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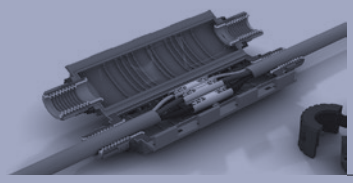
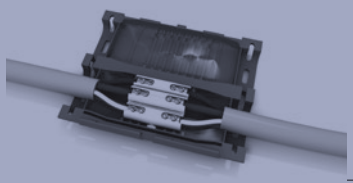
# 01 LOWVOLTAGE

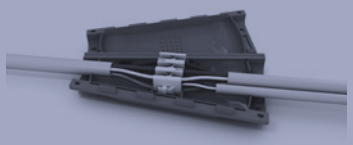
# 01.1 GEL-INSULATED JOINTS AND CONNECTING DEVICES

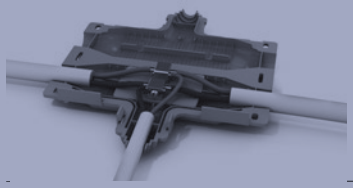
SHARK® SIXEIGHT® Series
IP68 Gel-insulated straight joints 6



SHARK® CLASSIC Series
Gel-insulated straight joints 10



SHARK® 600 Series
Gel-insulated Y-branch joints 14



SHARK® 400 Series
Gel-insulated T-branch joints 15

LEDJOY®
IP68 Gel-insulated junction device
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SHELL BOX® FLAT SERIES
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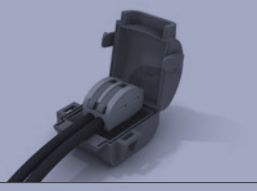

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IPX8 Gel-insulated connecting devices
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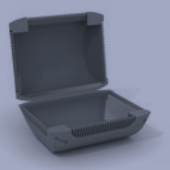

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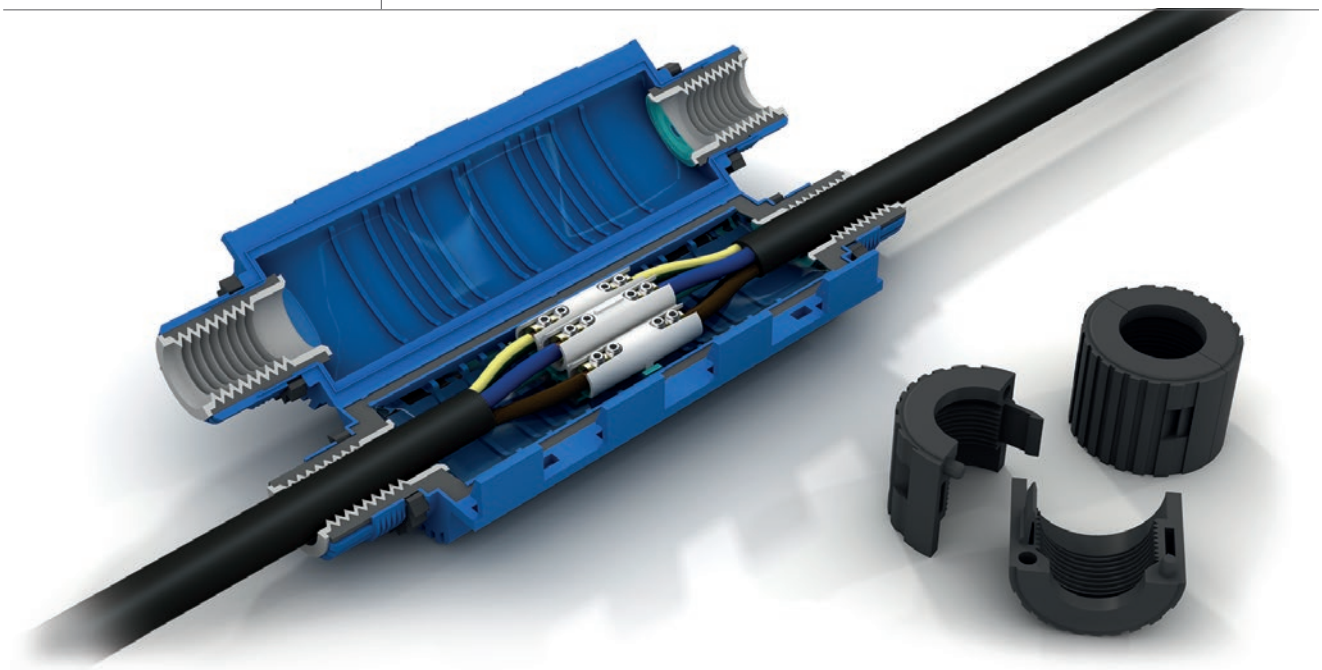
# Shark® SIXEIGHT® Series

## IP68 Gel-insulated straight joints for cables up to 5 cores



## Key features

- **100% water-tight and 100% dust-tight**
- No resin or gel to cast
- Ready to install
- Good mechanical resistance
- **No accidental access to live parts** (IEC 60364 Standard)
- Unlimited shelf life

- Available in 3 sizes and with several connectors and terminal blocks to suit a wide range of cables and applications

- Kit for armoured cables available upon request

## Applications

- Continuous immersion
- Laying conditions:
  direct buried, underground, overhead, in cable ducts

## Kit contents

- Gel joint
- Tightening and insulating nuts
- Installation instructions

Degree of protection (EN 60529)
**IP68** tested at 10 meters

Compliant to Standard
for low voltage 0,6/1 kV joints
**EN 50393**

Self-extinguishing
**EN 60695-2-11**

Low smoke
and toxic gases emission
**CEI 20-37/2-1**
**CEI 20-37/4**

Operating temperature range
**-20 °C to +90 °C**

CE Marking

Total protection

Double insulation

Continuous immersion

Ready to use

Re-enterable

Unlimited shelf life

Directive EU 2015/863
(RoHS 3)
Compliant

Non-toxic

Eco friendly

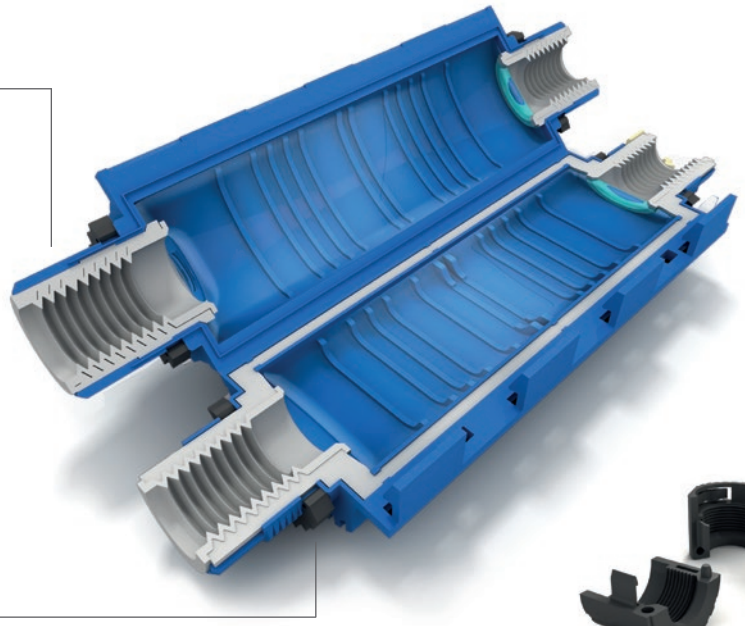
# Shark® SIXEIGHT® Series

IP68 Gel-insulated straight joints
for cables up to 5 cores

## Innovative and patented solutions

### modular gaskets

for optimal installations
and sealing performances
with cables of different
cross-sections
and outer diameters



### security racks

prevent nuts unscrewing and
the reopening of the joint without the use
of tools, ensuring no accidental contact
with live pasts, as required by IEC 60364
Standard

### modular nuts

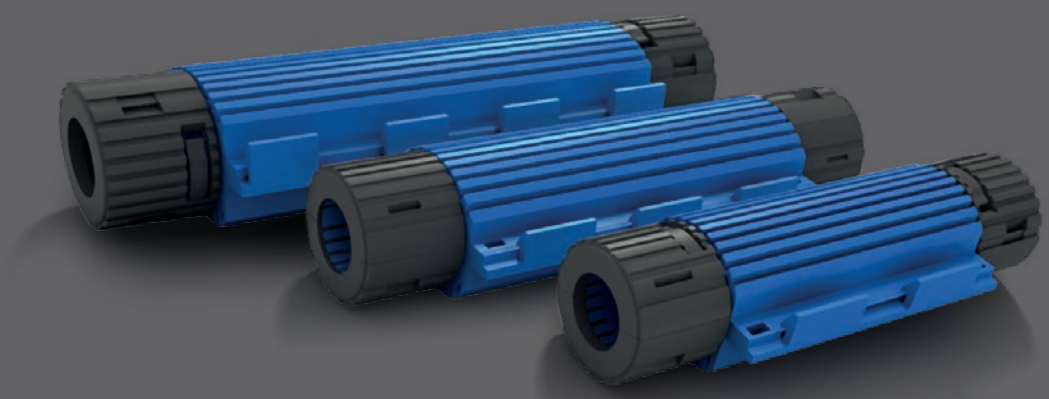
for safe and practical
installation on the junction
even after cable connection
completion

DESIGN INDEX ADI

PREMIO 2015 PRODOTTO DI DESIGN ITALIANO

## Award-winning Technology and Design

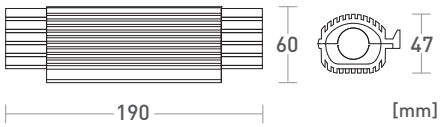
*Shark SIXEIGHT® has been selected by the Permanent Observatory of Design of the ADI (the Industrial Design Association) for inclusion in the ADI Design Index, ADI's annual publication that brings together the best Italian design*



# Shark® SIXEIGHT® Series

## IP68 Gel-insulated straight joints for cables up to 5 cores

SIZE 1




| ref. | item | included connector / terminal block | no. of cores | conductor cross-section range ($mm^2$) | cable diameter range (mm) | pack. (pcs) | min./ mult. ord. qty. | watch video |
|---|---|---|---|---|---|---|---|---|
| **SH6801** | SHARK 6801 | - | | 25 – 50<br>2,5 – 6 | 12 – 18 | 1 | 1 | - |
| **SH6801A** | SHARK 6801A | | | 25 – 50 | 12 – 18 | 1 | 1 | |
| **SH6801B** | SHARK 6801B | | | 2,5 – 6 | | 1 | 1 | |
| **NEW SH6801C** | SHARK 6801C | | | 2,5 – 6 | | 1 | 1 | – |

### CONNECTORS AND TERMINAL BLOCKS SPECIFICATIONS

Shear bolts connector
**for copper-to-copper, aluminum-to- aluminum and copper-to-aluminium connections**

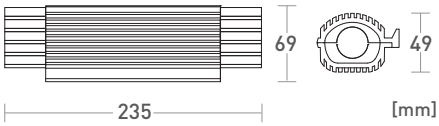
Insulated 3-core terminal block
EN 60998 - CSA/UL - VDE compliant
20 A current rating

Insulated 5-core terminal block with hex grub screw **for copper-to-copper, aluminum-to- aluminum and copper-to-aluminium connections**
(hex key included)

# Shark® SIXEIGHT® Series

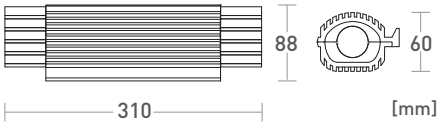
## IP68 Gel-insulated straight joints for cables up to 5 cores

SIZE 2




| ref. | item | included connector / terminal block | no. of cores | conductor cross-section range ($mm^2$) | cable diameter range (mm) | pack. (pcs) | min./ mult. ord. qty. | watch video |
|---|---|---|---|---|---|---|---|---|
| **SH6802** | SHARK 6802 | - | ● | 50 – 95 | 14 – 21 | 1 | 1 | - |
| | | | ●●●● | 2,5 – 10 | | | | |
| **SH6802A** | SHARK 6802A | | ●●●● | 2,5 – 10 | 14 – 21 | 1 | 1 | |
| **NEW SH6802B** | SHARK 6802B | | ● | 50 – 95 | | 1 | 1 | – |

SIZE 3




| ref. | item | included connector / terminal block | no. of cores | conductor cross-section range ($mm^2$) | cable diameter range (mm) | pack. (pcs) | min./ mult. ord. qty. | watch video |
|---|---|---|---|---|---|---|---|---|
| **SH6803** | SHARK 6803 | - | ● | 120 – 240 | 20 – 30 | 1 | 1 | - |
| | | | ●●●● | 10 – 25 | | | | |
| **SH6803A** | SHARK 6803A | | ●●●● | 10 – 25 | 20 – 30 | 1 | 1 | – |

### TERMINAL BLOCKS SPECIFICATIONS

Insulated 5-core terminal block with hex grub screw **for copper-to-copper, aluminum-to- aluminum and copper-to-aluminium connections**
(hex key included)

SHARK® GEL INSULATED JOINT

# Shark® Classic Series

## Gel-insulated straight joints for cables up to 5 cores

Insulated 5-core terminal block for **copper-to-copper, aluminum-to-aluminum and copper-to-aluminium connections**

## Applications

- Straight connections of 0,6/1 kV low voltage single and multicore cables up to 5 cores
- Installation conditions: direct buried, underground, overhead, in cable ducts
- Street lighting systems

## Key features

- No resin or gel to cast
- Ready to install
- Excellent electrical insulation
- Good mechanical resistance
- **No accidental access to live parts** (as per IEC 60364 Standard)
- Unlimited shelf life

- **6 sizes and 14 versions** to suit a wide range of cables and applications

Compliant to Standard for low voltage 0,6/1 kV joints
**EN 50393**

Self-extinguishing
**EN 60695-2-11**

Low smoke and toxic gases emission
**CEI 20-37/2-1**
**CEI 20-37/4**

Degree of protection (EN 60529) equivalent to **IPX8**
(immersion test at 1 meter depth according to EN 50393, par. 8.7)

Operating temperature range
**-20 °C to +90 °C**

CE Marking

IMQ Approved

RINA Approved

Double insulation

IPX8

Ready to use

Re-enterable

Unlimited shelf life

Directive EU 2015/863 (RoHS 3) Compliant

Non-toxic

Eco friendly

SHARK® GEL INSULATED JOINT

# Shark® Classic Series

## Gel-insulated straight joints for cables up to 5 cores

| cores | joint type | ref. | item | conductor cross-section range ($mm^2$) | included connector / terminal block / accessories | size | watch video |
|---|---|---|---|---|---|---|---|
| | | **SH0125** | SHARK 125 | 2,5 – 10 | | size 0 | |
| | | **SH0150** | SHARK 150 | 6 – 25 | | size 1 | |
| | | **SH1406** | SHARK 406/S | 10 – 50 | – | size 2 | |
| | | **SH1410** | SHARK 410/S | 70 – 150 | – | size 3 | |
| | | **SH1416** | SHARK 416/S | 95 – 185 | – | size 4 | |
| | | **SH1525** | SHARK 525/S | 95 – 240 | – | size 5 | – |
| | | **SH0315BL** | SHARK 315 | 0,5 – 1,5 | | size 0 | – |
| | | **SH0325** | SHARK 325 | 1,5 – 2,5 | | size 1 | – |
| | | **SH0306** | SHARK 306 | 1,5 – 6 | | size 2 | – |
| | | **SH0506** | SHARK 506 | 1,5 – 6 | | size 3 | |
| | | **SH0506WS** | SHARK 506WS | 1,5 – 6 | | size 4 | – |
| | | **SH0516** | SHARK 516 | 6 – 16 | | size 4 | |
| | | **SH0525** | SHARK 525 | 6 – 25 | | size 5 | – |
| | | **SH0525WS** | SHARK 525WS | 6 – 25 | | size 5 | – |

### INSTALLATION ACCESSORIES SPECIFICATIONS

Insulated 3-core terminal block
EN 60998 - CSA/UL - VDE compliant

Insulated 3-core and 5-core terminal block
with hex grub screws
**for copper-to-copper, aluminum-to- aluminum and copper-to-aluminium connections**
(hex key included)

U connector with hex screw grub
**for copper-to-copper connections**
(hex key included)

Cable strain relief system

Armour bonding kit (BEK Series) for armoured cables
included in SH0506WS and SH0525WS
and available separately for other joint kits

SHARK® GEL INSULATED JOINT

# Shark® Classic Series

Gel-insulated straight joints
for cables up to 5 cores

## Dimensions and sizes

| | size 0 | size 1 | size 2 | size 3 | size 4 | size 5 |
|---|---|---|---|---|---|---|
| **dimensions (mm) L × W × H** | 72 × 40 × 23 | 86 × 47 × 27 | 145 × 50 × 29 | 146 × 55 × 35 | 180 × 69 × 40 | 240 × 75 × 43 |

**REMARK**

Cable ties and instructions included in all kits

SHARK® GEL INSULATED JOINT

# Shark® Series

## Gel-insulated straight joints
## Bulk packaging

| | ref. | item | pack. (pcs) | min./mult. ord. qty. (pcs) |
|---|---|---|---|---|
| Classic Series | **SK0125** | SHARK 125 | 100 | 100 |
| | **SK0150** | SHARK 150 | 100 | 100 |
| | **SK1406** | SHARK 406/S | 50 | 50 |
| | **SK1410** | SHARK 410/S | 50 | 50 |
| | **SK1416** | SHARK 416/S | 50 | 50 |
| Series 400 | **SK0425** | SHARK 425 | 25 | 25 |
| | **SK1425** | SHARK 425/S | 25 | 25 |
| | **SK0435** | SHARK 435 | 25 | 25 |
| | **SK1435** | SHARK 435/S | 25 | 25 |

SHARK® GEL INSULATED JOINT

# SHARK® 600 Series

## Gel-insulated Y-branch joints cables up to 5 cores

### Connectors and terminal blocks included

- Pre-assembled
- suitable for copper-to-copper connections
- with hex grub screw (key included)
- PA 6.6, UL 94 V2 self-extinguishing body

## Applications

- Y-branch joints on low voltage 0,6/1 kV cables
- Installation conditions: direct buried, underground, overhead, in cable ducts
- Street lighting systems, galleries

## Key features

- No resin or gel to cast
- Ready to install
- **Branch connections without interrupting main cable**
- Excellent electrical insulation and good mechanical resistance
- **Cable secured inside joint**
- **No accidental access to live parts** (as per IEC 60364 Standard)

- **3 versions** to suit a wide range of cables and applications

Compliant to Standard for low voltage 0,6/1 kV joints
**EN 50393**

Self-extinguishing
**EN 60695-2-11**

Low smoke and toxic gases emission
**CEI 20-37/2-1**
**CEI 20-37/4**

Degree of protection (EN 60529) equivalent to **IPX8**
(immersion test at 1 meter depth according to EN 50393, par. 8.7)

Operating temperature range
**-20 °C to +90 °C**

CE Marking

Double insulation

IPX8

Ready to use

Re-enterable

Unlimited shelf life

Directive EU 2015/863 (RoHS 3) Compliant

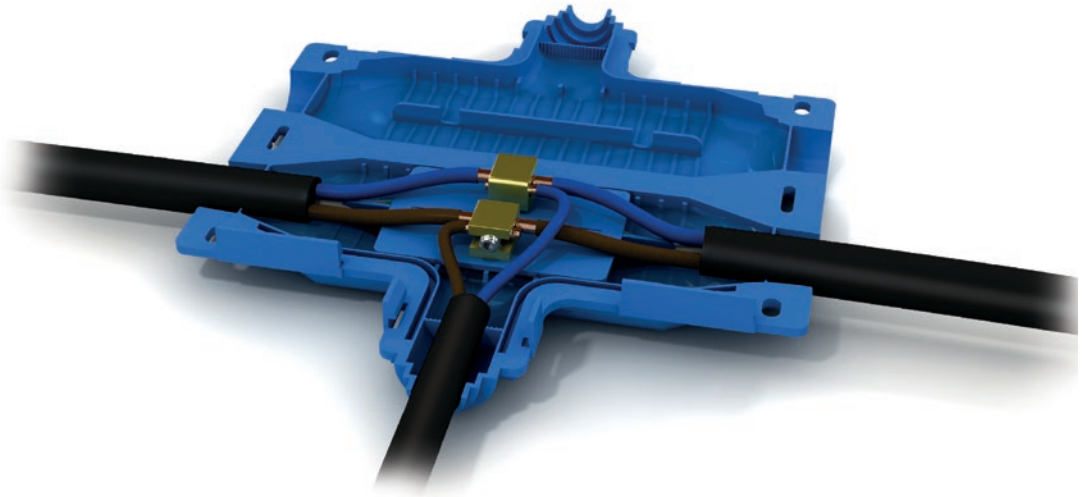
Non-toxic

Eco friendly

SHARK® GEL INSULATED JOINT

# Shark® 400 Series

## Gel-insulated T-branch joints cables up to 4 cores



## Applications

- T-branch joints on low voltage 0,6/1 kV cables
- Installation conditions: direct buried, underground, overhead, in cable ducts
- Street lighting systems, galleries

## Key features

- No resin or gel to cast
- Ready to install
- Excellent electrical insulation and good mechanical resistance
- **No accidental access to live parts** (as per IEC 60364 Standard)

Available in 2 sizes and 4 versions:

- **Versions with core separators** allow non-staggered installation when using non-insulated connectors
- **Versions without core separators** are suited for single-core cable connections

Compliant to Standard for low voltage 0,6/1 kV joints
**EN 50393**

Self-extinguishing
**EN 60695-2-11**

Low smoke and toxic gases emission
**CEI 20-37/2-1**
**CEI 20-37/4**

Degree of protection (EN 60529) equivalent to **IPX8**
(immersion test at 1 meter depth according to EN 50393, par. 8.7)

Operating temperature range
**-20 °C to +90 °C**

CE Marking

IMQ Approved

RINA Approved

IPX8

Double insulation

Ready to use

Re-enterable

Unlimited shelf life

Directive EU 2015/863 (RoHS 3) Compliant

Non-toxic

Eco friendly

SHARK® GEL INSULATED JOINT

# SHARK® 600 Series and 400 Series

## Gel-insulated Y-branch and T-branch joints cables up to 5 cores

600 Series

400 Series

| cores | joint type | ref. | item | conductor cross-section range (mm²) main cable | conductor cross-section range (mm²) branch cable | included separator / connector / terminal block | watch video |
|---|---|---|---|---|---|---|---|
| | | **SH6150** | SHARK 150Y | 10 – 35 rigid<br>10 – 50 flexible | 2,5 – 25 | | |
| | | **SH1425** | SHARK 425/S | 70 – 150 | 10 – 50 | – | – |
| | | **SH1435** | SHARK 435/S | 95 – 240 | 50 – 120 | – | – |
| | | **SH0425** | SHARK 425 | 6 – 25 | 1,5 – 16 | | |
| | | **SH0435** | SHARK 435 | 10 – 35 | 2,5 – 25 | | |
| | | **SH6516** | SHARK 516Y | 6 rigid<br>6 – 16 flexible | 2,5 – 16 | | |
| | | **SH6535** | SHARK 535Y | 10 – 25 rigid<br>16 – 35 flexible | 2,5 – 25 | | |

### INSTALLATION ACCESSORIES SPECIFICATIONS

- Insulated U connector with hex screw grub (hex key included)
- Insulated 5-core terminal block with hex grub screw (hex key included)
- Modular cores separator

### REMARKS

* Conductor cross-sections evaluated for connections without main cable interruption

- Armour bonding kit (BEK Series) available for armoured cables
- Cable ties and instructions included in all kits

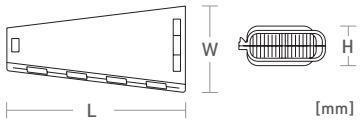
SHARK 150Y
- with 35 mm² main cable, max branch cable is 10 mm²
- with 50 mm² main cable, max branch cable is 6 mm²

SHARK® GEL INSULATED JOINT

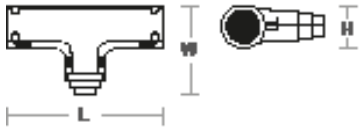
# SHARK® 600 Series and 400 Series

Gel-insulated Y-branch and T-branch joints
cables up to 5 cores

## Dimensions and sizes




| | SH6150 | SH6516 | SH6535 |
|---|---|---|---|
| dimensions (mm) L × W × H | 145 × 70 × 32 | 220 × 110 × 53 | 260 × 130 × 65 |

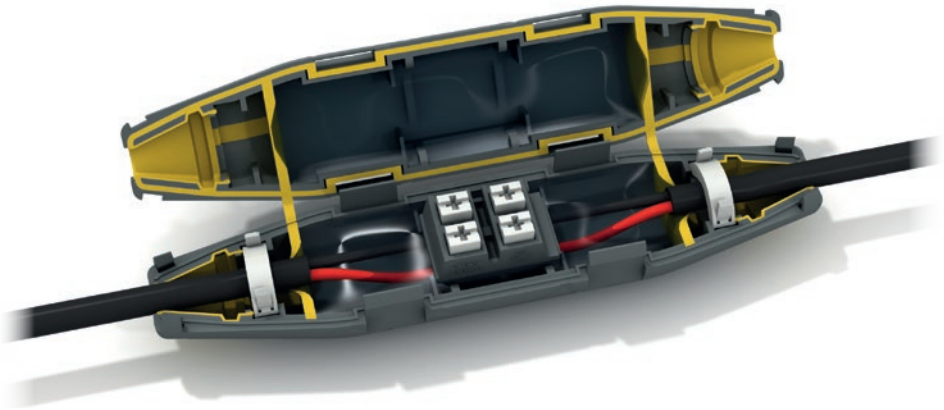



| | SH0425 \| SH1425 | SH0435 \| SH1435 |
|---|---|---|
| dimensions (mm) L × W × H | 210 × 125 × 49 | 250 × 143 × 46 |

LEDJOY SMART CONNECTION

# Ledjoy

## IP68 gel-insulated junction device with two connectors included



## Key features

- No rising damp along the cable due to capillarity effect
- Complete protection from water, dust, debris and weathering
- Quick and reliable installation in narrow spaces with no special tools needed
- Compact shape designed for installations in cable ducts, corrugated pipes, poles
- Low number of components to assemble
- No cable gland or any other component to be slided on the cable preventively
- Resistance against traction and other mechanical stresses
- Versatility of use: road and carriageway signs, gardens, fountains, walkover ground lighting, indoor residential and ambient lighting, LED lighting systems, video-surveillance systems, industrial and civil automation (barriers, gates), and many more

## Kit contents

- Rigid plastic polymer shell with snap closure, co-moulded with integrated **flexible selas and walls,** pre-filled with silicone gel
- 2 connectors included:
  **Two-core insulated spring-clamping connector**
  Three-core insulated screw-type connector
- Cable blocking system

watch video

Degree of protection (EN 60529)
**IP68**

Self-extinguishing
**EN 60695-2-11**

Rated Voltage
**450 V**

Rated Current
**24 A**

Conductor Cross-section range
(rigid and flexible)
**0,5 – 1,5 mm²**

CE Marking

Total Protection

Zero capillarity

Double insulation

Easy installation

Small size

Re-enterable

Unlimited shelf life

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

Non-toxic

Eco friendly

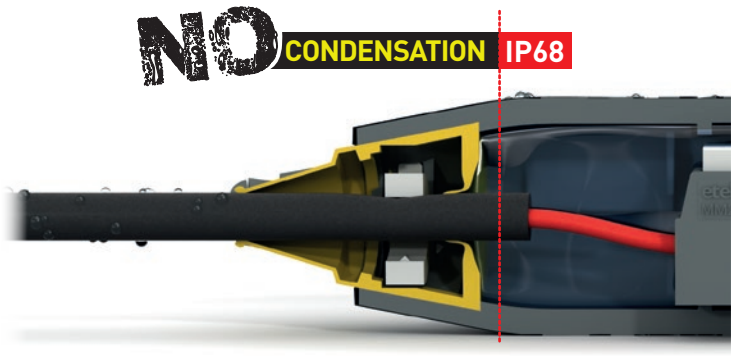
LEDJOY SMART CONNECTION

# Ledjoy®

IP68 gel-insulated junction device
with two connectors included

## Zero capillarity, no condensation

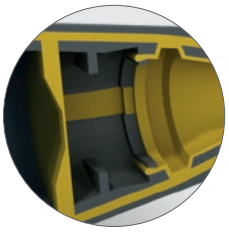
The silicone gel inside LEDJOY® guarantees long-term high protection and insulation, preventing moisture entering in the shell, the rise of damp along the cable due to capillary effect and the formation of condensation inside the appliances, a frequent cause of damage (especially LED lighting fixtures)

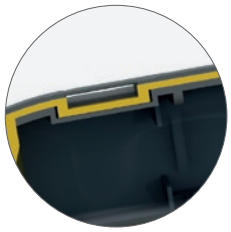



## Co-moulding technology

**rigid plastic outer shell**
> mechanical protection

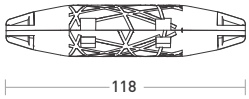
**flexible seals and walls**
> easy cable housing and complete sealing





## Cable blocking system

custom designed



[mm]

IP68

| cores | ref. | item | included connectors | cross-section range (mm²) | cable diameter min-max (mm) | pkg. (pcs) | min. ord. qty. | mult. ord. qty. | watch video |
|---|---|---|---|---|---|---|---|---|---|
| ●● / ●●● | LDJ01 | LEDJOY | | 0,5 – 1,5 | 5 – 9 | 1 | 12 | 12 | |

# SHELL BOX® FLAT SERIES

## IPX8 gel-insulated connecting devices with Wago® compact splicing connectors

NEW

FLAT SERIES

WAGO

### Mini dimensions, Max protection

The silicone gel ensure **IPX8 degree of protection** keeping the connection safe from water and weathering in a smaller and more compact design thanks to **Wago 221 series lever connectors**

*WAGO is a registered trademark of WAGO Verwaltungsgesellschaft mbH*

## Applications

- Connection, insulation and protection of small cross-section cables, also in presence of water (lighting equipments, door, window and gate automation, telephone and telecommunication systems, audio systems)
- Wiring junction boxes on ceilings or outdoors
- Terminal insulation of live cables

## Key features

- **Extra-compact dimensions,** suitable for installation in very narrow spaces
- Complete protection from water, dust, debris and weathering
- **Flexible and breakable walls:** adaptable to cables and ensure the gel leakage only where necessary to ensure the sealing of the connection
- Work on each conductor individually
- Quick and reliable installation with no special tools required
- Handy packaging in blisters
- **3 sizes e 5 versions** to reach the maximum versatility

## Kit contents

- Rigid plastic polymer shell with snap closure, co-molded with integrated **seals and flexible bulkheads** and pre-filled with silicone gel
- **Wago 221 compact splicing connectors**

Degree of protection (EN 60529)
**IPX8**

Self-extinguishing
**EN 60695-2-11**

Tensione di isolamento nominale
**450 V**

Rated Current
**32 A**

Conductor Cross-section range
(rigid and flexible)
**0,2 – 4 mm²**
**(24–12 AWG)**

CE Marking

Compact dimensions

Degree of protection

Double insulation

Easy to install

Re-enterable

Unlimited shelf life

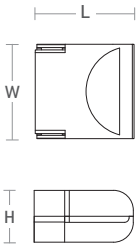
Directive EU 2015/863 (RoHS 3) Compliant

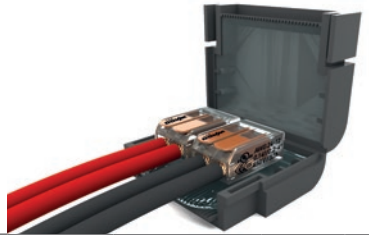
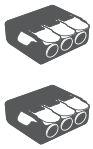
Non-toxic

Eco friendly

# SHELL BOX® FLAT SERIES

## IPX8 gel insulated connecting device with Wago® compact splicing connectors




| dimensions (mm) W × L × H | | ref. | item | included connectors | conductor cross-section range (mm²) | blister (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **size 1** 31,4 × 32 × 16 | | **MJBF113** | Shell Box 113 FLAT | 3 ways | 0,2 – 4 | 1 | 12 | 12 |
| **size 2** 42,5 × 32 × 16 | | **MJBF215** | Shell Box 215 FLAT | 5 ways | 0,2 – 4 | 1 | 12 | 12 |
| |  | **IJBF222** | Shell Box 222 FLAT | 2 ways | 0,2 – 4 | 1 | 12 | 12 |
| **size 3** 51,5 × 32 × 16 | | **MJBF323** | Shell Box 323 FLAT |  3 ways | 0,2 – 4 | 1 | 12 | 12 |
| | | **IJBF332** | Shell Box 332 FLAT | 2 ways | 0,2 – 4 | 1 | 12 | 12 |

SHELL BOX® mini junction box

# SHELL BOX®

## IPX8 gel insulated connecting device with SpringBox® lever connectors

## Applications

- Insulation and protection of small section size cable connections, of small cross-section cables, also in presence of water (lighting equipment, door, windows and gate automation, telephone and telecommunication systems, audio systems)
- Realization of junction boxes on ceilings or outdoors
- Terminal insulation of live cables

Protection against Water and Weathering
thanks to silicone gel that ensure **IPX8 degree of protection**

## Key features

- Complete protection from water, dust, debris and weathering
- **Flexible and fractured bulkheads:** adaptable to cables and ensure the gel leakage only where necessary to ensure the sealing of the connection
- Operations available on each conductor individually
- Quick and reliable installation with no special tools required
- Handy packaging in blisters
- **3 sizes e 6 versions** to reach the maximum versatility

## Kit contents

- Rigid plastic polymer shell with snap closure, co-molded with integrated **seals and flexible bulkheads** and pre-filled with silicone gel
- **Spring Box® insulated lever connectors** (pg. 56) low voltage directive 2014/35/EU, EN 60947-7-1 and EN 60998-2-2 compliant with con TÜV-Rheinland certificate

watch video

Degree of protection (EN 60529)
**IPX8**

Self-extinguishing
**EN 60695-2-11**

Rated insulation voltage
**600 V**

Rated Current
**32 A**

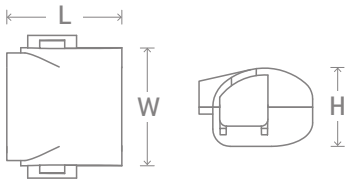
Conductor Cross-section range (rigid and flexible)
**0,2 – 4 mm²**
**(24–12 AWG)**

CE Marking
Degree of protection
Double insulation
Easy to install
Re-enterable
Unlimited shelf life
Directive EU 2015/863 (RoHS 3) Compliant
Non-toxic
Eco friendly

SHELL BOX®
mini junction box

# SHELL BOX®

## IPX8 gel insulated connecting device with SpringBox® lever connectors



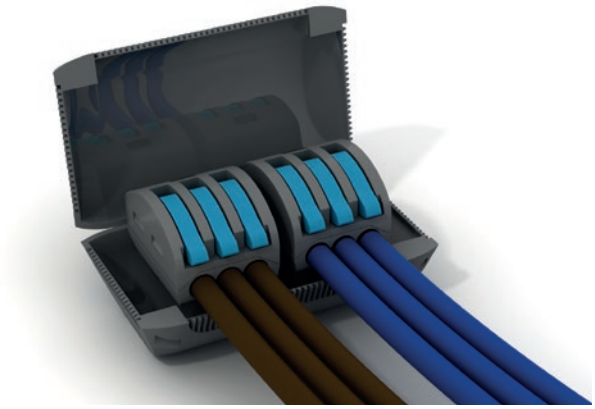

IPX8

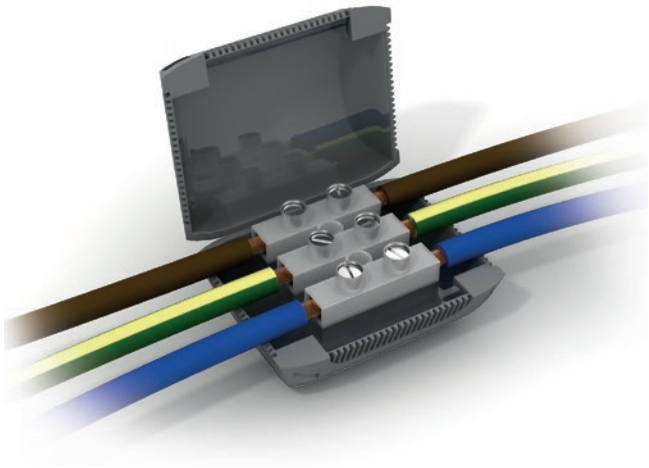
| dimensions (mm) W × L × H | | ref. | item | included connectors | conductor cross-section range (mm²) | blister (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **size 1** 26 × 33 × 23 | | **MJB112** | Shell Box 112 | 2 ways | 0,2 – 4 | 2 | 12 | 12 |
| | | **MJB113** | Shell Box 113 | 3 ways | 0,2 – 4 | 2 | 12 | 12 |
| **size 2** 34 × 33 × 23 | | **MJB215** | Shell Box 215 | 5 ways | 0,2 – 4 | 1 | 12 | 12 |
| | | **MJB222** | Shell Box 222 | 2 ways | 0,2 – 4 | 1 | 12 | 12 |
| **size 3** 46 × 33 × 23 | | **MJB323** | Shell Box 323 | 3 ways | 0,2 – 4 | 1 | 12 | 12 |
| | | **MJB332** | Shell Box 332 | 2 ways | 0,2 – 4 | 1 | 12 | 12 |

MiniBox gel insulated box

# MiniBox

## IPX8 gel-insulated protection device



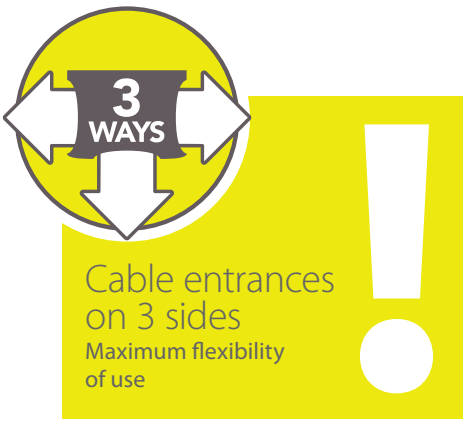


## Applications

- Insulation and protection of small section size cable connections, also in presence of water

## Key features

- **Maximum flexibility of use: cable entrances on 3 sides**
- Suitable for multiple kind of connectors:
  electrical connectors (lever connectors, TBOX®, terminal strips, ledstrip connectors), audio/video (BNC, type F, video surveillance system connectors, balun, balanced audio cables) home automation, etc.)
- **Flexible and breakable walls:** adaptable to cables and ensure the gel leakage only where necessary to ensure the sealing of the connection
- Ready to use
- Compact design
- **Reliability of gel technology**




## Specifications

- Rigid plastic shell pre-filled with silicone gel with snap closure and flexible and breakable cable entrance walls
- 3 sizes for use with a wide range of connectors

Degree of protection
(EN 60529)
**IPX8**

Operating temperature range
**−20 °C to +90 °C**

CE Marking

Degree of protection

Re-enterable

Unlimited shelf life

Directive EU 2015/863
(RoHS 3)
Compliant

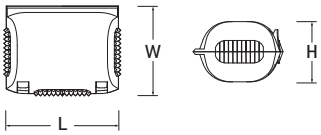
Non-toxic

Eco friendly

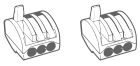
MiniBox
gel insulated box

# MiniBox

## IPX8 gel insulated junction device




CE IPX8

| ref. | item | dimensions L × P × H (mm) | suggested compatible connectors: compact lever connector | suggested compatible connectors: lever connector | suggested compatible connectors: TBOX® | terminal strip | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| **MBX01** | MiniBox 1 | 36,2 × 32,8 × 22 | | | **2,5 mm²** | – | 1 | 12 | 12 |
| | | | | | | | | | |
| **MBX02** | MiniBox 2 | 42,6 × 32,8 × 22 | | | **2,5 mm²** | **2,5 mm²** | 1 | 12 | 12 |
| | | | | | | | | | |
| | | | | | | | | | |
| **MBX03** | MiniBox 3 | 56,9 × 32,8 × 22 | | | **2,5 mm²** | **2,5 mm²** | 1 | 12 | 12 |
| | | | |  | **4 mm²** | | | | |
| | | | | | | | | | |

# 01 LOWVOLTAGE

# 01.2 SILICONE GEL FILLERS

MPGEL® PLUS
Fast cross-linking two-components silicone gel 28

CRYSTALGEL®
Crystal clear transparent two-components silicone gel 30

REPLAYGEL®
Repositionable two-components silicone gel 31

ONE GEL®
Ready-to-use single-component silicone gel 32

# MPgel® PLUS

## Fast cross-linking re-enterable two-component silicone gel for insulation and filling

Fast cross linking
12 minutes at 23 °C
Low downtime
of the line

## Applications

- Filler for branching enclousures
- Electric connections 0,6/1 kV insulation
- Electric components and boards insulation
- Protection of connections against weathering, moisture, dust and animals, bugs and leafs intrusion

## Key features

BOTTLES AND JUGS

- **Zero waste** thanks to separated components and graduaded jug
- New one liter jug

BAGS

- **Zero waste** thanks to the PPS
- Suited for application where a **limited quantity** of product is needed

Curing time at 23 °C
**12 min.**

Dielectric strength
**25,5 kV/mm**

Mixing ratio
**1:1**

Pot life at 23 °C
**5 min.**

Colour
**light blue**

Operating temperature range
**−60 °C to +200 °C**

FAST CURING TIME

IP68 SOLUTION with JuBox (p. 52)

High eletrical insulation

High protection from moisture

Re-enterable and removable

Low viscosity Easy to pour

Reusable after first use

Unlimited shelf life

Non-irritant

Odourless and without solvents

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

Eco friendly

NON HAZARDOUS European Regulationn. 1272/2008 (CLP)

# MPgel® PLUS

Fast cross-linking re-enterable two-component silicone gel for insulation and filling

## Bottles

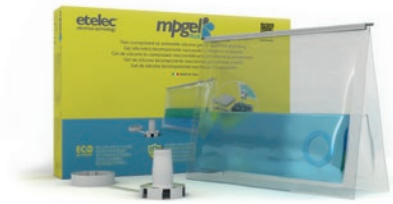
| | ref. | item | volume (liters) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|
| NEW | **MP0050** | MPGEL 0050 | 0,5 | 12 | 12 |
| | **MP0100** | MPGEL 100 | 1 | 12 | 12 |

### Contents

- 2 separate bottles
- 1 Liter graduated jug

**watch video**

## Bags



| ref. | item | volume (liters) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|
| **MP170** | MPGEL 170 | 0,170 | 4 | 4 |
| **MP240** | MPGEL 200 | 0,200 | 4 | 4 |
| **MP420** | MPGEL 420 | 0,420 | 4 | 4 |
| **MP600** | MPGEL 600 | 0,600 | 4 | 4 |

### Contents

- Easy mixable bag
- Perforation Pouring System (PPS)

**watch video**

## Tanks

| ref. | item | volume (liters) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|
| **MP1000** | MPGEL 1000 | 10 | 1 | 1 |

### Contents

- 2 Different tanks for each component
- 1 Liter graduated jug

# Crystalgel®

## Crystal clear re-enterable two-component silicone gel for insulation and filling

### Crystal clear Transparent

**Crystalgel®** is ideally suitable for applications where the connection and/or the content of the enclousure must be kept visible

## Applications

- Filler for branching enclousures
- Electric connections 0,6/1 kV insulation
- Electric components and boards insulation
- Protection of connections against weathering, moisture, dust and animals, bugs and leafs intrusion

watch video

| ref. | item | volume (liters) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|
| **MP0200** | CRYSTALGEL 1L | 1 | 12 | 12 |
| **MP2200** | CRYSTALGEL 2L | 2 | 12 | 12 |

## Contents

- 2 separate bottles (one for each component)
- 1 Liter graduated jug

Curing time at 23 °C
**24 min.**

Dielectric strength
**24,5 kV/mm**

Mixing ratio
**1:1**

Pot life at 23 °C
**10 min.**

Colour
**crystal clear transparent**

Operating temperature range
**−60 °C to +200 °C**

IP68 SOLUTION with JuBox (p. 52)

High electric insulation

High protection from moisture

Re-enterable and removable

Low viscosity Easy to pour

Reusable after first use

Unlimited shelf life

Non-irritant

Odourless and without solvents

Directive EU 2015/863 (RoHS 3) Compliant

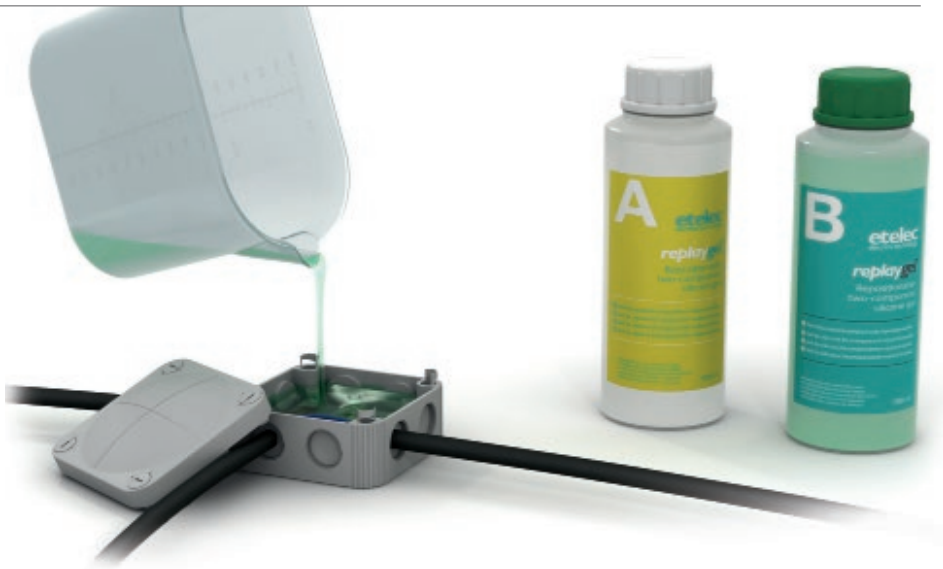
Halogen free

Eco friendly

NON HAZARDOUS European Regulation. 1272/2008 (CLP)

# Replaygel®

## Repositionable and re-enterable two-component silicone gel for insulation and filling




### Repositionable

**Replaygel®** thanks to its innovative formulation is **repositionable** and allows the connection to be **re-enterable** even after long periods from the first application:
Replaygel® easily and quickly self-agglomerates keeping intact its properties

### Applications

- Filler for branching enclosures
- Electric connections 0,6/1 kV insulation
- Designed to be used in troublesome installations
- Ideally suitable for vertical or upended applications

watch video

| ref. | item | volume (liters) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|
| **MP3100** | REPLAYLGEL 1L | 1 | 12 | 12 |

### Contents

- 2 separate bottles (one for each component)
- 1 Liter graduated jug

Curing time at 23 °C
**25 min.**

Dielectric strength
**24 kV/mm**

Mixing ratio
**1:1**

Pot life at 23 °C
**10 min.**

Colour
**light green**

Operating temperature range
**−60 °C to +200 °C**

Repositionable and re-enterable

IP68 SOLUTION with JuBox (p. 52)

High electric insulation

High protection from moisture

Re-enterable and removable

Reusable after first use

Unlimited shelf life

Non-irritant

Odourless and without solvents

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

Eco friendly

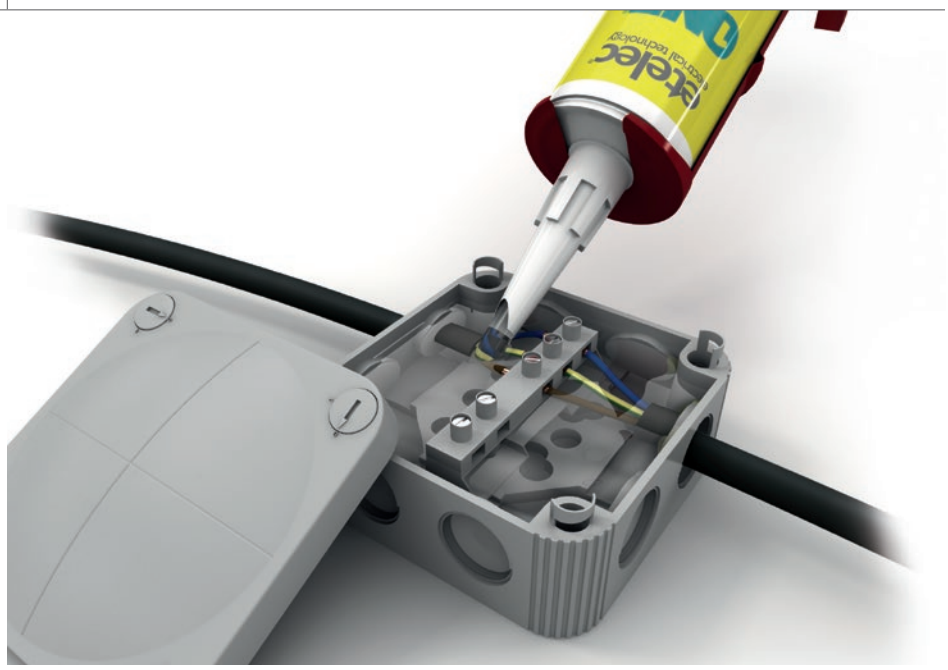
NON HAZARDOUS European Regulationn. 1272/2008 (CLP)

# ONE GEL®

## Ready to use re-enterable single component silicone gel for insulation and filling

### Ready to use

ONE GEL® is already cross-linked and supplied in cartridges suitable for the most common silicone guns for a fast application without waste



## Applications

- Filling of electrical junction boxes
- Electrical connections 0,6/1 kV insulation
- Electronic devices and boards insulation
- Designed for applications with hard to reach enclousers or connections
- Ideally suitable for vertical or upended applications
- Applicable in a wide range of sectors: civil, industrial, navy, aviation, automotive

| ref. | item | volume (liters) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|
| **ONEGEL** | ONE GEL | 0,3 | 24 | 24 |

Dielectric strength
**25 kV/mm**

Colour
**light blue**

Operating temperature range
**−60 °C to +200 °C**

Resistivity (IEC 60093)
**10 GΩ/mm**

Penetration (ISO 2137)
**300 mm / cono da 100 g**

Density (ISO 3219)
**0,97 g/l**

Volume reduction
**< 0,01%**

Ready to use
No component to mix

IP68 SOLUTION
with JuBox
(p. 52)

Vertical
application

High electrical
insulation

High protection from
moisture

Re-enterable
and removable

Unlimited shelf life

Non-irritant

Odourless and
without solvents

Directive
EU 2015/863 (RoHS 3)
Compliant

Halogen free

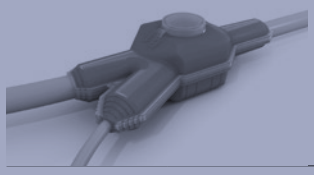
Eco friendly

NON HAZARDOUS
European Regulationn.
1272/2008 (CLP)

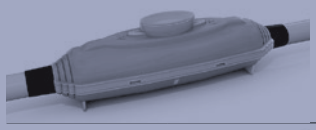
# 01 LOWVOLTAGE

# 01.3 CAST RESIN JOINTS

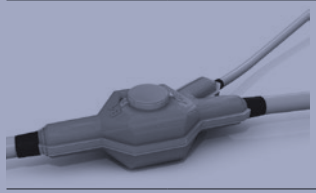
Resiljoint®
Re-enterable silicone resin straight joints 38



Resiljoint®
Re-enterable silicone resin Y-branch joints 40



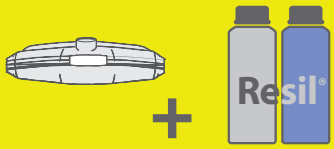
SUBMARINE® STRAIGHT SERIES
Solid state polyurethane resin straight joints 40



SUBMARINE® BRANCH SERIES
Solid state polyurethane resin Y-branch joints 42

# Resiljoint® re-enterable silicone resin straight joints

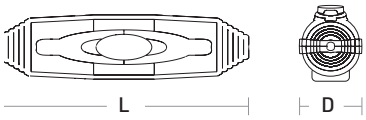
for cables up to 5 cores




**Resiljoint® joints are assembled combining the desired-size shell with the appropriate quantity of Resil® silicone resin**

## Applications

- Straight joints for low-voltage cables up to 0,6/1 kV on single and multicore cables up to 5 cores
- Laying conditions: in cable ducts, directly buried, underground, overhead
- Public lighting systems




| size | dimensions (mm) L × D |
|---|---|
| size 0 | 190 × 45 |
| size 1 | 191 × 51 |
| size 2 | 240 × 62 |
| size 3S | 357 × 62 |
| size 3 | 325 × 95 |
| size 4 | 520 × 100 |
| size 5 | 670 × 120 |
| size 6 | 870 × 200 |

## Key features

- **Key features of Resil®:** Re-enterable, ecologic, non toxic
- Resil® USE & REUSE: It is possible to mix only the needed quantinty of silicone resin **keeping the remaining part for subsequent use**
- **Multiple combinations of shells and filler for high versatility**
- **Quick, easy and precise dosage** of Resil® components: Resil is supplied with graduated jug with fill levels for most frequently used shell sizes
- **Good mechanical resistance** preventing accidental contact with live parts

- **8 sizes** for conductors cross section up to 1000 mm$^2$
- Snap-closure transparent shell
- Cores separator included

watch video

Compliant to Standard for low voltage 0,6/1 kV joints
**EN 50393**

Degree of protection (EN 60529) equivalent to IPX8 (immersion test at 1 meter depth according to EN 50393, par. 8.7)

CE Marking

Double insulation

Re-enterable

Eco friendly

NON HAZARDOUS
EU Regulationn. 1272/2008 (CLP)

# Resiljoint® re-enterable silicone resin straight joints

for cables up to 5 cores

| joint type | cores | size | conductor cross-section range * ($mm^2$) | shell ref. | Resil® (liters) | suggested optional connector / terminal block | cable diameter min–max (mm) | min. ord. qty. (shells) | mult. ord. qty. (shells) |
|---|---|---|---|---|---|---|---|---|---|
| | | size 0 | 6 – 50 | **GSA0** | 0,13 | – | 8 – 26 | 20 | 20 |
| | | size 1 | 6 – 50 | **GSA1** | 0,20 | MR10 | 7 – 30 | 20 | 20 |
| | | | 6 – 70 | | | – | | | |
| | | size 2 | 50 – 95 | **GSA2** | 0,33 | MR11 | 8 – 35 | 10 | 10 |
| | | | 25 – 185 | | | – | | | |
| | | size 3S | 50 – 185 | **GSA3S** | 0,55 | MR12 | 23 – 35 | 1 | 1 |
| | | | 95 – 240 | | | – | | | |
| | | size 3 | 150 – 300 | **GSA3** | 1,40 | MR13 | 20 – 54 | 1 | 1 |
| | | | 95 – 400 | | | – | | | |
| | | size 4 | 240 – 500 | **GSA4** | 2,90 | – | 33 – 60 | 1 | 1 |
| | | size 5 | 400 – 630 | **GSA5** | 6,50 | – | 45 – 73 | 1 | 1 |
| | | size 6 | 500 – 1000 | **GSA6** | 9,80 | – | 55 – 80 | 1 | 1 |
| | | size 0 | 1,5 – 10 | **GSA0** | 0,13 | (included with shells) | 8 – 26 | 20 | 20 |
| | | size 1 | 1,5 – 16 | **GSA1** | 0,20 | | 7 – 30 | 20 | 20 |
| | | size 2 | 4 – 25 | **GSA2** | 0,33 | | 8 – 35 | 10 | 10 |
| | | size 3S | 25 – 50 | **GSA3S** | 0,55 | | 23 – 35 | 1 | 1 |
| | | size 3 | 25 – 95 | **GSA3** | 1,40 | | 20 – 54 | 1 | 1 |
| | | size 4 | 95 – 150 | **GSA4** | 2,90 | | 33 – 60 | 1 | 1 |
| | | size 5 | 150 – 300 | **GSA5** | 6,50 | | 45 – 73 | 1 | 1 |
| | | size 6 | 185 – 400 | **GSA6** | 9,80 | | 55 – 80 | 1 | 1 |
| | | size 0 | 1,5 – 6 | **GSA0** | 0,13 | **NEW** MC506-RJ | 8 – 26 | 20 | 20 |
| | | size 1 | 1,5 – 10 | **GSA1** | 0,20 | MC510-RJ | 7 – 30 | 20 | 20 |
| | | size 2 | 2,5 – 25 | **GSA2** | 0,33 | MC525-RJ | 8 – 35 | 10 | 10 |

## INSTALLATION ACCESSORIES SPECIFICATIONS

MC shear bolts connector (p. **61**)
**for copper-to-copper, aluminum-to-aluminum and copper-to-aluminium connections**

MC-RJ insulated 5-core terminal block (p. **58**) with hex grub screws **for copper-to-copper, aluminum-to- aluminum and copper-to-aluminium connections** (hex key included)

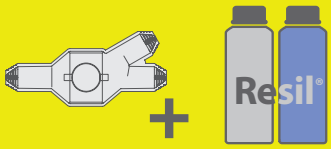
## REMARKS

* Suggested cross-sections may differ depending upon connecting device effectively used

▪ BEK armour bonding kit available for armoured cables (p. 61)

# Resiljoint® re-enterable silicone resin branch joints

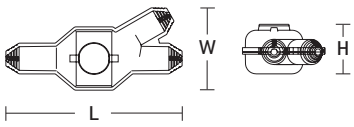
for cables up to 5 cores




**Resiljoint® joints are assembled combining the desired-size shell with the appropriate quantity of Resil® silicone resin**

## Applications

- Branch joints for low-voltage cables up to 0,6/1 kV on single and multicore cables up to 5 cores
- Laying conditions: in cable ducts, directly buried, underground, overhead
- Public lighting systems




| size | dimensions (mm) L × W × H |
|---|---|
| size 0 | 155 × 72 × 45 |
| size 1 | 200 × 94 × 55 |
| size 2 | 240 × 113 × 68 |
| size 3 | 360 × 155 × 90 |
| size 4 | 298 × 128 × 128 |
| size 5 | 430 × 130 × 130 |

## Key features

- **Key features of Resil®:** Re-enterable, ecologic, non toxic
- Resil® USE & REUSE: It is possible to mix only the needed quantinty of silicone resin **keeping the remaining part for subsequent use**
- **Multiple combinations of shells and filler for high versatility**
- **Quick, easy and precise dosage** of Resil® components: Resil is supplied with graduated jug with fill levels for most frequently used shell sizes
- **Good mechanical resistance** preventing accidental contact with live parts

- **6 sizes** for conductors cross section up to 630 mm²
- Snap-closure transparent shell
- Cores separator included (except GSB0)

watch video

Compliant to Standard for low voltage 0,6/1 kV joints
**EN 50393**

Degree of protection (EN 60529) equivalent to IPX8 (immersion test at 1 meter depth according to EN 50393, par. 8.7)

CE Marking

Double insulation

Re-enterable

Eco friendly

ECO product
NON HAZARDOUS
EU Regulationn. 1272/2008 (CLP)

# Resiljoint® re-enterable silicone resin branch joints

for cables up to 5 cores

| joint type | cores | size | conductor cross-section range * (mm²) main cable | conductor cross-section range * (mm²) branch cable | shell ref. | Resil® (liters) | suggested optional connector / terminal block | cable diameter min–max (mm) main cable | cable diameter min–max (mm) branch cable | min./ mult. ord. qty. (shells) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | size 0 | 1,5 – 50 | | **GSB0** | 0,18 | – | 8 – 19 | | 15 |
| | | size 1 | 4 – 70 | | **GSB1** | 0,25 | – | 7 – 23 | | 12 |
| | | size 2 | 35 – 150 | | **GSB2** | 0,40 | – | 12 – 27 | | 6 |
| | | size 3 | 50 – 400 | | **GSB3** | 1,60 | – | 13 – 45 | | 1 |
| | | size 4 | 300 – 500 | 300 – 400 | **GSB4** | 2,00 | – | 35 – 71 | 17 – 33 | 1 |
| | | size 5 | 300 – 630 | 300 – 400 | **GSB5** | 2,90 | – | 30 – 55 | 17 – 40 | 1 |
| | | size 0 | 1,5 – 4 | | **GSB0** | 0,18 | – | 8 – 19 | | 15 |
| | | size 1 | 4 – 6 | 2,5 – 6 | **GSB1** | 0,25 | (included with shells) | 7 – 23 | | 12 |
| | | size 2 | 6 – 25 | 2,5 – 25 | **GSB2** | 0,40 | | 12 – 27 | | 6 |
| | | size 3 | 25 – 95 | | **GSB3** | 1,60 | | 13 – 45 | | 1 |
| | | size 4 | 50 – 120 | 25 – 50 | **GSB4** | 2,00 | | 35 – 71 | 17 – 33 | 1 |
| | | size 5 | 95 – 185 | 10 – 70 | **GSB5** | 2,90 | | 30 – 55 | 17 – 40 | 1 |
| | | size 1 | 4 – 6 | 2,5 – 6 | **GSB1** | 0,25 | MU50610-RJ | 7 – 23 | | 12 |
| | | size 2 | 6 – 16 | 2,5 – 16 | **GSB2** | 0,40 | MU51635-RJ | 12 – 27 | | 6 |
| | | size 3 | 10 – 35 | 2,5 – 25 | **GSB3** | 1,60 | MU51635-RJ | 13 – 45 | | 1 |

| ref. | Kit contents | min./ mult. ord. qty. |
|---|---|---|
| **RE0100B0** | **Resil 100 -** Re-enterable silicone resin 1 liter + graduated jug (p. 46)<br><br>**5x GSB0** size 0 shells for branch joint | 6 |

## INSTALLATION ACCESSORIES SPECIFICATIONS

MC-RJ insulated 5-core terminal block with hex grub screws (hex key included) (p. 58) suitable for **branch connection without interrupting main cable**

Modular cores separator

## REMARKS

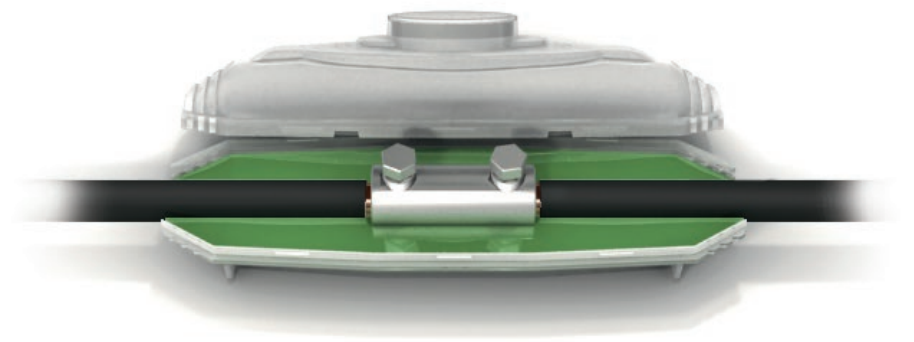
* Suggested cross-sections may differ depending upon connecting device effectively used
- Armour bonding kit (BEK Series) available for armoured cables

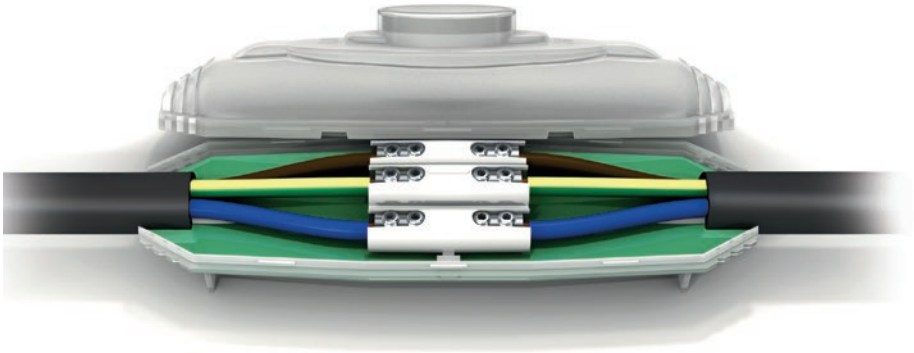
LOW VOLTAGE CAST RESIN JOINT
submarine®

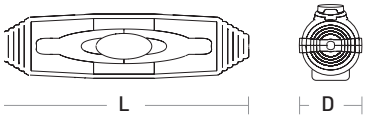
# SUBMARINE® Straight Series
## Cast resin straight joints
for cables up to 5 cores

### High mechanical resistance
Polyurethane cast resin ensure to Submarine® an high mechanical resistance and great protection against corrosion in all installation conditions

**Also available Resiljoint® straight joint with re-enterable eco-friendly silicone resin (p. 36)**








| size | dimensions (mm) L × D |
|---|---|
| size 0 | 190 × 45 |
| size 1 | 191 × 51 |
| size 2 | 240 × 62 |
| size 3S | 357 × 62 |
| size 3 | 325 × 95 |
| size 4 | 520 × 100 |
| size 5 | 670 × 120 |
| size 6 | 870 × 200 |

## Applications
- Straight low-voltage (0,6/1 kV) connections for single and multicore cables up to 5 cores
- Suitable for multiple laying conditions: cable ducts, directly buried, overhead
- Public lighting systems

## Key features
- Permanent installation
- Excellent resistance at great depths
- **High mechanical resistance**
- High electrical insulation and high protection against corrosion
- Direct Injection pouring system (DIPS) (except SKA0)
- Transparent shell
- Cores separator included

- **8 sizes and 11 versions** for cross sections up to 1000 mm²

watch video

Compliant to Standard for low voltage 0,6/1 kV joints
**EN 50393**

Degree of protection (EN 60529) equivalent to IPX8 (immersion test at 1 meter depth according to EN 50393, par. 8.7)

Operating temperature range
**−20 °C to +90 °C**

Polyurethane cast resin solid final state

Shelf life
**3 years**

CE Marking

Double insulation

IPX8

High mechanical resistance

LOW VOLTAGE CAST RESIN JOINT
submarine®

# SUBMARINE® Straight Series
## Cast resin straight joints
for cables up to 5 cores

| joint type | cores | ref. | item | conductor cross-section range * ($mm^2$) | installation accessories | cable diameter min–max (mm) | size | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| | | **SKA0** | SKA0 | 6 – 50 | – | 8 – 26 | size 0 | 8 | 8 |
| | | **SKA1** | SKA1 | 6 – 50 | MR10 (optional) | 7 – 30 | size 1 | 8 | 8 |
| | | | | 6 – 70 | – | | | | |
| | | **SKA2** | SKA2 | 50 – 95 | MR11 (optional) | 8 – 35 | size 2 | 10 | 10 |
| | | | | 25 – 185 | – | | | | |
| | | **SKA3S** | SKA3S | 50 – 185 | MR12 (optional) | 23 – 35 | size 3S | 1 | 1 |
| | | | | 95 – 240 | – | | | | |
| | | **SKA3** | SKA3 | 150 – 300 | MR13 (optional) | 20 – 54 | size 3 | 1 | 1 |
| | | | | 95 – 400 | – | | | | |
| | | **SKA4** | SKA4 | 240 – 500 | – | 33 – 60 | size 4 | 1 | 1 |
| | | **SKA5** | SKA5 | 400 – 630 | – | 45 – 73 | size 5 | 1 | 1 |
| | | **SKA6** | SKA6 | 500 – 1000 | – | 55 – 80 | size 6 | 1 | 1 |
| | | **SKA0** | SKA0 | 1,5 – 10 | (included) | 8 – 26 | size 0 | 20 | 20 |
| | | **SKA1** | SKA1 | 1,5 – 16 | | 7 – 30 | size 1 | 20 | 20 |
| | | **SKA2** | SKA2 | 4 – 25 | | 8 – 35 | size 2 | 10 | 10 |
| | | **SKA3S** | SKA3S | 25 – 50 | | 23 – 35 | size 3S | 1 | 1 |
| | | **SKA3** | SKA3 | 25 – 95 | | 20 – 54 | size 3 | 1 | 1 |
| | | **SKA4** | SKA4 | 95 – 150 | | 33 – 60 | size 4 | 1 | 1 |
| | | **SKA5** | SKA5 | 150 – 300 | | 45 – 73 | size 5 | 1 | 1 |
| | | **SKA6** | SKA6 | 185 – 400 | | 55 – 80 | size 6 | 1 | 1 |
| | | **NEW A00406** | A0-0406 | 1,5 – 6 | (included) | 8 – 26 | size 0 | 20 | 20 |
| | | **A10410** | A1-0410 | 1,5 – 10 | (included) | 7 – 30 | size 1 | 20 | 20 |
| | | **A20425** | A2-0425 | 2,5 – 25 | (included) | 8 – 35 | size 2 | 10 | 10 |

### INSTALLATION ACCESSORIES SPECIFICATIONS

insulated 5-core terminal block with hex grub screws **for copper-to-copper, aluminum-to- aluminum and copper-to-aluminium connections** (hex key included)

Modular cores separator

MC shear bolts connector (p. **61**) **for copper-to-copper, aluminum-to-aluminum and copper-to-aluminium connections**

### KIT CONTENTS

- Two transparent plastic shells with snap closure
- Solid final state polyurethane resin bag
- **Direct Injection Pouring System (ScID)** (except SKA0)
- Electrical tape
- Protective latex gloves (except SKA0)
- Installation instructions

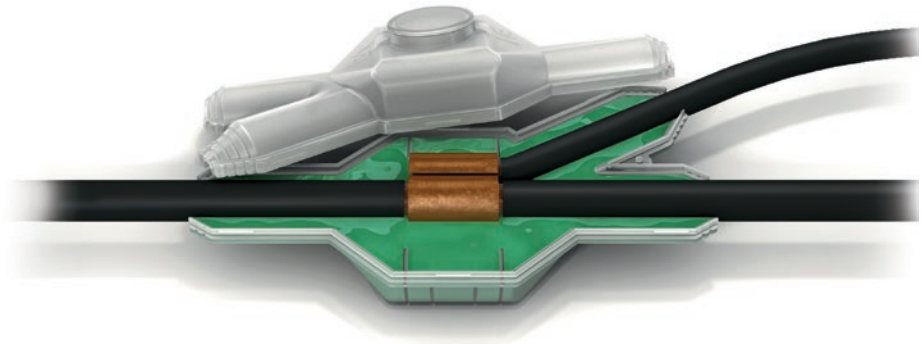
### REMARKS

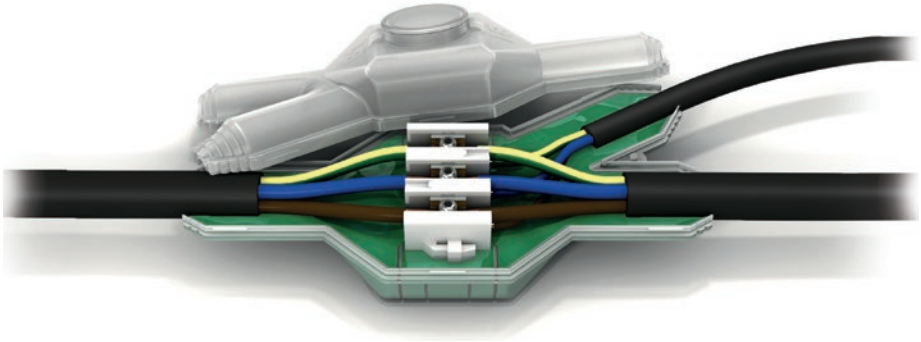
* Suggested cross-sections may differ depending upon connecting device effectively used

- BEK armour bonding kit (p. 61) available for armoured cables

LOW VOLTAGE CAST RESIN JOINT
submarine®

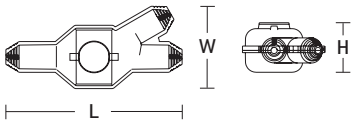
# SUBMARINE® Branch Series
## Cast resin straight joints
for cables up to 5 cores





### High mechanical resistance
Polyurethane cast resin ensure to Submarine® an high mechanical resistance and great protection against corrosion in all installation conditions

**Resiljoint® straight joint with re-enterable eco-friendly silicone resin avaliable as alternative (p. 38)**




| size | dimensions (mm) L × W × H |
|---|---|
| size 0 | 155 × 72 × 45 |
| size 1 | 200 × 94 × 55 |
| size 2 | 240 × 113 × 68 |
| size 3 | 360 × 155 × 90 |
| size 4 | 298 × 128 × 128 |
| size 5 | 430 × 130 × 130 |

## Applications
- Branch low-voltage (0,6/1 kV) connections for single and multicore cables up to 5 cores
- Suitable for multiple laying conditions: cable ducts, directly buried, overhead
- Public lighting systems

## Key features
- Permanent installation
- Excellent resistance at great depths
- **High mechanical resistance**
- Direct Injection pouring system (DIPS) (except SKA0)
- Transparent shell
- Cores separator included
- High electrical insulation and high protection against corrosion

- **6 sizes and 9 versions** for cross section range up to 630 mm²

watch video

Compliant to Standard for low voltage 0,6/1 kV joints
**EN 50393**

Degree of protection (EN 60529) equivalent to IPX8 (immersion test at 1 meter depth according to EN 50393, par. 8.7)

Operating Temperature range
**−20 °C to +90 °C**

Polyurethane cast resin solid final state

Shelf life
**3 years**

CE Marking

Double insulation

IPX8

High mechanical resistance

LOW VOLTAGE CAST RESIN JOINT
submarine®

# SUBMARINE® Branch Series
## Cast resin straight joints
for cables up to 5 cores

| joint type | cores | ref. | item | conductor cross-section range * (mm²) main cable | conductor cross-section range * (mm²) branch cable | installation accessories | cable diameter min–max (mm) main cable | cable diameter min–max (mm) branch cable | size | min./ mult. ord. qty. (shells) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **SKB0** | SKB0 | 1,5 – 50 | | – | 8 – 19 | | size 0 | 8 |
| | | **SKB1** | SKB1 | 4 – 70 | | – | 7 – 23 | | size 1 | 4 |
| | | **SKB2** | SKB2 | 35 – 150 | | – | 12 – 27 | | size 2 | 1 |
| | | **SKB3** | SKB3 | 50 – 400 | | – | 13 – 45 | | size 3 | 1 |
| | | **SKB4** | SKB4 | 300 – 500 | 300 – 400 | – | 35 – 71 | 17 – 33 | size 4 | 1 |
| | | **SKB5** | SKB5 | 300 – 630 | 300 – 400 | – | 30 – 55 | 17 – 40 | size 5 | 1 |
| | | **SKB0** | SKB0 | 1,5 – 4 | | – | 8 – 19 | | size 0 | 8 |
| | | **SKB1** | SKB1 | 4 – 6 | 2,5 – 6 | (included) | 7 – 23 | | size 1 | 4 |
| | | **SKB2** | SKB2 | 6 – 25 | 2,5 – 25 | | 12 – 27 | | size 2 | 1 |
| | | **SKB3** | SKB3 | 25 – 95 | | | 13 – 45 | | size 3 | 1 |
| | | **SKB4** | SKB4 | 50 – 120 | 25 – 50 | | 35 – 71 | 17 – 33 | size 4 | 1 |
| | | **SKB5** | SKB5 | 95 – 185 | 10 – 70 | | 30 – 55 | 17 – 40 | size 5 | 1 |
| | | **B10406** | B1-0406 | 4 – 6 | 2,5 – 6 | (included) | 7 – 23 | | size 1 | 4 |
| | | **B20416** | B2-0416 | 6 – 16 | 2,5 – 16 | (included) | 12 – 27 | | size 2 | 1 |
| | | **B30435** | B3-0435 | 10 – 35 | 2,5 – 25 | (included) | 13 – 45 | | size 3 | 1 |

### INSTALLATION ACCESSORIES SPECIFICATIONS

Insulated 5-core terminal block with hex grub screw (hex key included) suitable for **branch connection without interrupting main cable**

Modular cores separator

### KIT CONTENTS

- Two transparent plastic shells with snap closure
- Solid final state polyurethane resin bag
- **Direct Injection Pouring System (ScID)** (except SKB0)
- Electrical tape
- Protective latex gloves (except SKB0)
- Installation instructions

### REMARKS

* Suggested cross-sections may differ depending upon connecting device effectively used

- BEK armour bonding kit (p. 61) available for armoured cables

# 01 LOWVOLTAGE

# 01.4 RESIN FILLERS

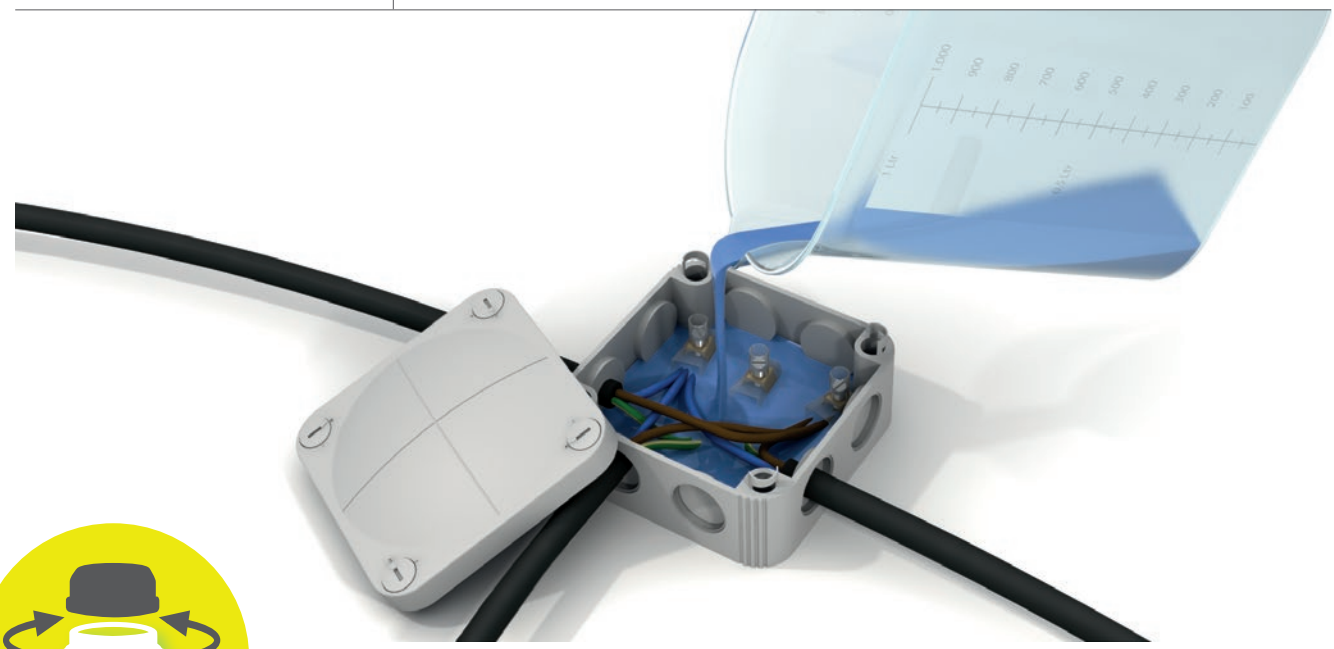
RESIL®
Re-enterable two-component silicone resin 48

RS®
Solid state two-component polyurethane resin 48

RS-5000
Solid state three-component epoxy resin 49

# RESIL®

## Re-enterable two-component silicone resin for insulation and filling



### USE & REUSE

Thanks to its innovative formulation and differently from traditional resins, **RESIL® can be used partially as needed** and the unused can be kept for further use: No wastes, **maximum yield and versatility**

## Applications

- Electrical junction boxes filling
- Insulation of 0,6/1 kV electrical connections
- **Ideal for low voltage Resil Joint®: straight joints RJA Series with GSA Series shells** (pg. 38) **and branch joints RJB Series with GSB Series shells** (pg. 40)

## Key features

- **May be partially used as needed**
- Can be mixed in one go in the jugs provided
- Fast and non-exothermic cross-linking
- Non-hygroscopic
- Good mechanical strength that prevents accidental contact with live parts
- Protection from water, dust, debris, weathering and animals, bugs and leaves intrusion
- Non-toxic (without isocyanates)

Curing time at 23 °C
**25 minuti**

Dielectric strength
**23 kV/mm**

Mixing ratio
**1:1**

Pot life at 23 °C
**15 minuti**

Colour
**blue**

Density
**1,3 g/cm³**

Operating temperature range
**−40 °C to +180 °C**

USE & REUSE
Reusable after first use

IP68 SOLUTION with JuBox (p. 52)

Re-enterable and removable

High electric insulation

High protection from moisture

Non-toxic

Eco friendly

ECO product

NON HAZARDOUS
European Regulationn. 1272/2008 (CLP)

# RESIL®

## Re-enterable two-component silicone resin for insulation and filling

| ref. | item | volume (liters) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|
| **RE0100** | Resil 100 | 1,0 | 12 | 12 |
| **RE0400** | Resil 400 | 4,0 | 1 | 1 |

## Contents

- Two separate bottles (one for each component)
- 1 liter (RE0100) or 5 liter (RE0400) graduated jug

watch video

| ref. | kit contents | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|
| **RE0100B0** | **Resil 100 -** Re-enterable silicone resin<br>1 liter + graduated jug ( p. 46)<br><br>**5x GSB0** size 0 shells<br>for Resiljoint branch joints | 6 | 6 |

watch video

SOLID-STATE RESIN

# RS®

solid final state two-component polyurethane resin in bags

## Applications

- All types of filling and insulation of electrical junction boxes with operating voltages of up to 1 kV

## Key features

- Watertight sealing of casing and/or connection
- Excellent mechanical protection thanks to the final solid state
- Fluid and homogeneous pouring without any accidental spillage, thanks to the **Perforation Pouring System (PPS)**

High mechanical protection
thanks to the final solid state of the resin

## Contents

- Bag with removable baffle
- Perforation Pouring System (PPS)
- Instructions

| ref. | item | volume (liters) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|
| **RS0150** | RS 150 | 0,110 | 4 | 4 | 4 |
| **RS0300** | RS 300 | 0,220 | 4 | 4 | 4 |
| **RS0400** | RS 400 | 0,290 | 4 | 4 | 4 |
| **RS0550** | RS 550 | 0,400 | 4 | 4 | 4 |
| **RS0650** | RS 650 | 0,470 | 4 | 4 | 4 |
| **RS1650** | RS 1650 | 1,200 | 4 | 4 | 4 |

dielectric strength
**> 20 kV/mm**

Pot life at 23 °C
**15 min**

Curing time at 23 °C
**25 min**

density
**1,37 g/cm³**

Hardness
**SHORE D 55**

Storage temperature
**+5 °C to + 40 °C**

Shelf life
**3 years**

**IP68 SOLUTION with JuBox**
(p. 52)

High mechanical protection

# RS 5000

solid final state quartz-loaded three-component epoxy resin

## Applications

- All types of filling and insulation of electrical junction boxes with operating voltages of up to 1 kV
- Ideal for filling large spaces (thanks to quartz aggregate)

## Key features

- Watertight sealing of casing and/or connection
- Excellent mechanical protection thanks to the final solid state

High mechanical protection
thanks to the final solid state of the resin

## Contents

- Can of resin
- Can of hardener
- Bag of powdered quartz
- Stirring stick

| ref. | item | volume (liters) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|
| **RS5000** | RS 5000 | 4,40 | 1 | 1 | 1 |

Dielectric strength
**> 20 kV/mm**

Pot life at 23 °C
**15 min**

Curing time at 23 °C
**50 min**

Density
**1,14 g/cm³**

Hardness
**SHORE D 85**

Colour
**grey**

Storage temperature
**+5 °C to + 40 °C**

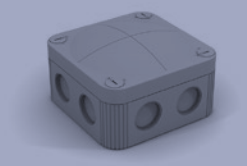
Shelf life
**2 years**

**IP68 SOLUTION with JuBox**
(p. 52)

High mechanical protection

# 01 LOWVOLTAGE

# 01.5 ELECTRICAL JUNCTION BOXES FOR IP68 SOLUTIONS



JUBOX
electrical junction boxes for IP68 solutions 52

JUBOX The junction box

# JuBox

## Junction box for sealing up to IP68

### IP68 Solution

JuBox used with an Etelec insulating filler (**MPgel®, Crystalgel®, ONE GEL®, Resil®**) allows to reach a **Degree of protection IP68 without use of cable glands**

## Key features

- Flexibility:
  IP66 with no additions;
  IP67 with cable gland. **No locknuts needed**
  **IP68 using Etelec® fillers**
- Easy and quick installation with no special tools needed
- Compact design
- Both for indoor or outdoor use
- Weathering, ozone and UV resistant

## Specifications

- Polypropilene (PP) shell, with thermoplastic elastomeric (TPE) flexible seals and membrane
- **Cable entries with flexible self-sealing perforation membranes and thread for optional cable glands without locking nuts**
- **Cable back entries with flexible self-sealing perforation membranes** (JuBox 049 e 095)
- Integrated cover locking screws, quick stroke, in plastic material
- 4 rear fixing holes
- Installation support with quick-connect clip included

Low voltage 2014/35/EU (LVD) compliant according to Standard
**EN 60670-1**
**EN 60670-22**

Degree of protection (EN 60529)
**IP66**
**IP67** with cable gland
**IP68 (15-meter depth)**
with Etelec® fillers and without locknuts

Flame retardant (glowing wire test)
**750 °C**

Operating temperature range
**−30 °C to +100 °C**

Installation temperature range
**−5 / +60 °C**

Cable diameter
**3 – 12 mm**

Thread size for optional cable glands
**M20 × 1,5**

IP68

**IP68 with Etelec® fillers**

RoHS

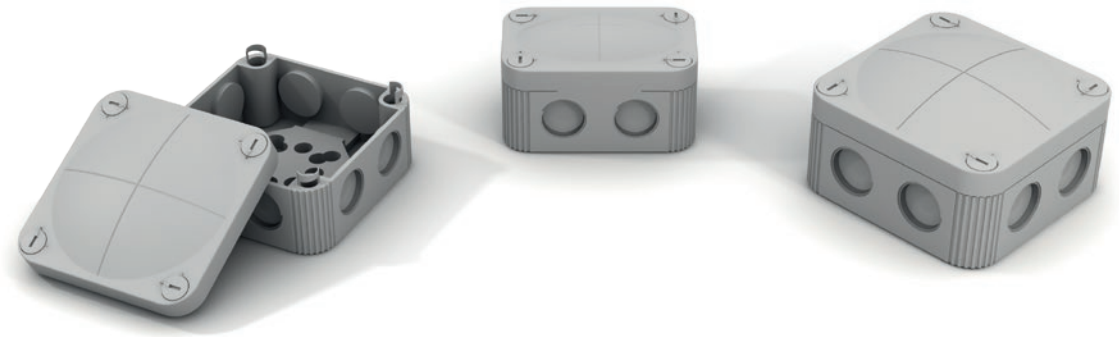
Directive EU 2015/863 (RoHS 3) Compliant

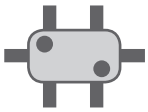
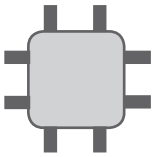
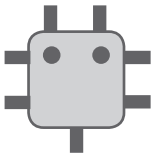
HF

Halogen free

# JuBox

## Junction box for sealing up to IP68



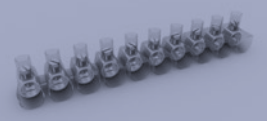
| ref. | item | misure L × P × H (mm) | ingressi cavo | volume (litri) | confez. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| **JBX049** | JUBOX 1 | 85 × 49 × 51 |  | 0,10 | 4 | 4 | 4 |
| **JBX085** | JUBOX 2 | 85 × 85 × 51 |  | 0,20 | 2 | 2 | 2 |
| **JBX095** | JUBOX 3 | 95 × 95 × 60 |  | 0,32 | 2 | 2 | 2 |

Filling volumes evaluated for empty boxes

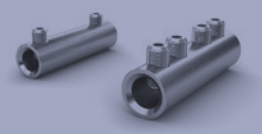
# 01 LOWVOLTAGE

# 01.6 CONNECTING ELEMENTS

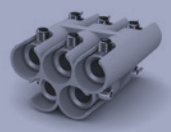
SPRING BOX®
Insulated lever connectors 56



TBOX®
Insulated screw terminals with screw-type clamping 57



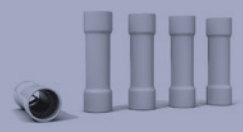
MC
Connector with hex grub screw 58



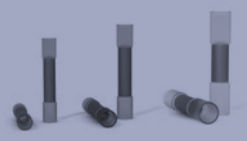
MC-RJ
Insulated terminal block with hex grub screws for straight joints 58

MU
U connector with hex grub screws 59

MU-RJ
Insulated terminal block with hex grub screws for branch joints 59

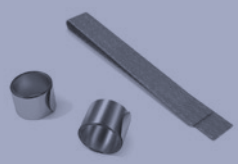


CP
Insulated compression connectors 60



CTT
Heat shrink insulated compression connectors 60

MR
Connector with shear head bolts 61

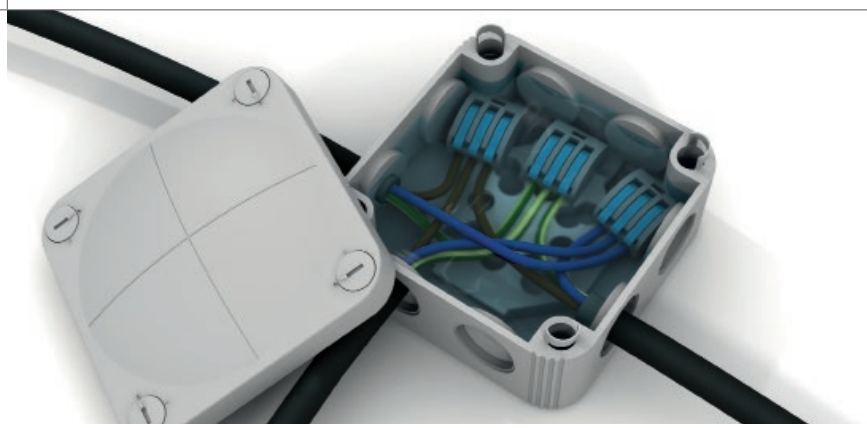


BEK
Armour bonding kit for low voltage cables 61

SPRING BOX lever connectors

# Spring Box®

## Insulated lever connectors



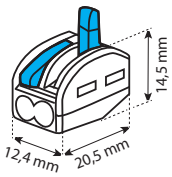
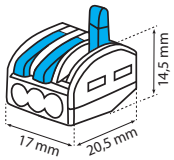
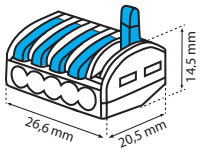
## Applications

- Low voltage small cross-section cables connection (lighting fixtures, automation for windows, doors and gates)
- Telephone system and telecommunications cables connection
- Audio systems and radio cable connection
- Terminal insulation for live cables

## Characteristics

- Low voltage Directive 2014/35/EU compliant **Certified by TÜV-Rheinland**
- Degree of protection IP20
- With voltage test point

Packed in 5 pc. polybags

| ref. | item | ways | conductor cross-section range ($mm^2$) | rated voltage and current | dimensions | pack. (pcs) | min./mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| **SBOX2** | Spring Box 2 | 2 | 0,2 – 4 | 600 V<br>32 A |  | 60 | 60 |
| **SBOX3** | Spring Box 3 | 3 | 0,2 – 4 | 600 V<br>32 A |  | 40 | 40 |
| **SBOX5** | Spring Box 5 | 5 | 0,2 – 4 | 600 V<br>32 A |  | 35 | 35 |

Compliance
**EN 60947-7-1**
**EN 60998-2-2**

Rated Voltage
**600 V**

Rated Current
**32 A**

Conductor Cross-section (rigid and flexible)
**0,2 – 4 $mm^2$**

Degree of protection
**IP20**

CE Marking

Certificato TÜV-Rheinland

Directive 2011/65/EU (RoHS 2) Compliant

TBOX WIRE CONNECTORS

# TBOX®

Insulated screw terminal connector

## Applications

- Connections of low voltage cables in junction boxes or overhead (e.g. lighting fixtures, ceilings) in residential buildings

## Specifications

- Transparent polycarbonate housing
- Brass conductor elements
- Galvanized steel screws with slotted head (from TBOX 15 to TBOX 100), or Phillips head ( TBOX 160)
- Galvanized steel hex grub screw (TBOX 250, TBOX 360)
- Degree of protection IP20
- IMQ Approved – CE Marking

## TBOX > 10-pole connector strip

| ref. | item | nominal cross section ($mm^2$) | rated voltage (V) | rated current (A) | pack. (pcs) | min. ord. qty. (pcs.) | mult. ord. qty. (pcs.) | Connecting capacity ($mm^2$) number of conductors 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| **TBOX015** | TBOX 015 | 1,5 | 450 | 24 | 10 | 100 | 100 | 1,5 | 1 | 0,75 |
| **TBOX025** | TBOX 025 | 2,5 | | 24 | 10 | 100 | 100 | 2,5 | 1,5 | 1 |
| **TBOX040** | TBOX 040 | 4 | | 32 | 10 | 100 | 100 | 4 | 2,5 | 1,5 |
| **TBOX060** | TBOX 060 | 6 | 500 | 41 | 10 | 100 | 100 | 6 | 4 | 2,5 |
| **TBOX100** | TBOX 100 | 10 | | 57 | 5 | 50 | 50 | 10 | 6 | 4 |
| **TBOX160** | TBOX 160 | 16 | | 76 | 5 | 50 | 50 | 16 | 10 | 6 |

## TBOX > 1 pole connector

| ref. | item | nominal cross section ($mm^2$) | rated voltage (V) | rated current (A) | pack. (pcs) | min. ord. qty. | mult. ord. qty. | Connecting capacity ($mm^2$) number of conductors 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| **TBOX250** | TBOX 250 | 25 | 500 | 101 | 5 | 50 | 50 | 25 | 16 | 10 |
| **TBOX350** | TBOX 350 | 35 | | 125 | 5 | 50 | 50 | 35 | 25 | 16 |

| ref. | kit contents | min./ mult. ord. qty. |
|---|---|---|
| **KT1067** | TBOX 040 - **20 pcs**<br>TBOX 060 - **20 pcs**<br>TBOX 100 - **10 pcs**<br>**INCLUDED**<br>**X10 Professional electricians scissors**<br>with wire cutter up to 50 $mm^2$ | 9 |

# MC

## Mechanical through connector
with hex grub screws

### Applications
- Straight connection of 0,6/1 kV low voltage conductors

### Key features
- No special crimping tool required for installation

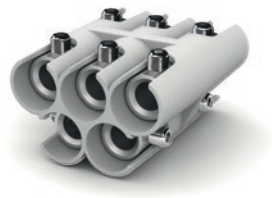
### Specifications
- Tin-plated connector body
- Steel hex grub screw

Suitable for **copper-to-copper, aluminium-to-aluminium and copper-to-aluminium** connections

| ref. | item | cores | conductor cross-section range ($mm^2$) | connector length (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| **MC0010** | MC10 | ● | 1,5 – 10 | 30 | 10 | 10 | 10 |
| **MC0025** | MC25 | ● | 2,5 – 25 | 40 | 10 | 10 | 10 |

# MC-RJ

## Insulated terminal block for straight joints
with hex grub screws



### Applications
- Straight connection of 0,6/1 kV low voltage conductors in Shark Sixeight® (p. 6) and Resil Joint® straight joints (p. 39)

### Key features
- No special crimping tool required for installation
- Hex key included

### Specifications
- PA insulating body
- Tin-plated connector bodies
- Steel hex grub screw

Suitable for **copper-to-copper, aluminium-to-aluminium and copper-to-aluminium** connections

| | ref. | item | cores | conductor cross-section range ($mm^2$) | length (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| | **MC0306RJ** | MC306-RJ | ●●● | 1,5 – 10 | 40 | 1 | 1 | 1 |
| NEW | **MC0506RJ** | MC506-RJ | ●●●● | 1,5 – 6 | 40 | 1 | 1 | 1 |
| | **MC0510RJ** | MC510-RJ | ●●●● | 1,5 – 10 | 40 | 1 | 1 | 1 |
| | **MC0525RJ** | MC525-RJ | ●●●● | 2,5 – 25 | 50 | 1 | 1 | 1 |

# MU

## Mechanical U connector
with hex grub screw

### Applications
- Straight and branch connection of 0,6/1 kV low voltage copper conductors

### Key features
- No special crimping tool required for installation

### Characteristics
- Brass connector body
- Steel hex grub screw

Suitable for **branch connections without interrupting main cable**

| ref. | item | cores | max conductor cross-section ($mm^2$) main cable | max conductor cross-section ($mm^2$) branch cable | connector length (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **MU0610** | MU-6/10 | ● | 25 | 10 | 22 | 10 | 10 | 10 |
| **MU1635** | MU-16/35 | ● | 50 | 6 | 28 | 10 | 10 | 10 |

# MU-RJ

## Insulated terminal block for branch joints
with hex grub screws

### Applications
- Branch connection of 0,6/1 kV low voltage copper conductors in Resil Joint® branch joints

### Key features
- No special crimping tool required for installation
- Hex key included

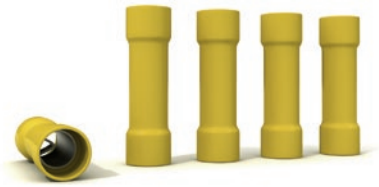
### Characteristics
- PA insulating body
- Tin-plated connector bodies
- Steel hex grub screw

Suitable for **branch connections without interrupting main cable**

| ref. | item | cores | conductor cross-section range ($mm^2$) main cable | conductor cross-section range ($mm^2$) branch cable | length (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **MU5P0610RJ** | MU50610-RJ | ●●●● | 6 – 16 | 2,5 – 16 | 32 | 1 | 1 | 1 |
| **MU5P1635RJ** | MU51635-RJ | ●●●● | 16 – 35 | 2,5 – 35 | 38 | 1 | 1 | 1 |

# CP

## Insulated compression connectors



### Applications

- Connection and insulation of 0,6/1 kV low voltage conductors
- Straight connection of conductors in Shark Sixeight 6801 joints (p. 6)

### Key features

- Range-taking
- Simple, quick and reliable installation

### Specifications

- Tinned copper connector body
- Supplied in 5-piece pack

Suitable for **copper-to-copper and aluminium-to-aluminium** connections

| ref. | item | cores | conductor cross-section range ($mm^2$) | connector length (mm) | colour | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **CP0306** | CP 306 | 5 × ● | 2,5 – 6 | 40 | yellow | 5 | 1 | 1 |

# CTT

## Heat shrink insulated compression connectors

with hot melt sealant

### Applications

- Connection and insulation of 0,6/1 kV low voltage conductors

### Key features

- Range-taking
- Simple, quick and reliable installation
- Sealing against moisture and corrosion
- Protection against vibrations
- visual inspection of the connection through transparent sheat

### Specifications

- polyolefin insulating sheath
- Hot melt adhesive lining
- Operating temeprature range: –55 °C to 125 °C

**Hot melt sealant guarantees maximum protection** of the connection

| ref. | item | cores | conductor cross-section range ($mm^2$) | connector length (mm) | colour | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **CT0515** | CTT 0,5/1,5 | ● | 0,5 – 1,5 | 35 | red | 100 | 1 | 1 |
| **CT1525** | CTT 1,5/2,5 | ● | 1,5 – 2,5 | 35 | blue | 100 | 1 | 1 |
| **CT0306** | CTT 3/6 | ● | 4 – 6 | 40 | yellow | 50 | 1 | 1 |

# MR

## Shear bolt through connector

### Applications

- Straight connection of 0,6/1 kV low voltage conductors

### Key features

- No special crimping tool required for installation

### Specifications

- Tin-plated connector body
- Steel shear head bolts

Suitable for **copper-to-copper, aluminium-to-aluminium and copper-to-aluminium** connections

| ref. | item | cores | conductor cross-section range ($mm^2$) | connector length (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| **MR0050** | MR 10 | ● | 6 – 50 | 53 | 1 | 1 | 1 |
| **MR0051** | MR 11 | ● | 50 – 95 | 58 | 1 | 1 | 1 |
| **MR0052** | MR 12 | ● | 95 – 240 | 119 | 1 | 1 | 1 |
| **MR0053** | MR 13 | ● | 150 – 300 | 130 | 1 | 1 | 1 |

# BEK

## Armour bonding kit for low voltage cables

### Applications

- Electrical continuity restoration of 0,6/1 kV low voltage armour cables

### Specifications

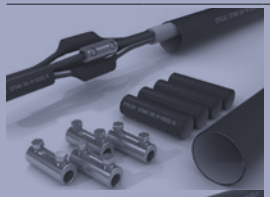
- 2 constant force steel roll springs
- Tinned copper earth braid

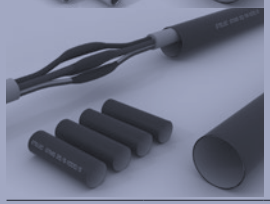
| ref. | item | cable diameter min–max (mm) | conductor cross-section range ($mm^2$) cores | | | | | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | ● | ●● | ●●● | ●●●● | ●●●●● | | | |
| **BEKA1** | BEKA1 | 12 – 20 | 10 - 25 | 1,5 - 10 | 1,5 - 10 | 1,5 - 10 | 1,5 - 6 | 1 | 1 | 1 |
| **BEKA2** | BEKA2 | 17 – 28 | 16 - 150 | - | 10 - 35 | 6 - 25 | 4 - 16 | 1 | 1 | 1 |
| **BEKA3** | BEKA3 | 40 – 60 | 95 - 300 | - | 25 - 95 | 25 - 95 | 25 - 95 | 1 | 1 | 1 |
| **BEKA4** | BEKA4 | 40 – 60 | 240 - 400 | - | 70 - 150 | 70 - 150 | 95 -120 | 1 | 1 | 1 |
| **BEKA5** | BEKA5 | 50 – 75 | 400 - 500 | - | 150 - 300 | 150 - 300 | 150 - 300 | 1 | 1 | 1 |

# 01 LOWVOLTAGE

# 01.7 HEAT SHRINK JOINTS

## HEAT SHRINK STRAIGHT JOINTS





GBT-C
for power cables - connectors included

GBT
for power cables

GBT-S
for signal and control cables - connectors included

64

## HEAT SHRINK BRANCH JOINTS

JCBT
with wrap-around sleeve

66

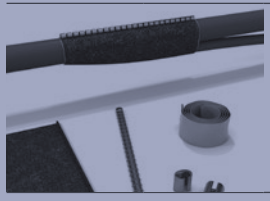
## FIRE RESISTANT HEAT SHRINK STRAIGHT JOINTS

GN-RF
for unarmoured power and signal/control cables

GN-RF-A
for armoured power and signal/control cables

68

## FIRE RESISTANT HEAT SHRINK BRANCH JOINTS



GN-RF-D
Fire resistant heat shrink branch joints

70

# GBT

## Heat shrink straight joints
for 0,6/1 kV low voltage cables

## Applications

watch video

- Straight joint for 0,6/1 kV low voltage power cables up to 4 cores and signal and control cables
- Laying conditions: submerged, cable ducts, directly buried
- **Ideal for submerged pumps**

GBT-C series kits include mechanical connectors with shear head bolts, **for copper-to-copper, aluminum-to-aluminum and copper-to-aluminium connections**

## Key features

- Compact size
- Available for a wide range of conductor cross-sections
- No special tool required for installation
- Chemical and weathering resistant
- Excellent electric insulation and sealing of the connection
- Good mechanical resistance
- UV resistant

**Specific kits available for:**
concentric neutral cables (GBT-N)
armoured cables (GBT-A)
and signal-control cables (GBT-S)

## Kit contents

- Inner sheaths for insulation of each core
- Outer sheat with sealant
- **(GBT-C only) 4 tin-plated mechanical through connectors with shear head bolts**
- (GBT-N only) tinned copper braid to connect concentric neutral
- (GBT-A only) armour bonding kit
- (GBT-S only) **Insulated compression connectors** for each core

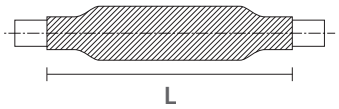
Compliant to Standard
for low voltage 0,6/1 kV joints
**EN 50393**

CE Marking

Unlimited shelf life

# GBT

## Heat shrink straight joints
for 0,6/1 kV low voltage cable




### GBT > heat shrink straight joints **for power cables**

| joint type | cores | ref. | item | conductor cross-section range ($mm^2$) | included/optional connector(s) | joint length L (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| | | **GB1016** | GBT-1016 | 10 – 16 | MR10 (optional) | 250 | 1 | 1 | 1 |
| | | **GB1070** | GBT-1070 | 25 – 70 | MR11 (optional) | 250 | 1 | 1 | 1 |
| | | **GB1150** | GBT-1150 | 95 – 150 | MR12 (optional) | 330 | 1 | 1 | 1 |
| | | **GB1300** | GBT-1300 | 185 – 300 | MR13 (optional) | 330 | 1 | 1 | 1 |
| | | **GB0406** | GBT-0406 | 1,5 – 6 | – | 200 | 1 | 1 | 1 |
| | | **GB0416C** | GBT-0416-C | 10 – 16 | 4 × (included) | 330 | 1 | 1 | 1 |
| | | **GB0416** | GBT-0416 | 10 – 16 | – | 330 | 1 | 1 | 1 |
| | | **GB0450C** | GBT-0450-C | 25 – 50 | 4 × (included) | 500 | 1 | 1 | 1 |
| | | **GB0435** | GBT-0435 | 25 – 35 | – | 500 | 1 | 1 | 1 |
| | | **GB0495C** | GBT-0495-C | 50 – 95 | 4 × (included) | 500 | 1 | 1 | 1 |
| | | **GB0470** | GBT-0470 | 50 – 70 | – | 500 | 1 | 1 | 1 |
| | | **GB4240C** | GBT-4240-C | 95 – 240 | 4 × (included) | 750 | 1 | 1 | 1 |
| | | **GB4150** | GBT-4150 | 95 – 150 | – | 750 | 1 | 1 | 1 |
| | | **GB4300C** | GBT-4300-C | 150 – 300 | 4 × (included) | 750 | 1 | 1 | 1 |
| | | **GB4300** | GBT-4300 | 185 – 300 | – | 750 | 1 | 1 | 1 |

### GBT-S > heat shrink straight joints **for signal and control cables**

| joint type | cores | ref. | item | conductor cross-section range ($mm^2$) | included connectors | joint length L (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| | 4 – 7 | **GB0007** | GBT-007-S | 1,5 – 2,5 | 7 × (included) | 330 | 1 | 1 | 1 |
| | 8 – 14 | **GB0014** | GBT-014-S | | 14 × (included) | 330 | 1 | 1 | 1 |
| | 16 – 30 | **GB0030** | GBT-030-S | | 30 × (included) | 375 | 1 | 1 | 1 |

# JCBT

## Heat shrink branch joints
with wrap-around sleeve
for 0,6/1 kV low voltage cables

Suitable for multi-core **branch connections without interrupting main cable**

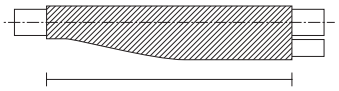
## Applications
- Branch joint for 0,6/1 kV low voltage cables up to 4 cores
- Laying conditions: direct buried, submerged, in cable ducts

## Key features
- Compact size
- High electrical and sealing performance
- Weathering, chemicals and UV-resistant
- Good mechanical resistance
- Available for a wide range of conductor cross-sections

## Kit contents
- Hot melt tape for cores insulation
- Thick wall wrap around sleeve **with sealant and steel closure**

MU mechanical connectors available separately (p. **59**)

## JCBT > heat shrink branch joints with wrap-around sleeve




| joint type | cores | ref. | item | conductor cross-section range * ($mm^2$) main cable | conductor cross-section range * ($mm^2$) branch cable | optional connectors | joint length L (mm) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| | | **JC0001** | JCBT-01 | 4 – 50 | 2,5 – 50 | (optional) | 250 | 1 | 1 |
| | | **JC0002** | JCBT-02 | 50 – 120 | 6 – 120 | | 250 | 1 | 1 |
| | | **JC0003** | JCBT-03 | 150 – 300 | 6 – 300 | | 400 | 1 | 1 |
| | | **JC0001** | JCBT-01 | 1,5 – 10 | 1,5 | (optional) | 250 | 1 | 1 |
| | | **JC0002** | JCBT-02 | 16 – 25 | 2,5 | | 250 | 1 | 1 |
| | | **JC0003** | JCBT-03 | 25 – 50 | 2,5 – 25 | | 400 | 1 | 1 |

Compliant to Standard
for low voltage 0,6/1 kV joints
**EN 50393**

CE Marking

Unlimited shelf life

# GN-RF

## **Fire resistant** heat shrink straight joints
for 0,6/1 kV low voltage cables

**GN-RF joint kits are expressly designed to maintain in service fire resistant cables in fire hazard environments**

## Applications

- Straight joint for 0,6/1 kV low voltage power cables up to 4 cores and signal and control cables
- Onboard ship safety and emergency circuits
- Tunnel, railway, underground, and other high crowded places

## Key features

- Compact size
- High electrical and sealing performance
- Weathering, chemicals and UV-resistant
- Good mechanical resistance

## Kit contents

- Inner heat shrink insulating sheats
- Fire resistant components
- Outer heat shrink protecting sheath with sealant
- (GN-RF-A only) **armour bonding kit**
- (kits for signal and control cables only) Insulated compression connectors

Connectors available separately (p. 58)

Compliant to Standard
for low voltage 0,6/1 kV joints
**EN 50393**

Fire Resistant according
to Standards
**CEI 20-36/2**
**IEC 60331-21**

Fire resistant

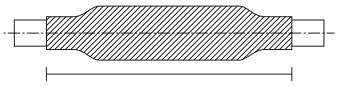
RINA Approved

CE Marking

Unlimited shelf life

# GN-RF

## **Fire resistant** heat shrink straight joints
for 0,6/1 kV low voltage cables




## > **Fire resistant** heat shrink straight joints **for power cables**

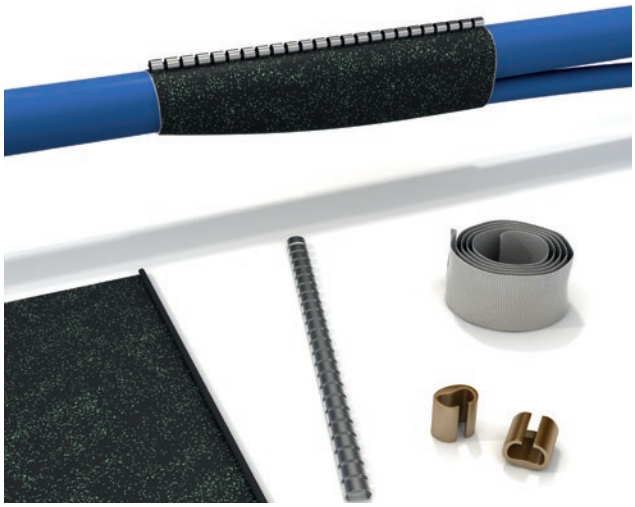
| joint type | cores | ref. | item | conductor cross-section range ($mm^2$) | included/optional installation accessories | | joint length L (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **GB3000** | GN-RF-4/4 | 1,5 – 4 | MR10 (optional) | | 300 | 1 | 1 | 1 |
| | | **GB3004** | GN-RF-A-4/4 | 1,5 – 4 | ? | | 375 | 1 | 1 | 1 |
| | | **GB3001** | GN-RF-4/16 | 6 – 16 | MR11 (optional) | | 300 | 1 | 1 | 1 |
| | | **GB3005** | GN-RF-A-4/16 | 6 – 16 | ? | | 375 | 1 | 1 | 1 |
| | | **GB3002** | GN-RF-4/50 | 25 – 50 | MR12 (optional) | | 375 | 1 | 1 | 1 |
| | | **GB3006** | GN-RF-A-4/50 | 25 – 50 | ? | | 500 | 1 | 1 | 1 |
| | | **GB3003** | GN-RF-4/150 | 70 – 150 | MR13 (optional) | | 500 | 1 | 1 | 1 |
| | | **GB3007** | GN-RF-A-4/150 | 70 – 150 | ? | | 750 | 1 | 1 | 1 |

## > **Fire resistant** heat shrink straight joints **for signal and control cables**

| joint type | cores | ref. | item | conductor cross-section range ($mm^2$) | included installation accessories | | joint length L (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|---|
| | 4 – 7 | **GB3008** | GN-RF-007 | 1,5 – 2,5 | 7 × (included) | - | 300 | 1 | 1 | 1 |
| | | **GB3011** | GN-RF-A-007 | | | | 375 | 1 | 1 | 1 |
| | 8 – 14 | **GB3009** | GN-RF-014 | | 14 × (included) | - | 300 | 1 | 1 | 1 |
| | | **GB3012** | GN-RF-A-014 | | | | 375 | 1 | 1 | 1 |
| | 16 – 30 | **GB3010** | GN-RF-030 | | 30 × (included) | - | 375 | 1 | 1 | 1 |
| | | **GB3013** | GN-RF-A-030 | | | | 500 | 1 | 1 | 1 |

# GN-RF-D

## **Fire resistant** heat shrink branch joints
with wrap-around sleeve
for 0,6/1 kV low voltage cables



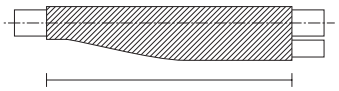
### Applications
- Branch joint for 0,6/1 kV low voltage cables up to 4 cores
- Onboard ship safety and emergency circuits
- Tunnel, railway, underground, and other high crowded places

### Key features
- Compact size
- High electrical and sealing performance
- Weathering, chemicals and UV-resistant
- Good mechanical resistance

**GN-RF-D joint kits are expressly designed to maintain in service fire resistant cables in fire hazard environments**

### Kit contents
- Components for cores insulation
- Fire resistant components
- Fire resistant wrap around sleeve with sealant
- **C-shape compression connectors**

## GN-RF-D > **Fire resistant** heat shrink straight joints




| joint type | cores | ref. | item | conductor cross-section range * (mm²) main cable | conductor cross-section range * (mm²) branch cable | included connectors | joint length L (mm) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| | | **GNRF410D** | GN-RF-4/10-D | 1,5 – 10 | 1,5 – 10 | 2 × (included) | 330 | 1 | 1 |
| | | **GNRF416D** | GN-RF-4/16-D | 1,5 – 16 | 1,5 – 16 | | 500 | 1 | 1 |

Compliant to Standard
for low voltage 0,6/1 kV joints
**EN 50393**

Fire Resistant according
to Standards
**CEI 20-36/2**
**IEC 60331-21**

Fire resistant

CE Marking

Unlimited shelf life

# 01 LOWVOLTAGE

# 01.9 HEAT SHRINK TERMINATIONS AND PRE-MOULDED PARTS

TTBT
heat shrink low voltage terminations 74

CTC
heat shrink sealing caps for single-core cables 75

TBT
heat shrink cable breakout boots
2-core up to 5-core cables 76

# TTBT

## Heat shrink low voltage terminations
0,6/1 kV cables 3- to 5-core

### Applications
- 0,6/1 kV low voltage cable termination 3- 4- and 5-cores

### Kit contents
- Heat shrink tubing for lugs insulation
- TBT heat shrink breakout boot - cross-linked polyolefin with sealant

Terminal lugs not included
Kits for armoured cables or with different length available on request

| cores | ref. | item | conductor cross-section range ($mm^2$) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|
| | **TTBT3016** | TTBT-3/16 | 4 – 16 | 1 | 1 |
| | **TTBT3050** | TTBT-3/50 | 25 – 50 | 1 | 1 |
| | **TTBT3150** | TTBT-3/150 | 70 – 150 | 1 | 1 |
| | **TTBT3300** | TTBT-3/300 | 185 – 300 | 1 | 1 |
| | **TTBT4016** | TTBT-4/16 | 4 – 16 | 1 | 1 |
| | **TTBT4050** | TTBT-4/50 | 25 – 50 | 1 | 1 |
| | **TTBT4150** | TTBT-4/150 | 70 – 150 | 1 | 1 |
| | **TTBT4300** | TTBT-4/300 | 185 – 300 | 1 | 1 |
| | **TTBT5010** | TTBT-5/10 | 4 – 10 | 1 | 1 |
| | **TTBT5050** | TTBT-5/50 | 16 – 50 | 1 | 1 |
| | **TTBT5095** | TTBT-5/95 | 70 – 95 | 1 | 1 |
| | **TTBT5240** | TTBT-5/240 | 120 – 240 | 1 | 1 |

Dielectric strength (IEC 60243)
**100 kV/cm**

Volume resistivity (IEC 60093)
**$1\times10^{12}$ Ω·cm**

Density (ISO 1183 method A)
**1,0–1,3 g/cm³**

Hardness (ISO 868)
**40–60 SHORE D**

Tensile strength (ISO 37)
**10,5 MPa** (min)

Ultimate elongation (ISO 37)
**300 %** (min)

Low temperature flexibility
(ASTM D 2671)
No cracking
after 4 hours at –40°C

Water absorption (ISO 62 method 1)
**0,5% max**
after 14 days at 23 °C

Accelerated ageing (ISO 188)
dopo 7 days at 150 °C

Tensile strength (ISO 37)
**8,5 MPa** (min)

Ultimate elongation (ISO 37)
**100 %** (min)

# CTC

## Heat shrink cable end cap

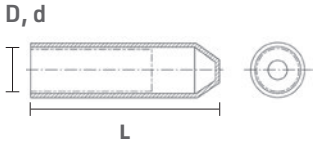
0,6/1 kV low voltage single-core cables
cross-linked polyolefin with hot melt sealant

## Applications

- Electrical insulation of 0,6/1 kV low voltage single-core cable ends
- Sealing and protection of cable ends during transportation and laying operations

## Key features

- High mechanical protection
- Resistenza agli agenti chimici ed atmosferici
- High electrical insulation
- Excellent sealing
- UV resistant




**D** Supplied expanded diameter
**d** Diameter after full recovery
**L** Minimum supply length

| cores | ref. | item | cable diameter min – max (mm) | D/d (mm) | L (mm) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| ● | **PP00104** | CTC-10/4 | 4 – 8 | 12/4 | 40 | 1 | 1 |
| | **PP02075** | CTC-20/7,5 | 8 – 16 | 20/7,5 | 55 | 1 | 1 |
| | **PP03515** | CTC-35/15 | 16 – 35 | 40/15 | 90 | 1 | 1 |
| | **PP05525** | CTC-55/25 | 25 – 47 | 55/25 | 125 | 1 | 1 |
| | **PP07532** | CTC-75/32 | 35 – 68 | 75/35 | 140 | 1 | 1 |
| | **PP10045** | CTC-100/45 | 45 – 90 | 100/45 | 160 | 1 | 1 |
| | **PP12070** | CTC-120/70 | 64 – 120 | 130/60 | 160 | 1 | 1 |

Dielectric strength (ASTM D149)
**12 kV/mm** (min)

Volume resistivity (ASTM D257)
**$1\times10^{14}$ Ω·cm** (min)

Relative permittivity (ASTM D150)
**5** (max)

Density (ASTM D792)
**1,05±0,2 g/cm³**

Hardness (ASTM D2240)
**45±10 SHORE D**

Tensile strength (ASTM D638)
**12 MPa** (min)

Ultimate elongation (ASTM D638)
**350 %** (min)

Low temperature flexibility
(ASTM D2671)
No cracking
after 4 hours at –40°C

Continuous operating temperature
(IEC 60216)
**-40 °C to +110 °C**

Water absorption (ASTM D570)
**0,2% max**

Accelerated ageing (ASTM D2671)
after 500 hours at 120 °C

Tensile strength (ASTM D638)
**11 MPa** (min)

ultimate elongation (ASTM D638)
**300 %** (min)

# TBT

## Heat shrink cable breakout boots

for 0,6/1 kV low voltage cables, 2-cores up to 5-cores
cross-linked polyolefin with hot melt sealant

### Applications

- Electrical insulation of 0,6/1 kV low voltage cable ends 2-cores up to 5-cores
- Sealing and protection of cable crutches for 2- to 5-core cables

### Key features

- High mechanical protection
- Weathering and chemicals resistant
- High electrical insulation
- Excellent sealing
- UV resistant

Dielectric strength (ASTM D149)
**12 kV/mm** (min)

Volume resistivity (ASTM D257)
**$1\times10^{14}$ Ω·cm** (min)

Relative permittivity (ASTM D150)
**5** (max)

Density (ASTM D792)
**1,05±0,2 g/cm³**

Hardness (ASTM D2240)
**45±10 SHORE D**

Tensile strength (ASTM D638)
**12 MPa** (min)

Ultimate elongation (ASTM D638)
**350 %** (min)

low temperature flexibility
(ASTM D2671)
No cracking
after 4 hours at –40°C

Continuous operating temperature
(IEC 60216)
**-40 °C to +110 °C**

Water absorption (ASTM D570)
**0,2% max**

Accelerated ageing (ASTM D2671)
after 500 hours at 120 °C

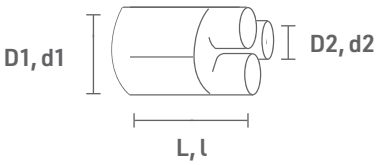
Tensile strength (ASTM D638)
**11 MPa** (min)

Ultimate elongation (ASTM D638)
**300 %** (min)

# TBT

## Heat shrink cable breakout boots

for 0,6/1 kV low voltage cables, 2-cores up to 5-cores
cross-linked polyolefin with hot melt sealant

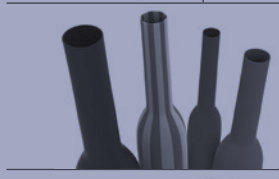



| | |
|---|---|
| **D1, D2** | Supplied expanded diameters |
| **d1, d2** | Diameters after full recovery |
| **L** | Minimum supply length |
| **l** | Maximum length after full recovery |

| cores | ref. | item | conductor cross-section range ($mm^2$) | D1/d1 (mm) | D2/d2 (mm) | L/l (mm) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **TBT/B > breakout boots for 2-core cables** | | | | | | | | |
| ●● | **PP20025** | TBT/B-25 | 5 – 25 | 32/10 | 14/4 | 70/85 | 1 | 1 |
| | **PP20150** | TBT/B-150 | 35 – 150 | 60/20 | 24/7 | 95/120 | 1 | 1 |
| | **PP20300** | TBT/B-300 | 185 – 300 | 70/22 | 30/8 | 95/120 | 1 | 1 |
| **TBT/T > breakout boots for 3-core cables** | | | | | | | | |
| ●●● | **PP30035** | TBT/T-35 | 4 – 35 | 36/14 | 15/4 | 80/100 | 1 | 1 |
| | **PP30150** | TBT/T-150 | 50 – 150 | 60/20 | 25/8 | 160/188 | 1 | 1 |
| | **PP30300** | TBT/T-300 | 185 – 300 | 80/30 | 36/13 | 185/215 | 1 | 1 |
| | **PP30500** | TBT/T-500 | 185 – 500 | 110/45 | 55/21 | 200/235 | 1 | 1 |
| | **PP30630** | TBT/T-630 | 400 – 630 | 140/56 | 68/28 | 215/250 | 1 | 1 |
| **TBT/Q > breakout boots for 4-core cables** | | | | | | | | |
| ●●●● | **PP40035** | TBT/Q-35 | 4 – 35 | 41/16 | 14/4 | 80/100 | 1 | 1 |
| | **PP40070** | TBT/Q-70 | 50 – 70 | 50/17 | 17/4 | 80/95 | 1 | 1 |
| | **PP40150** | TBT/Q-150 | 95 – 150 | 58/26 | 20/7 | 140/170 | 1 | 1 |
| | **PP40300** | TBT/Q-300 | 185 – 300 | 125/44 | 40/14 | 170/208 | 1 | 1 |
| **TBT/P > breakout boots for 5-core cables** | | | | | | | | |
| ●●●●● | **PP50010** | TBT/P-10 | 4 – 10 | 32/11 | 10/3 | 55/75 | 1 | 1 |
| | **PP50050** | TBT/P-50 | 16 – 50 | 57/17 | 15/4 | 80/110 | 1 | 1 |
| | **PP50095** | TBT/P-95 | 70 – 95 | 80/32 | 26/8 | 155/190 | 1 | 1 |
| | **PP50240** | TBT/P-240 | 120 – 240 | 100/33 | 32/8 | 145/190 | 1 | 1 |

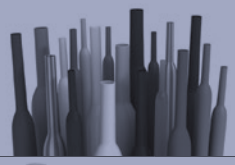
# 01 LOWVOLTAGE

# 01.10 HEAT SHRINK TUBINGS

Thin wall heat-shrink tubing in spool
GTUC black and coloured 80
GTGV green-yellow 82

ROLLBOX®
Thin wall heat-shrink tubing
in dispenser box 84



TUBINGS®
Thin wall heat-shrink tubing
in bars 86

miniTUBINGS®
Thin wall heat-shrink tubing
in precut assorted kit case 90

GTUM
Heat-shrink tubing with sealant
flexible and moisture-resistant 91

GTMS
Medium wall heat-shrink tubing
in spool / in bars with sealant 93

GTAS
Thick wall heat-shrink tubing
in bars with sealant 94

GTCR
Wrap-around heat-shrink tubing
with sealant 96

GTRF
Fire resistant heat-shrink tubing 97

Pole protection anticorrosive heat-shrink tubing
GTPA for poles to be installed 98
RJS for poles already installed

Heat-shrink installation tools 99

# GTUC
# GTGV

## Thin wall heat-shrink tubing in spool
cross-linked polyolefin
black and coloured

## Available colours

0 2 4 5
6 9 X 3

## Applications

- Electric insulation up to 0,6/1 kV
- Protection against abrasion and corrosion of electrical cables and conductors
- Reconstruction of low voltage cable insulation
- Identificitation of cables and conductors

## Key features

- Excellent mechanical protection
- Resistant to weathering and chemical agents
- Excellent electrical insulation
- Excellent sealing
- UV resistant
- Suitable for replacing adhesive and self-amalgamating insulating tapes

Thin wall cross-linked polyolefin

Shrink ratio
**2:1**

Good flexibility

Operating temperature range
**−55 °C to +125 °C**

Minimum shrink temperature
**70 °C**

Dielectric strength (UL 224)
**17 kV/mm**

Tensile strength (UL 224)
**14,8 MPa**

Elongation (UL 224)
**460 %**

After aging (UL 224)
tensile strength
**14,5 MPa**
elongation %
**480 %**

2:1
Shrink ratio

VW-1 UL 224
Flammability rating (except GTUC-X)

RoHS
Directive EU 2015/863 (RoHS 3) Compliant

HF
Halogen free

# GTUC

# Thin wall heat-shrink tubing in spool

cross-linked polyolefin
black and coloured

## GTUC size selection table

| item | D/d (mm) | wall thickness t (mm) | cable/wire diameter range (mm) | spool length (m) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|
| GTUC-1,2/0,6 | 1,2/0,6 | 0,45 | 0,7 – 1,1 | 300 | 300 | 300 |
| GTUC-1,6/0,8 | 1,6/0,8 | 0,45 | 1 – 1,4 | 300 | 300 | 300 |
| GTUC-2,4/1,2 | 2,4/1,2 | 0,50 | 1,4 – 2,2 | 150 | 150 | 150 |
| GTUC-3,2/1,6 | 3,2/1,6 | 0,50 | 1,9 – 2,9 | 150 | 150 | 150 |
| GTUC-4,8/2,4 | 4,8/2,4 | 0,50 | 2,9 – 4,3 | 150 | 150 | 150 |
| GTUC-6,4/3,2 | 6,4/3,2 | 0,65 | 3,8 – 5,8 | 75 | 75 | 75 |
| GTUC-9,5/4,8 | 9,5/4,8 | 0,65 | 5,7 – 8,6 | 75 | 75 | 75 |
| GTUC-12,7/6,4 | 12,7/6,4 | 0,65 | 7,7 – 11,4 | 75 | 75 | 75 |
| GTUC-19/9,5 | 19/9,5 | 0,75 | 11,4 – 17,1 | 75 | 75 | 75 |
| GTUC-25,4/12,7 | 25,4/12,7 | 0,90 | 15,2 – 22,9 | 30 | 30 | 30 |
| GTUC-38/19 | 38/19 | 1,00 | 22,8 – 34,2 | 30 | 30 | 30 |
| GTUC-51/25,4 | 51/25,4 | 1,15 | 30,5 – 45,9 | 30 | 30 | 30 |
| GTUC-76/38 | 76/38 | 1,27 | 45,6 – 68,4 | 15 | 15 | 15 |
| GTUC-102/51 | 102/51 | 1,40 | 61,2 – 91,8 | 15 | 15 | 15 |

## GTUC colour selection table

| | BLACK | RED | YELLOW | GREEN | BLUE | WHITE | TRANSPARENT |
|---|---|---|---|---|---|---|---|
| | 0 | 2 | 4 | 5 | 6 | 9 | X |
| item * | ref | | | | | | |
| GTUC-1,2/0,6 | **GT0012** | **GT2012** | **GT4012** | **GT5012** | **GT6012** | **GT9012** | **GTX012** |
| GTUC-1,6/0,8 | **GT0016** | **GT2016** | **GT4016** | **GT5016** | **GT6016** | **GT9016** | **GTX016** |
| GTUC-2,4/1,2 | **GT0024** | **GT2024** | **GT4024** | **GT5024** | **GT6024** | **GT9024** | **GTX024** |
| GTUC-3,2/1,6 | **GT0032** | **GT2032** | **GT4032** | **GT5032** | **GT6032** | **GT9032** | **GTX032** |
| GTUC-4,8/2,4 | **GT0048** | **GT2048** | **GT4048** | **GT5048** | **GT6048** | **GT9048** | **GTX048** |
| GTUC-6,4/3,2 | **GT0064** | **GT2064** | **GT4064** | **GT5064** | **GT6064** | **GT9064** | **GTX064** |
| GTUC-9,5/4,8 | **GT0095** | **GT2095** | **GT4095** | **GT5095** | **GT6095** | **GT9095** | **GTX095** |
| GTUC-12,7/6,4 | **GT0127** | **GT2127** | **GT4127** | **GT5127** | **GT6127** | **GT9127** | **GTX127** |
| GTUC-19/9,5 | **GT0019** | **GT2019** | **GT4019** | **GT5019** | **GT6019** | **GT9019** | **GTX019** |
| GTUC-25,4/12,7 | **GT0254** | **GT2254** | **GT4254** | **GT5254** | **GT6254** | **GT9254** | **GTX254** |
| GTUC-38/19 | **GT0038** | **GT2038** | **GT4038** | **GT5038** | **GT6038** | **GT9038** | **GTX038** |
| GTUC-51/25,4 | **GT0051** | **GT2051** | **GT4051** | **GT5051** | **GT6051** | **GT9051** | **GTX051** |
| GTUC-76/38 | **GT0076** | **GT2076** | **GT4076** | **GT5076** | **GT6076** | **GT9076** | **GTX076** |
| GTUC-102/51 | **GT0102** | **GT2102** | **GT4102** | **GT5102** | **GT6102** | **GT9102** | **GTX102** |

** To complete item description, add colour code suffix (e. g. GTUC-1,2/0,6-0 for black tubing spool)*

# GTGV

# Thin wall heat-shrink tubing in spool

cross-linked polyolefin
green/yellow

## GTGV selection chart

| item | ref. | D/d (mm) | wall thickness t (mm) | cable/wire diameter range (mm) | spool length (m) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| | GREEN/YELLOW 3 | | | | | | |
| GTGV-3/1,5 | **GT3003** | 3/1,5 | 0,51 | 1,8 – 2,7 | 150 | 150 | 150 |
| GTGV-6/3 | **GT3006** | 6/3 | 0,58 | 3,6 – 5,4 | 75 | 75 | 75 |
| GTGV-8/4 | **GT3008** | 8/4 | 0,64 | 4,8 – 7,2 | 75 | 75 | 75 |
| GTGV-10/5 | **GT3010** | 10/5 | 0,64 | 6 – 9 | 75 | 75 | 75 |
| GTGV-12/6 | **GT3012** | 12/6 | 0,64 | 7,2 – 10,8 | 75 | 75 | 75 |
| GTGV-19/9 | **GT3019** | 19/9 | 0,76 | 11 – 17 | 75 | 75 | 75 |
| GTGV-26/13 | **GT3026** | 26/13 | 0,89 | 15,6 – 23,4 | 30 | 30 | 30 |
| GTGV-38/19 | **GT3038** | 38/19 | 1,00 | 22,8 – 34,2 | 30 | 30 | 30 |

**D** **Supplied** diameter (before shrinking)
**d** Diameter after full recovery
**t** Thickness after full recovery

# ROLLBOX®

Thin wall heat-shrink tubing in dispenser box
cross-linked polyolefin

## Applications

- Electric insulation up to 0,6/1 kV
- Protection against abrasion and corrosion of electrical cables and conductors
- Reconstruction of low voltage cable insulation
- Identificitation of cables and conductors

## Key features

- Excellent mechanical protection
- Resistant to weathering and chemical agents
- Excellent electrical insulation
- Excellent sealing
- UV resistant
- Suitable for replacing adhesive and self-amalgamating insulating tapes

## Available colours

BK RD
BE YG

| ref. | item | kit contents | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|
| **KT1064** | ROLLKIT | **5x assorted size black Rollbox** (2 × RB0032 , 1 × RB0048, 1 × RB0064, 1 × RB0095)<br><br>**Electric hot air gun Air·on HL1606 2000 W** (p. 99) **INCLUDED** | 1 | 1 |

Thin wall cross-linked polyolefin

Shrink ratio
**2:1**

Good flexibility

Operating temperature range
**−55 °C to +125 °C**

Minimum shrink temperature
**70 °C**

Dielectric strength (UL 224)
**17 kV/mm**

Tensile strength (UL 224)
**14,8 MPa**

Elongation (UL 224)
**460 %**

After aging (UL 224)
tensile strength **14,5 MPa**
elongation % **480 %**

2:1
Shrink ratio

VW-1 UL 224
Flammability rating

RoHS
Directive EU 2015/863 (RoHS 3) Compliant

HF
Halogen free

# ROLLBOX®

Thin wall heat-shrink tubing in dispenser box
cross-linked polyolefin

## ROLLBOX® size selection table

| item | D/d (mm) | wall thickness t (mm) | cable/wire diameter range (mm) | spool length (m) | min./mult. ord. qty. (pcs) |
|---|---|---|---|---|---|
| ROLLBOX 1,6 | 1,6/0,8 | 0,45 | 1 – 1,4 | 10 | 1 |
| ROLLBOX 2,4 | 2,4/1,2 | 0,50 | 1,4 – 2,2 | 10 | 1 |
| ROLLBOX 3,2 | 3,2/1,6 | 0,50 | 1,9 – 2,9 | 10 | 1 |
| ROLLBOX 4,8 | 4,8/2,4 | 0,50 | 2,9 – 4,3 | 10 | 1 |
| ROLLBOX 6,4 | 6,4/3,2 | 0,65 | 3,8 – 5,8 | 8 | 1 |
| ROLLBOX 9,5 | 9,5/4,8 | 0,65 | 5,7 – 8,6 | 6 | 1 |
| ROLLBOX 12,7 | 12,7/6,4 | 0,65 | 7,7 – 11,4 | 5 | 1 |
| ROLLBOX 19 | 19/9,5 | 0,75 | 11,4 – 17,1 | 5 | 1 |
| ROLLBOX 25,4 | 25,4/12,7 | 0,90 | 15,2 – 22,9 | 4 | 1 |

## ROLLBOX® colour selection chart

| | BLACK ● BK | RED ● RD | BLUE ● BE | | GREEN/YELLOW ● YG | |
|---|---|---|---|---|---|---|
| item * | ref. | | | spool length (m) | ref. | spool length (m) |
| ROLLBOX 1,6 | **RB0016** | **RB2016** | **RB6016** | 10 | - | |
| ROLLBOX 2,4 | **RB0024** | **RB2024** | **RB6024** | 10 | - | |
| ROLLBOX 3,2 | **RB0032** | **RB2032** | **RB6032** | 10 | - | |
| ROLLBOX 4,8 | **RB0048** | **RB2048** | **RB6048** | 10 | - | |
| ROLLBOX 6,4 | **RB0064** | **RB2064** | **RB6064** | 8 | **RB3064** | 5 |
| ROLLBOX 9,5 | **RB0095** | **RB2095** | **RB6095** | 6 | **RB3095** | 3 |
| ROLLBOX 12,7 | **RB0127** | **RB2127** | **RB6127** | 5 | **RB3127** | 3 |
| ROLLBOX 19 | **RB0019** | **RB2019** | **RB6019** | 5 | **RB3019** | 2 |
| ROLLBOX 25,4 | **RB0254** | **RB2254** | **RB6254** | 4 | **RB3254** | 1,5 |

**D** **Supplied** diameter (before shrinking)
**d** Diameter after full recovery
**t** Thickness after full recovery

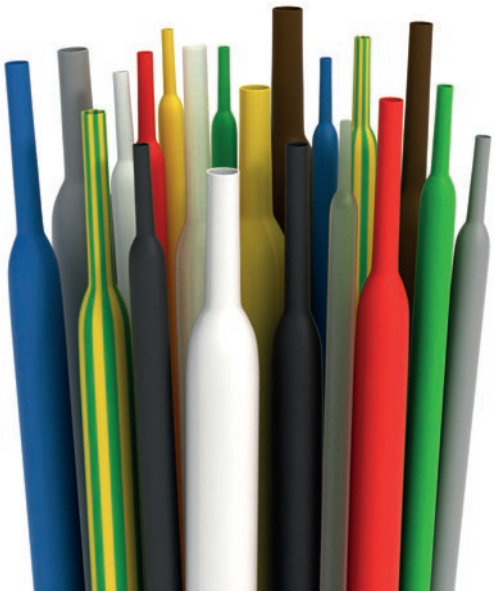
Tubings®

# TUBINGS®

Thin wall heat-shrink tubing in 1-meter bars
cross-linked polyolefin – black and coloured

5pz

Packed
in minibags



## Available colours

BK RD WH BE

TR YE VE GR

BW YG

*To complete item description, add the corresponding colour tag (e. g. GTUC/B-2,4/1,2-BK)*

## Applications

- Electric insulation up to 0,6/1 kV
- Protection against abrasion and corrosion of electrical cables and conductors
- Reconstruction of low voltage cable insulation
- Identificitation of cables and conductors

## Key features

- Excellent mechanical protection
- Resistant to weathering and chemical agents
- Excellent electrical insulation
- Excellent sealing
- UV resistant
- Suitable for replacing adhesive and self-amalgamating insulating tapes
- Individually labelled

Thin wall cross-linked polyolefin

Shrink ratio
**2:1**

Good flexibility

Operating temperature range
**−55 °C to +125 °C**

Minimum shrink temperature
**70 °C**

Dielectric strength (UL 224)
**17 kV/mm**

Tensile strength (UL 224)
**14,8 MPa**

Elongation (UL 224)
**460 %**

After aging (UL 224)

| | |
|---|---|
| tensile strength | **14,5 MPa** |
| elongation % | **480 %** |

2:1 — Shrink ratio

VW-1 UL 224 — Flammability rating (except GTUC/B-TR)

RoHS — Directive EU 2015/863 (RoHS 3) Compliant

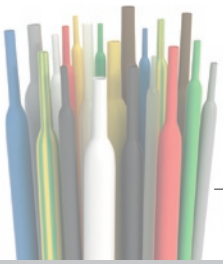
HF — Halogen free

# TUBINGS®

## Thin wall heat-shrink tubing in 1-meter bars cross-linked polyolefin – black and coloured

| colour | ref. | item | D/d (mm) | wall thickness t (mm) | length (m) | cable/wire diameter min–max (mm) | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|---|
| BLACK | GT1106 | GTUC/B-2,4/1,2-BK | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 30 | 5 |
| | GT1107 | GTUC/B-3,2/1,6-BK | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 30 | 5 |
| | GT1108 | GTUC/B-4,8/2,4-BK | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 30 | 5 |
| | GT1109 | GTUC/B-6,4/3,2-BK | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 30 | 5 |
| | GT1110 | GTUC/B-9,5/4,8-BK | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 20 | 5 |
| | GT1111 | GTUC/B-12,7/6,4-BK | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 15 | 5 |
| | GT1112 | GTUC/B-19/9,5-BK | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 10 | 5 |
| | GT1113 | GTUC/B-25,4/12,7-BK | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 6 | 3 |
| | GT1114 | GTUC/B-38/19-BK | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 4 | 2 |
| | GT1115 | GTUC/B-51/25,4-BK | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 2 | 1 |
| RED | GT1116 | GTUC/B-2,4/1,2-RD | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 5 | 5 |
| | GT1117 | GTUC/B-3,2/1,6-RD | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1118 | GTUC/B-4,8/2,4-RD | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1119 | GTUC/B-6,4/3,2-RD | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1120 | GTUC/B-9,5/4,8-RD | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |
| | GT1121 | GTUC/B-12,7/6,4-RD | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1122 | GTUC/B-19/9,5-RD | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1123 | GTUC/B-25,4/12,7-RD | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1124 | GTUC/B-38/19-RD | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |
| | GT1125 | GTUC/B-51/25,4-RD | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 1 | 1 |
| WHITE | GT1126 | GTUC/B-2,4/1,2-WH | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 5 | 5 |
| | GT1127 | GTUC/B-3,2/1,6-WH | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1128 | GTUC/B-4,8/2,4-WH | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1129 | GTUC/B-6,4/3,2-WH | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1130 | GTUC/B-9,5/4,8-WH | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |
| | GT1131 | GTUC/B-12,7/6,4-WH | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1132 | GTUC/B-19/9,5-WH | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1133 | GTUC/B-25,4/12,7-WH | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1134 | GTUC/B-38/19-WH | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |
| | GT1135 | GTUC/B-51/25,4-WH | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 1 | 1 |
| BLUE | GT1136 | GTUC/B-2,4/1,2-BE | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 5 | 5 |
| | GT1137 | GTUC/B-3,2/1,6-BE | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1138 | GTUC/B-4,8/2,4-BE | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1139 | GTUC/B-6,4/3,2-BE | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1140 | GTUC/B-9,5/4,8-BE | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |

CONT. →



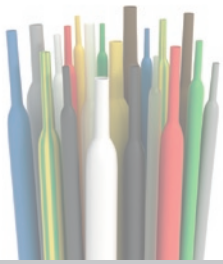
**D** **Supplied** diameter (before shrinking)
**d** Diameter after full recovery
**t** Thickness after full recovery

# TUBINGS®

Thin wall heat-shrink tubing in 1-meter bars
cross-linked polyolefin – black and coloured

→ CONT.D

| colour | ref. | item | D/d (mm) | wall thickness t (mm) | length (m) | cable/wire diameter min–max (mm) | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|---|
| BLUE | GT1141 | GTUC/B-12,7/6,4-BE | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1142 | GTUC/B-19/9,5-BE | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1143 | GTUC/B-25,4/12,7-BE | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1144 | GTUC/B-38/19-BE | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |
| | GT1145 | GTUC/B-51/25,4-BE | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 1 | 1 |
| TRANSPARENT | GT1146 | GTUC/B-2,4/1,2-TR | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 5 | 5 |
| | GT1147 | GTUC/B-3,2/1,6-TR | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1148 | GTUC/B-4,8/2,4-TR | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1149 | GTUC/B-6,4/3,2-TR | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1150 | GTUC/B-9,5/4,8-TR | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |
| | GT1151 | GTUC/B-12,7/6,4-TR | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1152 | GTUC/B-19/9,5-TR | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1153 | GTUC/B-25,4/12,7-TR | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1154 | GTUC/B-38/19-TR | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |
| | GT1155 | GTUC/B-51/25,4-TR | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 1 | 1 |
| YELLOW | GT1156 | GTUC/B-2,4/1,2-YE | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 5 | 5 |
| | GT1157 | GTUC/B-3,2/1,6-YE | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1158 | GTUC/B-4,8/2,4-YE | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1159 | GTUC/B-6,4/3,2-YE | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1160 | GTUC/B-9,5/4,8-YE | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |
| | GT1161 | GTUC/B-12,7/6,4-YE | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1162 | GTUC/B-19/9,5-YE | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1163 | GTUC/B-25,4/12,7-YE | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1164 | GTUC/B-38/19-YE | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |
| | GT1165 | GTUC/B-51/25,4-YE | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 1 | 1 |
| GREEN | GT1166 | GTUC/B-2,4/1,2-VE | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 5 | 5 |
| | GT1167 | GTUC/B-3,2/1,6-VE | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1168 | GTUC/B-4,8/2,4-VE | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1169 | GTUC/B-6,4/3,2-VE | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1170 | GTUC/B-9,5/4,8-VE | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |
| | GT1171 | GTUC/B-12,7/6,4-VE | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1172 | GTUC/B-19/9,5-VE | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1173 | GTUC/B-25,4/12,7-VE | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1174 | GTUC/B-38/19-VE | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |
| | GT1175 | GTUC/B-51/25,4-VE | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 1 | 1 |



CONT. →

**D** **Supplied** diameter (before shrinking)
**d** Diameter after full recovery
**t** Thickness after full recovery

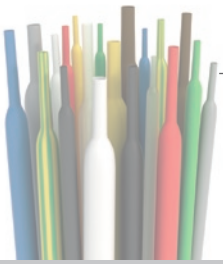
# TUBINGS®

## Thin wall heat-shrink tubing in 1-meter bars cross-linked polyolefin – black and coloured

→ CONT.D

| colour | ref. | item | D/d (mm) | wall thickness t (mm) | length (m) | cable/wire diameter min–max (mm) | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|---|
| GREY | GT1176 | GTUC/B-2,4/1,2-GR | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 5 | 5 |
| | GT1177 | GTUC/B-3,2/1,6-GR | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1178 | GTUC/B-4,8/2,4-GR | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1179 | GTUC/B-6,4/3,2-GR | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1180 | GTUC/B-9,5/4,8-GR | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |
| | GT1181 | GTUC/B-12,7/6,4-GR | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1182 | GTUC/B-19/9,5-GR | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1183 | GTUC/B-25,4/12,7-GR | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1184 | GTUC/B-38/19-GR | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |
| | GT1185 | GTUC/B-51/25,4-GR | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 1 | 1 |
| BROWN | GT1186 | GTUC/B-2,4/1,2-BW | 2,4/1,2 | 0,50 | 1,0 | 1,4 – 2,2 | 5 | 5 |
| | GT1187 | GTUC/B-3,2/1,6-BW | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1188 | GTUC/B-4,8/2,4-BW | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1189 | GTUC/B-6,4/3,2-BW | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1190 | GTUC/B-9,5/4,8-BW | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |
| | GT1191 | GTUC/B-12,7/6,4-BW | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1192 | GTUC/B-19/9,5-BW | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1193 | GTUC/B-25,4/12,7-BW | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1194 | GTUC/B-38/19-BW | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |
| | GT1195 | GTUC/B-51/25,4-BW | 51/25,4 | 1,15 | 1,0 | 30,5 – 45,9 | 1 | 1 |

| colour | ref. | item | D/d (mm) | wall thickness t (mm) | length (m) | cable/wire diameter min–max (mm) | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|---|
| GREEN / YELLOW | GT1197 | GTUC/B-3,2/1,6-YG | 3,2/1,6 | 0,50 | 1,0 | 1,9 – 2,9 | 5 | 5 |
| | GT1198 | GTUC/B-4,8/2,4-YG | 4,8/2,4 | 0,50 | 1,0 | 2,9 – 4,3 | 5 | 5 |
| | GT1199 | GTUC/B-6,4/3,2-YG | 6,4/3,2 | 0,65 | 1,0 | 3,8 – 5,8 | 5 | 5 |
| | GT1200 | GTUC/B-9,5/4,8-YG | 9,5/4,8 | 0,65 | 1,0 | 5,7 – 8,6 | 5 | 5 |
| | GT1201 | GTUC/B-12,7/6,4-YG | 12,7/6,4 | 0,65 | 1,0 | 7,7 – 11,4 | 5 | 5 |
| | GT1202 | GTUC/B-19/9,5-YG | 19/9,5 | 0,75 | 1,0 | 11,4 – 17,1 | 5 | 5 |
| | GT1203 | GTUC/B-25,4/12,7-YG | 25,4/12,7 | 0,90 | 1,0 | 15,2 – 22,9 | 3 | 3 |
| | GT1204 | GTUC/B-38/19-YG | 38/19 | 1,00 | 1,0 | 22,8 – 34,2 | 2 | 2 |



**D** **Supplied** diameter (before shrinking)
**d** Diameter after full recovery
**t** Thickness after full recovery

# miniTUBINGS®

Thin wall heat-shrink tubing in precut pieces assorted kit
cross-linked polyolefin – black and coloured

## Key features

- Excellent mechanical protection
- Resistant to weathering and chemical agents
- Excellent electrical insulation
- Excellent sealing
- UV resistant
- Suitable for replacing adhesive and self-amalgamating insulating tapes
- Assorted sizes and colours kit
- Handy 6-compartment case

## Applications

- Electric insulation up to 0,6/1 kV
- Protection against abrasion and corrosion of electrical cables and conductors
- Reconstruction of low voltage cable insulation
- Identificitation of cables and conductors

## Specifications

- 170 pieces 100 mm length each
- 6 sizes (D/d): 2,4/1,2 - 3,2/1,6 - 4,8/2,4 - 6,4/3,2 - 9,5/4,8 - 12,7/6,4
- miniTUBINGS colour: each size is assorted with all colours (black, red, white, blue, yellow)

| ref. | item | colours | length (mm) | pack. (pcs) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|
| **TUBOX001** | miniTUBINGS BLACK | ● | 100 | 170 | 12 | 12 |
| **TUBOX002** | miniTUBINGS COLOUR | ● ● ○ ● ● | 100 | 170 | 12 | 12 |

Thin wall cross-linked polyolefin

Shrink ratio
**2:1**

Good flexibility

Operating temperature range
**−55 °C to +125 °C**

Minimum shrink temperature
**70 °C**

Dielectric strength (UL 224)
**17 kV/mm**

Tensile strength (UL 224)
**14,8 MPa**

Elongation (UL 224)
**460 %**

After aging (UL 224)
tensile strength **14,5 MPa**
elongation % **480 %**

2:1
Shrink ratio

VW-1 UL 224
Flammability rating

RoHS
Directive EU 2015/863 (RoHS 3) Compliant

HF
Halogen free

# GTUM

## Heat-shrink tubing with sealant in 1,2 meter bars

flexible - moisture resistant - cross-linked polyolefi

### Applications

- Electric insulation up to 0,6/1 kV
- Protection of electrical cables and conductors against abrasion and corrosion
- Reconstruction of low voltage cable insulation

### Specifications

- Cross-linked polyolefin with hot-melting sealant
- High shrink ratio (3:1 or 4:1)
- Excellent flexibility
- Colour black
- UL E85381, MIL-DTL-23053/4 Class 3 Compliant

### shrink ratio 3:1

| ref. | item | D/d (mm) | bar length (m) | wall thickness (mm) | cable/wire diameter min–max (mm) | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|---|
| **GT7003** | GTUM-3/1-0 | 3/1 | 1,2 | 1,00 | 1,4 – 2,6 | 6 (5 pcs) | 6 |
| **GT7006** | GTUM-6/2-0 | 6/2 | 1,2 | 1,00 | 2,8 – 5,2 | 6 (5 pcs) | 6 |
| **GT7009** | GTUM-9/3-0 | 9/3 | 1,2 | 1,40 | 4,2 – 7,8 | 6 (5 pcs) | 6 |
| **GT7012** | GTUM-12/4-0 | 12/4 | 1,2 | 1,78 | 5,6 – 10,4 | 6 (5 pcs) | 6 |
| **GT7019** | GTUM-19/6-0 | 19/6 | 1,2 | 2,25 | 8,6 – 16,4 | 6 (5 pcs) | 6 |
| **GT7024** | GTUM-24/8-0 | 24/8 | 1,2 | 2,54 | 11,2 – 20,8 | 6 (5 pcs) | 6 |

### shrink ratio 4:1

| ref. | item | D/d (mm) | bar length (m) | wall thickness (mm) | cable/wire diameter min–max (mm) | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|---|
| **GT7104** | GTUM-4/1-0 | 4/1 | 1,2 | 1,00 | 1,6 – 3,4 | 6 (5 pcs) | 6 |
| **GT7108** | GTUM-8/2-0 | 8/2 | 1,2 | 1,00 | 3,2 – 6,8 | 6 (5 pcs) | 6 |
| **GT7112** | GTUM-12/3-0 | 12/3 | 1,2 | 1,40 | 4,8 – 10,2 | 6 (5 pcs) | 6 |
| **GT7116** | GTUM-16/4-0 | 16/4 | 1,2 | 1,78 | 6,4 – 13,6 | 6 (5 pcs) | 6 |
| **GT7124** | GTUM-24/6-0 | 24/6 | 1,2 | 2,25 | 9,6 – 20,4 | 6 (5 pcs) | 6 |
| **GT7132** | GTUM-32/8-0 | 32/8 | 1,2 | 2,54 | 12,8 – 27,2 | 6 (5 pcs) | 6 |
| **GT7152** | GTUM-52/13-0 | 52/13 | 1,2 | 2,54 | 20,8 – 44,2 | 6 (5 pcs) | 6 |

Dielectric strength (IEC 60243)
**120 kV/cm** (min)

Density (ISO 1183 method A)
**1,0–1,2 g/cm³**

Tensile strength (ISO 37)
**9 MPa (min)**

Ultimate elongation (ISO 37)
**300 % (min)**

**D** **Supplied** diameter (before shrinking)
**d** Diameter after full recovery
**t** Thickness after full recovery

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

# GTMS

## **Medium wall** heat-shrink tubing

in bars with sealant / in spool without sealant
cross-linked polyolefin

### Hot melt sealant

**Sealings® medium wall tubing bars** are provided with hot melt sealant, which ensures effective moisture sealing even in presence of irregular shapes and surfaces

### Applications

- Electric insulation of wires, conductors, cables and electrical connections up to 0,6/1 kV
- Sealing and protection against abrasion and corrosion on low and medium voltage cables and cable accessories
- Reliable in harsh climatic conditions and in polluted environments
- Continuous immersion installations (for bars with sealant)

### Features

- Medium wall cross-linked polyolefin with high electrical characteristics and mechanical strength
- UV-stabilized against weathering and irradiation
- Carbon black additivated
- Halogen-, silicone-, lead- and aluminium-free
- Non-toxic, non-corrosive
- Colour black
- Unlimited shelf life

Tensile strength (ISO 37)
**14 MPa** (min)

Ultimate elongation (ISO 37)
**350 %** (min)

Hardness (ISO 868)
**≥ 45 shore D**

Thermal Endurance
(tubing without sealant) (IEC 60216)
**120 °C** (min)

Dielectric strength (IEC 60243)
**≥ 10 kV/mm** (min)

Volume resistivity (IEC 60093)
**$1 \times 10^{10}$ Ω·cm** (min)

Water absorption (ISO 62 method 1)
**≤0,25%** (max) after 14 days at 23 °C

Low temperature flexibility
(ASTM D2671 procedure C)
**no cracking** after 4 hours at –40 °C

Accelerated ageing (ISO 188)
(7 days at 150 °C)

Tensile strength (ISO 37)
**14 MPa** (min)

Ultimate elongation (ISO 37)
**350 %** (min)

Resistance to liquids (ISO 1817)
(7 days in transformer oil at 23 °C)

Tensile strength (ISO 37)
**14 MPa** (min)

Ultimate elongation (ISO 37)
**300 %** (min)

3:1

Shrink ratio

RoHS

Directive EU 2015/863 (RoHS 3) Compliant

HF

Halogen free

# GTMS

## **Medium wall** heat-shrink tubing

in bars with sealant / in spool without sealant
cross-linked polyolefin

Sealings®

### SEALINGS > 1-meter bars with sealant

| ref. | item | D/d (mm) | bar length (m) | wall thickness T (mm) | wall thickness t (mm) | cable/wire diameter min–max (mm) | pack. (pcs) | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|---|---|
| **GT31010** | GTMS-10/3-1000/S | 10/3 | 1,0 | 0,3 | 1,0 | 3,5 – 9 | 10 | 10 | 10 |
| **GT31016** | GTMS-16/5-1000/S | 16/5 | 1,0 | 0,3 | 1,4 | 5,5 – 14,5 | 10 | 10 | 10 |
| **GT31025** | GTMS-25/8-1000/S | 25/8 | 1,0 | 0,4 | 2,0 | 9 – 22,5 | 10 | 10 | 10 |
| **GT31035** | GTMS-35/12-1000/S | 35/12 | 1,0 | 0,4 | 2,0 | 13 – 31,5 | 10 | 10 | 10 |
| **GT31050** | GTMS-50/16-1000/S | 50/16 | 1,0 | 0,5 | 2,0 | 18 – 45 | 5 | 5 | 5 |
| **GT31063** | GTMS-63/19-1000/S | 63/19 | 1,0 | 0,6 | 2,4 | 21 – 57 | 5 | 5 | 5 |
| **GT31075** | GTMS-75/22-1000/S | 75/22 | 1,0 | 0,6 | 2,7 | 24 – 68 | 5 | 5 | 5 |
| **GT31085** | GTMS-85/25-1000/S | 85/25 | 1,0 | 0,6 | 2,8 | 28 – 77 | 1 | 1 | 1 |
| **GT31095** | GTMS-95/29-1000/S | 95/29 | 1,0 | 0,7 | 3,1 | 32 – 86 | 1 | 1 | 1 |
| **GT31115** | GTMS-115/34-1000/S | 115/34 | 1,0 | 0,7 | 3,1 | 37 – 104 | 1 | 1 | 1 |
| **GT31140** | GTMS-140/42-1000/S | 140/42 | 1,0 | 0,7 | 3,1 | 46 – 126 | 1 | 1 | 1 |
| **GT31160** | GTMS-160/50-1000/S | 160/50 | 1,0 | 0,7 | 3,2 | 55 – 144 | 1 | 1 | 1 |
| **GT31180** | GTMS-180/60-1000/S | 180/60 | 1,0 | 0,7 | 3,2 | 66 – 162 | 1 | 1 | 1 |

### Without sealant > in spool

| ref. | item | D/d (mm) | wall thickness S (mm) | wall thickness s (mm) | cable/wire diameter min–max (mm) | spool length (m) | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|---|
| **GT30010** | GTMS-10/3-A/U | 10/3 | 0,3 | 1,0 | 3,5 – 9 | 40 | 40 | 40 |
| **GT30016** | GTMS-16/5-A/U | 16/5 | 0,3 | 1,4 | 5,5 – 14,5 | 40 | 40 | 40 |
| **GT30025** | GTMS-25/8-A/U | 25/8 | 0,4 | 2,0 | 9 – 22,5 | 40 | 40 | 40 |
| **GT30035** | GTMS-35/12-A/U | 35/12 | 0,4 | 2,0 | 13 – 31,5 | 30 | 30 | 30 |
| **GT30050** | GTMS-50/16-A/U | 50/16 | 0,5 | 2,0 | 18 – 45 | 25 | 25 | 25 |
| **GT30063** | GTMS-63/19-A/U | 63/19 | 0,6 | 2,4 | 21 – 57 | 15 | 15 | 15 |
| **GT30075** | GTMS-75/22-A/U | 75/22 | 0,6 | 2,7 | 24 – 68 | 10 | 10 | 10 |

**D** **Supplied** diameter (before shrinking)
**T** Thickness before shrinking

**d** Diameter after full recovery
**t** Thickness after full recovery

# GTAS

## **Thick wall** heat-shrink tubing

in bars with sealant
cross-linked polyolefin

### Hot melt sealant

**GTAS thick wall tubing bars** are provided with hot melt sealant, which ensures effective moisture sealing even in presence of irregular shapes and surfaces

### Applications

- Electric insulation of wires, conductors, cables and electrical connections up to 0,6/1 kV
- Sealing and protection against abrasion and corrosion on low, medium and high voltage cables and connections
- Reliable in harsh climatic conditions and in polluted environments
- Continuous immersion installations
- Suitable for marine, offshore and shipbuilding applications

### Specifications

- Thick wall cross-linked polyolefin with excellent electrical and mechanical characteristics
- UV-stabilized against weathering and irradiation
- Carbon black additivated
- Halogen-, silicone-, lead- and aluminium-free
- Non-toxic, non-corrosive
- Colour black
- Unlimited shelf life

Operating temperature range
**−40 °C / +100 °C**

Shrink temperature
**> 120 °C**

Low temperature flexibility
(ASTM D 2671 procedure C)
**no cracking** after 4 hours at −40 °C

Dielectric strength (IEC 60243)
**≥ 10 kV/mm** (min)

Colume resistivity (IEC 60093)
**$1\times10^{10}$ Ω·cm** (min)

Dielectric constant (IEC 60250)
**5.0** (max)

Density (ISO 1183 method A)
**0,8–1,0 g/cm³**

Hardness (ISO 868)
**≥ 45 shore D**

Longitudinal shrinkage after free recovery
**≤ -10%**

Tensile strength (ISO 37)
**12 MPa** (min)

Ultimate elongation (ISO 37)
**350 %** (min)

Water absorption (ISO 62 method 1)
**≤0,25%** (max) after 14 days at 23 °C

Accelerated ageing (ISO 188)
(7 days at 150 °C)

Tensile strength (ISO 37)
**12 MPa** (min)

Ultimate elongation (ISO 37)
**350 %** (min)

4:1

Shrink ratio

RoHS

Directive EU 2015/863 (RoHS 3)
Compliant

HF

Halogen free

# GTAS

## **Thick wall** heat-shrink tubing

in bars with sealant
cross-linked polyolefin

### GTAS > 1-meter bars with sealant

| ref. | item | D/d (mm) | bar length (m) | wall thickness S (mm) | wall thickness s (mm) | cable/wire diameter min–max (mm) | pack. (pcs) | min. ord.qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|---|---|
| **GT40009** | GTAS-12/3-1000/S | 12/3 | 1,0 | 0,7 | 2,0 | 3,5 – 10 | 10 | 10 | 10 |
| **GT40013** | GTAS-16/4-1000/S | 16/4 | 1,0 | 0,8 | 2,4 | 4,5 – 14 | 10 | 10 | 10 |
| **GT40020** | GTAS-24/6-1000/S | 24/6 | 1,0 | 0,8 | 2,7 | 6,5 – 22 | 10 | 10 | 10 |
| **GT40033** | GTAS-34/8-1000/S | 34/8 | 1,0 | 1,2 | 4,0 | 9 – 31 | 10 | 10 | 10 |
| **GT40043** | GTAS-48/12-1000/S | 48/12 | 1,0 | 1,3 | 4,5 | 13 – 44 | 5 | 5 | 5 |
| **GT40051** | GTAS-56/16-1000/S | 56/16 | 1,0 | 1,0 | 4,4 | 17,5 – 50 | 5 | 5 | 5 |
| **GT40070** | GTAS-70/20-1000/S | 70/20 | 1,0 | 1,0 | 4,4 | 22 – 63 | 5 | 5 | 5 |
| **GT40085** | GTAS-90/25-1000/S | 90/25 | 1,0 | 1,0 | 4,3 | 27 – 81 | 1 | 1 | 1 |
| **GT40105** | GTAS-110/30-1000/S | 110/30 | 1,0 | 1,0 | 4,3 | 33 – 100 | 1 | 1 | 1 |
| **GT40130** | GTAS-130/35-1000/S | 130/35 | 1,0 | 1,0 | 4,3 | 38 – 118 | 1 | 1 | 1 |
| **GT40160** | GTAS-160/50-1000/S | 160/50 | 1,0 | 1,0 | 4,3 | 55 – 144 | 1 | 1 | 1 |
| **GT40180** | GTAS-180/50-1000/S | 180/50 | 1,0 | 1,0 | 4,3 | 55 – 162 | 1 | 1 | 1 |

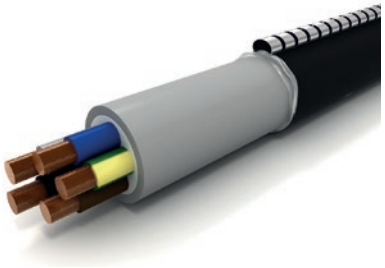
**D** **Supplied** diameter (before shrinking)
**T** Thickness before shrinking

**d** Diameter after full recovery
**t** Thickness after full recovery

# GTCR

## **Wrap-around** heat-shrink sleeve

with sealant - 1 meter length
thick wall polyolefin



## Applications

- Outer jacket permanent repair of low voltage cable and electrical connections outer jacket
- Electric insulation of wires, conductors, cables and electrical connections up to 0,6/1 kV
- Repair, sealing and protection of medium voltage cable jackets

## Key features

- Quick installation
- Excellent electrical properties
- High mechanical and abrasion resistance
- Suitable for replacing adhesive and self-amalgamating insulating tapes

**Suitable for repair of outer jacket of low voltage cables and connections already installed**

## Specifications

- **Thick wall cross-linked polyolefin** with hot melt sealant
- UV-stabilized against weathering and irradiation
- Carbon black additivated
- Halogen-, silicone-, lead- and aluminium-free
- Non-toxic, non-corrosive
- Shrink ratio > 3:1
- Colour black

| ref. | item | D/d (mm) | sleeve length (m) | wall thickness S (mm) | wall thickness s (mm) | cable/wire diameter min–max (mm) | pack. (pcs) | min. ord.qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|---|---|---|
| **GT41034** | GTCR-35/9-1000/S | 35/9 | 1,0 | 0,3 | 2,4 | 11 – 21 | 1 | 1 | 1 |
| **GT41053** | GTCR-54/15-1000/S | 54/15 | 1,0 | 0,3 | 2,0 | 17 – 32 | 1 | 1 | 1 |
| **GT41084** | GTCR-86/21-1000/S | 86/21 | 1,0 | 0,3 | 2,0 | 24 – 50 | 1 | 1 | 1 |
| **GT41107** | GTCR-108/27-1000/S | 108/27 | 1,0 | 0,3 | 2,0 | 31 – 65 | 1 | 1 | 1 |
| **GT41143** | GTCR-144/28-1000/S | 144/28 | 1,0 | 0,3 | 1,8 | 33 – 86 | 1 | 1 | 1 |
| **GT41198** | GTCR-203/50-1000/S | 203/50 | 1,0 | 0,3 | 2,1 | 56 – 120 | 1 | 1 | 1 |
| **GT41250** | GTCR-257/91-1000/S | 257/91 | 1,0 | 0,4 | 1,7 | 103 – 150 | 1 | 1 | 1 |

Operating temperature range
**–30 °C to +100 °C**

Shrink temperature
**> 120 °C**

Low temperature flexibility
(ASTM D 2671 procedure C)
**no cracking**
after 4 hours at –40 °C

Dielectric strength (IEC 60243)
**≥ 10 kV/mm** (min)

Volume resistivity
(IEC 60093)
**$1\times10^{10}$ Ω·cm** (min)

Dielectric constant
(IEC 60250)
**5.0** (max)

Density (ISO 1183 method A)
**1,0–1,2 g/cm³**

Hardness (ISO 868)
**≥ 50 shore D**

Tensile strength (ISO 37)
**15 MPa** (min)

Ultimate elongation (ISO 37)
**350 %** (min)

Water absorption
(ISO 62 method 1)
**≤0,5%** (max)
after 14 days at 23 °C

Accelerated ageing
(ISO 188) (7 days at 150 °C)

Tensile strength (ISO 37)
**12 MPa** (min)

Ultimate elongation (ISO 37)
**300 %** (min)

**D** **Supplied** diameter (before shrinking)
**T** Thickness before shrinking

**d** Diameter after full recovery
**t** Thickness after full recovery

3:1

Shrink ratio

RoHS

Directive EU 2015/863
(RoHS 3) Compliant

HF

Halogen free

# GTRF

## **Thick wall** heat-shrink tubing for fire hazard environments

cross-linked polyolefin - 1,5 meter bars

**GTRF tubings are suitable for use in safety and emergency networks which requires circuit service intergrity and/or insulation in fire hazard environments**

## Applications

- Electric insulation of wires, conductors, cables and electrical connections up to 0,6/1 kV
- Mechanical protection on low and medium voltage cables and cable accessories
- Suitable for use **in safety and emergency networks on shipboarding, in tunnels, railways, public accessible buildings, power plants, and other fire hazard environments**

## Specifications

- Thick wall cross-linked polyolefin
- Excellent electrical and mechanical properties
- Halogen-, silicone-, lead- and aluminium-free
- Non-corrosive
- UV-stabilized against irradiation
- Colour black

| ref. | item | D/d (mm) | bar length (m) | thickness S (mm) | thickness s (mm) | cable/wire diameter min–max (mm) | pack. (pcs) | min. ord.qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|---|---|---|
| **GT50008** | GTRF-8/3-1500/U | 8/3 | 1,5 | 0,6 | 2,0 | 3,5 – 7 | 1 | 1 | 1 |
| **GT50016** | GTRF-16/5-1500/U | 16/5 | 1,5 | 0,7 | 2,4 | 5,5 – 14,5 | 1 | 1 | 1 |
| **GT50024** | GTRF-24/8-1500/U | 24/8 | 1,5 | 0,9 | 2,9 | 9 – 21,5 | 1 | 1 | 1 |
| **GT50032** | GTRF-32/12-1500/U | 32/12 | 1,5 | 1,0 | 4,0 | 13 – 29 | 1 | 1 | 1 |
| **GT50045** | GTRF-45/16-1500/U | 45/16 | 1,5 | 1,0 | 4,0 | 17,5 – 40,5 | 1 | 1 | 1 |
| **GT50060** | GTRF-60/22-1500/U | 60/22 | 1,5 | 1,0 | 4,0 | 24 – 54 | 1 | 1 | 1 |
| **GT50070** | GTRF-70/25-1500/U | 70/25 | 1,5 | 1,0 | 4,0 | 27,5 – 63 | 1 | 1 | 1 |
| **GT50085** | GTRF-85/36-1000/U | 85/36 | 1,0 | 1,0 | 4,0 | 39,5 – 76,5 | 1 | 1 | 1 |
| **GT50120** | GTRF-120/50-1000/U | 120/50 | 1,0 | 1,0 | 4,2 | 55 – 108 | 1 | 1 | 1 |

Dielectric strength (IEC 60243)
**10 kV/mm** (min)

Volume resistivity (IEC 60093)
**$1\times10^{10}$ Ω·cm** (min)

Operating temperature range
**−40 °C to 120 °C**

Flammability and flame propagation test (EN 60332-1)
pass

Smoke density test (IEC 60134)
pass

Temperature index (NES 715 type B)
**250 °C** (min)

Longitudinal shrink after free recovery
**≤ -15%**

Density (ISO 1183 method A)
**1,5 g/cm³**

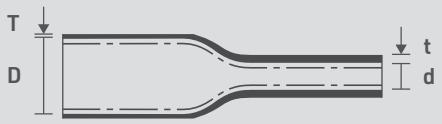
Tensile strength (ISO 37)
**8 MPa** (min)

Ultimate elongation (ISO 37)
**200 %** (min)

Corrosion (ASTM D 2671 proc. A)
No corrosion
after 16 hours at 150 °C

Low temperature flexibility (ASTM D 2671 procedure C)
**no cracking**
after 4 hours at –40 °C

Hardness (ISO 868)
**≥ 40 SHORE D**




**D** **Supplied** diameter (before shrinking)
**T** Thickness before shrinking

**d** Diameter after full recovery
**t** Thickness after full recovery

Fire resistant

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

# GTPA

## Anticorrosive heat shrink sleeve for pole protection

Sleeve **for pole installation**

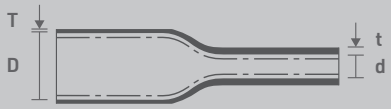
### Applications

- Protection against corrosion of metal poles
- Street lighting
- Electric traction
- Traffic lights
- Signs and signals

### Specifications

- Thick wall cross-linked polyolefin
- With hot melt sealant
- Colour black

| ref. | item | D/d (mm) | sleeve height (mm) | pole diameter min–max (mm) | min. ord.qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|
| **PA0801** | GTPA-90/25-450 | 90/25 | 450 | 60 – 70 | 1 | 1 |
| **PA1121** | GTPA-125/60-450 | 125/60 | | 85 – 105 | 1 | 1 |
| **PA1501** | GTPA-150/60-450 | 150/60 | | 85 – 130 | 1 | 1 |
| **PA1961** | GTPA-200/75-450 | 200/75 | | 145 – 180 | 1 | 1 |
| **PA2521** | GTPA-252/95-450 | 252/95 | | 175 – 230 | 1 | 1 |




**D** **Supplied** diameter (before shrinking)
**d** Diameter after full recovery

# RJS

## Anticorrosive heat shrink sheath for pole protection

Spool **for installed poles**

### Applications

- Protection against corrosion of metal poles
- Street lighting
- Electric traction
- Traffic lights

### Specifications

- Thick wall cross-linked polyolefin
- With hot melt sealant
- Colour black

| ref. | item | spool length (m) | height (mm) | min. ord.qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|
| **PA0430** | RJS-430X30M/C | 30 | 430 | 30 | 30 |

### WPCP > Patch for RJS

| ref. | item | width (mm) | altezza (mm) | min. ord.qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|
| **PA4381** | WPCP-IV-100X430 | 100 | 430 | 5 | 5 |

# Application tooling for heat shrink tubing

## AB 76 BR

### Gas powered portable hot air tool

#### Applications

- Installation of heat shrink tubings and parts

#### Specifications

- Max temperature at nozzle: 750 °C
- 340 g refill gas cartridge **(AC 19 BP)** with operating time: 1 hour and 30 minutes (approx.)

| ref. | item | min. ord.qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|
| **AB76BR** | AB 76 BR | 1 | 1 |
| **AC19BP** | AC 19 BP | 12 | 12 |

## HL1606

### Air·on electrical hot air gun

#### Applications

- Electrical hot air gun for installation of heat shrink tubings and parts, with and without adhesive

#### Specifications

- 2 temperature and air flow levels:
  I: 350 °C / 250 l/min
  II: 550 °C / 550 l/min
- 2000 W power
- Air flow reduction nozzle included

| ref. | item | min. ord.qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|
| **HL1606** | Air·on | 1 | 1 |

## HL1610

### Air·on electrical hot air gun **with temperature adjustment** and display

#### Applications

- Electrical hot air gun for installation of heat shrink tubings and parts, with and without adhesive

#### Specifications

- Eelctronic temperature adjustment with buttons and display
- Air flow temperature range: 50-450/650 °C
- 2-level air flow: 250 or 550 l/min
- Air flow reduction nozzle included
- 2000 W power

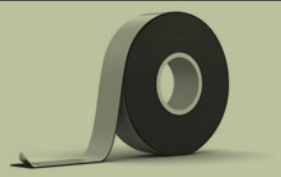
| ref. | item | min. ord.qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|
| **HL1610** | Air·on display | 1 | 1 |

# 02 ELECTRICAL TAPES

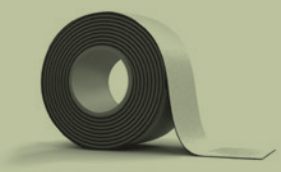
# 02 ELECTRICAL TAPES

ISOEL® 8900
PVC electrical tape 102

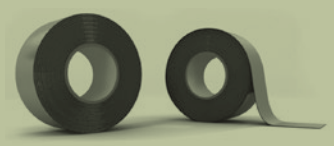
ISOEL® 633
PVC electrical tape - high performance 104



ISOEL® EPR
Self-amalgamating EPR insulating tape 105



ISOFIL® 626
Self-amalgamating butyl rubber insulating mastic tape 106



ISOALL®
Aluminum foil tape with adhesive 107

# ISOEL® 8900

## PVC electrical tape

## Key features

- Excellent electrical insulation
- Highly conformable
- Good resistance to abrasion, corrosion and moisture

## Applications

- Insulation, protection, fixing, maintenance, colour coding of low voltage electrical connections and cables up to 1 kV
- Suitable for application in all areas of civil and industrial electrical installations

| | ref. | item | width × length (mm × m) | thickness (mm) | colour | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|---|
| **15 mm × 10 m** | **NA4015** | ISOEL 15 BK | 15 × 10 | 0,15 | BLACK | 100 | 100 |
| | **NA4115** | ISOEL 15 BE | 15 × 10 | 0,15 | BLUE | 100 | 100 |
| | **NA4215** | ISOEL 15 GR | 15 × 10 | 0,15 | GREY | 100 | 100 |
| | **NA4315** | ISOEL 15 RD | 15 × 10 | 0,15 | RED | 100 | 100 |
| | **NA4415** | ISOEL 15 WH | 15 × 10 | 0,15 | WHITE | 100 | 100 |
| | **NA4515** | ISOEL 15 BW | 15 × 10 | 0,15 | BROWN | 100 | 100 |
| | **NA4615** | ISOEL 15 YG | 15 × 10 | 0,15 | GREEN/YELLOW | 100 | 100 |
| | **NA4715** | ISOEL 15 VE | 15 × 10 | 0,15 | GREEN | 100 | 100 |
| | **NA4815** | ISOEL 15 YE | 15 × 10 | 0,15 | YELLOW | 100 | 100 |
| **19 mm × 25 m** | **NA4019** | ISOEL 19 BK | 19 × 25 | 0,15 | BLACK | 120 | 120 |
| | **NA4119** | ISOEL 19 BE | 19 × 25 | 0,15 | BLUE | 120 | 120 |
| | **NA4219** | ISOEL 19 GR | 19 × 25 | 0,15 | GREY | 120 | 120 |
| | **NA4319** | ISOEL 19 RD | 19 × 25 | 0,15 | RED | 120 | 120 |
| | **NA4419** | ISOEL 19 WH | 19 × 25 | 0,15 | WHITE | 120 | 120 |
| | **NA4519** | ISOEL 19 BW | 19 × 25 | 0,15 | BROWN | 120 | 120 |
| | **NA4619** | ISOEL 19 YG | 19 × 25 | 0,15 | GREEN/YELLOW | 120 | 120 |
| | **NA4719** | ISOEL 19 VE | 19 × 25 | 0,15 | GREEN | 120 | 120 |
| | **NA4819** | ISOEL 19 YE | 19 × 25 | 0,15 | YELLOW | 120 | 120 |

CONTINUES →

Reference standard
**EN 60454-3-1**

Self-extinguishing (EN 60454)

Operating temperature range
**0 °C to +105 °C**

Dielectric strength (EN 60454)
**40 kV/mm**

Tensile strength (EN 60454)
**30 N/cm**

Elongation at break (EN 60454)
**180% - 170 %**

Adhesion (EN 60454)
**1,8 N/cm**

IMQ
approved

# ISOEL® 8900

PVC electrical tape

| (CONTINUED) → | ref. | item | width × length (mm × m) | thickness (mm) | colour | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|---|
| **25 mm × 25 m** | **NA4025** | ISOEL 25 BK | 25 × 25 | 0,15 | BLACK | 96 | 96 |
| | **NA4125** | ISOEL 25 BE | 25 × 25 | 0,15 | BLUE | 96 | 96 |
| | **NA4225** | ISOEL 25 GR | 25 × 25 | 0,15 | GREY | 96 | 96 |
| | **NA4325** | ISOEL 25 RD | 25 × 25 | 0,15 | RED | 96 | 96 |
| | **NA4425** | ISOEL 25 WH | 25 × 25 | 0,15 | WHITE | 96 | 96 |
| | **NA4525** | ISOEL 25 BW | 25 × 25 | 0,15 | BROWN | 96 | 96 |
| | **NA4625** | ISOEL 25 YG | 25 × 25 | 0,15 | GREEN/YELLOW | 96 | 96 |
| | **NA4725** | ISOEL 25 VE | 25 × 25 | 0,15 | GREEN | 96 | 96 |
| | **NA4825** | ISOEL 25 YE | 25 × 25 | 0,15 | YELLOW | 96 | 96 |

| ref. | kit contents | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|
| **NA4019K1** | NA4019 ISOEL 8900<br>PVC black electrical tape<br>19 mm × 25 m - **20 pcs.**<br><br>**INCLUDED**<br>**TOO® Professional electricians screwdriver**<br>1 kV insulated<br>GS-VDE approved | 20 | 5 |

# ISOEL® 633

## PVC electrical tape - high perfromance

+105 °C
-18 °C

Suitable for low temperature installation environments

## Key features

- **Suitable for low temperature installation environments**
- Excellent electrical performance
- Highly conformable
- Good resistance to abrasion, moisture, corrosion
- Supplied in plastic protective case

## Applications

- Suitable for application in all areas of civil and industrial electrical and electromechanical installations
- Electrical insulation for all wire and cable splices up to 1 kV
- Protective jacketing for wire, cable splices and repairs
- Primary electrical insulation for splices up to 600 V

| ref. | item | width × length (mm × m) | thickness (mm) | colour | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|
| **NA5633** | ISOEL 633 | 19 × 20 | 0,18 | BLACK | 10 | 10 |

Reference standard
**EN 60454-3-1**

Reference standard
**ASTM D3005**

Self-extinguishing
(EN 60454)

Operating temperature range
**−18 °C to +105 °C**

Tensile strength (EN 60454)
**35 N/cm**

Elongation at break (EN 60454)
**180 %**

Adhesion (EN 60454)
**1,8 N/cm**

Dielectric strength (EN 60454)
**40 kV/mm**

CSA certified

# ISOEL® EPR

## Self-amalgamating EPR insulating tape

**ISOEL® EPR**
**quickly amalgamates without the use of heat or external pressure**

## Key features

- Excellent physical and electrical properties
- Highly stable under all installation conditions
- Quickly amalgamates without the use of heat or external pressure after application
- Good resistance to abrasion, corrosion, and moisture

## Applications

- Primary electrical insulation for wires, cable splices and repairs up to 69 kV
- Compatible with a wide range of extruded cable insulations (polyethylene, PVC, butyl, neoprene,...)

| ref. | item | width × length (mm × m) | thickness (mm) | colour | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|
| **NA4623** | ISOEL 623 | 19 × 9,1 | 0,50 | BLACK | 10 | 10 |
| **NA4723** | ISOEL 723 | 19 × 9,1 | 0,75 | | 10 | 10 |
| **NA4823** | ISOEL 823 | 25 × 9,1 | | | 1 | 1 |
| **NA4923** | ISOEL 923 | 38 × 9,1 | | | 1 | 1 |
| **NA5023** | ISOEL 1023 | 51 × 9,1 | | | 1 | 1 |

Tensile strength (BS 903)
**2,2 MPa**

Operating temperature range
**−40 °C to +90 °C**

Elongation at break (BS 903)
**800 %**
(**650 %** for ISOEL EPR 623)

Volume resistivity (ASTM D257)
**$1 \times 10^{13}$ Ω m**
(**> $1 \times 10^{11}$ Ω m** per ISOEL EPR 623)

Dielectric strength (ASTM D150)
**38 kV/mm**
(**> 38 kV/mm** per ISOEL EPR 623)

RoHS

Directive EU 2015/863
(RoHS 3) Compliant

HF

Halogen free

# ISOFIL® 626

## High thickness self-amalgamating butyl rubber insulating mastic tape

**ISOFIL® 626**
**ensures excellent moisture-sealing and electrical properties under all installation conditions**

## Key features

- Excellent moisture-sealing and electrical properties
- Highly stable under all installation conditions
- Resistant to water and ozone
- Supplied in plastic protective case

## Applications

- Sealing and padding of all cable jackets, wires and electrical connections

| ref. | item | width × length (mm × m) | thickness (mm) | colour | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|
| **NA4626** | ISOFIL 626 | 38 × 1,5 | 3,2 | BLACK | 5 | 5 |

Volume resistivity
**> $10^{14}$ Ω cm**

Tensile strength
**> 3,5 × $10^{4}$ Pa**

Elongation at break
**> 500%**

Water absorption
**< 1%**

Operating temperature range
**−40 °C to +70 °C**

# ISOALL®

## Aluminum foil tape with adhesive

## Key features

- Highly conformable - Good mechanical resistance

## Applications

- Heating cable fixing to pipes and tanks

| ref. | item | width × length (mm × m) | thickness (mm) | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|
| **NA9050** | ISOALL | 50 × 50 | 0,065 | 1 | 1 |

Tensile strength (AFERA 4004)
**13,5 N/cm**

Elongation at break (AFERA 4005)
**2,5 %**

Adhesion to steel (AFERA 4001)
**10 N/cm**

Adhesion to backing (AFERA 4001)
**8 N/cm**

Operating temperature range
**−20 °C to +110 °C**

# 03 CABLEPULLINGLUBRICANTS

# 03 CABLE-PULLING LUBRICANTS

FLO® 950
Cable-pulling lubricant gel **110**

FLO® 350
Cable-pulling lubricant emulsion **111**

# FLO® 950

## Cable-pulling lubricant gel

## Applications

- Suitable for all types of electrical and telecommunications cables
- Application in cable conduits, even with curves and difficult ascents, and in vertically-laid cables

## Key features

- Applicable on all types of cable jacket **and also directly in cable conduits**
- Easy application
- High performance in frictional resistance reduction
- Slow drying
- No stains or residue
- Non-toxic and non-hazardous
- Chemically inert
- Odourless

Thanks to its gel formulation, FLO 950 can be used as prelubricant **pouring it directly into cable duct** before inserting the cables

| ref. | item | volume (litres) | min. order qty. (pcs) | mult. order qty. (pcs) |
|---|---|---|---|---|
| **FL9500** | FLO 950 | 0,950 | 12 | 12 |

Frictional resistance reduction coefficient for PVC cables
**0,11**

pH
**6 - 7**

Operating temperature range
**−5 °C to +50 °C**

Storage temperature
**+5 / +30 °C**

# FLO® 350

## Cable-pulling lubricant emulsion

## Applications

- Suitable for all types of electrical and telecommunications cables
- Application in cable conduits, even with curves and difficult ascents, and in vertically-laid cables

## Key features

- Applicable on all types of cable jacket
- Reduces frictional resistance up to 70 %
- Easy application
- Non-toxic and non-hazardous
- Chemically inert
- Odourless

**High frictional resistance reduction**
on all types of cable jacket

| ref. | item | volume (litres) | min. order qty. (pcs) | mult. order qty. (pcs) |
|---|---|---|---|---|
| **FL3500** | FLO 350 | 1,0 | 12 | 12 |

Frictional resistance reduction
**70%**

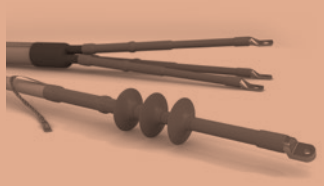
pH
**6 - 7**

Operating temperature range
**−5 °C to +50 °C**

Storage temperature
**+5 / +30 °C**

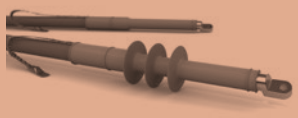
# 04 MEDIUMVOLTAGE

# 04.1 MEDIUM VOLTAGE TERMINATIONS AND SEPARABLE CONNECTORS



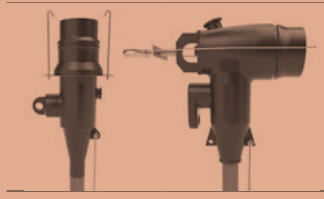

Heat shrink terminations

TTMT-I single-core indoor 114
TTMT-E single-core outdoor 115
TTMT-3I three-core indoor 116
TTMT-3E three-core outdoor 117

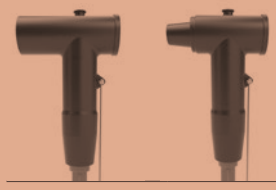

Cold shrink terminations

TAMT-L single-core indoor shedless 118
TAMT-I single-core indoor with sheds 119
TAMT-E single-core outdoor with sheds 120


Screened separable connectors - 250 A

TSD straight 122
TSS elbow 123


Screened separable connectors - 630 A

TS T-body asymmetric 124
TS-CA T-body separable coupling connectors 125

ENEL-approved terminations and connectors

heat-shrink terminations 126
separable connectors 127

# TTMT-I

## Heat shrink terminations
for Medium Voltage **single-core** polymeric cables up to 36 kV indoor

## Key features

- Each item covers a wide range of cross-sections
- No special tools required
- Reliable under harsh installation conditions
- Reduced footprint
- Reduced storage cost
- Unlimited shelf life

## Kit contents

Kit for **3 single-core terminations** with:

- anti-tracking oversheats
- stress control tubes
- sealing tapes
- **heat-shrink sheds** (in 24 and 36 kV kits only)

Installation instructions

watch video

CRMT * mechanical lugs (p. 146) or
CMMT compression lugs (p. 147) avaliable separately

Avaliable on request
**Armoured cables** kits (add suffix A to reference, e.g. TT070501A) and **aluminium tube screen cables** kit (add suffix H5 to reference, e.g. TT070501H5)

| rated voltage $U_0/U$ ($U_m$) | ref. | item | conductor cross-section range (mm²) | termination length (mm) | packaging | min. ord. qty. | mult. ord. qty. | * Suggested CRMT Cu/Al mechanical lug |
|---|---|---|---|---|---|---|---|---|
| 3,6/6 (7,2) kV 3,8/6,6 (7,2) kV | TT070501 | TTMT-7/50-I | 16 – 50 | 300 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT071201 | TTMT-7/120-I | 70 – 120 | | 3x single-core kit | 1 | 1 | CRMT 35/150 |
| | TT072401 | TTMT-7/240-I | 150 – 240 | | 3x single-core kit | 1 | 1 | CRMT 95/240 |
| | TT075001 | TTMT-7/500-I | 300 – 500 | | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | TT079991 | TTMT-7/1000-I | 630 – 1000 | | 3x single-core kit | 1 | 1 | – |
| 6/10 (12) kV 6,35/11 (12) kV | TT170251 | TTMT-17/25-I | 16 – 25 | 370 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT170701 | TTMT-17/70-I | 35 – 70 | | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT172401 | TTMT-17/240-I | 95 – 240 | | 3x single-core kit | 1 | 1 | CRMT 95/240 |
| | TT174001 | TTMT-17/400-I | 300 – 400 | | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | TT178001 | TTMT-17/800-I | 500 – 800 | | 3x single-core kit | 1 | 1 | – |
| 12/20 (24) kV 12,7/22 (24) kV | TT240701 | TTMT-24/70-I | 25 – 70 | 450 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT242401 | TTMT-24/240-I | 95 – 240 | | 3x single-core kit | 1 | 1 | CRMT 95/240 |
| | TT244001 | TTMT-24/400-I | 300 – 400 | | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | TT248001 | TTMT-24/800-I | 500 – 800 | | 3x single-core kit | 1 | 1 | – |
| 18/30 (36) kV 19/33 (36) kV | TT360951 | TTMT-36/95-I | 35 – 95 | 520 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT361851 | TTMT-36/185-I | 120 – 185 | | 3x single-core kit | 1 | 1 | CRMT 95/240 |
| | TT365001 | TTMT-36/500-I | 240 – 500 | | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | TT369991 | TTMT-36/1000-I | 500 – 1000 | | 3x single-core kit | 1 | 1 | – |

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

1-core or triplex polymeric-insulated cables (PVC, EPR, PE, XLPE) with wire or tape screen

Installation
**indoor**

Compliance
**CENELEC HD 629.1 S2**

Cable formation
**3 ×** ●

# TTMT-E

## Heat shrink terminations
for Medium Voltage **single-core** polymeric cables up to 36 kV outdoor

### Key features
- Each item covers a wide range of cross-sections
- No special tools required
- Reliable under harsh installation conditions
- Reduced footprint
- Reduced storage cost
- Unlimited shelf life

### Kit contents
Kit for **3 single-core terminations** with:
- anti-tracking oversheats
- stress control tubes
- sealing tapes
- **heat-shrink sheds**

Installation instructions

watch video

CRMT * mechanical lugs (p. 146) or
CMMT compression lugs (p. 147) avaliable separately

Avaliable on request:
**Armoured cables** kits (add suffix A to reference, e.g. TT170252A) and **aluminium tube screen cables** kit (add suffix H5 to reference, e.g. TT170252H5)

| rated voltage $U_0/U$ ($U_m$) | ref. | item | conductor cross-section range (mm²) | termination length (mm) | packaging | min. ord. qty. | mult. ord. qty. | * Suggested CRMT Cu/Al mechanical lug |
|---|---|---|---|---|---|---|---|---|
| 8,7/15(17,5) kV | TT170252 | TTMT-17/25-E | 16 – 25 | 450 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT170702 | TTMT-17/70-E | 35 – 70 | | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT172402 | TTMT-17/240-E | 95 – 240 | | 3x single-core kit | 1 | 1 | CRMT 95/240 |
| | TT174002 | TTMT-17/400-E | 300 – 400 | | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | TT178002 | TTMT-17/800-E | 500 – 800 | | 3x single-core kit | 1 | 1 | – |
| 12/20 (24) kV 12,7/22 (24) kV | TT240702 | TTMT-24/70-E | 25 – 70 | 520 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT242402 | TTMT-24/240-E | 95 – 240 | | 3x single-core kit | 1 | 1 | CRMT 95/240 |
| | TT244002 | TTMT-24/400-E | 300 – 400 | | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | TT248002 | TTMT-24/800-E | 500 – 800 | | 3x single-core kit | 1 | 1 | – |
| 18/30 (36) kV 19/33 (36) kV | TT360952 | TTMT-36/95-E | 50 – 95 | 720 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TT361852 | TTMT-36/185-E | 120 – 185 | | 3x single-core kit | 1 | 1 | CRMT 95/240 |
| | TT365002 | TTMT-36/500-E | 240 – 500 | | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | TT369992 | TTMT-36/1000-E | 630 – 1000 | | 3x single-core kit | 1 | 1 | – |

MEDIUM VOLTAGE

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

Cable formation
**3 ×**

1-core or triplex polymeric-insulated cables (PVC, EPR, PE, XLPE) with wire or tape screen

Installation
**outdoor**

Compliance
**CENELEC HD 629.1 S2**

# TTMT-3I

## Heat shrink terminations
for Medium Voltage **three-core** polymeric cables up to 36 kV indoor

### Key features
- Each item covers a wide range of cross-sections
- No special tools required
- Reliable under harsh installation conditions
- Small footprint
- Reduced storage cost
- Unlimited shelf life

### Kit contents
Kit for **one three-core termination** with:
- anti-tracking oversheats
- stress control tubes
- heat-shrink cable breakout booth
- sealing tapes
- **heat-shrink sheds** (24 kV and 36 kV kits only)

Installation instructions

CRMT * mechanical lugs (p. 146) or
CMMT compression lugs (p. 147) avaliable separately

**Armoured cables** kits (add suffix A to reference, e.g. TT070503A) avaliable on request

| rated voltage $U_0/U$ ($U_m$) | ref. | item | conductor cross-section range (mm²) | termination length (mm) | packaging | min. ord. qty. | mult. ord. qty. | * Suggested CRMT Cu/Al mechanical lug |
|---|---|---|---|---|---|---|---|---|
| 3,6/6 (7,2) kV 3,8/6,6 (7,2) kV | TT070503 | TTMT-7/50-3I | 16 – 50 | 450 | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT071203 | TTMT-7/120-3I | 70 – 120 | | 1 three-core kit | 1 | 1 | CRMT 35/150 |
| | TT072403 | TTMT-7/240-3I | 150 – 240 | | 1 three-core kit | 1 | 1 | CRMT 95/240 |
| | TT075003 | TTMT-7/500-3I | 300 – 500 | | 1 three-core kit | 1 | 1 | CRMT 185/400 |
| | TT079993 | TTMT-7/1000-3I | 630 – 1000 | | 1 three-core kit | 1 | 1 | – |
| 8,7/15(17,5) kV | TT170253 | TTMT-17/25-3I | 16 – 25 | 520 | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT170703 | TTMT-17/70-3I | 35 – 70 | | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT172403 | TTMT-17/240-3I | 95 – 240 | | 1 three-core kit | 1 | 1 | CRMT 95/240 |
| | TT174003 | TTMT-17/400-3I | 300 – 400 | | 1 three-core kit | 1 | 1 | CRMT 185/400 |
| | TT178003 | TTMT-17/800-3I | 400 – 800 | | 1 three-core kit | 1 | 1 | – |
| 12/20 (24) kV 12,7/22 (24) kV | TT240703 | TTMT-24/70-3I | 25 – 70 | 520 | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT242403 | TTMT-24/240-3I | 95 – 240 | | 1 three-core kit | 1 | 1 | CRMT 95/240 |
| | TT244003 | TTMT-24/400-3I | 300 – 400 | | 1 three-core kit | 1 | 1 | CRMT 185/400 |
| | TT248003 | TTMT-24/500-3I | 500 – 800 | | 1 three-core kit | 1 | 1 | – |
| 18/30 (36) kV 19/33 (36) kV | TT360953 | TTMT-36/95-3I | 35 – 95 | 720 | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT361853 | TTMT-36/185-3I | 120 – 185 | | 1 three-core kit | 1 | 1 | CRMT 95/240 |
| | TT365003 | TTMT-36/500-3I | 240 – 500 | | 1 three-core kit | 1 | 1 | CRMT 185/400 |

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

Cable formation
**1 ×**

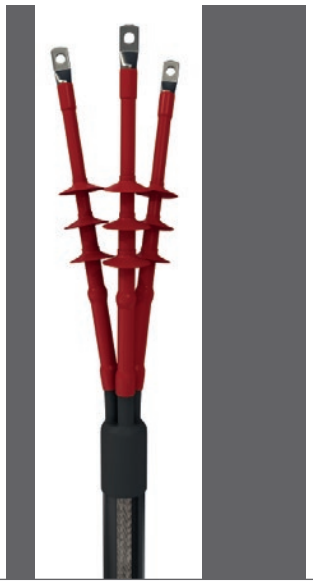
3-core
polymeric-insulated cables
(PVC, EPR, PE, XLPE)
with wire or tape screen

Installation
**indoor**

Compliance
**CENELEC HD 629.1 S2**

# TTMT-3E

## Heat shrink terminations
for Medium Voltage **three-core** polymeric cables up to 36 kV outdoor



### Key features
- Each item covers a wide range of cross-sections
- No special tools required
- Reliable under harsh installation conditions
- Reduced footprint
- Reduced storage cost
- Unlimited shelf life

### Kit contents
Kit for **one three-core termination** with:
- anti-tracking oversheats
- stress control tubes
- heat-shrink cable breakout booth
- sealing tapes
- **heat-shrink sheds**

Installation instructions

CRMT * mechanical lugs (p. 146) or
CMMT compression lugs (p. 147) avaliable separately

**Armoured cables** kits (add suffix A to reference, e.g. TT170256A) avaliable on request

| rated voltage $U_0/U$ ($U_m$) | ref. | item | conductor cross-section range (mm²) | termination length (mm) | packaging | min. ord. qty. | mult. ord. qty. | * Suggested CRMT Cu/Al mechanical lug |
|---|---|---|---|---|---|---|---|---|
| 8,7/15(17,5) kV | TT170256 | TTMT-17/25-3E | 16 – 25 | 720 | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT170706 | TTMT-17/70-3E | 35 – 70 | | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT172406 | TTMT-17/240-3E | 95 – 240 | | 1 three-core kit | 1 | 1 | CRMT 95/240 |
| | TT174006 | TTMT-17/400-3E | 300 – 400 | | 1 three-core kit | 1 | 1 | CRMT 185/400 |
| | TT178006 | TTMT-17/800-3E | 500 – 800 | | 1 three-core kit | 1 | 1 | – |
| 12/20 (24) kV 12,7/22 (24) kV | TT240706 | TTMT-24/70-3E | 25 – 70 | 900 | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT242406 | TTMT-24/240-3E | 95 – 240 | | 1 three-core kit | 1 | 1 | CRMT 95/240 |
| | TT244006 | TTMT-24/400-3E | 300 – 400 | | 1 three-core kit | 1 | 1 | CRMT 185/400 |
| | TT248006 | TTMT-24/800-3E | 500 – 800 | | 1 three-core kit | 1 | 1 | – |
| 18/30 (36) kV 19/33 (36) kV | TT360956 | TTMT-36/95-3E | 50 – 95 | 900 | 1 three-core kit | 1 | 1 | CRMT 25/95 |
| | TT361856 | TTMT-36/185-3E | 120 – 185 | | 1 three-core kit | 1 | 1 | CRMT 95/240 |
| | TT365006 | TTMT-36/500-3E | 240 – 500 | | 1 three-core kit | 1 | 1 | CRMT 185/400 |

MEDIUM VOLTAGE

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

Cable formation
**1 ×**

3-core
polymeric-insulated cables
(PVC, EPR, PE, XLPE)
with wire or tape screen

Installation
**outdoor**

Compliance
**CENELEC HD 629.1 S2**

# TAMT-L

## Cold shrink Terminations
for Medium Voltage **single-core** polymeric cables up to 24 kV
**indoor - shedless (skirtless)**

**NEW**

## Key features

- **Compact space-saving design, suited for tight-spaced cubicles**
- **Quick installation**
- Range-taking: a single item covers a wide range of cross sections
- **No heat or flame required for installation**
- Reliable also in polluted environments
- **Low labour cost**
- Low storage cost

## Kit contents

Kit for **three single-core** terminations, with:
- silicone rubber body for insulation, electric field control and anti-tracking features
- sealing tapes
- liquid silicone lubricant
- Installation instructions

CRMT * mechanical lugs (p. 146) or
CMMT compression lugs (p. 147) avaliable separately

Avaliable on request **armoured cables** kits
(add suffix A to reference, e.g. TB240951A)
and **aluminium tube screened cables** kit
(add suffix H5 to reference, e.g. TB240951H5)

| rated voltage $U_0/U$ ($U_m$) | ref. | item | max system voltage $U_m$ (kV) | conductor cross-sect. range (mm²) | cable insulation diameter min–max (mm) | termination length (mm) | packaging | min. ord. qty. | mult. ord. qty. | * Suggested CRMT Cu/Al mechanical lug |
|---|---|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV<br>12,7/22 (24) kV | TB240951 | TAMT-24/95-L | 17,5 kV | 25 – 120 | 14 – 25 | 320 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | | | 24 kV | 25 – 95 | | | | | | |
| | TB242401 | TAMT-24/240-L | 17,5 kV | 95 – 240 | 19 – 40 | 320 | 3x single-core kit | 1 | 1 | CRMT 95/240 |
| | | | 24 kV | 95 – 240 | | | | | | |

MEDIUM VOLTAGE

Rated Voltage
$U_0/U$ ($U_m$)
**up to 12/20 (24) kV**

Cable formation
**3 ×**

1-core or triplex
polymeric-insulated cables
(PVC, EPR, PE, XLPE)
with wire or tape screen

Installation
**indoor**

Compliance
**CENELEC HD 629.1 S2**

# TAMT-I

## Cold shrink Terminations
for Medium Voltage **single-core** polymeric cables up to 36 kV
**indoor**

### Key features

- **Quick installation**
- Range-taking: a single item covers a wide range of cross sections
- **No heat or flame required for installation**
- Integrated sheds
- Reliable also in polluted environments
- **Low labour cost**
- Low storage cost

watch video

### Kit contents

Kit for **three single-core** terminations, with:

- silicone rubber body for insulation, electric field control and anti-tracking features
- sealing tapes
- liquid silicone lubricant
- Installation instructions

CRMT * mechanical lugs (p. 146) or
CMMT compression lugs (p. 147) avaliable separately

Avaliable on request **armoured cables** kits
(add suffix A to reference, e.g. TB240701A)
and **aluminium tube screened cables** kit
(add suffix H5 to reference, e.g. TB240701H5)

| rated voltage $U_0/U$ ($U_m$) | ref. | item | max system voltage $U_m$ (kV) | conductor cross-sect. range (mm²) | cable insulation diameter min–max (mm) | termination length (mm) | packaging | min. ord. qty. | mult. ord. qty. | * Suggested CRMT Cu/Al mechanical lug |
|---|---|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV<br>12,7/22 (24) kV | TB240701 | TAMT-24/95-I | 17,5 kV | 25 – 120 | 14 – 25 | 305 | 3x single-core kit | 1 | 1 | CRMT 35/150<br>CRMT 25/95 |
| | | | 24 kV | 25 – 95 | | | | | | |
| | TB241851 | TAMT-24/300-I | 17,5 kV | 95 – 400 | 19 – 40 | 310 | 3x single-core kit | 1 | 1 | CRMT 95/240<br>CRMT 120/300<br>CRMT 185/400 |
| | | | 24 kV | 95 – 300 | | | | | | |
| | TB244001 | TAMT-24/630-I | 17,5 kV | 300 – 630 | 30 – 50 | 410 | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | | | 24 kV | 400 – 630 | | | | | | |
| 18/30 (36) kV<br>19/33 (36) kV | TB360951 | TAMT-36/50-I | 36 kV | 35 – 50 | 14 – 25 | 385 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TB363001 | TAMT-36/300-I | 36 kV | 70 – 300 | 19 – 40 | 390 | kit 3 unipolari | 1 | 1 | CRMT 95/240<br>CRMT 120/300 |
| | TB366001 | TAMT-36/630-I | 36 kV | 400 – 630 | 30 – 50 | 410 | kit 3 unipolari | 1 | 1 | CRMT 185/400 |

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

Cable formation
**3 ×**

1-core or triplex
polymeric-insulated cables
(PVC, EPR, PE, XLPE)
with wire or tape screen

Installation
**indoor**

Compliance
**CENELEC HD 629.1 S2**

# TAMT-E

## Cold shrink Terminations
for Medium Voltage **single-core** polymeric cables up to 36 kV
**outdoor**

## Key features

- **Quick installation**
- Range-taking: a single item covers a wide range of cross sections
- **No heat or flame required for installation**
- Integrated sheds
- Reliable also in polluted environments
- **Low labour cost**
- Low storage cost

watch video

## Kit contents

Kit for **three single-core** terminations, with:

- silicone rubber body for insulation, electric field control and anti-tracking features
- sealing tapes
- liquid silicone lubricant
- Installation instructions

CRMT * mechanical lugs (p. 146) or
CMMT compression lugs (p. 147) avaliable separately

**Armoured cables** kits (add suffix A to reference, e.g. TB240702A)
and **aluminium tube screened cables** kit
(add suffix H5 to reference, e.g. TB240702H5)
avaliable on request

MEDIUM VOLTAGE

| rated voltage $U_0/U$ ($U_m$) | ref. | item | max system voltage $U_m$ (kV) | conductor cross-sect. range (mm²) | cable insulation diameter min–max (mm) | termination length (mm) | packaging | min. ord. qty. | mult. ord. qty. | * Suggested CRMT Cu/Al mechanical lug |
|---|---|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV<br>12,7/22 (24) kV | TB240702 | TAMT-24/95-E | 17,5 kV | 25 – 120 | 14 – 25 | 385 | 3x single-core kit | 1 | 1 | CRMT 35/150<br>CRMT 25/95 |
| | | | 24 kV | 25 – 95 | | | | | | |
| | TB241852 | TAMT-24/300-E | 17,5 kV | 95 – 400 | 19 – 40 | 390 | 3x single-core kit | 1 | 1 | CRMT 95/240<br>CRMT 120/300<br>CRMT 185/400 |
| | | | 24 kV | 95 – 300 | | | | | | |
| | TB244002 | TAMT-24/630-E | 17,5 kV | 300 – 630 | 30 – 50 | 490 | 3x single-core kit | 1 | 1 | CRMT 185/400 |
| | | | 24 kV | 400 – 630 | | | | | | |
| 18/30 (36) kV<br>19/33 (36) kV | TB360952 | TAMT-36/50-E | 36 kV | 35 – 50 | 14 – 25 | 385 | 3x single-core kit | 1 | 1 | CRMT 25/95 |
| | TB363002 | TAMT-36/300-E | 36 kV | 70 – 300 | 19 – 40 | 390 | kit 3 unipolari | 1 | 1 | CRMT 95/240<br>CRMT 120/300 |
| | TB366002 | TAMT-36/630-E | 36 kV | 400 – 630 | 30 – 50 | 490 | kit 3 unipolari | 1 | 1 | CRMT 185/400 |

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

Cable formation
**3 ×** ●

1-core or triplex
polymeric-insulated cables
(PVC, EPR, PE, XLPE)
with wire or tape screen

Installation
**outdoor**

Compliance
**CENELEC HD 629.1 S2**

# TSD

## **Straight** Deadbreak Screened Separable Connectors for Medium Voltage single-core polymeric cables **24 kV - interface type A - 250 A**

## Applications

- Connection of Medium Voltage cables to electrical equipment with plug-in outside cone bushings and type A interface complying with EN 50180 and EN 50181 Standards

## Kit contents

Kit for **3 single-core** connectors with:

- moulded EPDM insulating body with outer semi-conductive screen surface
- cable lug and plug contact pin **for copper and aluminium conductors**
- sealing mastic
- self-amalgamating tape
- lubricant
- insulated earth wire
- bail system

Installation accessory parts and instructions

| rated voltage $U_0/U$ ($U_m$) | ref. | item | current rating (A) | conductor cross-section range ($mm^2$) | cable insulation diameter min–max (mm) | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | **TD250016** | TSD250-16/A | 250 | 16 | 13,5 – 17,4 | 3x single-core kit | 1 | 1 |
| | **TD250017** | TSD250-16/B | 250 | | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TD250025** | TSD250-25/A | 250 | 25 | 13,5 – 17,4 | 3x single-core kit | 1 | 1 |
| | **TD250026** | TSD250-25/B | 250 | | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TD250035** | TSD250-35/A | 250 | 35 | 13,5 – 17,4 | 3x single-core kit | 1 | 1 |
| | **TD250036** | TSD250-35/B | 250 | | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TD250037** | TSD250-35/C | 250 | | 19,6 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TD250050** | TSD250-50/A | 250 | 50 | 13,5 – 17,4 | 3x single-core kit | 1 | 1 |
| | **TD250051** | TSD250-50/B | 250 | | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TD250052** | TSD250-50/C | 250 | | 19,6 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TD250070** | TSD250-70/A | 250 | 70 | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TD250071** | TSD250-70/B | 250 | | 19,6 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TD250095** | TSD250-95/A | 250 | 95 | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TD250096** | TSD250-95/B | 250 | | 19,6 - 24,1 | 3x single-core kit | 1 | 1 |

MEDIUM VOLTAGE

Rated Voltage
$U_0/U$ ($U_m$)
**12/20 (24) kV**

Cable formation
**3 ×** ●

1-core or triplex polymeric-insulated cables (PVC, EPR, PE, XLPE) with wire or tape screen

Rated Current
**250 A**

Interface
**type A**

Installation
**indoor/outdoor**

Compliance
**CENELEC HD 629.1 S2**
**IEC 60502-4**

# TSS

## **Elbow** Deadbreak Screened Separable Connectors for Medium Voltage single-core polymeric cables **24 kV - interface type A- 250 A**

## Applications

- Connection of Medium Voltage cables to electrical equipment with plug-in outside cone bushings and type A interface complying with EN 50180 and EN 50181 Standards

## Kit contents

Kit for **3 single-core** connectors with:

- moulded EPDM insulating body with outer semi-conductive screen surface
- cable lug and plug contact pin **for copper and aluminium conductors**
- sealing mastic
- self-amalgamating tape
- lubricant
- insulated earth wire
- bail system

Installation accessory parts and instructions

| rated voltage $U_0/U$ ($U_m$) | ref. | item | current rating (A) | conductor cross-section range (mm²) | cable insulation diameter min–max (mm) | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | **TS250016** | TSS250-16/A | 250 | 16 | 13,5 – 17,4 | 3x single-core kit | 1 | 1 |
| | **TS250017** | TSS250-16/B | 250 | | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TS250025** | TSS250-25/A | 250 | 25 | 13,5 – 17,4 | 3x single-core kit | 1 | 1 |
| | **TS250026** | TSS250-25/B | 250 | | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TS250035** | TSS250-35/A | 250 | 35 | 13,5 – 17,4 | 3x single-core kit | 1 | 1 |
| | **TS250036** | TSS250-35/B | 250 | | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TS250037** | TSS250-35/C | 250 | | 19,6 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TS250050** | TSS250-50/A | 250 | 50 | 13,5 – 17,4 | 3x single-core kit | 1 | 1 |
| | **TS250051** | TSS250-50/B | 250 | | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TS250052** | TSS250-50/C | 250 | | 19,6 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TS250053** | TSS250-50/D | 250 | | 23,1 – 27,7 | 3x single-core kit | 1 | 1 |
| | **TS250070** | TSS250-70/A | 250 | 70 | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TS250071** | TSS250-70/B | 250 | | 19,6 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TS250072** | TSS250-70/C | 250 | | 23,1 – 27,7 | 3x single-core kit | 1 | 1 |
| | **TS250095** | TSS250-95/A | 250 | 95 | 16,3 – 20,8 | 3x single-core kit | 1 | 1 |
| | **TS250096** | TSS250-95/B | 250 | | 19,6 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TS250097** | TSS250-95/C | 250 | | 23,1 – 27,7 | 3x single-core kit | 1 | 1 |
| | **TS250098** | TSS250-95/D | 250 | | 27,9 – 33,5 | 3x single-core kit | 1 | 1 |
| | **TS250120** | TSS250-120/A | 250 | 120 | 19,6 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TS250121** | TSS250-120/B | 250 | | 23,1 – 27,7 | 3x single-core kit | 1 | 1 |
| | **TS250122** | TSS250-120/C | 250 | | 27,9 – 33,5 | 3x single-core kit | 1 | 1 |

Rated Voltage
$U_0/U$ ($U_m$)
**12/20 (24) kV**

Cable formation
**3 ×**

1-core or triplex polymeric-insulated cables (PVC, EPR, PE, XLPE) with wire or tape screen

Rated Current
**250 A**

Interface
**type A**

Installation
**indoor/outdoor**

Compliance
**CENELEC HD 629.1 S2**
**IEC 60502-4**

# TS

## **T-body** Screened Separable Connectors for Medium Voltage single-core polymeric cables **24 kV - type C interface - 630 A**

### Applications

- Connection of Medium Voltage cables to electrical equipment with plug-in outside cone bushings and type C interface complying with EN 50180 and EN 50181 Standards

Versions for voltage class $U_m$ = 36 kV and symmetrycal versions available upon request

### Kit contents

Kit for **3 single-core** connectors with:

- moulded EPDM insulating body with outer semi-conductive screen surface
- cable lug and bolt contact screw **for copper and aluminium conductors**
- sealing mastic
- self-amalgamating tape
- lubricant
- insulated earth wire

Installation accessory parts and instructions

MEDIUM VOLTAGE

| rated voltage $U_0/U$ ($U_m$) | ref. | item | current rating (A) | conductor cross-section range (mm²) | cable insulation diameter min–max (mm) | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | TS630025 | TS630-24/25 | 630 | 25 | 16,3 – 19,3 | 3x single-core kit | 1 | 1 |
| Compression cable lug | TS630035 | TS630-24/35 | 630 | 35 | | 3x single-core kit | 1 | 1 |
| | TS630050 | TS630-24/50 | 630 | 50 | | 3x single-core kit | 1 | 1 |
| | TS630070 | TS630-24/70 | 630 | 70 | 18,3 – 21,0 | 3x single-core kit | 1 | 1 |
| | TS630095 | TS630-24/95 | 630 | 95 | 20,0 – 24,1 | 3x single-core kit | 1 | 1 |
| | TS630120 | TS630-24/120 | 630 | 120 | | 3x single-core kit | 1 | 1 |
| | TS630150 | TS630-24/150 | 630 | 150 | 23,1 – 27,0 | 3x single-core kit | 1 | 1 |
| | TS630185 | TS630-24/185 | 630 | 185 | | 3x single-core kit | 1 | 1 |
| | TS630240 | TS630-24/240 | 630 | 240 | 24,9 – 28,9 | 3x single-core kit | 1 | 1 |
| | TS630300 | TS630-24/300 | 630 | 300 | 27,7 – 32,6 | 3x single-core kit | 1 | 1 |
| NEW 12/20 (24) kV 12,7/22 (24) kV | TS630025095 | TS630-24/25-95 | 630 | 25–95 | 16,3 – 24,1 | 3x single-core kit | 1 | 1 |
| Shear bolts cable lug | TS630120185 | TS630-24/120-185 | 630 | 120–185 | 20,0 – 27,0 | 3x single-core kit | 1 | 1 |
| | TS630240300 | TS630-24/240-300 | 630 | 240–300 | 24,9 – 32,6 | 3x single-core kit | 1 | 1 |

Rated Voltage
$U_0/U$ ($U_m$)
**12/20 (24) kV**

Cable formation
**3 ×**

1-core or triplex polymeric-insulated cables (PVC, EPR, PE, XLPE) with wire or tape screen

Rated Current
**630 A**

Interface
**type C**

Installation
**indoor/outdoor**

Compliance
**CENELEC HD 629.1 S2**
**IEC 60502-4**

# TS-CA

## **T-body** Screened Separable **Coupling Connectors** for Medium Voltage single-core polymeric cables **24 kV**

## Applications

- Connection of Medium Voltage cables **to the back of asymmetric TS separable connectors**

Versions for voltage class $U_m$ = 36 kV available upon request

## Kit contents

Kit for **3 single-core** connectors with:

- moulded EPDM insulating body with outer semi-conductive screen surface
- cable lug and bolt contact screw **for copper and aluminium conductors**
- sealing mastic
- self-amalgamating tape
- lubricant
- insulated earth wire

Installation accessory parts and instructions

| rated voltage $U_0/U$ ($U_m$) | ref. | item | current rating (A) | conductor cross-section range (mm²) | cable insulation diameter min–max (mm) | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | **TC630025** | TSCA-630-24/25 | 630 | 25 | 16,3 – 19,3 | 3x single-core kit | 1 | 1 |
| | **TC630035** | TSCA-630-24/35 | 630 | 35 | | 3x single-core kit | 1 | 1 |
| | **TC630050** | TSCA-630-24/50 | 630 | 50 | | 3x single-core kit | 1 | 1 |
| | **TC630070** | TSCA-630-24/70 | 630 | 70 | 18,3 – 21,0 | 3x single-core kit | 1 | 1 |
| | **TC630095** | TSCA-630-24/95 | 630 | 95 | 20,0 – 24,1 | 3x single-core kit | 1 | 1 |
| | **TC630120** | TSCA-630-24/120 | 630 | 120 | | 3x single-core kit | 1 | 1 |
| | **TC630150** | TSCA-630-24/150 | 630 | 150 | 23,1 – 27,0 | 3x single-core kit | 1 | 1 |
| | **TC630185** | TSCA-630-24/185 | 630 | 185 | | 3x single-core kit | 1 | 1 |
| | **TC630240** | TSCA-630-24/240 | 630 | 240 | 24,9 – 28,9 | 3x single-core kit | 1 | 1 |
| | **TC630300** | TSCA-630-24/300 | 630 | 300 | 27,7 – 32,6 | 3x single-core kit | 1 | 1 |

MEDIUM VOLTAGE

Rated Voltage
$U_0/U$ ($U_m$)
**12/20 (24) kV**

Cable formation
**3 ×**

1-core or triplex polymeric-insulated cables (PVC, EPR, PE, XLPE) with wire or tape screen

Installation
**indoor/outdoor**

Compliance
**CENELEC HD 629.1 S2**
**IEC 60502-4**

# Medium Voltage **Heat shrink** Terminations ENEL-approved

## > Single-core heat shrink termination kit for triplex cable

| rated voltage $U_0/U$ ($U_m$) | installation | ref. | item | cable type * | conductor cross-section range (mm²) | ENEL reference | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV<br>12,7/22 (24) kV | indoor | **TM273044** | TMMT-24/150-I/U | ARG7H5EXY | 35 – 150 | 273044 | 1 single-core kit | 1 | 1 |
| | outdoor | **TM273066** | TMMT-24/150-E/U | | | 273066 | 1 single-core kit | 1 | 1 |

CRMT mechanical lugs (p. 146) or CMMT compression lugs (p. 147) avaliable separately

## > Single-core heat shrink termination kit for cable with wire screen

| rated voltage $U_0/U$ ($U_m$) | installation | ref. | item | cable type * | cross-section range (mm²) | ENEL reference | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV<br>12,7/22 (24) kV | indoor | **TM273045** | TMMT-24/50-I/U | (A)RG7H1R(X) | 25 –50 | 273045 | 1 single-core kit | 1 | 1 |
| | | **NEW TM273049** | TMMT-24/630-I/U | | 400 – 630 | 273049 | 1 single-core kit | 1 | 1 |
| | outdoor | **TM273065** | TMMT-24/185-E/U | | 50 – 185 | 273065 | 1 single-core kit | 1 | 1 |

CRMT mechanical lugs (p. 146) or CMMT compression lugs (p. 147) avaliable separately

## > Single-core heat shrink termination kit for cable with aluminium tube screen

| rated voltage $U_0/U$ ($U_m$) | installation | ref. | item | cable type * | cross-section range (mm²) | matricola ENEL | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV<br>12,7/22 (24) kV | indoor | **TM273040** | TMMT-24/185-I/U-H5 | ARE4H5E(X) | 70 – 240 | 273040 include 273046 273048 | 1 single-core kit | 1 | 1 |
| | outdoor | **TM273064** | TMMT-24/185-E/U-H5 | | 70 – 240 | 273064 | 1 single-core kit | 1 | 1 |

CRMT mechanical lugs (p. 146) or CMMT compression lugs (p. 147) avaliable separately

* Cable type designation according to CEI-UNEL 35011 Standard

# Medium Voltage Screened **Separable Connectors** ENEL-approved

## > Single-core screened separable connector for cable with wire screen or with aluminium tube screen

| rated voltage $U_0/U$ ($U_m$) | installation | ref. | item | cable type * | conductor cross-section range (mm²) | ENEL reference | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | indoor/ outdoor | NEW TS273252 | TS630-24/95-H5 | (A)RG7H1R(X), ARE4H5E(X) | 95 | 273252 | 1 single-core kit | 1 | 1 |
| | | NEW TS273253 | TS630-24/185/R-H5 | | 150 – 185 | 273253 | 1 single-core kit | 1 | 1 |

Mechanical cable lug included

Other versions avaliable on request

## > Single-core screened separable connector for cablewith aluminium tube screen

| rated voltage $U_0/U$ ($U_m$) | installation | ref. | item | cable type * | conductor cross-section range (mm²) | ENEL reference | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | indoor/ outdoor | **TS273121** | TS630-24/185-H5 | ARE4H5E(X) | 185 | 273121 | 1 single-core kit | 1 | 1 |

Cable lug included

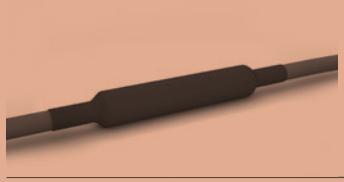
Other versions avaliable on request

MEDIUM VOLTAGE

* Cable type designation according to CEI-UNEL 35011 Standard

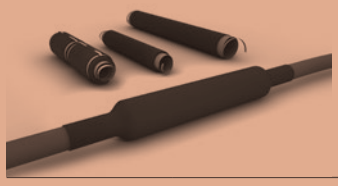
# 04 MEDIUMVOLTAGE

# 04.2 MEDIUM VOLTAGE JOINTS




Heat shrink joints

JTMT-1X single-core 130
JTMT-3X three-core 131


Giunti autorestringenti

JAMT-1X single-core 132
JAMT-1XM single-core - all-in-one 133

Heat shrink transition joints 134

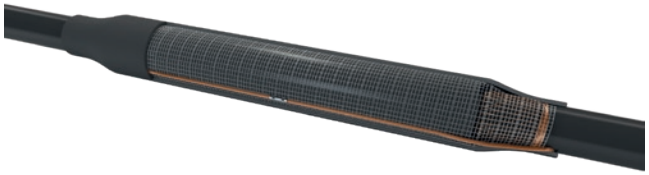
ENEL-approved joints

heat shrink
cold shrink 139


MEDIUM VOLTAGE

# JTMT-1X

## Heat shrink Joints
for Medium Voltage **single-core** polymeric cables up to 36 kV



Single-core polymeric cable

Single-core polymeric cable

## Key features

- Range-taking: a single item covers a wide range of cross sections
- No special tools required for installation
- Reliable under harsh environments
- Small footprint
- Reduced storage cost
- Unlimited shelf life

## Kit contents

Kit for **one single-core** joint with:

- double wall heat shrink sheat
- tinned copper braid
- outer heat shrink jacket with adhesive
- installation instructions

GRMT * mechanical connectors (p. 148) or GMMT compression connectors (p. 149) avaliable separately

ARM-JTMT armour continuity kit available for armoured cables (p. 151)

watch video

| rated voltage $U_0/U$ ($U_m$) | ref. | item | cross-section range (mm²) | joint length (mm) | packaging | min. ord. qty. | mult. ord. qty. | (*) Suggested GRMT Cu/Al mechanical connector |
|---|---|---|---|---|---|---|---|---|
| 3,6/6 (7,2) kV 3,8/6,6 (7,2) kV | JT070701 | JTMT-7/70-1X | 10 – 70 | 400 | 1 single-core kit | 1 | 1 | – |
| 8,7/15(17,5) kV | JT170501 | JTMT-17/50-1X | 25 – 50 | 600 | 1 single-core kit | 1 | 1 | GRMT 25/95 |
| | JT171201 | JTMT-17/120-1X | 50 – 120 | 600 | 1 single-core kit | 1 | 1 | GRMT 35/150 |
| | JT172401 | JTMT-17/240-1X | 120 – 240 | 700 | 1 single-core kit | 1 | 1 | GRMT 95/240 |
| | JT173001 | JTMT-17/300-1X | 300 | 750 | 1 single-core kit | 1 | 1 | GRMT 120/300 |
| 12/20 (24) kV 12,7/22 (24) kV | JT240951 | JTMT-24/95-1X | 25 – 95 | 650 | 1 single-core kit | 1 | 1 | GRMT 25/95 |
| | JT242401 | JTMT-24/240-1X | 95 – 240 | 700 | 1 single-core kit | 1 | 1 | GRMT 95/240 |
| | JT245001 | JTMT-24/500-1X | 240 – 500 | 800 | 1 single-core kit | 1 | 1 | GRMT 185/400 |
| | JT248001 | JTMT-24/800-1X | 500 – 800 | 800 | 1 single-core kit | 1 | 1 | – |
| 18/30 (36) kV 19/33 (36) kV | JT361501 | JTMT-36/150-1X | 35 – 150 | 1000 | 1 single-core kit | 1 | 1 | GRMT 35/150 |
| | JT363001 | JTMT-36/300-1X | 150 – 300 | 1000 | 1 single-core kit | 1 | 1 | GRMT 120/300 |
| | JT366301 | JTMT-36/630-1X | 400 – 630 | 1000 | 1 single-core kit | 1 | 1 | GRMT 185/400 |

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

Cable formation
**1 ×**

1-core or triplex polymeric-insulated cables (PVC, EPR, PE, XLPE) with wire or tape screen

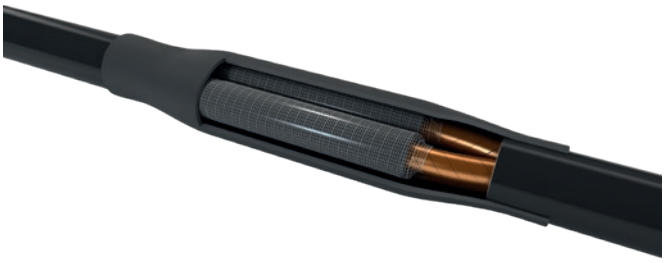
Directly buried, underground, overhead, in cable ducts, submersible

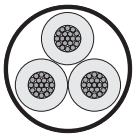
Compliance
**CENELEC HD 629.1 S2**

MEDIUM VOLTAGE

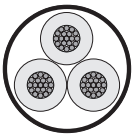
# JTMT-3X

## Heat shrink Joints
for Medium Voltage **three-core** polymeric cables up to 24 kV





Threee-core polymeric cable



Threee-core polymeric cable

## Key features

- Range-taking: a single item covers a wide range of cross sections
- No special tools required for installation
- Reliable under harsh environments
- Small footprint
- Reduced storage cost
- Unlimited shelf life

Versions for voltage class $U_m$ = 36 kV available upon request

## Kit contents

Kit for **one three-core** joint with:

- double wall heat shrink sheat
- tinned copper braid
- outer heat shrink jacket with adhesive
- installation instructions

GRMT * mechanical connectors (p. 148) or GMMT compression connectors (p. 149) avaliable separately

ARM-JTMT armour continuity kit available for armoured cables (p. 151)

| rated voltage $U_0/U$ ($U_m$) | ref. | item | conductor cross-section range (mm²) | joint length (mm) | packaging | min. ord. qty. | mult. ord. qty. | (*) Suggested GRMT Cu/Al mechanical connector |
|---|---|---|---|---|---|---|---|---|
| **8,7/15(17,5) kV** | **JT170503** | JTMT-17/50-3X | 25 – 50 | 1250 | 1 three-core kit | 1 | 1 | GRMT 25/95 |
| | **JT171203** | JTMT-17/120-3X | 50 – 120 | 1300 | 1 three-core kit | 1 | 1 | GRMT 35/150 |
| | **JT172403** | JTMT-17/240-3X | 120 – 240 | 1500 | 1 three-core kit | 1 | 1 | GRMT 95/240 |
| **12/20 (24) kV 12,7/22 (24) kV** | **JT240953** | JTMT-24/95-3X | 25 – 95 | 1500 | 1 three-core kit | 1 | 1 | GRMT 25/95 |
| | **JT242403** | JTMT-24/240-3X | 95 – 240 | 1600 | 1 three-core kit | 1 | 1 | GRMT 95/240 |
| | **JT244003** | JTMT-24/400-3X | 300 – 400 | 1600 | 1 three-core kit | 1 | 1 | GRMT 185/400 |

MEDIUM VOLTAGE

Rated Voltage
$U_0/U$ ($U_m$)
**up to 12/20 (24) kV**

Cable formation
**1 ×**

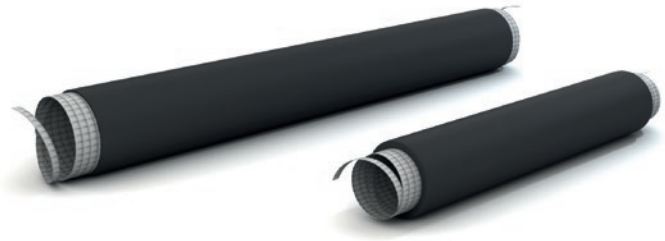
3-core
polymeric-insulated cables
(PVC, EPR, PE, XLPE)
with wire or tape screen

Directly buried, underground, overhead, in cable ducts, submersible

Compliance
**CENELEC HD 629.1 S2**

# JAMT-1X

## Cold shrink Joints
for Medium Voltage **single-core** polymeric cables up to 36 kV



Single-core polymeric cable

Single-core polymeric cable

## Key features

- Quick and easy installation
- Range-taking: a single item covers a wide range of cross sections
- No heat, flame or special tools required for installation
- Reliable under harsh environments
- Compact design
- Reduced line downtime
- Suitable for all laying conditions (directly buried, underground, overhead, in cable ducts, submersible)
- Small footprint
- Reduced storage cost
- Unlimited shelf life

## Kit contents

Kit for **one single-core** joint with:

- shear bolt connector
- silicone rubber cold shrink insulating body
- outer cold shrink protective sleeve
- silicone rubber filling and sealing tape
- silicone lubricant
- tinned copper braid
- installation instructions

MEDIUM VOLTAGE

| rated voltage $U_0/U$ ($U_m$) | ref. | item | conductor cross-section range (mm²) | joint length (mm) | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | JA240951 | JAMT-24/95-1X | 25 – 95 | 600 | kit 1 unipolare | 1 | 1 |
| | JA242401 | JAMT-24/240-1X | 70 – 240 | 600 | kit 1 unipolare | 1 | 1 |
| NEW | JA243001 | JAMT-24/300-1X | 150 – 300 | 600 | kit 1 unipolare | 1 | 1 |
| 18/30 (36) kV 19/33 (36) kV | JA360951 | JAMT-36/95-1X | 25 – 95 | 600 | kit 1 unipolare | 1 | 1 |
| | JA362401 | JAMT-36/240-1X | 70 – 240 | 600 | kit 1 unipolare | 1 | 1 |
| NEW | JA363001 | JAMT-36/300-1X | 150 – 300 | 600 | kit 1 unipolare | 1 | 1 |

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

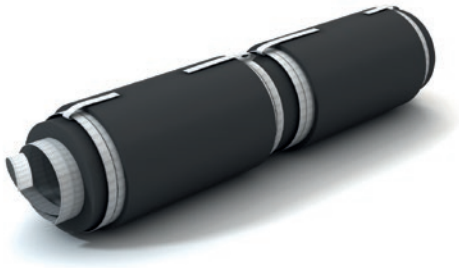
Cable formation
**1 ×**

1-core or triplex polymeric-insulated cables (PVC, EPR, PE, XLPE) with wire or tape screen

Compliance
**CENELEC HD 629.1 S2**

# JAMT-1XM

## **All-in-one** cold shrink joints
for medium voltage **single-core** polymeric cables up to 36 kV



Single-core polymeric cable

Single-core polymeric cable

watch video

## Key features

- single-piece design for quickest installation
- Range-taking: a single item covers a wide range of cross sections
- No heat, flame or special tools required for installation
- Reliable under harsh environments
- Compact design
- Reduced line downtime
- Suitable for all laying conditions (directly buried, underground, overhead, in cable ducts, submersible)
- Small footprint
- Reduced storage cost
- Unlimited shelf life

## Kit contents

Kit for **one single-core** joint with:

- shear bolt connector
- single-piece silicone rubber splicing body with **integrated** earth screen braid and outer cold shrink protective sleeve
- silicone rubber filling and sealing tape
- silicone lubricant
- tinned copper braid
- installation instructions

- **(1XM-H5 versions only):** aluminium tube screen bonding element

## > Joint kit for cable with wire or tape screen

| rated voltage $U_0/U$ ($U_m$) | ref. | item | conductor cross-section range (mm²) | joint length (mm) | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | **JA242401A** | JAMT-24/240-1XM | 70 – 240 | 450 | kit 1 unipolare | 1 | 1 |
| 18/30 (36) kV 19/33 (36) kV | **JA362401C** | JAMT-36/240-1XM | 70 – 240 | 450 | kit 1 unipolare | 1 | 1 |

## > Joint kit for cable with aluminium tape screen

| rated voltage $U_0/U$ ($U_m$) | ref. | item | conductor cross-section range (mm²) | joint length (mm) | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|
| 12/20 (24) kV 12,7/22 (24) kV | **JA242401B** | JAMT-24/240-1XM-H5 | 70 – 240 | 450 | kit 1 unipolare | 1 | 1 |
| 18/30 (36) kV 19/33 (36) kV | **JA362401D** | JAMT-36/240-1XM-H5 | 70 – 240 | 450 | kit 1 unipolare | 1 | 1 |

MEDIUM VOLTAGE

Rated Voltage
$U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

Cable formation
**1 ×**

1-core or triplex
polymeric-insulated cables
(PVC, EPR, PE, XLPE)
with wire or tape screen
**(1XM versions)**
or with aluminium tube screen
**(1XM-H5 versions)**

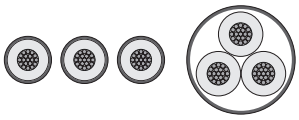
Compliance
**CENELEC HD 629.1 S2**

# JTMT

## Heat shrink **transition joints**

for medium voltage single- and three-core cables
with different insulation or formation

### 24 kV Transition Joint
### 3 single-core polymeric cables to 1 three-core polymeric cable



3 Single-core polymeric cables — 1 Three-core polymeric cable

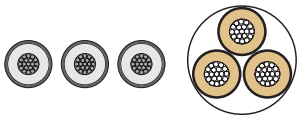
| ref. | item | conductor cross-section range (mm²) | min. ord. qty. | mult. ord. qty. | Suggested GRMT Cu/Al connector (*) |
|---|---|---|---|---|---|
| **JT240956** | JTMT-24/95-3X-1X | 25 – 95 | 1 | 1 | GRMT 25/95 |
| **JT242406** | JTMT-24/240-3X-1X | 95 – 240 | 1 | 1 | GRMT 95/240 |
| **JT245006** | JTMT-24/500-3X-1X | 240 – 500 | 1 | 1 | GRMT 185/400 |

### 24 kV Transition Joint
### 1 single-core polymeric cables to 1 single-core paper cable

1 Single-core polymeric cable — 1 Single-core paper cable

| ref. | item | conductor cross-section range (mm²) | min. ord. qty. | mult. ord. qty. | Suggested GRMT Cu/Al connector (*) |
|---|---|---|---|---|---|
| **JT240257** | JTMT-24/25-1X-1C | 25 – 95 | 1 | 1 | GRMT 25/95 |
| **JT242407** | JTMT-24/240-1X-1C | 95 – 240 | 1 | 1 | GRMT 95/240 |
| **JT244007** | JTMT-24/400-1X-1C | 240 – 500 | 1 | 1 | GRMT 185/400 |

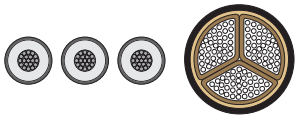
### 24 kV Transition Joint
### 3 single-core polymeric cables to 1 three-core paper cable



3 Single-core polymeric cables — 1 Three-core paper cable

| ref. | item | conductor cross-section range (mm²) | min. ord. qty. | mult. ord. qty. | Suggested GRMT Cu/Al connector (*) |
|---|---|---|---|---|---|
| **JT240258** | JTMT-24/25-1X-3C | 25 | 1 | 1 | GRMT 25/95 |
| **JT242408** | JTMT-24/240-1X-3C | 50 – 240 | 1 | 1 | GRMT 95/240 |
| **JT244008** | JTMT-24/400-1X-3C | 300 – 400 | 1 | 1 | GRMT 185/400 |

### 17,5 kV Transition Joint
### 3 single-core polymeric cables to 1 three-core belted paper cable



3 Single-core polymeric cables — 1 Three-core paper belted cable

| ref. | item | conductor cross-section range (mm²) | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|
| **JT170709** | JTMT-17/70-3CC-1X | 25 – 70 | 1 | 1 |
| **JT171509** | JTMT-17/150-3CC-1X | 50 – 150 | 1 | 1 |
| **JT173009** | JTMT-17/300-3CC-1X | 240 – 300 | 1 | 1 |
| **JT175009** | JTMT-17/500-3CC-1X | 400 – 500 | 1 | 1 |

Compliance
**CENELEC HD 629.2 S2**

* GRMT mechanical connectors (p. 148) or GMMT compression connectors (p. 149) avaliable separately

# **Heat shrink** medium voltage joints ENEL-approved

## > Heat shrink single-core joint kit for triplex cable

| ref. | item | cable type */ rated voltage | conductor cross-section range (mm²) | ENEL reference | ENEL technical specification | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **JT271072** | JTMT-24/150-I/U | ARG7H5EXY 12/20 (24) kV | 35 – 150 | 271072 | DJ 4376/2 | kit 1 unipolare | 1 | 1 |

GRMT mechanical connectors (p. 148) or GMMT compression connectors (p. 149) avaliable separately

## > Heat shrink single-core joint kit for wire screen cable

| ref. | item | cable type */ rated voltage | conductor cross-section range (mm²) | ENEL reference | ENEL technical specification | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **JT271071** | JTMT-24/185-I/U | (A)RG7H1R(X) 12/20 (24) kV | 50 – 185 | 271071 | DJ 4376/1 | kit 1 unipolare | 1 | 1 |

GRMT mechanical connectors (p. 148) or GMMT compression connectors (p. 149) avaliable separately

## > Heat shrink single-core joint kit for aluminium tube cable

| ref. | item | cable type */ rated voltage | conductor cross-section range (mm²) | ENEL reference | ENEL technical specification | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **JT271021** | JTMT-24/185-I/U-H5 | ARE4H5EX 12/20 (24) kV | 70 – 185 | 271021 | DJ 4387/2 | kit 1 unipolare | 1 | 1 |

GRMT mechanical connectors (p. 148) or GMMT compression connectors (p. 149) avaliable separately

# **Cold shrink** medium voltage joints ENEL-approved

## > Cold shrink single-core joint kit for aluminium tube cable

| ref. | item | cable type */ rated voltage | conductor cross-section range (mm²) | ENEL reference | ENEL technical specification | packaging | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|---|---|---|---|---|
| **NEW JA271025** | JAMT-24/185-I/U-H5 | ARE4H5EX 18/30 (36) kV | 70 – 185 | 271025 | NCDJ 4388 | kit 1 unipolare | 1 | 1 |

GRMT mechanical connectors (p. 148) or GMMT compression connectors (p. 149) avaliable separately

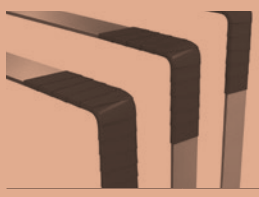
* Cable type designation according to CEI-UNEL 35011 Standard

# 04 MEDIUMVOLTAGE

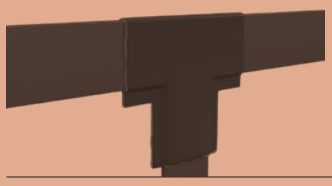
# 04.3 HEAT SHRINK TUBING AND TAPES FOR BUSBAR INSULATION

Heat shrink tubing for busbar insulation
in spool and in bars

GPSM medium-wall for 24 kV voltage class busbars 138
GPSA thick-wall for 36 kV voltage class busbars 140

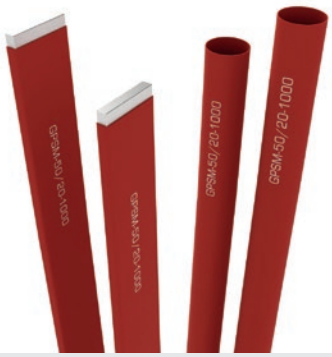

NTMT
Heat shrink tapes for busbar insulation 142


FTMT
Heat shrink sheets for busbar insulation 143

# GPSM

## Heat shrink **medium-wall** tubing for medium voltage busbar insulation up to 24 kV



### Applications

- Insulation and protection copper or aluminium round or rectangular busbars with voltage class up to 24 kV

### Key features

- Protection against accidental contacts
- High flexibility after recovering to ease application on busbar bends
- High mechanical resistance
- **Clearance distance reduction up to 45%**

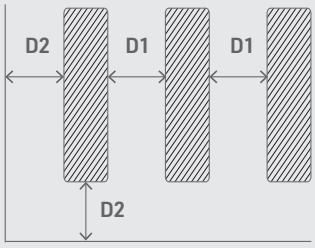
### Specifications

- Resistant to solvents
- UV resistant
- Resistant to weathering
- Halogen free
- Tubing reference and size printed on each bar for easy identification (GPSM-1000)

MEDIUM VOLTAGE

### Typical clearances for rectangular busbars in indoor applications

| maximum system voltage (voltage class) $U_M$ | clearance in air (mm) | | clearance with GPSM (mm) | |
|---|---|---|---|---|
| | D1 | D2 | D1 | D2 |
| 12 kV | 120 | 120 | 65 | 75 |
| 24 kV | 220 | 220 | 115 | 150 |




**D1** Phase-phase clearance
**D2** Phase-ground clearance

Rated Voltage $U_0/U$ ($U_m$)
**up to 12/20 (24) kV**

Dielectric strength (IEC 60243)
**200 kV/cm**

Volume resistivity (IEC 60093)
**$2\times10^8$ MΩ·cm**

Relative permittivity (IEC 60250)
**3,0**

Tensile strength (ISO 37)
**14 MPa**

Ultimate elongation (ISO 37)
**500 %**

Density (ISO R1183)
**1,1 g/cm³**

Water absorption (ISO R62)
**0,3 %**
(after 14 days at 23 °C)

Accelerated ageing
(after 168 h at 120 °C) (ISO 188)

tensile strength (ISO 37)
**12 MPa**

ultimate elongation (ISO 37)
**400 %**

# GPSM

Heat shrink **medium-wall** tubing
for medium voltage busbar insulation
up to 24 kV

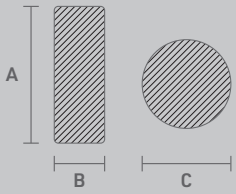
## GPSM-A/U > in spool

| ref. | item | D/d (mm) | spool length (m) | min. ord. qty. | mult. ord. qty. | Allowed busbar size: A+B (mm) min – max | Allowed busbar size: C (mm) min – max |
|---|---|---|---|---|---|---|---|
| **GP0015** | GPSM-15/6-A/U | 15/6 | 30 | 30 | 30 | 12 – 18 | 6,5 – 12 |
| **GP0030** | GPSM-30/12-A/U | 30/12 | 30 | 30 | 30 | 22 – 38 | 13,5 – 25 |
| **GP0050** | GPSM-50/20-A/U | 50/20 | 30 | 30 | 30 | 36 – 65 | 22 – 43 |
| **GP0075** | GPSM-75/30-A/U | 75/30 | 20 | 20 | 20 | 55 – 95 | 33 – 63 |
| **GP0100** | GPSM-100/40-A/U | 100/40 | 25 | 25 | 25 | 70 – 130 | 44 – 86 |
| **GP0120** | GPSM-120/50-A/U | 120/50 | 25 | 25 | 25 | 90 – 165 | 55 – 105 |
| **GP0175** | GPSM-175/70-A/U | 175/70 | 15 | 15 | 15 | 125 – 235 | 80 – 150 |
| **GP0205** | GPSM-205/110-A/U | 205/110 | 10 | 10 | 10 | 200 – 276 | 127 – 190 |

## GPSM-1000 > 1-meter bar

| ref. | item | D/d (mm) | length (m) | min. ord. qty. | mult. ord. qty. | Allowed busbar size: A+B (mm) min – max | Allowed busbar size: C (mm) min – max |
|---|---|---|---|---|---|---|---|
| **GP2015** | GPSM-15/6-1000 | 15/6 | 1 | 1 | 1 | 12 – 18 | 6,5 – 12 |
| **GP2030** | GPSM-30/12-1000 | 30/12 | 1 | 1 | 1 | 22 – 38 | 13,5 – 25 |
| **GP2050** | GPSM-50/20-1000 | 50/20 | 1 | 1 | 1 | 36 – 65 | 22 – 43 |
| **GP2075** | GPSM-75/30-1000 | 75/30 | 1 | 1 | 1 | 55 – 95 | 33 – 63 |
| **GP2100** | GPSM-100/40-1000 | 100/40 | 1 | 1 | 1 | 70 – 130 | 44 – 86 |
| **GP2120** | GPSM-120/50-1000 | 120/50 | 1 | 1 | 1 | 90 – 165 | 55 – 105 |
| **GP2175** | GPSM-175/70-1000 | 175/70 | 1 | 1 | 1 | 125 – 235 | 80 – 150 |
| **GP2205** | GPSM-205/110-1000 | 205/110 | 1 | 1 | 1 | 200 – 276 | 127 – 190 |

**D** Diameter **as supplied**
**d** Diameter **after** free recovery



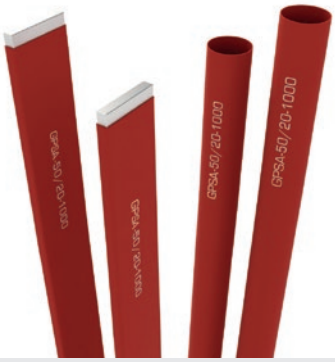

**A** Rectangular busbar longer side

**B** Rectangular busbar shorter side

**C** Round busbar diameter

# GPSA

## Heat shrink **thick-wall** tubing for medium voltage busbar insulation up to 36 kV




### Applications

- Insulation and protection copper or aluminium round or rectangular busbars with voltage class up to 36 kV

### Key features

- Protection against accidental contacts
- High flexibility after recovering to ease application on busbar bends
- High mechanical resistance
- **Clearance distance reduction up to 65%**

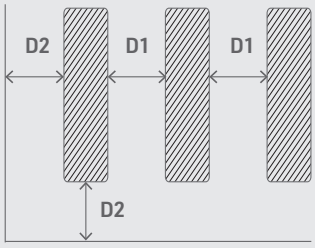
### Specifications

- Resistant to solvents
- UV resistant
- Resistant to weathering
- Halogen free
- Tubing reference and size printed on each bar for easy identification (GPSA-1000)

MEDIUM VOLTAGE

### Typical clearances for rectangular busbars in indoor applications

| maximum system voltage (voltage class) $U_M$ | clearance in air (mm) | | clearance with GPSM (mm) | |
|---|---|---|---|---|
| | D1 | D2 | D1 | D2 |
| **12** | 120 | 120 | 35 | 45 |
| **24** | 220 | 220 | 70 | 100 |
| **36** | 320 | 320 | 140 | 190 |




**D1** Phase-phase clearance
**D2** Phase-ground clearance

Rated Voltage $U_0/U$ ($U_m$)
**up to 18/30 (36) kV**

Dielectric strength (IEC 60243)
**200 kV/cm**

Volume resistivity (IEC 60093)
**$2\times10^8$ MΩ·cm**

Relative permittivity (IEC 60250)
**3,0**

Tensile strength (ISO 37)
**14 MPa**

Ultimate elongation (ISO 37)
**500 %**

Density (ISO R1183)
**1,1 g/cm³**

Water absorption (ISO R62)
**0,3 %**
(after 14 days at 23 °C)

Accelerated ageing
(after 168 h at 120 °C) (ISO 188)

tensile strength (ISO 37)
**12 MPa**

ultimate elongation (ISO 37)
**400 %**

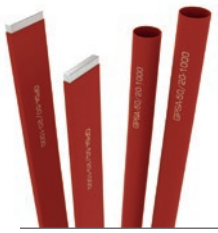
# GPSA

Heat shrink **thick-wall** tubing
for medium voltage busbar insulation
up to 36 kV

## GPSA-A/U > in spool

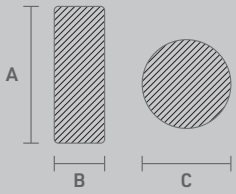
| ref. | item | D/d (mm) | spool length (m) | min. ord. qty. | mult. ord. qty. | Allowed busbar size A+B (mm) min – max | Allowed busbar size C (mm) min – max |
|---|---|---|---|---|---|---|---|
| **GP1025** | GPSA-25/10-A/U | 25/10 | 25 | 25 | 25 | 17 – 28 | 11 – 20 |
| **GP1040** | GPSA-40/16-A/U | 40/16 | 20 | 20 | 20 | 28 – 45 | 18 – 32 |
| **GP1065** | GPSA-65/25-A/U | 65/25 | 15 | 15 | 15 | 44 – 69 | 28 – 47 |
| **GP1100** | GPSA-100/40-A/U | 100/40 | 15 | 15 | 15 | 69 – 102 | 44 – 72 |
| **GP1150** | GPSA-150/60-A/U | 150/60 | 15 | 15 | 15 | 102 – 148 | 65 – 105 |
| **GP1175** | GPSA-175/80-A/U | 175/80 | 10 | 10 | 10 | 133 – 196 | 85 – 125 |

## GPSA-1000 > 1-meter bar



| ref. | item | D/d (mm) | length (m) | min. ord. qty. | mult. ord. qty. | Allowed busbar size A+B (mm) min – max | Allowed busbar size C (mm) min – max |
|---|---|---|---|---|---|---|---|
| **GP3025** | GPSA-25/10-1000 | 25/10 | 1 | 1 | 1 | 17 – 28 | 11 – 20 |
| **GP3040** | GPSA-40/16-1000 | 40/16 | 1 | 1 | 1 | 28 – 45 | 18 – 32 |
| **GP3065** | GPSA-65/25-1000 | 65/25 | 1 | 1 | 1 | 44 – 69 | 28 – 47 |
| **GP3100** | GPSA-100/40-1000 | 100/40 | 1 | 1 | 1 | 69 – 102 | 44 – 72 |
| **GP3150** | GPSA-150/60-1000 | 150/60 | 1 | 1 | 1 | 102 – 148 | 65 – 105 |
| **GP3175** | GPSA-175/80-1000 | 175/80 | 1 | 1 | 1 | 133 – 196 | 85 – 125 |

**D** Diameter **as supplied**
**d** Diameter **after** free recovery




**A** Rectangular busbar longer side

**B** Rectangular busbar shorter side

**C** Round busbar diameter

# NTMT

## Heat shrink tape
for medium voltage busbar insulation

## Applications
- Insulation and protection copper or aluminium busbars and connections with complex shape

## Key features
- Protection against accidental contacts
- High mechanical resistance

## Specifications
- Supplied in spool
- Hot-melting adhesive lining
- Installation with 2/3 overlapping
- Resistant to solvents
- UV resistant
- Resistant to weathering
- Halogen free

MEDIUM VOLTAGE

| ref. | item | tape width (mm) | tape length (m) | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|
| **NT0012** | NTMT-12-A | 25 | 10 | 10 | 10 |
| **NT0014** | NTMT-14-A | 50 | 10 | 10 | 10 |
| **NT0015** | NTMT-15-A | 75 | 10 | 10 | 10 |
| **NT0016** | NTMT-16-A | 100 | 10 | 10 | 10 |

Dielectric strength (IEC 60243)
**160 kV/cm**

Volume resistivity (IEC 60093)
**$1\times10^{8}$ MΩ·cm**

Relative permittivity (IEC 60250)
**3,0**

Tensile strength (ISO 37)
**15 MPa**

Ultimate elongation (ISO 37)
**400 %**

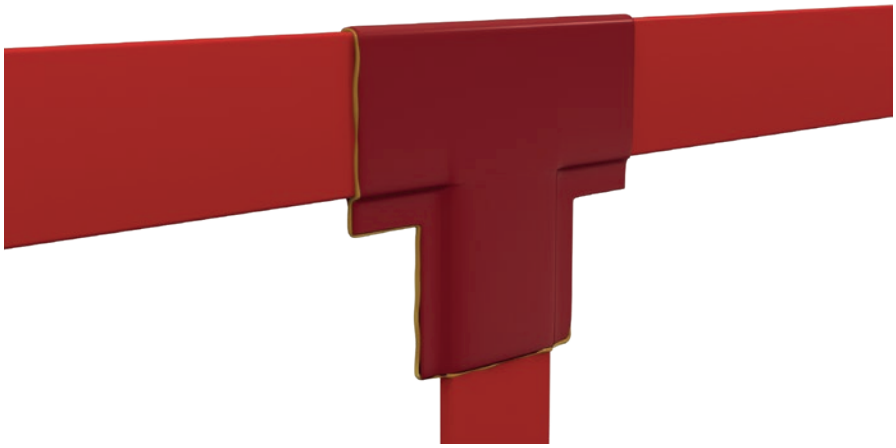
Density (ISO R1183)
**1,0 g/cm³**

Water absorption (ISO R62)
(after 14 days at 23 °C)
**< 1 %**

Copper corrosion
(ASTM D2671)
**none**

# FTMT

## Heat shrink sheet
for medium voltage busbar insulation



## Applications

- Insulation and protection copper or aluminium busbars and connections with complex shape where tubing application is impractical or unsuited

## Key features

- Protection against accidental contacts

## Specifications

- Resistant to solvents
- UV resistant
- Resistant to weathering
- Halogen free

FTMT-05

- 3 sheets with size 660 × 500 mm each

FTMT-10

- 1 roll with size 660 mm × 10 m

| ref. | item | dimensions (m) | packaging (pcs) | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|
| **FT0005** | FTMT-05 | 0,660 × 0,5 | 3 | 3 | 3 |
| **FT0010** | FTMT-10 | 0,660 × 10 | 1 | 1 | 1 |

MEDIUM VOLTAGE

Dielectric strength (IEC 60243)
**200 kV/cm**

Volume resistivity (IEC 60093)
**$1 \times 10^9$ MΩ·cm**

Relative permittivity (IEC 60250)
**3,4**

Tensile strength (ISO 37)
**6 MPa**

Ultimate elongation (ISO 37)
**590 %**

Density (ISO R1183)
**1,1 g/cm³**

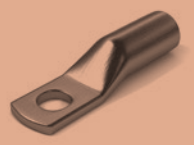
Water absorption (ISO R62)
(after 14 days at 23 °C)
**0,5 %**

Copper corrosion
(ASTM D2671)
**none**

# 04 MEDIUMVOLTAGE

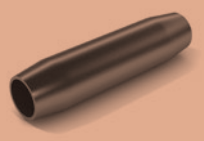
# 04.4 TERMINAL LUGS, CONNECTORS AND CONNECTING ELEMENTS FOR MEDIUM VOLTAGE

CRMT
Mechanical shear bolt terminal lugs 146

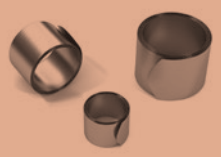


CMMT
Compression terminal lugs 147

GRMT
Mechanical shear bolt connectors 148



GMMT
Compression connectors 149



RS034
Constant force springs
for Medium Voltage cable screen and armour 150

ARM-JTMT Armour bonding kit
for Medium Voltage cables 151

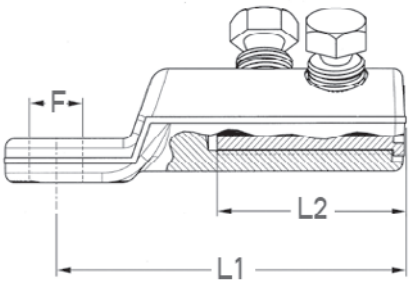
# CRMT

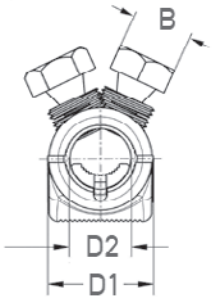
## Mechanical shear bolt terminal lugs
for copper or aluminium medium voltage cable conductors

NEW

### Applications
- Termination of copper or aluminium conductors in Medium Voltage cable ends

### Specifications
- Tin-plated aluminium alloy
- Insert for application on smaller conductor sizes
- No crimping tool required for installation



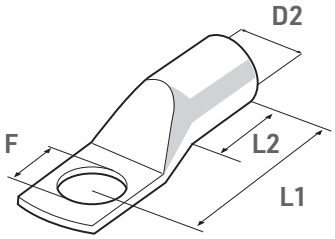

| ref. | item | conductor cross-section range ($mm^2$) | palm hole diameter F (mm) | number of bolts | bolt head size B (mm) | cable conductor material | dimensions (mm) | | | | min./ mult. order qty. (pcs) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | length L1 | outer diam. D1 | inner length L2 | inner diam. D2 | |
| **CR025095F13** | CRMT 25/95-13 | 25 – 95 | 13 | 1 | 14 | Cu, Al | 60 | 24 | 30 | 12,8 | 1 |
| **CR035150F13** | CRMT 35/150-13 | 35 – 150 | 13 | 1 | 17 | Cu, Al | 86 | 28 | 35 | 15,8 | 1 |
| **CR095240F13** | CRMT 95/240-13 | 95 – 240 | 13 | 2 | 19 | Cu, Al | 112 | 33 | 60 | 20 | 1 |
| **CR095240F17** | CRMT 95/240-17 | 95 – 240 | 17 | 2 | 19 | Cu, Al | 112 | 33 | 60 | 20 | 1 |
| **CR120300F13** | CRMT 120/300-13 | 120 – 300 | 13 | 2 | 22 | Cu, Al | 115 | 37 | 65 | 24 | 1 |
| **CR120300F17** | CRMT 120/300-17 | 120 – 300 | 17 | 2 | 22 | Cu, Al | 115 | 37 | 65 | 24 | 1 |
| **CR185400F13** | CRMT 185/400-13 | 185 – 400 | 13 | 3 | 22 | Cu, Al | 137 | 42 | 80 | 25,5 | 1 |
| **CR185400F17** | CRMT 185/400-17 | 185 – 400 | 17 | 3 | 22 | Cu, Al | 137 | 42 | 80 | 25,5 | 1 |

# CMMT

## Compression terminal lugs
for copper medium voltage cable conductors

### Applications
- Termination of copper conductors in Medium Voltage cable ends

### Specifications
- Tin-plated copper
- Double-crimping long body




| ref. | item | conductor cross-section range ($mm^2$) | palm hole diameter F (mm) | cable conductor material | dimensions (mm) | | | min./ mult. order qty. (pcs) |
|---|---|---|---|---|---|---|---|---|
| | | | | | length L1 | inner length L2 | inner diam. D2 | |
| **CM2535** | CMMT 25 | 25 | 12 | Cu | 38 | 17,5 | 7 | 1 |
| **CM3040** | CMMT 35 | 35 | 12 | Cu | 44 | 23 | 9 | 1 |
| **CM0050** | CMMT 50 | 50 | 12 | Cu | 48 | 25 | 10 | 1 |
| **CM7080** | CMMT 70 | 70 | 12 | Cu | 53 | 30 | 12 | 1 |
| **CM9510** | CMMT 95 | 95 | 12 | Cu | 60,5 | 34 | 13,7 | 1 |
| **CM0120** | CMMT 120 | 120 | 12 | Cu | 63 | 38 | 15,2 | 1 |
| **CM0150** | CMMT 150 | 150 | 12 | Cu | 70 | 42 | 16,7 | 1 |
| **CM0185** | CMMT 185 | 185 | 12 | Cu | 83 | 48 | 19,2 | 1 |
| **CM0240** | CMMT 240 | 240 | 14 | Cu | 93 | 53 | 21,2 | 1 |
| **CM0300** | CMMT 300 | 300 | 14 | Cu | 94 | 59 | 23,7 | 1 |

# GRMT

# Mechanical shear bolt connectors

## for copper or aluminium medium voltage cable conductors

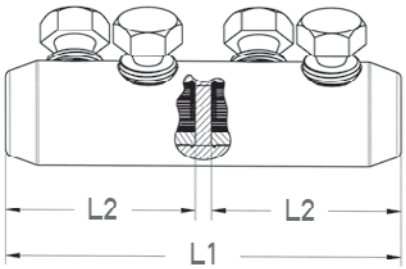
NEW

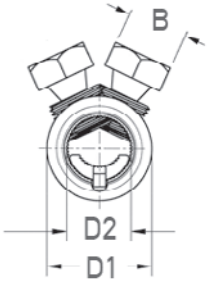
## Applications

- Connection of copper or aluminium conductors in Medium Voltage cable ends

## Specifications

- Tin-plated aluminium alloy
- Range-taking: each connector fits a wide conductor cross-section range
- Suited for aluminum to aluminum, aluminum to copper and copper to copper applications
- Center separator (stop)
- Inserts for application on smaller conductor sizes
- No crimping tool required for installation



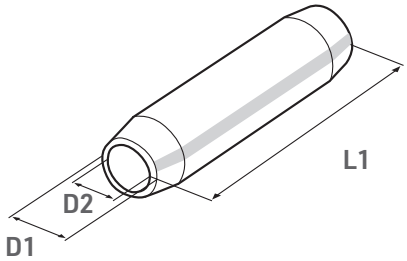

| ref. | item | conductor cross-section range ($mm^2$) | number of bolts | bolt head size B (mm) | cable conductor material | dimensions (mm) | | | | min./ mult. order qty. (pcs) |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | length L1 | outer diam. D1 | inner length L2 | inner diam. D2 | |
| **GR025095** | GRMT 25/95 | 25 – 95 | 2 | 14 | Cu, Al | 65 | 24 | 30 | 12,8 | 1 |
| **GR035150** | GRMT 35/150 | 35 – 150 | 2 | 17 | Cu, Al | 80 | 28 | 35 | 15,8 | 1 |
| **GR095240** | GRMT 95/240 | 95 – 240 | 4 | 19 | Cu, Al | 125 | 33 | 60 | 20 | 1 |
| **GR120300** | GRMT 120/300 | 120 – 300 | 4 | 22 | Cu, Al | 140 | 37 | 65 | 24 | 1 |
| **GR185400** | GRMT 185/400 | 185 – 400 | 6 | 22 | Cu, Al | 170 | 42 | 80 | 25,5 | 1 |

# GMMT

## Compression connectors
for copper medium voltage cable conductors

### Applications
- Connection of copper conductors in Medium Voltage cable ends

### Specifications
- Rame con stagnatura elettrolitica




| ref. | item | conductor cross-section range ($mm^2$) | cable conductor material | dimensions (mm) | | | min./ mult. order qty. (pcs) |
|---|---|---|---|---|---|---|---|
| | | | | length L1 | inner length L2 | inner diameter D2 | |
| **GM2535** | GMMT 25 | 25 | Cu | 60 | 11 | 7 | 1 |
| **GM3040** | GMMT 35 | 35 | Cu | 60 | 12,5 | 8,2 | 1 |
| **GM0050** | GMMT 50 | 50 | Cu | 60 | 14,5 | 10 | 1 |
| **GM6370** | GMMT 70 | 70 | Cu | 70 | 16,5 | 11,5 | 1 |
| **GM9510** | GMMT 95 | 95 | Cu | 80 | 20 | 12 | 1 |
| **GM0150** | GMMT 120/150 | 120–150 | Cu | 80 | 20 | 13,5 | 1 |
| **GM0185** | GMMT 185 | 185 | Cu | 80 | 23 | 15 | 1 |
| **GM0240** | GMMT 240 | 240 | Cu | 100 | 26,5 | 19,3 | 1 |

# RS 034

# Constant force roll springs

## Applications

- Electrical connection of cable shield and armour

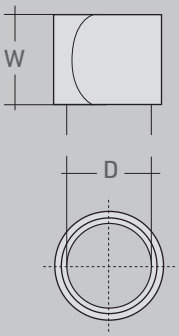
## Key features

- Solderless installation

## Specifications

- Constant force roll springs

| width W | ref. | item | application diameter range (mm) | length (mm) | supplied diameter D (mm) | width W (mm) | min./ mult. order qty. (pcs) |
|---|---|---|---|---|---|---|---|
| **13 mm** | **RS034A** | RS034-A | 12 – 20 | 280 | 10 | 13 | 1 |
| | **RS034K** | RS034-K | 12 – 20 | 400 | 10 | 13 | 1 |
| | **RS034B** | RS034-B | 17 – 28 | 400 | 14 | 13 | 1 |
| | **RS034C** | RS034-C | 25 – 40 | 570 | 20 | 13 | 1 |
| | **RS034D** | RS034-D | 36 – 60 | 850 | 30 | 13 | 1 |
| **25 mm** | **RS034E** | RS034-E | 17 – 29 | 570 | 14 | 25 | 1 |
| | **RS034N** | RS034-N | 25 – 34 | 650 | 19 | 25 | 1 |
| | **RS034F** | RS034-F | 30 – 39 | 700 | 22 | 25 | 1 |
| | **RS034M** | RS034-M | 33 – 45 | 850 | 25 | 25 | 1 |
| | **RS034G** | RS034-G | 40 – 60 | 950 | 30 | 25 | 1 |
| **30 mm** | **RS034H** | RS034-H | 50 – 75 | 1100 | 38 | 30 | 1 |
| | **RS034I** | RS034-I | 50 – 75 | 1350 | 38 | 30 | 1 |
| | **RS034L** | RS034-L | 57 – 85 | 1350 | 45 | 30 | 1 |
| | **RS034O** | RS034-O | 85 – 110 | 1500 | 70 | 30 | 1 |



# ARM-JTMT

## Kit di ripristino armatura per giunzioni di cavi Medium voltage

### Applications

- Restoring electrical connection of cable armour in Medium voltage joints

### Kit contents

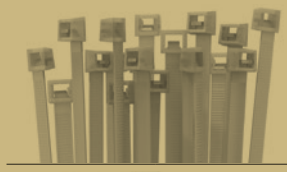
- 2 stainless steel roll springs
- Tinned copper earth braid

| ref. | item | application diameter range (mm) | maximum system voltage (voltage class) $U_m$ | | | | | | min./ mult. order qty. (pcs) |
|---|---|---|---|---|---|---|---|---|---|
| | | | 17,5 kV | | 24 kV | | 36 kV | | |
| | | | number of cores | | | | | | |
| | | | ⊙ | ⁂ | ⊙ | ⁂ | ⊙ | ⁂ | |
| | | | conductor cross-section range (mm²) | | | | | | |
| **ARMJT2540** | ARM-JTMT 25/40 | 25 – 40 | 25 – 150 | – | 25 – 95 | – | 35 – 95 | – | 1 |
| **ARMJT4060** | ARM-JTMT 40/60 | 40 – 60 | 150 – 400 | 16 – 50 | 120 – 300 | – | 120 – 400 | – | 1 |
| **ARMJT5075** | ARM-JTMT 50/75 | 50 – 75 | 500 – 630 | 35 – 120 | 400 – 630 | 35 – 95 | 400 – 630 | – | 1 |
| **ARMJT5785** | ARM-JTMT 57/85 | 57 – 85 | – | 95 – 240 | – | 50 – 185 | – | 35 – 95 | 1 |
| **ARMJT85110** | ARM-JTMT 85/110 | 85 – 110 | – | 300 | – | 240 – 300 | – | 120 – 300 | 1 |

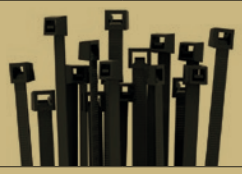
Approximate conductor cross-sections evaluated on single-core cables type RG7H1ANR and three-core cables type RG7H1OZR with steel-tape armour (cable designation according to CEI-UNEL 35011 Standard)

# 05 CABLINGANDFIXING

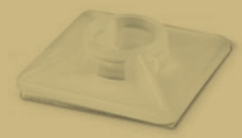
# 05.1 CABLING

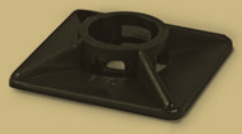
FB
Nylon cable ties - white 154



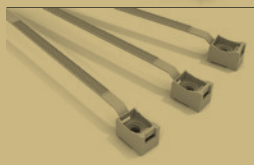
FN
Nylon cable ties - black 155



BB
Nylon self-adhesive cable tie mounts - white 156

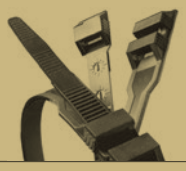


BN
Nylon self-adhesive cable tie mounts - black 156



FGS
Fascette fissatubi - Colour grigio 157

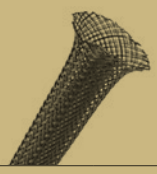
FBT
Nylon identification cable ties - white 157



CL
Nylon cable collars - black 158

UFF-8 / UFC-9
Pinze per applicazione fascette e collari 159

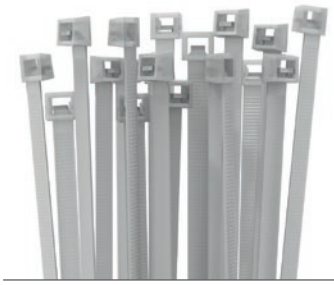
COBRABOX®
Guaina trecciata in poliestere - in dispenser 160



RHB
Guaina trecciata in poliestere - in bobina 161

# FB

# Nylon cable Ties
colour white



## Applications
- Routing, bundling and securing of cables, hoses and pipes

| ref. | item | dimensions (mm) | min–max bundle diameter (mm) | tensile strength (N) * | pack content (pcs) | min. ord. qty. (pk) | mult. ord. qty. (pk) |
|---|---|---|---|---|---|---|---|
| **FB07525** | FB07525 | 75 × 2,5 | 2 – 13 | 80 | 100 | 150 | 150 |
| **FB10025** | FB10025 | 100 × 2,5 | 3 – 20 | 80 | 100 | 150 | 150 |
| **FB13525** | FB13525 | 135 × 2,5 | 3 – 32 | 80 | 100 | 125 | 125 |
| **FB16025** | FB16025 | 160 × 2,5 | 4 – 39 | 80 | 100 | 100 | 100 |
| **FB20025** | FB20025 | 200 × 2,5 | 4 – 50 | 80 | 100 | 100 | 100 |
| **FB14035** | FB14035 | 140 × 3,5 | 3 – 33 | 180 | 100 | 100 | 100 |
| **FB20035** | FB20035 | 200 × 3,5 | 5 – 47 | 180 | 100 | 60 | 60 |
| **FB28035** | FB28035 | 280 × 3,5 | 7 – 75 | 180 | 100 | 65 | 65 |
| **FB36035** | FB36035 | 360 × 3,5 | 7 – 96 | 180 | 100 | 40 | 40 |
| **FB16045** | FB16045 | 160 × 4,5 | 5 – 35 | 220 | 100 | 50 | 50 |
| **FB18045** | FB18045 | 180 × 4,5 | 4 – 45 | 220 | 100 | 50 | 50 |
| **FB20045** | FB20045 | 200 × 4,5 | 5 – 47 | 220 | 100 | 50 | 50 |
| **FB25045** | FB25045 | 250 × 4,5 | 5 – 62 | 220 | 100 | 50 | 50 |
| **FB28045** | FB28045 | 280 × 4,5 | 7 – 70 | 220 | 100 | 50 | 50 |
| **FB36045** | FB36045 | 360 × 4,5 | 7 – 96 | 220 | 100 | 40 | 40 |
| **FB38045** | FB38045 | 380 × 4,5 | 7 – 101 | 220 | 100 | 35 | 35 |
| **FB43045** | FB43045 | 430 × 4,5 | 7 – 115 | 220 | 100 | 25 | 25 |
| **FB20075** | FB20075 | 200 × 7,5 | 7 – 47 | 530 | 100 | 25 | 25 |
| **FB24075** | FB24075 | 240 × 7,5 | 7 – 56 | 530 | 100 | 20 | 20 |
| **FB28075** | FB28075 | 280 × 7,5 | 8 – 68 | 530 | 100 | 20 | 20 |
| **FB36075** | FB36075 | 360 × 7,5 | 8 – 92 | 530 | 100 | 15 | 15 |
| **FB45075** | FB45075 | 450 × 7,5 | 11 – 117 | 530 | 100 | 10 | 10 |
| **FB54075** | FB54075 | 540 × 7,5 | 15 – 147 | 530 | 100 | 10 | 10 |
| **FB75075** | FB75075 | 750 × 7,5 | 12 – 205 | 530 | 100 | 1 | 1 |

* 1 kgf ≈ 10 N



Nylon (PA) 6.6

Flammability rating (UL 94)
**V2**

Colour
**white**

Specifications
**EN 62275**

Operating Temperature range
**-40 °C to +85 °C**

CE Marking

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

# FN

# Nylon cable Ties
colour black

## Applications
- Routing, bundling and securing of cables, hoses and pipes
- Also suited for outdoor installation

| ref. | item | dimensions (mm) | min–max bundle diameter (mm) | tensile strength (N) * | pack content (pcs) | min. ord. qty. (pk) | mult. ord. qty. (pk) |
|---|---|---|---|---|---|---|---|
| **FN07525** | FN07525 | 75 × 2,5 | 2 – 13 | 80 | 100 | 150 | 150 |
| **FN10025** | FN10025 | 100 × 2,5 | 3 – 20 | 80 | 100 | 150 | 150 |
| **FN13525** | FN13525 | 135 × 2,5 | 3 – 32 | 80 | 100 | 125 | 125 |
| **FN16025** | FN16025 | 160 × 2,5 | 4 – 39 | 80 | 100 | 100 | 100 |
| **FN20025** | FN20025 | 200 × 2,5 | 4 – 50 | 80 | 100 | 100 | 100 |
| **FN14035** | FN14035 | 140 × 3,5 | 3 – 33 | 180 | 100 | 100 | 100 |
| **FN20035** | FN20035 | 200 × 3,5 | 5 – 47 | 180 | 100 | 60 | 60 |
| **FN28035** | FN28035 | 280 × 3,5 | 7 – 75 | 180 | 100 | 65 | 65 |
| **FN36035** | FN36035 | 360 × 3,5 | 7 – 96 | 180 | 100 | 40 | 40 |
| **FN16045** | FN16045 | 160 × 4,5 | 5 – 35 | 220 | 100 | 50 | 50 |
| **FN18045** | FN18045 | 180 × 4,5 | 4 – 45 | 220 | 100 | 50 | 50 |
| **FN20045** | FN20045 | 200 × 4,5 | 5 – 47 | 220 | 100 | 50 | 50 |
| **FN25045** | FN25045 | 250 × 4,5 | 5 – 62 | 220 | 100 | 50 | 50 |
| **FN28045** | FN28045 | 280 × 4,5 | 7 – 70 | 220 | 100 | 50 | 50 |
| **FN36045** | FN36045 | 360 × 4,5 | 7 – 96 | 220 | 100 | 40 | 40 |
| **FN38045** | FN38045 | 380 × 4,5 | 7 – 101 | 220 | 100 | 35 | 35 |
| **FN43045** | FN43045 | 430 × 4,5 | 7 – 115 | 220 | 100 | 25 | 25 |
| **FN20075** | FN20075 | 200 × 7,5 | 7 – 47 | 530 | 100 | 25 | 25 |
| **FN24075** | FN24075 | 240 × 7,5 | 7 – 56 | 530 | 100 | 20 | 20 |
| **FN28075** | FN28075 | 280 × 7,5 | 8 – 68 | 530 | 100 | 20 | 20 |
| **FN36075** | FN36075 | 360 × 7,5 | 8 – 92 | 530 | 100 | 15 | 15 |
| **FN45075** | FN45075 | 450 × 7,5 | 11 – 117 | 530 | 100 | 10 | 10 |
| **FN54075** | FN54075 | 540 × 7,5 | 15 – 147 | 530 | 100 | 10 | 10 |
| **FN75075** | FN75075 | 750 × 7,5 | 12 – 205 | 530 | 100 | 1 | 1 |

* 1 kgf ≈ 10 N



Nylon (PA) 6.6
with carbon black

Flammability rating (UL 94)
**V2**

Colour
**black**

Specifications
**EN 62275**

Operating Temperature range
**-40 °C to +85 °C**

CE Marking

Directive EU 2015/863
(RoHS 3)
Compliant

Halogen free

# BB

## Nylon self-adhesive cable tie Mounts
4 ways - colour white

### Applications
- Fixing of FB cable ties to flat surfaces

| ref. | item | dimensions (mm) | max tie width (mm) | tensile strength (N) | pack content (pcs) | min. ord. qty. (pk) | mult. ord. qty. (pk) |
|---|---|---|---|---|---|---|---|
| **BB19194** | BB19194 | 19 × 19 | 4 | 10 | 100 | 15 | 15 |
| **BB27276** | BB27276 | 27 × 27 | 6 | 16 | 100 | 15 | 15 |

Nylon (PA) 6.6

Flammability rating (UL 94)
**V2**

Operating temperature range
**-40 °C to +85 °C**

Colour
**black**

CE Marking

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

# BN

## Nylon self-adhesive cable tie Mounts
4 ways - colour black

### Applications
- Fixing of FN cable ties to flat surfaces
- Also suited for outdoor installation

| ref. | item | dimensions (mm) | max tie width (mm) | tensile strength (N) | pack content (pcs) | min. ord. qty. (pk) | mult. ord. qty. (pk) |
|---|---|---|---|---|---|---|---|
| **BN19194** | BN19194 | 19 × 19 | 4 | 10 | 100 | 15 | 15 |
| **BN27276** | BN27276 | 27 × 27 | 6 | 16 | 100 | 15 | 15 |

Nylon (PA) 6.6
with carbon black

Flammability rating (UL 94)
**V2**

Colour
**black**

Operating temperature range
**-40 °C to +85 °C**

CE Marking

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

# FGS

## Fascette fissatubi in nylon
Colour gray

### Applications
- Fissaggio di tubi protettivi rigidi in plastica o metallo

### Features
- Foro con asola per il fissaggio con tasselli leggeri TX-6

| ref. | item | dimensions (mm) | pipe diameter range (mm) | tensile strength (N) * | pack content (pcs) | min. ord. qty. (pk) | mult. ord. qty. (pk) |
|---|---|---|---|---|---|---|---|
| **FGS16575** | FGS16575 | 165 × 7,5 | 12 - 35 | 220 | 100 | 20 | 20 |

Nylon (PA) 6.6

Flammability rating (UL 94)
**V2**

Colour
**grigio RAL 7035**

Specifications
**EN 62275**

Operating Temperature range
**-40 °C to +85 °C**

CE Marking

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

# FBT

## Nylon identification cable ties
Colour white

### Applications
- Bundling, securing and identification of cables, hoses and pipes in a single step

### Features
- 25 × 8 mm identification tab (plate) with writable surface

| ref. | item | dimensions (mm) | min–max bundle diameter (mm) | tensile strength (N) * | pack content (pcs) | min. ord. qty. (pk) | mult. ord. qty. (pk) |
|---|---|---|---|---|---|---|---|
| **FBT10025** | FBT10025 | 100 × 2,5 | 3 - 20 | 80 | 100 | 150 | 150 |

Nylon (PA) 6.6

Flammability rating (UL 94)
**V2**

Colour
**white**

Operating temperature range
**-40 °C to +85 °C**

CE Marking

Directive 2011/65/EU (RoHS 2) Compliant

Halogen free

# CL

# Double-locking tab nylon cable collars

colour black

## Applications

- Routing, bundling and securing of cables, hoses and pipes
- Also suited for outdoor installation and marine environments

## Key features

- Elevata resistenza alla trazione meccanica
- Chemical resistance to solvents, gasoline, hydrocarbons (at low temperatures and in low concentration)

| ref. | item | dimensions (mm) | min–max bundle diameter (mm) | tensile strength (N) * | pack content (pcs) | min. ordin. (cf) | multipli ordin. (cf) |
|---|---|---|---|---|---|---|---|
| **CL1809** | CL1809 | 180 × 9 | 4 - 40 | 350 | 100 | 10 | 10 |
| **CL2659** | CL2659 | 265 × 9 | 6 - 78 | 540 | 100 | 10 | 10 |
| **CL3609** | CL3609 | 360 × 9 | 6 - 100 | 540 | 100 | 10 | 10 |
| **CL5009** | CL5009 | 500 × 9 | 6 - 150 | 540 | 100 | 5 | 5 |

Nylon (PA) 6.6

Flammability rating (UL 94)
**V2**

Operating temperature range
**-40 °C to +85 °C**

Colour
**black**

CE Marking

Directive 2011/65/EU (RoHS 2) Compliant

Halogen free

CABLING AND FIXING

# UFF-8

## Manual tensioning tool for cable ties

### Applications

- Installation of nylon cable ties up to 8 mm width

### Features

- Adjustable tension force from 2,5 to 14 kg
- Flush cutting of the exceeding cable tie

| ref. | item | minimo ordinabile (pcs) | multipli ordinabili (pcs) |
|---|---|---|---|
| **UF0008** | UFF-8 | 1 | 1 |

# UFC-9

## Manual tensioning tool for cable collars

### Applications

- Installation of nylon cable ties up to 9 mm width

### Characteristics

- Adjustable tension force from 2,5 to 14 kg
- Flush cutting of the exceeding cable collar

| ref. | item | minimo ordinabile (pcs) | multipli ordinabili (pcs) |
|---|---|---|---|
| **UF0009** | UFC-9 | 1 | 1 |

# COBRABOX®

## Polyester braided sleeving - in dispenser box

## Applications

- Protection and bundling of electrical, electronic and telecommunication cables
- Civil, industrial, and automotive applications

## Key features

- High mechanical resistance
- Ottima resistenza alla trazione e al taglio
- Removable
- Good resistance to chemicals
- Good resistance to UV rays

| ref. | item | colour | nominal diameter (mm) | bundle diameter min–max (mm) | length (m) | minimo ordin. (cf) | multipli ordin. (cf) |
|---|---|---|---|---|---|---|---|
| **CB2003** | COBRABOX 03 | GRIGIO | 3 | 2 - 8 | 25 | 1 | 1 |
| **CB2004** | COBRABOX 04 | | 4 | 3 - 9 | 25 | 1 | 1 |
| **CB2005** | COBRABOX 05 | | 5 | 4 - 11 | 25 | 1 | 1 |
| **CB2006** | COBRABOX 06 | | 6 | 5 - 15 | 25 | 1 | 1 |
| **CB2008** | COBRABOX 08 | | 8 | 6 - 18 | 20 | 1 | 1 |
| **CB2010** | COBRABOX10 | | 10 | 8 - 21 | 20 | 1 | 1 |
| **CB2012** | COBRABOX 12 | | 12 | 10 - 20 | 10 | 1 | 1 |
| **CB2015** | COBRABOX 15 | | 15 | 12 - 29 | 10 | 1 | 1 |
| **CB2020** | COBRABOX 20 | | 20 | 15 - 33 | 10 | 1 | 1 |
| **CB2025** | COBRABOX 25 | | 25 | 20 - 45 | 10 | 1 | 1 |
| **CB2030** | COBRABOX 30 | | 30 | 25 - 48 | 5 | 1 | 1 |
| **CB2040** | COBRABOX 40 | | 40 | 35 - 60 | 3 | 1 | 1 |
| **CB2050** | COBRABOX 50 | | 50 | 45 - 75 | 3 | 1 | 1 |



Premium quality monofilament polyester

Flammability rating (UL 94)
**HB**

Continuous operating temperature
**-50 / +170 °C**

Melting point
**260 °C**

Tensile strength (ISO 37)
**4,80 kg/mm²**

Ultimate elongation (ISO 37)
**28–35 %**

Specific weight (ISO 1183)
**1,38 g/cm³**

Water absorption (ASTM D570)
**0,5% max**

RoHS — Directive EU 2015/863 (RoHS 3) Compliant

HF — Halogen free

Non-toxic

# RHB

# Polyester braided sleeving in spool

## Applications

- Protection and bundling of electrical, electronic and telecommunication cables
- Civil, industrial, and automotive applications

## Key features

- High mechanical resistance
- Ottima resistenza alla trazione e al taglio
- Removable
- Good resistance to chemicals
- Good resistance to UV rays

| ref. | item | colour | nominal diameter (mm) | bundle diameter min–max (mm) | spool length (m) | minimo ordin. (m) | multipli ordin. (m) |
|---|---|---|---|---|---|---|---|
| **RH1003** | RHB 03 BK | Black | 3 | 2 - 8 | 200 | 200 | 200 |
| **RH1004** | RHB 04 BK | | 4 | 3 - 9 | | 200 | 200 |
| **RH1005** | RHB 05 BK | | 5 | 4 - 11 | 100 | 100 | 100 |
| **RH1006** | RHB 06 BK | | 6 | 5 - 15 | | 100 | 100 |
| **RH1008** | RHB 08 BK | | 8 | 6 - 18 | | 100 | 100 |
| **RH1010** | RHB 10 BK | | 10 | 8 - 21 | | 100 | 100 |
| **RH1012** | RHB 12 BK | | 12 | 10 - 20 | | 100 | 100 |
| **RH1015** | RHB 15 BK | | 15 | 12 - 29 | | 100 | 100 |
| **RH1020** | RHB 20 BK | | 20 | 15 - 33 | 50 | 50 | 50 |
| **RH1025** | RHB 25 BK | | 25 | 20 - 45 | | 50 | 50 |
| **RH1030** | RHB 30 BK | | 30 | 25 - 48 | | 50 | 50 |
| **RH1040** | RHB 40 BK | | 40 | 35 - 60 | | 50 | 50 |
| **RH1050** | RHB 50 BK | | 50 | 45 - 75 | | 50 | 50 |
| **RH2003** | RHB 03 GR | GRIGIO | 3 | 2 - 8 | 200 | 200 | 200 |
| **RH2004** | RHB 04 GR | | 4 | 3 - 9 | | 200 | 200 |
| **RH2005** | RHB 05 GR | | 5 | 4 - 11 | 100 | 100 | 100 |
| **RH2006** | RHB 06 GR | | 6 | 5 - 15 | | 100 | 100 |
| **RH2008** | RHB 08 GR | | 8 | 6 - 18 | | 100 | 100 |
| **RH2010** | RHB 10 GR | | 10 | 8 - 21 | | 100 | 100 |
| **RH2012** | RHB 12 GR | | 12 | 10 - 20 | | 100 | 100 |
| **RH2015** | RHB 15 GR | | 15 | 12 - 29 | | 100 | 100 |
| **RH2020** | RHB 20 GR | | 20 | 15 - 33 | 50 | 50 | 50 |
| **RH2025** | RHB 25 GR | | 25 | 20 - 45 | | 50 | 50 |
| **RH2030** | RHB 30 GR | | 30 | 25 - 48 | | 50 | 50 |
| **RH2040** | RHB 40 GR | | 40 | 35 - 60 | | 50 | 50 |
| **RH2050** | RHB 50 GR | | 50 | 45 - 75 | | 50 | 50 |

Premium quality monofilament polyester

Flammability rating (UL 94)
**HB**

Continuous operating temperature
**-50 / +170 °C**

Melting point
**260 °C**

Tensile strength (ISO 37)
**4,80 kg/mm²**

Ultimate elongation (ISO 37)
**28–35 %**

Specific weight (ISO 1183)
**1,38 g/cm³**

Water absorption (ASTM D570)
**0,5% max**

Directive EU 2015/863 (RoHS 3) Compliant

Halogen free

Non-toxic

# 05 CABLING AND FIXING

# 05.2 FIXING

TX
Wall plug for light duty fixings 164

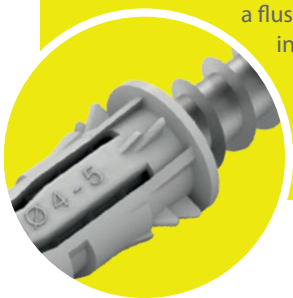
# TX

# Nylon wall plug with 4-way expansion

## for general light duty fixings

## Applications

- Light duty fixings on most common building materials: concrete, natural stone, solid and perforated bricks, hollow blocks made from lightweight concrete, aerated concrete, plasterboard panels



**4-way expansion**
provides uniform force distribution and guarantees high load-bearing values in all building materials

**anti-slip collar**
prevents the plug from slipping into the drill hole, and allows a flush-to-wall installation

**anti-twist fins**
near plug collar

Nylon (PA) 6.6
first-grade

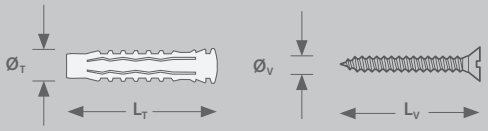
4-way expansion body

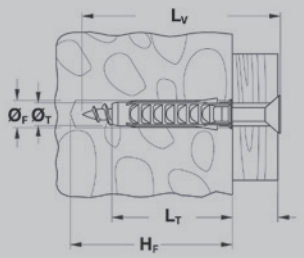
Alette antirotazione
in prossimità del collarino

Flush-to-wall installation

**Compliant to ETAG 020 Annex A**

| item | Plug diametro $Ø_T$ (mm) | Plug length $L_T$ (mm) | Screw diameter × length (mm × mm) | Drill diameter $Ø_F$ (mm) | Drill depth $H_F$ (mm) | Minimum drill hole depth (mm) | Recommended load concrete class ≥ C20/25 (daN) | Recommended load solid brick (daN) |
|---|---|---|---|---|---|---|---|---|
| TX 5 | 5 | 25 | 4 × 30 | 5 | 30 | 25 | 30 | 16 |
| TX 6 | 6 | 30 | 4,5 × 40 | 6 | 40 | 35 | 65 | 22 |
| TX 8 | 8 | 40 | 5 × 45 | 8 | 50 | 45 | 75 | 42 |
| TX 10 | 10 | 50 | 6 × 60 | 10 | 60 | 55 | 125 | 80 |



# TX

## Nylon wall plug with 4-way expansion
for general light duty fixings

| ref. | item | plug Ø × L (mm) | screw Ø × L (mm) | pack. (pcs) | min. ord. qty. (pk) | mult. ord. qty. (pk) |
|---|---|---|---|---|---|---|
| **TA0000** | TX 5 | 5 × 25 | 4 × 30 | 100 | 20 | 20 |
| **TAK505** | | | | 500 | 10 | 10 |
| **TA0001** | TX 6 | 6 × 30 | 4,5 × 40 | 100 | 60 | 60 |
| **TAK300** | | | | 300 | 10 | 10 |
| **TAK500** | | | | 500 | 12 | 12 |
| **TA0002** | TX 8 | 8 × 40 | 5 × 45 | 50 | 10 | 10 |
| **TA0003** | TX 10 | 10 × 50 | 6 × 60 | 25 | 10 | 10 |

TA0001
100-piece TX6 box

TAK300
300-piece TX6 bucket

TAK500
500-piece TX6 bucket

6-piece counter display for TAK500
dimensions (l×d×h): 18×53×58 cm

CABLING AND FIXING

# 06 HEATINGCABLES

# 06.1 CONSTANT POWER HEATING CABLES

## PIPES AND TANKS HEAT TRACING

EASY TRACE®
Constant power heating cable kit 168

## SURFACE HEATING OF RAMPS AND PAVEMENTS

HOT TRACE
Constant power heating mat kit 170

KT1040
Constant power heating mat kit
complete with accessories 171

# EASY TRACE®

## Constant power heating cable kit for pipes and tanks heat tracing

## Applications

Freeze protection for metal or plastic pipes up to 38 mm diameter

## Key features

- Ready to use
- Quick installation

### Ready to use

EASY TRACE® heating cable kits are supplied pre-assembled with Schuko plug and contact thermostat

## Specifications

Pre-assembled 15 W/m constant power heating cable kit with:

- power cable (2 m length)
- plug
- thermostat

| ref. | item | length (m) | total power (W) | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|
| **EASY02** | EASY02 | 2 | 35 | 1 | 1 |
| **EASY04** | EASY04 | 4 | 71 | 1 | 1 |
| **EASY08** | EASY08 | 8 | 117 | 1 | 1 |
| **EASY12** | EASY12 | 12 | 187 | 1 | 1 |
| **EASY18** | EASY18 | 18 | 275 | 1 | 1 |

Unit power
**15 W/m**

Degree of protection
**IPX7**

Thermostat setpoint
**+3 / +13 °C**

Cross-section size
**8 × 5,5 mm**

Supply voltage
**230 Vac**

Outer sheath
**PVC**

# EASY TRACE®

## Installation guidelines

### 1.

Before installing the heating cable, ensure that the area around the cable is free of sharp objects and combustible materials.

If the heating cable is installed on plastic pipesin order to improve thermal conductivity we recommend covering the pipe with aluminium tape (ISOALL type) before installing the cable.

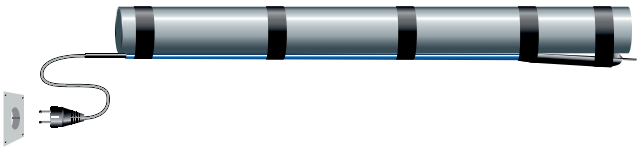
Stretch the cable along the bottom of the pipe, ensuring that the end with the plug is nearest to the power outlet.

### 2.

Begin fixing the thermostat with the side marked with a red dot in contact with the pipe, using PVC insulation tape (ISOEL type).

It is best to position the thermostat on the coldest end of the pipe, which is more exposed to low temperatures.

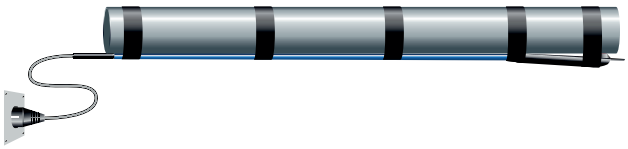
Continue fixing the heating cable on the pipe at intervals of approximately 300 mm, using the PVC insulating tape.



### 3.

It is advisable to fit a layer of insulation material round the pipe and the heating cable to improve the performance of the cable and reduce energy consumption.

When installation is complete, plug the power cord into the 230 V electrical outlet.

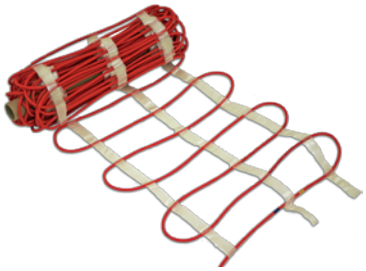


# HOT TRACE

Pre-assembled constant power heating mat kit
for surface heating of ramps and pavements

## Applications

- Defrosting and snow and ice melting snow on access ramps and outdoor surfaces used by pedestrians or vehicles
- Can be installed under concrete, brick paving, porphyry
- Also suitable for direct installation under asphalt surfaces



## Specifications

- Heating mats comprising a pre-assembled 225 W/m² constant power heating cable arranged in a zigzag pattern on a matrix of fiberglass reinforced tape
- Connection to the power supply via cold cable (5 m length) already connected to the heating cable, with connection point identification

| ref. | item | length (m) | superficie (m²) | total power (W) | total current (A) | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|---|
| **HTRC04** | HOT TRACE 4 | 4 | 2 | 450 | 1,9 | 1 | 1 |
| **HTRC08** | HOT TRACE 8 | 8 | 4 | 900 | 3,9 | 1 | 1 |
| **HTRC12** | HOT TRACE 12 | 12 | 6 | 1350 | 5,9 | 1 | 1 |
| **HTRC14** | HOT TRACE 14 | 14 | 7 | 1575 | 6,9 | 1 | 1 |
| **HTRC20** | HOT TRACE 20 | 20 | 10 | 2250 | 9,8 | 1 | 1 |

## Installation accessories

| ref. | description |
|---|---|
| **SH0306** | SHARK 306 gel joint with terminal block for hot cable-cold cable connection (p. 10) |
| **CTAHTC1** | Thermostat control unit (p. 184) |
| **STUHTC1** | Temperature and moisture sensor (p. 186) |

Unit power
**225 W/m²**

Supply voltage
**230 V ac**

Compliance
**EN 60800**

Tinned copper bus wires

PVC outer sheath

Screen 7 mm

Cable cross-section size
**8 × 5,5 mm**

Heating mat width
**0,5 m**

# KT1040

## Pre-assembled constant power heating mat kit with accessories

for surface heating of ramps and pavements

## Applications

- Defrosting and snow and ice melting snow on access ramps and outdoor surfaces used by pedestrians or vehicles
- Can be installed under concrete, brick paving, porphyry
- Also suitable for direct installation under asphalt surfaces

## Key features

- Ready to use
- quick and easy installation

## Kit contents

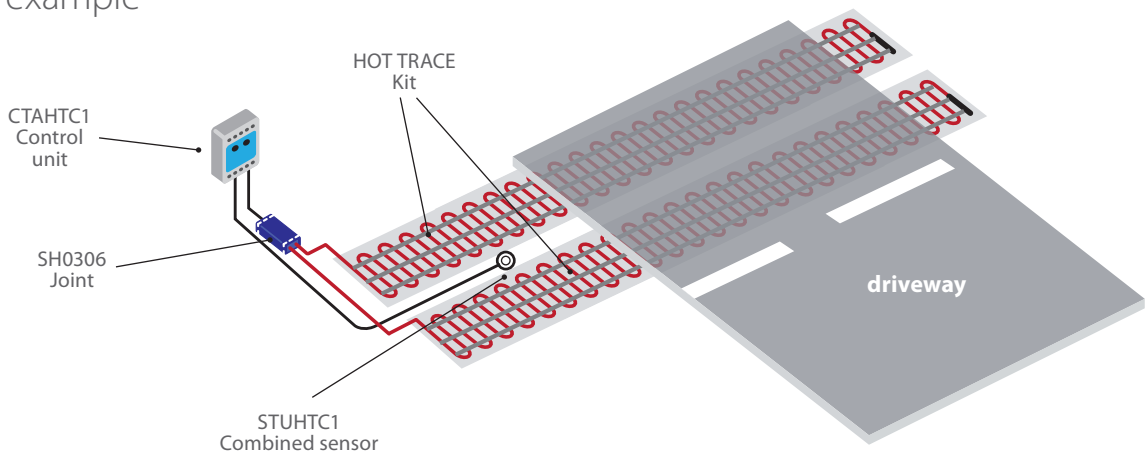
- n. 2 HOT TRACE 12 - Heating mats comprising a pre-assembled constant power heating cable arranged in a zigzag pattern on a matrix of fiberglass reinforced tape
- n. 1 CTAHTC1 - Control unit
- n. 1 STUHTC1 - Heavy duty temperature and moisture sensor
- n. 1 SHARK 306 - Gel joint with insulated three-pole terminal block
- Assembly instructions

### Quick and easy installation

KT1040 kits are supplied with a complete set of accessories required to make the tracing mat system

| ref. | item | length (m) | heated area ($m^2$) | total power (W) | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|---|---|
| **KT1040** | KT1040 | 12 | 12 | 2700 | 1 | 1 |

## KT1040
## Installation example




Unit power
**225 W/m²**

Supply voltage
**230 V ac**

Compliance
**EN 60800**

Tinned copper bus wires

PVC outer sheath

Screen 7 mm

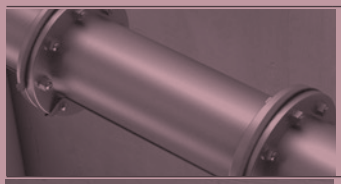
Cable cross-section size
**8 × 5,5 mm**

Heating mat width
**0,5 m**

# 06 HEATINGCABLES

# 06.2 SELF-REGULATING HEATING CABLES

## PIPE FREEZE PROTECTION AND FLOW MAINTENANCE




HTC-S
Compact self-regulating heating cable 174

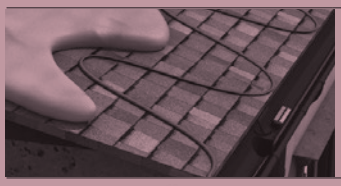
HTC-P / HTC-H
Self-regulating heating cable 175

HTC-PX / HTC-HX
Self-regulating heating cable for ATEX environments 176

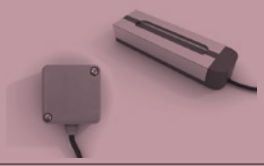
HTC-FF
Self-regulating heating cable in fluoropolymer for applications up to 195 ºC 177

Installation accessories 182


## ROOF AND GUTTER DE-ICING



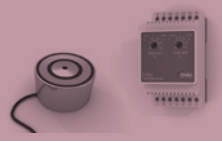

HTC-P / HTC-H
Self-regulating heating cable 180


Installation accessories 182


## SURFACE SNOW MELTING

HTC-H
Self-regulating heating cable 186


Installation accessories 187

# HTC-S

# **Compact** self-regulating heating cable

pipes and tanks tracing **up to 85 °C**

## Construction

*bus wires*
tinned copper

*self-regulating conductive core (heating matrix)*

*insulating inner jacket*
thermoplastic elastomer

*shield braid*
tinned copper

*outer jacket*
thermoplastic elastomer

## Applications

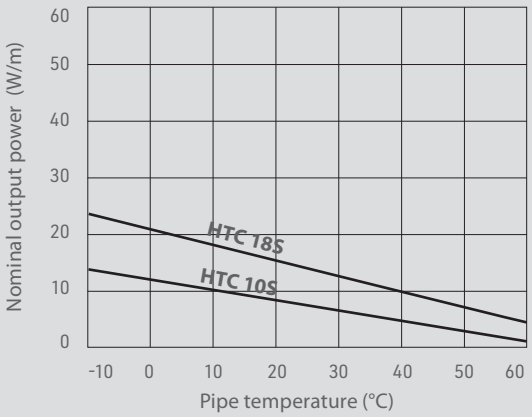
- Freeze protection or temperature maintenance of pipes and tanks containing liquids or gases (e. g. water pipe systems, industrial pipe systems)

## Specifications

- Compact size
- Outer jacket colour: red
- CE Marking

| ref. | item | power at 10 °C (W/m) | maximum exposure temperature | | minimum installation temperature | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|
| | | | continuous | intermittent | | | |
| **HTC10S** | HTC10S | 10 | 65 °C | 85 °C | –40 °C | 10 | 10 |
| **HTC18S** | HTC18S | 18 | | | | 10 | 10 |

## Output power rating




Nominal power output versus temperature graph evaluated on thermal insulated metal pipes

## Circuit length sizing

| ref. | ambient temperature at start-up (°C) | circuit breaker current rating | | | |
|---|---|---|---|---|---|
| | | 10 A | 16 A | 20 A | 25 A |
| | | maximum cable circuit length * (m) | | | |
| HTC10S | –20 | 77 | 111 | 139 | 173 |
| | 0 | 95 | 137 | 171 | 214 |
| | +10 | 100 | 144 | 180 | 225 |
| HTC18S | –20 | 41 | 59 | 74 | 92 |
| | 0 | 58 | 84 | 104 | 131 |
| | +10 | 60 | 86 | 108 | 135 |

* Estimated values for installation with type C curve, 30 mA ground-fault circuit breaker

Type
**self-regulating**

Supply voltage
**230 Vac**

Conductor Cross-section area
**0,6 mm²**

Maximum intermittent exposure temperature
**85 °C**

Maximum continuous exposure temperature
**65 °C**

Cable cross dimensions
**8 × 5 mm**

Minimum bend radius
**40 mm** (at –40°C)

# HTC-P
# HTC-H

## Self-regulating heating cable
pipes and tanks tracing **up to 85 °C**

## Construction

*bus wires*
tinned copper

*self-regulating conductive core (heating matrix)*

*insulating inner jacket*
modified polyolefin

*shield braid*
tinned copper

*outer jacket*
polyolefin

## Applications

- Freeze protection or temperature maintenance of pipes and tanks containing liquids or gases (e. g. water pipe systems, industrial pipe systems)

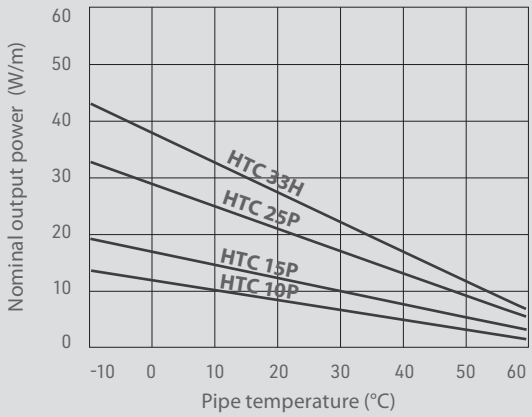
## Specifications

- Outer jacket colour: gray
- Degree of protection: IP 66 (EN 60529)
- CE Marking

**Also available HTC-FF Series in fluoropolymer (p. 177) and HTC-PX/HTC-HX Series for ATEX classified areas (p. 176)**

| ref. | item | power at 10 °C (W/m) | maximum exposure temperature | | minimum installation temperature | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|
| | | | continuous | intermittent | | | |
| **HTC10P** | HTC10P | 10 | 65 °C | 85 °C | – 40 °C | 10 | 10 |
| **HTC15P** | HTC15P | 15 | | | | 10 | 10 |
| **HTC25P** | HTC25P | 25 | | | | 10 | 10 |
| **HTC33H** | HTC33H | 33 | | | | 10 | 10 |

## Output power rating




Nominal power output versus temperature graph evaluated on thermal insulated metal pipes

## Circuit length sizing

| ref. | ambient temperature at start-up (°C) | circuit breaker current rating | | |
|---|---|---|---|---|
| | | 20 A | 30 A | 40 A |
| | | maximum cable circuit length * (m) | | |
| **HTC10P** | **–20** | 141 | 150 | 180 |
| | **0** | 161 | 180 | 180 |
| | **+10** | 150 | 180 | 180 |
| **HTC15P** | **–20** | 100 | 133 | 150 |
| | **0** | 115 | 150 | 150 |
| | **+10** | 130 | 150 | 150 |
| **HTC25P** | **–20** | 71 | 106 | 120 |
| | **0** | 80 | 120 | 120 |
| | **+10** | 110 | 120 | 120 |
| **HTC33H** | **–20** | 58 | 78 | 89 |
| | **0** | 66 | 89 | 100 |
| | **+10** | 90 | 100 | 100 |

* Estimated values for installation with type C curve, 30 mA ground-fault circuit breaker

Type
**self-regulating**

Supply voltage
**230 Vac**

Conductor Cross-section
**0,8 mm²** (18 AWG)

Maximum intermittent exposure temperature
**85 °C**

Maximum continuous exposure temperature
**65 °C**

Cable cross dimensions
**11,5 × 6,3 mm**

Minimum bend radius
**40 mm**

# HTC-PX
# HTC-HX

## Self-regulating heating cable **for ATEX environments**

temperatures **up to 85 °C** (T6 class)

## Construction

*bus wires*
tinned copper

*self-regulating conductive core (heating matrix)*

*insulating inner jacket*
modified polyolefin

*shield braid*
tinned copper

*outer jacket*
polyolefin

## Applications

- Freeze protection or process temperature maintenance in industrial environments of pipe systems, tanks and reservoirs up to 85 °C
- **Approved for use in potentially explosive environments (ATEX II 2 GD classified)**

## Specifications

- Degree of protection: IP 66 (EN 60529)
- CE Marking

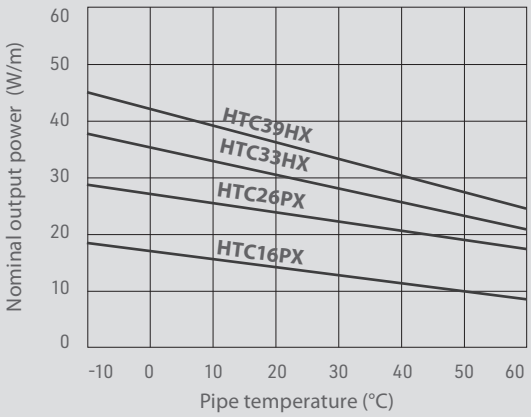
**IECEx** (EN IEC 60079)
Ex eb IIC T6 Gb – Ex tb IIIC T85°C Db

**ATEX Classification**
Ex II 2 GD

**FM Approved**
Class I, Div 2, Group A, B, C, D – Class II, Div 1, Group E, F, G

| ref. | item | power at 10 °C (W/m) | maximum exposure temperature | | minimum installation temperature | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|
| | | | continuous | intermittent | | | |
| **HTC16PX** | HTC16PX | 16 | 65 °C | 85 °C | –40 °C | 50 | 1 |
| **HTC26PX** | HTC26PX | 26 | | | | 50 | 1 |
| **HTC33HX** | HTC33HX | 33 | | | | 50 | 1 |
| **HTC39HX** | HTC39HX | 39 | | | | 50 | 1 |

## Output power rating




Nominal power output versus temperature graph evaluated on thermal insulated metal pipes

## Circuit length sizing

| ref. | ambient temperature at start-up (°C) | circuit breaker current rating | | | |
|---|---|---|---|---|---|
| | | 15 A | 20 A | 30 A | 40 A |
| | | maximum cable circuit length * (m) | | | |
| **HTC16PX** | **–20** | 72 | 92 | 138 | 149 |
| | **0** | 83 | 105 | 149 | 149 |
| | **+10** | 130 | 149 | 149 | 149 |
| **HTC26PX** | **–20** | 46 | 65 | 97 | 116 |
| | **0** | 54 | 73 | 111 | 116 |
| | **+10** | 81 | 111 | 116 | 116 |
| **HTC33HX** | **–20** | 37 | 53 | 80 | 101 |
| | **0** | 41 | 60 | 91 | 101 |
| | **+10** | 64 | 88 | 101 | 101 |
| **HTC39HX** | **–20** | 39 | 40 | 65 | 87 |
| | **0** | 48 | 47 | 70 | 94 |
| | **+10** | 55 | 58 | 89 | 94 |

* Estimated values for installation with type C curve, 30 mA ground-fault circuit breaker

Type
**self-regulating**

Supply voltage
**230 Vac**

Conductor Cross-section
**1,3 mm²** (16 AWG)

Maximum intermittent exposure temperature
**85 °C**
(IECEx T6)

Maximum continuous exposure temperature
**65 °C**

Cable cross dimensions
**12,8 × 6,3 mm**

Minimum bend radius
**40 mm** (at –40°C)

ATEX classification
**Ex II 2 GD**

FM18ATEX0062X

# HTC-FF

# Self-regulating heating cable **in fluoropolymer**

temperatures **up to 195 °C** (T3 class)

## Construction

*bus wires*
tinned copper

*self-regulating conductive core (heating matrix)*

*insulating inner jacket*
fluoropolymer

*shield braid*
tinned copper

*outer jacket*
fluoropolymer

## Applications

- Freeze protection or process temperature maintenance in industrial environments of pipe systems, tanks and reservoirs up to 195 °C
- **Suitable for use in environments with organic chemicals or corrosive substances**
- **Suitable for use in inhigh-temperature processes (e. g. steam washing)**

## Specifications

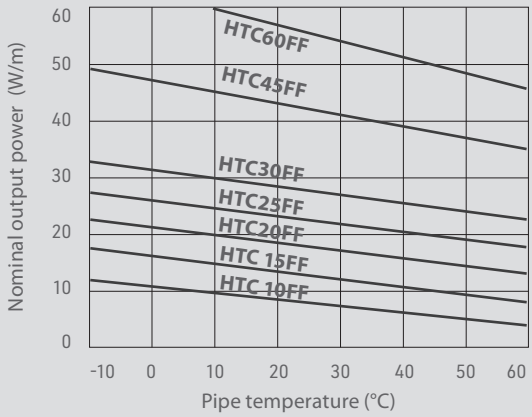
- high resistance to chemical agents
- Degree of protection: IP 66 (EN 60529)
- CE Marking

fino a
**195 °C**
(classe T3)

**Fluoropolymer Inner and outer jacket allow HTC-FF cables to be used also in presence of high-temperature processes (e. g. steam washing)**

| ref. | item | power at 10 °C (W/m) | maximum exposure temperature | | minimum installation temperature | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|
| | | | continuous | intermittent | | | |
| **HTC10FF** | HTC10FF | 10 | 120 °C | 195 °C | – 40 °C | 50 | 1 |
| **HTC15FF** | HTC15FF | 15 | | | | 50 | 1 |
| **HTC20FF** | HTC20FF | 20 | | | | 50 | 1 |
| **HTC25FF** | HTC25FF | 25 | | | | 50 | 1 |
| **HTC30FF** | HTC30FF | 30 | | | | 50 | 1 |
| **HTC45FF** | HTC45FF | 45 | | | | 50 | 1 |
| **HTC60FF** | HTC60FF | 60 | | | | 50 | 1 |

## Output power rating




Nominal power output versus temperature graph evaluated on thermal insulated metal pipes

## Circuit length sizing

| ref. | ambient temperature at start-up (°C) | circuit breaker current rating | | | |
|---|---|---|---|---|---|
| | | 15 A | 20 A | 30 A | 40 A |
| | | maximum cable circuit length * (m) | | | |
| **HTC20FF** | **–20** | 60 | 80 | 122 | 149 |
| | **0** | 70 | 94 | 142 | 149 |
| | **+10** | 78 | 103 | 147 | 149 |
| **HTC30FF** | **–20** | 38 | 51 | 77 | 103 |
| | **0** | 40 | 54 | 81 | 109 |
| | **+10** | 43 | 57 | 87 | 112 |
| **HTC45FF** | **–20** | 29 | 39 | 59 | 79 |
| | **0** | 32 | 42 | 64 | 85 |
| | **+10** | 34 | 45 | 68 | 90 |
| **HTC60FF** | **–20** | 19 | 25 | 38 | 52 |
| | **0** | 20 | 27 | 41 | 55 |
| | **+10** | 22 | 29 | 44 | 58 |

* Estimated values for installation with type C curve, 30 mA ground-fault circuit breaker

Type
**self-regulating**

Supply voltage **230 Vac**

Conductor Cross-section
**1,3 mm²** (16 AWG)
**2 mm²** (14 AWG) for HTC60FF

Maximum intermittent exposure temperature
**195 °C**
(IECEx T3)

Maximum continuous exposure temperature
**120 °C**

Cable cross dimensions
**12,5 × 5,5 mm**

Minimum bend radius
**40 mm** (at –40°C)

# KCP

## Kit di attraversamento del coibente
for self-regulating heating cables

## Applications

- Utilizzo in impianti traccianti realizzati con cavi scaldanti autoregolanti nei punti di attraversamento del coibente delle tubazioni

## Kit contents

- Perforated stainless steel plate, to be applied to pipe insulation
- Shaped gland for passing heating cable through pipe insulation

| ref. | item | application | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|
| **KCP00S** | KCP00S | HTC-S series cables | 1 | 1 |
| **KCP0PH** | KCP0PH | HTC-P and HTC-H series cables | 1 | 1 |

# Selection and sizing tables for pipe tracing self-regulating heating cables

### Lowest ambient temperature –10 °C

| Pipe outer diameter | | Insulation thickness | | | | |
|---|---|---|---|---|---|---|
| inch | mm | 10 mm | 20 mm | 30 mm | 40 mm | 50 mm |
| ½ | 21,3 | 1 × 10S<br>1 × 10P | 1 × 10S<br>1 × 10P | 1 × 10S<br>1 × 10P | 1 × 10S<br>1 × 10P | 1 × 10S<br>1 × 10P |
| ¾ | 26,9 | | | | | |
| 1 | 33,7 | | | | | |
| 1 ¼ | 42,4 | 1 × 18S | | | | |
| 1 ½ | 48,3 | | | | | |
| 2 | 60,3 | | | | | |
| 2 ½ | 76,1 | 1 × 25P | 1 × 18S | | | |
| 3 | 88,9 | | | | | |
| 4 | 114,3 | 1,3 × 25P | 1,1 × 18S | 1 × 18S | | |
| 6 | 165 | 1,3 × 33H | 1,3 × 18S | | 1,1 × 10S<br>1,1 × 10P | |

### Lowest ambient temperature –20 °C

| Pipe outer diameter | | Insulation thickness | | | | |
|---|---|---|---|---|---|---|
| inch | mm | 10 mm | 20 mm | 30 mm | 40 mm | 50 mm |
| ½ | 21,3 | 1 × 18S | 1 × 10S<br>1 × 10P | 1 × 10S<br>1 × 10P | 1 × 10S<br>1 × 10P | 1 × 10S<br>1 × 10P |
| ¾ | 26,9 | | | | | |
| 1 | 33,7 | 1,1 × 18S | 1,1 × 10S<br>1,1 × 10P | | | |
| 1 ¼ | 42,4 | 1 × 25P | 1 × 18S | | | |
| 1 ½ | 48,3 | 1,2 × 25P | | | | |
| 2 | 60,3 | 1 × 33H | 1,1 × 18S | 1 × 18S | | |
| 2 ½ | 76,1 | 1,3 × 33H | 1 × 25P | | 1 × 18S | |
| 3 | 88,9 | 1,5 × 33H | | | | |
| 4 | 114,3 | 1,8 × 33H | 1,3 × 25P | 1 × 25P | | 1 × 18S |
| 6 | 165 | 2 × 33H | 1,2 × 33H | | 1,2 × 18S | |

The number preceding heating cable reference is the number of runs of cable required for each meter of pipe, based on lowest ambient temperature, insulation thickness and pipe diameter.
For example: 1,3 × 25P means 1,3 meters of HTC25-P heating cable are required for each meter of pipe length.

# Heating cable extra length for flanges and valves

An extra length of heating cable is required in presence of flanges and valves on pipes.

Valves and flange tracing should always be carried out in compliance with minimum bend radius of heating cable used.

Heating cables installed on tanks should be fixed with ISOALL aluminum adhesive tape (p. 107).

### Sizing table

| Pipe outer diameter | | Application on flange (m) | Application on valve (m) |
|---|---|---|---|
| inch | mm | | |
| ½ | 21,3 | - | - |
| ¾ | 26,9 | | |
| 1 | 33,7 | 0,3 | 0,3 |
| 1 ½ | 48,3 | | 0,6 |
| 2 | 60,3 | | 0,9 |
| 3 | 88,9 | | |
| 4 | 114,3 | 0,6 | 1,2 |
| 6 | 165 | | |

# HTC-P
# HTC-H

# Self-regulating heating cable
## **roofs, gutters and downspouts** de-icing

## Construction

*bus wires*
tinned copper

*self-regulating conductive core (heating matrix)*

*insulating inner jacket*
modified polyolefin

*shield braid*
tinned copper

*outer jacket*
polyolefin

## Applications

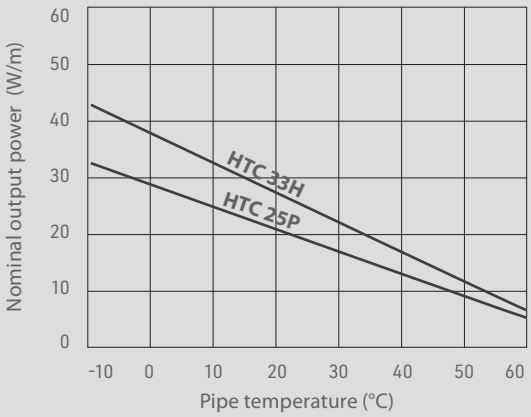
- Sbrinamento e scioglimento neve e ghiaccio su grondaie, pluviali e falde di tetti

## Characteristics

- Outer jacket colour: gray
- Degree of protection: IP 66 (EN 60529)
- CE Marking

| ref. | item | power at 10 °C (W/m) | maximum exposure temperature | | minimum installation temperature | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|
| | | | continuous | intermittent | | | |
| **HTC25P** | HTC25P | 25 | 65 °C | 85 °C | – 40 °C | 1 | 1 |
| **HTC33H** | HTC33H | 33 | | | | 1 | 1 |

## Output power rating




Nominal power output versus temperature graph evaluated on thermal insulated metal pipes

## Circuit length sizing

| ref. | ambient temperature at start-up (°C) | circuit breaker current rating | | |
|---|---|---|---|---|
| | | 20 A | 30 A | 40 A |
| | | maximum cable circuit length * (m) | | |
| HTC25P | –20 | 71 | 106 | 120 |
| | 0 | 80 | 120 | 120 |
| | +10 | 110 | 120 | 120 |
| HTC33H | –20 | 58 | 78 | 89 |
| | 0 | 66 | 89 | 100 |
| | +10 | 90 | 100 | 100 |

* Estimated values for installation with type C curve, 30 mA ground-fault circuit breaker

Type
**self-regulating**

Supply voltage
**230 Vac**

Conductor Cross-section
**0,8 mm²** (18 AWG)

Maximum intermittent exposure temperature
**85 °C**

Maximum continuous exposure temperature
**65 °C**

Cable cross dimensions
**11,5 × 6,3 mm**

Minimum bend radius
**40 mm** (at –40°C)

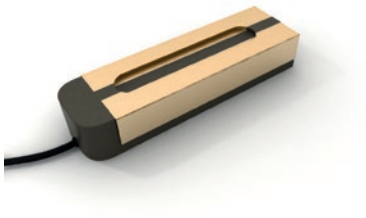
# Installation example

## Self-regulating heating cables for roofs, gutters and downspouts de-icing

# Self-regulating heating cables installation accessories
roof, gutter and downspout de-icing

## STGHTC1

## Humidity sensor
for gutters and downspouts



### Applications
- Humidity detection in self-regulating tracing systems for roof, gutter and downspout de-icing
- Installed in gutter or downspout
- Used in conjunction with CTA-HTC1 control unit

### Specifications
- Operating mode: humidity sensor
- Degree of protection: IP68
- Operating temperature range: –50 °C to +70 °C
- Dimensions: 105 × 30 × 13 mm
- Connecting cable:
  Conductor cross-section 4 × 1,5 mm²
  length: 10 m (extensible up to 200 m, with total wire resistance less than 10 Ω)

| ref. | item | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|
| **STGHTC1** | STGHTC1 | 1 | 1 |

## STTHTC1

## Temperature sensor
for self-regulating cables

### Applications
- Temperature detection in self-regulating tracing systems for roof, gutter and downspout de-icing
- Used in conjunction with CTA-HTC1 control unit
- Installed on the shadiest side of the building

### Specifications
- Operating mode: temperature detection
- Degree of protection: IP54
- Operating temperature range: –50 °C to +70 °C
- Dimensions: 50 × 50 × 35 mm
- Connecting cable:
  Conductor cross-section: 2 × 1,5 mm²
  length: 10 m (extensible up to 50 m, with total wire resistance less than 10 Ω)

| ref. | item | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|
| **STTHTC1** | STTHTC1 | 1 | 1 |

# CTAHTC1

## Control unit for self-regulating heat tracing systems

### Applications

Power on/off control of self-regulating heating circuits in presence of the appropriate climatic conditions detected by temperature and humidity sensors

### Specifications

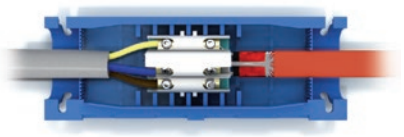
- Supply voltage: 230 V ac
- Switching capacity: 16 A (3600 W)
- Temperature setpoint range: 0 °C to 10 °C
- Ambient temperature range: –10 °C to +50 °C
- Degree of protection: IP20
- Dimensions: 86 × 52 × 59 mm
- Weight: 200 g

| ref. | item | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|
| **CTAHTC1** | CTAHTC1 | 1 | 1 |

# Installation accessories for self-regulating heating cables

## Shark 306

### Gel joint with terminal block
for hot lead/cold lead connection



### Applications
Connection of heat tracing cable (hot lead) to supply cable (cold lead) in self-regulating tracing systems

### Specifications
- Conductor cross-section: 3 × 1,5 – 6 mm²
- For further informations, see p. 13

| ref. | item | application | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|
| **SH0306** | SHARK 306 | HTC-S, HTC-P and HTC-H heating cables | 1 | 1 |

## GBHTC1

### Heat shrink joint with insulated connectors
for hot lead/cold lead connection

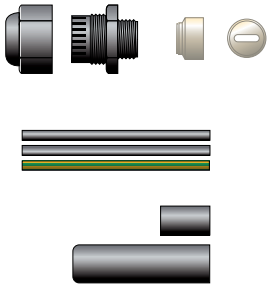
### Applications
Connection of heat tracing cable (hot lead) to supply cable (cold lead) in self-regulating tracing systems

| ref. | item | application | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|
| **GBHTC1** | GBHTC1 | HTC-S, HTC-P and HTC-H heating cables | 1 | 1 |

# Installation accessories for self-regulating heating cables

## KTA

## Kit di collegamento alimentazione e di terminazione
per cavi scaldanti autoregolanti



### Applications

In self-regulating heating cable systems:
- connecting heating cable to terminal block in supply junction box
- heating cable end cap termination

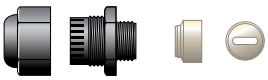
### Kit contents

- Heat shrink tubings
- Shaped cable gland, for passing heating cable through supply junction box

| ref. | item | application | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|
| **KTA00S** | KTA00S | HTC-S heating cables | 1 | 1 |
| **KTA0PH** | KTA0PH | HTC-P and HTC-H heating cables | 1 | 1 |

## PRHTC

## Shaped cable gland
for self-regulating heating cables



| ref. | item | application | min. ord. qty. (pcs) | mult. ord. qty. (pcs) |
|---|---|---|---|---|
| **PRHTC1** | PRHTC1 | HTC-S heating cables | 1 | 1 |
| **PRHTC2** | PRHTC2 | HTC-P and HTC-H heating cables | 1 | 1 |

# HTC-H

## Self-regulating heating cable
for surface heating of outdoor **ramps and pavements**

## Construction

*bus wires*
tinned copper

*self-regulating conductive core (heating matrix)*

*insulating inner jacket*
modified polyolefin

*shield braid*
tinned copper

*outer jacket*
polyolefin

## Applications

- Defrosting and snow and ice melting snow on access ramps and outdoor surfaces used by pedestrians or vehicles
- Can be installed under concrete, brick paving, porphyry
-

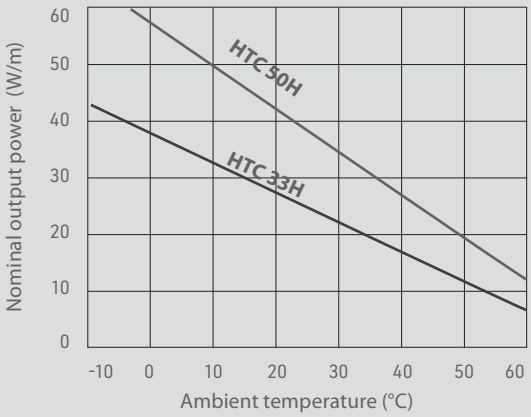
## Specifications

- Outer jacket colour: gray
- Degree of protection: IP 66 (EN 60529)
- CE Marking

| ref. | item | power at 0 °C (W/m) * | maximum exposure temperature | | minimum installation temperature | min. ord. qty. (m) | mult. ord. qty. (m) |
|---|---|---|---|---|---|---|---|
| | | | continuous | intermittent | | | |
| **HTC33H** | HTC33H | 50 | 65 °C | 85 °C | –40 °C | 1 | 1 |
| **HTC50H** | HTC50H | 90 | | | | 1 | 1 |

* For installation under concrete

## Output power rating




Nominal power output versus temperature graph

## Circuit length sizing

| ref. | start-up temperature under concrete | circuit breaker current rating | | | | |
|---|---|---|---|---|---|---|
| | | 16 A | 20 A | 30 A | 40 A | 50 A |
| | | maximum length of each cable circuit* (m) | | | | |
| **HTC33H** | **+10 °C** | 68 | 84 | 127 | 169 | - |
| **HTC50H** | **–15 °C** | - | - | 73 | 98 | 122 |

* Estimated values for installation with type C curve, 30 mA ground-fault circuit breaker

Type
**self-regulating**

Supply voltage
**230 Vac**

Conductor Cross-section
**0,8 mm²** (18 AWG)

Maximum intermittent exposure temperature
**85 °C**

Maximum continuous exposure temperature
**65 °C**

Cable cross dimensions
**11,5 × 6,3 mm**

Minimum bend radius
**40 mm** (at –40°C)

# STUHTC1

## Temperature, humidity and ice detection combined sensor
for outdoor surface heating applications

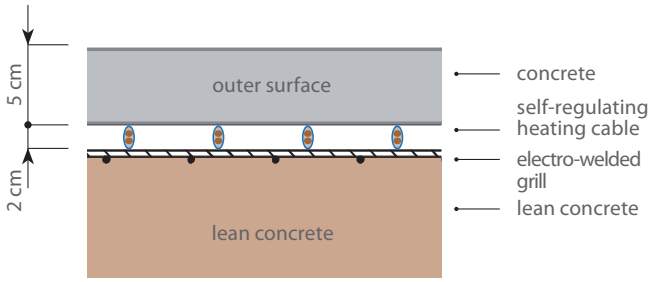
### Applications
- Outdoor surface heating system utilizing built with self-regulating cables fortemperature, mosture, frost and ice detection
- Connected to control unit

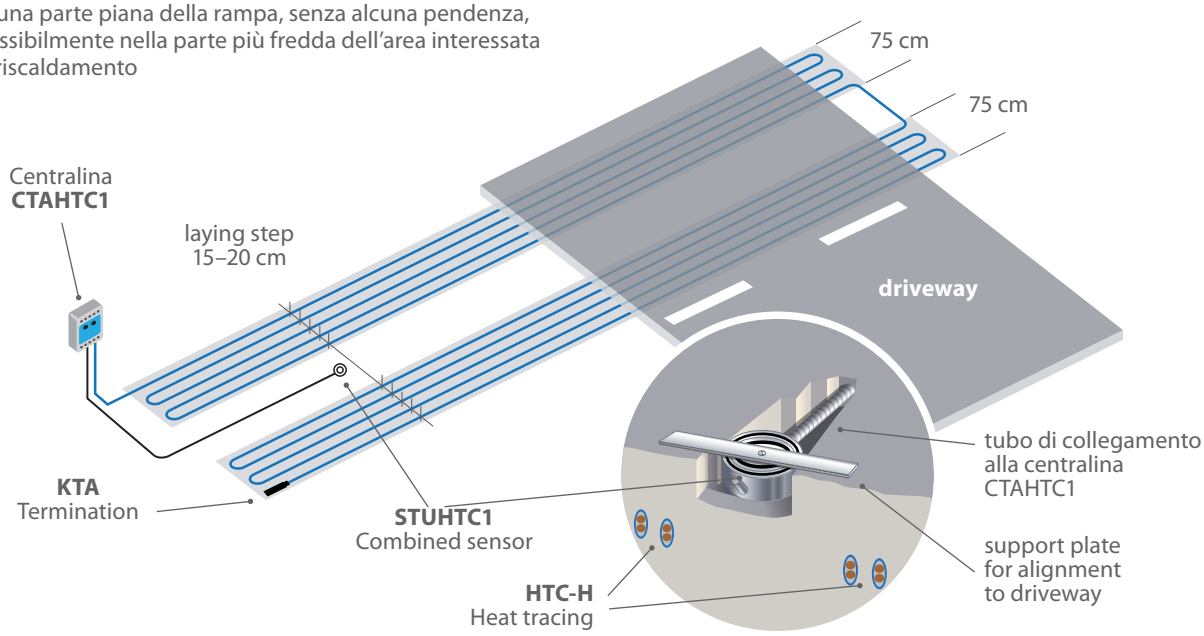
### Specifications
- Installation flush to surface
- Degree of protection: IP68
- Operating temeprature range: –50°C to 70 °C
- Dimensions (diameter × height): 63,5 × 78 mm – Weight: 250 g
- Connecting cable:
  Conductor cross-section 6 × 1,5 mm²
  length: 10 m (extensible up to 200 m, with total wire resistance less than 10 Ω)

| ref. | item | min. ord. qty. | mult. ord. qty. |
|---|---|---|---|
| **STUHTC1** | STUHTC1 | 1 | 1 |

# Example installation scheme
Self-regulating heating system for outdoor ramps and pavements

- Il cavo scaldante è fissato direttamente alla griglia elettrosaldata mediante comuni fascette plastiche
- Posa generalmente longitudinale alla direzione di marcia, con passo di circa 15–20 cm
- Il cavo scaldante deve essere posato di taglio (vedi figura), in modo da permettere una curvatura agevole all'atto dell'installazione
- il sensore combinato STUHTC1 deve essereposizionato in una parte piana della rampa, senza alcuna pendenza, possibilmente nella parte più fredda dell'area interessata al riscaldamento



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