-extinguishing, heat resistant/applicable for use at temperatures between -50°C and +180°C
- High elasticity
- High tracking resistance
- Unlimited storage life
- Friendly to the enviroment

The specific electrical problems of the cable termination are found at the point between the high-grade solid electrical insulation of the cable and the gaseous insulation air which has a significantly lower dielectric strength. In order to achieve sufficient insulating clearance, the outer conductive layer of the cable must be stripped to below the end of the core. This causes unacceptably high field intensities at the end of the outer conductive layer (see figure 1) which must be eliminated by means of special measures. Figure 2 shows the field of the cable termination controlled capacitively by a funnel shaped electrode. It is dimensioned in such a way that field intensities do not exceed at any point. This prevents harmful corona or partial discharge.

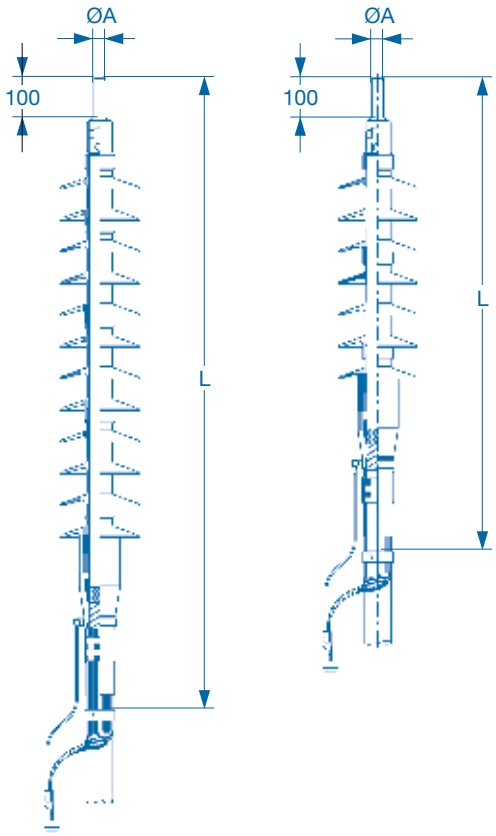



Electrical field without stress control (figure 1)




Electrical field with capacitive stress contol (figure 2)

# Dry type termination without supporting function




## Application:

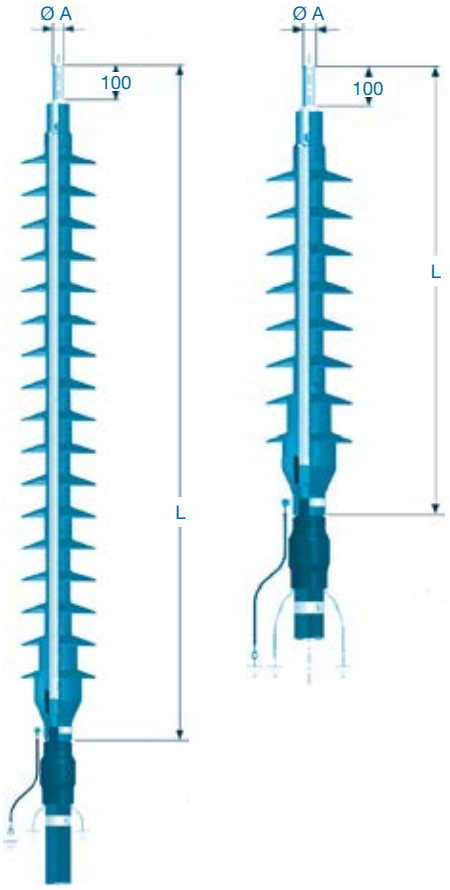
This two versions of silicone rubber terminations are designed for indoor and outdoor conditions. Main components of the termination are the pretested push-on silicone components with integrated stress cone for electrical field control.

- Integrated capacitive stress control system
- Piece tested silicone components
- Screw type top bolt, no special tools are required
- Top bolt covered by top part of silicone rubber
- Quick and easy assembly
- Long creepage distance due to optimised shed design
- Type test certificate in accordance with IEC 60840 available

## Technische details:

| Operation voltage | Type | Conductor Cu/Al max. | Diameter over prepared cable core min.-max. | Connection type Screw/Press | Length (L) | Pollution level | Creepage distance min. | Diameter (A) | No. of sheds |
|---|---|---|---|---|---|---|---|---|---|
| Um (kV) | | mm² | mm | | mm | | mm | mm | |
| 72.5 | THV 72 II size 36 | ...800 | 40.0...54.0 | S | 1100-1160 | c (II) | >1450 | 30 | 8 |
| 72.5 | THV 72 IV size 36 | ...800 | 40.0...54.0 | S | 1450-1540 | e (IV) | >2248 | 30 | 11 |
| 72.5 | THV 72 II size 46 | ...1200 | 51.5...65.0 | S | 1000-1040 | c (II) | >1450 | 30/50 | 8 |
| 72.5 | THV 72 IV size 46 | ...1200 | 51.5...65.0 | S | 1250-1280 | e (IV) | >2248 | 30/50 | 11 |
| 72.5 | THV 72 II size 56 | ...1600 | 63.0...78.0 | S | 1250-1280 | c (II) | >1450 | 50 | 8 |
| 72.5 | THV 72 IV size 56 | ...1600 | 63.0...78.0 | S | 1250-1280 | e (IV) | >2248 | 50 | 11 |

# Dry type termination without supporting function




## Application:

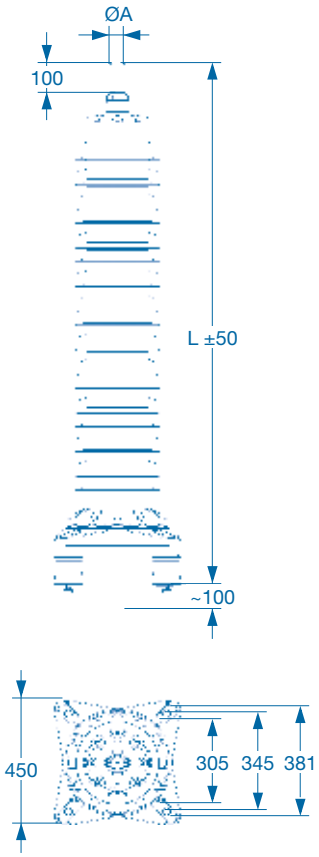
This two versions of silicone rubber terminations are designed for indoor and outdoor conditions. Main components of the termination are the pretested push-on silicone components with integrated stress cone for electrical field control.

- Integrated capacitive stress control system
- Piece tested silicone components
- Screw type top bolt, no special tools are required
- Top bolt covered by top part of silicone rubber
- Quick and easy assembly
- Long creepage distance due to optimised shed design
- Type test certificate in accordance with IEC 60840 available

## Technische details:

| Operation voltage Um (kV) | Type | Conductor Cu/Al max. mm² | Diameter over prepared cable core min.-max. mm | Connection type Screw/Press | Length (L) mm | Pollution level | Creepage distance min. mm | Diameter (A) mm | No. of sheds |
|---|---|---|---|---|---|---|---|---|---|
| 100 | THV 100 I size 46 | ...1000 | 51.5...65.0 | S | 1020-1060 | b (I) | >1600 | 50 | 8 |
| 100 | THV 100 I size 56 | ...1600 | 63.0...78.0 | S | 1020-1060 | b (I) | >1600 | 50 | 8 |
| 100 | THV 100 III size 46 | ...1000 | 51.5...65.0 | S | 1500-1550 | d (III) | >2500 | 50 | 14 |
| 100 | THV 100 III size 56 | ...1600 | 63.0...78.0 | S | 1780-1830 | d (III) | >2500 | 50 | 17 |
| 145 | THV 145 IV size 50 | ...500 | 55.0...66.0 | S | approx. 2300 | e (IV) | >4495 | 50 | 17 |
| 145 | THV 145 IV size 60 | ...1200 | 66.0...78.0 | S | approx. 2300 | e (IV) | >4495 | 50 | 17 |

# Outdoor termination with composite insulator




## Application:

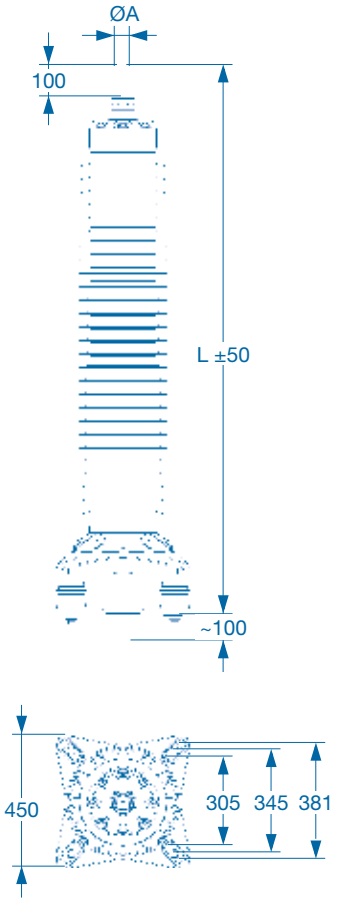
The different versions of this outdoor termination type FEV-V are designed for operation under several outdoor conditions. Main components of the termination are the composite insulator with upper metal work, metal base plate with supporting insulators and premoulded stress cone for electrical field control.

- Integrated premoulded stress control system made of silicone rubber
- All metal work made of corrosion resistant aluminum alloy
- Termination is standing on supporting pedestal insulators, so that the cable screen can be isolated from earth
- Top bolt available in two versions, screw type or press type
- Different top bolt diameter available suiting to the cable dimensions
- Type test certificate in accordance with IEC 60840 available

## Technische details:

| Operation voltage | Type | Conductor Cu/Al max. | Diameter over prepared cable core min.-max. | Connection type Screw/Press | Connection type Screw/Press | Length (L) | Pollution level | Creepage distance min. | Diameter (A) |
|---|---|---|---|---|---|---|---|---|---|
| Um (kV) | | mm² | mm | mm | | mm | | mm | mm |
| 72.5 | FEV 72-V | ...2500 | 34.5...97.0 | ...105 | S/P | 1400 | d (III) | >1813 | 30/50 |
| 145 | FEV 145-V | ...2500 | 34.5...84.0 | ...105 | S/P | 1900/2100 | b (II)/e (IV) | >3075. >5270 | 30/50 |
| 170 | FEV 170-V | ...2500 | 34.5...108.00 | ...105 | S/P | 2100 | e (IV) | >5270 | 30/50 |
| 245 | FEV 245-V | ...2500 | 64.0...120.0 | | S/P | 2750/3150 | d (III)/e (IV) | 6800/8400 | 30/50 |

# Outdoor termination with porcelain insulator




## Application:

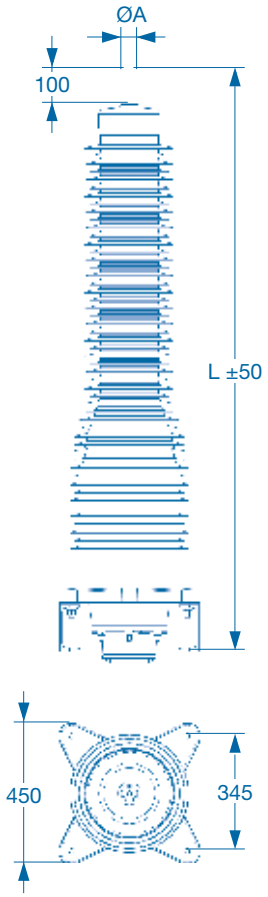
The different versions of this outdoor termination type FEV-P are designed for operation under several outdoor conditions. Main components of the termination are the composite insulator with upper metal work, metal base plate with supporting insulators and premoulded stress cone for electrical field control.

- Integrated premoulded stress control system made of silicone rubber
- All metal work made of corrosion resistant aluminum alloy
- Termination is standing on supporting pedestal insulators, so that the cable screen can be isolated from earth
- Top bolt available in two versions, screw type or press type
- Different top bolt diameter available suiting to the cable dimensions
- Type test certificate in accordance with IEC 60840 available

## Technische details:

| Operation voltage | Type | Conductor Cu/Al max. | Diameter over prepared cable core min.-max. | Connection type Screw/Press | Connection type Screw/Press | Length (L) | Pollution level | Creepage distance min. | Diameter (A) |
|---|---|---|---|---|---|---|---|---|---|
| Um (kV) | | mm² | mm | mm | | mm | | mm | mm |
| 72.5 | FEV 72-P | ...2500 | 34.5...84.0 | ...105 | S/P | 1500 | IV | >2248 | 30/50 |
| 145 | FEV 145-P | ...2500 | 34.5...97.0 | ...105 | S/P | 1950 | IV | >4495 | 30/50 |
| 170 | FEV 170-P | ...2500 | 34.5...108.00 | ...105 | S/P | 2150 | III | >4250 | 30/50 |
| 245 | FEV 245-P | ...2500 | 56.0...82.0 | | S/P | 2530 | IV | >7600 | 30/40 |

# Dry type outdoor termination




## Application:

This new generation of dry type termination is free of any liquid and gaseous insulation medium. Main components of the termination are the push-on silicone components with integrated stress cone for electrical field control and the liquid free epoxy resin insulator with silicone sheds.

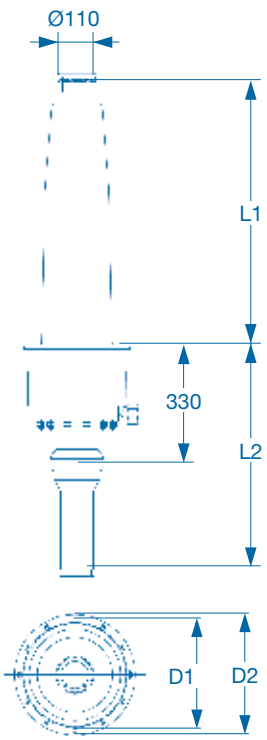
- Free of insulation liquid, no filling procedure
- Less parts to be assembled therefore faster installation
- Prefabricated capacitive silicone stress control system
- Plug-in part comprising four components (stress cone made of silicone rubber, cable gland, connetion bolt, spring loaded compression device)
- Easy to fit screw type conductor connector
- All metal work made of corrosion resistant aluminum alloy
- Type test certificate in accordance with IEC 60840 available

## Technische details:

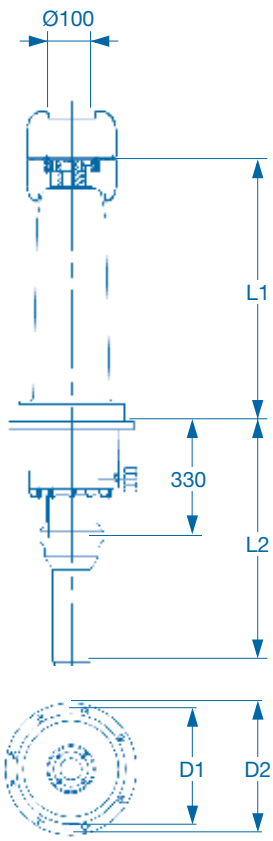
| Operation voltage | Type | Conductor Cu/Al max. | Diameter over prepared cable core min.-max. | Diameter over sheath max. | Connection type Screw/Press | Length (L) | Pollution level | Creepage distance min. | Diameter (A) |
|---|---|---|---|---|---|---|---|---|---|
| Um (kV) | | mm² | mm | mm | | mm | | mm | mm |
| 123 | KFEV 123 size 6 | ...2500 | 40.7...100.0 | ...135 | S | 1754 | e (IV) | >4495 | 60 |
| 145 | KFEV 145 size 4 | ...1200 | 34.5...76.0 | ...99 | S | 1750 | e (IV) | >4495 | 50 |

# Fluid filled GIS / transformer termination

SEV 72 kV




TEV 145/170 kV




## Application:

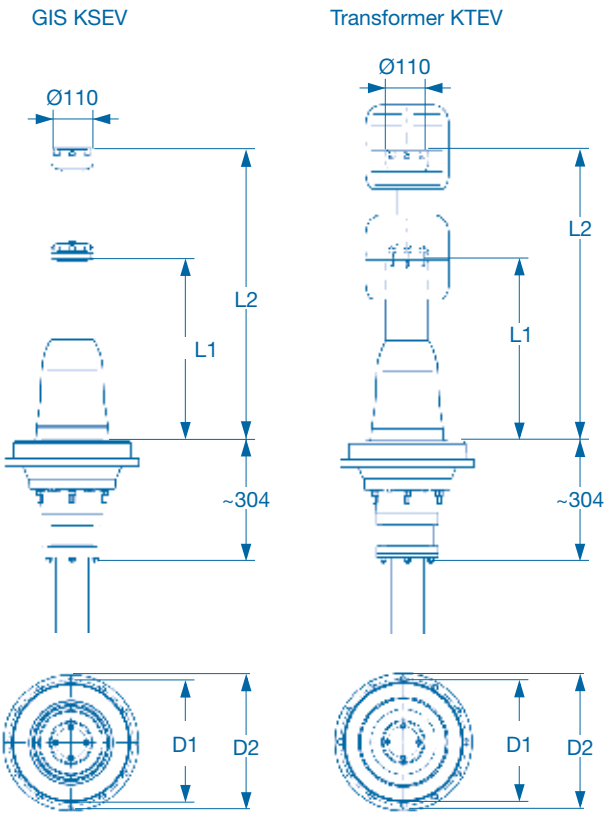
The termination is designed for direct installation in SF6 gas insulated switchgear (GIS) or in the oil filled cables box of the transformer. Major components of the termination are the pressure tight epoxy resin insulator with embedded electrode, metal fixing ring, metal cable gland and prefabricated stress cone for electrical field control.

- Integrated prefabricated stress control system with silicon rubber
- Pressure tight epoxy resin insulator is cast in one piece with integrated insulation ring at the bottom allowing to separate the cable screen from earth
- Cable gland made of corrosion resistant aluminum alloy
- Possible installation position vertical up to 45° then up to 90° oil expansion vessel required
- Type test according to IEC 60840 is available

## Technische details:

| Operation voltage | Type | Conductor Cu/Al max. | Diameter over prepared cable core min.-max. | Diameter over sheath max. | Connection type Screw/Press | Creepage distance | L1 | L2 | D1 | D2 |
|---|---|---|---|---|---|---|---|---|---|---|
| Um (kV) | | mm² | mm | mm | | | | mm | mm | mm |
| 72.5 | SEV 72 TEV 72 | ...1000 | 34.4...74.0 | ...85 | S/P | 500 | 583±1 | ~ 630 | 270±0.5 | 300 |
| 145 | SEV 145 TEV 145 | ...2500 | 41.6...108.00 | ...105 | S/P | 650 | 757±1 | ~ 630 | 320±0.5 | 350 |
| 170 | SEV 170 TEV 170 | ...2500 | 41.6...108.00 | ...105 | S/P | 750 | 757±1 | ~ 630 | 320±0.5 | 350 |

# Dry type plug-in GIS / transformer termination




## Application:

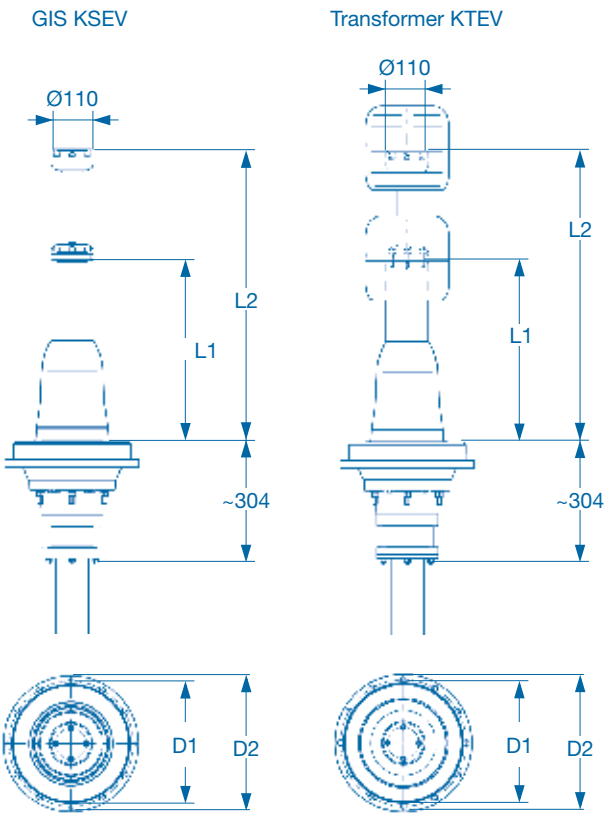
All versions of dry-type termination are designed for installation in SF6 gas insulated switchgear (GIS) or for installation in the oil filled cable box of the transformer. The complete termination consists of epoxy resin insulator with embedded electrode, fixing ring which is fitting to the cable, comprising metal cable gland, compression device and premoulded plug-in stress cone for electrical field control.

- Plug-in part comprising four components (stress cone made of silicone rubber, cable gland, connection bolt, spring loaded compression device)
- Insulator according with IEC 62271-209 for GIS and DIN EN 50299 for transformer termination
- Conductor connection bolt designed as mechanical screw type connector
- Type test certificate in accordance with IEC 60840 available
- Dead-end plug available (see page 16)

## Technische details:

| Operation voltage | Type | Conductor Cu/Al max. | Diameter over prepared cable core min.-max. | Diameter over sheath max. | Connection type Screw/Press | L1 | L2 | D1 | D2 |
|---|---|---|---|---|---|---|---|---|---|
| Um (kV) | | mm² | mm | mm | | mm | mm | mm | mm |
| 72.5 | KSEV 72/KTEV 72 size 2 | ...1000 | 35.5...76.0 | ...99 | S | 310±0.5 | 583±0.5 | 270±0.5 | 300 |
| 123...145 | KSEV 145/KTEV 145 size 4 | ...1200 | 35.5...76.0 | ...99 | S | 470±0.5 | 757±0.5 | 320±0.5 | 350 |

# Dry type plug-in GIS / transformer termination




## Application:

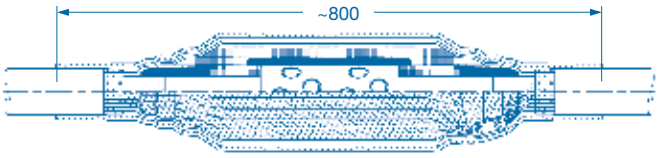
The new version of dry-type plug-in termination is designed for the voltage level up to 300 kV and to the biggest conductor cross-section up to 2500 mm2. With this large application range the termination still fulfils the dimensions according to the IEC standards. The termination is also applicable in the 145 kV voltage level with conductor cross section above 1200 mm².

- Very large application range for conductor cross sections up to 2500 mm²
- Insulator according with IEC 62271-209 for GIS and DIN EN 50299 for transformer termination
- Conductor connection bolt designed as mechanical screw type connector
- Type test certificate in accordance with IEC 60840/62067 available
- Dead-end plug available (see page 16)

## Technische details:

| Operation voltage | Type | Conductor Cu/Al max. | Diameter over prepared cable core min.-max. | Diameter over sheath max. | Connection type Screw/Press | L1 | L2 | D1 | D2 |
|---|---|---|---|---|---|---|---|---|---|
| Um (kV) | | mm² | mm | mm | | mm | mm | mm | mm |
| 123...170 | KSEV/KTEV size 6 | ...2500 | 47.0...100.0 | ...135 | S/P | 470±0.5 | 757±0.5 | 320±0.5 L1, 320±0.5 L2 | 350 L1, 350 L2 |
| 245 | KSEV/KTEV size 6 | ...2500 | 47.0...100.0 | ...135 | S/P | 620±2 | 960±2 | 475±0.5 L1, 582±0.5 L2 | 500 L1, 620 L2 |
| 245...300 | KSEV/KTEV size 9 | ...3200 | 81.0...140,00 | ...185 | S/P | 620±2 | 960±2 | 475±0.5 L1, 582±0.5 L2 | 500 L1, 620 L2 |

# Straight three piece joint




## Application:

This premoulded straight joint in three piece design with compact dimensions is made of silicone rubber. Main components of the standard straight joint are conductor connection sleeve, cable adapters, main joint sleeve and outer protective covering.

- Integrated premoulded stress control system with silicone rubber
- Three piece design with compact dimensions
- Screw type conductor connector
- Minimum tool requirement
- Version with screen separation available
- Type test certificate in accordance with IEC 60840/62067 available
- Various possibilities to connect different cable cross sections

## Technische details:

| Operation voltage<br>Um (kV) | Type | Conductor Cu max.<br>mm² | Conductor Al max.<br>mm² | Diameter over prepared cable core min.-max.<br>mm | Diameter approx.<br>mm | Connection type Screw/Press |
|---|---|---|---|---|---|---|
| 72.5 | SM 72 size 36 | ...630 | ...630 | 40.0...54.0 | 150 | S |
| 72.5 | SM 72 size 46 | ...1000 | ...1000 | 51.5...65.0 | 150 | S |
| 72.5 | SM 72 size 56 | ...1600 | ...1600 | 63.0...78.0 | 150 | S |
| 145 | SM 145 size 3 | ...1200*1 | ...1200*1 | 34.5...75.0 | 180 | S/P |
| 145 | SM 145 size 4 | ...2500*1 | ...1200*1 | 72.0...84.0 | 205 | S/P |
| 145 | SM 145 size 4x | ...2500*1 | ...2500*1 | 72.0...84.0 | 205 | S/P |
| 145 | SM 145 size 6 | ...2500*1 | ....1200*1 | 81.5...108.0 | 240 | S/P |
| 145 | SM 145 size 6x | ...2500*1 | ...2500*1 | 81.5...108.0 | 240 | S/P |
| 170 | SM 170 size 5 | ...2500*1 | ....1200*1 | 50.0...84.0 | 235 | S/P |
| 170 | SM 170 size 5x | ...2500*1 | ...2500*1 | 50.0...84.0 | 235 | S/P |
| 170 | SM 170 size 6 | ...2500*1 | ....1200*1 | 56.0...108.0 | 240 | S/P |
| 170 | SM 170 size 6x | ...2500*1 | ...2500*1 | 56.0...108.0 | 240 | S/P |
| 245 | SM 245 size 5 | ...2500*1 | ....1200*1 | 50.0...84.0 | 235 | S/P |
| 245 | SM 245 size 5x | ...2500*1 | ...2500*1 | 50.0...84.0 | 235 | S/P |
| 245 | SM 245 size 7 | ...2500*1 | ....1200*1 | 81.5...108.0 | 280 | S/P |
| 245 | SM 245 size 7x | ...2500*1 | ...2500*1 | 81.5...108.0 | 280 | S/P |

*1 >1200 up to 2500 mm² special crimping tool is required

# Straight three piece joint

## Application:

This premoulded straight joint in one piece design with compact dimensions is made of silicone rubber. Main components of the standard straight joint are conductor connection sleeve, main joint sleeve and outer protective covering.

- Very short and compact design
- Easy push on installation
- Minimum tools end installation space needed
- Easy conductor connection screw or compression type possible
- Available as cross bonding or straight through application
- Big coverage of application range from 40 to 120 mm Ø
- Advanced production technology
- Optimized cover housing in size and material
- Routine tested piece by piece
- Insulating material LSR silicone rubber of the highest quality
- Type test certificate in accordance with IEC 60840/62067 available

## Technische details:

| Operation voltage<br>Um (kV) | Type | Conductor Cu max.<br>mm² | Conductor Al max.<br>mm² | Diameter over prepared cable core min.-max.<br>mm | Diameter approx.<br>mm | Connection type Screw/Press |
|---|---|---|---|---|---|---|
| 72.5 | SME 72 size 36 | ...630 | ...630 | 40.0...54.0 | 150 | S |
| 72.5 | SME 72 size 46 | ...1000 | ...1000 | 51.5...65.0 | 150 | S |
| 145 | SME 145 size 4 | ...1600 | ...1600 | 41.6...84.0 | 170 | S |
| 145 | SME 145 size 4x | ...1600*1 | ...1600*1 | 41.6...84.0 | 170 | P |
| 170 | SME 170 size 6 | ...2500 | ...2500 | 56.0...120.0 | 240 | S |
| 170 | SME 170 size 6x | ...2500*1 | ...2500*1 | 56.0...120.0 | 240 | P |
| 245 | SME 245 size 6 | ...2500 | ...2500 | 56.0...120.0 | 240 | S |
| 245 | SME 245 size 6x | ...2500*1 | ...2500*1 | 56.0...120.0 | 240 | P |

**1 >1200 up to 2500 mm² special crimping tool is required*

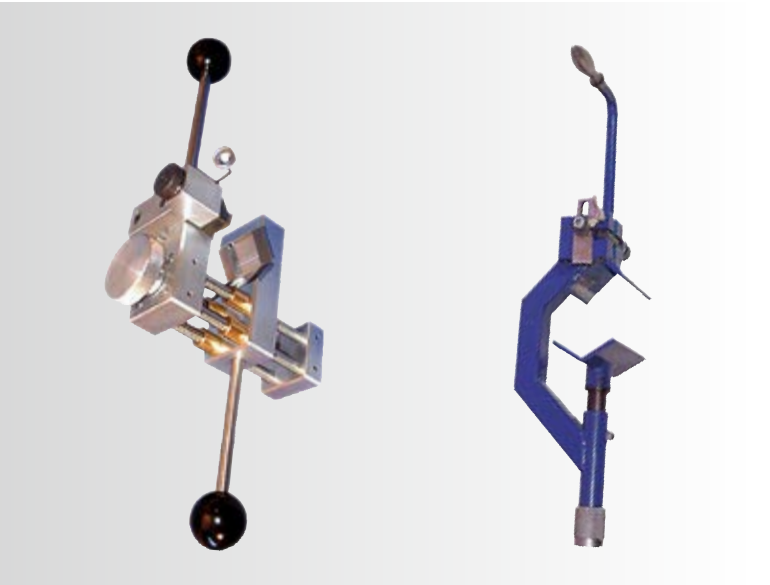
# Accessories

Link box for special bonded or earthed cable systems available for indoor and outdoor gantry mounted, outdoor within concrete pit in horizontal position. Link box has three zinc oxide sheath voltage limiters. All metal work in stainless steel.

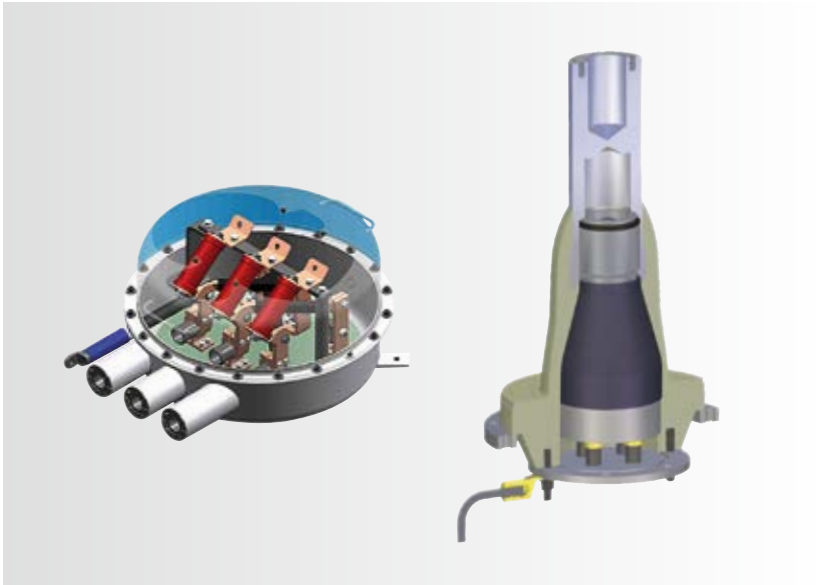
All joints are available with screen separation for special bonded or earthed cable systems.

Tools for cable preparation are the sheath stripper and the cable peeling tool to remove outer conductive layer.

Training course and supervision to guarantee perfect installation in our assembly department or on side are possible.



Cable peeling tool and sheath stripper



Link box with voltage limiters and dead-end plug for KSEV/KTEV

# Cable data

## Reguested information

To supply the optimal accessories solution detailed cable data are required. Please send this completed cable data form with your inquiry.

Customer Name: _____

Project Name: _____

Offer No.: _____ / _____

Date and Name: _____

Remarks: _____

| | Conductor | Special | Semi-conductive inner layer | Semi-conductive outer layer | Screen | Screen / Amouring | Special | Special | Oversheath |
|---|---|---|---|---|---|---|---|---|---|
| Diameter (mm) | | | | | | | | | |
| Diameter (mm) min. | | | | | | | | | |
| Diameter (mm) max. | | | | | | | | | |
| Cross section (mm²) | | | | | | | | | |
| Thickness (mm) | | | | | | | | | |
| | ○ Al | | ○ XLPE | | ○ Cu wires | ○ Cu wires | ○ Cu wires | ○ Cu wires | ○ PE |
| | ○ Cu | | ○ EPR | | ○ Cu tapes | ○ Cu tapes | ○ Cu tapes | ○ Cu tapes | ○ PVC |
| | ○ Solid round | | ○ Rubber | | ○ Lead | ○ Lead | ○ Lead | ○ Lead | |
| | ○ Solid sector | | ○ Paper | | ○ Al screen | ○ Al screen | ○ Al screen | ○ Al screen | |
| | ○ Stranded Al wire | | | | ○ Al wire | ○ Al wire | ○ Al wire | ○ Al wire | |
| | ○ Circular | | | | ○ Al tape | ○ Al tape | ○ Al tape | ○ Al tape | |
| | ○ Milliken | | | | ○ Steel wire | ○ Steel wire | ○ Steel wire | ○ Steel wire | |
| | ○ Keystone | | | | ○ Steel tape | ○ Steel tape | ○ Steel tape | ○ Steel tape | |
| | | | | | ○ Corrug. Al | ○ Corrug. Al | ○ Corrug. Al | ○ Corrug. Al | |
| | | | | | ○ Corrug. Cu | ○ Corrug. Cu | ○ Corrug. Cu | ○ Corrug. Cu | |
| | | | | | | ○ Filler | ○ Filler | ○ Filler | |
| | | | | | | ○ Laminated dfffoil Al | ○ Laminated dfffoil Al | ○ Laminated dfffoil Al | ○ Laminated dfffoil Al |
| | | | | | | ○ Laminated dfffoil Cu | ○ Laminated dfffoil Cu | ○ Laminated dfffoil Cu | ○ Laminated dfffoil Cu |

**Network Data:**

Operation voltage _____ kV

Basic impulse level _____ kV

Short circuit current (conductor) _____ kA

Short circuit current (shield) _____ kA

System grounding ○ solid ○ isolated ○ resonant


# Certificates

**nkt cables** is certified according to all main international standards and at all locations. High-voltage cable accessoires from **nkt cables** are produced in Cologne, Germany. All certificates are available on our websites.

Certificate

Standard ISO 9001:2008

Certificate Registr. No. 09 100 3032

Certificate Holder: **nkt cables GmbH**
Düsseldorfer Str. 400
D - 51061 Köln

including the locations according to annex

Scope: Development, production and sales of power cable systems and fibre optic cable systems, metal products

Proof has been furnished by means of an audit that the requirements of ISO 9001:2008 are met.

The due date for all future audits is 18.11.

Validity: The certificate is valid from 01.01.2014 until 31.12.2016.

First certification 1993

02.12.2013

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

DAkkS

Certificate

Standard ISO 14001:2004

Certificate Registr. No. 01 104 8221

Certificate Holder: **nkt cables GmbH**
Düsseldorfer Str. 400
D - 51061 Köln

including the locations according to annex

Scope: Development, production and sales of power cable systems and fibre optic cable systems, metal products

Proof has been furnished by means of an audit that the requirements of ISO 14001:2004 are met.

The due date for all future audits is 18.11.

Validity: The certificate is valid from 01.01.2014 until 31.12.2016.

First certification 1998

02.12.2013

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

DAkkS

# Zertifikat

Prüfungsnorm **ISO 50001:2011**

Zertifikat-Registrier-Nr. 01 407 8221

Unternehmen: **nkt cables GmbH**
Düsseldorfer Str. 400
D - 51061 Köln

mit den Standorten gemäß Anlage

Geltungsbereich: Entwicklung, Produktion und Vertrieb von Energiekabel- und Lichtwellenleitersystemen, Metallprodukten

Durch ein Audit wurde der Nachweis erbracht, dass die Forderungen der ISO 50001:2011 erfüllt sind.

Das Fälligkeitsdatum für Folgeaudits ist der 14.11.

Gültigkeit: Dieses Zertifikat ist gültig vom 29.11.2013 bis zum 28.11.2016.

02.12.2013

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

DAkkS

# Zertifikat

Prüfungsnorm **SCC**: 2006**

Zertifikat-Registrier-Nr. 01 013 092930

TÜV Rheinland Cert GmbH bescheinigt:

Zertifikatsinhaber: **nkt cables GmbH**
**Chempark Leverkusen**
Düsseldorfer Straße 400
D - 51061 Köln

Geltungsbereich: Vertrieb, Projektabwicklung und Montage von Hochspannungs- und Seekabelanlagen

Durch ein Audit, Bericht Nr. 092930, wurde der Nachweis erbracht, dass die Forderungen des Regelwerks „Sicherheits Certifikat Contraktoren" (SCC), Version 2006, an ein Arbeitsschutzmanagementsystem in Übereinstimmung mit dem Standard SCC** erfüllt sind.
Das Fälligkeitsdatum für Folgeaudits ist der 03. Dezember.

Gültigkeit: Dieses Zertifikat ist gültig vom 30.12.2009 bis zum 29.12.2012.
Erstzertifizierung 2009

Köln, 04.01.2010

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

TGA-ZM-58-95-62

# Certificate

Standard **BS OHSAS 18001:2007**

Certificate Registr. No. 01 213 092930

TÜV Rheinland Cert GmbH certifies:

Certificate Holder: **nkt cables GmbH**
Düsseldorfer Str. 400
D - 51061 Köln

including the location

Lichtlöcherberg 40
D - 06333 Hettstedt

Scope: Development, production, and sales of power cable systems and fibre optic cable systems, metal products

An audit was performed, Report No. 092930.
Proof has been furnished that the requirements according to BS OHSAS 18001:2007 are fulfilled.

The due date for all future audits is 21-11 (dd.mm).

Validity: The certificate is valid from 2012-12-12 until 2015-12-11.

2012-12-12

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

DQA-ZM-58-95-64

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