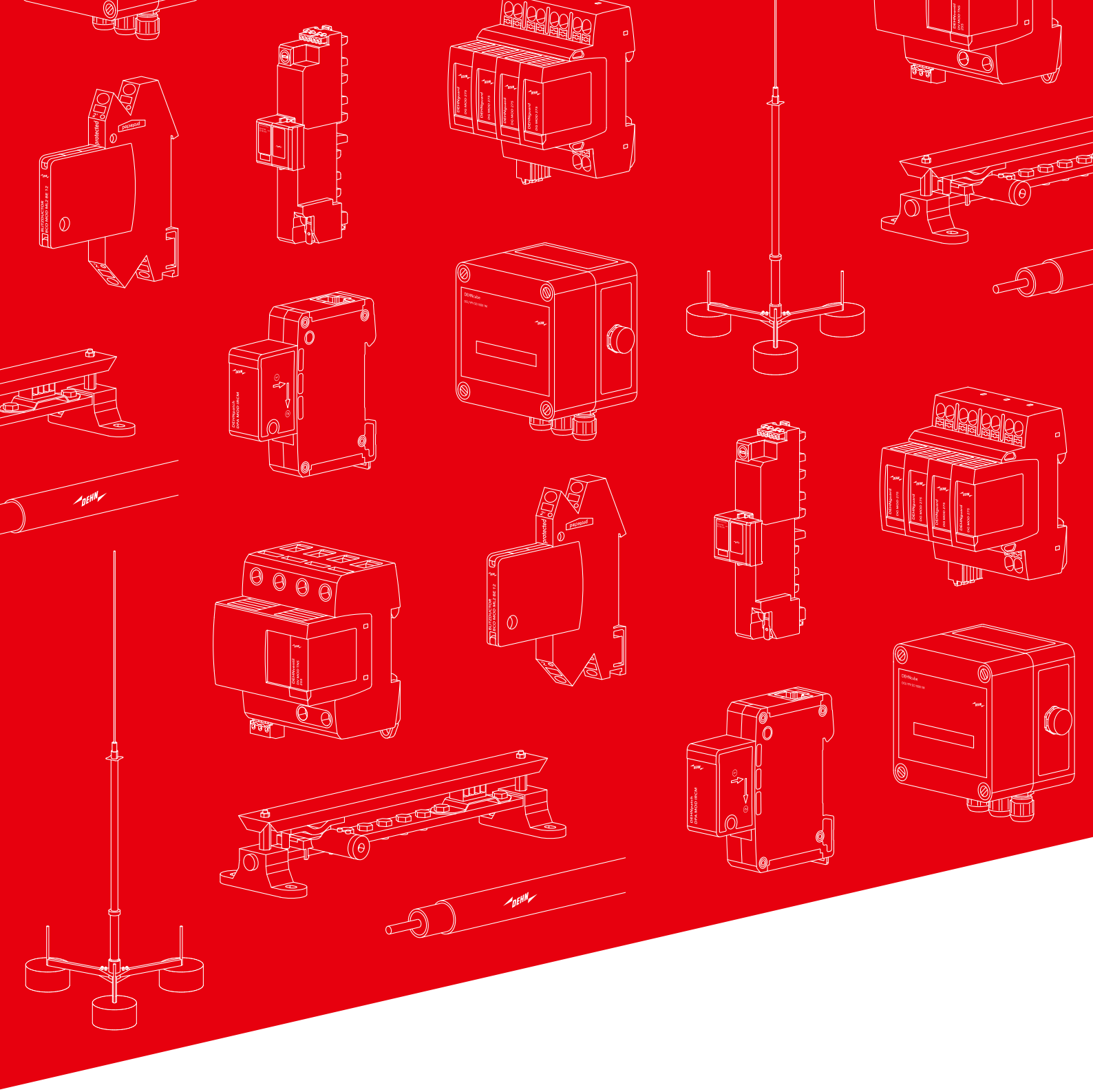


# Lightning Protection / Earthing Surge Protection

**Catalogue**

Valid from April 2025

**DEHN protects.**

www.dehn-international.com

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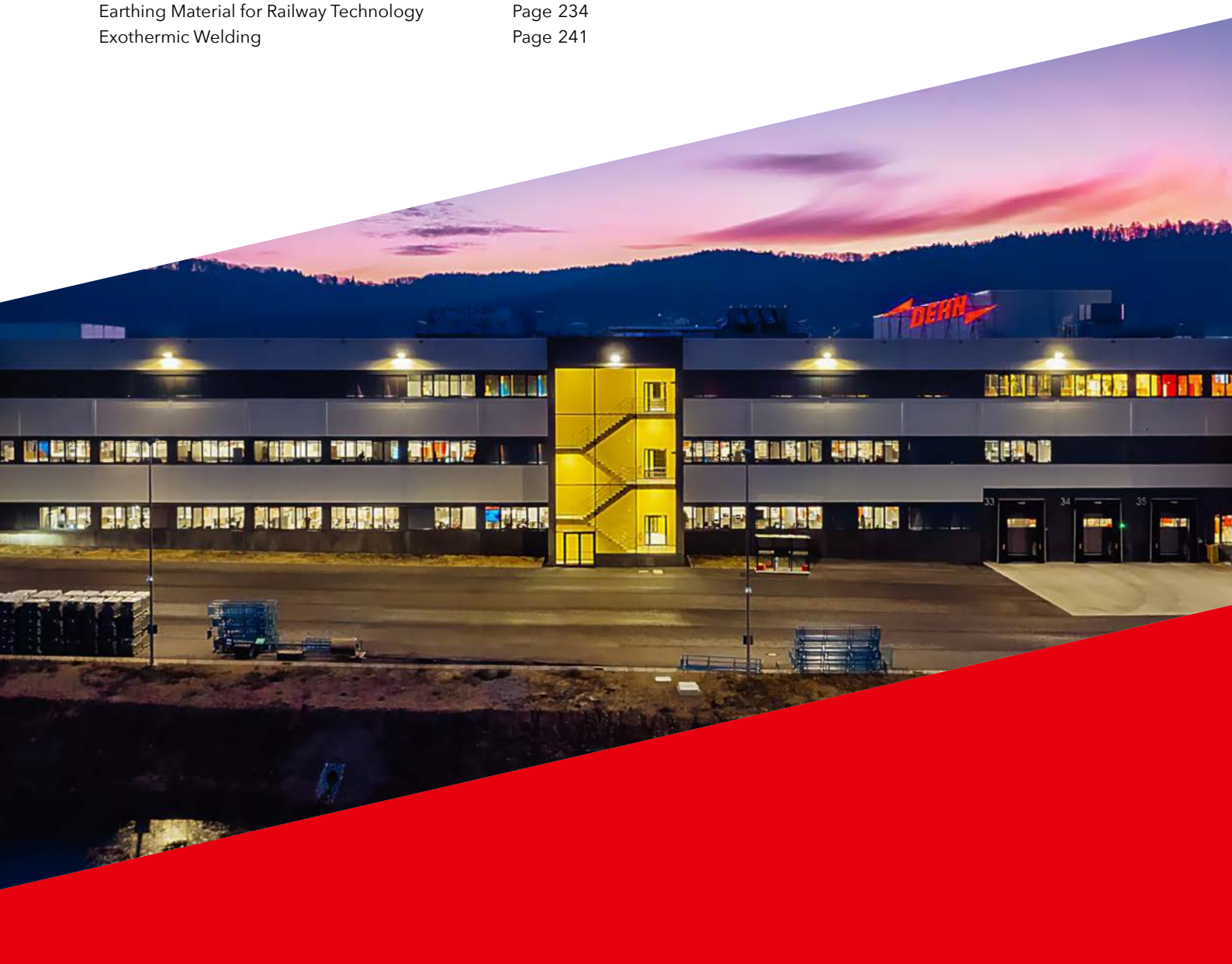
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# Services

Quickly find the right service product:
**https://de.hn/bKgsn**


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# Knowledge – DEHNacademy

## DEHN E-learning

You would like to know more about lightning and surge protection?

Whenever and wherever is convenient for you: take advantage of our constantly growing range of digital learning resources.

Our constantly growing range of e-learning resources supports you:

- whenever
- wherever
- convenient

benefitTake advantage of this free service, select a course and get started.

DEHN E-learning:
**https://de.hn/2J62Z**

## Events attended online and in person

Would you like to expand your knowledge in a group? You need expert knowledge for a specific branch?

Then the DEHNacademy seminars attended online or in-person are just the right thing for you.

Choose from a large selection of seminars and workshops on the topics: surge protection – lightning protection – safety equipment.

With the perfect balance of theory and practice. Each seminar ends with a certificate confirming your participation.

DEHNacademy:
**https://de.hn/3AQPe**

# Tools – Planning support

## DEHNplan

With the BIM-compatible, Web-based planning software, you can easily plan the standard-compliant external lightning protection and earthing system for your project. The efficient use of DEHNplan does not require any special prior knowledge and your specialised knowledge of lightning protection and earthing, as well as CAD skills, are sufficient.

**Advantages for you at a glance:**

- **3D lightning protection planning**
  Transparent, efficient and fast preparation and documentation in high planning quality
- **Standard-compliant**
  With just one tool, it's easy to achieve standard-compliant external lightning protection according to DIN EN 62305 (VDE 0185-305)
- **Future-proof**
  Equipped for future requirements with BIM-enabled software
- **Easy**
  Intuitive user interface and visual representation of protective space and separation distances for greater comprehensibility
- **Quick overview**
  Live incorporated bill of materials for cost transparency and all tender specifications in just a few steps
- **Cloud-based and up to date**
  Use not restricted to any particular work area with regular updates

DEHNplan:
**https://de.hn/9mgP1**

## DEHNconcept

Save yourself time, money and resources:
The DEHNconcept planning service creates a complete lightning protection concept for your project from a single source.
You will receive the optimum solution and project design for lightning protection and the earthing system for your object, quite simply as a complete module, including all planning documents in an open data format for your documentation. In addition, we discuss industry and country specifics with you in project meetings and on-site appointments.

**Examples from the services catalogue:**

- **Protection concepts and calculations for external and internal lightning protection**
  Budget planning, risk analysis, lightning protection concept, surge protection concept, separation distance calculation, checking the protected volume, 3D laser scanning, creating drawings and models
- **Protection concepts earthing of lightning protection**
  Earthing concept for lightning protection systems, earthing simulation of step voltage
- **Concepts and calculations specially for transformer stations**
  Calculation of earthing conductor cross-sections, earthing simulation of step and touch voltage in case of short-circuit current and/or lightning interference

DEHNconcept:
**https://de.hn/4oV2p**









# Expert knowledge from DEHN

## Inspection tour

Planning a new system or changes to existing systems? Get expert knowledge and personal advice. To do so, simply get in touch with a DEHN employee. Always near to you.

The highly trained lightning protection specialists in our field sales team will be happy to assist you. Providing expert knowledge on all aspects of earthing and lightning and surge protection.

Are you an end user or potential buyer from the private sector?

Please contact a specialist contractor in your area. To be found, for example, at **www.e-check.de** or **www.vdb.blitzschutz.com**.

Inspection tour:
**https://de.hn/vnGia**

## DEHN Test Centre

The ISO/IEC 17025 accredited DEHN Test Centre is one of the most powerful test laboratories for lightning impulse currents in the world.
Products, installations and systems are tested with test impulses of up to 400 kA (10/350 µs) in a facility spanning 800 m². Tests are conducted on the basis of the relevant test standards. Where necessary, they are accompanied by simulations.

In the DEHN Test Centre tests are carried out on

- lightning protection components,
- surge protective devices,
- and complete systems.

The tests and their results are documented in internationally recognised test reports. The accreditation symbol stands for maximum confidentiality and independence.
Are you interested in our services? Simply submit an enquiry and we will draw up a service offer tailored to your requirements.

DEHN Test Centre:
**https://de.hn/7LURR**

# Expert advice from DEHN

## Technischer Support

You plan or install lightning protection / earthing systems and have questions about the correct design?
You need some sort of surge protection and don't know exactly what to install or how to connect it?
You are occupied with the protection of people and systems and need help choosing the right voltage detector?

Our technical support provides expert advice and assistance. Whether you have questions about products or applications, planning or risk analyses, or standards: Our experts are happy to assist you. By phone, email or even on site upon agreement – **individual, competent, fast, reliable, free of charge.**

**How to reach us:**

Your query about earthing and equipotential bonding:
+49 9181 906 1750

Your query about lightning and surge protection:
+49 9181 906 1750

Your query about safety equipment:
+49 9181 906 1510

Technical Support:
**https://de.hn/9J8VP**






# Lightning Protection Van

## Consultation on site

DEHN lightning protection comes to you and your team. Our DEHN Lightning Protection Van is more than just a vehicle – it is a mobile experience and training venue in one. And all directly at your location.

The focus here is on our HVI lightning protection system, whether that be product innovations, installation tips or compact training courses on installation or measurement. Let our experts inform and train you personally.

Request a visit from the Lightning Protection Van. We look forward to hearing from you.

DEHN Lightning Protection Van:
**https://de.hn/bfnEF**

# Cable material and Accessories



Discover our cable material and accessories:
**https://de.hn/7Q32a**


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# Cable material and Accessories



## Round Wires

According to EN 62561-2, for use in lightning protection and earth-termination systems.



Conductor materials can only be supplied in the original coil weights.
Further conductor materials as specified in the standard series EN 62561-2 are available on request.

### DEHNalu wire



| General technical data: | |
|---|---|
| Length tolerance | +/- 5% |

| Type RD ... | 8 ALMGSI HH R148M | 8 ALMGSI HH R21M |
|---|---|---|
| **Part No.** | **840 008** | **840 108** |
| Diameter Ø conductor | 8 mm | 8 mm |
| Cross-section | 50 mm² | 50 mm² |
| Material | AlMgSi | AlMgSi |
| Characteristics | semi-rigid | semi-rigid |
| Standard | EN 62561-2 | EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6.4 kA | 6.4 kA |
| Coil weight | approx. 20 kg | approx. 3 kg |
| PU | 148 m | 21 m |

| Type RD ... | 8 ALMGSI WEI R148M | 8 ALMGSI WEI R21M |
|---|---|---|
| **Part No.** | **840 018** | **840 028** |
| Diameter Ø conductor | 8 mm | 8 mm |
| Cross-section | 50 mm² | 50 mm² |
| Material | AlMgSi | AlMgSi |
| Characteristics | soft, twistable | soft, twistable |
| Standard | based on EN 62561-2 | based on EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6.4 kA | 6.4 kA |
| Coil weight | approx. 20 kg | approx. 3 kg |
| PU | 148 m | 21 m |

| Type RD ... | 10 Al WEI R100M |
|---|---|
| **Part No.** | **840 010** |
| Diameter Ø conductor | 10 mm |
| Cross-section | 78 mm² |
| Material | Al |
| Characteristics | soft, twistable |
| Standard | EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 10 kA |
| Coil weight | approx. 21 kg |
| PU | 100 m |

Note: Al and AlMgSi may not be installed directly (without a gap) on, in, or under plaster, mortar or concrete, and also not in soil.

### DEHNalu wire with plastic sheath



Wire with plastic sheath (halogen-free, frost-resistant and UV-stabilised) as additional mechanical / corrosion protection, e.g. when installed behind facades. Not suitable for underground installation.

| Type RD ... | 8 ALMGSI WE KM R100M | 8 AL WE KM R100M |
|---|---|---|
| **Part No.** | **840 118** | **840 128** |
| Diameter Ø conductor | 8 mm | 8 mm |
| Cross-section | 50 mm² | 50 mm² |
| Material | AlMgSi | Al |
| Characteristics | soft | soft |
| Standard | based on EN 62561-2 | EN 62561-2 |
| Outside diameter Ø | 11 mm | 11 mm |
| Material of sheath | **plastic** | **plastic** |
| Sheath thickness | 1.5 mm | 1.5 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6.4 kA | 6.4 kA |
| Coil weight | approx. 20 kg | approx. 20 kg |
| Length tolerance | +/- 5% | +/- 5% |
| PU | 100 m | 100 m |

### DEHNcupal wire



Composite material with low weight in comparison to copper.
For use above ground as an air-termination and down conductor, or for equipotential bonding.

| Type RD ... | 8 AL CU WEI R110M |
|---|---|
| **Part No.** | **833 008** |
| Diameter Ø conductor | 8 mm |
| Cross-section | 50 mm² |
| Material | Al / Cu |
| Characteristics | soft, twistable |
| Standard | based on EN 62561-2 |
| Cu sheath | min. 0.26 mm |
| Coil weight | approx. 20 kg |
| Length tolerance | +/- 5% |
| PU | 110 m |

Note: DEHNcupal wire can be twisted or straightened using a wire straightening device.

## Copper wire



| General technical data: | |
|---|---|
| Diameter Ø conductor | 8 mm |
| Cross-section | 50 mm² |
| Material | Cu |
| Standard | EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 9.7 kA |
| Length tolerance | +/- 5% |

| Type RD ... | 8 CU F20 WEI R100M | 8 CU F20 WEI R20M |
|---|---|---|
| Part No. | 830 008 | 830 108 |
| Characteristics | soft F20 | soft F20 |
| Coil weight | approx. 45 kg | approx. 9 kg |
| PU | 100 m | 20 m |

| Type RD ... | 8 CU F25 HH R100M |
|---|---|
| Part No. | 830 038 |
| Characteristics | semi-rigid F25 |
| Coil weight | approx. 45 kg |
| PU | 100 m |

## Stainless steel wire



Stainless steel wires (Rd 10 mm) for use in soil have to be made of StSt (V4A) with a molybdenum content > 2 %, e.g. 1.4571 or 1.4404, in accordance with EN 62561-2, IEC/EN 62305-3, DIN 18014 and DIN VDE 0151.

| General technical data: | |
|---|---|
| Standard | based on EN 62561-2 |
| Length tolerance | +/- 5% |

| Type RD ... | 8 V2A R125M | 10 V2A R20M |
|---|---|---|
| Part No. | 860 908 | 860 920 |
| Diameter Ø conductor | 8 mm | 10 mm |
| Cross-section | 50 mm² | 78 mm² |
| Material | StSt | StSt |
| Material No. | 1.4301 / 1.4303 | 1.4301 / 1.4303 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 1.9 kA | 2.9 kA |
| Coil weight | approx. 50 kg | approx. 12 kg |
| PU | 125 m | 20 m |

| Type RD ... | 10 V2A R50M | 10 V2A R80M |
|---|---|---|
| Part No. | 860 950 | 860 910 |
| Diameter Ø conductor | 10 mm | 10 mm |
| Cross-section | 78 mm² | 78 mm² |
| Material | StSt | StSt |
| Material No. | 1.4301 / 1.4303 | 1.4301 / 1.4303 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 2.9 kA | 2.9 kA |
| Coil weight | approx. 31 kg | approx. 50 kg |
| PU | 50 m | 80 m |

| Type RD ... | 8 V4A R125M | 10 V4A R80M |
|---|---|---|
| Part No. | 860 008 | 860 010 |
| Diameter Ø conductor | 8 mm | 10 mm |
| Cross-section | 50 mm² | 78 mm² |
| Material | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 | 1.4571 / 1.4404 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 1.9 kA | 2.9 kA |
| Coil weight | approx. 50 kg | approx. 50 kg |
| PU | 125 m | 80 m |

| Type RD ... | 10 V4A R20M | 10 V4A R50M |
|---|---|---|
| Part No. | 860 020 | 860 050 |
| Diameter Ø conductor | 10 mm | 10 mm |
| Cross-section | 78 mm² | 78 mm² |
| Material | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 | 1.4571 / 1.4404 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 2.9 kA | 2.9 kA |
| Coil weight | approx. 12 kg | approx. 31 kg |
| PU | 20 m | 50 m |

## Copper-bonded steel wire



Copper-bonded steel round wires offer better conductivity than steel. With copper coating ≥ 250 µm on average. For use as an air-termination and down conductor, or for horizontal earth electrode.

| General technical data: | |
|---|---|
| Material | St / Cu |
| Characteristics | torsion-soft |
| Standard | IEC 62561-2-2012, DL/T 131 2-2013 |
| Cu sheath | ≥ 0.25 mm |
| Length tolerance | +/- 5% |

| Type RD ... | 8 STCU R100M | 10 STCU R100M |
|---|---|---|
| Part No. | 870 008 | 870 010 |
| Diameter Ø conductor | 8 mm | 10 mm |
| Cross-section | 50 mm² | 78 mm² |
| Coil weight | approx. 40 kg | approx. 62 kg |
| PU | 100 m | 100 m |

| Type RD ... | 13 ST CU R100M | 14 ST CU R100M |
|---|---|---|
| Part No. | 870 013 | 870 014 |
| Diameter Ø conductor | 13 mm | 14 mm |
| Cross-section | 133 mm² | 150 mm² |
| Coil weight | approx. 106 kg | approx. 122 kg |
| PU | 100 m | 100 m |

| Type | 16 ST CU R100M |
|---|---|
| Part No. | 870 016 |
| Diameter Ø conductor | 16 mm |
| Cross-section | 200 mm² |
| Coil weight | approx. 158 kg |
| PU | 100 m |

Note: DEHN copper coated round steel wire can be twisted or straightened with the wire straightening devices.

## Steel wire with plastic sheath



With plastic sheath as additional mechanical / corrosion protection, e.g. when connected to the lightning protection system. Suitable for installation in soil, on, in and under plaster, mortar or concrete.

| Type RD ... | 8 KM STTZN R75M | 10 KM STTZN R50M |
|---|---|---|
| Part No. | 800 108 | 800 110 |
| Diameter Ø conductor | 8 mm | 10 mm |
| Cross-section | 50 mm² | 78 mm² |
| Material | St/tZn | St/tZn |
| Standard | based on EN 62561-2 | based on EN 62561-2 |
| Outside diameter Ø | 11 mm | 13 mm |
| Material of sheath | plastic | plastic |
| Sheath thickness | 1.5 mm | 1.5 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 3.5 kA | 5.5 kA |
| Coil weight | approx. 33 kg | approx. 34 kg |
| Length tolerance | +/- 5% | +/- 5% |
| PU | 75 m | 50 m |

# Cable material and Accessories

## Steel wire

With zinc coating ≥ 50 µm on average (approx. 350 g/m²).



| General technical data: | |
|---|---|
| Material | **St/tZn** |
| Standard | based on EN 62561-2 |
| Length tolerance | +/- 5% |

| Type RD ... | 8 STTZN R127M | 8 STTZN R50M |
|---|---|---|
| **Part No.** | **800 008** | **800 028** |
| Diameter Ø conductor | 8 mm | 8 mm |
| Cross-section | 50 mm² | 50 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 3.5 kA | 3.5 kA |
| Coil weight | approx. 50 kg | approx. 20 kg |
| PU | 127 m | 50 m |

| Type RD ... | 10 STTZN R81M | 10 STTZN R30M |
|---|---|---|
| **Part No.** | **800 010** | **800 310** |
| Diameter Ø conductor | 10 mm | 10 mm |
| Cross-section | 78 mm² | 78 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 5.5 kA | 5.5 kA |
| Coil weight | approx. 50 kg | approx. 18.5 kg |
| PU | 81 m | 30 m |

## Steel wire, straightened, cut into bars

With zinc coating ≥ 50 µm on average (about 350 g/m²). Suitable for installation in reinforcements (e.g. concrete supports or concrete foundations).



| General technical data: | |
|---|---|
| Diameter Ø conductor | 10 mm |
| Cross-section | 78 mm² |
| Material | **St/tZn** |
| Standard | based on EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 5.5 kA |
| Length tolerance | +/- 5% |

| Type RD ... | 10 STTZN L1000 | 10 STTZN L2000 |
|---|---|---|
| **Part No.** | **800 906** | **800 908** |
| Length | 1 m | 2 m |
| PU | 10 pc(s) | 10 pc(s) |

| Type RD ... | 10 STTZN L3000 | 10 STTZN L6000 |
|---|---|---|
| **Part No.** | **800 910** | **800 911** |
| Length | 3 m | 6 m |
| PU | 10 pc(s) | 1 pc(s) |

Various Wire Straighteners can be found on page 225.



## Marker for Connection Lugs

Attached to round wires or strips to make them conspicuous (as required by DIN 18014) during the construction work.



| Type | SK RD10 FL30X3.5 GRGE PVC |
|---|---|
| **Part No.** | **478 099** |
| Material | **PVC** |
| Diameter Ø | 70 mm |
| Fits on Fl | 30 x 3.5 mm |
| Fits on Rd | 10 mm |
| Colour | green ● / yellow ● |
| PU | 20 pc(s) |

## Dripping Water Protective Collars

Prevents rain water from running down the round wire and soiling of the facade.



| Type MS 37 4.7 B7.5 K ... | GR | BR |
|---|---|---|
| **Part No.** | **276 056** | **276 057** |
| Material | **plastic** | **plastic** |
| Conductor Rd | 8 mm | 8 mm |
| Colour | grey ● | brown ● |
| Diameter Ø | 37 mm | 37 mm |
| PU | 100 pc(s) | 1 pc(s) |

## Strips

According to EN 62561-2, for use in earth-termination and lightning protection systems as well as for ring equipotential bonding.



Strips in different dimensions and materials are available upon request.

## Bare steel strip



| Type | BA 50X4 ST R30M |
|---|---|
| **Part No.** | **810 503** NEW |
| Width | 50 mm |
| Thickness | 4 mm |
| Cross-section | 200 mm² |
| Material | **St/bare (S235 JR)** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | DIN EN 62561-2 (VDE 0185-561-2) |
| Guideline | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 14 kA |
| Coil weight | approx. 50 kg |
| Length tolerance | +/- 5% |
| PU | 30 m |

## HDG steel strip

Zinc coating ≥ 70 µm on average (approx. 500 g/m²).



| General technical data: | | |
|---|---|---|
| Material | | St/tZn |
| Length tolerance | | +/- 5% |

| Type BA ... | 20X2.5 STTZN R100M | 30X3.5 STTZN R50M |
|---|---|---|
| Part No. | 810 225 | 810 335 |
| Width | 20 mm | 30 mm |
| Thickness | 2.5 mm | 3.5 mm |
| Cross-section | 50 mm² | 105 mm² |
| Standard | based on EN 62561-2 | EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 3.5 kA | 7.4 kA |
| Coil weight | approx. 40 kg | approx. 42 kg |
| PU | 100 m | 50 m |

| Type BA ... | 30X3.5 STTZN R25M | 30X3.5 STTZN EASY R25M |
|---|---|---|
| Part No. | 852 335 | 854 335 |
| Width | 30 mm | 30 mm |
| Thickness | 3.5 mm | 3.5 mm |
| Cross-section | 105 mm² | 105 mm² |
| Standard | EN 62561-2 | based on DIN EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 7.4 kA | 7.4 kA |
| Coil weight | approx. 21 kg | approx. 21 kg |
| PU | 25 m | 25 m |

| Type BA ... | BA 30X3.5 STTZN EASY R50M | BA 30X4 STTZN R52M |
|---|---|---|
| Part No. | 814 335 | 810 304 |
| Width | 30 mm | 30 mm |
| Thickness | 3.5 mm | 4 mm |
| Cross-section | 105 mm² | 120 mm² |
| Standard | based on DIN EN 62561-2 | EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 7.4 kA | 8.4 kA |
| Coil weight | approx. 42 kg | approx. 50 kg |
| PU | 50 m | 52 m |

| Type BA ... | BA 40X4 STTZN R40M | BA 40X5 STTZN R30M |
|---|---|---|
| Part No. | 810 404 | 810 405 |
| Width | 40 mm | 40 mm |
| Thickness | 4 mm | 5 mm |
| Cross-section | 160 mm² | 200 mm² |
| Standard | EN 62561-2 | EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 11.2 kA | 14 kA |
| Coil weight | approx. 50 kg | approx. 50 kg |
| PU | 40 m | 30 m |

| Type BA ... | 50X4 STTZN R30M |
|---|---|
| Part No. | 810 504 |
| Width | 50 mm |
| Thickness | 4 mm |
| Cross-section | 200 mm² |
| Standard | EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 14 kA |
| Coil weight | approx. 50 kg |
| PU | 30 m |

## Copper strip

Manufactured from high conductivity annealed copper (EN / BS EN 13601) for use in lightning protection and earthing systems.



| General technical data: | |
|---|---|
| Material | Cu |
| Length tolerance | +/- 5% |

| Type | BA 20X2.5 CU R100M | TAPE 25X3 CU R50M |
|---|---|---|
| Part No. | 831 225 | 128 010 |
| Width | 20 mm | 25 mm |
| Thickness | 2.5 mm | 3 mm |
| Cross-section | 50 mm² | 75 mm² |
| Standard | EN 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 9.7 kA | – |
| Coil weight | approx. 45 kg | approx. 33.5 kg |
| PU | 100 m | 50 m |

| Type | TAPE 25X4 CU R40M | TAPE 25X6 CU R40M |
|---|---|---|
| Part No. | 128 011 | 128 012 |
| Width | 25 mm | 25 mm |
| Thickness | 4 mm | 6 mm |
| Cross-section | 100 mm² | 150 mm² |
| Standard | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 40 m | 40 m |

| Type | TAPE 30X2 CU R40M | TAPE 30X2.5 CU R40M |
|---|---|---|
| Part No. | 128 018 | 128 019 |
| Width | 30 mm | 30 mm |
| Thickness | 2 mm | 2.5 mm |
| Cross-section | 60 mm² | 75 mm² |
| Standard | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 40 m | 40 m |

| Type | TAPE 30X5 CU R30M | TAPE 31X6 CU R30M |
|---|---|---|
| Part No. | 128 021 | 128 013 |
| Width | 30 mm | 31 mm |
| Thickness | 5 mm | 6 mm |
| Cross-section | 150 mm² | 186 mm² |
| Standard | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 30 m | 30 m |

| Type | TAPE 40X3 CU R20M | TAPE 40X5 CU R20M |
|---|---|---|
| Part No. | 128 022 | 128 023 |
| Width | 40 mm | 40 mm |
| Thickness | 3 mm | 5 mm |
| Cross-section | 120 mm² | 200 mm² |
| Standard | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 20 m | 20 m |

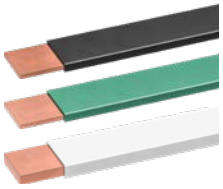
| Type | TAPE 40X6 CU R20M | TAPE 50X3 CU R20M |
|---|---|---|
| Part No. | 128 024 | 128 016 |
| Width | 40 mm | 50 mm |
| Thickness | 6 mm | 3 mm |
| Cross-section | 240 mm² | 150 mm² |
| Standard | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 20 m | 20 m |

| Type | TAPE 50X4 CU R20M | TAPE 50X6 CU R20M |
|---|---|---|
| Part No. | 128 230 | 128 235 |
| Width | 50 mm | 50 mm |
| Thickness | 4 mm | 6 mm |
| Cross-section | 200 mm² | 300 mm² |
| Standard | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 20 m | 20 m |

# Cable material and Accessories

## PVC covered copper strip

PVC covered copper tapes. Manufactured from high conductivity annealed copper (EN / BS EN 13601), for use in lightning protection and earthing systems.



| General technical data: | |
|---|---|
| Material | Cu |
| Standard | IEC / EN IEC / BS EN IEC 62561-2 |
| Covering thickness | 1 mm |
| Length tolerance | +/- 5% |

| Type | TAPE 25X3 CU PVC WHITE R50M | TAPE 25X3 CU PVC BROWN R50M |
|---|---|---|
| Part No. | 128 036 | 128 031 |
| Width | 25 mm | 25 mm |
| Thickness | 3 mm | 3 mm |
| Cross-section | 75 mm² | 75 mm² |
| Type | White | Brown |
| PU | 50 m | 50 m |

| Type | TAPE 25X3 CU PVC STONE R50M | TAPE 25X3 CU PVC GREEN R50M |
|---|---|---|
| Part No. | 128 035 | 128 032 |
| Width | 25 mm | 25 mm |
| Thickness | 3 mm | 3 mm |
| Cross-section | 75 mm² | 75 mm² |
| Type | Stone | Green |
| PU | 50 m | 50 m |

| Type | TAPE 25X3 CU PVC BLACK R50M | TAPE 25X3 CU PVC GREY R50M |
|---|---|---|
| Part No. | 128 030 | 128 034 |
| Width | 25 mm | 25 mm |
| Thickness | 3 mm | 3 mm |
| Cross-section | 75 mm² | 75 mm² |
| Type | Black | Grey |
| PU | 50 m | 50 m |

| Type | TAPE 25X6 CU PVC WHITE R40M | TAPE 25X6 CU PVC GREY R40M |
|---|---|---|
| Part No. | 128 080 | 128 081 |
| Width | 25 mm | 25 mm |
| Thickness | 6 mm | 6 mm |
| Cross-section | 150 mm² | 150 mm² |
| Type | White | Grey |
| PU | 40 m | 40 m |

| Type | TAPE 25X6 CU PVC GREEN R40M | TAPE 31X6 CU PVC WHITE R30M |
|---|---|---|
| Part No. | 128 085 | 128 090 |
| Width | 25 mm | 31 mm |
| Thickness | 6 mm | 6 mm |
| Cross-section | 150 mm² | 186 mm² |
| Type | Green | White |
| PU | 40 m | 30 m |

| Type | TAPE 31X6 CU PVC GREEN R30M | TAPE 31X6 CU PVC STONE R30M |
|---|---|---|
| Part No. | 128 095 | 128 094 |
| Width | 31 mm | 31 mm |
| Thickness | 6 mm | 6 mm |
| Cross-section | 186 mm² | 186 mm² |
| Type | Green | Stone |
| PU | 30 m | 30 m |

| Type | TAPE 50X3 CU PVC GREEN R20M | TAPE 50X6 CU PVC GREEN R20M |
|---|---|---|
| Part No. | 128 105 | 128 115 |
| Width | 50 mm | 50 mm |
| Thickness | 3 mm | 6 mm |
| Cross-section | 150 mm² | 300 mm² |
| Type | Green | Green |
| PU | 20 m | 20 m |

## Tinned copper strip

Manufactured from high conductivity annealed copper (EN / BS EN 13601) with a Tin coating, for use in lightning protection and earth termination systems.



| General technical data: | |
|---|---|
| Material | Cu / gal Sn |
| Standard | IEC / EN IEC / BS EN IEC 62561-2 |
| Length tolerance | +/- 5% |

| Type TAPE ... | 25X3 SNCU R50M | 25X4 SNCU R50M |
|---|---|---|
| Part No. | 128 250 | 128 251 |
| Width | 25 mm | 25 mm |
| Thickness | 3 mm | 4 mm |
| Cross-section | 75 mm² | 100 mm² |
| PU | 50 m | 50 m |

| Type TAPE ... | 25X6 SNCU R40M | 40X6 SNCU R20M |
|---|---|---|
| Part No. | 128 252 | 128 253 |
| Width | 25 mm | 40 mm |
| Thickness | 6 mm | 6 mm |
| Cross-section | 150 mm² | 240 mm² |
| PU | 40 m | 20 m |

| Type TAPE ... | 50X3 SNCU R20M | 50X4 SNCU R20M | 50X6 SNCU R20M |
|---|---|---|---|
| Part No. | 128 254 | 128 255 | 128 256 |
| Width | 50 mm | 50 mm | 50 mm |
| Thickness | 3 mm | 4 mm | 6 mm |
| Cross-section | 150 mm² | 200 mm² | 300 mm² |
| PU | 20 m | 20 m | 20 m |

## Stainless steel strip



| General technical data: | |
|---|---|
| Standard | EN 62561-2 |
| Length tolerance | +/- 5% |

| Type | BA 30X3.5 V2A R25M | BA 30X3.5 V2A R60M |
|---|---|---|
| Part No. | 860 925 | 860 900 |
| Width | 30 mm | 30 mm |
| Thickness | 3.5 mm | 3.5 mm |
| Cross-section | 105 mm² | 105 mm² |
| Material | StSt | StSt |
| Material No. | 1.4301 / 1.4303 | 1.4301 / 1.4303 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 3.9 kA | 3.9 kA |
| Coil weight | approx. 21 kg | approx. 49 kg |
| PU | 25 m | 60 m |

| Type | BA 30X3.5 V4A R25M | BA 30X3.5 V4A R60M |
|---|---|---|
| Part No. | 860 325 | 860 335 |
| Width | 30 mm | 30 mm |
| Thickness | 3.5 mm | 3.5 mm |
| Cross-section | 105 mm² | 105 mm² |
| Material | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 | 1.4571 / 1.4404 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 3.9 kA | 3.9 kA |
| Coil weight | approx. 21 kg | approx. 49 kg |
| PU | 25 m | 60 m |

| Type | BA 40X4 V4A R40M | BA 40X5 V4A R30M |
|---|---|---|
| Part No. | 860 404 | 860 405 |
| Width | 40 mm | 40 mm |
| Thickness | 4 mm | 5 mm |
| Cross-section | 160 mm² | 200 mm² |
| Material | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 | 1.4571 / 1.4404 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6 kA | 7.4 kA |
| Coil weight | approx. 50 kg | approx. 50 kg |
| PU | 40 m | 30 m |

## Cables

For use in lightning protection and earth-termination systems.

### Aluminium cable

e.g. for isolated air-termination systems (DEHNiso Combi).



| Type SEIL ... | 9 50Ω AL R100M |
|---|---|
| **Part No.** | **840 050** |
| Cross-section | 50 mm² |
| Cable structure qty x Ø wire | 19 x 1.8 mm |
| Material | Al |
| Standard | EN 62561-2 |
| Outside diameter Ø | 9 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 6.4 kA |
| Coil weight | approx. 13.5 kg |
| Length tolerance | +/- 5% |
| PU | 100 m |

Note: Al must not be installed directly (without distance) on, in or under plaster, mortar or concrete, and not in soil.

### Stainless steel cable

e.g. for equipotential bonding.



| Type SEIL ... | 8 V4A R100M | 10 V4A R100M |
|---|---|---|
| **Part No.** | **850 008** | **850 010** |
| Cross-section | 27 mm² | 42 mm² |
| Cable structure qty x Ø wire | [7x] 19 x ca. 0.59 mm | [7x] 19 x ca. 0.68 mm |
| Material | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 | 1.4571 / 1.4404 |
| Outside diameter Ø | 8 mm | 10 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 1 kA | 1.5 kA |
| Coil weight | approx. 23.5 kg | approx. 39.5 kg |
| Length tolerance | +/- 5% | +/- 5% |
| PU | 100 m | 100 m |

### Steel cable



| Type SEIL ... | 10 STGALZN R100M |
|---|---|
| **Part No.** | **801 050** |
| Cross-section | 42 mm² |
| Cable structure qty x Ø wire | [6x] 19 x 0.65 mm |
| Material | St/gal Zn |
| Outside diameter Ø | 10 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 3 kA |
| Coil weight | approx. 33 kg |
| Length tolerance | +/- 5% |
| PU | 100 m |

Cables in different dimensions and materials are available upon request.

### Copper cable



| General technical data: | |
|---|---|
| Material | Cu |
| Standard | EN 62561-2 |
| Length tolerance | +/- 5% |

| Type SEIL ... | 9 50Ω CU R50M | 9 50Ω CU R100M |
|---|---|---|
| **Part No.** | **832 739** | **832 740** |
| Cross-section | 50 mm² | 50 mm² |
| Cable structure qty x Ø wire | 19 x 1.8 mm | 19 x 1.8 mm |
| Outside diameter Ø | 9 mm | 9 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 9.7 kA | 9.7 kA |
| Coil weight | approx. 22 kg | approx. 44 kg |
| PU | 50 m | 100 m |

| Type SEIL ... | 10.5 70Ω CU R50M | 12.5 95Ω CU R50M |
|---|---|---|
| **Part No.** | **832 192** | **832 095** |
| Cross-section | 70 mm² | 95 mm² |
| Cable structure qty x Ø wire | 19 x 2.1 mm | 19 x 2.5 mm |
| Outside diameter Ø | 10.5 mm | 12.5 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 13.6 kA | 18.5 kA |
| Coil weight | approx. 30 kg | approx. 42 kg |
| PU | 50 m | 50 m |

| Type SEIL ... | 14.5 120Ω CU R25M |
|---|---|
| **Part No.** | **832 120** |
| Cross-section | 120 mm² |
| Cable structure qty x Ø wire | 19 x 2.8 mm |
| Outside diameter Ø | 14.5 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 23.4 kA |
| Coil weight | approx. 53 kg |
| PU | 25 m |

### Tinned copper cable



| General technical data: | |
|---|---|
| Material | Cu/gal Sn |
| Length tolerance | +/- 5% |

| Type SEIL ... | 7.5 CUGALSN 35Ω R100M | 9 50Ω CUGALSN R100M |
|---|---|---|
| **Part No.** | **832 838** | **832 839** |
| Cross-section | 35 mm² | 50 mm² |
| Cable structure qty x Ø wire | 7 x 2.5 mm | 19 x 1.8 mm |
| Standard | – | EN 62561-2 |
| Outside diameter Ø | 7.5 mm | 9 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 150 °C) | 5 kA | 7.2 kA |
| Coil weight | approx. 33 kg | approx. 44 kg |
| PU | 100 m | 100 m |

| Type SEIL ... | 10.5 70Ω CUGALSN R50M | 12.5 95Ω CUGALSN R50M |
|---|---|---|
| **Part No.** | **832 202** | **832 295** |
| Cross-section | 70 mm² | 95 mm² |
| Cable structure qty x Ø wire | 19 x 2.1 mm | 19 x 2.5 mm |
| Standard | EN 62561-2 | EN 62561-2 |
| Outside diameter Ø | 10.5 mm | 12.5 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 150 °C) | 10.1 kA | 13.7 kA |
| Coil weight | approx. 30 kg | approx. 42 kg |
| PU | 50 m | 50 m |

| Type SEIL ... | 14.5 120Ω CUGALSN R25M |
|---|---|
| **Part No.** | **832 320** |
| Cross-section | 120 mm² |
| Cable structure qty x Ø wire | 19 x 2.8 mm |
| Standard | EN 62561-2 |
| Outside diameter Ø | 14.5 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 150 °C) | 17.4 kA |
| Coil weight | approx. 53 kg |
| PU | 25 m |



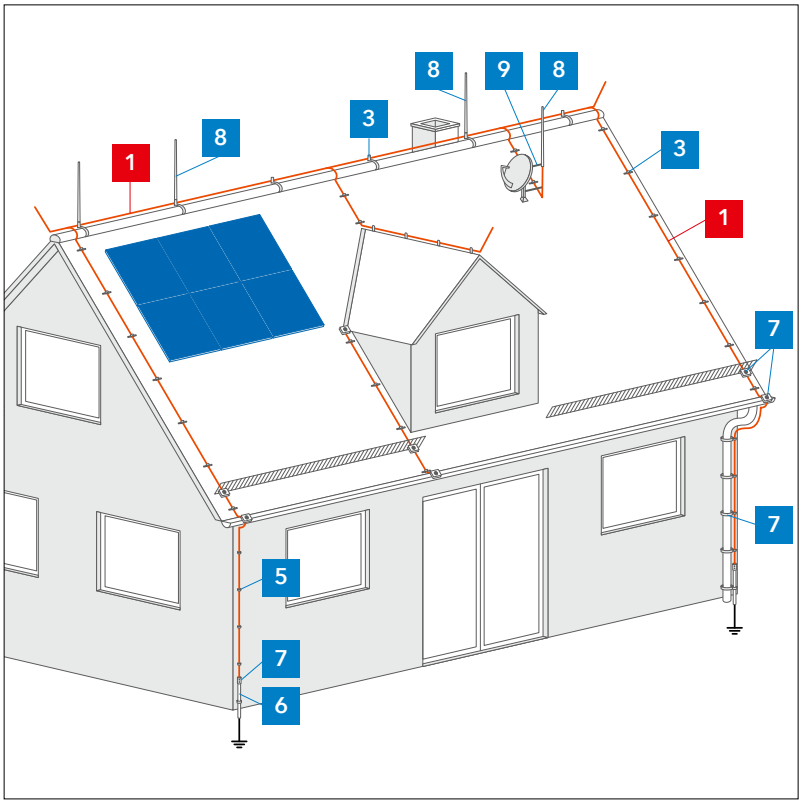
# External Lightning Protection



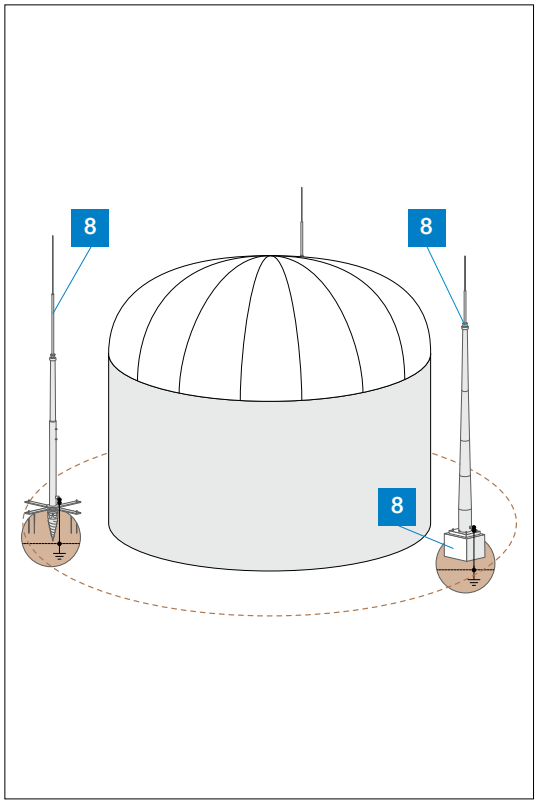
Discover our portfolio
External lightning protection:
**https://de.hn/5iet3**


| | |
|---|---|
| Flat Roof | Page 20 |
| Pitched Roof | Page 26 |
| Metal Roof / Corrugated Sheet Roofing | Page 33 |
| Down Conductor | Page 36 |
| Earth's entry | Page 47 |
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| Air-termination Rods / Air-termination Tips | Page 77 |
| Overview of gust wind speeds | Page 96 |
| Isolated Lightning Protection | Page 98 |
| Overview of gust wind speeds | Page 108 |

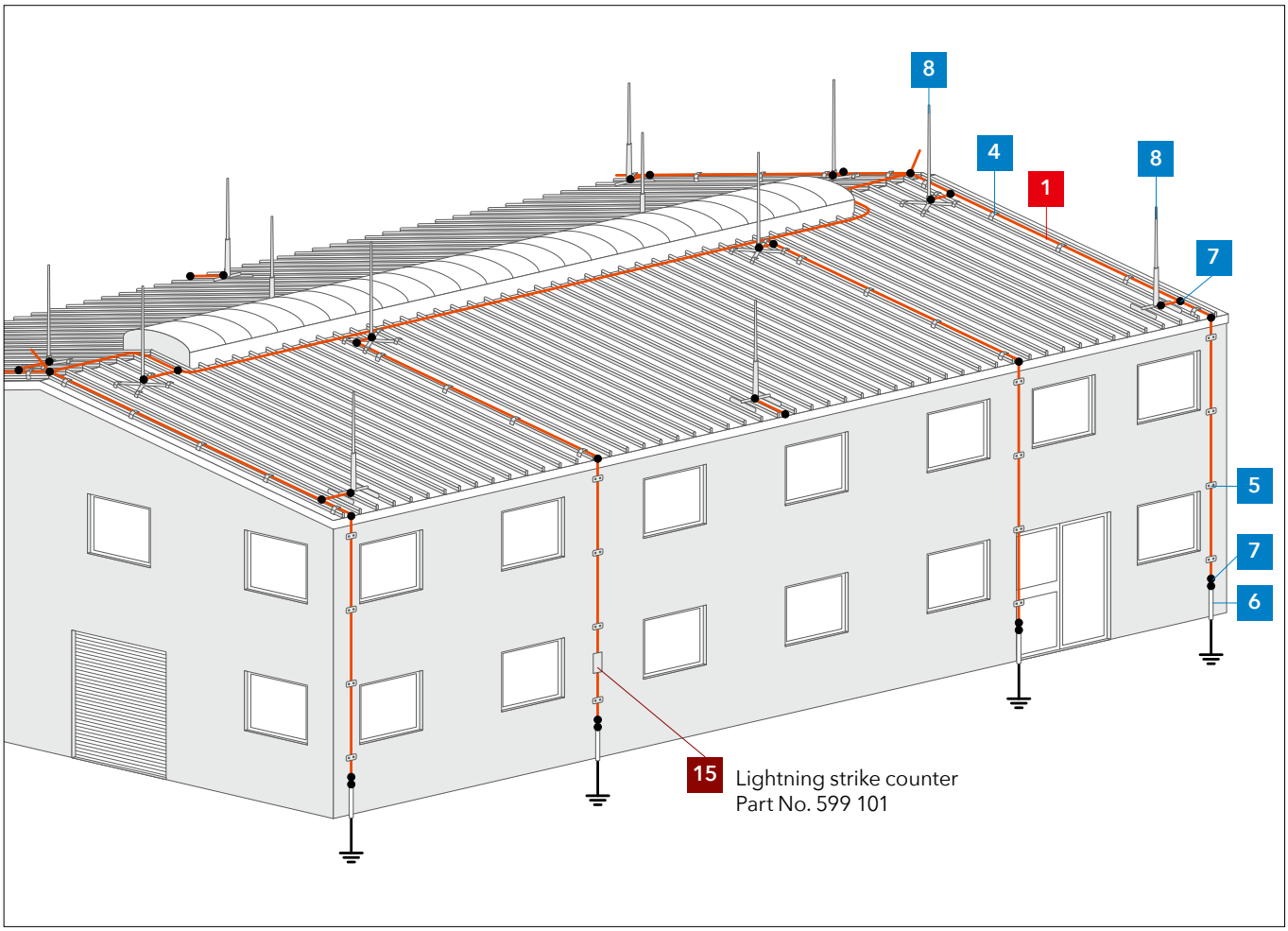
## External lightning protection of a residential building



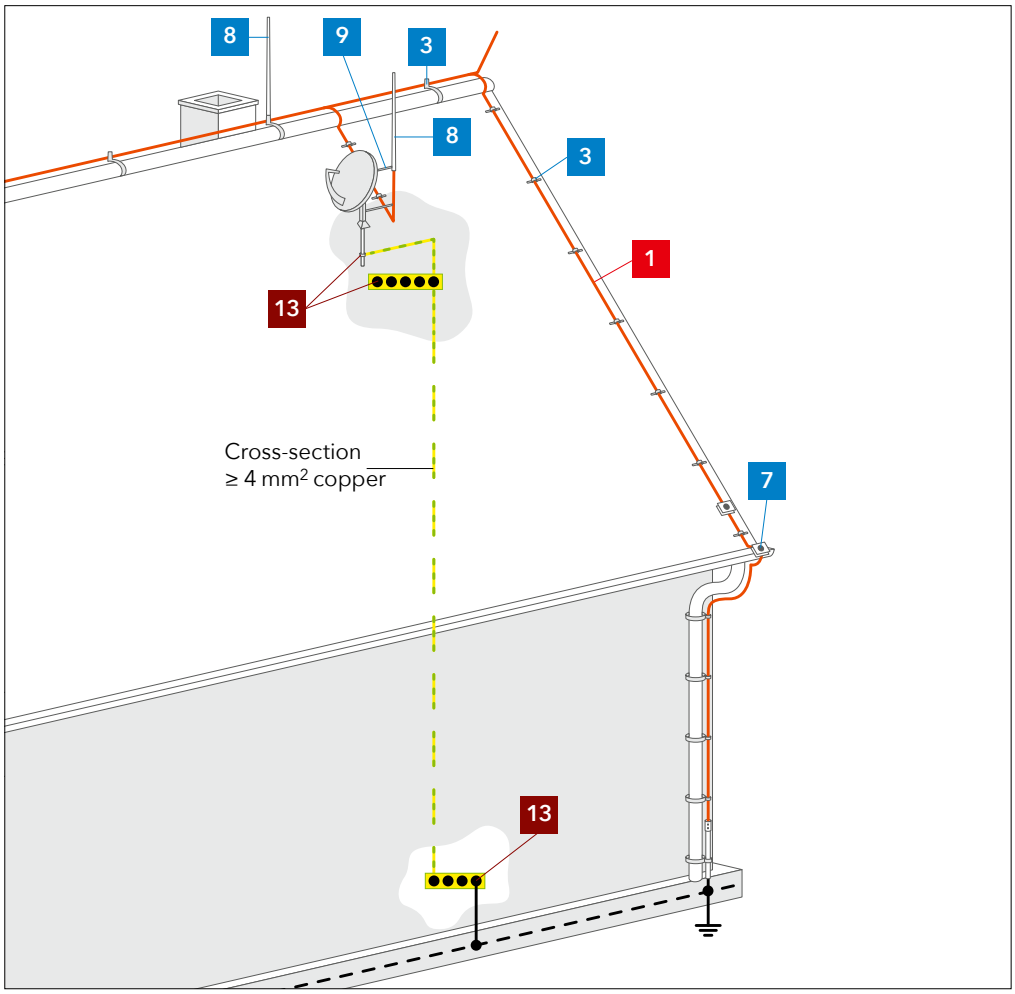

## ... of a gas container



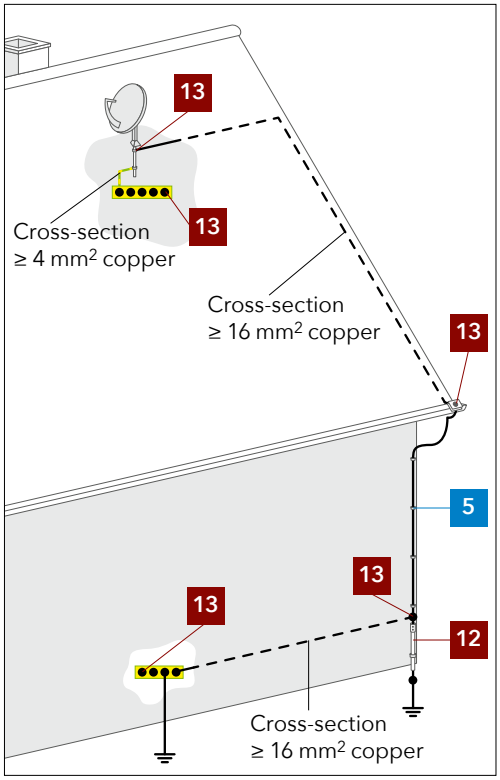

## External lightning protection of an industrial building with a metal roof



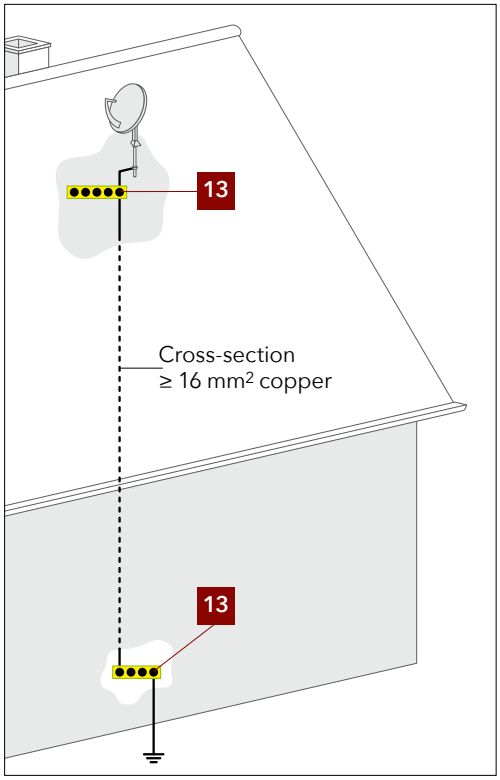
## Protection of an antenna system in case of an existing lightning protection system in accordance with IEC 60728-11




## Equipotential bonding under the roofing without a lightning protection system




## Equipotential bonding inside a building without a lightning protection system




Product

1


2


3


4


5


6


7


8


9






## Roof Conductor Holders for Flat Roofs

Roof conductor holders for attaching round conductors and strips (with adapter) to flat roofs.

- Conductor holder with weather-resistant plastic support plate, UV-stabilised and halogen-free
- Frost-resistant concrete block in accordance with EN 1338 for paving stones, frost resistance tested according to EN 1340 (frost/dew test)
- Concrete block and base part are recycled separately

### Type FB2, with two conductor supports



| Type DLH ... | FB2 8 LO 141X86X70 | FB2 8 FE 141X86X70 |
|---|---|---|
| **Part No.** | **253 050** | **253 060** |
| Conductor routing | loose | fixed |
| Material of conductor holder | **plastic** | **plastic** |
| Colour of conductor holder | black ● | black ● |
| Conductor support Rd | 8 mm | 8 mm |
| Weight | 1 kg | 1 kg |
| Block | **concrete (C35/45)** | **concrete (C35/45)** |
| Dimensions | 141 x 86 x 70 mm | 141 x 86 x 70 mm |
| PU | 10 pc(s) | 10 pc(s) |

### Type KF2, with two conductor supports

Clamped into roof sheeting strips (up to 5 mm thick) which are welded with or adhere to the roof sheeting.



| Type DLH ... | KF2 8 LO 141X86X70 |
|---|---|
| **Part No.** | **253 051** |
| Conductor routing | loose |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | black ● |
| Conductor support Rd | 8 mm |
| Dimensions | 141 x 86 x 70 mm |
| PU | 100 pc(s) |

### Type FB, with one conductor support



| Type DLH ... | FB 8 LO 100X100X70 |
|---|---|
| **Part No.** | **253 015** |
| Conductor routing | loose |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | black ● |
| Conductor support Rd | 8 mm |
| Weight | 1 kg |
| Block | **concrete (C35/45)** |
| Dimensions | 100 x 100 x 70 mm |
| PU | 10 pc(s) |

### Type KF, with one conductor support

Clamped into roof sheeting strips (up to 2.5 mm thick) which are welded with or adhere to the roof sheeting.



| Type DLH ... | KF 8 LO DBS 110X100X70 SW |
|---|---|
| **Part No.** | **253 030** |
| Conductor routing | loose |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | black ● |
| Conductor support Rd | 8 mm |
| Dimensions | 110 x 100 x 75 mm |
| PU | 100 pc(s) |

Separate plastic upper part for type KF (Part No. 253 016) is available upon request.

### With one conductor support

Roof conductor holder set for weighing down the down conductor on metal and flat roofs.



| Type DLH ... | 8.10 KS BES180 GP300 K |
|---|---|
| **Part No.** | **253 335** |
| Conductor routing | loose |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | grey ● |
| Conductor support Rd | 8-10 mm |
| Weight | 4.6 kg |
| Block | **concrete (C35/45)** |
| Dimensions | 300 x 300 x 84 mm |
| PU | 24 pc(s) |

## Accessories for Roof Conductor Holders for Flat Roofs

### Adapter for round conductors for type FB and KF



Snapped onto roof conductor holders for conductors Rd 10 mm, loose conductor routing.
Adapter for conductors Rd 6 mm (Part No. 253 022) is available upon request.

| Type | RLA 10 FB KF K SW |
|---|---|
| **Part No.** | **253 023** |
| Conductor support Rd | 10 mm |
| Material | **plastic** |
| Colour | black ● |
| PU | 50 pc(s) |

### Adapter for flat conductors for type FB and KF



Snapped onto roof conductor holders (Part No. 253 015) for flat conductors 30 mm, loose conductor leading.

| Type | FLA30 FB KF K SW |
|---|---|
| **Part No.** | **253 021** |
| Conductor support Fl | 30 mm |
| Material | **plastic** |
| Colour | black ● |
| PU | 50 pc(s) |

### Cap for type FB and KF



Snapped onto roof conductor holders (Part No. 253 015) to better secure air-termination conductors installed on slanted roofs.

| Type | KLA 8 FB KF K SW |
|---|---|
| **Part No.** | **253 025** |
| Conductor support Rd | 8 mm |
| Material | **plastic** |
| Colour | black ● |
| PU | 50 pc(s) |

### Clip for type FB2



Clip for snapping onto the roof conductor holder (part no. 253 050, 253 060), for additional fixing of the holder to the installed air-termination conductor on pitched roofs.

| Type | KLA 8 FB2 V2A |
|---|---|
| **Part No.** | **253 029** |
| Conductor support Rd | 8 mm |
| Material | StSt |
| Conductor routing | fixed |
| PU | 100 pc(s) |



| Type | LH 8.10 LO KS RA |
|---|---|
| **Part No.** | **253 303** NEU |
| Ausführung | UV-stabilisiert und witterungsbeständig |
| Leitungsführung | lose |
| Werkstoff Leitungshalter | **Kunststoff** |
| Farbe Leitungshalter | grau ● |
| Leitungshalter Aufnahme Rd | 8-10 mm |
| Bauhöhe Leitungshalter | 78 mm |
| VPE | 24 Stk. |

## Roof Conductor Holders for Flat Roofs with Fixing Holes

For installing air-termination systems on flat roofs and walls.

### Type St/tZn, large



With conductor holder DEHNQUICK, fixed conductor routing, height up to the centre of the conductor of 60 mm.

| Type | DLH DQ 6.10 GP100X100 STTZN |
|---|---|
| **Part No.** | **202 060** |
| Material of roof conductor holder | **St/tZn** |
| Dimensions | 100 x 100 mm |
| Fixing | [4x] Ø4 / [4x] Ø10 mm |
| Material of conductor holder | **St/tZn** |
| Conductor support Rd | 6-10 mm |
| PU | 1 pc(s) |

### Type St/tZn, small



With conductor holder DEHNQUICK, fixed conductor routing, height up to the centre of the conductor of 60 mm.

| Type | DLH DQ 6.10 GP50X60 STTZN |
|---|---|
| **Part No.** | **202 030** |
| Material of roof conductor holder | **St/tZn** |
| Dimensions | 50 x 60 mm |
| Fixing | [4x] Ø5.2 mm |
| Material of conductor holder | **St/tZn** |
| Conductor support Rd | 6-10 mm |
| PU | 50 pc(s) |

### Round fixing plate, St/tZn, large



Plate with threaded bolt M8, e.g. for DEHNsnap or DEHNhold for use on, e.g. roofing felt, concrete, steel and brickwork.

| Type | BP D100 GBM8 4XB10 4XB4 STTZN |
|---|---|
| **Part No.** | **297 015** |
| Material of roof conductor holder | **St/tZn** |
| Dimensions | approx. Ø100 mm |
| Fixing | [4x] Ø4 / [4x] Ø10 mm |
| PU | 25 pc(s) |

### Round fixing plate, plastic, small



Plate with threaded bolt M8, e.g. for DEHNsnap or DEHNhold for use on, e.g. roofing felt, concrete, steel and brickwork.

| Type | BP D40 GBM8 4XB4 K GR |
|---|---|
| **Part No.** | **297 025** |
| Material of roof conductor holder | **plastic** |
| Colour | grey ● |
| Dimensions | Ø40 mm |
| Fixing | [4x] Ø4 mm |
| PU | 100 pc(s) |

## Roof Bushings

For leading down conductors through roofs and for sealing roofs.

### For flat roofs



The max. processing temperature of +110 °C has to be observed during installation.
In case of connection heights exceeding 100 mm, the roof bushing and conductor have to be wrapped in a self-adhesive universal sealing tape (aluminium fixing tape).

| Type DDF ... | 8 10 16 FL20.30 D250 K |
|---|---|
| **Part No.** | **552 030** |
| Material | **plastic** |
| Colour | black ● |
| Bushing Rd | 8 / 10 / 16 mm |
| Bushing Fl | 20 x 2.5 / 30 x 3.5 mm |
| Diameter Ø | 250 mm |
| PU | 25 pc(s) |

### For tile and corrugated sheet roofs



| Type DDF ... | 8.10 D34 B16 K |
|---|---|
| **Part No.** | **552 010** |
| Hole | Ø16 mm |
| Material | **plastic** |
| Colour | black ● |
| Bushing Rd | 8-10 mm |
| Diameter Ø | 34 mm |
| PU | 25 pc(s) |

## Expansion Pieces

For temperature-related length compensation of long conductors (provided that the conductor routing in the holders is loose).

### Round design

For connection e.g. with MV clamp (Part No. 390 051).



| Type DS ... | 8 L395 AL |
|---|---|
| **Part No.** | **374 011** |
| Material | Al |
| Dimensions | Ø8 mm |
| Length | approx. 395 mm |
| Standard | EN 62561-2 |
| PU | 25 pc(s) |

### Flat design

For connection e.g. with KS connector (Part No. 301 000).
Note: At cross points two expansion pieces can be connected with one M10 x 20 mm screw and nut.



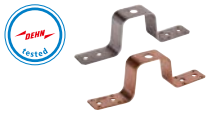
| Type DS ... | 30X2 L170 3XB11 AL |
|---|---|
| **Part No.** | **374 020** |
| Material | Al |
| Dimensions | 30 x 2 mm |
| Length | 170 mm |
| Fixing | [2x] Ø11 mm |
| Central hole | Ø11 mm |
| Standard | based on DIN EN 62561-2 |
| PU | 50 pc(s) |

## Bridging Brackets

For connection (riveting or screwing) of metal cladding.

**Application note:**
According to DIN EN 62305-3 Suppl. 1, four rivets Ø5 mm shall be used to connect material of ≥ 0.5 mm thickness, or two StSt self-tapping screws Ø6.3 mm (one on each side) for material of ≥ 2 mm thickness.

### Short design with middle hole



| Type UEBL ... | L170 B11 B5.2 6.5 AL | L170 B11 B5.2 6.5 CU |
|---|---|---|
| **Part No.** | **377 006** | **377 027** |
| Material | Al | Cu |
| Dimensions | 30 x 2 mm | 28 x 2 mm |
| Length | 170 mm | 170 mm |
| Fixing | [8x] Ø5.2 / [4x] Ø6.5 mm | [8x] Ø5.2 / [4x] Ø6.5 mm |
| Middle hole | Ø11 mm | Ø11 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

### Short design without middle hole



| Type UEBL ... | L170 B5.2 6.5 AL |
|---|---|
| **Part No.** | **377 016** |
| Material | Al |
| Dimensions | 30 x 2 mm |
| Length | 170 mm |
| Fixing | [8x] Ø5.2 / [4x] Ø6.5 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### Long design with middle hole



| Type UEBL ... | L220 B11 B5.2 6.5 AL |
|---|---|
| **Part No.** | **377 026** |
| Material | Al |
| Dimensions | 30 x 2 mm |
| Length | 220 mm |
| Fixing | [8x] Ø5.2 / [4x] Ø6.5 mm |
| Middle hole | Ø11 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

Bridging brackets with middle hole may be combined with KS connectors (e. g. Part No. 301 019).

## Bridging Braids

Suitable for connecting metal claddings (riveting or screwing) as an expansion compensation piece for round wires; or as compensation for certain temperature-related changes in length for round wires; Connection e.g. with KS connector part no. 301 019

**Application note:**
According to DIN EN 62305-3 Suppl. 1, four rivets Ø5 mm shall be used to connect material of ≥ 0.5 mm thickness, or two StSt tapping screws Ø6.3 mm (one on each side) for material of ≥ 2 mm thickness.

### Short design



| Type UEBB ... | L180 B10.5 B5.2 AL | L180 B10.5 B5.2 CU |
|---|---|---|
| **Part No.** | **377 015** | **377 007** |
| Material | Al | Cu |
| Length ($l_G$) | 180 mm | 180 mm |
| Cross-section | 50 mm² | 50 mm² |
| Fixing | [8x] Ø5.2 / [2x] Ø10.5 mm | [8x] Ø5.2 / [2x] Ø10.5 mm |
| Fixing possibility | blind rivets / screws | blind rivets / screws |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 10 pc(s) | 10 pc(s) |

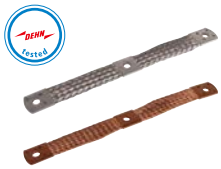
### Short design, fixed with drilling screws



| Type UEBB ... | L180 B10.5 B6.5 AL |
|---|---|
| **Part No.** | **377 045** |
| Material | Al |
| Length ($l_G$) | 180 mm |
| Cross-section | 50 mm² |
| Fixing | [4x] Ø6.5 / [2x] Ø10.5 mm |
| Fixing possibility | drilling screws / screws |
| Standard | EN 62561-1 |
| PU | 100 pc(s) |

### Long design, with middle hole

**Note:** At cross points, two bridging braids can be connected with a M10 x 20 mm screw and nut.



| Type UEBB ... | L300 3XB10.5 B5,2 AL | L300 3XB10.5 B5.2 CU |
|---|---|---|
| **Part No.** | **377 115** | **377 107** |
| Material | Al | Cu |
| Length ($l_G$) | 300 mm | 300 mm |
| Cross-section | 50 mm² | 50 mm² |
| Fixing | [8x] Ø5.2 / [3x] Ø10.5 mm | [8x] Ø5.2 / [3x] Ø10.5 mm |
| Central hole Ø | 10.5 mm | 10.5 mm |
| Fixing possibility | blind rivets / screws | blind rivets / screws |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 10 pc(s) | 10 pc(s) |

## Bridging Cables

Suitable for connecting / bridging metal claddings, or as compensation for certain temperature-related changes in length for round wires; connection e.g. with KS connector part no. 301 019.
For connecting/bridging fixed earthing terminals. Suitable for protective and functional equipotential bonding.

### Configurable lengths Outdoor

For use in outdoor areas with UV-stabilised conductor (H01N2-D)
Specify cable length when ordering (50 mm steps)



| General technical data: | | |
|---|---|---|
| Material of cable lug | | Cu/gal (Ni)Sn |
| Material of cable | | Cu |
| Cable | | H01N2-D |
| Fixing | | [2x] Ø10.5 mm |
| Insulation | | PVC black |
| Standard | | EN 62561-1 |

| Type UEBS ... | 16 L... B10.5 CU SW OD | 25 L... B10.5 CU SW OD |
|---|---|---|
| Part No. | 377 316 | 377 325 |
| Length (l1) | 200 - 1500 mm *) | 200 - 1500 mm *) |
| Cross-section | 16 mm² | 25 mm² |
| PU | 1 pc(s) | 1 pc(s) |

| Type UEBS ... | 35 L... B10.5 CU SW OD | 50 L... B10.5 CU SW OD |
|---|---|---|
| Part No. | 377 335 | 377 350 |
| Length (l1) | 200 - 1500 mm *) | 350 - 1500 mm *) |
| Cross-section | 35 mm² | 50 mm² |
| PU | 1 pc(s) | 1 pc(s) |

| Type UEBS ... | 70 L... B10.5 CU SW OD |
|---|---|
| Part No. | 377 370 |
| Length (l1) | 350 - 1500 mm *) |
| Cross-section | 70 mm² |
| PU | 1 pc(s) |

*) Specify cable length when ordering (50 mm steps)

### Standard lengths

Suitable for use outdoors



| General technical data: | | |
|---|---|---|
| Material of cable lug | | Al |
| Material of cable | | Cu |
| Cross-section | | 16 mm² |
| Fixing | | [4x] Ø6.5 / [2x] Ø10.5 mm |
| Insulation | | rubber EM5 black |
| Standard | | EN 62561-1 |

| Type UEBS ... | 16 L200 B10.5 B6.5 AL CU | 16 L300 B10.5 B6.5 AL CU |
|---|---|---|
| Part No. | 377 210 | 377 310 |
| Length (l1) | 200 mm | 300 mm |
| PU | 10 pc(s) | 100 pc(s) |

| Type UEBS ... | 16 L400 B10.5 B6.5 AL CU | 16 L500 B10.5 B6.5 AL CU |
|---|---|---|
| Part No. | 377 410 | 377 510 |
| Length (l1) | 400 mm | 500 mm |
| PU | 10 pc(s) | 10 pc(s) |

### Configurable lengths Indoor

For use indoors (H07V-K)
Specify cable length when ordering (50 mm steps)



| General technical data: | | |
|---|---|---|
| Material of cable lug | | Cu/gal (Ni)Sn |
| Material of cable | | Cu |
| Cable | | H07V-K |
| Fixing | | [2x] Ø10.5 mm |
| Standard | | EN 62561-1 |

| Type UEBS ... | 16 L... B10.5 CU SW ID | 16 L... B10.5 CU GNGE ID |
|---|---|---|
| Part No. | 377 216 | 377 217 |
| Length (l1) | 200 - 1500 mm *) | 200 - 1500 mm *) |
| Cross-section | 16 mm² | 16 mm² |
| Insulation | PVC black | PVC green / yellow |
| PU | 1 pc(s) | 1 pc(s) |

| Type UEBS ... | 25 L... B10.5 CU SW ID | 25 L... B10.5 CU GNGE ID |
|---|---|---|
| Part No. | 377 225 | 377 226 |
| Length (l1) | 200 - 1500 mm *) | 200 - 1500 mm *) |
| Cross-section | 25 mm² | 25 mm² |
| Insulation | PVC black | PVC green / yellow |
| PU | 1 pc(s) | 1 pc(s) |

| Type UEBS ... | 35 L... B10.5 CU SW ID | 35 L... B10.5 CU GNGE ID |
|---|---|---|
| Part No. | 377 235 | 377 236 |
| Length (l1) | 200 - 1500 mm *) | 200 - 1500 mm *) |
| Cross-section | 35 mm² | 35 mm² |
| Insulation | PVC black | PVC green / yellow |
| PU | 1 pc(s) | 1 pc(s) |

| Type UEBS ... | 50 L... B10.5 CU SW ID | 50 L... B10.5 CU GNGE ID |
|---|---|---|
| Part No. | 377 250 | 377 251 |
| Length (l1) | 350 - 1500 mm *) | 350 - 1500 mm *) |
| Cross-section | 50 mm² | 50 mm² |
| Insulation | PVC black | PVC green / yellow |
| PU | 1 pc(s) | 1 pc(s) |

| Type UEBS ... | 70 L... B10.5 CU SW ID | 70 L... B10.5 CU GNGE ID |
|---|---|---|
| Part No. | 377 270 | 377 271 |
| Length (l1) | 350 - 1500 mm *) | 350 - 1500 mm *) |
| Cross-section | 70 mm² | 70 mm² |
| Insulation | PVC black | PVC green / yellow |
| PU | 1 pc(s) | 1 pc(s) |

*) Specify cable length when ordering (50 mm steps)

## Drilling Screw

Self-tapping with hexagon head and collar, for connecting bridging brackets, braids or cables, e.g. to the metal capping of the roof parapet (for materials of ≥ 2 mm thickness).



| Type | BSC 6.3X19 SW10 V2A |
|---|---|
| Part No. | 528 619 |
| Material | StSt |
| Dimensions | 6.3 x 19 mm |
| Head | width across flats 10 |
| Standard | DIN 7504 |
| PU | 1 pc(s) |

## Blind Rivet

With StSt pin for connecting bridging brackets, braids or cables, according to DIN EN 62305-3 Suppl. 1.



| Type | BN 5X10 AL V2A |
|---|---|
| **Part No.** | **528 610** |
| Material | Al / StSt |
| Head | Ø5 mm |
| Length | 10 mm |
| Standard | similar to EN15979 (DIN 7337) |
| PU | 500 pc(s) |

## Bridging Cable with Seam Clamps

For connecting or bridging metal cladding (e.g. parts of the capping of the roof parapet) without drilling

- With one clamping plate each, e.g. for connection to the air-termination system and erection of air-termination tips (Rd 8-10 mm)
- For the seams of the capping of the roof parapet with an angle of 0-45° and a max. length up to 18 mm

**Your benefit: The design avoids soiling by drilling chips!**



| Type | UEBS 16 L400 CU FK0.7 10 V2A |
|---|---|
| **Part No.** | **365 419** |
| Clamping range of seam | 0.7-10 mm |
| Material of seam clamps | StSt |
| Length | 200 mm |
| Material of cable | Cu |
| Cross-section | 16 mm² |
| Standard | EN 62561-1 |
| PU | 5 pc(s) |

## Connection Kit for Safety Rope System

System for connecting the safety rope systems on roofs with the air-termination system; with pre-mounted connection lug for the safety rope and clamping frame.

### Rope diameter 6 mm



| Type ASSA ... | D6 L1000 6.10 CU V2A |
|---|---|
| **Part No.** | **365 509** |
| Clamping range of connection lug | Ø6 mm |
| Rope structure | 7 x 7 / 7 x 19 mm |
| Terminal lug material | StSt |
| Clamping piece support Rd | 6-10 mm |
| Length | 1000 mm |
| Material of rope | Cu |
| Cross-section | 16 mm² |
| Temperature range | -40 °C ... +80 °C |
| Insulation | rubber EM5 black |
| PU | 1 pc(s) |

### Rope diameter 8 mm



| Type ASSA ... | D8 L1000 6.10 CU V2A |
|---|---|
| **Part No.** | **365 519** |
| Clamping range of connection lug | Ø8 mm |
| Rope structure | 7 x 7 / 7 x 19 mm |
| Terminal lug material | StSt |
| Clamping piece support Rd | 6-10 mm |
| Length | 1000 mm |
| Material of rope | Cu |
| Cross-section | 16 mm² |
| Temperature range | -40 °C ... +80 °C |
| Insulation | rubber EM5 black |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |





## Roof Conductor Holders with Tension Spring for Ridge and Hip Tiles

For fixing air-termination conductors on the ridge, e.g. of tile roofs.

### SPANNsnap light

Fixed with a StSt tension spring, with conductor holder DEHNsnap, loose conductor routing, laterally adjustable.



| Type DLH ... | SSL 8 H16 FG180.280 GR V2A | SSL 8 H36 FG180.280 GR V2A |
|---|---|---|
| **Part No.** | **204 469** | **204 449** |
| Material of roof conductor holder | StSt | StSt |
| Clamping range of ridge tile width | 180-280 mm | 180-280 mm |
| Height of conductor holder (h1) | 16 mm | 36 mm |
| Material of conductor holder | **plastic** | **plastic** |
| Colour of conductor holder | grey | grey |
| Conductor support Rd | 8 mm | 8 mm |
| PU | 25 pc(s) | 25 pc(s) |

### SPANNgrip light

Fixed with a StSt tension spring, with conductor holder DEHNgrip, loose conductor routing, laterally adjustable.



| Type DLH ... | SGL 8 H20 FG180.280 V2A | SGL 8 H32 FG180.280 V2A |
|---|---|---|
| **Part No.** | **206 439** | **206 449** |
| Material of roof conductor holder | StSt | StSt |
| Clamping range of ridge tile width | 180-280 mm | 180-280 mm |
| Height of conductor holder (h1) | 20 mm | 32 mm |
| Material of conductor holder | StSt | StSt |
| Conductor support Rd | 8 mm | 8 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 25 pc(s) | 25 pc(s) |

### SPANNsnap

Fixed with a StSt tension spring, with conductor holder DEHNsnap, loose conductor routing, laterally adjustable.



| General technical data: | |
|---|---|
| Clamping range of ridge tile width | 180-280 mm |
| Material of conductor holder | **plastic** |
| Conductor support Rd | 8 mm |

| Type DLH SS 8 ... | H16 FG180.280 GR V2A | H16 FG180.280 BR CU |
|---|---|---|
| **Part No.** | **204 269** | **204 267** |
| Material of roof conductor holder | StSt | Cu |
| Height of conductor holder | 16 mm (h1) | 16 mm (h1) |
| Colour of conductor holder | grey | brown |
| PU | 25 pc(s) | 25 pc(s) |

| Type DLH ... | H36 FG180.280 GR V2A | H36 FG180.280 BR CU |
|---|---|---|
| **Part No.** | **204 249** | **204 247** |
| Material of roof conductor holder | StSt | Cu |
| Height of conductor holder | 36 mm (h1) | 36 mm (h1) |
| Colour of conductor holder | grey | brown |
| PU | 25 pc(s) | 25 pc(s) |

### SPANNgrip

Fixed with a StSt tension spring, with conductor holder DEHNgrip, loose conductor routing, laterally adjustable.



| General technical data: | |
|---|---|
| Clamping range of ridge tile width | 180-280 mm |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |

| Type DLH ... | SG 8 H20 FG180.280 V2A | SG 8 H20 FG180.280 CU |
|---|---|---|
| **Part No.** | **206 239** | **206 237** |
| Material of roof conductor holder | StSt | Cu |
| Height of conductor holder | 20 mm (h1) | 20 mm (h1) |
| Material of conductor holder | StSt | Cu |
| PU | 25 pc(s) | 25 pc(s) |

| Type DLH ... | SG 8 H32 FG180.280 V2A | SG 8 H32 FG180.280 CU |
|---|---|---|
| **Part No.** | **206 249** | **206 247** |
| Material of roof conductor holder | StSt | Cu |
| Height of conductor holder | 32 mm (h1) | 32 mm (h1) |
| Material of conductor holder | StSt | Cu |
| PU | 25 pc(s) | 25 pc(s) |

## Roof Conductor Holders Adjustable for Ridge and Hip Tiles

For fixing air-termination conductors on the ridge, e.g. of tile roofs.

### Steplessly adjustable with conductor holder DEHNsnap

Loose conductor routing, laterally adjustable (top centre to the bottom).



| General technical data: | |
|---|---|
| Clamping range | 180-280 mm |
| Material of conductor holder | **plastic** |
| Conductor support Rd | 8 mm |
| Length of clamping claw | 23 mm |

| Type DLH ... | DS 8 H16 FG180.280 GR V2A | DS 8 H16 FG180.280 BR V2A |
|---|---|---|
| **Part No.** | **204 109** | **204 911** |
| Material of roof conductor holder | StSt | StSt |
| Height of conductor holder (h1) | 16 mm | 16 mm |
| Colour of conductor holder | grey | brown |
| PU | 25 pc(s) | 25 pc(s) |

| Type DLH ... | DS 8 H16 FG180.280BR GALCU | DS 8 H36 FG180.280 GR V2A |
|---|---|---|
| **Part No.** | **204 107** | **204 129** |
| Material of roof conductor holder | Cu | StSt |
| Height of conductor holder (h1) | 16 mm | 36 mm |
| Colour of conductor holder | brown | grey |
| PU | 25 pc(s) | 25 pc(s) |

| Type DLH ... | DS 8 H36 FG180.280 BR V2A | DS 8 H36 FG180.280BR GALCU |
|---|---|---|
| **Part No.** | **204 913** | **204 127** |
| Material of roof conductor holder | StSt | Cu |
| Height of conductor holder (h1) | 36 mm | 36 mm |
| Colour of conductor holder | brown | brown |
| PU | 25 pc(s) | 25 pc(s) |

### Steplessly adjustable with conductor holder DEHNgrip

Loose conductor routing, laterally adjustable (top centre to the bottom).



| General technical data: | |
|---|---|
| Clamping range | 180-280 mm |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |

| Type DLH ... | DG 8 H20 FG180.280 V2A | DG 8 H20 FG180.280 KK V2A |
|---|---|---|
| **Part No.** | **206 109** | **206 809** |
| Material of roof conductor holder | StSt | StSt |
| Height of conductor holder (h1) | 20 mm | 20 mm |
| Material of conductor holder | StSt | StSt |
| Length of clamping claw | 23 mm | 15 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type DLH ... | DG 8 H20 FG180.280 KK GALCU | DG 8 H32 FG180.280 KK GALCU |
|---|---|---|
| **Part No.** | **206 807** | **206 817** |
| Material of roof conductor holder | Cu | Cu |
| Height of conductor holder (h1) | 20 mm | 32 mm |
| Material of conductor holder | Cu | Cu |
| Length of clamping claw | 15 mm | 15 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type DLH ... | DG 8 H32 FG180.280 KK V2A |
|---|---|
| **Part No.** | **206 819** |
| Material of roof conductor holder | StSt |
| Height of conductor holder (h1) | 32 mm |
| Material of conductor holder | StSt |
| Length of clamping claw | 15 mm |
| PU | 25 pc(s) |

### Adjustable in steps with conductor holder DEHNquick

Fixed conductor routing.



| General technical data: | |
|---|---|
| Conductor support Rd | 6-10 mm |
| Length of clamping claw | 24 mm |

| Type DLH ... | DQ 6.10 FG120.240 STTZN | DQ 6.10 FG200.280 STTZN |
|---|---|---|
| **Part No.** | **202 020** | **202 021** |
| Material of roof conductor holder | **St/tZn** | **St/tZn** |
| Clamping range | 120-240 mm | 200-280 mm |
| Material of conductor holder | **St/tZn** | **St/tZn** |
| PU | 25 pc(s) | 1 pc(s) |

| Type DLH ... | DQ 6.10 FG120.240 V2A | DQ 6.10 FG120.240 CU |
|---|---|---|
| **Part No.** | **202 900** | **202 027** |
| Material of roof conductor holder | StSt | Cu |
| Clamping range | 120-240 mm | 120-240 mm |
| Material of conductor holder | StSt | Cu |
| PU | 1 pc(s) | 1 pc(s) |

| Type DLH ... | DQ 6.10 FG200.280 CU |
|---|---|
| **Part No.** | **202 227** |
| Material of roof conductor holder | Cu |
| Clamping range | 200-280 mm |
| Material of conductor holder | Cu |
| PU | 25 pc(s) |

## Roof Conductor Holders for Ridge and Hip Tiles

For fixing air-termination conductors on the ridge.

### FIRSTsnap

Attached to the ridge tile clip of dry ridges, with conductor holder DEHNsnap, loose conductor routing.



| Type | LH FS 8 H16 GR V2A | LH FS 8 H16 K BR V2A |
|---|---|---|
| **Part No.** | **204 029** | **204 039** |
| Material of roof conductor holder | StSt | StSt |
| Height of conductor holder | 16 mm | 16 mm |
| Material of conductor holder | **plastic** | **plastic** |
| Colour of conductor holder | grey | brown |
| Conductor support Rd | 8 mm | 8 mm |
| PU | 50 pc(s) | 50 pc(s) |

### Two screw clamp with spacer and elastic sealing

For tiled, slated and corrugated sheet roofs, with weather-resistant spacer and elastic sealing, fixed conductor routing.



| Type | DLH ZS 7.10 FL20 KT12 STTZN |
|---|---|
| **Part No.** | **216 000** |
| Material of roof conductor holder | **plastic** |
| Hole | Ø12 mm |
| Material of conductor holder | **St/tZn** |
| Conductor support Rd | 7-10 mm |
| Conductor support Fl | 20 mm |
| PU | 25 pc(s) |

## Roof Conductor Holders with Angled, Flexible Brace for Roof Surfaces

For hanging into roof tiles, with a flexible brace made of thin StSt (0.3 mm) which moulds itself to the grooves of the tile.

### FLEXIsnap

Fixed to grooved tiles using the flexible brace, loose conductor routing.



| General technical data: | |
|---|---|
| Material of roof conductor holder | StSt |
| Length of brace | 170 mm |
| Material of conductor holder | **plastic** |
| Conductor support Rd | 8 mm |

| Type DLH ... | FS 8 H16 L170 GR V2A | FS 8 H16 L170 BR V2A |
|---|---|---|
| **Part No.** | **204 935** | **204 936** |
| Height of conductor holder (h1) | 16 mm | 16 mm |
| Colour of conductor holder | grey | brown |
| PU | 1 pc(s) | 50 pc(s) |

| Type DLH ... | FS 8 H36 L170 GR V2A | FS 8 H36 L170 BR V2A |
|---|---|---|
| **Part No.** | **204 937** | **204 938** |
| Height of conductor holder (h1) | 36 mm | 36 mm |
| Colour of conductor holder | grey | brown |
| PU | 50 pc(s) | 50 pc(s) |

### FLEXIgrip

Fixed to grooved tiles using the flexible brace, loose conductor routing.



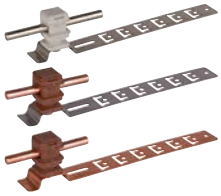
| Type DLH ... | FG 8 H32 L170 V2A | FG 8 H32 L170 V2A GALCU |
|---|---|---|
| **Part No.** | **204 949** | **204 957** |
| Material of roof conductor holder | StSt | StSt |
| Length of brace | 170 mm | 170 mm |
| Height of conductor holder (h1) | 32 mm | 32 mm |
| Material of conductor holder | StSt | Cu |
| Conductor support Rd | 8 mm | 8 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

## Roof Conductor Holders with Embossed Brace for Roof Surfaces

For fixing air-termination and down conductors.

### UNIsnap height 16 mm

With prepunched points for bending it and hooking it into roof tiles or battens, with conductor holder DEHNsnap, loose conductor routing.



| General technical data: | |
|---|---|
| Height of conductor holder | 16 mm |
| Material of conductor holder | **plastic** |
| Conductor support Rd | 8 mm |

| Type | DLH US 8 H16 L205 GR V2A | DLH US 8 H16 L205 BR V2A |
|---|---|---|
| **Part No.** | **204 149** | **204 921** |
| Material of roof conductor holder | StSt | StSt |
| Length of brace (l1) | 205 mm | 205 mm |
| Colour of conductor holder | grey | brown |
| PU | 50 pc(s) | 1 pc(s) |

| Type | DLH US 8 H16 L205 BR GALCU | DLH US 8 H16 L335 GR V2A |
|---|---|---|
| **Part No.** | **204 147** | **204 159** |
| Material of roof conductor holder | Cu | StSt |
| Length of brace (l1) | 205 mm | 335 mm |
| Colour of conductor holder | brown | grey |
| PU | 50 pc(s) | 50 pc(s) |

| Type | DLH US 8 H16 L335 BR GALCU | DLH US 8 H16 L475 GR V2A |
|---|---|---|
| **Part No.** | **204 157** | **204 169** |
| Material of roof conductor holder | Cu | StSt |
| Length of brace (l1) | 335 mm | 475 mm |
| Colour of conductor holder | brown | grey |
| PU | 50 pc(s) | 1 pc(s) |

## UNIsnap height 36 mm

With prepunched points, for bending it and hooking it into roof tiles or battens, with conductor holder DEHNsnap, loose conductor routing.



| General technical data: | |
|---|---|
| Height of conductor holder | 36 mm |
| Material of conductor holder | **plastic** |
| Conductor support Rd | 8 mm |

| Type | DLH US 8 H36 L205 GR V2A | DLH US 8 H36 L205 BR V2A |
|---|---|---|
| **Part No.** | **204 179** | **204 924** |
| Material of roof conductor holder | StSt | StSt |
| Length of brace (l1) | 205 mm | 205 mm |
| Colour of conductor holder | grey | brown |
| PU | 50 pc(s) | 50 pc(s) |

| Type | DLH US 8 H36 L205 BR GALCU | DLH US 8 H36 L335 GR V2A |
|---|---|---|
| **Part No.** | **204 177** | **204 189** |
| Material of roof conductor holder | Cu | StSt |
| Length of brace (l1) | 205 mm | 335 mm |
| Colour of conductor holder | brown | grey |
| PU | 50 pc(s) | 50 pc(s) |

| Type | DLH US 8 H36 L335 BR V2A | DLH US 8 H36 L335 BR GALCU |
|---|---|---|
| **Part No.** | **204 925** | **204 187** |
| Material of roof conductor holder | StSt | Cu |
| Length of brace (l1) | 335 mm | 335 mm |
| Colour of conductor holder | brown | brown |
| PU | 50 pc(s) | 50 pc(s) |

| Type | DLH US 8 H36 L475 GR V2A | DLH US 8 H36 L475 BR GALCU |
|---|---|---|
| **Part No.** | **204 199** | **204 197** |
| Material of roof conductor holder | StSt | Cu |
| Length of brace (l1) | 475 mm | 475 mm |
| Colour of conductor holder | grey | brown |
| PU | 50 pc(s) | 1 pc(s) |

## UNIsnap with clamping part

With prepunched points for bending it and hooking it into roof tiles or battens,with additional clamping part e.g. for slated roofs, with conductor holder DEHNsnap, loose conductor routing.



| Type | LH US 8 H16 L205 KT GR V2A |
|---|---|
| **Part No.** | **204 089** |
| Material of roof conductor holder | StSt |
| Length of brace (l1) | 205 mm |
| Height of conductor holder | 16 mm |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | grey |
| Conductor support Rd | 8 mm |
| PU | 1 pc(s) |

## DEHNsnap with Al base brace

Moulds itself to the grooves of the tile, with conductor holder DEHNsnap, loose conductor routing.



| Type | DLH DS 8 H36 L205 GR AL | DLH DS 8 H36 L205 BR AL |
|---|---|---|
| **Part No.** | **204 170** | **204 171** |
| Material of roof conductor holder | Al | Al |
| Length of brace (l1) | 205 mm | 205 mm |
| Height of conductor holder | 36 mm | 36 mm |
| Material of conductor holder | **plastic** | **plastic** |
| Colour of conductor holder | grey | brown |
| Conductor support Rd | 8 mm | 8 mm |
| PU | 50 pc(s) | 50 pc(s) |

## UNIgrip height 20 mm

With prepunched points for bending it and hooking it on roof tiles or battens, with conductor holder DEHNgrip, loose conductor routing.



| General technical data: | |
|---|---|
| Height of conductor holder | 20 mm |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |

| Type | DLH UG 8 H20 L205 V2A | DLH UG 8 H20 L205 CU |
|---|---|---|
| **Part No.** | **206 209** | **206 207** |
| Material of roof conductor holder | StSt | Cu |
| Length of brace (l1) | 205 mm | 205 mm |
| Material of conductor holder | StSt | Cu |
| PU | 50 pc(s) | 50 pc(s) |

| Type | DLH UG 8 H20 L335 V2A | DLH UG 8 H20 L335 CU |
|---|---|---|
| **Part No.** | **206 219** | **206 217** |
| Material of roof conductor holder | StSt | Cu |
| Length of brace (l1) | 335 mm | 335 mm |
| Material of conductor holder | StSt | Cu |
| PU | 50 pc(s) | 50 pc(s) |

| Type | DLH UG 8 H20 L475 V2A | DLH UG 8 H20 L475 CU |
|---|---|---|
| **Part No.** | **206 229** | **206 227** |
| Material of roof conductor holder | StSt | Cu |
| Length of brace (l1) | 475 mm | 475 mm |
| Material of conductor holder | StSt | Cu |
| PU | 50 pc(s) | 50 pc(s) |

### UNIgrip height 32 mm

With prepunched points for bending it and hooking it on roof tiles or battens, with conductor holder DEHNgrip, loose conductor routing.



| General technical data: | |
|---|---|
| Material of roof conductor holder | StSt |
| Height of conductor holder | 32 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |

| Type | DLH UG 8 H32 L205 V2A | DLH UG 8 H32 L335 V2A |
|---|---|---|
| Part No. | 206 309 | 206 319 |
| Length of brace (l1) | 205 mm | 335 mm |
| PU | 50 pc(s) | 50 pc(s) |

| Type | DLH UG 8 H32 L475 V2A |
|---|---|
| Part No. | 206 329 |
| Length of brace (l1) | 475 mm |
| PU | 50 pc(s) |

### UNIgrip with clamping part, height 20 mm

With prepunched points for bending it and hooking it into roof tiles or battens, with additional clamping part, e.g. for slated roofs, with conductor holder DEHNgrip, loose conductor routing.



| Type | DLH UG 8 H20 L205 KT V2A |
|---|---|
| Part No. | 206 289 |
| Material of roof conductor holder | StSt |
| Length of brace (l1) | 205 mm |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### DEHNgrip with Al brace

Moulds itself to the grooves of the tile, with conductor holder DEHNgrip, loose conductor routing.



| Type | DLH DG 8 H20 L205 V2A AL | DLH DG 8 H32 L205 V2A AL |
|---|---|---|
| Part No. | 206 170 | 206 171 |
| Material of roof conductor holder | Al | Al |
| Length of brace (l1) | 205 mm | 205 mm |
| Height of conductor holder | 20 mm | 32 mm |
| Material of conductor holder | StSt | StSt |
| Conductor support Rd | 8 mm | 8 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

## Roof Conductor Holders with Brace for Roof Surfaces

Inserted on tiled, slated and roofing felt roofs.

### Straight

Straight, with conductor holder DEHNquick, for conductors Rd 6-10 mm, fixed conductor routing.



| General technical data: | |
|---|---|
| Height of brace | 55 mm |
| Conductor support Rd | 6-10 mm |

| Type DLH DQ 6.10 H55 ... | L260 STTZN | L260 V2A |
|---|---|---|
| Part No. | 202 040 | 202 902 |
| Material of roof conductor holder | St/tZn | StSt |
| Length of brace | 260 / 2 mm | 260 / 1 mm |
| Material of conductor holder | St/tZn | StSt |
| PU | 50 pc(s) | 50 pc(s) |

| Type DLH DQ 6.10 H55 L260 ... | CU |
|---|---|
| Part No. | 202 037 |
| Material of roof conductor holder | Cu |
| Length of brace | 260 / 2 mm |
| Material of conductor holder | Cu |
| PU | 50 pc(s) |

### Cranked

With conductor holder DEHNquick, fixed conductor routing.



| General technical data: | |
|---|---|
| Height of brace | 55 mm |
| Conductor support Rd | 6-10 mm |

| Type DLH DQ 6.10 H55 ... | L260 GS STTZN | L260 GS V2A |
|---|---|---|
| Part No. | 202 010 | 202 901 |
| Material of roof conductor holder | St/tZn | StSt |
| Length of brace | 260 / 2 mm | 260 / 1 mm |
| Material of conductor holder | St/tZn | StSt |
| PU | 50 pc(s) | 50 pc(s) |

| Type DLH DQ 6.10 H55 L260 ... | GS CU |
|---|---|
| Part No. | 202 017 |
| Material of roof conductor holder | Cu |
| Length of brace | 260 / 2 mm |
| Material of conductor holder | Cu |
| PU | 1 pc(s) |

## Roof Conductor Holders with Angled Brace for Roof Surfaces

Hung into the roof tiles.

### With conductor holder DEHNsnap

Loose conductor routing.



| Type DLH ... | DS 8 H16 L169 WS V2A |
|---|---|
| **Part No.** | **204 359** |
| Material of roof conductor holder | StSt |
| Length of brace (l1) | 169 mm |
| Height of conductor holder | 16 mm |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | grey |
| Conductor support Rd | 8 mm |
| PU | 1 pc(s) |

### With conductor holder DEHNgrip

Loose conductor routing.



| Type DLH ... | DG 8 H20 L169 WS V2A |
|---|---|
| **Part No.** | **206 359** |
| Material of roof conductor holder | StSt |
| Length of brace (l1) | 169 mm |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With conductor holder DEHNquick

Hung into roof tiles or battens, fixed conductor routing (lengthwise or crosswise).



| Type DLH ... | DQ 6.10 H55 L115 WS STTZN | DQ 6.10 H55 L410 WS STTZN |
|---|---|---|
| **Part No.** | **202 050** | **202 080** |
| Material of roof conductor holder | **St/tZn** | **St/tZn** |
| Length of brace (l1) | 115 mm | 410 mm |
| Material of conductor holder | **St/tZn** | **St/tZn** |
| Conductor support Rd | 6-10 mm | 6-10 mm |
| PU | 25 pc(s) | 50 pc(s) |

## Roof Conductor Holders with Clamping Device for Roof Surfaces

For fixing air-termination and down conductors.

### PLATTENsnap

Fixed on overlapping constructions, with conductor holder DEHNsnap, loose conductor routing.



| Type | LH PS 8 H16 KB4.6 GR V2A | LH PS 8 H16 KB4.6 BR V2A |
|---|---|---|
| **Part No.** | **204 069** | **204 079** |
| Material of roof conductor holder | StSt | StSt |
| Clamping range | 4-6 mm | 4-6 mm |
| Height of conductor holder | 16 mm | 16 mm |
| Material of conductor holder | **plastic** | **plastic** |
| Colour of conductor holder | grey | brown |
| Conductor support Rd | 8 mm | 8 mm |
| PU | 50 pc(s) | 50 pc(s) |

### ZIEGELsnap

Fixed between flat tiles (plain tiles) and slabs, with conductor holder DEHNsnap, loose conductor routing.



| Type | LH ZS 8 H16 KB4.16 GR V2A | LH ZS 8 H16 KB4.16 BR V2A |
|---|---|---|
| **Part No.** | **204 049** | **204 059** |
| Material of roof conductor holder | StSt | StSt |
| Clamping range | 4-16 mm | 4-16 mm |
| Height of conductor holder | 16 mm | 16 mm |
| Material of conductor holder | **plastic** | **plastic** |
| Colour of conductor holder | grey | brown |
| Conductor support Rd | 8 mm | 8 mm |
| PU | 50 pc(s) | 50 pc(s) |

### ZIEGELgrip

Fixed between flat tiles (plain tiles) and slabs, with conductor holder DEHNgrip, loose conductor routing.



| Type | LH ZG 8 H20 KB4.16 V2A |
|---|---|
| **Part No.** | **206 049** |
| Material of roof conductor holder | StSt |
| Clamping range | 4-16 mm |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### DEHNgrip for bitumen shingles

As well as for roof and wall slabs, loose conductor routing.



| Type | DLH DG H20 UK8 V2A | DLH DG 8 H20 KB8.18 V2A |
|---|---|---|
| **Part No.** | **206 389** | **206 399** |
| Material of roof conductor holder | StSt | StSt |
| Clamping range | 2-8 mm | 8-18 mm |
| Height of conductor holder | 20 mm | 20 mm |
| Material of conductor holder | StSt | StSt |
| Conductor support Rd | 8 mm | 8 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

### DEHNgrip for metal roof shingles

For fixing air-termination and down conductors on e.g. PREFA roof systems (PREFA small format) as well as bitumen shingles and shingles made of natural materials



| Type | DLH DG 8 H20 KB2.8 KU V2A |
|---|---|
| **Part No.** | **206 379** |
| Material of roof conductor holder | StSt |
| Clamping range | 2-8 mm |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Roof Conductor Holders with Preformed Brace for Roof Surfaces

Hung onto the groove of roof tiles.

### Hung onto the lower groove, with conductor holder DEHNgrip

Loose conductor routing.



| Type DLH ... | DG 8 H20 L103 EH V2A |
|---|---|
| **Part No.** | **206 349** |
| Material of roof conductor holder | StSt |
| Length of brace | 103 mm |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### Hung onto the lower groove, with conductor holder DEHNsnap

Hung onto the lower groove of pantiles, with conductor holder DEHNsnap, loose conductor routing, brace length 90 mm.



| Type DLH ... | DS 8 H36 L90 EH GR V2A | DS 8 H36 L90 EH BR V2A |
|---|---|---|
| **Part No.** | **204 229** | **204 239** |
| Material of roof conductor holder | StSt | StSt |
| Length of brace | 90 mm | 90 mm |
| Height of conductor holder | 36 mm | 36 mm |
| Material of conductor holder | **plastic** | **plastic** |
| Colour of conductor holder | grey | brown |
| Conductor support Rd | 8 mm | 8 mm |
| PU | 50 pc(s) | 50 pc(s) |

### Hung onto the upper groove, with conductor holder DEHNgrip

Hung onto the groove of pantiles, with conductor holder DEHNgrip, loose conductor routing, brace length 87 mm.



| Type DLH ... | DG 8 H20 L87 EH V2A |
|---|---|
| **Part No.** | **206 369** |
| Material of roof conductor holder | StSt |
| Length of brace | 87 mm |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Components for Buildings with Thatched Roof

Lightning protection system components for buildings with thatched roofs.
Air-termination conductors on thatched roofs have to be installed at a distance to the roof, e.g. on isolating supports. Certain distances also have to be kept to the eaves.
The span width for ridge conductors is approx. 15 m and for down conductors approx. 10 m without additional supports. Span stakes have to be fastened to the roof construction (rafters and crossbars) using anchor bolts and flat washers.
Today an isolated (HVI) lightning protection system is often used as an external lightning protection system for buildings with thatched roofs.

### Clamping cap

Fixed to wooden stakes (Part No. 145 241).
With air-termination tip (length 300 mm, Ø10 mm, StSt).



| Typ | SPK 100X100 FSP10 300 7.10 V2A |
|---|---|
| **Art.-Nr.** | **146 309** |
| Material | StSt |
| Support Rd | 7-10 mm |
| PU | 1 pc(s) |

### Roof conductor support

With conductor holder.



| Typ DLS ... | 6.10 134X300X598 EHI |
|---|---|
| **Art.-Nr.** | **240 000** |
| Material | **oak** (impregnated) |
| Dimensions (l x w x h) | 134 x 300 x 598 mm |
| Support Rd | 6-10 mm |
| PU | 1 pc(s) |

### Eaves supports St/tZn / StSt

For spanning conductors/cables over it.
Distance between the wall and conductors is adjustable.



| General technical data: | | |
|---|---|---|
| Support Rd | | 7-10 mm |

| Typ TS 7.10 ... | V1.0 1.15M STTZN | V1.25 1.40M STTZN |
|---|---|---|
| **Art.-Nr.** | **239 000** | **239 001** |
| Material | **St/tZn** | **St/tZn** |
| Adjustable range (l1) | 1.05-1.20 m | 1.40-1.55 m |
| PU | 1 pc(s) | 1 pc(s) |

| Typ TS 7.10 ... | V1.25 1.55M V2A | V1.45 1.75M V2A |
|---|---|---|
| **Art.-Nr.** | **239 009** | **239 019** |
| Material | StSt | StSt |
| Adjustable range (l1) | 1.25-1.55 m | 1.45-1.75 m |
| PU | 1 pc(s) | 1 pc(s) |

### Anchoring block

To fix the conductors / cables on the wall.



| Typ ASK ... | 8 150 40 2XB10.5 V2A |
|---|---|
| **Art.-Nr.** | **241 009** |
| Material | StSt |
| Dimensions (l x w x d) | 150 x 40 x 6 mm |
| Support Rd | 8 mm |
| PU | 20 pc(s) |



## Roof Conductor Holders for Metal Roofs

For fixing additional air-termination systems on metal roofs.
When using two roof conductor holders (clamps / clamping pieces) which have been tested for the respective roof profile, a lightning current carrying capability of 100 kA (10/350 µs) is provided.

### For roofs with round standing seam, with clamping piece



| Type | DLH KB 6.10 RSF20.25 V2A | DLH KB 6.10 RSF20.25 AL |
|---|---|---|
| **Part No.** | **223 010** | **223 040** |
| Material of roof conductor holder | StSt | Al |
| Clamping range | Ø20-25 mm | Ø20-25 mm |
| Material of conductor holder | StSt | Al |
| Conductor support Rd | 6-10 mm | 6-10 mm |
| Conductor routing | fixed | fixed |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

*) For exact assignment, see test certificate.

### For roofs with round standing seam, with DEHNgrip



| Type | DLH DG 8 RSF20.25 V2A | DLH DG 8 RSF20.25 AL |
|---|---|---|
| **Part No.** | **223 011** | **223 041** |
| Material of roof conductor holder | StSt | Al |
| Clamping range | Ø20-25 mm | Ø20-25 mm |
| Height of conductor holder | 20 mm | 20 mm |
| Material of conductor holder | StSt | StSt |
| Conductor support Rd | 8 mm | 8 mm |
| Conductor routing | loose | loose |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

### For roofs with clamping seam, with clamping piece (e.g. RIB ROOF Speed 500 by Zambelli)



| Type | DLH KB 6.10 KF18.22 AL |
|---|---|
| **Part No.** | **223 070** |
| Material of roof conductor holder | Al |
| Clamping range | approx. 18 / 22 mm |
| Material of conductor holder | Al |
| Conductor support Rd | 6-10 mm |
| Conductor routing | fixed |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

*) For exact assignment, see test certificate.

### For roofs with clamping seam, with DEHNgrip (e.g. RIB-ROOF Speed 500 by Zambelli)



| Type | DLH DG 8 KF18.22 AL |
|---|---|
| **Part No.** | **223 071** |
| Material of roof conductor holder | Al |
| Clamping range | approx. 18 / 22 mm |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Conductor routing | loose |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### For roofs with standing seam, with clamping piece



| Type | FK KB 6.10 KBF0.7 8 W V2A |
|---|---|
| **Part No.** | **365 059** |
| Material of roof conductor holder | StSt |
| Clamping range | 0.7-8 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 6-10 mm |
| Conductor routing | fixed |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## For roofs with standing seam, with DEHNgrip



| Type | DLH DG 8 SF0.7 8 V2A |
|---|---|
| **Part No.** | **223 031** |
| Material of roof conductor holder | StSt |
| Clamping range | 0.7-8 mm |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Conductor routing | loose |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## For trapezoidal roofs, with clamping piece

Hung into the fixing screws of the roof.



| Type | DLH KB 6.10 TD B8.5 V2A |
|---|---|
| **Part No.** | **223 020** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Conductor support Rd | 6-10 mm |
| Conductor routing | fixed |
| PU | 50 pc(s) |

## For trapezoidal roofs, with DEHNgrip

Hung into the fixing screws of the roof.



| Type | DLH DG 8 TD B8.5 V2A |
|---|---|
| **Part No.** | **223 021** |
| Material of roof conductor holder | StSt |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Conductor routing | loose |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

# Roof Conductor Holders with Adhesive Pad

For installing air-termination systems, e.g. on trapezoidal roofs.
The conductor holder can be used on smooth (unstructured) surfaces such as metal roofs / metal surfaces.
The conductor holders are stuck to the roof (remove protective backing).

## DEHNsnap conductor holder with formable aluminium brace



| Type DLH ... | DS 8 H16 KP K AL |
|---|---|
| **Part No.** | **297 130** |
| Brace material | Aluminium - formable |
| Material of conductor holder | **Plastic** |
| Colour of conductor holder | grey ● |
| Conductor support Rd | 8 mm |
| Type of conductor holder | DEHNsnap |
| Height of conductor holder | 16 mm |
| Conductor routing | loose |
| Dimensions | as per CAD |
| PU | 50 pc(s) |

## DEHNgrip conductor holder with formable aluminium brace



| Type DLH ... | DG 8 H20 KP V2A AL |
|---|---|
| **Part No.** | **297 140** |
| Brace material | Aluminium - formable |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Type of conductor holder | DEHNgrip |
| Height of conductor holder | 20 mm |
| Conductor routing | loose |
| Dimensions | as per CAD |
| PU | 50 pc(s) |

## DEHNsnap conductor holder with base plate



| Type DLH ... | DS 8 H36 KP67 K GR |
|---|---|
| **Part No.** | **297 110** |
| Base plate material | **plastic** |
| Base plate colour | grey ● |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | grey ● |
| Conductor support Rd | 8 mm |
| Type of conductor holder | DEHNsnap |
| Height of conductor holder | 36 mm |
| Conductor routing | loose |
| Dimensions | Ø67 mm |
| PU | 50 pc(s) |

## DEHNgrip conductor holder with base plate



| Type DLH ... | DG 8 H32 KP67 V2A K GR |
|---|---|
| **Part No.** | **297 120** |
| Base plate material | **plastic** |
| Base plate colour | grey ● |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Type of conductor holder | DEHNgrip |
| Height of conductor holder | 32 mm |
| Conductor routing | loose |
| Dimensions | Ø67 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

**Note:**
For cleaning the adhesive points for roof conductor holders with adhesive pad use ISOPROPYL ALCOHOL 99.1 to 99.9% (CAS No. 67-63-0).

## Roof Conductor Holders for Corrugated Sheet Roofs

For installing ridge conductors and conductors on the roof surface.
Corrugations 177 mm (profile 5) and 130 mm (profile 8).

### For corrugated sheet roofs (profile 5), with DEHNquick

For installation on the roof surface.



| Type DLH ... | DQ 6.10 WPRO5 STTZN |
|---|---|
| **Part No.** | **202 005** |
| Material of roof conductor holder | **St/tZn** |
| Material of conductor holder | **St/tZn** |
| Conductor support Rd | 6-10 mm |
| Conductor routing | fixed |
| PU | 50 pc(s) |

### For corrugated sheet roofs (profile 5), with DEHNgrip

For installation on the roof surface.



| Type DLH ... | DQ 8 WPRO5 V2A STTZN |
|---|---|
| **Part No.** | **206 105** |
| Material of roof conductor holder | **St/tZn** |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Conductor routing | loose |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### For corrugated sheet roofs (profile 5 and profile 8), with DEHNquick

For installing ridge conductors and conductors on the roof surface, angled design.



| Type DLH ... | DQ 6.10 WPRO5 8 STTZN |
|---|---|
| **Part No.** | **202 015** |
| Material of roof conductor holder | **St/tZn** |
| Material of conductor holder | **St/tZn** |
| Conductor support Rd | 6-10 mm |
| Conductor routing | fixed |
| PU | 50 pc(s) |

### For corrugated sheet roofs (profile 5 and profile 8), with DEHNquick

For installing ridge conductors and conductors on the roof surface, angled design.



| Type DLH ... | DQ 6.10 WPRO5 8 V2A |
|---|---|
| **Part No.** | **202 906** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Conductor support Rd | 6-10 mm |
| Conductor routing | fixed |
| PU | 50 pc(s) |

### For corrugated sheet roofs (profile 5 and profile 8), with DEHNgrip

For installing ridge conductors and conductors on the roof surface, straight design.



| Type DLH ... | DG 8 H20 WPRO5 8 V2A |
|---|---|
| **Part No.** | **206 339** |
| Material of roof conductor holder | StSt |
| Height of conductor holder | 20 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 8 mm |
| Conductor routing | loose |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### For corrugated sheet roofs (profile 5 and profile 8), with DEHNsnap

For installing ridge conductors and conductors on the roof surface, straight design.



| Type DLH ... | DS 8 H16 WPRO5 8 GR V2A | DS 8 H16 WPRO5 8 BR V2A |
|---|---|---|
| **Part No.** | **204 906** | **204 916** |
| Material of roof conductor holder | StSt | StSt |
| Height of conductor holder | 16 mm | 16 mm |
| Material of conductor holder | **plastic** | **plastic** |
| Colour of conductor holder | grey | brown |
| Conductor support Rd | 8 mm | 8 mm |
| Conductor routing | loose | loose |
| PU | 50 pc(s) | 50 pc(s) |



## Conductor Holders DEHNgrip

Screwless StSt holder system with loose conductor routing.

### Height 20 mm



| Type LH DG ... | 8 H20 IGM6 V2A | 8 H20 B7.8 V2A |
|---|---|---|
| **Part No.** | **207 019** | **207 009** |
| Thread of conductor holder | M6 | – |
| Hole of conductor holder | – | Ø7.8 mm |
| Material of conductor holder | StSt | StSt |
| Conductor support Rd | 8 mm | 8 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

| Type LH DG ... | 8 H20 IGM6 CU | 8 H20 B7.8 CU |
|---|---|---|
| **Part No.** | **207 017** | **207 007** |
| Thread of conductor holder | M6 | – |
| Hole of conductor holder | – | Ø7.8 mm |
| Material of conductor holder | Cu | Cu |
| Conductor support Rd | 8 mm | 8 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

### Height 32 mm



| General technical data: | | |
|---|---|---|
| Conductor support Rd | | 8 mm |
| Standard | | EN 62561-4 |

| Type LH DG ... | 8 H32 IGM6 V2A | 8 H32 B7.8 V2A |
|---|---|---|
| **Part No.** | **207 039** | **207 029** |
| Thread of conductor holder | M6 | – |
| Hole of conductor holder | – | Ø7.8 mm |
| Material of conductor holder | StSt | StSt |
| PU | 50 pc(s) | 50 pc(s) |

| Type LH DG ... | 8 H32 IGM6 CU | 8 H32 B7.8 CU |
|---|---|---|
| **Part No.** | **207 037** | **207 027** |
| Thread of conductor holder | M6 | – |
| Hole of conductor holder | – | Ø7.8 mm |
| Material of conductor holder | Cu | Cu |
| PU | 50 pc(s) | 50 pc(s) |

### Height 20 mm, pre-assembled with screw, plastic base and plug

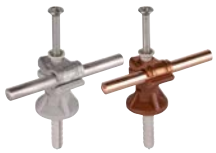


| Type LH DG ... | 8 H20 HS5X50 KD8 V2A GR | 8 H20 HS5X50 KD8 CU BR |
|---|---|---|
| **Part No.** | **207 109** | **207 107** |
| Hole of conductor holder | Ø7.8 mm | Ø7.8 mm |
| Material of conductor holder | StSt | Cu |
| Conductor support Rd | 8 mm | 8 mm |
| Screw | 5 x 50 mm | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm | Ø8 x 40 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

## Conductor Holders DEHNfix

Two-in-one system (fixes the holder and the conductor) with conductor holder DEHNquick, fixed conductor routing, UV-stabilised.

### Height 30 mm



| General technical data: | | |
|---|---|---|
| Material of base part | | plastic |
| Conductor support Rd | | 6-10 mm |
| Nail plug | | Ø8 x 80 mm |
| Drilling depth | | 45 mm |

| Type LH DFI DQ 6.10 ... | STTZN H30 GR | V2A H30 GR |
|---|---|---|
| **Part No.** | **250 000** | **250 001** |
| Material of clamp | St/tZn | StSt |
| Colour of conductor holder | grey | grey |
| PU | 50 pc(s) | 50 pc(s) |

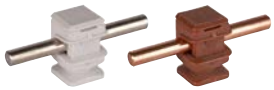
| Type LH DFI DQ 6.10 ... | CU H30 BR |
|---|---|
| **Part No.** | **250 007** |
| Material of clamp | Cu |
| Colour of conductor holder | brown |
| PU | 50 pc(s) |

Note: Only suitable for solid stone or concrete.

## Conductor Holders DEHNsnap

Plastic holder system with loose conductor routing.

### Height 16 mm with female thread



| General technical data: | | |
|---|---|---|
| Material of conductor holder | | **plastic** |
| Conductor support Rd | | 8 mm |

| **Type LH DS 8 ...** | **H16 IGM6 GR** | **H16 IGM6 BR** |
|---|---|---|
| **Part No.** | **204 001** | **204 007** |
| Thread of conductor holder | M6 | M6 |
| Colour of conductor holder | grey | brown |
| PU | 100 pc(s) | 50 pc(s) |

| **Type LH DS 8 ...** | **H16 IGM8 GR** | **H16 IGM8 BR** |
|---|---|---|
| **Part No.** | **204 002** | **204 017** |
| Thread of conductor holder | M8 | M8 |
| Colour of conductor holder | grey | brown |
| PU | 50 pc(s) | 100 pc(s) |

### Height 36 mm with female thread



| General technical data: | | |
|---|---|---|
| Material of conductor holder | | **plastic** |
| Conductor support Rd | | 8 mm |

| **Type LH DS 8 ...** | **H36 IGM6 GR** | **H36 IGM6 BR** |
|---|---|---|
| **Part No.** | **204 003** | **204 027** |
| Thread of conductor holder | M6 | M6 |
| Colour of conductor holder | grey | brown |
| PU | 100 pc(s) | 100 pc(s) |

| **Type LH DS 8 ...** | **H36 IGM8 GR** | **H36 IGM8 BR** |
|---|---|---|
| **Part No.** | **204 004** | **204 037** |
| Thread of conductor holder | M8 | M8 |
| Colour of conductor holder | grey | brown |
| PU | 50 pc(s) | 50 pc(s) |

### Height 16 mm with screw



| **Type LH DS 8 ...** | **H16 HS5X50 GR** |
|---|---|
| **Part No.** | **204 006** |
| Thread of conductor holder | M8 |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | grey |
| Conductor support Rd | 8 mm |
| Screw | 5 x 50 mm |
| PU | 50 pc(s) |

### Height 16 mm, pre-assembled with screw, cover plate and dowel



| **Type LH DS 8 ...** | **H16 HS5X50 KD8 GR** |
|---|---|
| **Part No.** | **204 120** |
| Thread of conductor holder | M8 |
| Material of conductor holder | **plastic** |
| Colour of conductor holder | grey |
| Conductor support Rd | 8 mm |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| PU | 50 pc(s) |

## Conductor Holders DEHNhold

Conductor holder with a slotted saddle clamp for fixing round conductors, fixed conductor routing.
For use with different materials, e.g. Al, StSt, St/tZn and Cu.

### With female thread



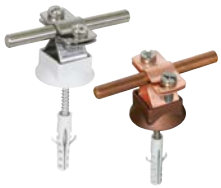
| **Type LH ZS ...** | **8.10 FL20 M8 V2A** | **8.10 FL20 M8 CU** |
|---|---|---|
| **Part No.** | **274 110** | **274 117** |
| Material of conductor holder | StSt | StSt / gal Cu |
| Conductor support Rd | 8-10 mm | 8-10 mm |
| Conductor support Fl | 20 mm | 20 mm |
| Height of conductor holder | 20 mm | 20 mm |
| Thread of conductor holder | M8 | M8 |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

### With female thread, pre-assembled with plastic base



| **Type LH ZS ...** | **8.10 FL20 M8 KS V2A** |
|---|---|
| **Part No.** | **274 150** |
| Material of conductor holder | StSt |
| Conductor support Rd | 8-10 mm |
| Conductor support Fl | 20 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With female thread, pre-assembled with screw, plastic base and plug



| **Type LH ZS ...** | **8.10 FL20 KS KD8X40 V2A** | **8.10 FL20 KS KD8X40 CU** |
|---|---|---|
| **Part No.** | **274 160** | **274 167** |
| Material of conductor holder | StSt | StSt / gal Cu |
| Conductor support Rd | 8-10 mm | 8-10 mm |
| Conductor support Fl | 20 mm | 20 mm |
| Height of conductor holder | 20 mm | 20 mm |
| Thread of conductor holder | M8 | M8 |
| Plastic base | grey | brown |
| Screw | 5 x 50 mm | 5 x 50 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

### With female thread, e.g. for round wire with plastic sheath



| Type LH ZS ... | 13 M8 V2A |
|---|---|
| **Part No.** | **274 113** |
| Material of conductor holder | StSt |
| Conductor support Rd | 13 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| PU | 50 pc(s) |

## Conductor Holders with Saddle Clamp and Flange

Complete unit with flange for installing conductors, fixed conductor routing.

### With M8 female thread



| Type LH ZS ... | 7.10 IGM8 STTZN ZG |
|---|---|
| **Part No.** | **275 110** |
| Conductor support Rd | 7-10 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamp | **St/tZn** |
| Material of base part | **ZDC** |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With female thread, pre-assembled with screw and plug



| Type LH ZS ... | 7.10 KD8X40 STTZN ZG |
|---|---|
| **Part No.** | **275 160** |
| Conductor support Rd | 7-10 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamp | **St/tZn** |
| Material of base part | **ZDC** |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With female thread, e.g. for round wire with plastic sheath



| Type LH ZS ... | 13 IGM8 STTZN ZG |
|---|---|
| **Part No.** | **275 113** |
| Conductor support Rd | 11-13 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamp | **St/tZn** |
| Material of base part | **ZDC** |
| PU | 50 pc(s) |

## Conductor Holder with Saddle Clamp – Flat Design

Two-screw clamp with two M6 screws, for round and flat conductors.
With plastic cover disc (grey).

### Pre-assembled with wood screw, plastic cover disc (grey) and plug



| Type | LH ZS 7.10 FL30 AS KD8X40 V2A |
|---|---|
| **Part No.** | **286 819** |
| Conductor support Rd | 7-10 mm |
| Conductor support Fl | 30 mm |
| Height of conductor holder | 10 mm |
| Material of conductor holder | StSt |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Round Conductor Holders

Conductor holders used for securing solid round and stranded cable conductors to building surfaces.

### Round Conductor Holders

Holders for bare and PVC covered solid round and cable conductors.



| General technical data: | | |
|---|---|---|
| Standards | | IEC / EN / BS EN 62561-4 |
| Classification | | Metallic, With screws, Clamp the conductor |

| Type RCH ... | BCCU 8.10/16.70 HCA | BCCU 70.150 HCA |
|---|---|---|
| **Part No.** | **118 162** | **118 163** |
| Material | High Copper Alloy | High Copper Alloy |
| Conductor Material | Bare and PVC covered copper | Bare and PVC covered copper |
| Clamping range (Stranded / Cable) | 16 - 70 mm² | 70 - 150 mm² |
| Clamping range Rd | 8 - 10 mm | – |
| Tightening Torque | 6 Nm | 6 Nm |
| PU | 50 pc(s) | 50 pc(s) |

| Type RCH ... | BCCU 150.300 HCA | BCCU 8.10/16.70 ALA |
|---|---|---|
| **Part No.** | **118 164** | **118 165** |
| Material | High Copper Alloy | Aluminium Alloy |
| Conductor Material | Bare and PVC covered copper | Bare and PVC covered aluminium |
| Clamping range (Stranded / Cable) | 150 - 300 mm² | – |
| Clamping range Rd | – | 8 - 10 mm |
| Tightening Torque | 6 Nm | 2 Nm |
| PU | 50 pc(s) | 50 pc(s) |

## Stranded Cable Clips

These cable clips are an easy way to secure the stranded and solid round copper conductors to the building surface.



| General technical data: | |
|---|---|
| Material | Copper |
| Standards | IEC / EN / BS EN 62561-4 |
| Classification | Metallic, With screws, Clamp the conductor |

| Type | SCC BCU 50 CU | SCC BCU 70 CU |
|---|---|---|
| Part No. | 117 165 | 117 166 |
| Conductor Material | Bare Copper | Bare Copper |
| Clamping range (Stranded / Cable) | 50 mm² | 70 mm² |
| PU | 50 pc(s) | 50 pc(s) |

| Type | SCC CCU 50 CU | SCC CCU 70 CU |
|---|---|---|
| Part No. | 117 185 | 117 186 |
| Conductor Material | PVC Covered Copper | PVC Covered Copper |
| Clamping range (Stranded / Cable) | 50 mm² | 70 mm² |
| PU | 50 pc(s) | 50 pc(s) |

## Cover Discs and Plastic Bases

Intermediate element for screw-on / snap-on conductor and rod holders.

### Plastic base

Snapped onto the conductor holders DEHNgrip and DEHNhold.



| Type | KS 35 14 B8.5 UVS GR | KS 35 14 B8.5 UVS BR |
|---|---|---|
| Part No. | 276 016 | 276 017 |
| Height | 10 mm | 10 mm |
| Diameter Ø | 35 mm | 35 mm |
| Material | plastic | plastic |
| Colour | grey | brown |
| Type | UV-stabilised | UV-stabilised |
| PU | 100 pc(s) | 100 pc(s) |

### Cover disc, plastic



| Type | AS 37 5 B7.5 UVS K GR | AS 37 5 B7.5 UVS K BR |
|---|---|---|
| Part No. | 276 006 | 276 007 |
| Height | 5 mm | 5 mm |
| Diameter Ø | 37 mm | 37 mm |
| Material | plastic | plastic |
| Colour | grey | brown |
| Type | UV-stabilised | UV-stabilised |
| PU | 100 pc(s) | 100 pc(s) |

### Cover disc, StSt



| Type | AS 37 5 B8.5 V2A |
|---|---|
| Part No. | 276 009 |
| Height | 5 mm |
| Diameter Ø | 37 mm |
| Material | StSt |
| PU | 100 pc(s) |

## Conductor Holder with Claw

Conductor holder for wall mounting with M6 clamping screw.
Fixed conductor routing.



| Type | LH KR 6.10 H22 B6.5 V2A |
|---|---|
| Part No. | 273 019 |
| Hole Ø | 6.5 mm |
| Material of conductor holder | StSt |
| Conductor support Rd | 6-10 mm |
| Height of conductor holder | 22 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Flush-mounted Conductor Holders/Saddle Clamps

Suitable for flush mounting.

### DEHNQUICK with nail plug



| General technical data: | |
|---|---|
| Conductor support Rd | 6-10 mm |

| Type | LH DQ 6.10 ND6X60 V2A | LH DQ 6.10 ND8X80 STTZN |
|---|---|---|
| Part No. | 390 120 | 390 121 |
| Material of conductor holder | StSt | St/tZn |
| Nail plug | Ø6 x 60 mm | Ø8 x 80 mm |
| PU | 50 pc(s) | 50 pc(s) |

| Type | LH DQ 6.10 ND8X80 V2A |
|---|---|
| Part No. | 390 122 |
| Material of conductor holder | StSt |
| Nail plug | Ø8 x 80 mm |
| PU | 50 pc(s) |

### DEHNQUICK

Single-screw clamp with flexible clamping range and fixed conductor routing.



| General technical data: | |
|---|---|
| Conductor support Rd | 6-10 mm |

| Type UEL DQ ... | 6.10 B8.5 STTZN | 6.10 B8.5 V2A | 6.10 B6.5 V2A |
|---|---|---|---|
| Part No. | 202 000 | 202 001 | 202 169 |
| Material of conductor holder | St/tZn | StSt | StSt |
| Hole Ø | 8.5 mm | 8.5 mm | 6.5 mm |
| PU | 50 pc(s) | 50 pc(s) | 100 pc(s) |

### Clamping piece

Single-screw clamp with flexible clamping range and fixed conductor routing.



| Type | KB 6.10 B9 STTZN | KB 6.10 B9 V2A |
|---|---|---|
| Part No. | 390 110 | 390 119 |
| Material of conductor holder | St/tZn | StSt |
| Conductor support Rd | 6-10 mm | 6-10 mm |
| Hole Ø | 9 mm | 9 mm |
| PU | 100 pc(s) | 100 pc(s) |

## Conductor Holders for Downpipes

For installing down conductors on downpipes with fixed conductor routing.
All types are also suitable for plastic downpipes.

### Type PPS
With worm gear.



| General technical data: | |
|---|---|
| Conductor support Rd | 8 mm |

| Type LH ... | 8 SB80.100 SCG V2A | 8 SB80.100 SCG GALCU |
|---|---|---|
| Part No. | 200 079 | 200 077 |
| Clamping range Ø pipe | 80-100 mm | 80-100 mm |
| Material of conductor holder | StSt | StSt / gal Cu |
| PU | 50 pc(s) | 50 pc(s) |

| Type LH ... | 8 SB100.120 SCG V2A | 8 SB100.120 SCG GALCU |
|---|---|---|
| Part No. | 200 089 | 200 087 |
| Clamping range Ø pipe | 100-120 mm | 100-120 mm |
| Material of conductor holder | StSt | StSt / gal Cu |
| PU | 50 pc(s) | 50 pc(s) |

### Type PS
Screwless, pre-punched for tongs.

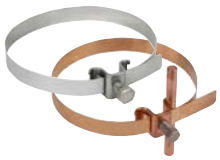


| General technical data: | |
|---|---|
| Conductor support Rd | 8 mm |

| Type LH ... | 8 SB80.120 SCL V2A | 8 SB80.120 SCL CU |
|---|---|---|
| Part No. | 200 069 | 200 067 |
| Clamping range Ø pipe | 80-120 mm, in steps of 5 mm | 80-120 mm, in steps of 5 mm |
| Material of conductor holder | StSt | Cu |
| PU | 25 pc(s) | 25 pc(s) |

| Type LH ... | 8 SB100 SCL V2A | 8 SB100 SCL CU |
|---|---|---|
| Part No. | 200 059 | 200 057 |
| Clamping range Ø pipe | 100 mm | 100 mm |
| Material of conductor holder | StSt | Cu |
| PU | 25 pc(s) | 25 pc(s) |

### Type PV
Adjustable, with clamping screw M8.



| General technical data: | |
|---|---|
| Conductor support Rd | 6-8 mm |

| Type LH ... | 6.8 SB50.120 SPSM8 V2A | 6.8 SB50.150 SPSM8 V2A |
|---|---|---|
| Part No. | 200 029 | 200 039 |
| Clamping range Ø pipe | 50-120 mm | 50-150 mm |
| Material of conductor holder | StSt | StSt |
| PU | 10 pc(s) | 10 pc(s) |

| Type LH ... | 6.8 SB50.120 SPSM8 CU |
|---|---|
| Part No. | 200 027 |
| Clamping range Ø pipe | 50 -120 mm |
| Material of conductor holder | Cu/bronze |
| PU | 10 pc(s) |

## Downpipe Clamps

Pipe clamps for connecting downpipes to the lightning equipotential bonding according to IEC/EN 62305-3.
Connection possibilities for Rd, e.g. with KS connector (Part No. 301 000) or with clamping piece (Part No. 390 150) (depending on material).

### For fixed pipe diameters



| General technical data: | | |
|---|---|---|
| Hole Ø | | 11 mm |
| Standard | | EN 62561-1 |

| Type | RRS 100 B11 STTZN | RRS 120 B11 STTZN |
|---|---|---|
| Part No. | 420 100 | 420 120 |
| Material | St/tZn | St/tZn |
| Clamping range pipe Ø (d1) | 100 mm | 120 mm |
| PU | 50 pc(s) | 1 pc(s) |

| Type | RRS 100 B11 CU | RRS 120 B11 CU |
|---|---|---|
| Part No. | 420 107 | 420 127 |
| Material | Cu | Cu |
| Clamping range pipe Ø (d1) | 100 mm | 120 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Bimetallic type
For connecting St conductors with Cu downpipes, with St/tZn clamping piece and intermediate plate (Cupal).



| Type | ZMRRS 100 KB 6.10 CU STTZN |
|---|---|
| Part No. | 420 207 |
| Material | Cu / St/tZn |
| Clamping range pipe Ø (d1) | 100 mm |
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Type RV, adjustable

With additional anti-rotation protection of the fixing screw and markings, predetermined bending points as well as prepunched cutting aids.



| General technical data: | |
|---|---|
| Hole Ø | 10.5 mm |
| Standard | EN 62561-1 |

| Type | RRS V 60.100 B10.5 STTZN | RRS V 60.100 B10.5 AL |
|---|---|---|
| Part No. | 423 010 | 423 011 |
| Material | St/tZn | Al |
| Clamping range pipe Ø (d1) | 60-100 mm | 60-100 mm |
| Length (l1) | 337 mm | 337 mm |
| PU | 50 pc(s) | 50 pc(s) |

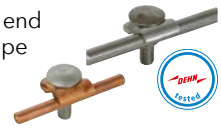
| Type | RRS V 60.100 B10.5 CU | RRS V 60.100 B10.5 V2A |
|---|---|---|
| Part No. | 423 017 | 423 019 |
| Material | Cu | StSt |
| Clamping range pipe Ø (d1) | 60-100 mm | 60-100 mm |
| Length (l1) | 337 mm | 337 mm |
| PU | 1 pc(s) | 50 pc(s) |

| Type | RRS V 60.150 B10.5 STTZN | RRS V 60.150 B10.5 AL |
|---|---|---|
| Part No. | 423 020 | 423 021 |
| Material | St/tZn | Al |
| Clamping range pipe Ø (d1) | 60-150 mm | 60-150 mm |
| Length (l1) | 494 mm | 494 mm |
| PU | 50 pc(s) | 50 pc(s) |

| Type | RRS V 60.150 B10.5 CU | RRS V 60.150 B10.5 V2A |
|---|---|---|
| Part No. | 423 027 | 423 029 |
| Material | Cu | StSt |
| Clamping range pipe Ø (d1) | 60-150 mm | 60-150 mm |
| Length (l1) | 494 mm | 494 mm |
| PU | 50 pc(s) | 50 pc(s) |

## Clamping Piece Variants

For example as a connection with end piece for constructions or downpipe clamps.
Clamping piece with square hole 11 mm and truss head screw.



| General technical data: | |
|---|---|
| Clamping range Rd | 6-10 mm |
| Screw | M10 x 35 mm |
| Standard | EN 62561-1 |

| Type KB 6.10 FRM10X35 ... | STTZN | CU |
|---|---|---|
| Part No. | 390 150 | 390 157 |
| Material of clamp | St/tZn | Cu |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| Material of screw / nut | St/tZn | StSt |
| PU | 100 pc(s) | 1 pc(s) |

| Type KB 6.10 FRM10X35 ... | V2A |
|---|---|
| Part No. | 390 159 |
| Material of clamp | StSt |
| Clamping range (stranded / cable) | – |
| Material of screw / nut | StSt |
| PU | 100 pc(s) |

## KS Connectors

Clamping screw connector (**K**lemm**S**chrauben-Verbinder) for lightning current carrying connection of round conductors, e.g. to flat profiles, downpipe clamps or other parts of the lightning protection system.

### One-piece, St/tZn

With screw and nut M10.



| Type | KSV 7.10 STTZN | KSV 7.10 FER STTZN |
|---|---|---|
| Part No. | 301 000 | 301 010 |
| Material of clamping screw | St/tZn | St/tZn |
| Material of clamp | ZDC | ZDC |
| Clamping range Rd | 7-10 mm | 7-10 mm |
| Type | – | + spring washer |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 100 pc(s) | 100 pc(s) |

### One-piece, Cu

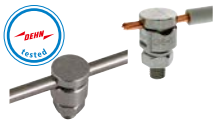
With screw and nut M10.



| Type | KSV 6.10 CU | KSV 6.10 FER CU |
|---|---|---|
| Part No. | 301 007 | 301 017 |
| Material of clamping screw | Cu | Cu |
| Material of clamp | high copper alloy | high copper alloy |
| Clamping range Rd | 6-10 mm | 6-10 mm |
| Connection (single-wire / multi-wire) | 16-50 mm² | 25-70 mm² |
| Type | – | + spring washer |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 100 pc(s) | 100 pc(s) |

### One-piece, StSt

With screw and nut M10.



| General technical data: | |
|---|---|
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |

| Type | KSV 6.10 V2A | KSV 6.10 V4A |
|---|---|---|
| Part No. | 301 009 | 301 089 |
| Material of clamping screw | StSt | StSt (V4A) |
| Material of clamp | StSt | StSt (V4A) |
| Connection (single-wire / multi-wire) | 25-70 mm² | 25-70 mm² |
| Type | – | – |
| PU | 100 pc(s) | 100 pc(s) |

| Type | KSV 6.10 FER V2A | KSV 6.10 FER V4A |
|---|---|---|
| Part No. | 301 019 | 301 099 |
| Material of clamping screw | StSt | StSt (V4A) |
| Material of clamp | StSt | StSt (V4A) |
| Connection (single-wire / multi-wire) | 25-70 mm² | 25-70 mm² |
| Type | + spring washer | + spring washer |
| PU | 100 pc(s) | 100 pc(s) |

| Type | UKSV 6.10 AQ16 50 V4A |
|---|---|
| Part No. | 540 122 |
| Material of clamping screw | StSt (V4A) |
| Material of clamp | StSt (V4A) |
| Connection (single-wire / multi-wire) | 16-50 mm² |
| Type | + spring washer |
| PU | 25 pc(s) |

## One-piece, long, StSt

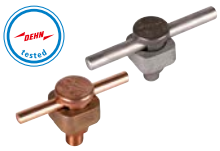
With screw and nut M10, length 60 mm.



| Type | KSVL 6.10 FER V2A |
|---|---|
| Part No. | 301 020 |
| Material of clamping screw | StSt |
| Material of clamp | StSt |
| Clamping range Rd | 6-10 mm |
| Connection (single-wire / multi-wire) | 25-70 mm² |
| Type | + spring washer |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Heavy design

With screw and nut M12.



| Type | KSV 8.12.5 STTZN | KSV 8.12.5 CU |
|---|---|---|
| Part No. | 300 002 | 300 017 |
| Material of clamping screw | St/tZn | Cu |
| Material of clamp | MCI | high copper alloy |
| Clamping range Rd | 8-12.5 mm | 8-12.5 mm |
| Connection (single-wire / multi-wire) | 50-95 mm² | 50-95 mm² |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 1 pc(s) |

## Two-piece, gap 30 mm

With screw and nut M10.



| Type | KSV 2X7.10 STTZN |
|---|---|
| Part No. | 302 010 |
| Material of clamping screw | St/tZn |
| Material of clamp | ZDC |
| Clamping range Rd | 7-10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Two-piece, gap 40 mm

With screw and nut M10.



| Type | AP 2X6.10 V2A |
|---|---|
| Part No. | 301 229 |
| Material of clamping screw | StSt |
| Material of clamp | StSt |
| Clamping range Rd | 6-10 mm |
| Type | + spring washer |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

# Plastic Conductor Holders for Downpipes

For insulated fixing of earth entries to metal downpipes.
Holder with clamping part for fixing the tensioning strap (dimensions 14 x 0.3 mm).

## For round conductors

Fixed conductor routing, made of weather-resistant plastic, UV-stabilised and halogen-free.



| Type | LH ZS 6.11 SBB PA V2A |
|---|---|
| Part No. | 275 711 |
| Material of conductor holder | PA |
| Material of clamping part | StSt |
| Conductor support Rd | 6-11 mm |
| PU | 50 pc(s) |

## For flat strips or round conductors

Fixed conductor routing, made of weather-resistant plastic, UV-stabilised and halogen-free.



| Type | LH ZS 6.11 FL30 SBB PA V2A |
|---|---|
| Part No. | 275 730 |
| Material of conductor holder | PA |
| Material of clamping part | StSt |
| Conductor support Rd | 6-11 mm |
| Conductor support Fl | 30 mm |
| PU | 50 pc(s) |

## For earth entry rods

Fixed conductor routing, made of weather-resistant plastic, UV-stabilised and halogen free.



| Type | LH ZS 16 SBB PA V2A |
|---|---|
| Part No. | 275 716 |
| Material of conductor holder | PA |
| Material of clamping part | StSt |
| Conductor support Rd | 16 mm |
| PU | 50 pc(s) |

## Separate grip head

For combination with endless tensioning strap (Part No. 540 931 or Part No. 540 905).



| Type | SPK 14X0.3 V2A |
|---|---|
| Part No. | 540 930 |
| Material of grip head / strap | StSt |
| Screw | (SW13) M8 x 16 mm |
| PU | 25 pc(s) |

## Endless tensioning strap

Cut to length with sheet metal shears.



| Type | SPB 14X0.3 L50M V2A | SPB 14X0.3 L100M V2A |
|---|---|---|
| Part No. | 540 931 | 540 905 |
| Material of grip head / strap | StSt | StSt |
| Dimensions of strap (w x d) | 14 x 0.3 mm | 14 x 0.3 mm |
| Packing | plastic | cardboard |
| Length | 50 m | 100 m |
| PU | 1 pc(s) | 1 pc(s) |

## Flat Strip Holders DEHNhold

For fixing flat conductors via a slotted clamp, fixed conductor routing.
For use with different materials, e.g. Al, StSt, St/tZn and Cu.

### With female thread



| Type FBH ZS 30 ... | M8 V2A |
|---|---|
| **Part No.** | **274 030** |
| Material of conductor holder | StSt |
| Conductor support Fl | 30 x 3.5 mm |
| Conductor support Rd | 6-10 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### Pre-assembled with screw, plastic base and plug



| Type FBH ZS 30 ... | KS KD8X40 V2A |
|---|---|
| **Part No.** | **274 230** |
| Material of conductor holder | StSt |
| Conductor support Fl | 30 x 3.5 mm |
| Conductor support Rd | 6-10 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Flat Strip Holders with Clamping Plate – Flat Design

Two-screw clamp with M6 screws.

### With slot (6.5 x 16 mm)



| Type FBH ZS ... | 30 B6.5X16 STTZN | 40 B6.5X16 STTZN |
|---|---|---|
| **Part No.** | **284 030** | **284 040** |
| Height of conductor holder | 10 mm | 10 mm |
| Conductor support Fl | 30 x 3.5 mm | 40 x 4-5 mm |
| Material of conductor holder | **St/tZn** | **St/tZn** |
| Material of base part | **St/tZn** | **St/tZn** |
| Width of component (l1) | 58 mm | 70 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 100 pc(s) | 100 pc(s) |

### With slot (6.5 x 16 mm) and pre-assembled wood screw



| Type FBH ZS ... | 30 B6.5X16 HS5X50 STTZN | 30 B6.5X16 HS5X50 V2A |
|---|---|---|
| **Part No.** | **286 030** | **286 139** |
| Height of conductor holder | 10 mm | 8.5 mm |
| Conductor support Fl | 30 x 3.5 mm | 30 x 3.5 mm |
| Material of conductor holder | **St/tZn** | StSt |
| Material of base part | **St/tZn** | StSt |
| Screw | 5 x 50 mm | 5 x 50 mm |
| Width of component (l1) | 58 mm | 58 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

## Flat Strip Holders with Clamping Plate and Flange

Complete unit with flange for installing flat strips.

### With female thread



| Type FBH ZS 30 IGM8 ... | STTZN ZG |
|---|---|
| **Part No.** | **275 030** |
| Conductor support Fl | 30 x 3.5 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamping plate | **St/tZn** |
| Material of base part | **ZDC** |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With female thread, pre-assembled with screw and plug



| Type FBH ZS 30 IGM8 ... | KD8X40STTZN ZG |
|---|---|
| **Part No.** | **275 230** |
| Conductor support Fl | 30 x 3.5 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamping plate | **St/tZn** |
| Material of base part | **ZDC** |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Non-Metallic Tape Clips

Non-Metallic conductor holders used for securing bare and PVC covered flat conductors to building surfaces.

### For Bare and PVC Covered Flat Conductors



| General technical data: | |
|---|---|
| Material | **PP** (UV stabilised) |
| Clamping range Fl | 25 x 3 mm |
| Conductor Fixing | Press to fit |
| Recommended Fixings | Countersunk Wood Screws 1 ½" x No. 10 and No 10 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-4 |

| Type TCC ... | BFL 25X3 BROWN PP | BFL 25X3 GREY PP |
|---|---|---|
| **Part No.** | **118 010** | **118 011** |
| Conductor Material | Bare (Copper, Tinned Copper, Aluminium, Stainless Steel) | Bare (Copper, Tinned Copper, Aluminium, Stainless Steel) |
| PVC Covering Thickness | – | – |
| Colour | Brown | Grey |
| PU | 100 pc(s) | 100 pc(s) |

| Type TCC ... | CFL 25X3 WHITE PP | CFL 25X3 STONE PP |
|---|---|---|
| **Part No.** | **118 025** | **118 024** |
| Conductor Material | PVC Covered (Copper, Tinned Copper, Aluminium, Stainless Steel) | PVC Covered (Copper, Tinned Copper, Aluminium, Stainless Steel) |
| PVC Covering Thickness | approx. 1 mm | approx. 1 mm |
| Colour | White | Stone |
| PU | 100 pc(s) | 100 pc(s) |

## Tape Conductor Holders

Conductor holders used for securing bare and PVC covered flat conductors to building surfaces.

### Tape Conductor Holders

Holders for bare and PVC covered flat conductors.



| General technical data: | |
|---|---|
| Material of screw | Stainless Steel |
| Tightening Torque | 6 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" x 10 and No 10 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-4 |

| Type | TCH BCU 25X3 HCA | TCH CCU 25X3 HCA |
|---|---|---|
| **Part No.** | **118 077** | **118 083** |
| Material | **High Copper Alloy** | **High Copper Alloy** |
| Conductor Material | Bare Copper | PVC Covered Copper |
| Clamping range Fl | 25 x 3 mm | 25 x 3 mm |
| PVC Covering Thickness | – | approx. 1 mm |
| Clamping screw | CSK M5 x 2 Nos | CSK M5 x 2 Nos |
| PU | 50 pc(s) | 50 pc(s) |

| Type | TCH BCCU 25.31X3.6 HCA | TCH BCCU 40.50X3.6 HCA |
|---|---|---|
| **Part No.** | **118 049** | **118 059** |
| Material | **High Copper Alloy** | **High Copper Alloy** |
| Conductor Material | Bare and PVC Covered Copper | Bare and PVC Covered Copper |
| Clamping range Fl | W (20 - 31 mm) x T (3 - 6 mm) | W (40 - 50 mm) x T (3 - 6 mm) |
| PVC Covering Thickness | approx. 1 mm | approx. 1 mm |
| Clamping screw | Cross head M5 x 2 Nos | Cross head M5 x 2 Nos |
| PU | 50 pc(s) | 50 pc(s) |

| Type | TCH BAL 25X3 ALA | TCH CAL 25X3 ALA |
|---|---|---|
| **Part No.** | **118 071** | **118 073** |
| Material | **Aluminium Alloy** | **Aluminium Alloy** |
| Conductor Material | Bare Aluminium | PVC Covered Aluminium |
| Clamping range Fl | 25 x 3 mm | 25 x 3 mm |
| PVC Covering Thickness | – | approx. 1 mm |
| Clamping screw | CSK M5 x 2 Nos | CSK M5 x 2 Nos |
| PU | 50 pc(s) | 50 pc(s) |

## Tape Conductor Clips

Tape Conductor Clips used for securing bare and PVC covered flat conductors flush to building surfaces.



| General technical data: | |
|---|---|
| Clamping range Fl | 25 x 3 mm |
| Recommended Fixings | 2 x Countersunk Wood Screws 1 ½" x 10 and No 10 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-4 |

| Type | TCC BCU 25X3 CU | TCC CCU 25X3 CU |
|---|---|---|
| Part No. | 118 086 | 118 085 |
| Material | Copper | Copper |
| Conductor Material | Bare Copper | PVC Covered Copper |
| PVC Covering Thickness | – | approx. 1 mm |
| PU | 100 pc(s) | 100 pc(s) |

| Type | TCC BAL 25X3 ALA | TCC CAL 25X3 ALA |
|---|---|---|
| Part No. | 118 075 | 118 076 |
| Material | Aluminium Alloy | Aluminium Alloy |
| Conductor Material | Bare Aluminium | PVC Covered Aluminium |
| PVC Covering Thickness | – | approx. 1 mm |
| PU | 100 pc(s) | 100 pc(s) |

## Flat Strip / Round Conductor Holders with Thrust Piece

For wall mounting.
Thrust piece with M8 screw for installing flat strips up to 11 mm and round conductors 6-10 mm.

### Distance from wall 11 mm



| General technical data: | |
|---|---|
| Fixing | Ø15 / 9 x 20 mm |
| Slot width | 12 mm |
| Material of screw | StSt |
| Standard | EN 62561-4 |

| Type FRH 11 6.10 ... | WA11 B7 STTZN | WA11 B7 CU |
|---|---|---|
| Part No. | 277 230 | 277 237 |
| Material of conductor holder | St/tZn | Cu |
| PU | 25 pc(s) | 25 pc(s) |

| Type FRH 11 6.10 ... | WA11 B7 V2A |
|---|---|
| Part No. | 277 239 |
| Material of conductor holder | StSt |
| PU | 25 pc(s) |

### Distance from wall 15 mm



| Type FRH 11 6.10 ... | WA15 B7 STTZN | WA15 B7 V2A |
|---|---|---|
| Part No. | 277 240 | 277 249 |
| Material of conductor holder | St/tZn | StSt |
| Fixing | 7 x 15 mm | Ø15 / 9 x 20 mm |
| Slot width | 12 mm | 12 mm |
| Material of screw | StSt | StSt |
| Pressure plate material | StSt | StSt |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 25 pc(s) | 25 pc(s) |

## Anchors for Rigid Foam Boards

For fixing conductor, flat strip and rod holders in external thermal insulation composite systems.
With star drive (TX40).
Mounting with wood screws Ø4.5 mm.

This anchor may only be used for fixing conductor holders if there is no additional traction on the down conductor.

### Short design



| Type HSPD HS4.5 ... | L50 PA |
|---|---|
| **Part No.** | **200 600** |
| Material | **PA** |
| Thickness of insulating material | 60 mm |
| Anchoring depth / length | 50 mm |
| PU | 50 pc(s) |

### Long design



| Type HSPD HS4.5 ... | L85 PA |
|---|---|
| **Part No.** | **200 601** |
| Material | **PA** |
| Thickness of insulating material | 100 mm |
| Anchoring depth / length | 85 mm |
| PU | 50 pc(s) |

## Wood Screws with Threaded Head

Hanger bolt for fixing conductor, flat strip and rod holders with female thread.



| Type HSC ... | 8X32 AGM8X13 STGALZN | 8X42 AGM8X13 STGALZN |
|---|---|---|
| **Part No.** | **528 850** | **528 870** |
| Material | **St/gal Zn** | **St/gal Zn** |
| Thread | M8 | M8 |
| Total length (l1) | 53 mm | 73 mm |
| Thread length (l2) | 32 mm | 42 mm |
| PU | 1 pc(s) | 1 pc(s) |



## Earth Entry Rod Set

Complete with disconnecting sleeve and connection clamps (KS screws).

### Type St/tZn

With disconnecting sleeve (Part No. 450 000) and KS screws (Part No. 300 000).



| Type EESS 16 1500 TM 2KS7.10 ... | STTZN |
|---|---|
| **Part No.** | **480 150** |
| Material | **St/tZn** |
| Standard | EN 62561-(1+2) |
| Length | 1500 mm |
| Connection KS screw Rd | 7-10 mm |
| Connection sleeve Rd / Rd | 7-10 / 16 mm |
| PU | 1 pc(s) |

### Type Cu

With disconnecting sleeve (Part No. 450 007) and KS screws (Part No. 300 007).



| Type EESS 16 1500 TM 2KS7.10 ... | CU |
|---|---|
| **Part No.** | **480 157** |
| Material | Cu |
| Standard | EN 62561-(1+2) |
| Length | 1500 mm |
| Connection KS screw Rd | 6-10 mm |
| Connection sleeve Rd / Rd | 7-10 / 16 mm |
| PU | 1 pc(s) |

## Heat-Shrinkable Sleeve

Heat-shrinkable sleeve for coating Rd and Fl conductors, e.g. when leading terminal lugs out of the concrete or earth entries out of the ground.
UV-stabilised, customised length.



| Typ | SCSC 16 FL30 L...M SW |
|---|---|
| **Art.-Nr.** | **554 011** |
| For Rd | 16 mm |
| For Fl | 30 mm |
| Material | **DERAY** |
| Colour | black ● |
| PU | 1 m |

## Earth Entry Rods

For connecting down conductors to the earth-termination system.

### Chamfered



| General technical data: | | | |
|---|---|---|---|
| Standard | | | EN 62561-2 |
| Diameter Ø | | | 16 mm |

| Type | FS 16 1500 STTZN | FS 16 2000 STTZN |
|---|---|---|
| **Part No.** | **483 150** | **483 200** |
| Material | **St/tZn** | **St/tZn** |
| Length (l1) | 1500 mm | 2000 mm |
| PU | 10 pc(s) | 1 pc(s) |

| Type EES 16 ... | 1000 V4A | 1500 V4A | 2000 V4A |
|---|---|---|---|
| **Part No.** | **104 903** | **104 905** | **104 906** |
| Material | StSt (V4A) | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| Length (l1) | 1000 mm | 1500 mm | 2000 mm |
| PU | 1 pc(s) | 10 pc(s) | 1 pc(s) |

### Tapered

Notched conductor Ø10 mm, partly insulated (length approx. 700 mm).



| General technical data: | | | |
|---|---|---|---|
| Material | | | **St/tZn** |
| Diameter Ø | | | 16 / 10 mm |

| Type | EES 16.10 1500 STTZN | EES 16.10 1750 STTZN |
|---|---|---|
| **Part No.** | **480 018** | **480 019** |
| Total length (l1) | 1500 mm | 1750 mm |
| Partial length Ø16 mm (l2) | 1000 mm | 750 mm |
| Partial length Ø10 mm (l3) | 500 mm | 1000 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | EES 16.10 2000 STTZN | EES 16.10 2500 STTZN |
|---|---|---|
| **Part No.** | **480 020** | **480 021** |
| Total length (l1) | 2000 mm | 2500 mm |
| Partial length Ø16 mm (l2) | 1000 mm | 1500 mm |
| Partial length Ø10 mm (l3) | 1000 mm | 1000 mm |
| PU | 10 pc(s) | 1 pc(s) |

## Straightened / Angled Connection Lugs

For connecting down conductors to the earth-termination system; made of corrosion-resistant stainless steel.

### Round wires



| General technical data: | | |
|---|---|---|
| Material | | StSt (V4A) |
| Material No. | | 1.4571 / 1.4404 |
| ASTM / AISI: | | 316Ti / 316L |
| Dimensions | | Ø10 mm |
| Cross-section | | 78 mm² |
| Standard | | EN 62561-2 |

| Type AF ... | 10 V4A 1000 | 10 V4A 1500 |
|---|---|---|
| Part No. | 860 110 | 860 115 |
| Length (l1) | 1000 mm | 1500 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type AF ... | 10 V4A 2000 | 10 V4A 3000 |
|---|---|---|
| Part No. | 860 129 | 860 130 |
| Length (l1) | 2000 mm | 3000 mm |
| PU | 5 pc(s) | 5 pc(s) |

### Flat strips



| General technical data: | | |
|---|---|---|
| Material | | StSt (V4A) |
| Material No. | | 1.4571 / 1.4404 |
| ASTM / AISI: | | 316Ti / 316L |
| Dimensions | | 30 x 3.5 mm |
| Cross-section | | 105 mm² |
| Standard | | EN 62561-2 |

| Type AF ... | 30X3.5 V4A 1000 | 30X3.5 V4A 1500 |
|---|---|---|
| Part No. | 860 210 | 860 215 |
| Length (l1) | 1000 mm | 1500 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type AF ... | 30X3.5 V4A 3000 | 30X3.5 V4A 4000 |
|---|---|---|
| Part No. | 860 230 | 860 240 |
| Length (l1) | 3000 mm | 4000 mm |
| PU | 5 pc(s) | 5 pc(s) |

### Flat strips with holes

Holes at intervals of 500 mm.



| Type AF ... | 30X3.5 V4A B6.5X12 3000 |
|---|---|
| Part No. | 860 430 |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 |
| ASTM / AISI: | 316Ti / 316L |
| Length (l1) | 3000 mm |
| Dimensions | 30 x 3.5 mm |
| Fixing | [6x] 6.5 x 12 mm |
| Hole distance | 500 mm |
| Cross-section | 105 mm² |
| Standard | EN 62561-2 |
| PU | 5 pc(s) |

### Flat strips, angled

For wall mounting (without a gap) with holes for countersunk head screws.



| Type AF ... | 30X3.5 V4A ZW 1500 | 30X3.5 V4A ZW 3000 |
|---|---|---|
| Part No. | 860 315 | 860 330 |
| Material | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 | 1.4571 / 1.4404 |
| ASTM / AISI: | 316Ti / 316L | 316Ti / 316L |
| Length (l1) | 1500 mm | 3000 mm |
| Dimensions | 30 x 3.5 mm | 30 x 3.5 mm |
| Connection | disconnecting clamp or KS connector | disconnecting clamp or KS connector |
| Fixing | [3x] Ø6.5 mm | [6x] Ø6.5 mm |
| Hole distance | 500 mm | 500 mm |
| Cross-section | 105 mm² | 105 mm² |
| Standard | EN 62561-2 | EN 62561-2 |
| PU | 5 pc(s) | 5 pc(s) |

Other dimensions are available upon request.

## Marker for Connection Lugs

Attached to round wires or strips to make them conspicuous (as required by DIN 18014) during the construction work.



| Type | SK RD10 FL30X3.5 GRGE PVC |
|---|---|
| Part No. | 478 099 |
| Material | PVC |
| Diameter Ø | 70 mm |
| Fits on Fl | 30 x 3.5 mm |
| Fits on Rd | 10 mm |
| Colour | green ● / yellow ● |
| PU | 20 pc(s) |

## Conductor Holder with Saddle Clamp – Flat Design

Two-screw clamp with two M6 screws, for round and flat conductors.
With plastic cover disc (grey).

### Pre-assembled with wood screw, plastic cover disc (grey) and plug



| Type | LH ZS 7.10 FL30 AS KD8X40 V2A |
|---|---|
| Part No. | 286 819 |
| Conductor support Rd | 7-10 mm |
| Conductor support Fl | 30 mm |
| Height of conductor holder | 10 mm |
| Material of conductor holder | StSt |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Conductor Holders DEHNhold

Conductor holder with a slotted saddle clamp for fixing round conductors, fixed conductor routing.
For use with different materials, e.g. Al, StSt, St/tZn and Cu.

### With female thread



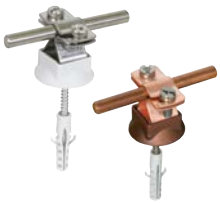
| Type LH ZS ... | 8.10 FL20 M8 V2A | 8.10 FL20 M8 CU |
|---|---|---|
| **Part No.** | **274 110** | **274 117** |
| Material of conductor holder | StSt | StSt / gal Cu |
| Conductor support Rd | 8-10 mm | 8-10 mm |
| Conductor support Fl | 20 mm | 20 mm |
| Height of conductor holder | 20 mm | 20 mm |
| Thread of conductor holder | M8 | M8 |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

### With female thread, pre-assembled with plastic base



| Type LH ZS ... | 8.10 FL20 M8 KS V2A |
|---|---|
| **Part No.** | **274 150** |
| Material of conductor holder | StSt |
| Conductor support Rd | 8-10 mm |
| Conductor support Fl | 20 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With female thread, pre-assembled with screw, plastic base and plug



| Type LH ZS ... | 8.10 FL20 KS KD8X40 V2A | 8.10 FL20 KS KD8X40 CU |
|---|---|---|
| **Part No.** | **274 160** | **274 167** |
| Material of conductor holder | StSt | StSt / gal Cu |
| Conductor support Rd | 8-10 mm | 8-10 mm |
| Conductor support Fl | 20 mm | 20 mm |
| Height of conductor holder | 20 mm | 20 mm |
| Thread of conductor holder | M8 | M8 |
| Plastic base | grey ● | brown ● |
| Screw | 5 x 50 mm | 5 x 50 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

### With female thread, e.g. for round wire with plastic sheath



| Type LH ZS ... | 13 M8 V2A |
|---|---|
| **Part No.** | **274 113** |
| Material of conductor holder | StSt |
| Conductor support Rd | 13 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| PU | 50 pc(s) |

## Conductor Holders with Saddle Clamp and Flange

Complete unit with flange for installing conductors, fixed conductor routing.

### With M8 female thread



| Type LH ZS ... | 7.10 IGM8 STTZN ZG |
|---|---|
| **Part No.** | **275 110** |
| Conductor support Rd | 7-10 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamp | **St/tZn** |
| Material of base part | **ZDC** |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With female thread, pre-assembled with screw and plug



| Type LH ZS ... | 7.10 KD8X40 STTZN ZG |
|---|---|
| **Part No.** | **275 160** |
| Conductor support Rd | 7-10 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamp | **St/tZn** |
| Material of base part | **ZDC** |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With female thread, e.g. for round wire with plastic sheath



| Type LH ZS ... | 13 IGM8 STTZN ZG |
|---|---|
| **Part No.** | **275 113** |
| Conductor support Rd | 11-13 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamp | **St/tZn** |
| Material of base part | **ZDC** |
| PU | 50 pc(s) |

## Rod Holders DEHNhold

For fixing air-termination and earth entry rods, with slotted saddle clamp, fixed conductor routing.
For use with different materials, e.g. Al, StSt, St/tZn and Cu.

### With female thread



| Type | LH ZS 16 M8 V2A |
|---|---|
| **Part No.** | **274 116** |
| Material of conductor holder | StSt |
| Conductor support Rd | 16 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| PU | 50 pc(s) |

### Pre-assembled with screw, plastic base and plug

With female thread.



| Type | SH ZS 16 KS KD8X40 V2A |
|---|---|
| **Part No.** | **274 260** |
| Material of conductor holder | StSt |
| Conductor support Rd | 16 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Screw | 5 x 50 mm |
| Plastic dowel | Ø8 x 40 mm |
| PU | 50 pc(s) |

## Rod Holders with Saddle Clamp and Flange

Complete unit with flange for installing air-termination and earth entry rods, fixed conductor routing.

### With female thread



| Type SH ZS 16 ... | M8 V2A |
|---|---|
| **Part No.** | **275 116** |
| Conductor support Rd | 16 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of saddle clamp | **St/tZn** |
| Material of base part | **ZDC** |
| PU | 50 pc(s) |

### Pre-assembled with screw and plug



| Type SH ZS 16 ... | KD8X40 STTZN ZG |
|---|---|
| **Part No.** | **275 260** |
| Conductor support Rd | 16 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of saddle clamp | **St/tZn** |
| Material of base part | **ZDC** |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| PU | 50 pc(s) |

## Rod Holders DEHNfix

Two-in-one holder system (fixes the holder and the conductor), fixed conductor routing.
Only suitable for solid stone or concrete.



| Type | SH DFI 16 STTZN H42 GR |
|---|---|
| **Part No.** | **252 000** |
| Material of saddle clamp | **St/tZn** |
| Material of base part | **plastic** |
| Colour of conductor holder | grey |
| Installation height of base part | 42 mm |
| Conductor support Rd | 16 mm |
| Nail plug | 100 / 60 mm |
| Hole Ø for nail plug | 10 mm |
| Drilling depth | 60 mm |
| PU | 50 pc(s) |

## Rod Holder with Claw

For wall mounting with M6 fixing screw, fixed conductor routing.



| Type | SH KR 13.16 H28 B6.5 V2A |
|---|---|
| **Part No.** | **275 019** |
| Hole Ø | 6.5 mm |
| Material of conductor holder | StSt |
| Height of conductor holder | 28 mm |
| Conductor support Rd | 13-16 mm |
| PU | 50 pc(s) |

## Flat Strip Holders DEHNhold

For fixing flat conductors via a slotted clamp, fixed conductor routing.
For use with different materials, e.g. Al, StSt, St/tZn and Cu.

### With female thread



| Type FBH ZS 30 ... | M8 V2A |
|---|---|
| **Part No.** | **274 030** |
| Material of conductor holder | StSt |
| Conductor support Fl | 30 x 3.5 mm |
| Conductor support Rd | 6-10 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### Pre-assembled with screw, plastic base and plug



| Type FBH ZS 30 ... | KS KD8X40 V2A |
|---|---|
| **Part No.** | **274 230** |
| Material of conductor holder | StSt |
| Conductor support Fl | 30 x 3.5 mm |
| Conductor support Rd | 6-10 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Flat Strip Holders with Clamping Plate – Flat Design

Two-screw clamp with M6 screws.

### With slot (6.5 x 16 mm)



| Type FBH ZS ... | 30 B6.5X16 STTZN | 40 B6.5X16 STTZN |
|---|---|---|
| **Part No.** | **284 030** | **284 040** |
| Height of conductor holder | 10 mm | 10 mm |
| Conductor support Fl | 30 x 3.5 mm | 40 x 4-5 mm |
| Material of conductor holder | **St/tZn** | **St/tZn** |
| Material of base part | **St/tZn** | **St/tZn** |
| Width of component (l1) | 58 mm | 70 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 100 pc(s) | 100 pc(s) |

### With slot (6.5 x 16 mm) and pre-assembled wood screw



| Type FBH ZS ... | 30 B6.5X16 HS5X50 STTZN | 30 B6.5X16 HS5X50 V2A |
|---|---|---|
| **Part No.** | **286 030** | **286 139** |
| Height of conductor holder | 10 mm | 8.5 mm |
| Conductor support Fl | 30 x 3.5 mm | 30 x 3.5 mm |
| Material of conductor holder | **St/tZn** | StSt |
| Material of base part | **St/tZn** | StSt |
| Screw | 5 x 50 mm | 5 x 50 mm |
| Width of component (l1) | 58 mm | 58 mm |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 50 pc(s) | 50 pc(s) |

## Flat Strip Holders with Clamping Plate and Flange

Complete unit with flange for installing flat strips.

### With female thread



| Type FBH ZS 30 IGM8 ... | STTZN ZG |
|---|---|
| **Part No.** | **275 030** |
| Conductor support Fl | 30 x 3.5 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamping plate | **St/tZn** |
| Material of base part | **ZDC** |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### With female thread, pre-assembled with screw and plug



| Type FBH ZS 30 IGM8 ... | KD8X40STTZN ZG |
|---|---|
| **Part No.** | **275 230** |
| Conductor support Fl | 30 x 3.5 mm |
| Thread of conductor holder | M8 |
| Height of conductor holder | 20 mm |
| Material of clamping plate | **St/tZn** |
| Material of base part | **ZDC** |
| Screw | 5 x 50 mm |
| Plastic plug | Ø8 x 40 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Flat Strip / Round Conductor Holders with Thrust Piece

For wall mounting.
Thrust piece with M8 screw for installing flat strips up to 11 mm and round conductors 6-10 mm.

### Distance from wall 11 mm



| General technical data: | | |
|---|---|---|
| Fixing | | Ø15 / 9 x 20 mm |
| Slot width | | 12 mm |
| Material of screw | | StSt |
| Standard | | EN 62561-4 |

| Type FRH 11 6.10 ... | WA11 B7 STTZN | WA11 B7 CU |
|---|---|---|
| **Part No.** | **277 230** | **277 237** |
| Material of conductor holder | **St/tZn** | **Cu** |
| PU | 25 pc(s) | 25 pc(s) |

| Type FRH 11 6.10 ... | WA11 B7 V2A |
|---|---|
| **Part No.** | **277 239** |
| Material of conductor holder | StSt |
| PU | 25 pc(s) |

### Distance from wall 15 mm



| Type FRH 11 6.10 ... | WA15 B7 STTZN | WA15 B7 V2A |
|---|---|---|
| **Part No.** | **277 240** | **277 249** |
| Material of conductor holder | **St/tZn** | StSt |
| Fixing | 7 x 15 mm | Ø15 / 9 x 20 mm |
| Slot width | 12 mm | 12 mm |
| Material of screw | StSt | StSt |
| Pressure plate material | StSt | StSt |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 25 pc(s) | 25 pc(s) |

## FIX Test Joint

With insulating piece and disconnetion lug.



| Type | FTS 8.10 FL30.40 IS STTZN |
|---|---|
| **Part No.** | **453 100** |
| Material | **St/tZn** |
| Clamping range Rd / Fl | 8-10 / 30-40 mm |
| Insulating piece | **plastic** grey |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

Version for conductor Rd / Rd 8-10 mm part no. 453 102 available upon request.
*) For exact assignment, see test certificate.

## UF Test Joint Boxes

For underground installation, for disconnecting the down conductor from the earth-termination system for measuring purposes.

### Type GCI – with integrated, easily accessible test joint

Detachable with a key, including terminal for the down conductor and the earthing conductor, open (without bottom).



| Type UFTSK ... | 7.10 FL40 300X220X120 GG |
|---|---|
| **Part No.** | **549 001** |
| Material | **GCI** |
| Colour | black (varnished) ● |
| Dimensions | 300 x 220 x 120 mm |
| Clamping range Rd / Fl | 7-10 / 30-40 mm |
| Max. permissible load | 40 kN |
| PU | 1 pc(s) |

### Type GCI – without test joint

Open (without bottom).



| Type UFTSK ... | 300X220X120 GG |
|---|---|
| **Part No.** | **549 000** |
| Material | **GCI** |
| Colour | black (varnished) ● |
| Dimensions | 300 x 220 x 120 mm |
| Max. permissible load | 40 kN |
| PU | 1 pc(s) |

### Type plastic – with integrated, easily accessible test joint

Detachable with a key, including terminal for the down conductor and the earthing conductor, open (without bottom).



| Type UFTSK ... | 7.10 FL40 197X197X204 K |
|---|---|
| **Part No.** | **549 050** |
| Material | **plastic** |
| Colour | grey ● |
| Dimensions | 197 x 197 x 204 mm |
| Clamping range Rd / Fl | 7-10 / 30-40 mm |
| Max. permissible load | 15 kN |
| PU | 1 pc(s) |

### Type plastic – without test joint

Open (without bottom).



| Type UFTSK ... | 197X197X204 K |
|---|---|
| **Part No.** | **549 051** |
| Material | **plastic** |
| Colour | grey ● |
| Dimensions | 197 x 197 x 204 mm |
| Max. permissible load | 15 kN |
| PU | 1 pc(s) |

### Type StSt – with integrated, easily accessible test joint

Detachable with a key, including terminal for the down conductor and the earthing conductor, open (without bottom).



| Type UFTSK ... | 7.10 FL40 200X200X105 V2A |
|---|---|
| **Part No.** | **549 090** |
| Material | StSt |
| Dimensions | 200 x 200 x 105 mm |
| Clamping range Rd / Fl | 7-10 / 30-40 mm |
| Max. permissible load | 40 kN |
| PU | 1 pc(s) |

### Type StSt – without test joint

Open (without bottom).



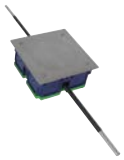
| Type UFTSK ... | 200X200X105 V2A |
|---|---|
| **Part No.** | **549 091** |
| Material | StSt |
| Dimensions | 200 x 200 x 105 mm |
| Max. permissible load | 40 kN |
| PU | 1 pc(s) |

## Test Joint Boxes

For concrete construction with integrated test joint and special construction markings.

### With rigid connection lugs

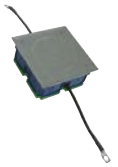
Rd 8 and Rd 10 mm, approx. 200 mm long (insulated).



| Type TSK 140X140 V2A ... | AF8 10 L200 STTZN |
|---|---|
| **Part No.** | **476 010** |
| Material of box | **plastic** |
| Dimensions of box | 140 x 140 x 68 mm |
| Material of cover | StSt |
| Dimensions of cover | 160 x 160 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### With flexible connection cables

Made from CU (16 mm²) and cable lug made out of Cu/gal Sn (hole 10.5 mm).



| Type TSK 140X140 V2A ... | AL16CU |
|---|---|
| **Part No.** | **476 016** |
| Material of box | **plastic** |
| Dimensions of box | 140 x 140 x 68 mm |
| Material of cover | StSt |
| Dimensions of cover | 160 x 160 mm |
| Standard | EN 62561 |
| PU | 1 pc(s) |

## Test Joint Box for External Thermal Insulation Composite Systems

The telescopic test joint box is particularly designed for external thermal insulation composite systems (full thermal insulation).
It is continuously adjustable from 90-140 mm. Thanks to the additional spacer, the test joint box can be used for insulation material thicknesses up to 320 mm.

### Test joint box with spacer

For insualtion material thicknesses between 140 mm and 320 mm.



| Type | TSKS WDVS 185X140X88 AH50.200 K V2A |
|---|---|
| **Part No.** | **476 055** |
| Material of box | **PC / ABS** |
| Dimensions of box | 185 x 145 mm |
| Material of cover | StSt |
| Material of spacer | **PP** |
| Dimensions of spacer | 120 x 120 x 200 mm |
| Installation depth | 90-320 mm |
| PU | 1 pc(s) |

### Test joint box

For insulation material thicknesses between 90 mm and 140 mm.



| Type | TSK WDVS 180X140X88 K V2A |
|---|---|
| **Part No.** | **476 050** |
| Material of box | **PC / ABS** |
| Dimensions of box | 185 x 145 mm |
| Material of cover | StSt |
| Installation depth | 90-140 mm |
| PU | 1 pc(s) |

### Separate spacer

With styrofoam core (no heat bridge) for combination with the test joint box. Can be shortened by 50 - 200 mm at 10 mm intervals.



| Type | AH TSK WDVS 50.200 K |
|---|---|
| **Part No.** | **476 053** |
| Material of spacer | **PP** |
| Dimensions of spacer | 120 x 120 x 200 mm |
| PU | 1 pc(s) |

## Inspection Doors

For flush-mounted test joints.

### Type StSt with square spanner

For screw mounting (holes Ø8-10 mm) with detachable door.



| Type RTUP ... | 290X230 VKS V2A |
|---|---|
| Part No. | 476 020 |
| Material | StSt |
| Mounting dimensions | 200 x 140 mm |
| Dimensions | 290 x 230 mm |
| PU | 1 pc(s) |

### Type St/tZn with square spanner

For walling in / plastering, with claws (length 60 mm, distance 100 mm).



| Type RTUP ... | 230X180 VKS STTZN |
|---|---|
| Part No. | 476 001 |
| Material | St/tZn |
| Mounting dimensions | 205 x 155 mm |
| Dimensions | 230 x 180 mm |
| PU | 10 pc(s) |

### Type St/tZn with snap lock

Light design for walling in / plastering, with claws (length 60 mm, distance 100 mm).



| Type RTUP ... | 230X180 SV STTZN |
|---|---|
| Part No. | 476 100 |
| Material | St/tZn |
| Mounting dimensions | 205 x 155 mm |
| Dimensions | 230 x 180 mm |
| PU | 10 pc(s) |

## Carrier Plate for VDB Test Badge

For attaching the test badge to the down conductor or earth entry.



### For round / flat conductors

| Type | TS 7.10 FL30 PP V2A |
|---|---|
| Part No. | 480 113 |
| Material | StSt |
| Clamping range Rd / Fl | 7-10 / 30 mm |
| Dimensions | 84 x 58 x 1 mm |
| PU | 50 pc(s) |

## Two-Screw Clamp

With M6 thread, for combination with the "Attention! Equipotential bonding" sign (Part No. 480 599) or e.g. with number plates.



| Type ZSUEL ... | 7.10 2XM6 LA38 AL |
|---|---|
| Part No. | 480 291 |
| Material | Al |
| Clamping range Rd / Fl | 7-10 / 30 mm |
| PU | 100 pc(s) |

## Variable Number Plates

Test joints, down conductors and connection lugs can be marked using the variable number plate. On site, the individual pre-embossed numbers can be quickly inserted into the plate without additional tools. This ensures uniform marking.

### Assortment case for number plate, variable

Sortimo assortment case with number marking set.



**Content:**
100x each of number inset "0", "1", "2", "3", "4", "5", "6", "7", "8", "9"
100x number inset without embossment
100x variable number plate with slot
300x combination head screw StSt M6 x 16 mm
50x carrier plate StSt for VDB test badge
50x saddle clamp Al Rd 7-10 mm
50x saddle clamp Al Rd 16 mm

| Type | NS SOB 0.9 |
|---|---|
| Part No. | 490 999 |
| Material | Plastic |
| Dimensions | 450 x 360 x 120 mm |
| PU | 1 pc(s) |

### Variable number plate for round / flat conductors

Consisting of a number plate with slots (Part No. 490 100), a saddle clamp (Part No. 480 291) and two combination head screws (Part No. 490 020).



| Type | NST 7.10 FL30 ON AL |
|---|---|
| Part No. | 490 110 |
| Material of plate | Al |
| Material of saddle clamp | Al |
| Clamping range Rd / Fl | 7-10 / 30 mm |
| Material of screw | StSt |
| Screw | M6 x 16 mm |
| PU | 50 pc(s) |

### Variable number plate for earth entry rods

Consisting of a number plate with slots (Part No. 490 100), a saddle clamp (Part No. 490 022) and two combination head screws (Part No. 490 020).



| Type | NST 16 ON AL |
|---|---|
| Part No. | 490 116 |
| Material of plate | Al |
| Material of saddle clamp | Al |
| Clamping range Rd | 16 mm |
| Material of screw | StSt |
| Screw | M6 x 16 mm |
| PU | 50 pc(s) |

### Number plate with slots

Number plate to hold (un)embossed number insets (e.g. Part No. 490 001).



| Type | NST ON AL |
|---|---|
| Part No. | 490 100 |
| Material | Al |
| PU | 100 pc(s) |

"Customised versions with company name and address are available on request."

## Embossed number inset



Embossed number inset for slotting into the number plate (Part No. 490 100, 490 110, 490 116) without tools.

| General technical data: | |
|---|---|
| Material | StSt |

| Type | NSE 0 V2A | NSE 1 V2A |
|---|---|---|
| Part No. | 490 000 | 490 001 |
| Number | 0 | 1 |
| PU | 100 pc(s) | 100 pc(s) |

| Type | NSE 2 V2A | NSE 3 V2A |
|---|---|---|
| Part No. | 490 002 | 490 003 |
| Number | 2 | 3 |
| PU | 100 pc(s) | 100 pc(s) |

| Type | NSE 4 V2A | NSE 5 V2A |
|---|---|---|
| Part No. | 490 004 | 490 005 |
| Number | 4 | 5 |
| PU | 100 pc(s) | 100 pc(s) |

| Type | NSE 6 V2A | NSE 7 V2A |
|---|---|---|
| Part No. | 490 006 | 490 007 |
| Number | 6 | 7 |
| PU | 100 pc(s) | 100 pc(s) |

| Type | NSE 8 V2A | NSE 9 V2A |
|---|---|---|
| Part No. | 490 008 | 490 009 |
| Number | 8 | 9 |
| PU | 100 pc(s) | 100 pc(s) |

## Plain number inset



Plain number inset for slotting into the number plate (Part No. 490 100, 490 110, 490 116) without tools.

| Type | NSE BLANK AL |
|---|---|
| Part No. | 490 900 |
| Material | StSt |
| PU | 100 pc(s) |

## Carrier plate for VDB test badge



For fixing the test badge on the down conductor or earth entry rod.

| Type | TS 16 FL30 PP V2A |
|---|---|
| Part No. | 490 021 |
| Material | StSt |
| Dimensions | 84 x 58 x 1 mm |
| PU | 50 pc(s) |

## Combination head screw



| Type | KSS M6X16 V2A |
|---|---|
| Part No. | 490 020 |
| Material | StSt |
| Screw | M6 x 16 mm |
| PU | 100 pc(s) |

## Saddle clamp for number plate



| Type | ZSUEL 7.10 2XM6 LA38 AL | ZSUEL 16 2XM6 LA38 V2A |
|---|---|---|
| Part No. | 480 291 | 490 022 |
| Material | Al | Al |
| Clamping range Rd / Fl | 7-10 / 30 mm | – |
| Clamping range Rd | – | 16 mm |
| PU | 100 pc(s) | 100 pc(s) |

## Accessories for Variable Number Plates

### Assortment case, empty



Assortment case with inset boxes in different sizes for sorting the content, and with fast click system for safe transportation.

| Type | NS SOB L |
|---|---|
| Part No. | 490 099 |
| Material | Plastic |
| Dimensions (l x w x h) | 450 x 360 x 120 mm |
| PU | 1 pc(s) |

All number plates are available with different numbes or lettering on request!

## Earth Rod Seals

Earth Rod Seals create a watertight sealing of the Earth Rod installation, available in various sizes to acommodate our Earth Rod Portfolio.

### Double Flange



| General technical data: | |
|---|---|
| Material | High density Polyethylene |
| Dimensions (Ø x h) | 366 x 1280 mm |
| Tube Dimensions (Ø x h) | 50 x 1200 mm |
| Standards | IEC / EN / BS EN 62561-5 |
| Assembly instructions | Refer Instructions (2211) |

| Type ER SEAL 2FLANGE ... | 5/8"PL | 3/4"PL |
|---|---|---|
| Part No. | 138 315 | 138 316 |
| Rod Diameter | 14.2 mm | 17.2 mm |
| Rod type | 5/8" Copper Bonded Earth Rod | 3/4" Copper Bonded Earth Rod |
| PU | 1 pc(s) | 1 pc(s) |

| Type ER SEAL 2FLANGE ... | 15 PL | 16 PL |
|---|---|---|
| Part No. | 138 320 | 138 321 |
| Rod Diameter | 15 mm | 16 mm |
| Rod type | Copper / Nickel plated copper | Copper / Nickel plated copper / Stainless steel |
| PU | 1 pc(s) | 1 pc(s) |

| Type ER SEAL 2FLANGE ... | 20 PL |
|---|---|
| Part No. | 138 322 |
| Rod Diameter | 20 mm |
| Rod type | Copper / Nickel plated copper / Stainless steel |
| PU | 1 pc(s) |

Note : Earth Rod to be purchased separately.

## Number plates that can be marked

Numbers from 1 to 999 and also certain combinations, such as A01, b02, C03, d04, etc., can be created with the 7-segment number plate and the accompanying paint marker. The special black paint marker has been tried and tested over a long period of time in use with the number plate, is highly opaque, dries quickly, is weatherproof and extremely light-resistant, as well as abrasion-resistant. Other paints or pens cannot be recommended.
The number plate without pre-embossing can be used for on-site marking with punched numbers 10 mm in size.



### Number plate with 7-segment embossing for round / flat conductors

For on-site marking with a paint marker



| Type NS ... | 7.10 FL30 7SEG AL |
|---|---|
| Part No. | 484 000 |
| Material | Al |
| Clamping range Rd / Fl | 7-10 / 30 mm |
| PU | 50 pc(s) |

### Number plate with 7-segment embossing for earth entry rods

For on-site marking with a paint marker



| Type NS ... | 16 7SEG AL |
|---|---|
| Part No. | 484 001 |
| Material | Al |
| Clamping range Rd | 16 mm |
| PU | 50 pc(s) |

## Accessories for Number plates that can be marked

### Edding Paint Marker

Paint marker for labelling the number plates with 7-segment embossment.



| Type | EDD 780 SW |
|---|---|
| Part No. | 484 010 |
| Colour | black ● |
| PU | 1 pc(s) |

### Without number for round / flat conductors

For on-site labelling with punched numbers 0-9, size 10 mm.



| Type NS ... | 7.10 FL30 OZ AL |
|---|---|
| Part No. | 480 003 |
| Material | Al |
| Clamping range Rd / Fl | 7-10 / 30 mm |
| PU | 50 pc(s) |

### Without number for earth entry rods

For on-site labelling with punched numbers 0-9, size 10 mm.



| Type NS ... | 16 OZ AL |
|---|---|
| Part No. | 480 004 |
| Material | Al |
| Clamping range Rd | 16 mm |
| PU | 50 pc(s) |

All number plates are available with different numbes or lettering on request!

## Earth Pits and Bonding Bars

The concrete inspection pit is classfied for heavy duty usage, suitable for most types of earthing and lightning protection installations.

### Concrete Earth Pit

The concrete inspection pit is classfied for heavy duty usage, suitable for most types of earthing and lightning protection installations.



| Type | ER INSPIT 320 160 CL |
|---|---|
| Part No. | 138 091 |
| Material | Concrete |
| Dimensions (l x w x h) | 320 x 320 x 160 mm |
| Load Stress Classification | Class H |
| Load Capacity | 50kN |
| Standards | IEC / EN / BS EN 62561-5 |
| PU | 1 pc(s) |

### Polymer Earth Pit

The polymer inspection pit is classfied for heavy duty usage, suitable for most types of earthing and lightning protection installations.



| Type | ER INSPIT 308 308 214 PLL |
|---|---|
| Part No. | 138 097 |
| Material | Polymer Plastic |
| Dimensions (l x w x h) | 308 x 308 x 214 mm |
| Load Stress Classification | Class H |
| Load Capacity | 50kN |
| Standards | IEC / EN / BS EN 62561-5 |
| PU | 1 pc(s) |

### Earth Pit Bonding Bars

5-Hole Earth Bars can be installed in the slots of the Concrete and Polymer Earth Pits providing multiple conductor connections.



| Type EB ... | SH 25X6 M10 285 CU |
|---|---|
| Part No. | 138 094 |
| Material | Copper |
| Number of Connections | 5 |
| Dimensions W x T | 25 x 6 mm |
| Length L | 285 mm |
| Hole size | M10 |
| Recommended Fixings | Mounted in Earth Pit |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |
| PU | 1 pc(s) |



## MV Clamps

Multipurpose connecting clamp (**M**ehrzweck**V**erbindungs-Klemme) for universal use as a cross clamp, T clamp and parallel clamp; two-piece.

### With hexagon screw

Thread in the base part.



| General technical data: | | |
|---|---|---|
| Standard | | EN 62561-1 |

| Type | MVK 8.10 SKM10X30 STTZN | MVK 8.10 SKM10X30 AL |
|---|---|---|
| **Part No.** | **390 050** | **390 051** |
| Material of clamp | **St/tZn** | **Al** |
| Clamping range Rd | 8-10 mm | 8-10 mm |
| Screw | M10 x 30 mm | M10 x 30 mm |
| Material of screw / nut | **St/tZn** | **StSt** |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 7.3 kA | – |
| PU | 50 pc(s) | 50 pc(s) |

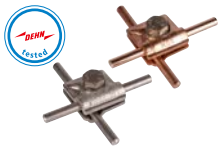
| Type | MVK 8.10 SKM10X30 V2A | MVK 8 SKM10X30 CU |
|---|---|---|
| **Part No.** | **390 059** | **390 057** |
| Material of clamp | **StSt** | **Cu** |
| Clamping range Rd | 8-10 mm | 8 mm |
| Clamping range (stranded / cable) | – | 25-70 mm² |
| Screw | M10 x 30 mm | M10 x 30 mm |
| Material of screw / nut | **StSt** | **StSt** |
| PU | 50 pc(s) | 50 pc(s) |

| Type | MVK 10 SKM10X35 STTZN | MVK 10 SKM10X35 V2A |
|---|---|---|
| **Part No.** | **391 050** | **391 059** |
| Material of clamp | **St/tZn** | **StSt** |
| Clamping range Rd | 10 mm | 10 mm |
| Screw | M10 x 35 mm | M10 x 35 mm |
| Material of screw / nut | **St/tZn** | **StSt** |
| PU | 50 pc(s) | 50 pc(s) |

| Type | MVK 8.10 SKM10X35 V4A | MVK 10 SKM10X35 V4A |
|---|---|---|
| **Part No.** | **390 079** | **391 058** |
| Material of clamp | **StSt (V4A)** | **StSt (V4A)** |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| Clamping range Rd | 8-10 mm | 10 mm |
| Connection (solid / stranded) | 35-70 mm² | – |
| Screw | M10 x 35 mm | M10 x 35 mm |
| Material of screw / nut | **StSt (V4A)** | **StSt (V4A)** |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 4.7 kA | – |
| PU | 50 pc(s) | 50 pc(s) |

### With hexagon screw and spring washer

Thread in the base part.



| General technical data: | | |
|---|---|---|
| Standard | | EN 62561-1 |

| Type | MVK 8.10 SKM10X30 FSC STTZN | MVK 8.10 SKM10X30 FSC AL |
|---|---|---|
| **Part No.** | **390 550** | **390 551** |
| Material of clamp | **St/tZn** | **Al** |
| Clamping range Rd | 8-10 mm | 8-10 mm |
| Screw | M10 x 30 mm | M10 x 30 mm |
| Material of screw / nut | **St/tZn** | **StSt** |
| PU | 50 pc(s) | 50 pc(s) |

| Type | MVK 8.10 SKM10X35 FSC STBL | MVK 8.10 SKM10X30 FSC V2A |
|---|---|---|
| **Part No.** | **390 553** | **390 559** |
| Material of clamp | **St/bare** | **StSt** |
| Clamping range Rd | 8-10 mm | 8-10 mm |
| Screw | M10 x 35 mm | M10 x 30 mm |
| Material of screw / nut | **St/bare** | **StSt** |
| PU | 50 pc(s) | 50 pc(s) |

| Type | MVK 8 SKM10X30 FSC CU | MVK 10 SKM10X35 FSC STTZN |
|---|---|---|
| **Part No.** | **390 557** | **391 550** |
| Material of clamp | **Cu** | **St/tZn** |
| Clamping range Rd | 8 mm | 10 mm |
| Screw | M10 x 30 mm | M10 x 35 mm |
| Material of screw / nut | **StSt** | **St/tZn** |
| PU | 50 pc(s) | 50 pc(s) |

## With hexagon screw and spring washer for air-termination rods

Thread in the base part



| Type | MVK 8.10 16 SKM10X40 FSC STTZN | MVK 8.10 16 SKM10X40 FSC V2A |
|---|---|---|
| **Part No.** | **392 050** | **392 059** |
| Material of clamp | **St/tZn** | StSt |
| Clamping range Rd | 8-10 / 16 mm | 8-10 / 16 mm |
| Screw | M10 x 40 mm | M10 x 40 mm |
| Material of screw / nut | **St/tZn** | StSt |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## With truss head screw for air-termination rods

and anti-rotation protection (square hole in the upper part).



| Type | MVK 8.10 16 FRM10X40 STTZN | MVK 8.10 16 FRM10X40 V2A |
|---|---|---|
| **Part No.** | **392 060** | **392 069** |
| Material of clamp | **St/tZn** | StSt |
| Clamping range Rd | 8-10 / 16 mm | 8-10 / 16 mm |
| Screw | M10 x 40 mm | M10 x 40 mm |
| Material of screw / nut | **St/tZn** | StSt |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## Bimetallic MV clamp

For connecting conductors made of different materials, with intermediate plate (Cupal) and thread in the base part.



| Type | ZMMVK 8 8.10 SKM10X30 CU AL |
|---|---|
| **Part No.** | **390 657** |
| Material of clamp | Cu / Al |
| Clamping range Rd Cu | 8 mm |
| Clamping range Rd Al | 8-10 mm |
| Screw | M10 x 30 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## With truss head screw

and anti-rotation protection (square hole in the upper part).



| General technical data: | |
|---|---|
| Standard | EN 62561-1 |

| Type | MVK 8.10 FRM10X35 STTZN | MVK 8.10 FRM10X35 AL |
|---|---|---|
| **Part No.** | **390 060** | **390 061** |
| Material of clamp | **St/tZn** | Al |
| Clamping range Rd | 8-10 mm | 8-10 mm |
| Screw | M10 x 35 mm | M10 x 35 mm |
| Material of screw / nut | **St/tZn** | **St/tZn** |
| PU | 50 pc(s) | 50 pc(s) |

| Type | MVK 8 FRM10X35 CU | MVK 10 FRM10X35 STTZN |
|---|---|---|
| **Part No.** | **390 067** | **391 060** |
| Material of clamp | Cu | **St/tZn** |
| Clamping range Rd | 8 mm | 10 mm |
| Clamping range (stranded / cable) | 25-70 mm² | – |
| Screw | M10 x 35 mm | M10 x 35 mm |
| Material of screw / nut | StSt | **St/tZn** |
| PU | 50 pc(s) | 50 pc(s) |

| Type | MVK 10 FRM10X35 V2A | MVK 8.10 FRM10X35V2A STTZN |
|---|---|---|
| **Part No.** | **391 069** | **390 063** |
| Material of clamp | StSt | **St/tZn** |
| Clamping range Rd | 10 mm | 8-10 mm |
| Screw | M10 x 35 mm | M10 x 35 mm |
| Material of screw / nut | StSt | StSt |
| PU | 50 pc(s) | 50 pc(s) |

| Type | MVK 10 FRM10X45 V4A | MVK 10 FRM10X35 V4A |
|---|---|---|
| **Part No.** | **391 068** | **391 066** |
| Material of clamp | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| Clamping range Rd | 10 mm | 10 mm |
| Screw | M10 x 45 mm | M10 x 35 mm |
| Material of screw / nut | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| PU | 50 pc(s) | 50 pc(s) |

## MV clamps, with locking lug

Multi-purposeconnecting clamp with locking lug for universal use as a cross clamp, T clamp and parallel clamp; two-part

- Secure locking of the MV clamp in a cross arrangement
- Time saving during installation due to screw-in technology

### With truss head screw



Multi-purpose connecting clamp for universal use as a cross clamp, T clamp and parallel clamp for aboveground and underground connections.
The locking lug is used to lock the MV clamp securely in a cross arrangement.

| Type MVK AR 8.10 ... | FRM10X40 V4A |
|---|---|
| **Part No.** | **391 070** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd | 8-10 mm |
| Screw | M10 x 40 mm |
| Material of screw / nut | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 9.8 *) kA |
| PU | 50 pc(s) |

### With hexagon screw



Multi-purpose connecting clamp for universal use as a cross clamp, T clamp and parallel clamp for aboveground and underground connections.
The locking lug is used to lock the MV clamp securely in a cross arrangement.

| Type MVK AR 8.10 ... | SKM10X40 V4A |
|---|---|
| **Part No.** | **391 079** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd | 8-10 mm |
| Clamping range (stranded / cable) | 35-70 mm² |
| Screw | M10 x 40 mm |
| Material of screw / nut | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 9.8 *) kA |
| PU | 50 pc(s) |

## MMV Clamps

Mini multipurpose connecting clamp (Mini-Mehr-zweckVerbindungs-Klemme) for universal use as a cross clamp, T clamp and parallel clamp, with anti-rotation protection.

### With truss head screw

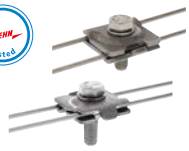


| General technical data: | |
|---|---|
| Clamping range Rd | 6-8 mm |
| Standard | EN 62561-1 |

| Type | MMVK 6.8 FRM10X35 STTZN | MMVK 6.8 FRM10X35 CU |
|---|---|---|
| **Part No.** | **390 250** | **390 257** |
| Material of clamp | **St/tZn** | **Cu** |
| PU | 50 pc(s) | 50 pc(s) |

| Type | MMVK 6.8 FRM10X35 V2A |
|---|---|
| **Part No.** | **390 259** |
| Material of clamp | StSt |
| PU | 50 pc(s) |

### With hexagon screw



| Type | MMVK 3.5 8.10 SKM8X30 STBLANK | MMVK 3.5 8.10 SKM8X30 V4A |
|---|---|---|
| **Part No.** | **390 565** | **540 271** |
| Material of clamp | **St/bare** | StSt (V4A) |
| Material No. | – | 1.4571 / 1.4404 / 1.4401 |
| Clamping range Rd | – | 3-10 mm |
| Connection (solid/ stranded) | – | 16 mm² |
| Clamping range Rd / Rd | 8-10 / 3-5 mm | – |
| Clamping range Rd / Rd | 3-5 / 3-5 mm | – |
| Standard | EN 62561-1 | based on EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

### Bimetallic MMV clamp



For connecting conductors made of different materials, with intermediate plate (Cupal).

| Type | ZMMVK 6.8 FRM10X35 CU STTZN |
|---|---|
| **Part No.** | **390 267** |
| Material of clamp | **Cu / St/tZn** |
| Clamping range Rd Cu | 6-8 mm |
| Clamping range Rd St/tZn | 6-8 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## MAXI MV Clamps

MAXI multipurpose connecting clamp (**M**AXI-**M**ehr-zweck**V**erbindungs-Klemme) for universal use as cross clamp, T clamp and parallel clamp, for connecting earth rods or reinforcements; three-part, with thread in the base part.

### With hexagon screw



| Type MAMVK ... | 8.16 15.25 STTZN | 8.16 15.25 STBL |
|---|---|---|
| **Part No.** | **308 041** | **308 040** |
| Material of clamp | **St/tZn** | **St/bare** |
| Clamping range Rd | 8-16 / 15-25 mm | 8-16 / 15-25 mm |
| Material thickness | 3.0 / 2.0 mm | 3.0 / 2.0 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6.2 kA | 10.2 kA |
| Approvals | – | UL 467 |
| Stock No. | 5999-12-362-1557 | – |
| PU | 20 pc(s) | 20 pc(s) |

### With defined tightening torque

Same design as Part No. 308 041, but with StSt (V2A) M12x65 mm AF10 tear-off screw, with tear-off torque 35 +/-3 Nm, instead of standard hexagon head screw



- Reliable mounting quality due to constant torque and defined clamping force
- Easy mounting without torque spanner
- Enormously time saving compared to exothermic welding
- No welding smoke hazard for the installer
- No environmental risk

| Type MAMVK 8.16 15.25 ... | STTZN ARS35NM PAR 20P |
|---|---|
| **Part No.** | **308 044** |
| Material of clamp | **St/tZn** |
| Clamping range Rd | 8-16 / 15-25 mm |
| Material thickness | 3.0 / 2.0 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6.2 kA |
| PU | 20 pc(s) |

## Clamping Piece Variants

For example as a connection with end piece for constructions or downpipe clamps.
Clamping piece with square hole 11 mm and truss head screw.



| General technical data: | |
|---|---|
| Clamping range Rd | 6-10 mm |
| Screw | M10 x 35 mm |
| Standard | EN 62561-1 |

| Type KB 6.10 FRM10X35 ... | STTZN | CU |
|---|---|---|
| **Part No.** | **390 150** | **390 157** |
| Material of clamp | **St/tZn** | **Cu** |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| Material of screw / nut | **St/tZn** | **StSt** |
| PU | 100 pc(s) | 1 pc(s) |

| Type KB 6.10 FRM10X35 ... | V2A |
|---|---|
| **Part No.** | **390 159** |
| Material of clamp | **StSt** |
| Material of screw / nut | **StSt** |
| PU | 100 pc(s) |

## KS Connectors

Clamping screw connector (KlemmSchrau-ben-Verbinder) for lightning current carrying connec-tion of round conductors, e.g. to flat profiles, downpipe clamps or other parts of the lightning protection system.

### One-piece, St/tZn

With screw and nut M10.



| Type | KSV 7.10 STTZN | KSV 7.10 FER STTZN |
|---|---|---|
| **Part No.** | **301 000** | **301 010** |
| Material of clamping screw | **St/tZn** | **St/tZn** |
| Material of clamp | **ZDC** | **ZDC** |
| Clamping range Rd | 7-10 mm | 7-10 mm |
| Type | – | + spring washer |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 100 pc(s) | 100 pc(s) |

### One-piece, Cu

With screw and nut M10.



| Type | KSV 6.10 CU | KSV 6.10 FER CU |
|---|---|---|
| **Part No.** | **301 007** | **301 017** |
| Material of clamping screw | **Cu** | **Cu** |
| Material of clamp | **high copper alloy** | **high copper alloy** |
| Clamping range Rd | 6-10 mm | 6-10 mm |
| Connection (single-wire / multi-wire) | 16-50 mm² | 25-70 mm² |
| Type | – | + spring washer |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 100 pc(s) | 100 pc(s) |

### One-piece, StSt

With screw and nut M10.



| General technical data: | |
|---|---|
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |

| Type | KSV 6.10 V2A | KSV 6.10 V4A |
|---|---|---|
| **Part No.** | **301 009** | **301 089** |
| Material of clamping screw | **StSt** | **StSt (V4A)** |
| Material of clamp | **StSt** | **StSt (V4A)** |
| Connection (single-wire / multi-wire) | 25-70 mm² | 25-70 mm² |
| PU | 100 pc(s) | 100 pc(s) |

| Type | KSV 6.10 FER V2A | KSV 6.10 FER V4A |
|---|---|---|
| **Part No.** | **301 019** | **301 099** |
| Material of clamping screw | **StSt** | **StSt (V4A)** |
| Material of clamp | **StSt** | **StSt (V4A)** |
| Connection (single-wire / multi-wire) | 25-70 mm² | 25-70 mm² |
| Type | + spring washer | + spring washer |
| PU | 100 pc(s) | 100 pc(s) |

| Type | UKSV 6.10 AQ16 50 V4A |
|---|---|
| **Part No.** | **540 122** |
| Material of clamping screw | **StSt (V4A)** |
| Material of clamp | **StSt (V4A)** |
| Connection (single-wire / multi-wire) | 16-50 mm² |
| Type | + spring washer |
| PU | 25 pc(s) |

## One-piece, long, StSt

With screw and nut M10, length 60 mm.

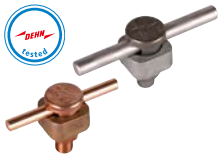


| Type | KSVL 6.10 FER V2A |
|---|---|
| **Part No.** | **301 020** |
| Material of clamping screw | StSt |
| Material of clamp | StSt |
| Clamping range Rd | 6-10 mm |
| Connection (single-wire / multi-wire) | 25-70 mm² |
| Type | + spring washer |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

*) For exact classification, see test certificate.

## Heavy design

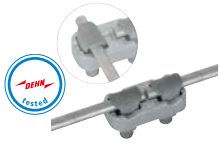
With screw and nut M12.



| Type | KSV 8.12.5 STTZN | KSV 8.12.5 CU |
|---|---|---|
| **Part No.** | **300 002** | **300 017** |
| Material of clamping screw | St/tZn | Cu |
| Material of clamp | MCI | high copper alloy |
| Clamping range Rd | 8-12.5 mm | 8-12.5 mm |
| Connection (single-wire / multi-wire) | 50-95 mm² | 50-95 mm² |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 1 pc(s) |

## Two-piece, gap 30 mm

With screw and nut M10.



| Type | KSV 2X7.10 STTZN |
|---|---|
| **Part No.** | **302 010** |
| Material of clamping screw | St/tZn |
| Material of clamp | ZDC |
| Clamping range Rd | 7-10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Two-piece, gap 40 mm

With screw and nut M10.



| Type | AP 2X6.10 V2A |
|---|---|
| **Part No.** | **301 229** |
| Material of clamping screw | StSt |
| Material of clamp | StSt |
| Clamping range Rd | 6-10 mm |
| Type | + spring washer |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

*) For exact classification, see test certificate.

# Connectors

For connecting round conductors in T and longitudinal arrangements.

## EST connector

One-screw T connector.



| Type | ESTV 8 RG |
|---|---|
| **Part No.** | **310 008** |
| Material of clamp | ZDC |
| Clamping range Rd | 8 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## ES connectors

One-screw connectors for longitudinal arrangements.



| Type | ESV 8 ZG | ESV 8 RG |
|---|---|---|
| **Part No.** | **309 008** | **309 087** |
| Material of clamp | ZDC | high copper alloy |
| Clamping range Rd | 8 mm | 8 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

# ES Disconnecting Clamp

Single-screw disconnecting clamp (Ein-Schrauben-Trennklemme) for connecting down conductors with earth entries.



| Type | ESTK 8.10 ZG |
|---|---|
| **Part No.** | **463 010** |
| Material | ZDC |
| Clamping range Rd / Rd | 8 / 10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

# Universal Connector

For connecting round conductors in cross, T, and parallel arrangements and for twin conductor connection.



| Type | UV 8.10 KTP V2A |
|---|---|
| **Part No.** | **315 119** |
| Material of clamp | StSt |
| Clamping range Rd | 8-10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Parallel Connectors

For connecting two conductors in parallel arrangement.

### For equal diameters with one screw



| Type PV ... | 7.10 FRM10X35 STTZN | 7.10 FRM10X35 V4A |
|---|---|---|
| **Part No.** | **306 020** | **306 029** |
| Material of clamp | **St/tZn** | **StSt (V4A)** |
| Material No. | – | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Clamping range Rd / Rd | 7-10 mm | 7-10 mm |
| Clamping range (stranded / cable) | – | 25-120 mm² |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 4.0 kA | 2.9 kA |
| PU | 50 pc(s) | 50 pc(s) |

### For equal diameters with two screws



| Type PV ... | 7.10 SKM8X20 STTZN | 7.10 SKM8X20 CU |
|---|---|---|
| **Part No.** | **307 000** | **307 007** |
| Material of clamp | **St/tZn** | **Cu** |
| Clamping range Rd / Rd | 7-10 mm | 7-10 mm |
| Clamping range (stranded / cable) | – | 16-95 mm² |
| Standard | EN 62561-1 | EN 62561-1 |
| Stock No. | 5999-12-158-2303 | – |
| PU | 50 pc(s) | 50 pc(s) |

### For different diameters with one screw



| Type PV ... | 6.22 FRM10X40 STBLANK | 6.22 FRM10X40 STTZN |
|---|---|---|
| **Part No.** | **306 121** | **306 122** |
| Material of clamp | **St/bare** | **St/tZn** |
| Clamping range Rd / Rd | 6-22 / 6-22 mm | 6-22 / 6-22 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6.1 kA | 6.1 kA |
| PU | 50 pc(s) | 50 pc(s) |

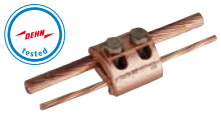
### For different diameters 4-10 mm with two scews



| Type PV ... | 4.10 SKM8X30 STTZN | 4.10 SKM8X30 CU |
|---|---|---|
| **Part No.** | **305 000** | **305 007** |
| Material of clamp | **St/tZn** | **Cu** |
| Clamping range Rd / Rd | 4-10 mm | 4-10 mm |
| Clamping range (stranded / cable) | – | 10-70 mm² |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | – | 13.6 kA |
| PU | 50 pc(s) | 50 pc(s) |

### For equal and different cable diameters, small

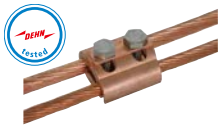
With thread in the base part and lock nut M8.
Specified short-circuit current applies to 70 mm² Cu cable.



| Type PV ... | 5.12.5 SKM8X45 CU |
|---|---|
| **Part No.** | **306 100** |
| Material of clamp | **Cu** |
| Clamping range Rd / Rd | 5-12.5 mm |
| Clamping range (stranded / cable) | 16-95 mm² |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 13.6 kA |
| PU | 25 pc(s) |

### For equal and different cable diameters, large

With thread in the base part and lock nut M10.
Specified short-circuit current applies to 70 mm² Cu cable.



| Type PV ... | 5.16 SKM10X50 CU |
|---|---|
| **Part No.** | **306 101** |
| Material of clamp | **Cu** |
| Clamping range Rd / Rd | 5-16 mm |
| Clamping range (stranded / cable) | 16-150 mm² |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 13.6 kA |
| PU | 25 pc(s) |

## Connecting Sleeves

For longitudinal connection of two round conductors with four screws.

### ZDC 8



| Type VM ... | 8 SKM6X10 ZG |
|---|---|
| **Part No.** | **385 203** |
| Material of clamp | **ZDC** |
| Clamping range Rd | 8 mm |
| Screw | M6 x 10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### ZDC 7-10



| Type VM ... | 7.10 SKM6X12 ZG |
|---|---|
| **Part No.** | **385 202** |
| Material of clamp | **ZDC** |
| Clamping range Rd | 7-10 mm |
| Screw | M6 x 12 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Al 8



| Type VM ... | 8 SKM6X8 AL |
|---|---|
| Part No. | 385 213 |
| Material of clamp | Al |
| Clamping range Rd | 8 mm |
| Screw | M6 x 8 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Cu 8



| Type VM ... | 8 SKM6X8 CU |
|---|---|
| Part No. | 385 207 |
| Material of clamp | Cu |
| Clamping range Rd | 8 mm |
| Screw | M6 x 8 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Cross Units for Aboveground Connections

of conductors in cross, parallel and T arrangement.

### Without intermediate plate



| Type KS 8.10 8.10 FL30 OV ... | STTZN | CU |
|---|---|---|
| Part No. | 314 300 | 314 307 |
| Material of clamp | St/tZn | Cu |
| Clamping range Rd / Rd | 8-10 / 8-10 mm | 8-10 / 8-10 mm |
| Clamping range Rd / Fl | 8-10 / 30 mm | 8-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| Clamping range (stranded / cable) | – | 35-70 mm² |
| Dimensions | 50 x 50 x 2.5 mm | 50 x 50 x 2.5 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

### With intermediate plate



| Type KS 8.10 8.10 FL30 OV ... | ZP STTZN |
|---|---|
| Part No. | 314 310 |
| Material of clamp | St/tZn |
| Clamping range Rd / Rd | 8-10 / 8-10 mm |
| Clamping range Rd / Fl | 8-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm |
| Dimensions | 50 x 50 x 2.5 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Cross Units for Aboveground and Underground Connections

of conductors in cross, parallel and T arrangement.

### With intermediate plate, for round and flat conductors



| General technical data: | | |
|---|---|---|
| Clamping range Rd / Rd | | 8-10 / 8-10 mm |
| Clamping range Rd / Fl | | 8-10 / 30 mm |
| Clamping range Fl / Fl | | 30 / 30 mm |
| Dimensions | | 60 x 60 x 3 mm |
| Standard | | EN 62561-1 |

| Type KS ... | 8.10 8.10 FL30 ZP STTZN | 8.10 8.10 FL30 ZP CU |
|---|---|---|
| Part No. | 319 201 | 319 207 |
| Material of clamp | St/tZn | Cu |
| Clamping range (stranded / cable) | – | 35-70 mm² |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 14 kA | 29 kA |
| PU | 25 pc(s) | 25 pc(s) |

| Type KS ... | 8.10 8.10 FL30 ZP V4A |
|---|---|
| Part No. | 319 209 |
| Material of clamp | StSt (V4A) |
| Clamping range (stranded / cable) | 35-70 mm² |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 7 kA |
| PU | 25 pc(s) |

### With intermediate plate, for round and flat conductors up to 40 mm



| Type KS ... | 8.10 FL40 STTZN | 8.10 FL40 CU |
|---|---|---|
| Part No. | 321 045 | 321 047 |
| Material of clamp | St/tZn | Cu |
| Clamping range Rd / Fl | 8-10 / 30-40 mm | 8-10 / 30-40 mm |
| Clamping range Fl / Fl | 30-40 / 30-40 mm | 30-40 / 30-40 mm |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions | 70 x 70 x 3 mm | 70 x 70 x 3 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 12.6 kA | 35.1 kA |
| PU | 25 pc(s) | 25 pc(s) |

### With intermediate plate, for two round and flat conductors up to 40 mm



| Type KS ... | 7.10 7.10 FL40 ZP V4A |
|---|---|
| Part No. | 319 229 |
| Material of clamp | StSt (V4A) |
| Clamping range Rd / Rd | 7-10 / 7-10 mm |
| Clamping range Rd / Fl | 7-10 / 30-40 mm |
| Clamping range Fl / Fl | 30-40 / 30-40 mm |
| Clamping range (stranded / cable) | 35-95 mm² |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Dimensions | 70 x 70 x 3 mm |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 5.0 kA |
| PU | 25 pc(s) |

## With intermediate plate, for earth entries / air-termination rods



| Type KS ... | 8.10 16 FL30 ZP STTZN | 8.10 16 FL30 ZP V4A |
|---|---|---|
| **Part No.** | **319 202** | **319 219** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Rd / Rd | 16 / 8-10 mm | 16 / 8-10 mm |
| Clamping range Rd / Fl | 16 / 30 mm | 16 / 30 mm |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions | 60 x 60 x 3 mm | 60 x 60 x 3 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

## Without intermediate plate, for round and flat conductors



| General technical data: | |
|---|---|
| Clamping range Rd / Fl | 8-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm |
| Dimensions | 60 x 60 x 3 mm |
| Standard | EN 62561-1 |

| Type KS ... | 8.10 FL30 STTZN | 8.10 FL30 CU |
|---|---|---|
| **Part No.** | **318 201** | **318 207** |
| Material of clamp | **St/tZn** | Cu |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 14 kA | 29 kA |
| PU | 25 pc(s) | 1 pc(s) |

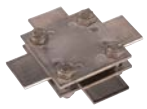
| Type KS ... | 8.10 FL30 V4A |
|---|---|
| **Part No.** | **318 209** |
| Material of clamp | StSt (V4A) |
| Clamping range (stranded / cable) | 35-120 mm² |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 7.4 kA |
| PU | 25 pc(s) |

## Without intermediate plate, for two round and flat conductors



| Type KS ... | 8.10 8.10 FL30 STTZN | 8.10 8.10 FL30 V4A |
|---|---|---|
| **Part No.** | **318 251** | **318 219** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Rd / Rd | 8-10 / 8-10 mm | 8-10 / 8-10 mm |
| Clamping range Rd / Fl | 8-10 / 30 mm | 8-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions | 60 x 60 x 3 mm | 60 x 60 x 3 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 14 kA | 7.4 kA |
| PU | 25 pc(s) | 25 pc(s) |

## Without intermediate plate, for two flat conductors



| Type KS ... | FL30 STTZN | FL30 V4A |
|---|---|---|
| **Part No.** | **318 033** | **318 233** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions | 60 x 60 x 3 mm | 60 x 60 x 3 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 8.4 kA | 7.0 kA |
| PU | 25 pc(s) | 25 pc(s) |

## Without intermediate plate, for two flat conductors up to 40 mm



| Type KS ... | FL40 STTZN |
|---|---|
| **Part No.** | **320 044** |
| Material of clamp | **St/tZn** |
| Clamping range Fl / Fl | 30-40 / 30-40 mm |
| Dimensions | 70 x 70 x 3 mm |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 12.6 kA |
| PU | 25 pc(s) |

# Cross Units with Truss Head Screws for Aboveground and Underground Connections

of conductors in cross, parallel and T arrangement. Version with anti-rotation protection for mounting with a tool.

## With intermediate plate for round and flat conductors



| Type KS 8.10 ... | 8.10 FL30 ZP FRSM8 STTZN | 8.10 FL30 ZP FRSM8 V4A |
|---|---|---|
| **Part No.** | **318 203** | **318 229** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Clamping range Rd / Rd | 8-10 / 8-10 mm | 8-10 / 8-10 mm |
| Clamping range Rd / Fl | 8-10 / 30 mm | 8-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| Clamping range (stranded / cable) | – | 35-70 mm² |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions | 60 x 60 x 3 mm | 60 x 60 x 3 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 14 kA | 7 kA |
| PU | 1 pc(s) | 25 pc(s) |

## Without intermediate plate for round and flat conductors



| Type KS 8.10 ... | FL30 FRSM8 STTZN | FL30 FRSM8 V4A |
|---|---|---|
| **Part No.** | **318 205** | **318 239** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Clamping range Rd / Fl | 8-10 / 30 mm | 8-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions | 60 x 60 x 3 mm | 60 x 60 x 3 mm |
| Standard | EN 6561-1 | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 14 kA | 7.4 kA |
| PU | 25 pc(s) | 25 pc(s) |

## SV Clamps for Underground Connections

SV (angled connector) clamps for cross, parallel and T connections.



| Type | SVK 6.28 FL30 STBL |
|---|---|
| **Part No.** | **308 062** |
| Material of clamp | **St/bare** |
| Clamping range Rd / Fl | 6-28 / 30 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 7.3 kA |
| PU | 50 pc(s) |

## SV Clamps for Aboveground and Underground Connections

SV (angled connector) clamps for cross, parallel and T connections, with anti-rotation protection of the screws.

### For flat and round conductors



| General technical data: | | |
|---|---|---|
| Clamping range Rd / Rd | | 7-10 / 7-10 mm |
| Screw | | M10 x 30 mm |
| Standard | | EN 62561-1 |

| Type SVK ... | 7.10 7.10 FL30 STTZN | 7.10 7.10 FL30 V4A |
|---|---|---|
| **Part No.** | **308 220** | **308 229** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Rd / Fl | 7-10 / 30 mm | 7-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions (l1 x d1) | 94 x 4 mm | 94 x 3 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 7.3 kA | 3.2 kA |
| PU | 25 pc(s) | 25 pc(s) |

| Type SVK ... | 7.10 7.10 FL40 STTZN | 7.10 7.10 FL40 V4A |
|---|---|---|
| **Part No.** | **308 320** | **308 329** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Rd / Fl | 7-10 / 30-40 mm | 7-10 / 30-40 mm |
| Clamping range Fl / Fl | 30-40 / 30-40 mm | 30-40 / 30-40 mm |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions (l1 x d1) | 108 x 4 mm | 108 x 3 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 14.0 kA | 14.0 kA |
| PU | 25 pc(s) | 25 pc(s) |

### For one flat and round conductor or two flat conductors



| Type SVK ... | 7.10 FL30 V4A |
|---|---|
| **Part No.** | **308 249** |
| Material of clamp | StSt (V4A) |
| Clamping range Rd / Fl | 7-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm |
| Screw | M10 x 30 mm |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Dimensions (l1 x d1) | 94 x 3 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

### For flat conductors



| Type SVK ... | FL30 STTZN | FL30 V4A |
|---|---|---|
| **Part No.** | **308 230** | **308 239** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| Screw | M10 x 30 mm | M10 x 30 mm |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions (l1 x d1) | 94 x 4 mm | 94 x 3 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 8.2 kA | 3.9 kA |
| PU | 25 pc(s) | 25 pc(s) |

### For flat conductors, round conductors and earth entry rods



| Type SVK ... | 7.10 16 FL40 STTZN |
|---|---|
| **Part No.** | **308 330** |
| Material of clamp | **St/tZn** |
| Clamping range Rd / Rd | 7-10 / 16 mm |
| Clamping range Rd / Fl | 16 / 30-40 mm |
| Screw | M10 x 30 mm |
| Dimensions (l1 x d1) | 108 x 4 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## SVP Clamps for Aboveground and Underground Connections

Diagonal and parallel connecting clamps (Schräg-Verbinder-Parallel-Klemmen) for cross and parallel connections, with slotted upper part (no need to detach the screws).



| Type SVPK 8.10 8.10 ... | FL30 STTZN | FL30 V4A |
|---|---|---|
| **Part No.** | **308 060** | **308 069** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Rd / Rd | 8-10 / 8-10 mm | 8-10 / 8-10 mm |
| Clamping range Rd / Fl | 8-10 / 30 mm | 8-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## Connection Clamps

For connection to steel constructions and steel sheets.

### Lengthwise or crosswise connection



| Type AK 7.10 ... | FRM10X45 KBF0.4 12 TGTZN | FRM10X45 KBF0.4 12 RG |
|---|---|---|
| **Part No.** | **371 009** | **371 007** |
| Clamping range | 0.4-12 mm | 0.4-12 mm |
| Material of clamp | **MCI/tZn** | **high copper alloy** |
| Clamping range Rd | 7-10 mm | 7-10 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 20 pc(s) | 1 pc(s) |

## Connection Clamps for Steel Girders

Heavy design, for connection to steel constructions.

### Vertical design, with clamping piece

Lengthwise or crosswise connection with clamping piece.



| General technical data: | |
|---|---|
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |

| Type AK ... | 6.10 KB S KBF3 18 STTZN | 6.10 KB S KBF3 18 V2A |
|---|---|---|
| **Part No.** | **372 110** | **372 119** |
| Clamping range | 3-18 mm | 3-18 mm |
| Material of clamp | **St/tZn** | **StSt** |
| PU | 25 pc(s) | 25 pc(s) |

| Type AK ... | 6.10 KB S KBF18 35 STTZN | 6.10 KB S KBF18 35 V2A |
|---|---|---|
| **Part No.** | **372 140** | **372 149** |
| Clamping range | 18-35 mm | 18-35 mm |
| Material of clamp | **St/tZn** | **StSt** |
| PU | 25 pc(s) | 25 pc(s) |

### Horizontal design, with clamping piece

Lengthwise or crosswise connection with clamping piece.



| General technical data: | |
|---|---|
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |

| Type AK ... | 6.10 KB W KBF3 18 STTZN | 6.10 KB W KBF3 18 V2A |
|---|---|---|
| **Part No.** | **372 210** | **372 219** |
| Clamping range | 3-18 mm | 3-18 mm |
| Material of clamp | **St/tZn** | **StSt** |
| PU | 25 pc(s) | 25 pc(s) |

| Type AK ... | 6.10 KB W KBF18 35 STTZN | 6.10 KB W KBF18 35 V2A |
|---|---|---|
| **Part No.** | **372 240** | **372 249** |
| Clamping range | 18-35 mm | 18-35 mm |
| Material of clamp | **St/tZn** | **StSt** |
| PU | 25 pc(s) | 1 pc(s) |

### Vertical design, with KS connector

Lengthwise or crosswise connection with KS connector.



| General technical data: | |
|---|---|
| Standard | EN 62561-1 |

| Type AK ... | 7.10 KSV S KBF3 18 STTZN | 6.10 KSV S KBF3 18 V2A |
|---|---|---|
| **Part No.** | **372 120** | **372 129** |
| Clamping range | 3-18 mm | 3-18 mm |
| Material of clamp | **St/tZn** | **StSt** |
| Clamping range Rd | 7-10 mm | 6-10 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type AK ... | 7.10 KSV S KBF18 35 STTZN | 6.10 KSV S KBF18 35 V2A |
|---|---|---|
| **Part No.** | **372 150** | **372 159** |
| Clamping range | 18-35 mm | 18-35 mm |
| Material of clamp | **St/tZn** | **StSt** |
| Clamping range Rd | 7-10 mm | 6-10 mm |
| PU | 25 pc(s) | 25 pc(s) |

### Horizontal design, with KS connector

Lengthwise or crosswise connection with KS connector.



| General technical data: | |
|---|---|
| Standard | EN 62561-1 |

| Type AK ... | 7.10 KSV W KBF3 18 STTZN | 6.10 KSV W KBF3 18 V2A |
|---|---|---|
| **Part No.** | **372 220** | **372 229** |
| Clamping range | 3-18 mm | 3-18 mm |
| Material of clamp | **St/tZn** | **StSt** |
| Clamping range Rd | 7-10 mm | 6-10 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type AK ... | 7.10 KSV W KBF18 35 STTZN | 6.10 KSV W KBF18 35 V2A |
|---|---|---|
| **Part No.** | **372 250** | **372 259** |
| Clamping range | 18-35 mm | 18-35 mm |
| Material of clamp | **St/tZn** | **StSt** |
| Clamping range Rd | 7-10 mm | 6-10 mm |
| PU | 25 pc(s) | 25 pc(s) |

## Connection Clamps with Thrust Piece

For connection to steel constructions and steel sheets with a single-screw technique.

### Small design
Lengthwise or crosswise connection.



| Type AK 6.10 DS ... | KBF5 18 STTZN | KBF5 18 V2A |
|---|---|---|
| **Part No.** | **372 018** | **372 019** |
| Clamping range | 5-18 mm | 5-18 mm |
| Material of clamp | **St/tZn** | **StSt** |
| Clamping range Rd | 6-10 mm | 6-10 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

### Large design
Lengthwise or crosswise connection.

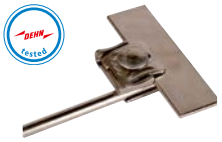


| Type AK 6.10 DS ... | KBF18 35 STTZN |
|---|---|
| **Part No.** | **372 035** |
| Clamping range | 18-35 mm |
| Material of clamp | **St/tZn** |
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## Seam Clamps

For connecting conductors with seams of the same or of different materials.

### With clamping piece
Longitudinal or cross conductor routing.

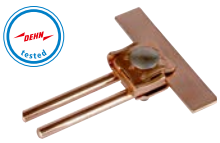


| General technical data: | |
|---|---|
| Clamping range of seam | 0.7-8 mm |
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |

| Type | FK KB 6.10 KBF0.7 8 STTZN | FK KB 6.10 KBF0.7 8 AL |
|---|---|---|
| **Part No.** | **365 030** | **365 031** |
| Material of clamp | **St/tZn** | **Al** |
| PU | 50 pc(s) | 50 pc(s) |

| Type | FK KB 6.10 KBF0.7 8 CU | FK KB 6.10 KBF0.7 8 V2A |
|---|---|---|
| **Part No.** | **365 037** | **365 039** |
| Material of clamp | **Cu** | **StSt** |
| PU | 50 pc(s) | 50 pc(s) |

### With double clamp
Longitudinal or cross conductor routing.



| General technical data: | |
|---|---|
| Clamping range of seam | 0.7-8 mm |
| Clamping range Rd | 8-10 mm |
| Standard | EN 62561-1 |

| Type | FK DUL 8.10 KBF0.7 8 STTZN | FK DUL 6.10 KBF0.7 8 AL |
|---|---|---|
| **Part No.** | **365 010** | **365 011** |
| Material of clamp | **St/tZn** | **Al** |
| PU | 50 pc(s) | 50 pc(s) |

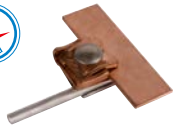
| Type | FK DUL 8.10 KBF0.7 8 CU | FK DUL 6.10 KBF0.7 8 V2A |
|---|---|---|
| **Part No.** | **365 017** | **365 019** |
| Material of clamp | **Cu** | **StSt** |
| PU | 50 pc(s) | 50 pc(s) |

### With clamping piece, for hooking under seams
Which are close to a roof or wall surface.
Longitudinal or cross conductor routing.



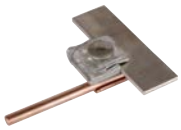
| Type | FK KB 6.10 KBF0.7 10 STTZN | FK KB 6.10 KBF0.7 10 CU |
|---|---|---|
| **Part No.** | **365 020** | **365 027** |
| Clamping range of seam | 0.7-10 mm | 0.7-10 mm |
| Material of clamp | **St/tZn** | **Cu** |
| Clamping range Rd | 6-10 mm | 6-10 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

### Bimetallic, for Cu seams, with intermediate plate (Cupal)



| Type | ZMFK KB 6.10 KBF0.7 8 STTZN CU |
|---|---|
| **Part No.** | **365 117** |
| Clamping range of seam | 0.7-8 mm |
| Material of clamp | **St/tZn / Cu** |
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### Bimetallic, for St/tZn seams, with intermediate plate (Cupal)



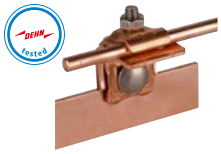
| Type | ZMFK KB 6.10 KBF0.7 8 CU STTZN |
|---|---|
| **Part No.** | **365 127** |
| Clamping range of seam | 0.7-8 mm |
| Material of clamp | **Cu / St/tZn** |
| Clamping range Rd | 6-10 mm |
| PU | 1 pc(s) |

## Saddle Clamps with Enlarged Contact Surface

For connecting conductors with seams; enlarged contact surface.

### Angled design

Longitudinal or cross conductor routing.



| General technical data: | |
|---|---|
| Clamping range of seam | 0.7-8 mm |
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |

| Type FK ... | KB 6.10 KBF0.7 8 W STTZN | KB 6.10 KBF0.7 8 W AL |
|---|---|---|
| Part No. | 365 050 | 365 051 |
| Material of clamp | St/tZn | Al |
| PU | 50 pc(s) | 50 pc(s) |

| Type FK ... | KB 6.10 KBF0.7 8 W CU | KB 6.10 KBF0.7 8 W V2A |
|---|---|---|
| Part No. | 365 057 | 365 059 |
| Material of clamp | Cu | StSt |
| PU | 50 pc(s) | 50 pc(s) |

### Straight design

Longitudinal or cross conductor routing.



| General technical data: | |
|---|---|
| Clamping range of seam | 0.7-10 mm |
| Clamping range Rd | 8-10 mm |
| Standard | EN 62561-1 |

| Type FK ... | MV 8.10 KBF0.7 10 STTZN | MV 8.10 KBF0.7 10 AL |
|---|---|---|
| Part No. | 365 220 | 365 221 |
| Material of clamp | St/tZn | Al |
| PU | 50 pc(s) | 50 pc(s) |

| Type FK ... | MV 8.10 KBF0.7 10 CU | MV 8.10 KBF0.7 10 V2A |
|---|---|---|
| Part No. | 365 227 | 365 229 |
| Material of clamp | Cu | StSt |
| PU | 50 pc(s) | 50 pc(s) |

## Gutter Clamps with Single-screw Technique

For connecting conductors with gutters.

### With clamping piece



| Type DRK ... | KB 8.10 W16.22 EST STTZN | KB 8.10 W16.22 EST AL |
|---|---|---|
| Part No. | 339 100 | 339 101 |
| Clamping range bead | 16-22 mm | 16-22 mm |
| Material of clamp | St/tZn | Al |
| Clamping range Rd | 8-10 mm | 8-10 mm |
| Width | 40 mm | 40 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 1 pc(s) |

### With double clamping piece



| Type DRK ... | DUL 8.10 W16.22 EST STTZN | DUL 8.10 W16.22 EST AL |
|---|---|---|
| Part No. | 339 110 | 339 111 |
| Clamping range bead | 16-22 mm | 16-22 mm |
| Material of clamp | St/tZn | Al |
| Clamping range Rd | 8-10 mm | 8-10 mm |
| Width | 40 mm | 40 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

## Gutter Clamps

For connecting conductors to gutters.

### With clamping piece

Longitudinal or cross conductor routing.



| General technical data: | |
|---|---|
| Clamping range bead | 16-22 mm |
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |

| Type | DRK KB 6.10 W16.22 STTZN | DRK KB 6.10 W16.22 AL |
|---|---|---|
| Part No. | 339 060 | 339 061 |
| Material of gutter clamp | St/tZn | Al |
| Material of conductor clamp | St/tZn | Al |
| Width / material thickness | 40 mm | 40 / 3 mm |
| Material of screw | St/tZn | StSt |
| PU | 25 pc(s) | 25 pc(s) |

| Type | DRK KB 6.10 W16.22 CU | DRK KB 6.10 W16.22 V2A |
|---|---|---|
| Part No. | 339 067 | 339 069 |
| Material of gutter clamp | Cu | StSt |
| Material of conductor clamp | Cu | StSt |
| Width / material thickness | 40 / 2 mm | 40 / 2 mm |
| Material of screw | StSt | StSt |
| PU | 25 pc(s) | 25 pc(s) |

### With double clamp

Longitudinal or cross conductor routing.



| General technical data: | |
|---|---|
| Clamping range bead | 16-22 mm |
| Clamping range Rd | 8-10 mm |
| Standard | EN 62561-1 |

| Type | DRK DUL 8.10 W16.22 STTZN | DRK DUL 8.10 W16.22 AL |
|---|---|---|
| Part No. | 339 050 | 339 051 |
| Material of gutter clamp | St/tZn | Al |
| Material of conductor clamp | St/tZn | StSt |
| Width / material thickness | 40 / 2 mm | 40 / 3 mm |
| Material of screw | St/tZn | StSt |
| PU | 25 pc(s) | 25 pc(s) |

| Type | DRK DUL 8.10 W16.22 CU | DRK DUL 8.10 W16.22 V2A |
|---|---|---|
| Part No. | 339 057 | 339 059 |
| Material of gutter clamp | Cu | StSt |
| Material of conductor clamp | Cu | StSt |
| Width / material thickness | 40 / 2 mm | 40 / 2 mm |
| Material of screw | StSt | StSt |
| PU | 25 pc(s) | 25 pc(s) |

## Bimetallic, for gutters (Cu), with clamping piece (St/tZn) and intermediate plate (Cupal)



| Type | ZMDRK KB 6.10 W16.22 CU STTZN |
|---|---|
| **Part No.** | **339 167** |
| Clamping range bead | 16-22 mm |
| Material of gutter clamp | Cu / St/tZn |
| Clamping range Rd | 6-10 mm |
| Material of screw | StSt |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Bimetallic, for gutters (Cu), with double clamp (St/tZn) and intermediate plate (Cupal)



| Type | ZMDRK DUL 8.10 W16.22 CU STTZN |
|---|---|
| **Part No.** | **339 157** |
| Clamping range bead | 16-22 mm |
| Material of gutter clamp | Cu / St/tZn |
| Clamping range Rd | 8-10 mm |
| Material of screw | StSt |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## With two-screw clamp, width 40 mm

Longitudinal conductor routing.



| General technical data: | |
|---|---|
| Clamping range bead | 13-25 mm |
| Clamping range Rd | 7-10 mm |
| Material of screw | StSt |
| Standard | EN 62561-1 |

| Type | DRK ZS 7.10 W13.25 STTZN | DRK ZS 7.10 W13.25 AL |
|---|---|---|
| **Part No.** | **338 000** | **338 001** |
| Material of gutter clamp | St/tZn | Al |
| Material of conductor clamp | St/tZn | Al |
| Width / material thickness | 40 / 3 mm | 40 / 3 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type | DRK ZS 7.10 W13.25 CU | DRK ZS 7.10 W13.25 V2A |
|---|---|---|
| **Part No.** | **338 007** | **338 009** |
| Material of gutter clamp | Cu | StSt |
| Material of conductor clamp | Cu | StSt |
| Width / material thickness | 40 / 3 mm | 40 / 2,5 mm |
| PU | 25 pc(s) | 25 pc(s) |

## With two-screw clamp, width 60 mm

Longitudinal conductor routing.



| Type | DRK ZS 7.10 W13.25 B60 STTZN |
|---|---|
| **Part No.** | **339 010** |
| Clamping range bead | 13-25 mm |
| Material of gutter clamp | St/tZn |
| Clamping range Rd | 7-10 mm |
| Material of conductor clamp | St/tZn |
| Width / material thickness | 60 / 2.5 mm |
| Material of screw | StSt |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

# Snow Guard Clamps

For connecting conductors to snow guards, longitudinal connection with two-screw clamp.



| Type SGK ZS 7.10 ... | KB3.13 STTZN | KB3.13 CU |
|---|---|---|
| **Part No.** | **343 000** | **343 007** |
| Clamping range | 3-13 mm | 3-13 mm |
| Material of clamp | St/tZn | Cu |
| Width | 90 mm | 90 mm |
| Clamping range Rd | 7-10 mm | 7-10 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 1 pc(s) |

# Connection Brackets

For connecting metal cladding using blind rivets or screws.

## With square hole

Dimensions 11 x 11 mm (e.g. for M10 KS connector), longitudinal or cross connection.



| General technical data: | |
|---|---|
| Fixing | [4x] Ø5.2 / [2x] Ø6.5 mm |
| Standard | EN 62561-1 |

| Type AL ZF B11.11 B5.2 ... | 6.5 L81 AL | 6.5 L81 CU | 6.5 L81 V2A |
|---|---|---|---|
| **Part No.** | **377 005** | **377 017** | **377 009** |
| Material of bracket | Al | Cu | StSt |
| PU | 50 pc(s) | 50 pc(s) | 50 pc(s) |

## With clamping piece

Longitudinal or cross connection.



| Type AL ZF KB 6.10STTZN ... | B5.2 6.5 L81 AL |
|---|---|
| **Part No.** | **377 100** |
| Material of bracket | Al |
| Fixing | [4x] Ø5.2 / [2x] Ø6.5 mm |
| Material of clamping piece | St/tZn |
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## With double clamp

Longitudinal or cross connection.



| General technical data: | |
|---|---|
| Fixing | [4x] Ø5.2 / [2x] Ø6.5 mm |
| Clamping range Rd | 8-10 mm |
| Standard | EN 62561-1 |

| Type AL ZF ... | DUL 6.10 B5.2 6.5 L81 AL | DUL 6.10 B5.2 6.5 L81 STTZN |
|---|---|---|
| **Part No.** | **377 200** | **377 201** |
| Material of bracket | Al | HDG steel |
| Material of double clamp | Al | HDG steel |
| PU | 50 pc(s) | 50 pc(s) |

| Type AL ZF DUL ... | 6.10 B5.2 6.5 L81 V2A |
|---|---|
| **Part No.** | **377 209** |
| Material of bracket | StSt |
| Material of double clamp | StSt |
| PU | 50 pc(s) |

## Clamping Shoes

For connecting conductors to structural parts.

### With hole



| Type KS ... | 8 B11 STTZN | 10 B11 STTZN |
|---|---|---|
| **Part No.** | **345 008** | **345 010** |
| Clamping range Rd | 8 mm | 10 mm |
| Material | **St/tZn** | **St/tZn** |
| Fixing hole Ø | 11 mm | 11 mm |
| PU | 100 pc(s) | 100 pc(s) |

### With screws



| Type KS ... | 7.10 B10.5 AL |
|---|---|
| **Part No.** | **347 205** |
| Clamping range Rd | 7-10 mm |
| Material | Al |
| Fixing hole Ø | 10.5 mm |
| Standard | EN 62561-1 |
| PU | 100 pc(s) |

## Clamping Piece

For connecting flat material to structural parts or, for example, connection clamps for steel girders (without a hole in the flat strip).



| Type | KS B11.11 FL30X4 V2A |
|---|---|
| **Part No.** | **380 129** |
| Clamping range Fl | up to 30 x 4 mm |
| Material | StSt |
| Fixing | square hole 11 x 11 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## FS Clamps (Air-termination Rod Clamps)

For connecting air-termination rods/tips to one or two conductors.
Connection of two conductors improves the lightning current distribution and thus reduces the separation distance.

### For air-termination tip 10 mm

With truss head screw, plate, nut and double conductor clamp.



| Type FSK ... | 3X8.10 FRM10X50 AL |
|---|---|
| **Part No.** | **380 110** |
| Material of clamp | Al |
| Clamping range of air-termination tip | 8-10 mm |
| Clamping range Rd | 2x 8-10 mm |
| Material of plate | StSt |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### For air-termination rod 16 mm

With truss head screw, plate, nut and double conductor holder.



| Type FSK ... | 2X8.10 16 FRM10X50 AL |
|---|---|
| **Part No.** | **380 116** |
| Material of clamp | Al |
| Clamping range of air-termination rod | 16 mm |
| Clamping range Rd | 2x 8-10 mm |
| Material of plate | StSt |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Rod Clamps

For connecting air-termination rods to conductors, for longitudinal connection of all conductor materials. Cross connection (cross arrangement) only St/tZn and StSt.



| Type FSK 8.10 16 ... | SKM10X25 STTZN | SKM10X25 V2A |
|---|---|---|
| **Part No.** | **380 020** | **380 029** |
| Material of clamp | **St/tZn** | StSt |
| Clamping range Rd / Rd | 8-10 / 16 mm | 8-10 / 16 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## Connecting Sleeve for Air-Termination Rods

With embossings (stop) for connecting longer air-termination rods (transport length).
When using the connecting sleeve, the air-termination rod must be additionally fixed above the sleeve.



| Type | VM 16 SKM8X12 AL |
|---|---|
| **Part No.** | **385 216** |
| Material | Al |
| Clamping range Rd / Rd | 16 / 16 mm |
| Screw | M8 x 12 mm |
| Material of screw | StSt |
| Outside diameter Ø | 28 mm |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

## MV Clamps for Air-Termination Rods

Multi-purpose connecting clamp for universal use as a cross clamp, T clamp and parallel clamp; two-piece.

### With hexagon screw, spring washer and thread in the base part



| Type MVK 8.10 16 ... | SKM10X40 FSC STTZN | SKM10X40 FSC V2A |
|---|---|---|
| **Part No.** | **392 050** | **392 059** |
| Material of clamp | **St/tZn** | StSt |
| Clamping range Rd | 8-10 / 16 mm | 8-10 / 16 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## With truss head screw and anti-rotation protection



| Type MVK 8.10 16 ... | FRM10X40 STTZN | FRM10X40 V2A |
|---|---|---|
| **Part No.** | **392 060** | **392 069** |
| Material of clamp | **St/tZn** | StSt |
| Clamping range Rd | 8-10 / 16 mm | 8-10 / 16 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## Cupal Sleeves

For corrosion-resistant connection of steel or aluminium with copper.

### Pushed onto cut conductors

Note: Rd 8 mm = 50 mm²



| General technical data: | | |
|---|---|---|
| Material thickness | | 1.0 mm |

| Type CUPAH ... | GL Q25 L29 AL CU | GL Q35 L32 AL CU |
|---|---|---|
| **Part No.** | **562 250** | **562 035** |
| Material outside | Al | Al |
| Material inside | Cu | Cu |
| Cross-section | 25 mm² | 35 mm² |
| Length | 29 mm | 32 mm |
| Inside diameter Ø | 6.3 mm | 7.5 mm |
| Outside diameter Ø | 8.3 mm | 9.5 mm |
| PU | 100 pc(s) | 100 pc(s) |

| Type CUPAH ... | GL Q50 L40 AL CU | GL Q35 L32 CU AL |
|---|---|---|
| **Part No.** | **562 050** | **562 135** |
| Material outside | Al | Cu |
| Material inside | Cu | Al |
| Cross-section | 50 mm² | 35 mm² |
| Length | 40 mm | 32 mm |
| Inside diameter Ø | 8.2 mm | 7.5 mm |
| Outside diameter Ø | 10.0 mm | 9.5 mm |
| PU | 100 pc(s) | 100 pc(s) |

| Type CUPAH ... | GL Q50 L40 CU AL |
|---|---|
| **Part No.** | **562 150** |
| Material outside | Cu |
| Material inside | Al |
| Cross-section | 50 mm² |
| Length | 40 mm |
| Inside diameter Ø | 8.2 mm |
| Outside diameter Ø | 10.0 mm |
| PU | 100 pc(s) |

### Attached to uncut conductors

Note: Rd 8 mm = 50 mm²



| Type CUPAH ... | UGL Q50 L60 AL CU | UGL Q50 L60 CU AL |
|---|---|---|
| **Part No.** | **562 001** | **562 101** |
| Material outside | Al | Cu |
| Material inside | Cu | Al |
| Cross-section | 50 mm² | 50 mm² |
| Length | 60 mm | 60 mm |
| Inside diameter Ø | 8.5 mm | 8.5 mm |
| Outside diameter Ø | 9.5 mm | 9.5 mm |
| Material thickness | 0.5 mm | 0.5 mm |
| PU | 100 pc(s) | 100 pc(s) |

## Cupal Sheets

Metal strips for corrosion-resistant connection of steel or aluminium with copper.



| Type CUPAB ... | 500X40X0.5 AL CU | 500X60X0.5 AL CU |
|---|---|---|
| **Part No.** | **562 440** | **562 460** |
| Material | Al / Cu | Al / Cu |
| Dimensions | 500 x 40 x 0.5 mm | 500 x 60 x 0.5 mm |
| PU | 1 pc(s) | 1 pc(s) |

## UNI Disconnecting Clamps

For connecting down conductors with earth entries or for connecting conductors made of different materials.

### With intermediate plate for two round conductors



| Type | UTK 8.10 8.10 ZP V2A | UTK 8.10 8.10 ZP CU |
|---|---|---|
| **Part No.** | **459 129** | **459 127** |
| Material | StSt | Cu |
| Clamping range Rd / Rd | 8-10 / 8-10 mm | 8-10 / 8-10 mm |
| Distance between screws | 40 mm | 40 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 1 pc(s) |

### Bimetallic, for two round conductors (Cu and St/tZn or StSt (V4A))



| Type | ZMTK 8.10 8.10 CU STTZN |
|---|---|
| **Part No.** | **460 517** |
| Material | Cu / St/tZn |
| Clamping range Rd / Rd | 8-10 / 8-10 mm |
| Distance between screws | 40 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### With intermediate plate for a round and a flat conductor



| Type | UTK 8.10 FL30 ZP V2A |
|---|---|
| **Part No.** | **459 139** |
| Material | StSt |
| Clamping range Rd / Fl | 8-10 / 30 mm |
| Distance between screws | 40 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### Bimetallic, for a round Cu conductor and a flat St/tZn or StSt (V4A) conductor



| Type | ZMTK 8.10 FL30 CU STTZN |
|---|---|
| **Part No.** | **460 557** |
| Material | Cu / St/tZn |
| Clamping range Rd / Fl | 8-10 / 30 mm |
| Distance between screws | 40 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## With intermediate plate for earth entry rods



| Type | UTK 8.10 16 ZP V2A |
|---|---|
| Part No. | 459 119 |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Distance between screws | 40 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Bimetallic, for a round Cu conductor and a St/tZn or StSt (V4A) earth entry rod



| Type | ZMTK 8.10 16 CU STTZN |
|---|---|
| Part No. | 460 507 |
| Material | Cu / St/tZn |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Distance between screws | 40 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## With intermediate plate for two round conductors, narrow design



| Type | UTK 7.10 7.10 S ZP STTZN |
|---|---|
| Part No. | 459 003 |
| Material | St/tZn |
| Clamping range Rd / Rd | 7-10 / 7-10 mm |
| Distance between screws | 30 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## With intermediate plate for earth entry rods, narrow design



| Type | UTK 7.10 16 S ZP STTZN |
|---|---|
| Part No. | 459 000 |
| Material | St/tZn |
| Clamping range Rd / Rd | 7-10 / 16 mm |
| Distance between screws | 30 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## With intermediate plate for an earth entry rod and a flat conductor



| Type | UTK 16 FL30 ZP V2A |
|---|---|
| Part No. | 459 159 |
| Material | StSt |
| Clamping range Rd / Fl | 16 / 30 mm |
| Distance between screws | 40 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Without intermediate plate for two round conductors



| Type | UTK 8.10 8.10 V2A | UTK 8.10 8.10 STTZN |
|---|---|---|
| Part No. | 459 029 | 459 020 |
| Material | StSt | St/tZn |
| Clamping range Rd / Rd | 8-10 / 8-10 mm | 8-10 / 8-10 mm |
| Distance between screws | 40 mm | 40 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## Without intermediate plate for a round and a flat conductor



| Type | UTK 8.10 FL30 V2A | UTK 8.10 FL30 STTZN |
|---|---|---|
| Part No. | 459 039 | 459 030 |
| Material | StSt | St/tZn |
| Clamping range Rd / Fl | 8-10 / 30 mm | 8-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm | – |
| Distance between screws | 40 mm | 40 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## Without intermediate plate for earth entry rods



| Type | UTK 8.10 16 V2A | UTK 8.10 16 STTZN |
|---|---|---|
| Part No. | 459 019 | 459 010 |
| Material | StSt | St/tZn |
| Clamping range Rd / Rd | 8-10 / 16 mm | 8-10 / 16 mm |
| Distance between screws | 40 mm | 40 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 1 pc(s) |

## Disconnecting Clamp – Austrian Standard

With connecting screw, for round conductors.



| Type | OENTK 7.10 7.10 ZG |
|---|---|
| Part No. | 460 213 |
| Material | ZDC |
| Clamping range Rd / Rd | 7-10 / 7-10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Connecting / Disconnecting Clamps

Two-piece or three-piece connection system with thread in the base part.

### Two-piece, for a round and a flat conductor



| Type VTK ... | 7.10 FL30.40 STTZN | 7.10 FL30.40 CU |
|---|---|---|
| **Part No.** | **454 100** | **454 107** |
| Material | **St/tZn** | **Cu** |
| Clamping range Rd / Fl | 7-10 / 30-40 mm | 7-10 / 30-40 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

### Three-piece, (with intermediate plate) for a round and a flat conductor



| Type VTK ... | 5.10 FL30.40 ZP STTZN |
|---|---|
| **Part No.** | **454 000** |
| Material | **St/tZn** |
| Clamping range Rd / Fl | 5-10 / 30-40 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

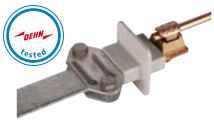
### Two-piece, for two flat conductors



| Type VTK ... | FL30 TGTZN |
|---|---|
| **Part No.** | **455 000** |
| Material | **MCI/tZn** |
| Clamping range Fl / Fl | 30 / 30 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Bimetallic Disconnecting Clamp with Shield

Bimetallic version for connecting conductors made of different materials.



| Type | ZMTK 6.10 FL30.40 CU STTZN |
|---|---|
| **Part No.** | **460 147** |
| Material | **Cu / St/tZn** |
| Clamping range Rd / Fl | 6-10 / 30-40 mm |
| Shield | **plastic** grey |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Disconnecting Sleeves

For connecting down conductors with earth entry rods.

### Open design for earth entry rods



| Type TM ... | 7.10 16 ZG | 7.10 16 RG |
|---|---|---|
| **Part No.** | **450 000** | **450 007** |
| Material | **ZDC** | **high copper alloy** |
| Clamping range Rd / Rd | 7-10 / 16 mm | 7-10 / 16 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 1 pc(s) |

### Open design for earth entry rods



| Type TM ... | 7.10 16 AL |
|---|---|
| **Part No.** | **450 001** |
| Material | **Al** |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### Closed design for earth entry rods



| Type TM ... | G 7.10 16 ZG |
|---|---|
| **Part No.** | **450 011** |
| Material | **ZDC** |
| Clamping range Rd / Rd | 7-10 / 16 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### Open design for wires



| Type TM ... | 8.10 8 AL |
|---|---|
| **Part No.** | **450 101** |
| Material | **Al** |
| Clamping range Rd / Rd | 8-10 / 8 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Connecting components 200 kA (10/350 µs)

For use in class of LPS I and II (LPL I, II).
Clamps are tested with a 200 kA (10/350 µs) lightning impulse current, based on EN 62561-1.

### UNI disconnecting clamp for two round conductors



| Type | UTK 200 2X10 FL30 ZP V2A |
|---|---|
| Part No. | 459 200 |
| Material | StSt |
| Clamping range Rd / Rd | 10 / 10 mm |
| Clamping range Rd / Fl | 10 / 30 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### UNI disconnecting clamp for earth entry rods



| Type | UTK 200 8.10 16 ZP V2A |
|---|---|
| Part No. | 459 219 |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### Clamping piece



| Type | KS 200 B11.11 FL30X4 V2A |
|---|---|
| Part No. | 380 209 |
| Material | StSt |
| Clamping range Fl | 30 x 4 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### KS connector



| Type | KSV 200 10 FER V2A |
|---|---|
| Part No. | 301 209 |
| Material | StSt |
| Clamping range Rd | 10 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### MV clamp for round conductors



| Type | MVK 200 8.10 SKM10X30 V2A |
|---|---|
| Part No. | 390 209 |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### MV clamp for air-termination rods



| Type | MVK 200 8.10 16 SKM10X40 FSC V2A |
|---|---|
| Part No. | 392 209 |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

## Square Conductor Clamps

Square Tape Clamps for interconnecting various sizes of flat conductors in parallel, cross, and T connection arrangements to form a continuous network. Equipped with a countersunk hole for fixing the clamp to structural surfaces. The Clamps have a high resistance to corrosion and show high mechanical strength to ensure a lasting connection.

### Square Tape Clamps

Square Tape Clamps for interconnecting flat tapes in parallel, cross, and T connection arrangements to form a continuous network.



| General technical data: | |
|---|---|
| Material of Clamp Fixings | Stainless Steel |
| Tightening Torque | 6 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type STC ... | BCU FL 25X3 HCA | BCU FL 20.31X2.5.6 HCA |
|---|---|---|
| Part No. | 118 202 | 118 208 |
| Material | High Copper Alloy | High Copper Alloy |
| Conductor Material | Bare Copper | Bare Copper |
| Clamping range Fl / Fl | 25 x 3 / 25 x 3 mm | W (20-31 mm) x T (2.5-6 mm) / W (20-31 mm) x T (2.5-6 mm) |
| PU | 15 pc(s) | 15 pc(s) |

| Type STC ... | BCU FL 40.50X2.5.6 HCA | BAL FL 25X3 ALA |
|---|---|---|
| Part No. | 118 219 | 118 209 |
| Material | High Copper Alloy | Aluminium Alloy |
| Conductor Material | Bare Copper | Bare Aluminium |
| Clamping range Fl / Fl | W (40-50 mm) x T (2.5-6 mm) / W (40-50 mm) x T (2.5-6 mm) | 25 x 3 / 25 x 3 mm |
| PU | 15 pc(s) | 15 pc(s) |

| Type STC ... | BAL FL 25X3.6 ALA |
|---|---|
| Part No. | 118 218 |
| Material | Aluminium Alloy |
| Conductor Material | Bare Aluminium |
| Clamping range Fl / Fl | W (25 mm) x T (3-6 mm) / W (25 mm) x T (3-6 mm) |
| PU | 15 pc(s) |

## Square Cable Clamps



Square Cable Clamps for interconnecting stranded cables in cross and T connection arrangements to form a continuous network. The Clamps have a high resistance to corrosion and show high mechanical strength to ensure a lasting connection.

| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Material of Clamp Fixings | Stainless Steel |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type | SCC BCCU SC 16.70 HCA | SCC BCCU SC 35.150 HCA |
|---|---|---|
| Part No. | 118 628 | 118 634 |
| Clamping range Stranded cable / Stranded cable | 16 - 70 mm² / 16 - 70 mm² | 35 - 150 mm² / 35 - 150 mm² |
| Tightening Torque | 5 Nm | 12 Nm |
| PU | 9 pc(s) | 5 pc(s) |

| Type | SCC BCCU SC 70.300 HCA |
|---|---|
| Part No. | 118 635 |
| Clamping range Stranded cable / Stranded cable | 70 - 300 mm² / 70 - 300 mm² |
| Tightening Torque | 12 Nm |
| PU | 2 pc(s) |

Note: Clamp can be used as a conductor holder for stranded PVC covered cables

## Multipurpose Square Conductor Clamps



Square Conductor Clamps for interconnecting various sizes of flat, round and stranded conductors in parallel, cross, and T connection arrangements to form a continuous network. Equipped with a countersunk hole for fixing the clamp to structural surfaces. The Clamps have a high resistance to corrosion and show high mechanical strength to ensure a lasting connection.

| Type | STRCC FLRDSC 25X3/8.10-50.120 HCA | STRCC FLRDSC 25X3/8.10-50.120 ALA |
|---|---|---|
| Part No. | 118 606 | 118 620 |
| Material | High Copper Alloy | Aluminium Alloy |
| Conductor Material | Copper | Aluminium |
| Clamping range Fl / Rd | 25 x 3 mm / 8-10 mm | 25 x 3 mm / 8-10 mm |
| Clamping range Fl / Stranded cable | 25 x 3 mm / 50 - 120 mm² | 25 x 3 mm / 50 - 120 mm² |
| Material of Clamp Fixings | Stainless Steel | Stainless Steel |
| Tightening Torque | 6 Nm | 6 Nm |
| Standards | IEC / EN / BS EN 62561-1 | IEC / EN / BS EN 62561-1 |
| Classification | Class H | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA | $I_{imp}$ 100 kA |
| PU | 1 pc(s) | 1 pc(s) |

# Test Clamps, Metal Bonding Clamps & Bimetallic Connectors

Test Clamps form a disconnecting joint in parallel or inline arrangements between the air-termination and down conductor network and/or down conductor network and earthing network. Equipped with countersunk hole for fixing the clamp to structural surfaces. The Clamps have a high resistance to corrosion and show high mechanical strength to ensure a lasting connection.

## Test Clamps



Test or Junction clamps are used to form a disconnecting joint between the air-termination and down conductor network and/or down conductor network and earthing network. The base of the clamp has got counter sunk holes for fixing the clamp to the surface of the structure.

| General technical data: | |
|---|---|
| Material of screw | Stainless steel |
| Tightening Torque | 15 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type | TJC FL 25X3 HCA | TJC FL 25X3 ALA |
|---|---|---|
| Part No. | 118 281 | 118 252 |
| Material | High Copper Alloy | Aluminium Alloy |
| Conductor Material | Copper | Aluminium |
| Clamping range Fl / Fl | 25 x 3 / 25 x 3 mm | 25 x 3 / 25 x 3 mm |
| Clamping screw | Hex head screw M8 x 2 Nos | Hex head screw M8 x 2 Nos |
| PU | 12 pc(s) | 12 pc(s) |

| Type | TJC FL 25.50X3.6 HCA | TJC FLRDSC 25X3/8.10/50.70 HCA |
|---|---|---|
| Part No. | 118 268 | 118 285 |
| Material | High Copper Alloy | High Copper Alloy |
| Conductor Material | Copper | Copper |
| Clamping range Fl / Fl | W (25-50) x T (3-6) / W (25-50) x T (3-6) mm | – |
| Clamping range Fl / Rd | – | 25 x 3 / 8 - 10 mm |
| Clamping range Fl / Stranded cable | – | 25 x 3 mm / 50 - 70 mm² |
| Clamping screw | Hex head screw M8 x 2 Nos | Hex head screw M8 x 2 Nos |
| Conductor Fixing screw | Hex head screw M10 x 2 Nos | Hex head screw M8 x 2 Nos |
| PU | 4 pc(s) | 2 pc(s) |

| Type TJC ... | FLRDSC 25X3/ 8.10/50.70 ALA | RDSC 50.70/ 8.10 HCA | FLRD 31X3.5/ 8.10 STST |
|---|---|---|---|
| Part No. | 118 286 | 118 283 | 118 256 |
| Material | Aluminium Alloy | High Copper Alloy | Stainless Steel (StSt) |
| Conductor Material | Aluminium | Copper | Copper, Aluminium, St/tZn, StSt |
| Clamping range Fl / Fl | – | – | 31 x 3.5 / 31 x 3.5 mm |
| Clamping range Fl / Rd | 25 x 3 / 8 - 10 mm | – | 31 x 3.5 / 8 - 10 mm |
| Clamping range Rd / Rd | – | – | 8 - 10 / 8 - 10 mm |
| Clamping range Fl / Stranded cable | 25 x 3 mm / 50 - 70 mm² | – | |
| Clamping range Rd / Rd | – | 8 - 10 / 8 - 10 mm | – |
| Clamping range Rd / Stranded cable | – | 8 - 10 mm / 50 - 70 mm² | – |
| Clamping range Stranded cable / Stranded cable | – | 50 - 70 / 50 - 70 mm² | – |
| Clamping screw | Hex head screw M8 x 2 Nos | – | Hex head screw M6 x 2 Nos |
| Conductor Fixing screw | Hex head screw M8 x 2 Nos | Hex head screw M8 x 2 Nos | Hex head screw M6 x 2 Nos |
| PU | 10 pc(s) | 12 pc(s) | 5 pc(s) |

## Metal Work Bonding Clamps



Metal Work Bonding Clamps for connecting flat, round and stranded conductors in parallel connection arrangement to form a continuous network. Equipped with accessories for fixing the clamp to metal surfaces. The Clamps have a high resistance to corrosion and show high mechanical strength to ensure a lasting connection.

| General technical data: | |
|---|---|
| Clamping range Fl | 25 x 3 mm |
| Clamping screw / Recommended fixings | Hex Head Screw M10 |
| Material of screw | Stainless Steel |
| Tightening Torque | 20 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type MWBC ... | FLSC 25X3/50 HCA | FL 25X3 HCA |
|---|---|---|
| **Part No.** | **118 272** | **118 273** |
| Material | High Copper Alloy | High Copper Alloy |
| Conductor Material | Copper | Copper |
| Clamping range (Stranded / Cable) | 50 mm² | – |
| PU | 20 pc(s) | 20 pc(s) |

| Type | MWBC FL 25X3 ALA |
|---|---|
| **Part No.** | **118 275** |
| Material | Aluminium Alloy |
| Conductor Material | Aluminium |
| Clamping range (Stranded / Cable) | – |
| PU | 20 pc(s) |

## Bimetallic Connectors



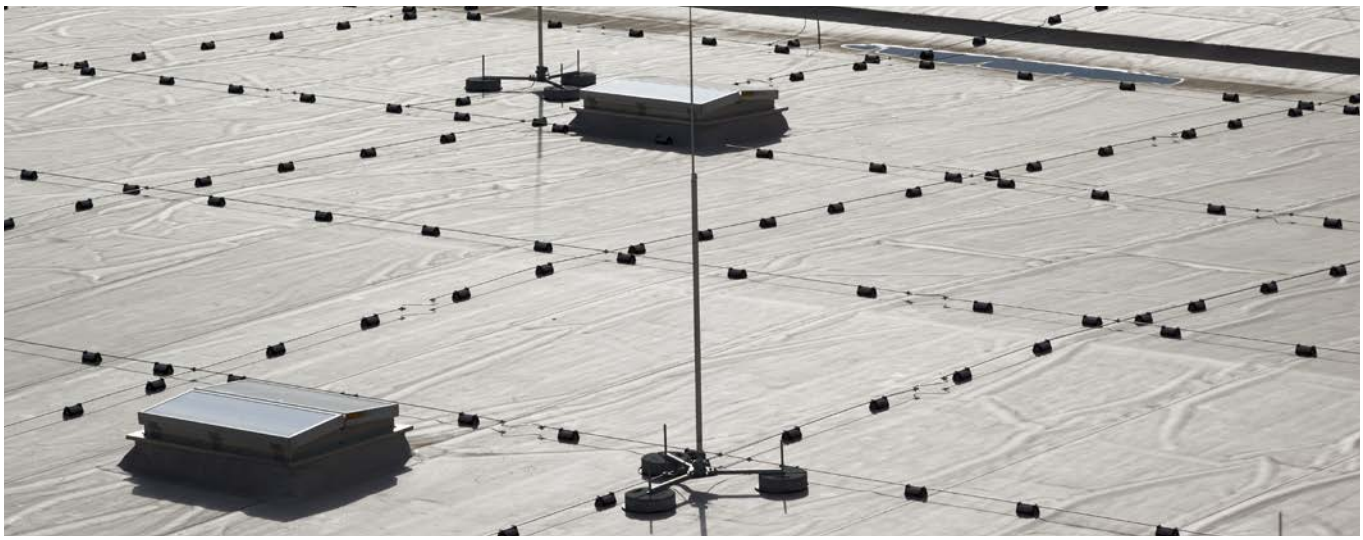
Available in a range of configurations providing interconnection between various conductor types such as flat tape to flat tape, solid conductor to flat tape, stranded conductor to flat tape, solid conductor to solid conductor. These connectors avoid bimetallic corrosion and are mechanically strong to ensure a lasting connection. The Clamps are designed with a central mounting hole for fixing the clamp to the structure.

| General technical data: | |
|---|---|
| Material | Stainless Steel (StSt) |
| Material of screw | Stainless steel |
| Tightening Torque | 15 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type BMC ... | FL 25X3 STST | RD 8 STST |
|---|---|---|
| **Part No.** | **118 313** | **118 314** |
| Conductor Material | Copper, Aluminium | Copper, Aluminium, Stainless Steel, Galvanised Steel |
| Clamping range Fl / Fl | 25 x 3 / 25 x 3 mm | – |
| Clamping range Fl / Rd | – | – |
| Clamping range Fl / Stranded cable | – | – |
| Clamping range Rd / Rd | – | 8 / 8 mm |
| Clamping range Rd / Stranded cable | – | – |
| Clamping range Stranded cable / Stranded cable | – | – |
| Clamping screw | Hex Head Bolt, plain & spring washer M8 x 2 Nos | Hex Head Bolt M8 x 2 Nos |
| PU | 20 pc(s) | 15 pc(s) |

| Type BMC ... | FLRDSC 25X3/8-50 STST |
|---|---|
| **Part No.** | **118 315** |
| Conductor Material | Copper, Aluminium, Stainless Steel, Galvanised Steel |
| Clamping range Fl / Fl | – |
| Clamping range Fl / Rd | 25 x 3 / 8 mm |
| Clamping range Fl / Stranded cable | 25 x 3 mm / 50 mm² |
| Clamping range Rd / Rd | – |
| Clamping range Rd / Stranded cable | – |
| Clamping range Stranded cable / Stranded cable | – |
| Clamping screw | Hex Head Bolt, plain & spring washer M8 x 2 Nos |
| PU | 15 pc(s) |

Note: For clamping stranded conductors use Loctite 242 – "apply several drops on thread of clamping screw"



When installing air-termination rods in a concrete base, the information shown opposite and the maximum gust wind speeds must be taken into account. This information applies to the usual materials used for air-termination rods (Al, St/tZn, Cu and StSt).
For protecting roof structures, chimneys, etc., also for installation with a concrete base. Depending on the gust wind speed, additional fastenings, e.g. DEHNiso spacers, are required.

| Height | Concrete bases Part No. 102 075 1x 8.5 kg | Concrete bases Part No. 102 010 1x 17 kg | Concrete bases Part No. 102 010 2x 17 kg |
|---|---|---|---|
| 1.0 m (Ø10 mm) | 135 km/h | – | – |
| 1.5 m (Ø16/10 mm) | – | 150 km/h | 185 km/h |
| 2.0 m (Ø16/10 mm) | – | 105 km/h | 155 km/h |
| 2,5 m (Ø16/10 mm) | – | – | 120 km/h |

## Air-Termination Rods / Tips

For protecting roof-mounted structures, chimneys, etc., also for erection with concrete base.
Additional fasteners, e.g. DEHNiso spacers, are necessary depending on the gust wind speed.

**Note:** Permissible roof loads have to be considered and checked with the constructor where required.

### Diameter 10 mm, chamfered

Especially for concrete base (8.5 kg) with fixing wedge (Part No. 102 075) or for fixing using conductor holders.



| General technical data: | |
|---|---|
| Total length (l1) | 1000 mm |
| Diameter Ø | 10 mm |
| Standard | EN 62561-2 |

| Type | FS 10 1000 AL | FS 10 1000 V2A |
|---|---|---|
| Part No. | 101 000 | 101 009 |
| Material | AlMgSi | StSt |
| PU | 20 pc(s) | 20 pc(s) |

| Type | FS 10 1000 CU |
|---|---|
| Part No. | 101 007 |
| Material | Cu |
| PU | 20 pc(s) |

### With forged lug

And clamping screw for connecting Rd 7-10 mm.



| Type | FSS 16 1000 KS STTZN | FSS 16 1500 KS STTZN |
|---|---|---|
| Part No. | 100 100 | 100 150 |
| Total length (l1) | 1000 mm | 1500 mm |
| Material | St/tZn | St/tZn |
| Diameter Ø | 16 mm | 16 mm |
| Terminal clamping range | 7-10 mm | 7-10 mm |
| Standard | EN 62561-(1+2) | EN 62561-(1+2) |
| PU | 10 pc(s) | 10 pc(s) |

### Diameter 16 mm, chamfered



| General technical data: | |
|---|---|
| Diameter Ø | 16 mm |
| Standard | EN 62561-2 |

| Type | FS 16 1500 AL | FS 16 2000 AL |
|---|---|---|
| Part No. | 104 150 | 104 200 |
| Total length (l1) | 1500 mm | 2000 mm |
| Material | AlMgSi | AlMgSi |
| PU | 10 pc(s) | 10 pc(s) |

| Type | FS 16 2500 AL | FS 16 3000 AL |
|---|---|---|
| Part No. | 104 250 | 104 300 |
| Total length (l1) | 2500 mm | 3000 mm |
| Material | AlMgSi | AlMgSi |
| PU | 10 pc(s) | 10 pc(s) |

| Type | FS 16 1000 STTZN | FS 16 1250 STTZN |
|---|---|---|
| Part No. | 483 100 | 483 125 |
| Total length (l1) | 1000 mm | 1250 mm |
| Material | St/tZn | St/tZn |
| PU | 10 pc(s) | 10 pc(s) |

| Type | FS 16 1500 STTZN | FS 16 2000 STTZN |
|---|---|---|
| Part No. | 483 150 | 483 200 |
| Total length (l1) | 1500 mm | 2000 mm |
| Material | St/tZn | St/tZn |
| PU | 10 pc(s) | 1 pc(s) |

### Diameter 16 mm, cut to length on site



| Type | FS 16 6000 AL |
|---|---|
| Part No. | 104 600 |
| Total length (l1) | 6000 mm |
| Material | AlMgSi |
| Diameter Ø | 16 mm |
| Standard | EN 62561-2 |
| PU | 1 pc(s) |

## With tapering, chamfered

Length of tapering 1000 mm.



| General technical data: | |
|---|---|
| Material | AlMgSi |
| Diameter Ø | 16 / 10 mm |
| Type | chamfered |
| Standard | EN 62561-2 |

| Type | FS 16 10 1500 AL | FS 16 10 2000 AL |
|---|---|---|
| Part No. | 103 210 | 103 220 |
| Total length (l1) | 1500 mm | 2000 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | FS 16 10 2500 AL | FS 16 10 3000 AL |
|---|---|---|
| Part No. | 103 230 | 103 240 |
| Total length (l1) | 2500 mm | 3000 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | FS 16 10 3500 AL | FS 16 10 4000 AL |
|---|---|---|
| Part No. | 103 250 | 103 260 |
| Total length (l1) | 3500 mm | 4000 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | | FS 16 10 5000 AL |
|---|---|---|
| Part No. | | 103 280 |
| Total length (l1) | | 5000 mm |
| PU | | 10 pc(s) |

## Tubular air-termination rods with tapering 16 / 10 mm

Light design; length of tapering 1000 mm.



| General technical data: | |
|---|---|
| Diameter Ø | 16 / 10 mm |
| Standard | EN 62561-2 |

| Type | RFS 16 10 1500 AL | RFS 16 10 2000 AL |
|---|---|---|
| Part No. | 103 410 | 103 420 |
| Total length (l1) | 1500 mm | 2000 mm |
| Material | AlMgSi | AlMgSi |
| PU | 10 pc(s) | 10 pc(s) |

| Type | RFS 16 10 2500 AL | RFS 16 10 3000 AL |
|---|---|---|
| Part No. | 103 430 | 103 440 |
| Total length (l1) | 2500 mm | 3000 mm |
| Material | AlMgSi | AlMgSi |
| PU | 10 pc(s) | 10 pc(s) |

| Type | RFS 16 10 3500 AL | RFS 16 10 4000 AL |
|---|---|---|
| Part No. | 103 450 | 103 460 |
| Total length (l1) | 3500 mm | 4000 mm |
| Material | AlMgSi | AlMgSi |
| PU | 10 pc(s) | 10 pc(s) |

| Type | RFS 16 10 5000 AL | RFS 16 10 1500 CU |
|---|---|---|
| Part No. | 103 480 | 103 417 |
| Total length (l1) | 5000 mm | 1500 mm |
| Material | AlMgSi | Cu |
| PU | 10 pc(s) | 10 pc(s) |

| Type | RFS 16 10 1500 V2A | RFS 16 10 2000 V2A |
|---|---|---|
| Part No. | 103 419 | 103 429 |
| Total length (l1) | 1500 mm | 2000 mm |
| Material | StSt | StSt |
| PU | 10 pc(s) | 10 pc(s) |

| Type | RFS 16 10 2500 V2A | RFS 16 10 3000 V2A |
|---|---|---|
| Part No. | 103 439 | 103 449 |
| Total length (l1) | 2500 mm | 3000 mm |
| Material | StSt | StSt |
| PU | 10 pc(s) | 10 pc(s) |

## With tapering, M16 thread

Length of tapering 1000 mm.



| General technical data: | |
|---|---|
| Material | AlMgSi |
| Diameter Ø | 16 / 10 mm |
| Type | M16 |
| Standard | EN 62561-2 |

| Type | FS M16 10 1500 AL | FS M16 10 2000 AL |
|---|---|---|
| Part No. | 103 211 | 103 221 |
| Total length (l1) | 1500 mm | 2000 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | FS M16 10 2500 AL | FS M16 10 3000 AL |
|---|---|---|
| Part No. | 103 231 | 103 241 |
| Total length (l1) | 2500 mm | 3000 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | FS M16 10 3500 AL | FS M16 10 4000 AL |
|---|---|---|
| Part No. | 103 251 | 103 261 |
| Total length (l1) | 3500 mm | 4000 mm |
| PU | 10 pc(s) | 10 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

# Rod Holders DEHNhold

For fixing air-termination and earth entry rods, with slotted saddle clamp, fixed conductor routing.
For use with different materials, e.g. Al, StSt, St/tZn and Cu.

## With female thread



| Type | LH ZS 16 M8 V2A |
|---|---|
| Part No. | 274 116 |
| Material of conductor holder | StSt |
| Conductor support Rd | 16 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| PU | 50 pc(s) |

## Pre-assembled with screw, plastic base and plug

With female thread.



| Type | SH ZS 16 KS KD8X40 V2A |
|---|---|
| Part No. | 274 260 |
| Material of conductor holder | StSt |
| Conductor support Rd | 16 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Screw | 5 x 50 mm |
| Plastic dowel | Ø8 x 40 mm |
| PU | 50 pc(s) |

## Self-supporting Air-Termination Rods 2.5 to 3.5 m

| Concrete bases | Plastic base plates |
|---|---|
| 8.5 kg, Part No. 102 075 | Part No. 102 060 |
| 17 kg, Part No. 102 010 | Part No. 102 050 |

With tripod for protecting roof-mounted structures, adjustable to a roof inclination up to max. 10°.

The concrete base (Part No. 102 075 or 102 010) and the base plate (Part No. 102 060 or 102 050) have to be ordered separately.

**Note**: Permissible roof loads have to be considered and checked with the constructor where required.



### For air-termination rods Ø22 mm

| General technical data: | |
|---|---|
| Radius | 320 mm |
| Space required for tripod with 3 bases, 8.5 kg each (l x w) | 730 x 800 mm |
| Space required for tripod with 3 bases, 17 kg each (l x w) | 850 x 930 mm |
| Material of air-termination rod | Al |
| Material of tripod | St/tZn |
| Standard | EN 62561-(1+2) |

| Type FS ... | 22 16 10 2500 AL DBS R320 STTZN | 22 16 10 3000 AL DBS R320 STTZN |
|---|---|---|
| Part No. | 105 525 | 105 530 |
| Height | 2500 mm | 3000 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS ... | 22 16 10 3500 AL DBS R320 STTZN |
|---|---|
| Part No. | 105 535 |
| Height | 3500 mm |
| PU | 1 pc(s) |

**Note:**
The small, space-saving tripod Part No. 105 357 can be used with Ø40 mm arrester rods in addition to the two sets up to heights of 5.0 m.
The tripods and arrester rods must be ordered separately. See the wind load table on page xx.



### For air-termination rods Ø40 mm

| Type FS ... | D40 16 10 3000 AL DBS KB STTZN | D40 16 10 3500 AL DBS KB STTZN |
|---|---|---|
| Part No. | 105 531 | 105 536 |
| Height | 3000 mm | 3500 mm |
| Radius | 220 mm | 220 mm |
| Space required for tripod (l x w) | 668 x 718 mm | 668 x 718 mm |
| Material of air-termination rod | Al | Al |
| Material of tripod | St/tZn | St/tZn |
| Standard | EN 62561-(1+2) | EN 62561-(1+2) |
| PU | 1 pc(s) | 1 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

## Self-supporting Air-Termination Rods 4 to 9 m

With hinged tripod for protecting larger roof-mounted structures, adjustable to the roof inclination up to max. 10°.
The stackable concrete base (Part No. 102 010) and the base plate (Part No. 102 050) have to be ordered separately.

**Note**: Permissible roof loads have to be considered and checked with the constructor where required.



### Height up to 5.5 m

| General technical data: | |
|---|---|
| Radius | 560 mm |
| Space required for tripod | 1210 x 1340 mm |
| Material of tripod | St/tZn |
| Material of air-termination rod | Al |
| Standard | EN 62561-(1+2) |

| Type FS D40 ... | 16 10 4000 AL DBS KB STTZN | 22 16 10 4500 AL DBS KB STTZN |
|---|---|---|
| Part No. | 105 400 | 105 450 |
| Height | 4000 mm | 4500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 5000 AL DBS KB STTZN | 22 16 10 5500 AL DBS KB STTZN |
|---|---|---|
| Part No. | 105 500 | 105 550 |
| Height | 5000 mm | 5500 mm |
| PU | 1 pc(s) | 1 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

## Height up to 9 m with adjustable StSt braces Ø10 mm



| General technical data: | | |
|---|---|---|
| Radius | | 1435 mm |
| Space required for tripod | | 2530 x 2850 mm |
| Material of tripod | | **St/tZn** |
| Material of air-termination rod | | **Al** |
| Standard | | EN 62561-(1+2) |

| **Type FS D40 ...** | **16 10 6000 AL DBS KB STTZN** | **22 16 10 6500 AL DBS KB STTZN** |
|---|---|---|
| **Part No.** | **105 600** | **105 650** |
| Height | 6000 mm | 6500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type FS D40 ...** | **16 10 7000 AL DBS KB STTZN** | **22 16 10 7500 AL DBS KB STTZN** |
|---|---|---|
| **Part No.** | **105 700** | **105 750** |
| Height | 7000 mm | 7500 mm |
| PU | 1 pc(s) | 1 pc(s) |

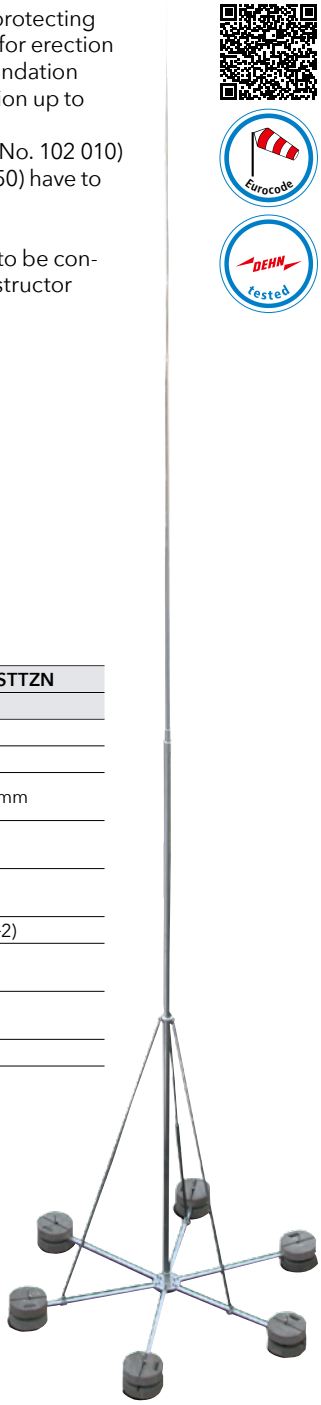
| **Type FS D40 ...** | **16 10 8000 AL DBS KB STTZN** | **22 16 10 8500 AL DBS KB STTZN** |
|---|---|---|
| **Part No.** | **105 800** | **105 850** |
| Height | 8000 mm | 8500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type FS D40 ...** | | **22 16 10 9000 AL DBS KB STTZN** |
|---|---|---|
| **Part No.** | | **105 900** |
| Height | | 9000 mm |
| PU | | 1 pc(s) |

## Self-supporting Air-Termination Rods 10 and 11 m

With hinged six-legged stand for protecting larger roof-mounted structures or for erection on compacted ground without foundation works, adjustable to a roof inclination up to max. 10°
The stackable concrete base (Part No. 102 010) and the base plate (Part No. 102 050) have to be ordered separately.

**Note**: Permissible roof loads have to be considered and checked with the constructor where required.



### Free height 10 m

| **Type FS D60 10 ...** | **10M AL SBS STTZN** |
|---|---|
| **Part No.** | **105 910** |
| Height | 10000 mm |
| Radius | 1200 mm |
| Space required for six-legged stand | 2900 x 2560 mm |
| Material of six-legged stand | **St/tZn** |
| Material of air-termination mast/air-termination rod | **Al** |
| Standard | EN 62561-(1+2) |
| Surface load with 12 bases, 17 kg each | 268 kg |
| Surface load with 18 bases, 17 kg each | 370 kg |
| PU | 1 pc(s) |

### Free height 11 m

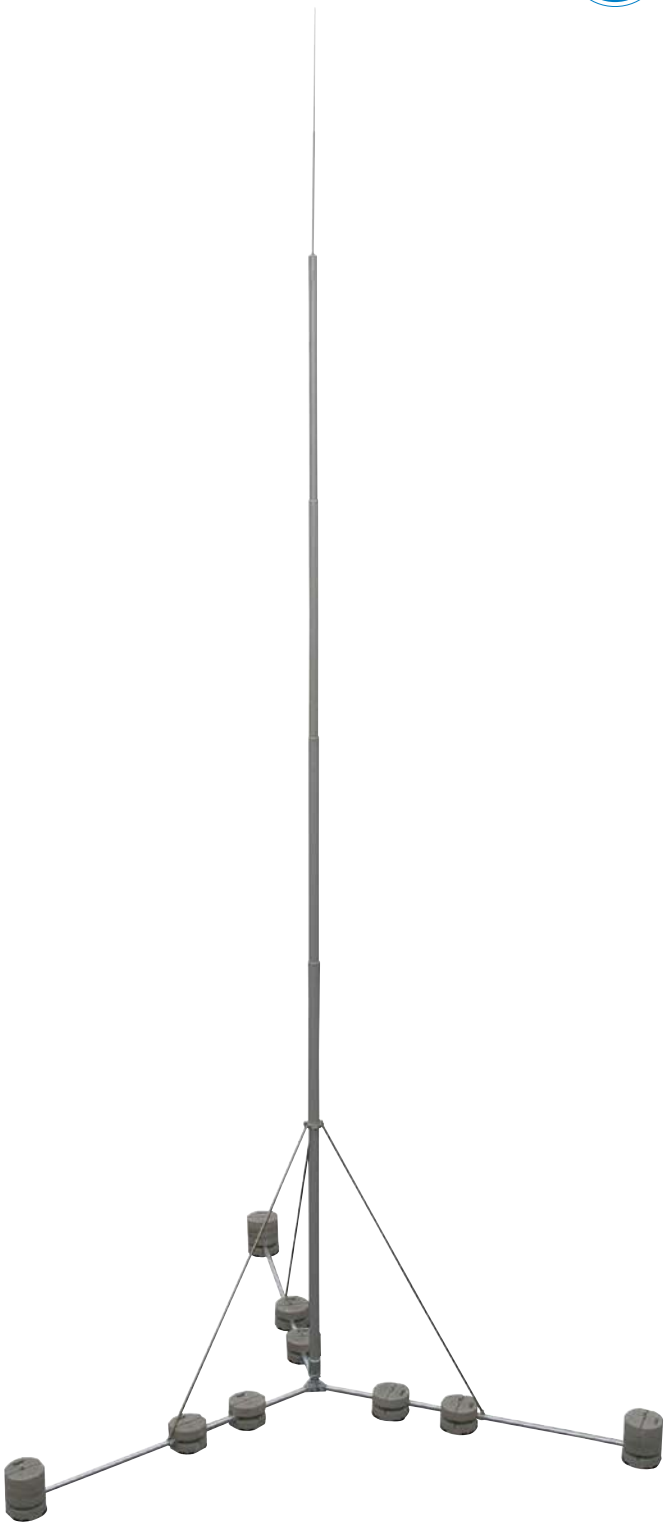
| **Type FS D60 10 ...** | **11M AL SBS STTZN** |
|---|---|
| **Part No.** | **105 911** |
| Height | 11000 mm |
| Radius | 1200 mm |
| Space required for six-legged stand | 2900 x 2560 mm |
| Material of six-legged stand | **St/tZn** |
| Material of air-termination mast/air-termination rod | **Al** |
| Standard | EN 62561-(1+2) |
| Surface load with 12 bases, 17 kg each | 269 kg |
| Surface load with 18 bases, 17 kg each | 371 kg |
| PU | 1 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

## Self-supporting Air-Termination Rods 12 to 14 m

With hinged tripod for protecting larger roof-mounted structures or for erection on compacted ground without foundation works.
Adjustable to a roof inclination of max. 5°.
The stackable concrete block (Part No. 102 010) and the base plate (Part No. 102 050) have to be ordered separately.

**Note**: Permissible roof loads have to be considered and checked with the constructor where required.



### Free height 12 m

| Type FS D100 10 ... | 12M AL DBS STTZN |
|---|---|
| **Part No.** | **105 922** |
| Height | 12000 mm |
| Radius | 3000 mm |
| Space required for tripod | 4920 x 5640 mm |
| Material of tripod | **St/tZn** |
| Material of air-termination mast /air-termination rod | **Al** |
| Standard | EN 62561-(1+2) |
| Surface load with 18 bases, 17 kg each | approx. 420 kg |
| Surface load with 21 bases, 17 kg each | approx. 475 kg |
| Surface load with 24 bases, 17 kg each | approx. 525 kg |
| PU | 1 pc(s) |

### Free height 13 m

| Type FS D100 10 ... | 13M AL DBS STTZN |
|---|---|
| **Part No.** | **105 923** |
| Height | 13000 mm |
| Radius | 3000 mm |
| Space required for tripod | 4920 x 5640 mm |
| Material of tripod | **St/tZn** |
| Material of air-termination mast /air-termination rod | **Al** |
| Standard | EN 62561-(1+2) |
| Surface load with 18 bases, 17 kg each | approx. 421 kg |
| Surface load with 21 bases, 17 kg each | approx. 476 kg |
| Surface load with 24 bases, 17 kg each | approx. 526 kg |
| PU | 1 pc(s) |

### Free height 14 m

| Type FS D100 10 ... | 14M AL DBS STTZN |
|---|---|
| **Part No.** | **105 924** |
| Height | 14000 mm |
| Radius | 3000 mm |
| Space required for tripod | 4920 x 5640 mm |
| Material of tripod | **St/tZn** |
| Material of air-termination mast /air-termination rod | **Al** |
| Standard | EN 62561-(1+2) |
| Surface load with 18 bases, 17 kg each | approx. 430 kg |
| Surface load with 21 bases, 17 kg each | approx. 481 kg |
| Surface load with 24 bases, 17 kg each | approx. 532 kg |
| PU | 1 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

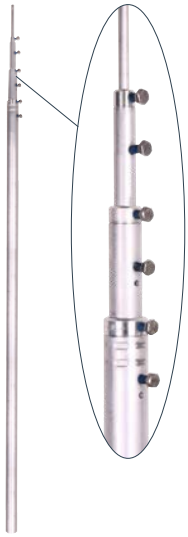
## Telescopic air-termination rods

Can be used in three and four-legged stands and for fixing on to, for example, walls or other structures.

The respective wind loads and the quantity of concrete bases can be found in the installation instructions.

The maximum free length refers to the distance between the rod tip and the upper holder (fixing point).
For reasons of stability, the centre holder (3 fixing points) should be mounted directly below the upper holder if possible. The distance must not be more than 15 cm. The lower holder (fixing point) has to be installed within a range of ≤ 15 cm at the end of the air-termination rod.

### Height 1.5-5.2 m



| Type FS T ... | D40 1500 5200 AL |
|---|---|
| **Part No.** | **105 185** |
| Total length | 5200 mm |
| Air-termination tip (Ø length) | 10-1000 mm |
| Termination mast (Ø length) | 40/30/20-4200 mm |
| Transport length | 1650 mm |
| Mast segments | 4 |
| Foot Ø | 40 mm |
| Max. free length with air-termination rod | 4200 mm |
| Clamping length | 500 mm and 1000 mm |
| Number of fixings | 2 |
| Material of air-termination rod | Al |
| Standard | DIN EN 62561-(1+2) |
| PU | 1 pc(s) |

### Height 1.6-6.5 m

| Type FS T ... | D50 1600 6500 AL |
|---|---|
| **Part No.** | **105 186** |
| Total length | 6500 mm |
| Air-termination tip (Ø length) | 10-1000 mm |
| Termination mast (Ø length) | 50/40/30/20-5500 mm |
| Transport length | 1650 mm |
| Mast segments | 5 |
| Foot Ø | 50 mm |
| Max. free length with air-termination rod | 5200 mm |
| Clamping length | 1000 mm and 1300 mm |
| Number of fixings | 2-3 |
| Material of air-termination rod | Al |
| Standard | DIN EN 62561-(1+2) |
| PU | 1 pc(s) |

### Height 1.8-8 m

| Type FS T ... | D60 1800 8000 AL |
|---|---|
| **Part No.** | **105 188** |
| Total length | 8000 mm |
| Air-termination tip (Ø length) | 10-1000 mm |
| Termination mast (Ø length) | 50/60/50/40/30/20-7000 mm |
| Transport length | 1850 mm |
| Mast segments | 6 |
| Foot Ø | 60 mm |
| Max. free length with air-termination rod | 6300 mm |
| Clamping length | 1700 mm |
| Number of fixings | 3 |
| Material of air-termination rod | Al |
| Standard | DIN EN 62561-(1+2) |
| PU | 1 pc(s) |

## Accessories for Telescopic air-termination rods

### Connection bracket

Connection bracket as per DIN EN 62561-1, to connect round conductors to air-termination rods using KS connectors.



| Type | AS D40 KSV 6.10 V2A |
|---|---|
| **Part No.** | **105 374** |
| Material | StSt |
| Clamping range Rd | 6-10 mm |
| Type for air-termination rods | Ø40 mm |
| Standard | DIN EN 62561-1 |
| PU | 1 pc(s) |

### Connection bracket

Connection bracket as per DIN EN 62561-1, to connect round conductors to air-termination rods using KS connectors.



| Type | AS D50 KSV 6.10 V2A |
|---|---|
| **Part No.** | **105 375** |
| Material | StSt |
| Clamping range Rd | 6-10 mm |
| Type for air-termination rods | Ø50 mm |
| Standard | DIN EN 62561-1 |
| PU | 1 pc(s) |

## Telescopic, self-supporting air-termination rods up to 8 m

Self-supporting air-termination rod with hinged three or four-legged stand for protecting larger roof-mounted structures, adjustable to the roof slope up to max. 10°.

The stackable concrete base (weight 17 kg / part no. 102 010) and the plastic base plate (part no. 102 050) have to be ordered separately.

**Note:** Permissible roof loads have to be considered and checked with the constructor where required.

### With HDG steel stand



| General technical data: | |
|---|---|
| Air-termination tip (Ø length) | 10-1000 mm |
| Stand material | **HDG steel (St/tZn)** |
| Air-termination mast material | **Al** |
| Standard | DIN EN 62561-(1+2) |

| Type FS T ... | D40 1.5 5.2M AL DBS RA560 STTZN | D50 1.6 6.5M AL DBS RA1435 STTZN |
|---|---|---|
| **Part No.** | **105 711** | **105 713** |
| Height | 5200 mm | 6500 mm |
| Termination mast (Ø length) | 40/30/20-4200 mm | 50/40/30/20-5500 mm |
| Radius | 560 mm | 1435 mm |
| Space required for stand | 1210 x 1340 mm | 2850 x 2530 mm |
| PU | 1 pc(s) | 1 pc(s) |

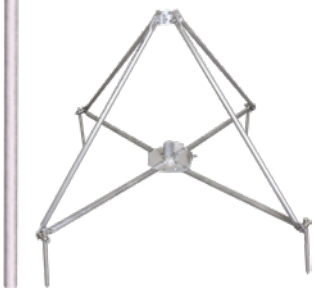
| Type FS T ... | D50 1.8 8.0M AL DBS RA1435 STTZN |
|---|---|
| **Part No.** | **105 716** |
| Height | 8000 mm |
| Termination mast (Ø length) | 50/60/50/40/30/20-7000 mm |
| Radius | 1435 mm |
| Space required for stand | 2850 x 2530 mm |
| PU | 1 pc(s) |

### With stainless steel stand

Tripod
Part No. 105 710



Four-legged stand
Part No. 105 712
Part No. 105 714
Part No. 105 715



| General technical data: | |
|---|---|
| Air-termination tip (Ø length) | 10-1000 mm |
| Stand material | **StSt** |
| Air-termination mast material | **Al** |
| Standard | DIN EN 62561-(1+2) |

| Type FS T ... | D40 1.5 5.2M AL DBS RA680 V2A | D50 1.6 6.5M AL VBS RA680 V2A |
|---|---|---|
| **Part No.** | **105 710** | **105 712** |
| Height | 5200 mm | 6500 mm |
| Termination mast (Ø length) | 40/30/20-4200 mm | 50/40/30/20-5500 mm |
| Radius | 680 mm | 680 mm |
| Space required for stand | 1400 x 1600 mm | 1400 x 1400 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS T ... | D50 1.8 8.0M AL VBS RA680 V2A | D50 1.8 8.0M AL VBS RA1330 V2A |
|---|---|---|
| **Part No.** | **105 714** | **105 715** |
| Height | 8000 mm | 8000 mm |
| Termination mast (Ø length) | 50/60/50/40/30/20-7000 mm | 50/60/50/40/30/20-7000 mm |
| Radius | 680 mm | 1330 mm |
| Space required for stand | 1400 x 1400 mm | 2300 x 2300 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Accessories for Telescopic, self-supporting air-termination rods up to 8 m

### Concrete base

With fixing wedge, stackable, for erecting tripods and air-termination rods Ø16 mm, chamfered or tapered, DEHNiso spacer Ø16 mm or conductor holder (Part No. 253 279).



| Type | BES 17KG KT16 D337 SET |
|---|---|
| **Part No.** | **102 010** |
| Weight | 17 kg |
| Support | with fixing wedge Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | **StSt** |
| PU | 54 pc(s) |

### Concrete base

Concrete base without wedge for the erection of tripods and four-legged stands



| Type | BES 17KG KT16 D337 |
|---|---|
| **Part No.** | **102 012** |
| Weight | 17 kg |
| Support | Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| PU | 54 pc(s) |

## Air-Termination Rods D40

For fixing on to, for example, walls or other structures.

The maximum free length refers to the distance between the rod tip and the upper holder (fixing point).
For reasons of stability, the centre holder (3 fixing points) should be mounted directly below the upper holder if possible. The distance must not be more than 15 cm. The lower holder (fixing point) has to be installed within a range of ≤ 15 cm at the end of the air-termination rod.



### Al

| General technical data: | | |
|---|---|---|
| Material of air-termination rod | | Al |
| Standard | | EN 62561-(1+2) |

| Type FS D40 ... | 16 10 4000 KSV AL | 22 16 10 4500 KSV AL |
|---|---|---|
| Part No. | 105 170 | 105 175 |
| Total length (l1) | 4000 mm | 4500 mm |
| Max. free length with air-termination rod (l2) | 3500 mm | 4000 mm |
| Clamping length (l3) | 500 mm | 500 mm |
| Number of fixings | 2 | 2 |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 5000 KSV AL | 22 16 10 5500 KSV AL |
|---|---|---|
| Part No. | 105 171 | 105 176 |
| Total length (l1) | 5000 mm | 5500 mm |
| Max. free length with air-termination rod (l2) | 4000 mm | 4500 mm |
| Clamping length (l3) | 1000 mm | 1000 mm |
| Number of fixings | 2 | 2 |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 6000 KSV AL | 22 16 10 6500 KSV AL |
|---|---|---|
| Part No. | 105 172 | 105 177 |
| Total length (l1) | 6000 mm | 6500 mm |
| Max. free length with air-termination rod (l2) | 4500 mm | 5000 mm |
| Clamping length (l3) | 1500 mm | 1500 mm |
| Number of fixings | 3 | 3 |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 7000 KSV AL | 22 16 10 7500 KSV AL |
|---|---|---|
| Part No. | 105 173 | 105 178 |
| Total length (l1) | 7000 mm | 7500 mm |
| Max. free length with air-termination rod (l2) | 5500 mm | 5500 mm |
| Clamping length (l3) | 1500 mm | 2000 mm |
| Number of fixings | 3 | 3 |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 8000 KSV AL | 22 16 10 8500 KSV AL |
|---|---|---|
| Part No. | 105 174 | 105 179 |
| Total length (l1) | 8000 mm | 8500 mm |
| Max. free length with air-termination rod (l2) | 5500 mm | 5500 mm |
| Clamping length (l3) | 2500 mm | 3000 mm |
| Number of fixings | 3 | 3 |
| PU | 1 pc(s) | 1 pc(s) |

### StSt

| General technical data: | | |
|---|---|---|
| Material of air-termination rod | | StSt |
| Standard | | EN 62561-(1+2) |

| Type FS D40 ... | 16 10 4000 KSV V2A | 22 16 10 4500 KSV V2A |
|---|---|---|
| Part No. | 105 190 | 105 195 |
| Total length (l1) | 4000 mm | 4500 mm |
| Max. free length with air-termination rod (l2) | 3500 mm | 4000 mm |
| Clamping length (l3) | 500 mm | 500 mm |
| Number of fixings | 2 | 2 |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 5000 KSV V2A | 22 16 10 5500 KSV V2A |
|---|---|---|
| Part No. | 105 191 | 105 196 |
| Total length (l1) | 5000 mm | 5500 mm |
| Max. free length with air-termination rod (l2) | 4000 mm | 4500 mm |
| Clamping length (l3) | 1000 mm | 1000 mm |
| Number of fixings | 2 | 2 |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 6000 KSV V2A | 22 16 10 6500 KSV V2A |
|---|---|---|
| Part No. | 105 192 | 105 197 |
| Total length (l1) | 6000 mm | 6500 mm |
| Max. free length with air-termination rod (l2) | 4500 mm | 5000 mm |
| Clamping length (l3) | 1500 mm | 1500 mm |
| Number of fixings | 3 | 3 |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 7000 KSV V2A | 22 16 10 7500 KSV V2A |
|---|---|---|
| Part No. | 105 193 | 105 198 |
| Total length (l1) | 7000 mm | 7500 mm |
| Max. free length with air-termination rod (l2) | 5500 mm | 5500 mm |
| Clamping length (l3) | 1500 mm | 2000 mm |
| Number of fixings | 3 | 3 |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS D40 ... | 16 10 8000 KSV V2A | 22 16 10 8500 KSV V2A |
|---|---|---|
| Part No. | 105 194 | 105 199 |
| Total length (l1) | 8000 mm | 8500 mm |
| Max. free length with air-termination rod (l2) | 5500 mm | 5500 mm |
| Clamping length (l3) | 2500 mm | 3000 mm |
| Number of fixings | 3 | 3 |
| PU | 1 pc(s) | 1 pc(s) |

Shorter transport lengths (separable pipe) are available upon request. Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

## Stands for air-termination rods D40 and GRP/Al supporting tubes

For erection with concrete bases (weight 17 kg). Adjustable to the roof slope up to max. 10° using a variable fixing on the base holder. The D40 air-termination rods / supporting tubes must be ordered separately.

The stackable concrete bases, the plastic base plates, the base holder set for holding additional concrete bases and the adapter set for D40 air-termination rods are each available separately in the accessories.

### Tripod, small



For air-termination rods D40, DEHNiso Combi supporting tubes with air-termination rod / tip or HVI Conductor installed in / on the supporting tube.
Connection with double clamp for 2x Rd 8–10 mm [lightning-current-carrying capability 100 kA (10/350 µs)].

| Type | DBS KB D50 RA680 V2A |
|---|---|
| **Part No.** | **107 390** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 680 mm |
| Space required for tripod | 1175 x 1020 mm |
| PU | 1 pc(s) |

*) Only with adapter set part no. 107 399.

### Tripod, large



For air-termination rods D40, DEHNiso Combi supporting tubes with air-termination rod / tip or HVI Conductor installed in / on the supporting tube.
Connection with double clamp for 2x Rd 8–10 mm [lightning-current-carrying capability 100 kA (10/350 µs)].

| Type | DBS KB D50 RA1330 V2A |
|---|---|
| **Part No.** | **107 391** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 1330 mm |
| Space required for tripod | 2300 x 1995 mm |
| PU | 1 pc(s) |

*) Only with adapter set part no. 107 399.

### Four-legged stand, small



For air-termination rods D40, D50 and D60, DEHNiso Combi supporting tubes with air-termination rod / tip or HVI Conductor installed in / on the supporting tube.
Connection with double clamp for 2x Rd 8–10 mm [lightning-current-carrying capability 100 kA (10/350 µs)].

| Type | VBS KB D50 RA680 V2A |
|---|---|
| **Part No.** | **107 490** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 680 mm |
| Space required for tripod | 960 x 960 mm |
| PU | 1 pc(s) |

*) Only with adapter set part no. 107 399.

### Four-legged stand, large



For air-termination rods D40, D50 and D60, DEHNiso Combi supporting tubes with air-termination rod / tip or HVI Conductor installed in / on the supporting tube.
Connection with double clamp for 2x Rd 8–10 mm [lightning-current-carrying capability 100 kA (10/350 µs)].

| Type | VBS KB D50 RA1330 V2A |
|---|---|
| **Part No.** | **107 491** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 1330 mm |
| Space required for tripod | 1880 x 1880 mm |
| PU | 1 pc(s) |

*) Only with adapter set part no. 107 399.

### Hinged design, St/tZn



For air-termination rods Ø40 mm or supporting tubes Ø50 mm, length 3200 mm (e.g. Part No. 105 440 or 105 300) without additional fixing to structural elements.
Connection with double clamp for 2x Rd 8-10 mm [lightning current carrying capability 100 kA (10/350 µs)].

| Type DBS KB D40.50 ... | RA560 STTZN | RA620 STTZN |
|---|---|---|
| **Part No.** | **105 200** | **105 351** |
| Support | Ø40 / 50 mm | 40 / 50 mm |
| Radius | 560 mm | 620 mm |
| Space required for tripod | 1200 x 1330 mm | 1300 x 1450 mm |
| Standard | EN 62561-1 | – |
| PU | 1 pc(s) | 1 pc(s) |

## Accessories for Stands for air-termination rods D40 and GRP/Al supporting tubes

### Set of base support rods for tripods



| Type | SOH 3 200 V2A |
|---|---|
| **Part No.** | **107 396** |
| For tripod | Part No. 107 390 / 107 391 |
| Number of concrete bases | 1 to 2 |
| Material | StSt |
| Diameter | 16 mm |
| Length | 200 mm |
| PU | 1 pc(s) |

### Set of base support rods for four-legged stands



| Type | SOH 4 200 V2A |
|---|---|
| **Part No.** | **107 496** |
| For four-legged stand | Part No. 107 490 / 107 491 |
| Number of concrete bases | 1 to 2 |
| Material | StSt |
| Diameter | 16 mm |
| Length | 200 mm |
| PU | 1 pc(s) |

### Adapter set



Adapter set for reducing the diameter from 50 mm to 40 mm for tripods and four-legged stands.

| Type | RED D40 V2A DBS VBS |
|---|---|
| **Part No.** | **107 399** |
| For tripod | Part No. 107 390 / 107 391 |
| For four-legged stand | Part No. 107 490 / 107 491 |
| Material | StSt |
| PU | 1 pc(s) |

## Supporting tube stand for GRP/Al supporting tubes and Ø40 air-termination rods

For erection by means of a counter plate on wire mesh cable trays and steel girders or other structures. The adapter set for Ø40 air-termination rods is available separately in the accessories.
The D40 air-termination rods / supporting tubes must be ordered separately.



| Type | SRS D50 300 300 H500 STTZN |
|---|---|
| **Part No.** | **105 244** NEW |
| Material | **HDG steel** |
| Support | Ø50 mm and Ø40 mm *) |
| Fixing | 4x 13 x 30 mm |
| Plate dimensions | 300 x 300 x 8 mm |
| Height | 500 mm |
| PU | 1 pc(s) |

*) For holding Ø40-mm air-termination rods, only possible with adapter kit, part no. 107 399, and the holding of Ø40-mm HVI supporting tubes, only possible with adapter, part no. 819 799.

## Accessories for Supporting tube stand for GRP/Al supporting tubes and Ø40 air-termination rods

### Counter plate for supporting tube stands Ø50



| Type | GP 300 300 T8 STTZN |
|---|---|
| **Part No.** | **105 243** NEW |
| Material | **HDG steel** |
| Fixing | 4x 13 x 30 mm |
| Dimensions | 300 x 300 x 8 mm |
| PU | 1 pc(s) |

### Adapter set

Adapter set for reducing the diameter from 50 mm to 40 mm for tripods and four-legged stands.



| Type | RED D40 V2A DBS VBS |
|---|---|
| **Part No.** | **107 399** |
| For tripod | Part No. 107 390 / 107 391 |
| For four-legged stand | Part No. 107 490 / 107 491 |
| Material | StSt |
| PU | 1 pc(s) |

### Adapter



| Type | AD 50 40 L110 STTZN |
|---|---|
| **Part No.** | **819 799** |
| Material | **HDG steel** |
| PU | 1 pc(s) |

## Concrete bases

For air-termination rods, for protecting small roof-mounted structures on flat roofs and for installing spacers from the DEHNiso spacer product line, e.g. for isolated ring conductors or for self-supporting air-termination rods in the tripod (only with a weight of 17 kg).

**Note:** Please contact us to find out whether the material of the roof conductor holder or base plate is compatible with the roof elements.

### Weight 17 kg, with fixing wedge

Stackable, for air-termination rods Ø16 mm, chamfered, tapered, or for DEHNiso spacers Ø16 mm.



| Type BES ... | 17KG KT16 D337 SET |
|---|---|
| **Part No.** | **102 010** |
| Weight | 17 kg |
| Support | wedge Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of wedge | StSt |
| PU | 54 pc(s) |

### Weight 17 kg, concrete base with fixing wedge and adapted base plate

Stackable



| Type BES ... | 17KG KT16 ULP D337 SET |
|---|---|
| **Part No.** | **102 340** |
| Weight | 17 kg |
| Support | with fixing wedge Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of wedge | StSt |
| PU | 54 pc(s) |

### Weight 17 kg, with threaded adapter

For air-termination rods with M16 thread.



| Type BES ... | 17KG M16 D337 |
|---|---|
| **Part No.** | **102 002** |
| Weight | 17 kg |
| Support | M16 thread |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of adapter | **plastic** |
| PU | 54 pc(s) |

### Weight 17 kg

Concrete base without wedge for the erection of tripods and four-legged stands with M16 base support rods (e.g. part no. 107 390 + 107 396 ...).



| Type BES ... | 17KG KT16 D337 |
|---|---|
| **Part No.** | **102 012** |
| Weight | 17 kg |
| Support | Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| PU | 54 pc(s) |

### Weight 8.5 kg, with fixing wedge



For air-termination tips Ø10 mm, length 1000 mm, or DEHNiso spacers Ø16 mm, length up to 675 mm (distance 0.8 m), or conductor holders (Part No. 253 279).

| Type BES ... | 8.5KG KT10 16 D240 SET |
|---|---|
| **Part No.** | **102 075** |
| Weight | 8.5 kg |
| Support | wedge Ø10 / 16 mm |
| Diameter Ø | 240 mm |
| Material | **concrete (C45/55)** |
| Material of wedge | StSt |
| PU | 120 pc(s) |

### Weight 8.5 kg, with threaded adapter



For air-termination rods with thread and additional fixing, e.g. with DEHNiso spacers.

| Type BES ... | 8.5KG M16 D240 |
|---|---|
| **Part No.** | **102 003** |
| Weight | 8.5 kg |
| Support | M16 thread |
| Diameter Ø | 240 mm |
| Material | **concrete (C45/55)** |
| Material of adapter | **plastic** |
| PU | 120 pc(s) |

## Accessories for Concrete bases

### Wedge for Concrete Base



| Type | KEIL BES NIRO |
|---|---|
| **Part No.** | **102 019** |
| Material | StSt |
| Dimension (l x w x d) | 60 x 18 x 1.5 mm |
| PU | 54 pc(s) |

### Support tool



Aluminium support tool with safety bow made of stainless steel, for concrete bases of 8.5 kg and 17 kg.

| Type | TG AL SB A2 BES 17KG |
|---|---|
| **Part No.** | **590 000** NEW |
| Material | Al / StSt |
| Diameter | 16 mm |
| PU | 1 pc(s) |

## Plastic base plates

To protect the roof sheeting under the concrete base.

### Large



For concrete bases (Part Nos. 102 010, 102 002), weight 17 kg.

| Type ULP KS ... | D370 SW |
|---|---|
| **Part No.** | **102 050** |
| Outside diameter Ø | 370 mm |
| Inside diameter Ø | 360 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

### Small



For concrete bases (Part No. 102 075, 102 003), weight 8.5 kg.

| Type ULP KS ... | D280 SW |
|---|---|
| **Part No.** | **102 060** |
| Outside diameter Ø | 280 mm |
| Inside diameter Ø | 270 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

## Mounting Bracket for Air-Termination Systems on Metal Roofs

Stainless steel mounting bracket for installing HVI air-termination systems or air-termination rods on metal roofs:

Mounting bracket suitable for vertical mounting of air-termination systems on metal roofs with a max. roof slope of up to 53°.

For fixing Ø40/50 air-termination rods and for top-mounting HVI light plus and HVI supporting tubes with inside conductor routing.

**Note:** Mounting conditions on site must be clarified with the builder. You can find more information on max. gust wind speeds at www.dehn-international.com



| Type | MDH D48 VB550.900 V2A |
|---|---|
| **Part No.** | **105 241** |
| Material | StSt |
| Adjustment range | 550-900 mm |
| Roof inclination | 5-53° |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Accessories for Mounting Bracket for Air-Termination Systems on Metal Roofs

### C-mounting rail for mounting bracket for installation on metal roofs



C mounting rails with holes for fixing the mounting bracket on roofs with large batten distances (> 600 mm).

| Type | MSC MDH V4A L1000 MZ V2A | MSC MDH V4A L1500 MZ V2A |
|---|---|---|
| **Part No.** | **123 050** | **123 051** |
| Material of the rail | StSt (V4A) | StSt (V4A) |
| Dimensions of the rail (l x w x h) | [2x] 1000 x 41 x 41 mm | [2x] 1500 x 41 x 41 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MSC MDH V4A L2000 MZ V2A |
|---|---|
| **Part No.** | **123 052** |
| Material of the rail | StSt (V4A) |
| Dimensions of the rail (l x w x h) | [2x] 2000 x 41 x 41 mm |
| PU | 1 pc(s) |

## Air-Termination Rods for Metal Roofs

For protecting roof-mounted structures, domelights, etc.
It is fixed at the end of the braces (Ø11-mm holes) by four holders for metal roofs.
The holders must be selected according to the roof profile (round standing seam part no. 123 040, clamping seam part no. 123 041, standing seam 123 042, without seam for riveting or screwing 123 043).

### Height 2000 mm
With M16 threaded bolts.



| Type FS ... | 16 10 2000 MD AL V2A |
|---|---|
| **Part No.** | **123 021** |
| Total length (Ø16 / 10 mm) | 2000 mm |
| Max. gust wind speed | 184 km/h |
| Profile distance | 230-520 mm |
| Fixing | [4x] Ø11 mm |
| Material of braces | StSt |
| Material of air-termination rod | Al |
| Standard | EN 62561-(1+2) |
| PU | 1 pc(s) |

### Height up to 3500 mm
Adjustable to a roof inclination up to max. 10°.



| General technical data: | |
|---|---|
| Profile distance | 230-520 mm |
| Fixing | [4x] Ø11 mm |
| Material of braces | StSt |
| Standard | EN 62561-(1+2) |

| Type FS ... | 22 16 10 2500 SK AL V2A | 22 16 10 3000 SK AL V2A |
|---|---|---|
| **Part No.** | **123 425** | **123 430** |
| Total length (Ø22 / 16 / 10 mm) | 2500 mm | 3000 mm |
| Max. gust wind speed | 185 km/h | 149 km/h |
| Material of air-termination rod | Al | Al |
| PU | 1 pc(s) | 1 pc(s) |

| Type FS ... | 22 16 10 3500 SK AL V2A |
|---|---|
| **Part No.** | **123 435** |
| Total length (Ø22 / 16 / 10 mm) | 3500 mm |
| Max. gust wind speed | 114 km/h |
| Material of air-termination rod | Al / StSt |
| PU | 1 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

## Accessories for Mounting Bracket for Air-Termination Systems on Metal Roofs

### Holder for metal roofs with round standing seam
Screw with self-locking nut.



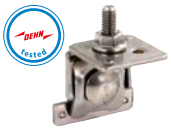
| Type | HA M8 RSF20.25 V2A |
|---|---|
| **Part No.** | **123 040** |
| Material of holder | StSt |
| Clamping range | Ø20-25 mm |
| Screw | M8 x 25 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 12 pc(s) |

### Holder for metal roofs with clamping seam (e.g. RIB-ROOF Speed 500 from Zambelli)
Screw with self-locking nut.



| Type | HA M8 KF18.22 V2A |
|---|---|
| **Part No.** | **123 041** |
| Material of holder | StSt |
| Clamping range | approx. 18 / 22 mm |
| Screw | M8 x 25 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 12 pc(s) |

### Holder for metal roofs with standing seam
Screw with self-locking nut.



| Type | HA M8 SF0.7 8 V2A |
|---|---|
| **Part No.** | **123 042** |
| Material of holder | StSt |
| Clamping range | 0.7-8 mm |
| Screw | M8 x 25 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 12 pc(s) |

### Holder for metal roofs for riveting or screwing
Screw lock using self-locking nut with serrated bearing.
**Note:** The leak-tightness of the roof must be ensured during installation; e.g. by using waterproof cup rivets. You might need to consult with the trade people responsible.



| Type | HA M8 AL ZF B5.2 6.5 V2A |
|---|---|
| **Part No.** | **123 043** |
| Material of holder | StSt |
| Fixing | [4x] Ø5.2 / [2x] Ø6.5 mm |
| Screw | M8 x 25 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 12 pc(s) |

## Air-Termination Rod for Trapezoidal Roofs

For protecting roof-mounted structures, domelights etc.
The air-termination rod is placed in the gap between the trapezoidal seams profile.
The variable base frame can be adjusted to all trapeziodal profiles.
The special holder for the air-termination rod can compensate roof inclinations up to 10°.



Type with a length of 1500 mm (with Part No. 103 210) is available upon request.

| Type | FS 16 10 2000 TD AL V2A K |
|---|---|
| **Part No.** | **123 032** |
| Total length (Ø16 / 10 mm) | 2000 mm |
| Max. gust wind speed | 137 km/h |
| Profile distance | 600-770 mm |
| Material of air-termination rod | Al |
| Material of bases | plastic |
| Standard | EN 62561-2 |
| PU | 1 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

## Supports for Air-Termination Rods D40

### Wall mounting bracket for horizontal mounting, flat



| Type | WB D40 WA V2A |
|---|---|
| **Part No.** | **105 140** |
| Material | StSt |
| Fixing | [8x] Ø5.1 / [4x] 11 x 20 mm |
| Distance from wall | 80 mm |
| Clamping range for air-termination rod | 40 mm |
| PU | 1 pc(s) |

### Wall mounting bracket for vertical mounting



| Type | WB D40.50 SE WA46 V2A | WB D40.50 SE WA110 V2A |
|---|---|---|
| **Part No.** | **105 342** | **105 348** |
| Material | StSt | StSt |
| Fixing | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm |
| Distance from wall | 46 mm | 110 mm |
| Clamping range for air-termination rod | 40-50 mm | 40-50 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Wall mounting bracket, adjustable from 150-200 mm

For attaching supporting tubes or air-termination rods D40 / D50, with double clamp for connecting 2x Rd 8-10 mm.



| Type | WB D40.50 V150.200 V2A |
|---|---|
| **Part No.** | **105 344** |
| Material | StSt |
| Fixing | [4x] 12 x 26 mm |
| Distance from wall | 150-200 mm |
| Clamping range Rd | 8-10 mm |
| Clamping range for air-termination rod | 40-50 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Wall mounting bracket, adjustable from 230-1300 mm



| Type | WB D40.50 V230.400 STTZN V2A | WB D40.50 V400.700 STTZN V2A |
|---|---|---|
| **Part No.** | **105 347** | **105 343** |
| Material | St/tZn / StSt | St/tZn / StSt |
| Distance from wall | 230-400 mm | 400-700 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Railing clamp



| Type | BS D40.50 D48.60 V2A |
|---|---|
| **Part No.** | **105 354** |
| Material | StSt |
| Clamping range Ø of pipe | 48-60 mm (1 1/2-2") |
| Clamping range for air-termination rod | 40-50 mm |
| PU | 5 pc(s) |

### Railing clamp with spacer

With spacer for adjusting e.g. antenna supports.



| Type | BSC D40 DS95 D45.65 V2A |
|---|---|
| **Part No.** | **105 162** |
| Material | StSt |
| Clamping range Ø of pipe | 45-65 mm (1 1/2-2") |
| Clamping range for air-termination rod | 40-50 mm |
| Length of spacer | 95 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Fixing clamp with tensioning strap

Two fixing clamps ensure mechanical stability and a lightning current carrying capability of 100 kA (10/350 µs).



| Type | BSC D40.50 SB50.300 V2A |
|---|---|
| **Part No.** | **105 160** |
| Material | StSt |
| Clamping range Ø of pipe | 50-300 mm |
| Clamping range for air-termination rod | 40-50 mm |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Fixing clamp with tensioning strap and spacer

With additional long spacer for adjusting sector antenna supports on the mast.



| Type | BS D40.50 DS95 SB50.300 V2A |
|---|---|
| **Part No.** | **105 163** |
| Material | StSt |
| Clamping range Ø of pipe | 50-300 mm |
| Clamping range for air-termination rod | 40-50 mm |
| Dimensions of strap (w x d) | 25 x 3.0 mm |
| Length of spacer | 95 mm |
| PU | 1 pc(s) |

## Telescopic Lightning Protection Mast with Screw Foundation

Air-termination mast for protecting special facilities such as biogas plants and free field PV systems against direct lightning strikes.
The masts are erected in a screw foundation.
No digging or foundation work necessary.
The screw foundation is screwed into the natural ground and fixed in place by three earth rods Ø20 mm, length 1500 mm (Part No. 620 151). These must be ordered separately.
The air-termination masts are designed according to Eurocode.
These calculations are based on a natural ground pressure of 0.02 kN/cm² (e.g. loamy, sandy, gravelly soil of medium density).



| General technical data: | |
|---|---|
| Standard | EN 62561-(1+2) |

| Type TBM ... | 6M SCFU STTZN AL | 7M SCFU STTZN AL |
|---|---|---|
| Part No. | 103 121 | 103 122 |
| Material | St/tZn / Al / StSt | St/tZn / Al |
| Height above ground level (l1) | 6000 mm | 7000 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type TBM ... | 8M SCFU STTZN AL | 9M SCFU STTZN AL |
|---|---|---|
| Part No. | 103 123 | 103 124 |
| Material | St/tZn / Al / StSt | St/tZn / Al |
| Height above ground level (l1) | 8000 mm | 9000 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type TBM ... | 10M SCFU STTZN AL | 11M SCFU STTZN AL |
|---|---|---|
| Part No. | 103 125 | 103 126 |
| Material | St/tZn / Al / StSt | St/tZn / Al |
| Height above ground level (l1) | 10000 mm | 11000 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Mast holder, heavy version

For erecting air-termination systems on installations, such as biogas plants

The heavy version of the mast holder enables the mounting of air-termination masts with a diameter of Ø55–100 mm.



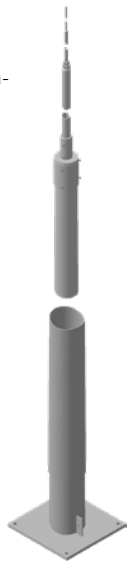
| Type | WB D55.100 SE WA150 STTZN |
|---|---|
| Part No. | 105 352 NEW |
| Material | HDG steel |
| Fixing | [4x] Ø14 mm |
| Distance from wall | 106 mm |
| Clamping range (Ø mast) | 55-100 mm |
| Material of threaded rod / nut / washer | StSt |
| PU | 1 pc(s) |

## Telescopic Lightning Protection Mast for Bucket or Concrete Foundations

Air-termination mast for protecting facilities – such as biogas plants and free field PV systems, systems located in a hazardous area and ammunition depots – against direct lightning strikes.
The masts are erected in a bucket foundation (pre-fabricated) or an on-site concrete foundation with foundation basket (to be ordered separately).
For detailed information on the plug-in system, foundation and erection, please see the installation instructions.
Advantages of the air-termination mast system:

- Excavation work can be completed in advance
- Erection in (prefabricated) bucket foundation on site with comparatively little effort, or
- Erection in on-site concrete foundations with foundation basket (concrete curing time to be observed for scheduling and erection)
- Version with flange plate for fast mounting
- Easily adjustable with M24 threaded bolts
- Detailed mounting instructions
- Verifiable statics (upon request)
- Components:
- Air-termination rod, HDG steel, Ø42 / 25 / 15 mm, length 2400 or 5400 mm, with M20 thread and lock nut
- Conic mast segments
- Flange plate with terminal lug for earth connection borehole Ø12 mm (for Ø10-mm round conductor, e.g. with KS connector, part no. 301 019)

Max. transport length 6 m.



| General technical data: | |
|---|---|
| Material | St/tZn |
| Standard | EN 62561-(1+2) |

| Type TBM ... | 13.35M FP400 STTZN | 16.35M FP400 STTZN |
|---|---|---|
| Part No. | 103 013 | 103 016 |
| Height above ground level | 13380 mm | 16380 mm |
| Mast segments | 2 | 2 |
| Dimensions of flange plate | 400 x 400 mm | 400 x 400 mm |
| Flange plate | 4x Ø27 mm for 4x M24 (300 x 300 mm) | 4x Ø27mm for 4x M24 (300 x 300 mm) |
| Dim. of on-site concrete foundation (l x w x h) | 1400 x 1400 x 900 mm | 1400 x 1400 x 900 mm |
| Weight | approx. 228 kg | approx. 230 kg |
| PU | 1 pc(s) | 1 pc(s) |

| Type TBM ... | 19.35M FP565 STTZN | 22.35M FP565 STTZN |
|---|---|---|
| Part No. | 103 019 | 103 022 |
| Height above ground level | 19380 mm | 22380 mm |
| Mast segments | 3 | 4 |
| Dimensions of flange plate | 400 x 400 mm | 565 x 565 mm |
| Flange plate | 4x Ø27 mm for 4x M24 (300 x 300 mm) | 8x Ø27 mm for 8x M24 (490 x 490 mm) |
| Dim. of on-site concrete foundation (l x w x h) | 1600 x 1600 x 900 mm | 1800 x 1800 x 900 mm |
| Weight | approx. 310 kg | approx. 450 kg |
| PU | 1 pc(s) | 1 pc(s) |

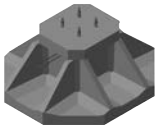
| Type TBM ... | 24.85M FP565 STTZN |
|---|---|
| Part No. | 103 025 |
| Height above ground level | 24880 mm |
| Mast segments | 5 |
| Dimensions of flange plate | 565 x 565 mm |
| Flange plate | 8x Ø27 mm for 8x M24 (490 x 490 mm) |
| Dim. of on-site concrete foundation (l x w x h) | 2000 x 2000 x 900 mm |
| Weight | approx. 550 kg |
| PU | 1 pc(s) |

## Bucket Foundations for Telescopic Lightning Protection Masts

Prefabricated element for easy erection of telescopic lightning protection masts.
No concreting on site.
For detailed information on the telescopic system, foundation and erection, please see he installation instructions.

### Type KöFU I

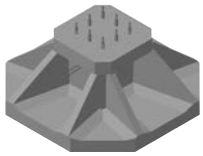
For masts with a height above ground level from 13.35 m to 19.35 m (Part No. 103 013 / 103 016 / 103 019).
Flange plate 400 x 400 mm.



| Type KÖFU ... | I TBM FP400 |
|---|---|
| **Part No.** | **103 030** |
| Material | **concrete (C50/60)** |
| Dimensions | 1800 x 2000 x 850 mm |
| Weight | approx. 2.5 t |
| PU | 1 pc(s) |

### Type KöFU II

For masts with a height of 22.35 m to 24.85 m above ground (part no. 103 022 or 103 025).
Flange plate 565 x 565 mm.



| Type KÖFU ... | II TBM FP565 |
|---|---|
| **Part No.** | **103 031** |
| Material | **concrete (C50/60)** |
| Dimensions | 2400 x 2400 x 1010 mm |
| Weight | approx. 4.9 t |
| PU | 1 pc(s) |

## Foundation Basket for On-site Concrete Foundations

With threaded bolts for setting in concrete, suitable for the flange plate of telescopic lightning protection masts.
For detailed information on the telescopic system, foundation and erection, see the installation instructions.

### Small design

For masts with a height above ground level from 13.35 m to 19.35 m (Part No. 103 013 / 103 016 / 103 019).
Flange plate 400 x 400 mm.



| Type AKO TBM ... | FP400 |
|---|---|
| **Part No.** | **103 040** |
| Material | **steel** |
| Dimensions | 472 x 324 x 870 mm |
| Type of threaded bolt | 4x M24 (300 x 300 mm) |
| PU | 1 pc(s) |

### Large design

For masts with a height above ground level from 22.35 m to 24.85 m (Part No. 103 022 or 103 025).
Flange plate 565 x 565 mm.



| Type AKO TBM ... | FP565 |
|---|---|
| **Part No.** | **103 041** |
| Material | **steel** |
| Dimensions | 662 x 662 x 870 mm |
| Type of threaded bolt | 8x M24 (490 x 490 mm) |
| PU | 1 pc(s) |

## Air-Termination Rod for Ridge and Hip Tiles

For protecting solar thermal modules, photovoltaic generators or other roof-mounted structures on steep roofs.
The clamping bracket must be adjusted to the diameter of the ridge tiles before it is used to secure the air-termination rod.



| Type | FS 10 1000 FG AL V2A |
|---|---|
| Part No. | 123 109 |
| Material of air-termination rod | Al |
| Length | 1000 mm |
| Clamping range | 120-240 mm |
| Standard | EN 62561-2 |
| PU | 1 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

## Holders for Air-Termination Systems on Ridge and Hip Tiles

For air-termination rods or spacer bars with conductor holder, for protecting solar thermal modules, photovoltaic generators or other roof-mounted structures on steep roofs.
The holder is mounted using a tensioning strap. One clip is permanently fixed to one end of the tensioning strap. The holder can be adjusted to various types of ridge tiles using the adjustable clip at the other end.

Air-termination tips / rods or spacer bars have to be ordered separately.

### Single design

For air-termination tips (length 1000 mm) or spacer bars (GRP, Ø10 mm).



| Type HA ... | 10 1F FG120.300 V2A |
|---|---|
| Part No. | 123 110 |
| Clamping range Rd | 10 mm |
| Tensioning range | 120-300 mm |
| Material of fixing bush | StSt |
| PU | 1 pc(s) |

### Double design

For air-termination rods Ø16 / 10 mm, max. length of 1.5 m, incl. clamping piece for connecting round conductors Rd 6-10 mm.



| Type HA ... | 16 2F FG120.300 V2A |
|---|---|
| Part No. | 123 116 |
| Clamping range Rd | 16 mm |
| Tensioning range | 120-300 mm |
| Mounting distance (l1) | approx. 280 / 350 / 420 mm |
| Material of fixing bush | StSt |
| PU | 1 pc(s) |

## Accessories for Holders for Air-Termination Systems on Ridge and Hip Tiles

### Air-termination tips

For protecting roof-mounted structures, chimneys.



| Type | FS 10 1000 AL | FS 10 1000 V2A |
|---|---|---|
| Part No. | 101 000 | 101 009 |
| Total length | 1000 mm | 1000 mm |
| Material | Al | StSt |
| Standard | EN 62561-2 | EN 62561-2 |
| Diameter Ø | 10 mm | 10 mm |
| PU | 20 pc(s) | 20 pc(s) |

### Tubular air-termination rods

For protecting roof-mounted structures.



| Type | RFS 16 10 1500 AL |
|---|---|
| Part No. | 103 410 |
| Total length (l1) | 1500 mm |
| Material | AlMgSi |
| Diameter Ø | 16 / 10 mm |
| Max. gust wind speed | 175 km/h |
| PU | 10 pc(s) |

### Spacer bar with conductor holder

For insertion into the holder for air-termination systems on ridge and hip tiles. For raised conductor routing, loose conductor routing.



| Type | DILH 8 DS10 L280 K GR GFK | DILH 8 DS10 L420 K GR GFK |
|---|---|---|
| Part No. | 253 315 | 253 325 |
| Conductor support Rd | 8 mm | 8 mm |
| Material of conductor holder | plastic | plastic |
| Length (l1) | 280 mm | 420 mm |
| Insulating clearance | 220 mm | 360 mm |
| Permanent temperature range | -30 °C ... +80 °C | -30 °C ... +80 °C |
| Standard | Based on DIN IEC/ TS 62561-8 (VDE V 0185-561-8) | Based on DIN IEC/ TS 62561-8 (VDE V 0185-561-8) |
| PU | 24 pc(s) | 24 pc(s) |

## Rod Holder for Gable Roofs

Base for fixing air-termination rods on steep roofs, with anti-rotation protection (toothed lock washer) and lock nut as well as boreholes for screwing the brace onto the roof battens.
At the chimney, the air-termination rod requires additional fixing e.g. by means of DEHNiso spacer.



| Type | SH BB16 L475 WS V2A STTZN |
|---|---|
| Part No. | 223 005 |
| Material of brace | St/tZn |
| Material of bolt | StSt |
| Length of brace | 475 mm |
| Conductor support Rd | 16 mm |
| PU | 1 pc(s) |

## Pipe Clamp for Air-Termination Rods

For fixing as well as lightning current carrying contact of the air-termination rod, e.g. on metal substructures of photovoltaic (PV) installations (square hollow profile); typically installed on steel frame or reinforced concrete structures. When mounted on pipes, the pressure plate (flat plate 2x angled) has to be removed. Two pipe clamps have to be installed on each air-termination rod.

The maximum free length of the respective air-termination rod according to the wind load must be considered for installation.



| Type | BRS 50.300 BB16 8 V2A |
|---|---|
| **Part No.** | **540 105** |
| Material of head / strap | StSt |
| Clamping range of square hollow profile | 40 x 60 to 70 x 70 mm |
| Clamping range of pipe | 50-300 mm |
| Connection Rd | 16 mm |
| Dimensions of tensioning strap | 1100 x 25 x 0.3 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Angled Air-Termination Tips

For protecting, e.g. free field photovoltaic systems or carports with a PV system against direct lightning strikes.
A distance of 15-20 cm between the seam clamps and the free length of 80-85 cm should be ensured.
The air-termination tip is adjustable to the inclination angle of the PV system. The standard type is 55° angled which corresponds to a PV system inclination of 35°.

### Air-termination tip with two seam clamps (Part No. 365 031)

Clamping range of the seam clamps 0.7-8 mm.



| Type | FSPS 10 1000 W55 FK AL |
|---|---|
| **Part No.** | **101 110** |
| Total length | 1000 mm |
| Material | Al |
| Diameter Ø | 10 mm |
| PU | 1 pc(s) |

### Separate air-termination tip

Can be combined, e.g. with connection clamps for steel girders.



| Type | FSP 10 1000 W55 AL |
|---|---|
| **Part No.** | **101 010** |
| Total length | 1000 mm |
| Material | Al |
| Diameter Ø | 10 mm |
| PU | 10 pc(s) |

Special lengths of all air-termination rods / self-supporting air-termination rods are available upon request.

## Air-Termination Stud

For installing meshed air-termination systems, for accessible flat roofs, e.g. parking decks.
The air-termination stud and the conductors may either be installed in concrete or in the joints between the decks.



| Type | FP D80 ET70 8.10 V2A |
|---|---|
| **Part No.** | **108 009** |
| Material of clamp | StSt |
| Material of stud | StSt |
| Connection Rd | 8-10 mm |
| Installation depth | min. 70 mm |
| Levelling range | 18 mm |
| PU | 1 pc(s) |

## Air-Termination Tips

End cap for air-termination conductors.

### For steel or aluminium conductors



| Type FS ... | 7.10 ZG |
|---|---|
| **Part No.** | **110 000** |
| Material | ZDC |
| Conductor Rd | 7-10 mm |
| Length | 29 mm |
| Outside diameter Ø | 15 mm |
| PU | 50 pc(s) |

### For copper conductors



| Type FS ... | 8 MSGALCU |
|---|---|
| **Part No.** | **110 017** |
| Material | Brass/gal Cu |
| Conductor Rd | 8 mm |
| Length | 29 mm |
| Outside diameter Ø | 14 mm |
| PU | 10 pc(s) |

## Air-Termination Rods, Bases and Accessories

Air-termination rods manufactured from 99% copper, designed to be mounted in the flat, multi-purpose and ridge air-terminal bases. To protect structures and buildings from direct lightning strikes, designed as per the latest EN 62561-2 and EN 62561-1 standards. These air-termination rods are suitable for mounting multi point holders and air-termination spikes.

### M16 Copper Air-Termination Rods



| General technical data: | |
|---|---|
| Material | Copper |
| Size T | M16 |
| Nominal Diameter D | 15 mm |
| Accessories | M16 Lock Nut |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 |

| Type | AR 15 M16 500 CU | AR 15 M16 600 CU |
|---|---|---|
| Part No. | 117 430 | 117 431 |
| Length L | 500 mm | 600 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | AR 15 M16 1000 CU | AR 15 M16 1500 CU |
|---|---|---|
| Part No. | 117 432 | 117 433 |
| Length L | 1000 mm | 1500 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | AR 15 M16 2000 CU | AR 15 M16 3000 CU |
|---|---|---|
| Part No. | 117 434 | 117 435 |
| Length L | 2000 mm | 3000 mm |
| PU | 10 pc(s) | 5 pc(s) |

### M10 Copper Air-Termination Rods



| General technical data: | |
|---|---|
| Material | Copper |
| Size T | M10 |
| Nominal Diameter D | 10 mm |
| Accessories | M10 Lock Nut |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 |

| Type AR 10 M10 ... | 1000 CU | 600 CU | 500 CU |
|---|---|---|---|
| Part No. | 117 441 | 117 440 | 117 439 |
| Length L | 1000 mm | 600 mm | 500 mm |
| PU | 20 pc(s) | 20 pc(s) | 20 pc(s) |

### M10 Aluminium Air-Termination Rods



| General technical data: | |
|---|---|
| Material | Aluminium |
| Size T | M10 |
| Nominal Diameter D | 10 mm |
| Accessories | M10 Lock Nut |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 |

| Type AR 10 M10 ... | 300 AL | 500 AL | 1000 AL |
|---|---|---|---|
| Part No. | 117 447 | 117 448 | 117 449 |
| Length L | 300 mm | 500 mm | 1000 mm |
| PU | 25 pc(s) | 20 pc(s) | 20 pc(s) |

Note: During high winds and extreme weather conditions air rods over 1000 mm long can be subjected to fatigue mechanisms. It is therefore recommended that additional supports are considered before installation.

### M16 Aluminium Air-Termination Rods



| General technical data: | |
|---|---|
| Material | Aluminium |
| Size T | M16 |
| Nominal Diameter D | 15 mm |
| Accessories | M16 Lock Nut |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 |

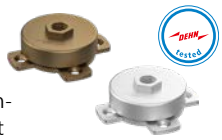
| Type AR 15 M16 ... | 300 AL | 500 AL |
|---|---|---|
| Part No. | 117 442 | 117 443 |
| Length L | 300 mm | 500 mm |
| PU | 25 pc(s) | 10 pc(s) |

| Type AR 15 M16 ... | 1000 AL | 1500 AL | 2000 AL |
|---|---|---|---|
| Part No. | 117 444 | 117 445 | 117 446 |
| Length L | 1000 mm | 1500 mm | 2000 mm |
| PU | 10 pc(s) | 10 pc(s) | 10 pc(s) |

Note: During high winds and extreme weather conditions air rods over 1000 mm long can be subjected to fatigue mechanisms. It is therefore recommended that additional supports are considered before installation.

### Air-Termination Rod Bases

Air-Termination Rod Bases are used to mount Air-Termination Rods to flat surfaces. The bases are designed for clamping flat conductors to allow straight through, cross, right angle and T- connections.



| Type | ARB M16 FL 25X3 HCA | ARB M16 FL 25X3 ALA |
|---|---|---|
| Part No. | 117 465 | 117 466 |
| Material | High Copper Alloy | Aluminium Alloy |
| Air Termination Rod Material | Copper | Aluminium |
| Conductor Material | Copper | Aluminium |
| Air Termination Rod Thread Size | M16 / M10 *) | M16 / M10 *) |
| Clamping range Fl | 25 x 3 mm | 25 x 3 mm |
| Tightening Torque | 15 Nm | 15 Nm |
| Standards | IEC / EN / BS EN 62561-1 | IEC / EN / BS EN 62561-1 |
| Classification | Higher than Class H (200 kA) | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA | $I_{imp}$ 100 kA |
| PU | 4 pc(s) | 4 pc(s) |

### Multipurpose Air-Termination Rod Bases

Multipurpose Air-Termination Rod Bases are used to mount Air-Termination Rods to flat vertical or horizontal surfaces. The bases are designed for clamping flat conductors to allow straight through, cross, right angle, parallel and T- connections..



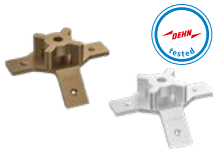
| General technical data: | |
|---|---|
| Air-Termination Rod Thread Size | M16 / M10 *) |
| Clamping range Fl | 25 x 3 mm |
| Clamping range Rd | 8 - 10 mm |
| Clamping range (Stranded / Cable) | 50 - 70 mm² |
| Clamping range Fl / Rd | 25 x 3 mm / 8 - 10 mm |
| Clamping range Fl / Stranded cable | 25 x 3 mm / 50 - 70 mm² |
| Clamping range Rd / Stranded cable | 8 - 10 mm / 50 - 70 mm² |
| Tightening Torque | 15 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type MARB M16/M10 ... | FLRDSC 25X3/8.10/50.70 HCA | FLRDSC 25X3/8.10/50.70 ALA |
|---|---|---|
| Part No. | 118 473 | 117 473 |
| Material | High Copper Alloy | Aluminium Alloy |
| Air-Termination Rod Material | Copper | Aluminium |
| Conductor Material | Copper | Aluminium |
| PU | 4 pc(s) | 4 pc(s) |

*) Use M10 Air-Termination Rod Adapter, Part Number: 118472

## Air-Termination Rod Ridge Bases

Air-Termination Rod Rdige Bases are used to mount Air-Termination Rods ridge saddle surfaces. The bases are designed for clamping flat conductors to allow straight through, cross, right angle and T-connections..



| Type | ARRB M16 FL 25X3 HCA | ARRB M16 FL 25X3 ALA |
|---|---|---|
| **Part No.** | **118 471** | **117 471** |
| Material | High Copper Alloy | Aluminium Alloy |
| Air Termination Rod Material | Copper | Aluminium |
| Conductor Material | Copper | Aluminium |
| Air Termination Rod Thread Size | M16 / M10 *) | M16 / M10 *) |
| Clamping range Fl | 25 x 3-6 mm | 25 x 3-6 mm |
| Tightening Torque | 15 Nm | 15 Nm |
| Standards | IEC / EN / BS EN 62561-1 | IEC / EN / BS EN 62561-1 |
| Classification | Class H | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA | $I_{imp}$ 100 kA |
| PU | 1 pc(s) | 1 pc(s) |

*) Use M10 Air-Termination Rod Adapter, Part Number: 118472

## Base Adapter for M16 to M10 Air-Termination Rod

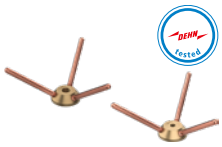
Use this Adapter when mounting M10 Air-Termination Rods in our M16 Air-Termination Rod Bases Range.



| Type | ARBA M16/M10 STST |
|---|---|
| **Part No.** | **118 472** |
| Material | Stainless Steel |
| Air Termination Rod Thread Size | M10 |
| Thread Size | M16 |
| Tightening Torque | 15 Nm |
| PU | 15 pc(s) |

## Multi Points for Air-Termination Rods

Multipoints can be mounted onto our range of M10 and M16 Air-Termination Rods.



| General technical data: | |
|---|---|
| Number of Spikes | 3 |
| Tightening Torque | 10 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type | ARMP 3W M16 HCA | ARMP 3W M10 HCA |
|---|---|---|
| **Part No.** | **118 464** | **118 466** |
| Material | High Copper Alloy | High Copper Alloy |
| Air Termination Rod / Spike Material | Copper | Copper |
| Air Termination Rod Thread Size | M16 | M10 |
| Accessories | M16 Lock Nut | M10 Lock Nut |
| PU | 1 pc(s) | 1 pc(s) |

| Type | ARMP 3W M16 HCA | ARMP 3W M10 ALA |
|---|---|---|
| **Part No.** | **118 465** | **118 467** |
| Material | Aluminium Alloy | Aluminium Alloy |
| Air Termination Rod/Spike Material | Aluminium | Aluminium |
| Air Termination Rod Thread Size | M16 | M10 |
| Accessories | M16 Lock Nut | M10 Lock Nut |
| PU | 1 pc(s) | 1 pc(s) |

Note: Recommended use of LOCTITE 242 Blue on spike threads during Installation.

## Wall Mounting Brackets for Air-Termination Rods

Wall Mounting Brackets are used to mount Air-Termination Rods to vertical surfaces, to be used in conjunction with Couplers.



| Type | ARSB M16 HCA | ARSB M16 ALA |
|---|---|---|
| **Part No.** | **118 478** | **118 479** |
| Material | High Copper Alloy | Aluminium Alloy |
| Air Termination Rod Material | Copper | Aluminium |
| Air Termination Rod Thread Size | M16 | M16 |
| PU | 2 pc(s) | 2 pc(s) |

## Couplers for Wall Mounting Brackets and Air-Termination Rods

Couplers are used to connect the Bracket mounted Air-Termintation Rods to the Lightning Protection System.



| General technical data: | |
|---|---|
| Air Termination Rod Thread Size | M16 |
| Clamp Fixings | Hex Head Bolt M8 x 2 Nos |
| Material of Clamp Fixings | Stainless Steel |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type | ARC M16 FL 25X3 HCA | ARC M16 SC 50.70 HCA |
|---|---|---|
| **Part No.** | **138 251** | **138 252** |
| Material | High Copper Alloy | High Copper Alloy |
| Air Termination Rod Material | Copper | Copper |
| Conductor Material | Copper | Copper |
| Clamping range Fl | 25 x 3 mm | – |
| Clamping range (Stranded / Cable) | – | 50 - 70 mm² |
| Tightening Torque | 10 Nm | 15 Nm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | ARC M16 FL 25X3 ALA |
|---|---|
| **Part No.** | **138 253** |
| Material | Aluminium Alloy |
| Air Termination Rod Material | Aluminium |
| Conductor Material | Aluminium |
| Clamping range Fl | 25 x 3 mm |
| Clamping range (Stranded / Cable) | – |
| Tightening Torque | 10 Nm |
| PU | 10 pc(s) |

## Strike Pads

Strike Pads are used as exposed conductive points inter-connected by the air termination system hidden/embedded in the building's facade, e.g. car parks, below the tiles, or in lateral air-termination network for protection of buildings over 60 meters high.



| General technical data: | |
|---|---|
| Clamping range Fl | 25 x 3 mm |
| Tightening Torque | 15 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type SP M10 FL ... | 25X3 HCA | 25X3 ALA | 25X3 STST |
|---|---|---|---|
| **Part No.** | **118 411** | **118 412** | **118 413** |
| Material | High Copper Alloy | Aluminium Alloy | Stainless Steel |
| Conductor Material | Copper | Aluminium | Copper, Aluminium, HDG-Steel |
| PU | 2 pc(s) | 2 pc(s) | 2 pc(s) |

**Max. Gust wind speeds in km/h for air-termination systems.**

## Tripod mounting - air-termination systems

| Air-termination rods | | | Tripod, small, StSt (V2A) and Adapter set D40 Part No. **107 390 + 107 399** | | | | Tripod, large, StSt (V2A) Part No. **107 391** | | | | Four-legged stand, small, StSt (V2A) and Adapter set D40 Part No. **107 490 + 107 399** | | | | Four-legged stand, large, StSt (V2A) Part No. **107 491** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of concrete bases | | | 3x | 6x | 9x | 12x | 3x | 6x | 9x | 12x | 4x | 8x | 12x | 16x | 4x | 8x | 12x | 16x |
| Part No. | Material | Height [mm] | | | | | | | | | | | | | | | | |
| **105 170** | Al | 4000 | 132 | 185 | 185 | 185 | 170 | 185 | 185 | 185 | 178 | 185 | 185 | 185 | 185 | 185 | 185 | 185 |
| **105 175** | Al | 4500 | 120 | 168 | 186 | 186 | 149 | 186 | 186 | 186 | 155 | 186 | 186 | 186 | 186 | 186 | 186 | 186 |
| **105 171** | Al | 5000 | 103 | 137 | 170 | 186 | 129 | 179 | 186 | 186 | 129 | 184 | 186 | 186 | 176 | 186 | 186 | 186 |
| **105 176** | Al | 5500 | 96 | 124 | 149 | 183 | 121 | 163 | 187 | 187 | 121 | 170 | 187 | 187 | 159 | 187 | 187 | 187 |
| **105 172** | Al | 6000 | – | 110 | 132 | 149 | 108 | 137 | 174 | 187 | 105 | 140 | 149 | 149 | 137 | 187 | 187 | 187 |
| **105 177** | Al | 6500 | – | 104 | 124 | 137 | 103 | 132 | 159 | 170 | 99 | 132 | 137 | 137 | 132 | 170 | 170 | 170 |
| **105 173** | Al | 7000 | – | 93 | 110 | 121 | 93 | 117 | 137 | 137 | 93 | 117 | 121 | 121 | 117 | 137 | 137 | 137 |
| **105 178** | Al | 7500 | – | – | 105 | 112 | – | 112 | 129 | 129 | – | 112 | 112 | 112 | 112 | 129 | 129 | 129 |
| **105 174** | Al | 8000 | – | – | 97 | 104 | – | 104 | 112 | 112 | – | 103 | 104 | 104 | 104 | 112 | 112 | 112 |
| **105 179** | Al | 8500 | – | – | 93 | 100 | – | 100 | 108 | 108 | – | 100 | 100 | 100 | 99 | 108 | 108 | 108 |
| **105 190** | NIRO | 4000 | 132 | 185 | 191 | 191 | 169 | 191 | 191 | 191 | 176 | 191 | 191 | 191 | 191 | 191 | 191 | 191 |
| **105 195** | NIRO | 4500 | 120 | 165 | 192 | 192 | 149 | 192 | 192 | 192 | 155 | 192 | 192 | 192 | 192 | 192 | 192 | 192 |
| **105 191** | NIRO | 5000 | 103 | 132 | 167 | 193 | 132 | 177 | 193 | 193 | 129 | 182 | 193 | 193 | 176 | 193 | 193 | 193 |
| **105 196** | NIRO | 5500 | 98 | 124 | 149 | 179 | 121 | 163 | 193 | 193 | 122 | 168 | 193 | 193 | 163 | 193 | 193 | 193 |
| **105 192** | NIRO | 6000 | – | 111 | 129 | 149 | 111 | 139 | 173 | 194 | 107 | 140 | 163 | 163 | 140 | 193 | 194 | 194 |
| **105 197** | NIRO | 6500 | – | 104 | 121 | 137 | 105 | 132 | 159 | 180 | 101 | 132 | 147 | 147 | 132 | 180 | 180 | 180 |
| **105 193** | NIRO | 7000 | – | 93 | 110 | 124 | 96 | 117 | 137 | 140 | 93 | 117 | 124 | 124 | 122 | 140 | 140 | 140 |
| **105 198** | NIRO | 7500 | – | 93 | 105 | 117 | 93 | 112 | 133 | 133 | – | 112 | 120 | 120 | 117 | 132 | 132 | 132 |
| **105 194** | NIRO | 8000 | – | – | 97 | 105 | – | 105 | 117 | 117 | – | 104 | 105 | 105 | 105 | 117 | 117 | 117 |
| **105 199** | NIRO | 8500 | – | – | 93 | 103 | – | 99 | 112 | 112 | – | 100 | 103 | 103 | 104 | 112 | 112 | 112 |

## Tripod mounting - air-termination systems

| Air-termination rods | | | Tripod, small, **St/tZn**, Part No. **105 357** | | | |
|---|---|---|---|---|---|---|
| Number of concrete bases | | | 3x | 6x | 9x | 12x |
| Part No. | Material | Height [mm] | | | | |
| **105 170** | Al | 4000 | 103 | 137 | 171 | 185 |
| **105 175** | Al | 4500 | 93 | 124 | 149 | 178 |
| **105 171** | Al | 5000 | – | 104 | 124 | 140 |
| **105 190** | StSt | 4000 | 101 | 133 | 167 | 191 |
| **105 195** | StSt | 4500 | 93 | 122 | 144 | 173 |
| **105 191** | StSt | 5000 | – | 103 | 122 | 137 |

## Self-supporting air-termination rods

| Tripod, St/tZn | | | 3x 8,5 kg | 3x 17 kg |
|---|---|---|---|---|
| Number of concrete bases | | | | |
| Part No. | Material | Height [mm] | | |
| **105 525** | Al | 2500 | 137 | 185 |
| **105 530** | Al | 3000 | 112 | 168 |
| **105 535** | Al | 3500 | 95 | 135 |

| Tripod, St/tZn | | | 3x | 6x | 9x | 12x |
|---|---|---|---|---|---|---|
| Number of concrete bases | | | | | | |
| Part No. | Material | Height [mm] | | | | |
| **105 531** | Al | 3000 | 135 | 194 | 196 | 196 |
| **105 536** | Al | 3500 | 110 | 149 | 190 | 197 |

## Self-supporting air-termination rods

... arrow arrangement

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Number of concrete bases | | | 3x | 6x | 9x | 3x | 6x | 9x |
| Part No. | Material | Height [mm] | | | | | | |
| **105 400** | Al | 4000 | 132 | 184 | 185 | 105 | 144 | 185 |
| **105 450** | Al | 4500 | 117 | 163 | 186 | 96 | 129 | 163 |
| **105 500** | Al | 5000 | 99 | 132 | 163 | – | 108 | 132 |
| **105 550** | Al | 5500 | 93 | 121 | 147 | – | 101 | 121 |

## Self-supporting air-termination rods

| Number of concrete bases | | | 3x | 6x | 9x | 12x | 18x | 21x | 24x |
|---|---|---|---|---|---|---|---|---|---|
| Part No. | Material | Height [mm] | | | | | | | |
| **105 600** | Al | 6000 | 110 | 137 | 170 | 187 | – | – | – |
| **105 650** | Al | 6500 | 105 | 132 | 159 | 187 | – | – | – |
| **105 700** | Al | 7000 | 96 | 120 | 137 | 163 | – | – | – |
| **105 750** | Al | 7500 | 93 | 112 | 135 | 149 | – | – | – |
| **105 800** | Al | 8000 | – | 105 | 124 | 137 | – | – | – |
| **105 850** | Al | 8500 | – | 101 | 117 | 132 | – | – | – |
| **105 900** | Al | 9000 | – | 101 | 117 | 121 | – | – | – |
| **105 910** | Al | 10000 | – | – | – | 121 | 140 | – | – |
| **105 911** | Al | 11000 | – | – | – | 112 | 135 | – | – |
| **105 922** | Al | 12000 | – | – | – | – | 129 | 149 | 170 |
| **105 923** | Al | 13000 | – | – | – | – | 124 | 137 | 149 |
| **105 924** | Al | 14000 | – | – | – | – | 117 | 132 | 145 |

**Max. Gust wind speeds in km/h for air-termination systems.**

## Tripod mounting - air-termination systems

| Air-termination rods | | | Supporting tube stand Part No. **105 244** |
|---|---|---|---|
| Part No. | Material | Height [mm] | |
| **105 185** | Al | 4200 | 188 |
| | | 4700 | 170 |
| | | 5200 | 132 |
| **105 186** | Al | 5500 | 186 |
| | | 6000 | 168 |
| | | 6500 | 152 |
| **105 170** | Al | 4000 | 183 |
| **105 175** | Al | 4500 | 184 |
| **105 171** | Al | 5000 | 184 |
| **105 176** | Al | 5500 | 182 |
| **105 172** | Al | 6000 | 147 |
| **105 177** | Al | 6500 | 135 |
| **105 173** | Al | 7000 | 117 |
| **105 178** | Al | 7500 | 112 |
| **105 174** | Al | 8000 | 99 |
| **105 179** | Al | 8500 | 98 |
| **105 190** | StSt | 4000 | 191 |
| **105 195** | StSt | 4500 | 192 |
| **105 191** | StSt | 5000 | 192 |
| **105 196** | StSt | 5500 | 191 |
| **105 192** | StSt | 6000 | 149 |
| **105 197** | StSt | 6500 | 140 |
| **105 193** | StSt | 7000 | 121 |
| **105 198** | StSt | 7500 | 117 |
| **105 194** | StSt | 8000 | 105 |
| **105 199** | StSt | 8500 | 100 |

## Telescopic, self-supporting air-termination rods

| Part No. | Material FS/Stativ | Height [mm] | Number of concrete bases 3x | 6x | 9x | 12x | 4x | 8x | 12x | 16x |
|---|---|---|---|---|---|---|---|---|---|---|
| **105 710** | Al/StSt | 4200 | 112 | 149 | 191 | 191 | – | – | – | – |
| | | 4700 | 108 | 144 | 174 | 174 | – | – | – | – |
| | | 5200 | 104 | 137 | 149 | 149 | – | – | – | – |
| **105 711** | Al/St/tZn | 4200 | 110 | 147 | 183 | – | – | – | – | – |
| | | 4700 | 105 | 137 | 174 | – | – | – | – | – |
| | | 5200 | 99 | 132 | 149 | – | – | – | – | – |
| **105 712** | Al/StSt | 5500 | – | – | – | – | 105 | 144 | 183 | 189 |
| | | 6000 | – | – | – | – | 105 | 137 | 172 | 172 |
| | | 6500 | – | – | – | – | 101 | 135 | 149 | 149 |
| **105 713** | Al/St/tZn | 5500 | 116 | 149 | 187 | 189 | – | – | – | – |
| | | 6000 | 112 | 144 | 172 | 172 | – | – | – | – |
| | | 6500 | 110 | 137 | 149 | 149 | – | – | – | – |
| **105 714** | Al/StSt | 7000 | – | – | – | – | – | 108 | 129 | 150 |
| | | 7500 | – | – | – | – | – | 105 | 124 | 144 |
| | | 8000 | – | – | – | – | – | 105 | 126 | 140 |
| **105 715** | Al/StSt | 7000 | 110 | 140 | 170 | 170 | – | – | – | – |
| | | 7500 | 105 | 137 | 159 | 159 | – | – | – | – |
| | | 8000 | 105 | 137 | 155 | 155 | – | – | – | – |
| **105 716** | Al/St/tZn | 7000 | 93 | 112 | 135 | 149 | – | – | – | – |
| | | 7500 | – | 112 | 132 | 152 | – | – | – | – |
| | | 8000 | – | 110 | 129 | 147 | – | – | – | – |

## Air-Termination Rods for Metal Roofs

| Part No. | Material | Height [mm] | | |
|---|---|---|---|---|
| **123 021** | Al | 2000 | 184 | – |
| **123 425** | Al | 2500 | 185 | – |
| **123 430** | Al | 3000 | 149 | – |
| **123 435** | Al/StSt | 3500 | 114 | – |
| **123 032** | Al | 2000 | – | 137 |

## Telescopic lightning protection mast with screw foundation

surface tube and tripod **St/tZn**

| Part No. | Material | Height [mm] |
|---|---|---|
| **103 121** | Al/StSt | 6000 | 229 |
| **103 122** | Al | 7000 | 185 |
| **103 123** | Al/StSt | 8000 | 177 |
| **103 124** | Al | 9000 | 159 |
| **103 125** | Al/StSt | 10000 | 116 |
| **103 126** | Al | 11000 | 112 |

## Telescopic lightning protection mast for bucket or concrete foundations

| Part No. | Material | Height [mm] | Bucket Foundation Part No. **103 030** | Concrete Foundation Part No. **103 040** |
|---|---|---|---|---|
| **103 013** | St/tZn | 13380 | 143 | 194 |
| **103 016** | St/tZn | 16380 | 135 | 135 |
| **103 019** | St/tZn | 19380 | 107 | 131 |
| | | | Part No. **103 031** | Part No. **103 041** |
| **103 022** | St/tZn | 22380 | 129 | 129 |
| **103 025** | St/tZn | 24880 | 127 | 127 |

## Wall assembly – air-termination systems

| Part No. | Material | free length | Height [mm] | |
|---|---|---|---|---|
| **105 170** | Al | 3500 | 4000 | 186 |
| **105 175** | Al | 4000 | 4500 | 187 |
| **105 171** | Al | 4000 | 5000 | 187 |
| **105 176** | Al | 4500 | 5500 | 188 |
| **105 172** | Al | 4500 | 6000 | 187 |
| **105 177** | Al | 5000 | 6500 | 184 |
| **105 173** | Al | 5500 | 7000 | 150 |
| **105 178** | Al | 5500 | 7500 | 155 |
| **105 174** | Al | 5500 | 8000 | 150 |
| **105 179** | Al | 5500 | 8500 | 155 |
| **105 190** | StSt | 3500 | 4000 | 193 |
| **105 195** | StSt | 4000 | 4500 | 194 |
| **105 191** | StSt | 4000 | 5000 | 193 |
| **105 196** | StSt | 4500 | 5500 | 194 |
| **105 192** | StSt | 4500 | 6000 | 194 |
| **105 197** | StSt | 5000 | 6500 | 193 |
| **105 193** | StSt | 5500 | 7000 | 149 |
| **105 198** | StSt | 5500 | 7500 | 164 |
| **105 194** | StSt | 5500 | 8000 | 155 |
| **105 199** | StSt | 5500 | 8500 | 164 |
| **105 185** | Al | 3700 | 4200 | 190 |
| | | 4200 | 4700 | 174 |
| | | 4200 | 5200 | 155 |
| **105 186** | Al | 4500 | 5500 | 189 |
| | | 4700 | 6000 | 174 |
| | | 5200 | 6500 | 149 |
| **105 188** | Al | 5300 | 7000 | 178 |
| | | 5800 | 7500 | 170 |
| | | 6300 | 8000 | 157 |

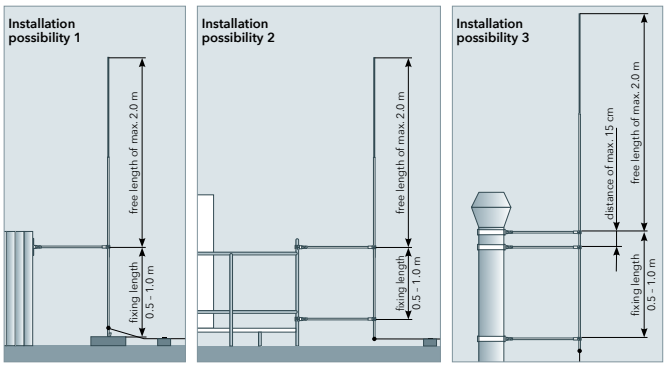
## Air-termination tips in the concrete base

| Part No. | Material | Height [mm] | 1x 8,5 kg | 1x 17 kg | 2x 17 kg |
|---|---|---|---|---|---|
| Diameter 10 mm, chamfered | | | | | |
| **101 000** | Al | 1000 | 135 | – | – |
| **101 009** | StSt | 1000 | 129 | – | – |
| **101 007** | Cu | 1000 | 128 | – | – |
| Diameter 16 mm, chamfered | | | | | |
| **104 150** | Al | 1500 | – | 119 | 174 |
| **104 200** | Al | 2000 | – | – | 126 |
| **104 250** | Al | 2500 | – | – | 104 |
| **483 100** | St/tZn | 1000 | – | 182 | 240 |
| **483 125** | St/tZn | 1250 | – | 139 | 205 |
| **483 150** | St/tZn | 1500 | – | 116 | 166 |
| **483 200** | St/tZn | 2000 | – | – | 122 |
| With tapering, chamfered Ø16/10 mm | | | | | |
| **103 210** | Al | 1500 | – | 149 | 194 |
| **103 220** | Al | 2000 | – | 107 | 149 |
| **103 230** | Al | 2500 | – | – | 117 |
| **103 240** | Al | 3000 | – | – | 98 |
| With tapering, chamfered Ø16/10 mm, M16 thread | | | | | |
| **103 211** | Al | 1500 | – | 149 | 194 |
| **103 221** | Al | 2000 | – | 107 | 149 |
| **103 231** | Al | 2500 | – | – | 117 |
| Tubular air-termination rods w. tapering Ø16/10 mm | | | | | |
| **103 410** | Al | 1500 | – | 149 | 196 |
| **103 420** | Al | 2000 | – | 110 | 155 |
| **103 430** | Al | 2500 | – | – | 120 |
| **103 440** | Al | 3000 | – | – | 100 |
| **103 417** | Cu | 1500 | – | 143 | 215 |
| **103 419** | StSt | 1500 | – | 144 | 214 |
| **103 429** | StSt | 2000 | – | 105 | 147 |
| **103 439** | StSt | 2500 | – | – | 114 |
| **103 449** | StSt | 3000 | – | – | 95 |



## DEHNiso Spacers

Variable holder range for conductors and air-termination rods for maintaining the separation distance according to DIN EN 62305-3 (VDE 0185-305-3).
Spacer bar made of glass-fibre reinforced plastic (GRP), Ø16 mm, UV-stabilised, light grey colour.
The DEHNiso spacers meet the requirements of DIN/IEC TS 62561-8.




### With rod holder and fixing plate

Fixed conductor routing.



| General technical data: | |
|---|---|
| Conductor support Rd | 16 mm |
| Material of conductor holder | StSt |
| Fixing | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm |
| Permanent temperature range | -50 °C ... +100 °C |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type DIDH ... | 16 530 BP V2A GFK | 16 690 BP V2A GFK |
|---|---|---|
| Part No. | 106 115 | 106 120 |
| Length (l1) | 530 mm | 690 mm |
| Insulating clearance (l2) | 445 mm | 605 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type DIDH ... | 16 1030 BP V2A GFK |
|---|---|
| Part No. | 106 123 |
| Length (l1) | 1030 mm |
| Insulating clearance (l2) | 945 mm |
| PU | 1 pc(s) |

### With conductor holder and fixing plate

Fixed conductor routing.



| General technical data: | |
|---|---|
| Conductor support Rd | 7-10 mm |
| Material of conductor holder | StSt |
| Fixing | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm |
| Permanent temperature range | -50 °C ... +100 °C |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type DIDH ... | 7.10 530 BP V2A GFK | 7.10 690 BP V2A GFK |
|---|---|---|
| Part No. | 106 090 | 106 100 |
| Length (l1) | 530 mm | 690 mm |
| Insulating clearance (l2) | 445 mm | 605 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type DIDH ... | 7.10 1030 BP V2A GFK |
|---|---|
| Part No. | 106 105 |
| Length (l1) | 1030 mm |
| Insulating clearance (l2) | 945 mm |
| PU | 1 pc(s) |

### With rod holder and pipe clamp



| General technical data: | |
|---|---|
| Conductor support Rd | 16 mm |
| Material of conductor holder | StSt |
| Clamping range of pipe | 40-60 mm (1 1/4-2") |
| Permanent temperature range | -50 °C ... +100 °C |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type DIDH ... | 16 530 RS40.60 V2A | 16 690 RS40.60 V2A |
|---|---|---|
| Part No. | 106 225 | 106 226 |
| Length (l1) | 530 mm | 690 mm |
| Insulating clearance (l2) | 445 mm | 605 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type DIDH ... | 16 1030 RS40.60 V2A |
|---|---|
| Part No. | 106 228 |
| Length (l1) | 1030 mm |
| Insulating clearance (l2) | 945 mm |
| PU | 1 pc(s) |

## With rod holder and pipe clamp



| General technical data: | |
|---|---|
| Conductor support Rd | 16 mm |
| Material of conductor holder | StSt |
| Clamping range of pipe | 50-300 mm |
| Permanent temperature range | -50 °C ... +100 °C |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type DIDH ... | 16 530 SB50.300 V2A | 16 690 SB50.300 V2A |
|---|---|---|
| Part No. | 106 245 | 106 246 |
| Length (l1) | 530 mm | 690 mm |
| Insulating clearance (l2) | 445 mm | 605 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type DIDH ... | 16 1030 SB50.300 V2A |
|---|---|
| Part No. | 106 248 |
| Length (l1) | 1030 mm |
| Insulating clearance (l2) | 945 mm |
| PU | 1 pc(s) |

## With DEHNgrip conductor holder

For installation, e.g. in a concrete base (Part No. 102 075). Loose conductor routing.



| Type DIDH ... | 8 675 KT V2A GFK |
|---|---|
| Part No. | 106 160 |
| Conductor support Rd | 8 mm |
| Material of conductor holder | StSt |
| Length (l1) | 675 mm |
| Insulating clearance (l2) | 590 mm |
| Permanent temperature range | -50 °C ... +100 °C |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## With MMV clamp

For crossing points, when installed in a concrete base (Part No. 102 075), fixed conductor routing.



| Type DIDH ... | 6.10 675 MMV KT V2A GFK |
|---|---|
| Part No. | 106 150 |
| Conductor support Rd | 6-10 mm |
| Material of conductor holder | StSt |
| Length (l1) | 675 mm |
| Insulating clearance (l2) | 590 mm |
| Permanent temperature range | -50 °C ... +100 °C |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

Verisons with other spacer bar lengths are available upon request.

## Accessories for DEHNiso Spacers

### Spacer bar

Cut to length (variable length).



| Type | DIST 16 3000 GFK |
|---|---|
| Part No. | 106 125 |
| Material | GRP |
| Permanent temperature range | -50 °C ... +100 °C |
| Colour of spacer bar | light grey (RAL 7035) |
| Diameter Ø | 16 mm |
| Total length | 3000 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### Fixing bush

Variable fixing of conductor and rod holders on a spacer bar (Ø16 mm), with M8 female thread.



| Type | BB16 IGM8 ZG |
|---|---|
| Part No. | 106 126 |
| Material | ZDC |
| Female thread | M8 |
| Diameter Ø | 23 mm |
| PU | 20 pc(s) |

### Fixing plate

Base plate for fixing the spacer or spacer bar (Ø16 mm), e.g. on structural parts.



| Type | BP BB16 V2A ZG |
|---|---|
| Part No. | 106 127 |
| Material of fixing plate | StSt |
| Material of fixing bush | ZDC |
| Fixing | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm |
| Dimensions | 170 x 40 x 3 mm |
| PU | 20 pc(s) |

### Conductor holder with fixing bush

For fixing conductors on the GRP bar.



| Type | LH 7.10 BB16 V2A ZG |
|---|---|
| Part No. | 106 128 |
| Material of conductor holder | StSt |
| Conductor support Rd | 7-10 mm |
| Conductor routing | fixed |
| PU | 20 pc(s) |

### Rod holder with fixing bush

For fixing air-termination rods on the GRP bar.



| Type | SH 16 BB16 V2A ZG |
|---|---|
| Part No. | 106 129 |
| Material of conductor holder | StSt |
| Conductor support Rd | 16 mm |
| Conductor routing | fixed |
| PU | 20 pc(s) |

## Accessories for DEHNiso Spacers

### Spacers with conductor holder

For fixing conductors at different supports, fixed conductor routing.



| General technical data: | |
|---|---|
| Conductor support Rd | 7-10 mm |
| Material of conductor holder | StSt |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type DIDH ... | 7.10 515 V2A GFK16 | 7.10 675 V2A GFK16 |
|---|---|---|
| Part No. | 106 165 | 106 170 |
| Length (l1) | 515 mm | 675 mm |
| Insulating clearance (l2) | 435 mm | 595 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type DIDH ... | 7.10 1015 V2A GFK16 |
|---|---|
| Part No. | 106 175 |
| Length (l1) | 1015 mm |
| Insulating clearance (l2) | 935 mm |
| PU | 1 pc(s) |

### Spacers with rod holder

For fixing air-termination rods at different supports, fixed conductor routing.



| General technical data: | |
|---|---|
| Conductor support Rd | 16 mm |
| Material of conductor holder | StSt |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type DIDH ... | 16 515 V2A GFK16 | 16 675 V2A GFK16 |
|---|---|---|
| Part No. | 106 178 | 106 180 |
| Length (l1) | 515 mm | 675 mm |
| Insulating clearance (l2) | 435 mm | 595 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type DIDH ... | 16 1015 V2A GFK16 |
|---|---|
| Part No. | 106 185 |
| Length (l1) | 1015 mm |
| Insulating clearance (l2) | 935 mm |
| PU | 1 pc(s) |

### Fixing bolt

With M10 thread, nut, toothed lock washer and screw for accommodating the spacer bar.



| Type | BB16 GSM10 AL | BB16 GSM10 V2A |
|---|---|---|
| Part No. | 106 301 | 106 309 |
| Material of bolt | Al | StSt |
| Clamping range Rd | 16 mm | 16 mm |
| PU | 20 pc(s) | 20 pc(s) |

### Fixing bracket

With fixing bolt (Al) for spacer bar (Ø16 mm).



| Type BW90 ... | BB16 B5.1 6.5 11 V2A |
|---|---|
| Part No. | 106 311 |
| Material | StSt |
| Angle | 90° |
| Fixing | [4x] Ø5.1 / [2x] Ø6.5 / [2x] 11 x 20 mm |
| PU | 20 pc(s) |

### Fixing bracket

For DEHNiso spacer, with hole Ø11 mm.



| Type BW90 ... | B11 B5.1 6.5 11 V2A |
|---|---|
| Part No. | 106 310 |
| Material | StSt |
| Angle | 90° |
| Fixing | [4x] Ø5.1 / [2x] Ø6.5 / [2x] 11 x 20 mm |
| Dimensions | 110 x 60 x 30 mm |
| PU | 20 pc(s) |

### Fixing bracket

For DEHNiso spacer, with hole Ø11 mm.



| Type BW45 ... | B11 B5.1 6.5 11 V2A |
|---|---|
| Part No. | 106 315 |
| Material | StSt |
| Angle | 45° |
| Fixing | [4x] Ø5.1 / [2x] Ø6.5 / [2x] 11 x 20 mm |
| Dimensions | 104 x 54 x 30 mm |
| PU | 20 pc(s) |

### Corner bracket

With fixing bolt (Al) for spacer bar (Ø16 mm).



| Type EBW90 ... | BB16 B5.1 6.5 11 V2A |
|---|---|
| Part No. | 106 316 |
| Material | StSt |
| Angle | 90° |
| Fixing | [8x] Ø5.1 / [4x] Ø6.5 / [4x] 11x20 mm |
| Dimensions | 132 x 155 x 30 mm |
| PU | 1 pc(s) |

### Pipe clamp

With fixing bush for spacer bars (Ø16 mm) for pipes up to Ø60 mm.



| Type | RS D40.60 BB16 V2A ZG |
|---|---|
| Part No. | 106 352 |
| Material of clamp | StSt |
| Clamping range for pipe Ø | 40-60 mm (1 1/4-2") |
| Material of bush | ZDC |
| PU | 10 pc(s) |

## Pipe clamp

With fixing bush for spacer bars (Ø16 mm) for pipes up to Ø90 mm.



| Type | RS D70.90 BB16 V2A ZG |
|---|---|
| Part No. | 106 353 |
| Material of clamp | StSt |
| Clamping range for pipe Ø | 70-90 mm (2 1/4-3") |
| Material of bush | ZDC |
| PU | 1 pc(s) |

## Railing clamp

For square hollow profiles with bush for spacer bars (Ø16 mm).



| Type | BS 4K 20.50 BB16 ZG V2A |
|---|---|
| Part No. | 106 312 |
| Material | ZDC / StSt |
| Clamping range for square profile | 20 x 20 to 50 x 50 mm |
| PU | 5 pc(s) |

## Clip for fixing spacers to pipes

Fixing by means of tensioning straps up to 30 mm (e.g. tensioning strap 25 x 0.3 mm with grip head Part No. 106 323), with fixing bolt for spacer bar (Ø16 mm).



| Type | BB SPB30 BB16 V2A AL |
|---|---|
| Part No. | 106 321 |
| Material of clip | StSt |
| Material of bolt | Al |
| Width of slot (l x w) | 32 x 6 mm |
| Fixing | [2x] Ø11 mm |
| PU | 10 pc(s) |

## Attachment with fixing bush

For fixing spacers (Ø16 mm) to pipes, e.g. using a pipe clamp (Part No. 106 323).



| Type | AS SPB25 BB16 V2A |
|---|---|
| Part No. | 106 322 |
| Material | StSt |
| Width of slot (l x w) | 26 x 6 mm |
| Clamping range Rd | 16 mm |
| PU | 10 pc(s) |

## Pipe clamp

For fixing (clamping) conductor holders (e.g. Part No. 275 319).



| Type | BRS SPB25 50.300 V2A |
|---|---|
| Part No. | 106 323 |
| Material of head / strap | StSt |
| Clamping range Ø | 50-300 mm |
| Dimensions of strap | 1100 x 25 x 0.3 mm |
| Material of screw | StSt |
| PU | 10 pc(s) |

## Clip

Fixed on pipes using a tensioning strap (Part No. 540 901, dimensions 25 x 0.3 mm) in combination with a with grip head (Part No. 106 324), with square hole, suitable for M8 screws.



| Type | BUE SPB25 V2A |
|---|---|
| Part No. | 106 320 |
| Material | StSt |
| Clamping range of tube Ø | approx. 50-300 mm |
| PU | 20 pc(s) |

## Separate grip head

For combination with endless tensioning strap (Part No. 540 901) in case of larger pipe diameters.



| Type | SPK 25X0.3 V2A |
|---|---|
| Part No. | 106 324 |
| Material of head | StSt |
| For strap (w x d) | 25 x 0.3 mm |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| PU | 20 pc(s) |

## Tensioning strap



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| Part No. | 540 901 |
| Material | StSt |
| Strap dimensions (w x d) | 25 x 0.3 mm |
| Length | 100 m |
| PU | 1 pc(s) |

## Adapter for angled support

For air-termination rods (Ø16 mm) with 2 fixing bolts for spacer bars (Ø16 mm).



| Type | AD WAS 16 BB16 V2A |
|---|---|
| Part No. | 106 325 |
| Material | StSt |
| Clamping range Rd | 16 / 16 mm |
| PU | 10 pc(s) |

## Adapter for angled support

For supporting tubes DEHNiso Combi (Ø50 mm) with 2 fixing bolts for spacer bars (Ø16 mm).



| Type | AD WAS 50 BB16 V2A |
|---|---|
| Part No. | 106 326 |
| Material | StSt |
| Clamping range Rd | 50 / 16 mm |
| PU | 1 pc(s) |

## Accessories for DEHNiso Spacers

### Fixing adapters
For seam and connection clamps.



| General technical data: | |
|---|---|
| Material of bar | StSt |
| Bar Ø | 8 mm |
| Material of bush | ZDC |

| Type | BA RD8 BB16 V2A ZG | BA90 RD8 BB16 V2A ZG |
|---|---|---|
| Part No. | 106 340 | 106 341 |
| Angle | 0° | 90° |
| PU | 20 pc(s) | 20 pc(s) |

| Type | BA130 RD8 BB16 V2A ZG |
|---|---|
| Part No. | 106 342 |
| Angle | 130° |
| PU | 20 pc(s) |

### MV clamp
Especially for fixing air-termination rods to spacer bars without fixing bush.



| Type MVK ... | 16 16 FRM10X50 V2A |
|---|---|
| Part No. | 393 069 |
| Material | StSt |
| Conductor support Rd | 16 / 16 mm |
| Conductor routing | fixed |
| PU | 50 pc(s) |

### Connection clamp with fixing bolt
For fixing spacers (Ø16 mm), e.g. to steel girders.



| Type | AK 3.18 BB16 V2A AL |
|---|---|
| Part No. | 106 319 |
| Clamping range | 3-18 mm |
| Clamping range Rd | 16 mm |
| Material of fixing bolt | Al |
| Connection with | fixing bolt |
| PU | 1 pc(s) |

## Air-Termination Rods GRP/Al

For erecting isolated air-termination systems, e.g. on flat roofs, installed in a concrete base with fixing wedge.

The material factor $k_m$ = 0.7 is used to determine the separation distance (length of spacer bar).
Diameter 16 mm, UV-stabilised, light grey colour, permanent temperature range -50 to +100 °C.

The GRP/Al air-termination rods meet the requirements of DIN/IEC TS 62561-8.



### Crimped

| Type | FS 16 10 1660 GFK AL | FS 16 10 2000 GFK AL |
|---|---|---|
| Part No. | 106 207 | 106 210 |
| Total length (l1) | 1660 mm | 2000 mm |
| Insulating clearance (l2) | 635 mm | 975 mm |
| Material of air-termination tip / bush | Al | Al |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) | 10 pc(s) |

### Variable with M10 thread
e.g. for air-termination tip (Part No. 101 001), air-termination tip with MV clamp (Part No. 105 071) (for crossing points) or MV clamp for spanning cables (Part No. 105 079).



| Type | DIST 16 M10 675 GFK | DIST 16 M10 1015 GFK |
|---|---|---|
| Part No. | 106 217 | 106 220 |
| Total length (l1) | 675 mm | 1015 mm |
| Insulating clearance (l2) | 635 mm | 975 mm |
| Material of air-termination tip / bush | Al | Al |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) | 10 pc(s) |

## Accessories for Air-Termination Rods GRP/Al

### Air-termination tip with lock nut
Screw-in design



| Type | FS 10 1000 M10 V2A |
|---|---|
| Part No. | 101 001 |
| Material | StSt |
| Diameter Ø | 10 mm |
| Length | 1000 mm |
| Thread | M10 |
| Standard | EN 62561-2 |
| PU | 1 pc(s) |

### Air-termination tip with MV clamp

For screwing into the head of the supporting tube and fixing air-termination conductors (wires or cables).
With M10 thread.



| Type FSP ... | 10 1000 MVK 8.10 V2A |
|---|---|
| **Part No.** | **105 071** |
| Material of air-termination tip | StSt |
| Air-termination tip (l x Ø) | 1000 x 10 mm |
| Clamping range Rd | 8-10 mm |
| Thread | M10 |
| Standard | EN 62561-(1+2) |
| PU | 1 pc(s) |

### MV clamp for spanning cables

For screwing into the head of the supporting tube, with M10 screw, for spanning cables



| Type | MVK 8.10 M10 V2A |
|---|---|
| **Part No.** | **105 079** |
| Material | StSt |
| Clamping range Rd | 8-10 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## DEHNiso Roof Conductor Holders

Variable range of holders for keeping the separation distance when installing conductors on flat roofs.
Spacer bar made of glass-fibre reinforced plastic (GRP) Ø10 mm, UV-stabilised, light grey colour
Spacer with concrete block and base plate, for conductors Rd 8 mm.
The DEHNiso roof conductor holders are tested in line with DIN/IEC TS 62561-8.

Spacer with concrete block and base plate, loose conductor routing.

**Note:** Please contact us to find out whether the material of the roof conductor holder or base plate is compatible with the roof elements.



| Type DIDLH 8 ... | H295 D300 BS | H435 D300 BS |
|---|---|---|
| **Part No.** | **253 115** | **253 125** |
| Material of roof conductor holder | **plastic / GRP** | **plastic / GRP** |
| Length (l1) | 295 mm | 435 mm |
| Insulating clearance | 220 mm | 360 mm |
| Total weight | approx. 4.8 kg | approx. 4.8 kg |
| Permanent temperature range | -30 °C ... +80 °C | -30 °C ... +80 °C |
| Standard | Based on DIN IEC/TS 62561-8 (VDE V 0185-561-8) | Based on DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 24 pc(s) | 24 pc(s) |

## Accessories for DEHNiso Roof Conductor Holders

### Spacer bar with conductor holder

For insertion into the base plate (lock bush), stabilised with concrete block. For raised conductor routing, loose conductor routing.



| Type DILH ... | 8 DS10 L280 K GR GFK | 8 DS10 L420 K GR GFK |
|---|---|---|
| **Part No.** | **253 315** | **253 325** |
| Material of conductor holder | **plastic** | **plastic** |
| Length (l1) | 280 mm | 420 mm |
| Insulating clearance | 220 mm | 360 mm |
| Permanent temperature range | -30 °C ... +80 °C | -30 °C ... +80 °C |
| Standard | Based on DIN IEC/TS 62561-8 (VDE V 0185-561-8) | Based on DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 24 pc(s) | 24 pc(s) |

### Conductor holder with lock bush

For fixing the conductor to the GRP bar.



| Type | DILH 8 SB10 K GR |
|---|---|
| **Part No.** | **253 302** |
| Material | **plastic** |
| Colour | grey |
| Conductor support Rd | 8 mm |
| Permanent temperature range | -30 °C ... +80 °C |
| PU | 24 pc(s) |

### Spacer bar for DEHNiso roof conductor holders



Cut to length (variable length).

| Type | DIST 10 3000 GFK |
|---|---|
| **Part No.** | **253 310** |
| Material | **GRP** |
| Colour | light grey (RAL 7035) |
| Diameter Ø | 10 mm |
| Length | 3000 mm |
| Permanent temperature range | -30 °C ... +80 °C |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### Concrete block

For stabilising the base plate.



| Type BES 4.6KG ... | SB10 180X180X70 |
|---|---|
| **Part No.** | **253 301** |
| Material | **concrete (C35/45)** |
| Weight | 4.6 kg |
| Dimensions | 180 x 180 x 70 mm |
| PU | 24 pc(s) |

### Base plate

Base plate to hold the spacer bar (Part Nos. 253 315, 253 325) and conductor holder (Part No. 253 289) and to protect the roof sheeting under the concrete block (Part No. 253 301).



| Type | GP B10 H60 D300 KS GR |
|---|---|
| **Part No.** | **253 300** |
| Diameter Ø | 300 mm |
| Diameter Ø of lock bush | 10 mm |
| Height | 60 mm |
| Material | **plastic** |
| Colour | grey |
| PU | 24 pc(s) |

## DEHNiso Combi Sets

Components for isolated air-termination systems.
For protecting large roof-mounted structures, e.g. air-conditioning systems, heat exchangers, etc.
For keeping the separation distance to electrically conductive parts according to IEC/EN 62305-3.
The separation distance (insulating clearance) is determined with material factor $k_m$ = 0.7.

### One-piece, total height 4200 mm



Consisting of:

1x air-termination tip StSt, L = 1000 mm
(Part No. 105 071)

1x supporting tube GRP/Al, L = 3200 mm
(Part No. 105 300)

2x wall mounting bracket StSt
(Part No. 105 340)

1x spacer GRP/Al, L = 1030 mm
(Part No. 106 331)

| Type DICS WB ... | D50.10 4.2M GFK AL V2A |
|---|---|
| **Part No.** | **105 440** |
| Total length | 4200 mm |
| Number of fixing brackets | 2 |
| Length of supporting tube | 3200 mm |
| Max. free length with air-termination tip | 3500 mm |
| Material of supporting tube | **GRP / Al** |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### One-piece, total height 5700 mm



Consisting of:

1x air-termination tip StSt, L = 1000 mm
(Part No. 105 071)

1x supporting tube GRP/Al, L = 4700 mm
(Part No. 105 301)

3x wall mounting bracket StSt
(Part No. 105 340)

2x spacer GRP/Al, L = 1030 mm
(Part No. 106 331)

| Type DICS WB ... | D50 10 5700 GFK AL V2A |
|---|---|
| **Part No.** | **105 455** |
| Total length | 5700 mm |
| Number of fixing brackets | 3 |
| Length of supporting tube | 4700 mm |
| Max. free length with air-termination tip | 4000 mm |
| Material of supporting tube | **GRP / Al** |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Two-piece, total height 7200 mm



(transport length 3200 mm)

Consisting of:

1x air-termination tip StSt, L = 1000 mm
(Part No. 105 071)

1x supporting tube GRP/Al, L = 6200 mm
(Part No. 105 302)

3x wall mounting bracket StSt
(Part No. 105 340)

3x spacer GRP/Al, L = 1030 mm
(Part No. 106 331)

| Type DICS WB ... | D50 10 7200 GFK AL V2A |
|---|---|
| **Part No.** | **105 470** |
| Total length | 7200 mm |
| Number of fixing brackets | 3 |
| Length of supporting tube | 6200 mm |
| Max. free length with air-termination tip | 4000 mm |
| Material of supporting tube | **GRP / Al** |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Accessories for DEHNiso Combi Sets

### Supporting tubes GRP / Al



For isolated air-termination systems, with female thread, for air-termination tips or MV clamps for spanning cables.
One-piece.

| Type SR D50 M10 ... | 3200 GFK AL | 4700 GFK AL |
|---|---|---|
| **Part No.** | **105 300** | **105 301** |
| Material of supporting tube | **GRP / Al** | **GRP / Al** |
| Length of supporting tube (l1) | 3200 mm | 4700 mm |
| Outside diamter Ø | 50 mm | 50 mm |
| Length of insulating clearance | 1535 mm | 1535 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

### Supporting tube GRP / Al



For isolated air-termination systems, with female thread, for air-termination tips or MV clamps for spanning cables.
Also suitable for fixing the HVI Conductor.
Two-piece.

| Type SR D50 M10 ... | 6200 TB GFK AL |
|---|---|
| **Part No.** | **105 302** |
| Material of supporting tube | **GRP / Al** |
| Length of supporting tube | 6200 mm |
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1535 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Supporting tube GRP / Al

One-piece, combined with air-termination rod Ø16 / 10 mm, length 2500 mm, Al.



| Type | SR D50 3200 FS16.10 2500 GFK AL |
|---|---|
| **Part No.** | **105 306** |
| Material of supporting tube | **GRP / Al** |
| Total length | 5700 mm |
| Length of supporting tube | 3200 mm |
| Outside diamter Ø | 50 mm |
| Length of insulating clearance | 1535 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Air-termination tip with MV clamp

For screwing into the head of the supporting tube and fixing air-termination conductors (wires or cables).
With M10 thread.



| Type | FSP 10 1000 MVK 8.10 V2A |
|---|---|
| **Part No.** | **105 071** |
| Material of air-termination tip | StSt |
| Air-termination tip (l x Ø) | 1000 x 10 mm |
| Clamping range Rd | 8-10 mm |
| Thread | M10 |
| Standard | EN 62561-(1+2) |
| PU | 1 pc(s) |

## MV clamp for spanning cables

For screwing into the head of the supporting tube, with M10 screw, for spanning cables.



| Type | MVK 8.10 M10 V2A |
|---|---|
| **Part No.** | **105 079** |
| Material | StSt |
| Clamping range Rd | 8-10 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Wall mounting bracket for horizontal mounting, flat

For fixing supporting tubes onto the structure to be protected or the wall.



| Type | WB D50 WA V2A |
|---|---|
| **Part No.** | **105 340** |
| Material | StSt |
| Clamping range for supporting tube | 50 mm |
| Distance from wall / corner | 80 mm |
| Dimensions of fixing | 320 mm |
| Fixing | [8x] Ø5.1 / [4x] 11 x 20 mm |
| PU | 1 pc(s) |

## Wall mounting bracket for horizontal mounting, corner

For fixing supporting tubes onto the structure to be protected or the wall.



| Type | EB D50 WA V2A |
|---|---|
| **Part No.** | **105 341** |
| Material | StSt |
| Clamping range for supporting tube | 50 mm |
| Distance from wall / corner | 80 mm |
| Dimensions of fixing | 152 mm |
| Fixing | [8x] Ø5.1 / [4x] 11 x 20 mm |
| PU | 1 pc(s) |

## Wall mounting bracket for vertical mounting

For attaching supporting tubes or air-termination rods D40 / D50 to roof-mounted structures or walls.



| Type WB ... | D40.50 SE WA46 V2A | D40.50 SE WA110 V2A |
|---|---|---|
| **Part No.** | **105 342** | **105 348** |
| Material of bracket | StSt | StSt |
| Fixing | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm |
| Clamping range for supporting tube | 40-50 mm | 40-50 mm |
| Distance from wall | 46 mm | 110 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Wall mounting bracket, adjustable from 150-200 mm

For attaching supporting tubes or air-termination rods D40 / D50, with double clamp for connecting 2x Rd 8-10 mm.



| Type WB ... | D40.50 V150.200 V2A |
|---|---|
| **Part No.** | **105 344** |
| Material of bracket | StSt |
| Clamping range for supporting tube | 40-50 mm |
| Distance from wall | 150-200 mm |
| Dimensions of plate | 120 x 120 x 4 mm |
| Fixing | [4x] 12 x 26 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Wall mounting bracket, adjustable from 230-1300 mm

For fixing supporting tubes or air-termination rods D40 / D50.



| General technical data: | |
|---|---|
| Material of bracket | St/tZn / StSt |
| Clamping range for supporting tube | 40-50 mm |
| Dimensions of plate | 120 x 120 x 4 mm |
| Fixing | [4x] 12 x 26 mm |

| Type | WB D40.50 V230.400 STTZN V2A | WB D40.50 V400.700 STTZN V2A |
|---|---|---|
| **Part No.** | **105 347** | **105 343** |
| Distance from wall | 230-400 mm | 400-700 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type | WB D40.50 V700.1300 STTZN V2A |
|---|---|
| **Part No.** | **105 349** |
| Distance from wall | 700-1300 mm |
| PU | 1 pc(s) |

## Accessories for DEHNiso Combi Sets

### Fixing clamp with tensioning strap
For fixing supporting tubes to structural elements, e.g. antenna masts.



| Type BS ... | D50 SB50.300 V2A |
|---|---|
| Part No. | 105 360 |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| PU | 1 pc(s) |

### Fixing clamp with tensioning strap
With additional spacer for adjusting the sector antenna supports to the mast.



| Type BS ... | D50 DS30 SB50.300 V2A |
|---|---|
| Part No. | 105 361 |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| Length of spacer | 30 mm |
| PU | 1 pc(s) |

### Fixing clamp with tensioning strap
With additional long spacer for adjusting sector antenna supports to the mast.



| Type BS ... | D50 DS90 SB50.300 V2A |
|---|---|
| Part No. | 105 362 |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| Length of spacer | 95 mm |
| PU | 1 pc(s) |

### Railing clamp
For pipes.



| Type BS ... | D40.50 D48.60 V2A |
|---|---|
| Part No. | 105 354 |
| Material | StSt |
| Clamping range for pipe Ø | 48-60 mm (1 1/2-2") |
| Clamping range for supporting tube | 40-50 mm |
| PU | 5 pc(s) |

### Railing clamp
With spacer for adjusting, e.g. antenna supports.



| Type BSC ... | D40 DS95 D45.65 V2A |
|---|---|
| Part No. | 105 162 |
| Material | StSt |
| Clamping range for pipe Ø | 45-65 mm (1 1/2-2") |
| Clamping range for supporting tube | 40-50 mm |
| Length of spacer | 95 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Railing clamp
For pipes.



| Type | BS D40.50 D70.90 V2A |
|---|---|
| Part No. | 105 355 |
| Material | StSt |
| Clamping range for pipe Ø | 70-90 mm (2 1/4-3") |
| Clamping range for supporting tube | 40-50 mm |
| PU | 1 pc(s) |

### Railing clamp
For square hollow profiles.



| Type | BS D40.50 4K20.50 V2A | BS D40.50 4K60.120 V2A |
|---|---|---|
| Part No. | 105 356 | 105 376 |
| Material | StSt | StSt |
| Clamping range for square profile | 20 x 20 to 50 x 50 mm | 60 x 120 mm |
| Clamping range for supporting tube | 40-50 mm | 40-50 mm |
| PU | 5 pc(s) | 1 pc(s) |

### Pipe clamp
With fixing bush for spacer bars (Ø16 mm) for pipes up to Ø60 mm.



| Type | RS D40.60 BB16 V2A ZG |
|---|---|
| Part No. | 106 352 |
| Material of clamp | StSt |
| Clamping range for pipe Ø | 40-60 mm (1 1/4-2") |
| Material of bush | ZDC |
| PU | 10 pc(s) |

### Pipe clamp
With fixing bush for spacer bars (Ø16 mm) for pipes up to Ø90 mm.



| Type | RS D70.90 BB16 V2A ZG |
|---|---|
| Part No. | 106 353 |
| Material of clamp | StSt |
| Clamping range for pipe Ø | 70-90 mm (2 1/4-3") |
| Material of bush | ZDC |
| PU | 1 pc(s) |

## Railing clamp

For square hollow profiles with bush for spacer bars (Ø16 mm).



| Type | BS 4K 20.50 BB16 ZG V2A |
|---|---|
| **Part No.** | **106 312** |
| Material | **ZDC / StSt** |
| Clamping range for square profile | 20 x 20 to 50 x 50 mm |
| PU | 5 pc(s) |

## Spacers for supporting tubes

For fixing conductors to the supporting tube and keeping the separation distance according to IEC/EN 62305-3.



| Type | DIDH 7.10 690 D50 V2A | DIDH 7.10 1030 D50 V2A |
|---|---|---|
| **Part No.** | **106 328** | **106 331** |
| Material of spacer | **GRP** | **GRP** |
| Material of fixing element | **StSt** | **StSt** |
| Total length (l1) | 690 mm | 1030 mm |
| Insulating clearance (l2) | 605 mm | 945 mm |
| Permanent temperature range | -50 °C ... +100 °C | -50 °C ... +100 °C |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

## Tripod for DEHNiso Combi

For the free erection of supporting tubes Ø50 mm or air-termination rods Ø40 mm, length 3,200 mm (e.g. part no. 105 300 or 105 440) without additional fixing to structural elements.
Adjustable to the roof inclination up to max. 10°.
Connection with double clamp for 2x Rd 8–10 mm [lightning-current-carrying capability 100 kA (10/350 µs)].
The stackable concrete base (part no. 102 010) and the plastic base plate (part no. 102 050) have to be ordered separately.



Hinged for transport.

| Type DBS KB ... | D40.50 RA560 STTZN |
|---|---|
| **Part No.** | **105 200** |
| Material of tripod | **St/tZn** |
| Support | 40 / 50 mm |
| Number of concrete bases | 6 / 9 blocks, 17 kg each |
| Radius | 560 mm |
| Space required for tripod | 1200 x 1330 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Tripod D50

For the free erection of supporting tubes Ø50 mm with a length of 4.7–6.2 m (e.g. part no. 105 455 or 105 470) without additional fixing to structural elements.
Adjustable to the roof inclination up to max. 10°.
Connection with double clamp for 2x Rd 8–10 mm [lightning-current-carrying capability 100 kA (10/350 µs)].
The stackable concrete base (part no. 102 010) and the plastic base plate (part no. 102 050) have to be ordered separately.

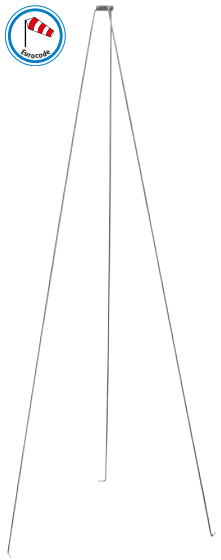


Hinged for transport.

| Type DBS KB ... | D40.50 RA1435 STTZN |
|---|---|
| **Part No.** | **105 201** |
| Material of tripod | **St/tZn** |
| Support | 40 / 50 mm |
| Number of concrete bases | 3-12 blocks, 17 kg each |
| Radius | 1435 mm |
| Required space for tripod | 2530 x 2850 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Bracing

Brace, 3x with clamp for pipe, Ø50 mm for fixing to the tripod (part no. 105 201). Brace suitable for supporting tubes with a length of 4700 mm (e.g. part nos 105 332, 105 316, 105 333, 105 317, 105 322, 105 323, 105 565, 105 575).



| Type | ABST 3F D50 2900 V2A |
|---|---|
| **Part No.** | **105 601** |
| Material | **StSt** |
| Brace length | 2910 mm |
| Ø clamp | 50 mm |
| PU | 1 pc(s) |

**Max. Gust wind speeds in km/h for air-termination systems.**

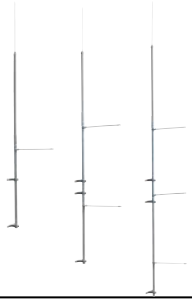
## DEHNiso Spacers

| Part No. | holder distance | DEHNalu wire | 1x 8.5 kg | 1x 17 kg | 2x 17 kg |
|---|---|---|---|---|---|
| **106 160** | 1000 mm | Ø8 mm | 104 | 176 | – |
| **106 150** | 1000 mm | Ø8 mm | 104 | 176 | – |
| **106 165** | 1000 mm | Ø8 mm | 125 | 219 | – |
| **106 170** | 1000 mm | Ø8 mm | 104 | 176 | – |
| **106 175** | 1000 mm | Ø8 mm | – | 125 | – |
| **106 207** | 1000 mm | Ø8 mm | – | 114 | 129 |
| **106 210** | 1000 mm | Ø8 mm | – | 93 | 105 |



## DEHNiso Combi Sets

| Part No. | length | free length with air-termination tip | |
|---|---|---|---|
| **105 440** | 4200 mm | 3500 mm | 234 |
| **105 455** | 5700 mm | 4000 mm | 212 |
| **105 470** | 7200 mm | 4000 mm | 212 |



## DEHNiso Roof Conductor Holders

| Part No. | holder distance | DEHNalu wire | concrete base 4.6 kg |
|---|---|---|---|
| **253 115** | 1000 mm | Ø8 mm | 163 |
| **253 125** | 1000 mm | Ø8 mm | 125 |



# HVI
# Lightning Protection

Discover our HVI lightning protection:
**https://de.hn/7RAAQ**


HVI light plus Conductor — Page 112
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HVI Conductor — Page 126
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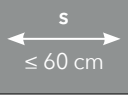
# HVI Lightning Protection

## HVI light plus Conductor

NEW

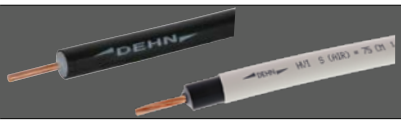


**Separation distance**
**s** ≤ 60 cm „air"
**s** ≤ 120 cm „solid material"

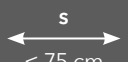



| | |
|---|---|
| Outer diameter / colour | 21 mm / grey |
| Equivalent separation distance (air) | ≤ 60 cm |
| Equivalent separation distance (solid material) | ≤ 120 cm |
| Operating temperature | -30 °C ... +70 °C |
| Tested with $I_{imp}$ (10/350 µs) based on EN 62561-1 | H1 / 150 kA |
| For use in class of LPS in case of a single down conductor without current distribution ($k_c$ = 1) | II, III, IV |
| Installation in Ex zone 1 and 21 | allowed |
| Maximum permissible conductor length LPL II (at $k_c$ = 1) | 10 m |
| Maximum permissible conductor length LPL III / IV (at $k_c$ = 1) | 15 m |

## HVI Conductor

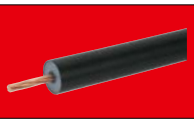



**Separation distance**
**s** ≤ 75 cm „air"
**s** ≤ 150 cm „solid material"




| | |
|---|---|
| Outer diameter / colour | 20 mm / black or 23 mm / grey |
| Equivalent separation distance (air) | ≤ 75 cm |
| Equivalent separation distance (solid material) | ≤ 150 cm |
| Operating temperature | -30 °C ... +70 °C |
| Tested with $I_{imp}$ (10/350 µs) based on EN 62561-11 | 150 kA |
| For use in class of LPS in case of a single down conductor without current distribution ($k_c$ = 1) | II, III, IV |
| Installation in Ex zone 1 and 21 | allowed |
| Maximum permissible conductor length LPL II (at $k_c$ = 1) | 12.5 m |
| Maximum permissible conductor length LPL III / IV (at $k_c$ = 1) | 18.75 m |

## HVI power Conductor



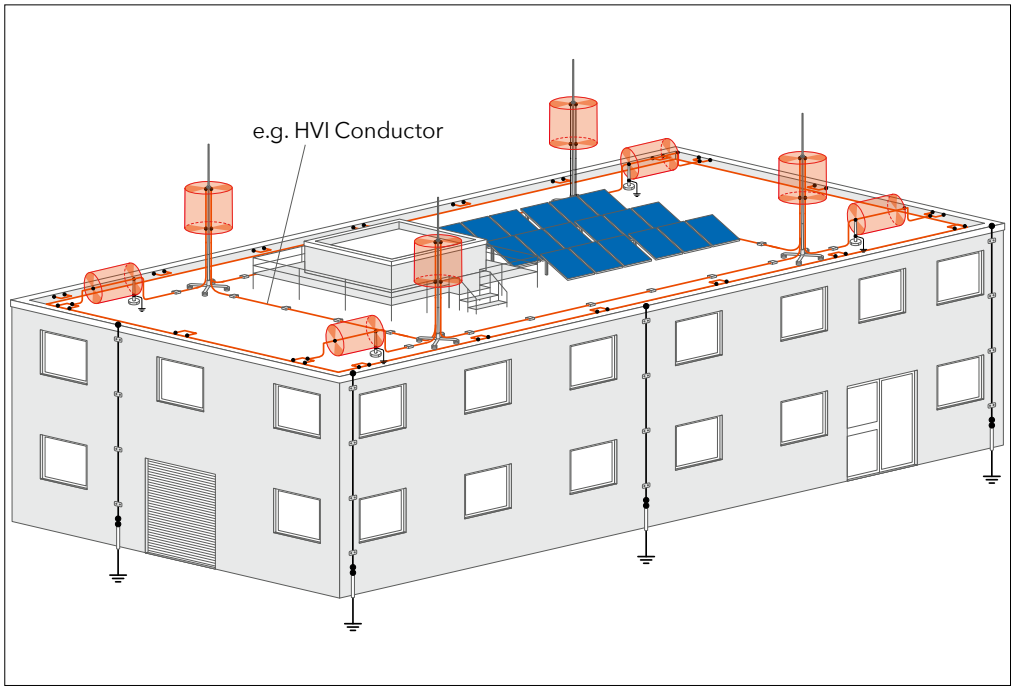
**Separation distance**
**s** ≤ 90 cm „air"
**s** ≤ 180 cm „solid material"




| | |
|---|---|
| Outer diameter / colour | 27 mm / black |
| Equivalent separation distance (air) | ≤ 90 cm |
| Equivalent separation distance (solid material) | ≤ 180 cm |
| Operating temperature | -30 °C ... +70 °C |
| Tested with $I_{imp}$ (10/350 µs) based on EN 62561-1 | 200 kA |
| For use in class of LPS in case of a single down conductor without current distribution ($k_c$ = 1) | I, II, III, IV |
| Installation in Ex zone 1 and 21 | allowed |
| Maximum permissible conductor length LPL I (at $k_c$ = 1) | 11.25 m |
| Maximum permissible conductor length LPL II (at $k_c$ = 1) | 15.0 m |
| Maximum permissible conductor length LPL III / IV (at $k_c$ = 1) | 22.5 m |

# HVI Lightning Protection

## Partly isolated lightning protection system for an administration building



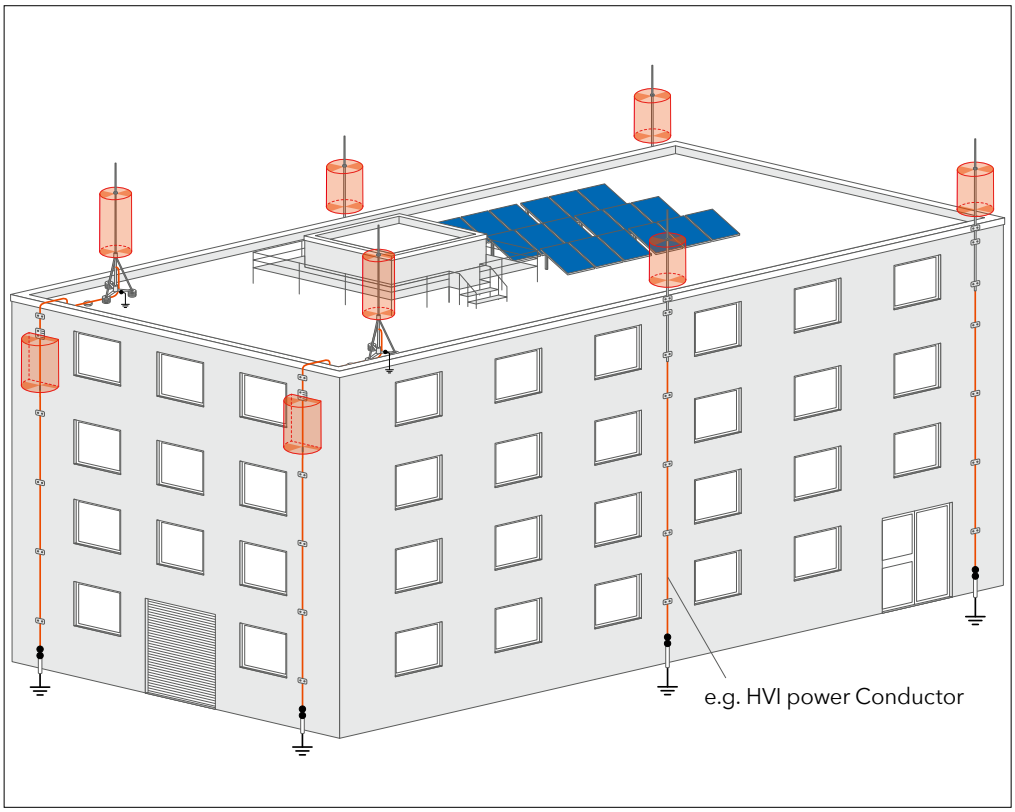

Product







## Partly isolated lightning protection system for an industrial building



# HVI light plus Conductor



| Technical data | HVI light plus Conductor (on a reel) | HVI light plus Conductor (cut to length) |
|---|---|---|
| Picture |  |  |
| Structure | solid | solid |
| Cross section of the inner conductor (Cu) | 19 mm² | 19 mm² |
| Colour of conductor | signal grey (RAL 7004) | signal grey (RAL 7004) |
| Outer diameter | 21 mm | 21 mm |
| Equivalent separation distance (air) | ≤ 60 cm | ≤ 60 cm |
| Equivalent separation distance (solid material) | ≤ 120 cm | ≤ 120 cm |
| Minimum bending radius | 210 mm | 210 mm |
| Operating temperature | -30 °C ... +70 °C | -30 °C ... +70 °C |
| Installation temperature | -5 °C ... +40 °C | -5 °C ... +40 °C |
| Tensile strength | 800 N | 800 N |
| UV / weather-resistant | yes | yes |
| Tested with $I_{imp}$ (10/350 µs) based on EN 62561-1 | H1 / 150 kA | H1 / 150 kA |
| For use in class of LPS in case of a single down conductor without current distribution ($k_c$ = 1) | II, III, IV | II, III, IV |
| Installation in Ex zone 1 and 21 | allowed | allowed |
| Max. order length | 100 m / 500 m | 6 m ... 70 m |
| Cable weight / 100 m | 45 kg | – |

## Supporting tube with HVI light plus Conductor

Discreet supporting tube with pre-assembled, internal HVI light plus Conductor with low wind exposed surface.
Wide choice of lengths, from 6 m to 70 m.

### HVI light plus Conductor inside the supporting tube with air-termination tip

Supporting tube with internal sealing end / EB spring element and air-termination tip, StSt, Ø10 mm, length 500 / 1,000 mm.



| General technical data: | |
|---|---|
| Material of air-termination tip | StSt |
| Material of supporting tube | GRP / Al |
| Outside diameter Ø | 40 mm |
| Diameter Ø conductor | 21 mm |
| Material of conductor | Cu |
| Minimum order length | 6 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type HVI LI PL L6M ... | SR1600 FSP500 GFK AL V2A | SR1600 FSP1000 GFK AL V2A |
|---|---|---|
| Part No. | 819 672 | 819 673 |
| Length of air-termination tip | 500 mm | 1000 mm |
| Length of supporting tube | 1600 mm | 1600 mm |
| Transport length | 1600 mm | 1600 mm |
| Colour of conductor | grey | grey |
| PU | 1 pc(s) | 1 pc(s) |

| Type HVI LI PL L6M ... | SR2400 FSP500 GFK AL V2A | SR2400 FSP1000 GFK AL V2A |
|---|---|---|
| Part No. | 819 674 | 819 675 |
| Length of air-termination tip | 500 mm | 1000 mm |
| Length of supporting tube | 2400 mm | 2400 mm |
| Transport length | 2400 mm | 2400 mm |
| Colour of conductor | grey | grey |
| PU | 1 pc(s) | 1 pc(s) |

Specifications regarding max. gust wind speeds of the air-termination systems can be found in the wind load matrix.

## Air-termination mast for HVI light plus Conductor on flat roofs

Complete kit, consisting of air-termination tip/rod, supporting tube, fixing kit and stand for installation on flat roofs (installation outside the tube).

Specifications regarding max. gust wind speeds of the air-termination systems can be found in the wind load matrix.

### Air-termination mast with small tripod and air-termination tip



| Type FM D40 ... | L2200 GFK AL V2A DBS R320 STTZN | L2700 GFK AL V2A DBS R320 STTZN |
|---|---|---|
| Part No. | 819 685 | 819 690 |
| Height | 2200 mm | 2700 mm |
| Material of tripod | St/tZn | HDG steel (St/tZn) |
| Radius of tripod | 320 mm | 320 mm |
| Material of supporting tube | GRP / Al | GRP / Al |
| Length of supporting tube | 1600 mm | 1600 mm |
| Length of air-termination tip | 500 mm | 1000 mm |
| Material of air-termination tip | StSt | StSt |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

### Air-termination mast with large tripod and air-termination tip



| Type FM D40 L2700 GFK AL V2A DBS ... | R560 STTZN |
|---|---|
| Part No. | 819 682 |
| Height | 2700 mm |
| Material of tripod | St/tZn |
| Radius of tripod | 560 mm |
| Material of supporting tube | GRP / Al |
| Length of supporting tube | 1600 mm |
| Length of air-termination tip | 1000 mm |
| Material of air-termination tip | StSt |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Air-termination mast with large tripod and air-termination rod



| Type FM D40 ... | L3700 GFK AL DBS R560 STTZN | L4700 GFK AL DBS R560 STTZN |
|---|---|---|
| Part No. | 819 687 | 819 680 |
| Height | 3700 mm | 4700 mm |
| Material of tripod | HDG steel (St/tZn) | HDG steel (St/tZn) |
| Radius of tripod | 560 mm | 560 mm |
| Material of supporting tube | GRP / Al | GRP / Al |
| Length of supporting tube | 1600 mm | 1600 mm |
| Length of air-termination rod | 2000 mm | 3000 mm |
| Material of air-termination rod | AlMgSi | AlMgSi |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

## Air-termination mast with HVI light plus Conductor

The air-termination mast for extreme heights, including discreet supporting tube and pre-assembled HVI light plus Conductor installed inside the tube.



| Type | FM 60 L9M IP HVI LI PL GFK AL STTZN |
|---|---|
| **Part No.** | **819 735** |
| Total length of air-termination mast | 8800 mm |
| Length of air-termination rod | 1500 mm |
| Length of supporting tube | 1600 mm |
| Length of mast pipe | 6000 mm |
| Diameter Ø conductor | 21 mm |
| Colour of conductor | grey |
| Material of conductor | Cu |
| Minimum order length | 10 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

Specifications regarding max. gust wind speeds of the air-termination systems can be found in the wind load matrix.

## Air-termination mast with HVI light plus Conductor for metal and roof rafter brackets

Discreet supporting tube for installation on a metal roof/roof rafter bracket with pre-assembled, internal HVI light plus Conductor.



| Type | HVI LI PL L6M SR2680 FSP1000 GFK AL V2A |
|---|---|
| **Part No.** | **819 688** |
| Material of supporting tube | GRP / Al |
| Length of supporting tube | 2680 mm |
| Transport length | 2680 mm |
| Length of air-termination tip | 1000 mm |
| Diameter Ø conductor | 21 mm |
| Colour of conductor | grey |
| Material of conductor | Cu |
| Equivalent separation distance s (air) | ≤ 60 cm |
| Minimum order length | 6 m |
| Max. order length | 70 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

Specifications regarding max. gust wind speeds of the air-termination systems can be found in the wind load matrix.

## HVI light plus Conductor

HVI light plus Conductor is supplied in reels, either cut to length or pre-assembled.

### HVI light plus Conductor (pre-assembled, installation inside the supporting tube)

With one head piece for inside installation and one connection element (enclosed loose).
Minimum order length 6 m, conductor length has to be stated when ordering (in 0.5 m steps).



| Type HVI LI PL ... | RIV 60 21 L6M GR |
|---|---|
| **Part No.** | **819 636** |
| Material of conductor | Cu |
| Material of insulation | PE |
| Material of sheath | PE |
| Colour of conductor | grey |
| Diameter Ø conductor | 21 mm |
| Minimum order length | 6 m |
| Max. order length | 70 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### HVI light plus Conductor (Pre-assembled, installation outside the supporting tube)

With one head piece for outside installation and one connection element (enclosed loose).
Minimum order length 6 m, conductor length has to be stated when ordering (in 0.5 m steps).



| Type HVI LI PL ... | RAV 60 21 L6M GR |
|---|---|
| **Part No.** | **819 638** |
| Material of conductor | Cu |
| Material of insulation | PE |
| Material of sheath | PE |
| Colour of conductor | grey |
| Diameter Ø conductor | 21 mm |
| Minimum order length | 6 m |
| Max. order length | 70 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### HVI light plus Conductor (Supplied in reels)

The HVI light plus Conductor for on-site assembly comes on a disposable plywood reel. Hexagon socket wrench included in delivery. Length 100 / 500 m.



| Type HVI LI PL ... | 60 21 L100M GR | 60 21 L500M GR |
|---|---|---|
| **Part No.** | **819 600** | **819 605** |
| Material of conductor | Cu | Cu |
| Material of insulation | PE | PE |
| Material of sheath | PE | PE |
| Colour of conductor | grey | grey |
| Diameter Ø conductor | 21 mm | 21 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 100 m | 500 m |

## HVI light plus Conductor (Cut to length)



HVI light plus Conductor Cut to length for on-site assembly. The conductor is delivered as a coil.
Please specify conductor length when ordering (0.5 m steps).

| Type HVI LI PL ... | 60 21 L .. GR |
|---|---|
| **Part No.** | **819 609** |
| Material of conductor | Cu |
| Material of insulation | **PE** |
| Material of sheath | **PE** |
| Colour of conductor | grey |
| Diameter Ø conductor | 21 mm |
| Minimum order length | 6 m |
| Max. order length | 70 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

HVI check:
**https://de.hn/6iNdZ**

## Testable, insulated connection elements for HVI light plus Conductor



| General technical data: | | |
|---|---|---|
| Suitable for | | HVI light plus |
| Material | | StSt / **plastic** |
| Lightning current carrying capability (10/350 µs) | | 150 kA |

| **Part No.** | **819 646** | **819 647** |
|---|---|---|
| It should be installed | Earth-side | Installation inside the tube |
| Connection | Bolt Ø10 mm, L 50 mm with M12 thread with spring washer | Special mushroom head |
| PU | 5 pc(s) | 5 pc(s) |

| Type AE ISO ... | RAV KF HVI 60 V2A |
|---|---|
| **Part No.** | **819 648** |
| It should be installed | Installation outside the tube |
| Connection | Bolt Ø10 mm, L 50 mm with M12 thread with spring washer |
| PU | 5 pc(s) |

## Connection elements for HVI light plus Conductor

Mounting-optimised connection elements for routing inside/outside the tube and connection to the earthing system or ring conductor or other parts of the external lightning protection system.

## Connection element for HVI light plus Conductor



A connection element for sealing the HVI light plus Conductor, for implementing the sealing end of the conductor on the supporting tube (head piece) or for connecting to other parts of the external lightning protection system or earth-termination system (including a heat-shrinkable sleeve).
This connection element can be used for installation outside the tube for HVI light plus supporting tubes.

| Type | AE BO10 KF HVI 60 V2A |
|---|---|
| **Part No.** | **819 640** |
| Material | StSt |
| Connection | bolt Ø10 mm, L 50 mm |
| Diameter Ø connection element | 21 mm |
| Lightning current carrying capability (10/350 µs) | 150 kA |
| PU | 10 pc(s) |

## Connection kit for HVI light plus Conductor for installation inside the tube



Two connection elements for sealing the HVI light plus Conductor at both ends. A connection element for implementing the sealing end of the conductor in the supporting tube (head piece) and a connection element for connecting to other parts of the external lightning protection system or earth-termination system (including two heat-shrinkable sleeves).
These connection elements can be used with HVI light plus supporting tubes.

| Type | HVI LI PL ASS RIV KF V2A |
|---|---|
| **Part No.** | **819 645** |
| Material | StSt |
| Connection | bolt Ø10 mm, L 50 mm |
| Diameter Ø connection element | 21 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Measuring point terminal



Measuring points for HVI check.

| Type | MPK 18 V2A |
|---|---|
| **Part No.** | **819 649** |
| Suitable for | HVI light plus and HVI |
| Material | StSt |
| Clamping range Ø | 18–20 mm |
| PU | 5 pc(s) |

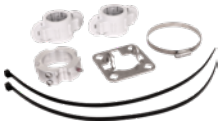
## EB element



For discharging the electric field of the HVI light plus Conductor in the sealing end range or in other cases.

| Type | PAE 18 EX AB11 V2A |
|---|---|
| **Part No.** | **410 222** |
| Material | StSt |
| Clamping range Ø | 18 mm |
| Connection hole Ø | 10.5 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Air-termination mast fixing kit, D40



Fixing kit for attaching the HVI light plus Conductor to the HVI light plus supporting tubes, Ø40 mm, consisting of connection plate and fixing ring with stainless steel clamp for the sealing end (including four plastic holder halves and two cable ties).

| Type | BFS SR D40 4AE HVI LI PL AL V2A KST |
|---|---|
| **Part No.** | **819 642** |
| Material | StSt / Al / **Plastic** |
| Connection plate support | square hole 13 mm |
| Conductor holder | 4x |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Air-termination mast fixing kit, D50



Fixing kit for attaching the HVI light plus Conductor to the HVI supporting tubes, Ø50 mm, consisting of connection plate and fixing ring with stainless steel clamp for the sealing end (including four plastic holder halves and two cable ties).

| Type | BFS SR D50 4AE HVI LI PL AL V2A KST |
|---|---|
| **Part No.** | **819 283** |
| Material | StSt / Al / **Plastic** |
| Connection plate support | Square hole, 13 mm |
| Conductor holder | 4x |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Connection plate



Connection plate (for four conductors) for installing the HVI light plus Conductor on the supporting tube Ø40 mm (e.g. Part No. 105 672, 105 673, 105 677, 105 678).

| Type | AP SR D40 4AE HVI LI PL V2A |
|---|---|
| **Part No.** | **819 298** |
| Material | StSt |
| Connection plate support | Square hole, 13 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Accessories for Connection elements for HVI light plus Conductor

### Fixing kit for D40/50 supporting tubes



Fixing kit for installing the HVI light plus Conductor or HVI long Conductor on supporting tubes, consisting of two half shells and one cable tie for fixing up to four HVI Conductors in the GRP area of the supporting tube.

| Type | BFS SR D50 4AE HVI KST | BFS SR D40 4AE HVI LI PL KST |
|---|---|---|
| **Part No.** | **819 297** | **819 296** |
| Material | **Plastic** | **Plastic** |
| Diameter Ø | 50 mm | 40 mm |
| Conductor holder | 4x | 4x |
| PU | 1 pc(s) | 1 pc(s) |

### Heat-shrinkable sleeve, grey



| Type | WSS L120 GR |
|---|---|
| **Part No.** | **819 997** |
| Material | **PE** |
| Length (l) | 120 mm |
| Inner diameter (d) | 32 mm |
| Colour | grey |
| PU | 10 pc(s) |

## Supporting tubes for HVI light plus Conductor

Discreet supporting tube with/without side outlet and for metal roof/roof rafter bracket.

### Without side outlet



Supporting tube with internal sealing end / EB spring element **without** side outlet. Air-termination tip, StSt, Ø10 mm, length 500/1000 mm.

| **General technical data:** | |
|---|---|
| Outside diameter Ø | 40 mm |
| Length of insulating clearance | 1230 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D40 ... | 1600 FSP500 HVI LI PL GFK AL V2A | 1600 FSP1000 HVI LI PL GFK AL V2A |
|---|---|---|
| **Part No.** | **105 672** | **105 673** |
| Length of air-termination tip | 500 mm | 1000 mm |
| Material of supporting tube | **GRP / Al** | **GRP / Al** |
| Length of supporting tube | 1600 mm | 1600 mm |
| Transport length | 1600 mm | 1600 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D40 ... | 2400 FSP500 HVI LI PL GFK AL V2A | 2400 FSP1000 HVI LI PL GFK AL V2A |
|---|---|---|
| **Part No.** | **105 674** | **105 675** |
| Length of air-termination tip | 500 mm | 1000 mm |
| Material of supporting tube | **GRP / Al** | **GRP / Al** |
| Length of supporting tube | 2400 mm | 2400 mm |
| Transport length | 2400 mm | 2400 mm |
| PU | 1 pc(s) | 1 pc(s) |

### With side outlet



Supporting tube with internal sealing end / EB spring element **with** side outlet | air-termination tip, StSt, Ø10 mm, length: 500 / 1,000 mm.

| Type SR D40 ... | 2400 FSP500 SA HVI LI PL GFK AL | 2400 FSP1000 SA HVI LI PL GFK AL |
|---|---|---|
| **Part No.** | **105 677** | **105 678** |
| Length of air-termination tip | 500 mm | 1000 mm |
| Material of supporting tube | **GRP / Al** | **GRP / Al** |
| Length of supporting tube | 2400 mm | 2400 mm |
| Transport length | 2400 mm | 2400 mm |
| Outside diameter Ø | 40 mm | 40 mm |
| Length of insulating clearance | 1230 mm | 1230 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

### For metal roof/roof rafter bracket



Supporting tube with internal sealing end / EB spring element for sub-roof installation. Air-termination tip, StSt, Ø10 mm, length 1000 mm.

| Type SR D40 ... | 2680 FSP1000 DSH GFK AL V2A |
|---|---|
| **Part No.** | **105 688** |
| Length of air-termination tip | 1000 mm |
| Material of supporting tube | **GRP / Al** |
| Length of supporting tube | 2680 mm |
| Transport length | 2680 mm |
| Outside diameter Ø | 40 mm |
| Length of insulating clearance | 1230 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Conductor holder for HVI light plus Conductor in hazardous areas

Special conductor holders for the HVI light plus Conductor for use in Ex zones 1 and 21.

### HVI light plus Ex W55 holder

For fixing to metal structural components (e.g. façades) in Ex zones 1 and 21.



| Type | LH ZS 18 EX W55 BP V2A |
|---|---|
| **Part No.** | **275 460** |
| Material | StSt |
| Conductor support Rd | 18 mm |
| Distance from wall | 55 mm |
| Fixing | [4x] Ø5.1 / [2x] 7 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI light plus Ex W160 holder

For fixing to metal structural components (e.g. façades) in Ex zones 1 and 21.



| Type | LH ZS 18 EX W160 BP V2A |
|---|---|
| **Part No.** | **275 461** |
| Material | StSt |
| Conductor support Rd | 18 mm |
| Distance from wall | 160 mm |
| Fixing | [4x] Ø5.1 / [2x] 7 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI light plus Ex busbar 500

For installing the HVI Conductor with conductor holders HVI light plus Ex W55 on a non-conductive structure, e.g. stone, wood.



| Type | VS EX 500 V2A |
|---|---|
| **Part No.** | **275 498** |
| Material of brace | StSt |
| Fixing | [4x] Ø5.5 / [2x] 7 x 10 mm |
| Dimension (l x w x d) | 450 x 30 x 3 mm |
| PU | 10 pc(s) |

### HVI light plus Ex P55 holder

For fixing to pipes (e.g. with pipe clamp [part no. 106 323]) in Ex zones 1 and 21.



| Type | LH ZS 18 EX P55 SBB V2A |
|---|---|
| **Part No.** | **275 464** |
| Material | StSt |
| Conductor support Rd | 18 mm |
| Distance from wall | 55 mm |
| Clamping range of tube | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI light plus Ex P160 holder

For fixing to pipes (e.g. with pipe clamp [part no. 106 323]) in Ex zones 1 and 21.



| Type | LH ZS 18 EX P160 SBB V2A |
|---|---|
| **Part No.** | **275 462** |
| Material | StSt |
| Conductor support Rd | 18 mm |
| Distance from wall | 160 mm |
| Clamping range of tube | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

## Tools and accessories

Tools for the assembly of our high-voltage-resistant, insulated down conductors and accessories for HVI check.

### Stripping tool





| Type | AW DEHNHELIX | HVI TOOL CKS |
|---|---|---|
| **Part No.** | **597 230** | **597 231** NEW |
| Diameter Ø conductor | 23 mm | 8-35 mm |
| Material of moulded part | **Plastic** | **Plastic** |
| Material of blade | StSt | StSt |
| Colour | black ● | black ● / red ● |
| PU | 1 pc(s) | 1 pc(s) |

### Stripping tool



HVI strip 20 tool for stripping the semi-conducting sheath and the PE insulation of the HVI Conductor and HVI light plus Conductor with an outer diameter of 20 mm. The stripping length is adjustable in steps of 0.2 mm (lock points) using the knob in the handle. Version complete with handle and stripping insert.

| Type | HVI STRIP 20 |
|---|---|
| **Part No.** | **597 220** |
| Diameter Ø conductor | 20 mm (remove the grey sheath beforehand if necessary) |
| Material of moulded part | **Plastic** |
| Material of blade | StSt |
| Colour | black ● / red ● |
| Dimensions | approx. 231 x 97 mm |
| PU | 1 pc(s) |

### Cable shears



Cable shears for easily cutting the HVI light Conductor, HVI Conductor (outer diameter 20 / 23 mm), HVI power Conductor (outer diameter 27 mm) and CUI Conductor to length.
The special design of the cable shears also allows for the correct cutting of stranded conductors, making it easier to attach connection elements.

| Type | HVI CUTTER 32 |
|---|---|
| **Part No.** | **597 032** |
| Diameter Ø conductor | up to 32 mm |
| Material of knife | **Tool steel** (CR-Moly (SCM440)) |
| Material of handles | **Carbon steel** (SS400) |
| Length | 600 mm |
| Colour of handles | red (similar to RAL 3020) ● |
| PU | 1 pc(s) |

## Cutting head

Cutting head for mounting the testable, insulated connection elements on high-voltage-resistant, insulated down conductors.



| Type | ISO HEAD 21 |
|---|---|
| **Part No.** | **597 125** NEW |
| Diameter Ø conductor | 21 mm |
| Material of moulded part | Al |
| Material of blade | Steel alloy |
| Colour | red ● |
| Dimensions | approx. 105 x 40 mm |
| PU | 1 pc(s) |

## Insulating cap

Insulating caps for the dielectric withstand test on high-voltage-resistant, insulated down conductors.

Kit: 5 pieces in a suitable rucksack.
The insulating caps allow the connection elements to be safely insulated, thus preventing contact and errors of measurement.



| Type | ISOK L450 RS SET |
|---|---|
| **Part No.** | **597 817** NEW |
| Colour | black ● |
| Opening (Ø) | 34 mm |
| Suitable for | HVI light plus and HVI |
| Length | 450 mm |
| Material | **Plastic** |
| PU | 1 pc(s) |

## Accessories for Tools and accessories

### Spare blades for stripping tool HVI head 20

1 pack = 4 pieces



| Type | EK HVI HEAD 20 |
|---|---|
| **Part No.** | **597 101** |
| Material | StSt |
| PU | 1 PAK |

### Lateral replacement blades for cutting head



| Type | EK SEIT ISO HEAD |
|---|---|
| **Part No.** | **597 104** NEW |
| For cutting head | Part No. 597 125 |
| Material | **Steel alloy** |
| PU | 1 pc(s) |

## Accessories for HVI light plus Conductor

A wide range of items for fixing the HVI light plus Conductor along the discharge and conductor route, as well as various accessory items.

### Roof conductor holders for flat roofs

For fixing round conductors and strips on flat roofs with one conductor support type FB.



| Type | DLH FB 8 LO 100X100X70 |
|---|---|
| **Part No.** | **253 015** |
| Conductor routing | loose |
| Material of conductor holder | **plastic** |
| Conductor support Rd | 8 mm |
| Block | **concrete (C35/45)** |
| Weight | 1 kg |
| PU | 10 pc(s) |

### Adapter for installing the HVI light Conductor / HVI Conductor / HVI light plus Conductor on flat roofs

For snapping on to the roof conductor holder type FB (part no. 253 015) and KF (part no. 253 030).



| Type | RLA 20 FB K SW |
|---|---|
| **Part No.** | **253 026** |
| Material | **plastic** |
| Colour | black ● |
| Conductor support Rd | 20-21 mm |
| PU | 50 pc(s) |

### Roof conductor holder

For flat roofs, weight approx. 4.7 kg
Conductor holder, concrete block and base plate, for routing of the HVI light Conductor, HVI light plus Conductor HVI Conductor on flat roofs.



| Type | DLH ZS 20 23 V2A 4.7KG BES180 GP300 K |
|---|---|
| **Part No.** | **253 229** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Total weight | approx. 4.7 kg |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Roof conductor holder

For flat roofs, weight approx. 8.6 kg
Conductor holder, concrete base and plastic base plate, for routing of the HVI light Conductor, HVI light plus Conductor HVI Conductor on flat roofs.



| Type | DLH ZS 20 23 V2A 8.5KG KT D240 ULP |
|---|---|
| **Part No.** | **253 239** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Total weight | approx. 8.6 kg |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Conductor holder



Conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor, HVI Conductor for fixing into a base plate (Part No. 253 300) with concrete block (Part No. 253 301).

| Type | LH ZS 20 23 DS10 L75 V2A |
|---|---|
| **Part No.** | **253 289** |
| Material | StSt |
| Conductor support Rd | 20-23 mm |
| Height of conductor holder | 87 mm |
| Bolt | Ø10 mm (push-fit) |
| PU | 1 pc(s) |

## Concrete block



For stabilising the base plate.

| Type | BES 4.6KG SB10 180X180X70 |
|---|---|
| **Part No.** | **253 301** |
| Material | **concrete (C35/45)** |
| Weight | 4.6 kg |
| Dimensions | 180 x 180 x 70 mm |
| PU | 24 pc(s) |

## Base plate



Base plate to hold the spacer bar (Part Nos. 253 315, 253 325) and conductor holder (Part No. 253 289) and to protect the roof sheeting under the concrete block (Part No. 253 301).

| Type | GP B10 H60 D300 KS GR |
|---|---|
| **Part No.** | **253 300** |
| Diameter Ø | 300 mm |
| Diameter Ø of lock bush | 10 mm |
| Height | 60 mm |
| Material | **plastic** |
| Colour | grey |
| PU | 24 pc(s) |

## Conductor holder



Conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor HVI Conductor for fixing into a concrete base with wedge (Part No. 102 075).

| Type | LH ZS 20 23 KT D16 L85 V2A |
|---|---|
| **Part No.** | **253 279** |
| Material | StSt |
| Conductor support Rd | 20-23 mm |
| Height of conductor holder | 125 mm |
| Bolt | Ø16 mm (wedge-fit) |
| PU | 1 pc(s) |

## Spacer with EB element for HVI light plus Conductor



Spacer for establishing the variable adjustment range of the HVI light plus Conductor.
With MV clamp for the connection to the equipotential bonding (Rd 16 mm / Rd 8–10 mm).
The concrete base (part no. 102 010, weight 17 kg) and the plastic base plate (part no. 102 050) have to be ordered separately.

| Type | DH PAE 18 D16 1000 AL V2A |
|---|---|
| **Part No.** | **105 466** |
| Material of spacer | Al |
| Length of spacer | 1000 mm |
| Conductor support Rd | 18 mm |
| Material of conductor holder | StSt |
| Clamping range Rd MV clamp | 8-10 / 16 mm |
| Clamp material | Al |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Concrete base



With fixing wedge, for air-termination tips Ø10, length 1000 mm or DEHNiso spacers Ø16 mm, length up to 675 mm (distance 0.8 m) or conductor holder (Part No. 253 279).

| Type | BES 8.5KG KT10 16 D240 SET |
|---|---|
| **Part No.** | **102 075** |
| Total weight | 8.5 kg |
| Diameter Ø | 240 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | StSt |
| PU | 120 pc(s) |

## Base plate



To protect the roof sheeting under the concrete base.
For concrete bases (Part No. 102 075, 102 003).

| Type | ULP KS D280 SW |
|---|---|
| **Part No.** | **102 060** |
| Outside diameter Ø | 280 mm |
| Inside diameter Ø | 270 mm |
| Material | **EVA** |
| Colour | black |
| PU | 1 pc(s) |

## Spacer for the HVI Conductor / HVI light plus Conductor



Spacer for additional mechanical fixing in the variable sealing end area.
The spacer is installed with **two** concrete bases (part no. 102 010; weight: 17 kg). The **concrete base** and the **plastic base plate** (part no. 102 050) must be **ordered separately**.

| Type | DH ZS 20 D16 1270 GFK PA |
|---|---|
| **Part No.** | **106 815** |
| Material of spacer | **GRP** |
| Material of conductor holder / adapter | **PA** |
| Number of concrete bases | 2 (17 kg each) |
| Length | 1270 mm |
| Insulating clearance | 1245 mm |
| Conductor support Rd | 20-21 mm |
| Thread | M8 |
| PU | 1 pc(s) |

## Concrete base

With fixing wedge, stackable, for erecting tripods and air-termination rods Ø16 mm, chamfered or tapered, DEHNiso spacer Ø16 mm or conductor holder (Part No. 253 279).



| Type | BES 17KG KT16 D337 SET |
|---|---|
| **Part No.** | **102 010** |
| Weight | 17 kg |
| Support | with fixing wedge Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | StSt |
| PU | 54 pc(s) |

## Base plate

To protect the roof sheeting under the concrete base.
For concrete bases (Part Nos. 102 010, 102 002).



| Type | ULP KS D370 SW |
|---|---|
| **Part No.** | **102 050** |
| Outside diameter Ø | 370 mm |
| Inside diameter Ø | 360 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

## Spacer for the HVI light Conductor / HVI light plus Conductor

Spacer for implementing the adjustment range (length 1200 mm) without additional connection to the equipotential bonding.
The spacer is installed, e.g. in a concrete block with fixing wedge (17 kg) (Part No. 102 340).



| Type | DH ZS 20 D16 1000 GFK PA | DH ZS 20 D16 500 GFK PA |
|---|---|---|
| **Part No.** | **106 812** | **106 852** |
| Material of spacer | **GRP** | **GRP** |
| Material of conductor holder / adapter | **PA** | **PA** |
| Length (l1) | 1000 mm | 500 mm |
| Conductor support Rd | 20-21 mm | 20-21 mm |
| Thread | M8 | M8 |
| Max. gust wind speed (1x block 17 kg, holder distance 1000 mm) | 98 km/h | 151 km/h |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

## Roof conductor holder

Roof conductor holder with prepunched points for bending and hooking in the roof tile and for bolting to the roof battens, for routing the HVI Conductor, HVI light plus Conductor, in gable roof surfaces.



| Type | DLH ZS 20 23 H55 L205 V2A |
|---|---|
| **Part No.** | **202 829** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Length of brace | 205 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Roof conductor holders for roofs with round standing seam

Roof conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor HVI Conductor for fixing to metal roofs with round standing seam.



| Type | DLH RSF ZS 20 23 V2A |
|---|---|
| **Part No.** | **202 850** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | Ø20-25 mm |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder for roofs with clamping seam (e.g. RIB-ROOF Speed 500 from Zambelli)

Roof conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor HVI Conductor for fixing to metal roofs with clamping seam.



| Type | DLH KF ZS 20 23 V2A |
|---|---|
| **Part No.** | **202 851** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | approx. 18 / 22 mm |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder for roofs with standing seam

Roof conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor HVI Conductor for fixing to metal roofs with standing seam.



| Type | DLH SF ZS 20 23 V2A |
|---|---|
| **Part No.** | **202 852** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | 0.7-8 mm |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder with connection lug

Roof conductor holder with slotted saddle clamp for HVI light Conductors, HVI Conductors and Z-shaped connection lug for riveting or screwing to metal roofs.



| Type | DLH AL ZS 20 23 V2A |
|---|---|
| **Part No.** | **202 853** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Fixing | [4x] Ø5.2 / [2x] Ø6.5 mm |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Conductor holder with tensioning strap

With metal conductor holder.



| Type | LH ZS 20 23 SB50.300 V2A |
|---|---|
| Part No. | 275 320 |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Tensioning range Ø pipe | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Conductor holder for fixing with a tensioning strap

For fixing the HVI Conductor to pipes, e.g. with pipe clamp (Part No. 106 323).



| Type | LH ZS 20 23 SBH 25X0.3 V2A |
|---|---|
| Part No. | 275 319 |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

## Pipe clamp

For fixing (clamping) conductor holders (e.g. Part No. 275 319).



| Type | BRS SPB25 50.300 V2A |
|---|---|
| Part No. | 106 323 |
| Material of head / strap | StSt |
| Clamping range Ø | 50-300 mm |
| Dimensions of strap | 1100 x 25 x 0.3 mm |
| Material of screw | StSt |
| PU | 10 pc(s) |

## Separate grip head

For combination with endless tensioning strap (Part No. 540 901) in case of larger pipe diameters.



| Type | SPK 25X0.3 V2A |
|---|---|
| Part No. | 106 324 |
| Material of head | StSt |
| For strap (w x d) | 25 x 0.3 mm |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| PU | 20 pc(s) |

## Tensioning strap



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| Part No. | 540 901 |
| Material | StSt |
| Strap dimensions (w x d) | 25 x 0.3 mm |
| Length | 100 m |
| PU | 1 pc(s) |

## Conductor holder

With thread.
For wall mounting with two-screw clamp (not for use in the sealing end range).



| Type | LH ZS 20 23 GM8 V2A | LH ZS 20 23 GM6 V2A |
|---|---|---|
| Part No. | 275 250 | 275 251 |
| Material of conductor holder | StSt | StSt |
| Conductor support Rd | 20-23 mm | 20-23 mm |
| Thread | M8 | M6 |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) | 25 pc(s) |

## Conductor holder

With plastic base.
For wall mounting with two-screw clamp (not for use in the sealing end range).



| Type | LH ZS 20 23 KS H10 V2A |
|---|---|
| Part No. | 275 259 |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Thread | M8 |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Conductor holder

With slotted hole.
Wall-mounted conductor holder with two-screw clamp (not for use in the sealing end range).



| Type | LH ZS 20 23 B5.5X10 V2A |
|---|---|
| Part No. | 275 252 |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Fixing hole | 5.5 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Conductor holder for the HVI Conductor / HVI light plus Conductor

For mounting on walls and for mounting in the sealing end range.



| Type | LH ZS 20 H19 IGM8 GR PA |
|---|---|
| Part No. | 275 220 |
| Material of conductor holder | PA |
| Conductor support Rd | 20-21 mm |
| Female thread | M8 |
| Fixing hole | 6.5 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Conductor holder for the HVI Conductor / HVI light plus Conductor

For wall mounting with two-screw clamp (not for use in the sealing end range).



| Type LH ZS ... | 20 H10 B6.5X16 V2A |
|---|---|
| Part No. | 275 229 |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-21 mm |
| Fixing hole | 6.5 x 16 mm |
| Screw | M6 x 14 mm |
| PU | 50 pc(s) |

## Conductor holder with tensioning strap

With conductor holder made of PA.



| Type | LH ZS 20 SB50.300 PA V2A |
|---|---|
| **Part No.** | **275 330** |
| Material of conductor holder | **PA** |
| Conductor support Rd | 20-21 mm |
| Tensioning range Ø pipe | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Heat-shrinkable sleeve, grey



| Type | WSS L120 GR |
|---|---|
| **Part No.** | **819 997** |
| Material | **PE** |
| Length (l) | 120 mm |
| Inner diameter (d) | 32 mm |
| Colour | grey |
| PU | 10 pc(s) |

## Cable tie

Cable ties for routing the various cables with the plastic holder half shells.



| Type | KB UVB 460X7.6 SW | KB UVB 546X13 SW |
|---|---|---|
| **Part No.** | **819 998** | **819 999** |
| Length | 460 mm | 546 mm |
| Width | 7.6 mm | 13.2 mm |
| Material | **Polyamide 6.6** | **Polyamide 6.6** |
| Design | UV-resistant | UV-resistant |
| PU | 100 pc(s) | 50 pc(s) |

## Sign

**Front** in German
ACHTUNG! Getrennter Blitzschutz mit HVI Leitung
**Back** in English
ATTENTION! Separated Lightning Protection with HVI conductor system




| Type | HWS 300X210 AGBS HVI DE EN K |
|---|---|
| **Part No.** | **480 598** |
| Material | **plastic** |
| Dimensions (l x w x d) | 300 x 210 x 1 mm |
| Fixing | [4x] Ø6.5 mm |
| Hole distance | 270 / 180 mm |
| PU | 1 pc(s) |

## Sign

**Front** in German
ACHTUNG! Potentialausgleich

**Back** in English
ATTENTION! Equipotential Bonding

Hole distance suitable for two-screw clamp (Part No. 480 291).




| Type | HWS 70X30 APA DE EN K |
|---|---|
| **Part No.** | **480 599** |
| Material | **plastic** |
| Dimensions (l x w x d) | 70 x 30 x 1 mm |
| Fixing | [2x] Ø6.5 mm |
| Hole distance | 38 mm |
| PU | 10 pc(s) |

## Adapter for installing the HVI Conductor on flat roofs

For snapping on to the roof conductor holder type FB (part no. 253 015) and KF (part no. 253 030).



| Type | RLA 23 FB K SW |
|---|---|
| **Part No.** | **253 027** |
| Material | **plastic** |
| Colour | black ● |
| Conductor support Rd | 23 mm |
| PU | 50 pc(s) |

## Air-termination tip adapter

Reducing adapter for Ø22-mm fixtures for the central mounting of Ø10/16-mm air-termination rods on HVI supporting tubes.



| Type | AD 22 16 L45 AL | AD 22 10 L45 AL |
|---|---|---|
| **Part No.** | **819 895** NEW | **819 898** NEW |
| Material | Al | Al |
| Reduction (Ø) | 22/16 mm | 22/10 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | AD 22 16 L45 V2A | AD 22 10 L45 V2A |
|---|---|---|
| **Part No.** | **819 896** NEW | **819 897** NEW |
| Material | NIRO | NIRO |
| Reduction (Ø) | 22/16 mm | 22/10 mm |
| PU | 10 pc(s) | 10 pc(s) |

# Supporting tube fixing

Wide variety of holders and fixings for supporting tubes and air-termination rods

## Fixing clamp

Clamp for fixing the supporting tube, e.g. on the antenna pole. With spacer, length 30 mm for adjusting antenna supports.



| Type | BSC D40 D45.65 V2A |
|---|---|
| **Part No.** | **105 161** |
| Material | StSt |
| Clamping range of pipe Ø | 45-65 mm (1 $^1/_2$-2'') |
| Clamping range of supporting tube | 40-50 mm |
| Length of spacer | 30 mm |
| PU | 1 pc(s) |

## Wall mounting bracket for vertical mounting

For attaching supporting tubes or air-termination rods D40 / D50 to roof-mounted structures or walls.



| Type | WB D40.50 SE WA46 V2A | WB D40.50 SE WA110 V2A |
|---|---|---|
| **Part No.** | **105 342** | **105 348** |
| Material of bracket | StSt | StSt |
| Fixing | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm |
| Clamping range for supporting tube | 40-50 mm | 40-50 mm |
| Distance from wall | 46 mm | 110 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Wall mounting bracket for horizontal mounting, flat

For fixing Ø40 mm supporting tubes to the structure to be protected or to a wall.



| Type | WB D40 WA V2A |
|---|---|
| Part No. | 105 140 |
| Material | StSt |
| Fixing | [8x] Ø5.1 / [4x] 11 x 20 mm |
| Distance from wall | 80 mm |
| Clamping range of air-termination rod | 40 mm |
| PU | 1 pc(s) |

## Railing clamp

For pipes.

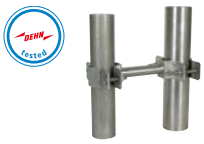


| Type | BS D40.50 D48.60 V2A |
|---|---|
| Part No. | 105 354 |
| Material | StSt |
| Clamping range for pipe Ø | 48-60 mm (1 1/2-2'') |
| Clamping range for supporting tube | 40-50 mm |
| PU | 5 pc(s) |

## Railing clamp

With spacer for adjusting, e.g. antenna supports.

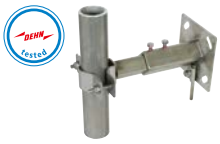
*) For exact assignment, see test certificate.



| Type | BSC D40 DS95 D45.65 V2A |
|---|---|
| Part No. | 105 162 |
| Material | StSt |
| Clamping range for pipe Ø | 45-65 mm (1 1/2-2'') |
| Clamping range for supporting tube | 40-50 mm |
| Length of spacer | 95 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Wall mounting bracket, adjustable from 150-200 mm

For attaching supporting tubes or air-termination rods D40 / D50, with double clamp for connecting 2x Rd 8-10 mm.



| Type | WB D40.50 V150.200 V2A |
|---|---|
| Part No. | 105 344 |
| Material of bracket | StSt |
| Clamping range for supporting tube | 40-50 mm |
| Distance from wall | 150-200 mm |
| Dimensions of plate | 120 x 120 x 4 mm |
| Fixing | [4x] 12 x 26 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Holder for air-termination rods and supporting tubes

Fixing clamp with tensioning strap.

*) For exact assignment, see test certificate.



| Type | BSC D40.50 SB50.300 V2A |
|---|---|
| Part No. | 105 160 |
| Material | StSt |
| Clamping range Ø pipe | 50-300 mm |
| Clamping range of air-termination rod | 40-50 mm |
| Dimensions of strip (w x d) | 25 x 0.3 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Wall mounting bracket, adjustable from 230-1300 mm

For fixing supporting tubes or air-termination rods D40 / D50.



| General technical data: | |
|---|---|
| Material of bracket | St/tZn / StSt |
| Clamping range for supporting tube | 40-50 mm |
| Dimensions of plate | 120 x 120 x 4 mm |
| Fixing | [4x] 12 x 26 mm |

| Type | WB D40.50 V700.1300 STTZN V2A | WB D40.50 V400.700 STTZN V2A |
|---|---|---|
| Part No. | 105 349 | 105 343 |
| Distance from wall | 700-1300 mm | 400-700 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type | WB D40.50 V230.400 STTZN V2A |
|---|---|
| Part No. | 105 347 |
| Distance from wall | 230-400 mm |
| PU | 1 pc(s) |

# Mounting Bracket for Installation on Rafters

For side fixing of the

- HVI light plus Conductor inside the supporting tube (Ø40 mm)
- HVI Conductor routed inside the supporting tube (Ø50 mm)
- And to attach and fix the supporting tubes and for the sub-roof installation of the HVI Conductor or HVI light plus Conductor.



**Note:** Mounting conditions on site must be clarified with the builder. You can find more information on max. gust wind speeds at www.dehn-international.com

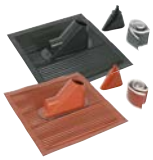
| Type DASH ... | D48 AS600.750 STTZN |
|---|---|
| Part No. | 105 240 |
| Material | St/tZn |
| Adjustment range | 600-750 mm |
| Roof inclination | 20-50° |
| Diameter Ø of supporting tube | 48 mm |
| Fixing screw | ✪ 8 x 120 mm |
| PU | 1 pc(s) |

## Accessories f. Mounting Bracket f. Installation on Rafters

### Roof bushing kit

For bushing and sealing of poles and pipes on steep roofs

- Universal use on different roof tiles due to malleable aluminium roof tile
- Roof bushing kit comprises aluminium roof tile, rubber grommet and sealing tape.



| Type DADS ... | D10 16 48 AL SCH | D10 16 48 AL ROT |
|---|---|---|
| Part No. | 105 245 | 105 246 |
| Material of roof tile | aluminium, with UV-stabilised plastic coating | aluminium, with UV-stabilised plastic coating |
| Dimensions of roof tile | 450 x 500 mm | 450 x 500 mm |
| Diameter Ø of mast hole | 10 / 16 / 48 mm | 10 / 16 / 48 mm |
| Roof inclination | 24-53° | 24-53° |
| Material of rubber grommet | UV-stabilised rubber mixture | UV-stabilised rubber mixture |
| Material of sealing tape | rubber-based plastic sealant | rubber-based plastic sealant |
| Type of sealing tape | strongly adhesive, self-welding | strongly adhesive, self-welding |
| Dimensions of sealing tape | 600 x 80 mm | 600 x 80 mm |
| Processing temperature | +5 °C ... +40 °C | +5 °C ... +40 °C |
| Permanent temperature range of sealing tape | -40 °C ... +80 °C | -40 °C ... +80 °C |
| Colour | black ● | red ● |
| PU | 1 pc(s) | 1 pc(s) |

## Mounting Bracket for Air-Termination Systems on Metal Roofs

Stainless steel mounting bracket for installing HVI air-termination systems or air-termination rods on metal roofs:
Mounting bracket suitable for vertical mounting of air-termination systems on metal roofs with a max. roof slope of up to 53°.
For fixing Ø40/50 air-termination rods and for top-mounting HVI light plus and HVI supporting tubes with inside conductor routing.

**Note:** Mounting conditions on site must be clarified with the builder. You can find more information on max. gust wind speeds at www.dehn-international.com



| Type MDH ... | D48 VB550.900 V2A |
|---|---|
| **Part No.** | **105 241** |
| Material | StSt |
| Adjustment range | 550-900 mm |
| Roof inclination | 5-53° |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Accessories for Mounting Bracket for Air-Termination Systems on Metal Roofs

### Holder for metal roofs with round standing seam

Screw with self-locking nut.



| Type | HA M8 RSF20.25 V2A |
|---|---|
| **Part No.** | **123 040** |
| Material of holder | StSt |
| Clamping range | Ø20-25 mm |
| Screw | M8 x 25 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 12 pc(s) |

### Holder for metal roofs with clamping seam (e.g. RIB-ROOF Speed 500 from Zambelli)

Screw with self-locking nut.



| Type | HA M8 KF18.22 V2A |
|---|---|
| **Part No.** | **123 041** |
| Material of holder | StSt |
| Clamping range | approx. 18 / 22 mm |
| Screw | M8 x 25 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 12 pc(s) |

### Holder for metal roofs with standing seam

Screw with self-locking nut.



| Type | HA M8 SF0.7 8 V2A |
|---|---|
| **Part No.** | **123 042** |
| Material of holder | StSt |
| Clamping range | 0.7-8 mm |
| Screw | M8 x 25 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 12 pc(s) |

### Holder for metal roofs for riveting or screwing

Screw lock using self-locking nut with serrated bearing.
**Note:** The leak-tightness of the roof must be ensured during installation; e.g. by using waterproof cup rivets. You might need to consult with the trade people responsible.



| Type HA M8 ... | AL ZF B5.2 6.5 V2A |
|---|---|
| **Part No.** | **123 043** |
| Material of holder | StSt |
| Fixing | [4x] Ø5.2 / [2x] Ø6.5 mm |
| Screw | M8 x 25 mm |
| Material of screw / nut | StSt |
| Standard | EN 62561-1 |
| PU | 12 pc(s) |

### C-mounting rail for mounting bracket for installation on metal roofs

C mounting rails with holes for fixing the mounting bracket on roofs with large batten distances (> 600 mm).



| Type | MSC MDH V4A L1000 MZ V2A | MSC MDH V4A L1500 MZ V2A |
|---|---|---|
| **Part No.** | **123 050** | **123 051** |
| Material of the rail | StSt (V4A) | StSt (V4A) |
| Dimensions of the rail (l x w x h) | [2x] 1000 x 41 x 41 mm | [2x] 1500 x 41 x 41 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MSC MDH V4A L2000 MZ V2A |
|---|---|
| **Part No.** | **123 052** |
| Material of the rail | StSt (V4A) |
| Dimensions of the rail (l x w x h) | [2x] 2000 x 41 x 41 mm |
| PU | 1 pc(s) |

**Max. Gust wind speeds in km/h for air-termination systems.**

## Tripod mounting – support tube

| Cable in the support tube GFK / Al | | Installation type outside \| inside | | Tripod, small, St/tZn Part No. **105 357** | | | | Tripod, small, St/tZn Part No. **105 351** | | | | ... arrow arrangement Part No. **105 351** | | | | Supporting tube stand Part No. **105 244** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Part No. | Height [mm] | Number of concrete bases | | 3x | 6x | 9x | 12x | 3x | 6x | 9x | 12x | 3x | 6x | 9x | 12x | |
| **105 672 819 672** | 2100 | 0 | 1 | – | 239 | 240 | 240 | – | 240 | 240 | 240 | – | 240 | 240 | 240 | – |
| | | 1 | 0-1 | 135 | 192 | 239 | 240 | 192 | 240 | 240 | 240 | 147 | 212 | 240 | 240 | 240 |
| | | 2-4 | 0-1 | 118 | 165 | 204 | 217 | 166 | 217 | 217 | 217 | 126 | 183 | 217 | 217 | 212 |
| **105 673 819 673** | 2600 | 0 | 1 | – | 212 | 235 | 235 | – | 235 | 235 | 235 | – | 235 | 235 | 235 | – |
| | | 1 | 0-1 | 125 | 178 | 219 | 228 | 178 | 228 | 228 | 228 | 135 | 197 | 228 | 228 | 226 |
| | | 2-4 | 0-1 | 112 | 155 | 192 | 200 | 155 | 200 | 200 | 200 | 121 | 172 | 200 | 200 | 198 |
| **105 674 819 674** | 2900 | 0 | 1 | – | 149 | 191 | 223 | – | 216 | 240 | 240 | – | 171 | 212 | 240 | – |
| | | 1 | 0-1 | 93 | 124 | 149 | 179 | 124 | 173 | 199 | 199 | 100 | 135 | 171 | 199 | 240 |
| | | 2-4 | 0-1 | – | 110 | 132 | 149 | 111 | 147 | 170 | 170 | – | 117 | 144 | 170 | 212 |
| **105 675 819 675** | 3400 | 0 | 1 | – | 140 | 179 | 209 | – | 202 | 234 | 234 | – | 159 | 199 | 234 | – |
| | | 1 | 0-1 | – | 120 | 144 | 172 | 122 | 166 | 190 | 190 | 96 | 129 | 163 | 190 | 225 |
| | | 2-4 | 0-1 | – | 105 | 128 | 147 | 107 | 140 | 163 | 163 | – | 114 | 137 | 163 | 197 |

| Cable in the support tube GFK / Al | | Installation type outside \| inside | | Tripod, small, StSt and Adapter set D40 Part No. **107 390 + 107 399** | | | | Four-legged stand, small, StSt and Adapter set D40 Part No. **107 490 + 107 399** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Part No. | Height [mm] | Number of concrete bases | | 3x | 6x | 9x | 12x | 4x | 8x | 12x | 16x |
| **105 674 819 674** | 2900 | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | 121 | 170 | 209 | 240 | 159 | 225 | 240 | 240 |
| | | 2-4 | 0-1 | 108 | 144 | 181 | 211 | 137 | 196 | 215 | 215 |
| **105 675 819 675** | 3400 | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | 117 | 163 | 201 | 228 | 149 | 217 | 228 | 228 |
| | | 2-4 | 0-1 | 105 | 140 | 176 | 201 | 135 | 191 | 201 | 201 |
| **105 677** | 2900 | 0 | 1 | 147 | 208 | 240 | 240 | 195 | 240 | 240 | 240 |
| | | 1 | 0-1 | 121 | 170 | 209 | 240 | 159 | 225 | 240 | 240 |
| | | 2-4 | 0-1 | 108 | 144 | 181 | 211 | 137 | 196 | 215 | 215 |
| **105 678** | 3400 | 0 | 1 | 137 | 196 | 237 | 237 | 185 | 237 | 237 | 237 |
| | | 1 | 0-1 | 117 | 163 | 201 | 228 | 149 | 217 | 228 | 228 |
| | | 2-4 | 0-1 | 105 | 140 | 176 | 201 | 135 | 191 | 201 | 201 |

## Wall assembly

| Part No. | $L_{(max)}$ [mm] | Number of holders *) | Installation type outside \| inside | | |
|---|---|---|---|---|---|
| **105 674 819 674** | 2400 | *) 2 pc(s) | 0 | 1 | 240 |
| | | | 1 | 0-1 | 240 |
| | | | 2-4 | 0-1 | 217 |
| **105 675 819 675** | 2900 | *) 2 pc(s) | 0 | 1 | 237 |
| | | | 1 | 0-1 | 229 |
| | | | 2-4 | 0-1 | 202 |
| **819 735** | 7200 | *) 3 pc(s) | 0 | 1 | 195 |
| | | | 1 | 0-1 | 152 |
| | | | 2-4 | 0-1 | 132 |

## Flat roof – tripod in a set

... arrow arrangement

| Part No. | Height [mm] | Number of concrete bases | Installation type outside | 3x | 6x | 9x | 3x | 6x | 9x |
|---|---|---|---|---|---|---|---|---|---|
| **819 682** | 2700 | 1 | | 169 | 228 | 228 | 132 | 190 | 228 |
| | | 2-4 | | 147 | 200 | 200 | 116 | 166 | 200 |
| **819 687** | 3700 | 1 | | 137 | 159 | 159 | 110 | 155 | 199 |
| | | 2-4 | | 128 | 159 | 159 | 103 | 140 | 159 |
| **819 680** | 4700 | 1 | | 99 | 99 | 99 | – | – | – |
| | | 2-4 | | 99 | 99 | 99 | – | – | – |
| **819 685** | 2200 | 1 | | 132 | | | | | |
| | | 2-4 | | 117 | | | | | |
| **819 690** | 2700 | 1 | | 125 | | | | | |
| | | 2-4 | | 110 | | | | | |

## Special solutions

| Part No. | Height [mm] | Installation type outside \| inside | | Rafter bracket, St/tZn Part No. **105 240** | Metal roof bracket, StSt Part No. **105 241** |
|---|---|---|---|---|---|
| **105 688 819 688** | 3680 | 0 | 1 | 149 | 149 |
| | | 1 | 0-1 | 124 | 124 |
| | | 2-4 | 0-1 | 110 | 110 |

# HVI Conductor



| Technical data | HVI Conductor (pre-assembled) | HVI long Conductor (on a reel) | HVI long Conductor (cut to length) |
|---|---|---|---|
| Picture |  |  |  |
| Structure | solid / stranded | solid / stranded | solid / stranded |
| Cross section of the inner conductor (Cu) | 19 mm² | 19 mm² | 19 mm² |
| Colour of conductor | black / grey | black / grey | black / grey |
| Outer diameter | 20 / 23 mm | 20 / 23 mm | 20 / 23 mm |
| Equivalent separation distance (air) | ≤ 75 cm | ≤ 75 cm | ≤ 75 cm |
| Equivalent separation distance (solid material) | ≤ 150 cm | ≤ 150 cm | ≤ 150 cm |
| Minimum bending radius | 200 / 230 mm | 200 / 230 mm | 200 / 230 mm |
| Operating temperature | -30 °C ... +70 °C | -30 °C ... +70 °C | -30 °C ... +70 °C |
| Installation temperature | -5 °C ... +40 °C | -5 °C ... +40 °C | -5 °C ... +40 °C |
| Tensile strength | 950 N | 950 N | 950 N |
| UV / weather-resistant | yes | yes | yes |
| Tested with $I_{imp}$ (10/350 µs) based on EN 62561-1 | 150 kA | 150 kA | 150 kA |
| For use in class of LPS in case of a single down conductor without current distribution ($k_c$ = 1) | II, III, IV | II, III, IV | II, III, IV |
| Installation in Ex zone 1 and 21 | allowed | allowed | allowed |
| Max. order length | 6 m ... 60 / 70 m | 100 m / 400 m / 500 m | 6 m ... 60 / 70 m |
| Cable weight / 100 m | – | 46 kg / 54 kg | – |

## Supporting Tube with HVI Conductor

Optically optimised installation of the HVI Conductor inside the supporting tube creates less wind exposed surface.
For use up to an equivalent separation distance s ≤ 75 cm (in air) or s ≤ 150 cm (solid material).
Conductor length to be indicated when ordering (steps of 0.5 m).

### HVI Conductor in supporting tube with air-termination tip

With internal sealing end and air-termination tip, StSt, Ø10 mm, length 1000 mm.



| Type HVI ... | 20 M L6M SR3200 IP FSP1000 GFK AL | 23 L6M SR3200 IP FSP1000 GFK AL |
|---|---|---|
| **Part No.** | **819 326** | **819 336** |
| Material of supporting tube | **GRP / Al** | **GRP / Al** |
| Length of supporting tube | 3200 mm | 3200 mm |
| Transport length | 3200 mm | 3200 mm |
| Outside diameter Ø | 50 mm | 50 mm |
| Diameter Ø conductor | 20 mm | 23 mm |
| Colour of conductor | black ● | grey ● |
| Material of conductor | Cu | Cu |
| Minimum order length | 6 m | 6 m |
| Max. free length with air-termination tip (wall mounting) | 3500 mm | 3500 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

### HVI Conductor in supporting tube (side outlet) with air-termination tip and small tripod

With internal sealing end and air-termination tip, StSt, Ø10 mm, length 1,000 mm.
With tripod (part no. 107 390).



| Type HVI ... | 20M L6M SR3200 SA FSP1000 AL DBS V2A | 23 L6M SR3200 SA FSP1000 AL DBS V2A |
|---|---|---|
| **Part No.** | **819 371** | **819 381** |
| Material of supporting tube | **GRP / Al** | **GRP / Al** |
| Length of supporting tube | 3200 mm | 3200 mm |
| Transport length | 3200 mm | 3200 mm |
| Outside diameter Ø | 50 mm | 50 mm |
| Diameter Ø conductor | 20 mm | 23 mm |
| Colour of conductor | black ● | grey ● |
| Material of conductor | Cu | Cu |
| Radius of tripod | 680 mm | 680 mm |
| Space required for tripod | 1175 x 1020 mm | 1175 x 1020 mm |
| Minimum order length | 6 m | 6 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

### HVI Conductor in supporting tube with air-termination rod

With internal sealing end and air-termination rod, Al, Ø22 / 16 / 10 mm, length 2,500 mm.



| General technical data: | |
|---|---|
| Material of supporting tube | **GRP / Al** |
| Outside diameter Ø | 50 mm |
| Material of conductor | Cu |
| Minimum order length | 6 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type HVI ... | 20 M L6M SR3200 IP RFS2500 GFK AL | 23 L6M SR3200 IP RFS2500 GFK AL |
|---|---|---|
| **Part No.** | **819 328** | **819 338** |
| Length of supporting tube | 3200 mm | 3200 mm |
| Transport length | 3200 mm | 3200 mm |
| Diameter Ø conductor | 20 mm | 23 mm |
| Colour of conductor | black ● | grey ● |
| Max. free length with air-termination rod (wall mounting) | 5000 mm | 5000 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type HVI ... | 20 M L6M SR4700 IP RFS2500 GFK AL | 23 L6M SR4700 IP RFS2500 GFK AL |
|---|---|---|
| **Part No.** | **819 426** | **819 438** |
| Length of supporting tube | 4700 mm | 4700 mm |
| Transport length | 4700 mm | 4700 mm |
| Diameter Ø conductor | 20 mm | 23 mm |
| Colour of conductor | black ● | grey ● |
| Max. free length with air-termination rod (wall mounting) | 5500 mm | 5500 mm |
| PU | 1 pc(s) | 1 pc(s) |

### HVI Conductor in supporting tube (side outlet) with air-termination rod and small tripod

With internal sealing end and air-termination rod, Al, Ø22 / 16 / 10 mm, length 2,500 mm.
With tripod (part no. 107 390).



| Type HVI ... | 20M L6M SR3200 SA RFS2500 AL DBS V2A | 23 L6M SR3200 SA RFS2500 AL DBS V2A |
|---|---|---|
| **Part No.** | **819 373** | **819 383** |
| Material of supporting tube | **GRP / Al** | **GRP / Al** |
| Length of supporting tube | 3200 mm | 3200 mm |
| Transport length | 3200 mm | 3200 mm |
| Outside diameter Ø | 50 mm | 50 mm |
| Diameter Ø conductor | 20 mm | 23 mm |
| Colour of conductor | black ● | grey ● |
| Material of conductor | Cu | Cu |
| Radius of tripod | 680 mm | 680 mm |
| Space required for tripod | 1175 x 1020 mm | 1175 x 1020 mm |
| Minimum order length | 6 m | 6 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

### HVI Conductor in supporting tube (side outlet) with air-termination rod and large tripod

With internal sealing end and air-termination rod, Al, Ø22 / 16 / 10 mm, length 2,500 mm.
With tripod (part no. 107 391).



| Type HVI ... | 20M L6M SR4700 SA RFS2500 AL DBS V2A | 23 L6M SR4700 SA RFS2500 AL DBS V2A |
|---|---|---|
| **Part No.** | **819 473** | **819 483** |
| Material of supporting tube | **GRP / Al** | **GRP / Al** |
| Length of supporting tube | 4700 mm | 4700 mm |
| Transport length | 4700 mm | 4700 mm |
| Outside diameter Ø | 50 mm | 50 mm |
| Diameter Ø conductor | 20 mm | 23 mm |
| Colour of conductor | black ● | grey ● |
| Material of conductor | Cu | Cu |
| Radius of tripod | 1330 mm | 1330 mm |
| Space required for tripod | 2300 x 1995 mm | 2300 x 1995 mm |
| Minimum order length | 6 m | 6 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

The conductor cannot be returned as it is made to order.

## Air-Termination Mast with HVI Conductor

For a maximum free length of the whole air-termination system of 8.5 m.
To be fixed with three variable supports (Part No. 105 345).

Transport length 6000 mm.

With 1x HVI Conductor installed inside the supporting tube. Conductor length has to be stated when ordering (0.5 m steps).

Maximum total length of the HVI Conductor of 12.5 m in case of class of LPS II.
Maximum total length of the HVI Conductor of 18.5 m in case of class of LPS III.



| Type | FM 60 L11M IP HVI M L10M GFK AL STTZN |
|---|---|
| **Part No.** | **819 730** |
| Total length of air-termination mast | 10800 mm |
| Length of air-termination rod | 3000 mm |
| Length of supporting tube | 2100 mm |
| Length of mast pipe | 6000 mm |
| Colour of conductor | black ● |
| Minimum order length | 10 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Accessories for Air-Termination Mast with HVI Conductor

### Variable support for air-termination masts

Three supports should be mounted for each air-termination mast.
Clamping range of air-termination mast Ø60 mm.



| Type WB D60 ... | V250.350 STTZN |
|---|---|
| **Part No.** | **105 345** |
| Material of support | **St/tZn** |
| Adjustment range | 250-350 mm |
| Fixing holes Ø | [4x] 12 x 25 mm |
| PU | 1 pc(s) |

## Air-termination Mast for Sub-roof Installation of the HVI Conductor

For top mount on roof rafter brackets
Optically optimised routing of the HVI Conductor inside the supporting tube. The HVI Conductor is led through the mast support of the roof rafter bracket and installed in the region of the counter/roof battens.
Advantages:

- Sub-roof installation – optically indiscernible
- Top mount with only one visible tube
- No mechanical load, e.g. snow



### HVI Conductor in supporting tube with air-termination rod

| Type | HVI 20 M L6M SR1955 FS2500 DSH GFK AL |
|---|---|
| **Part No.** | **819 247** |
| Material of supporting tube | **GRP / Al** |
| Length of supporting tube | 1955 mm |
| Length of air-termination rod | 2500 mm |
| Outside diameter Ø GRP | 50 mm |
| Diameter Ø conductor | 20 mm |
| Colour of conductor | black ● |
| Material of conductor | Cu |
| Minimum order length | 6 m |
| Max. gust wind speed | 140 km/h |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## HVI Conductor / HVI long Conductor

High-voltage-resistant, insulated down conductor for keeping the separation distance to electrically conductive parts according to IEC 62305-3.

For use up to an equivalent separation distance s ≤ 75 cm (in air) or s ≤ 150 cm (solid material).

### HVI Conductor (pre-assembled, installation inside the supporting tube)

With one head piece and one connection element (enclosed loose).
Minimum order length 6 m, conductor length has to be stated when ordering (in steps of 0.5 m).



| Type HVI ... | RIV 75 20 L6M SW M | RIV 75 23 L6M GR M |
|---|---|---|
| **Part No.** | **819 220** | **819 223** |
| Material of conductor | Cu | Cu |
| Material of insulation | **PE** | **PE** |
| Material of sheath | **PE** | **PE** |
| Colour of conductor | black ● | grey ● |
| Diameter Ø conductor | 20 mm | 23 mm |
| Minimum order length | 6 m | 6 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

**Note:**
Mast holder, heavy version (Part No. 105 352), see page 90.

### HVI Conductor (pre-assembled, installation outside the supporting tube)

With one head piece and one connection element (enclosed loose).
Minimum order length 6 m, conductor length has to be stated when ordering (in steps of 0.5 m).



| Type HVI ... | RAV 75 20 L6M SW M | RAV 75 23 L6M GR M |
|---|---|---|
| Part No. | 819 226 | 819 227 |
| Material of conductor | Cu | Cu |
| Material of insulation | PE | PE |
| Material of sheath | PE | PE |
| Colour of conductor | black ● | grey ● |
| Diameter Ø conductor | 20 mm | 23 mm |
| Minimum order length | 6 m | 6 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

### HVI long Conductor (on cable reel)

The HVI long Conductor comes on a disposable plywood reel. Allen key included in delivery.



| General technical data: | |
|---|---|
| Material of conductor | Cu |
| Material of insulation | PE |
| Material of sheath | PE |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type HVI ... | LO 75 20 L100M SW M | LO 75 23 L100M GR M |
|---|---|---|
| Part No. | 819 135 | 819 136 |
| Colour of conductor | black ● | grey ● |
| Diameter Ø conductor | 20 mm | 23 mm |
| PU | 100 m | 100 m |

| Type HVI ... | LO 75 20 L500M SW M | LO 75 23 L400M GR M |
|---|---|---|
| Part No. | 819 138 | 819 110 |
| Colour of conductor | black ● | grey ● |
| Diameter Ø conductor | 20 mm | 23 mm |
| PU | 500 m | 400 m |

### HVI long Conductor (cut to length)

Cut-to-length HVI long Conductor for on-site assembly. Conductor is delivered as a coil.
Conductor length has to be stated when ordering (0.5 m steps).



| Type HVI ... | LO 75 20 L... SW M | LO 75 23 L... GR M |
|---|---|---|
| Part No. | 819 131 | 819 132 |
| Material of conductor | Cu | Cu |
| Material of insulation | PE | PE |
| Material of sheath | PE | PE |
| Colour of conductor | black ● | grey ● |
| Diameter Ø conductor | 20 mm | 23 mm |
| Minimum order length | 6 m | 6 m |
| Max. order length | 70 m | 60 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

## Connection Elements for HVI long Conductor

### Connection kit for HVI long Conductor Ø20 mm, installation inside the supporting tube



Connection elements for sealing the HVI long Conductor at both ends, for implementing the sealing end of the conductor in the supporting tube (head piece) and connection element for connecting other parts of the external lightning protection system or earth-termination system (incl. two heat-shrinkable sleeves).
These connection elements may be used with HVI long supporting tubes.

| Type | HVI LO ASS RIV KF 20 V2A |
|---|---|
| Part No. | 819 145 |
| Material | StSt |
| Connection | bolt Ø10 mm, L 50 mm |
| Diameter Ø connection element | 23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Connection kit for HVI long Conductor Ø20 mm, installation outside the supporting tube



Connection elements for sealing the HVI long Conductor at both ends, for establishing the sealing end of the conductor outside the supporting tube (head piece for connection plate) and connection element for connecting to other parts of the external lightning protection system or earthing system (incl. two heat-shrinkable sleeves).
These connection elements may only be used for HVI long supporting tubes in combination with the fixing kit (Part No. 819 294).

| Type | HVI LO ASS RAV KF 20 V2A |
|---|---|
| Part No. | 819 146 |
| Material | StSt |
| Connection | bolt Ø10 mm, L 50 mm |
| Diameter Ø connection element | 23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Connection element (head piece) for HVI long Conductor Ø20 mm, installation outside the supporting tube



Connection element for sealing the HVI long Conductor, for establishing the sealing end of the conductor on the outside of the supporting tube (head piece for connection plate), incl. one heat-shrinkable sleeve.

| Type | AEA KO KF HVI 20 SW V2A |
|---|---|
| Part No. | 819 197 |
| Material | StSt |
| Connection | M12 thread |
| Diameter Ø connection element | 23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

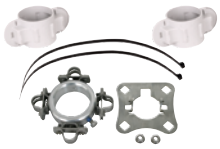
## Connection element for HVI long Conductor Ø20 mm



Connection element for sealing the HVI long Conductor for establishing the sealing end of the conductor for other parts of the external lightning protection or earth-termination system (incl. one heat-shrinkable sleeve).

| Type | AE BO10 KF HVI 20 SW V2A |
|---|---|
| **Part No.** | **819 199** |
| Material | StSt |
| Connection | bolt Ø10 mm, L 50 mm |
| Diameter Ø connection element | 23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Fixing kit for HVI long Conductor black / grey



Fixing kit for installation of the HVI long Conductor on HVI long supporting tubes, consisting of a connection plate (4x, including two self-locking nuts with serrated bearings) and a fixing ring with four slotted conductor holders (Ø20 mm) for the sealing end (including two cable ties with plastic holder halves).

| Type | BFS D61 4X20 |
|---|---|
| **Part No.** | **819 294** |
| Material | StSt / Al |
| Connection plate support | square hole 13 mm |
| Conductor holder | 4 x 20 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## EB connection element for HVI long Conductor



For discharging the electric field of the HVI long Conductor in the sealing end range. pecial slotted design to electrically contact the semi-conductive sheath.

| Type | PAE 20 23 AB11 V2A |
|---|---|
| **Part No.** | **410 229** |
| Material | StSt |
| Clamping range Ø | 20 mm |
| Connection hole Ø | 11 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Measuring point terminal



Measuring points for HVI check.

| Type | MPK 18 V2A |
|---|---|
| **Part No.** | **819 649** NEW |
| Suitable for | HVI light plus and HVI |
| Material | StSt |
| Clamping range Ø | 18-20 mm |
| PU | 5 pc(s) |

## Accessories f. Connection Elements for HVI long Conductor

## Connection Plate



Connection plate (4x, including two self-locking nuts with serrated bearings) for installing the HVI long Conductor on the supporting tube Ø50 mm (e.g. part no. 105 330, 105 331, 105 332, 105 333).

| Type | AP SR D50 4AE HVI V2A |
|---|---|
| **Part No.** | **819 288** |
| Material | StSt |
| Support | square hole 13 mm |
| PU | 1 pc(s) |

## Fixing bolt



Fixing bolt for spanning a 50 mm² aluminium cable (Part No. 840 050) to an air-termination rod (Ø22 / Ø16 mm) or a connection plate (e.g. Part No. 819 289 or 819 288).

| Type | BB 1XB11GSM8 1XB23GSM12 AL |
|---|---|
| **Part No.** | **105 229** |
| Hole | 1x B 11 mm, 1x B 23 mm |
| Material of bolt | Al |
| Wire end ferrule | 50 mm² |
| Material of wire end ferrule | Cu/gal Sn |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

## Wire end ferrule



Wire end ferrule for securely fixing the aluminium cable with a cross-section of 50 mm² (Part No. 840 050).

1 pack = 10 pieces.

| Type | AEH 50 L22 CUGALSN |
|---|---|
| **Part No.** | **444 050** |
| Material | Cu/gal Sn |
| Cross section | 50 mm² |
| PU | 1 PAK |

## Supporting tube collar for noise reduction



Supporting tube collar for routing and centring the internally installed HVI long Conductor, Ø20 mm and Ø23 mm in the supporting tube for noise reduction.

Consisting of:
7x plastic shield
7x black, heat-shrinkable sleeve

| Type | SCHIRM HVI SCH RED |
|---|---|
| **Part No.** | **819 235** |
| Can be used for | HVI long black and HVI long grey |
| conductor diameter Ø | 20 / 23 mm |
| Material | Plastic |
| PU | 1 pc(s) |

## Cable tie



Cable ties for routing the various cables with the plastic holder half shells.

| Type | KB UVB 460X7.6 SW | KB UVB 546X13 SW |
|---|---|---|
| **Part No.** | **819 998** | **819 999** |
| Length | 460 mm | 546 mm |
| Width | 7.6 mm | 13.2 mm |
| Material | Polyamide 6.6 | Polyamide 6.6 |
| Design | UV-resistant | UV-resistant |
| PU | 100 pc(s) | 50 pc(s) |

## Heat-shrinkable sleeve, grey



| Type | WSS L120 GR |
|---|---|
| **Part No.** | **819 997** |
| Material | PE |
| Length (l) | 120 mm |
| Inner diameter (d) | 32 mm |
| Colour | grey |
| PU | 10 pc(s) |

## Supporting tube for HVI Conductor, sub-roof installation

Supporting tube for HVI Conductor for on-site assembly, air-termination rod, Al, Ø22 / 16 / 10 mm.

Used with rafter bracket (Part No. 105 240) or metal roof bracket (Part No. 105 241).



### With air-termination rod

| Type SR D50 1950 FS22 16 10 ... | 2500 DSH GFK AL |
|---|---|
| **Part No.** | **105 281** |
| Material of air-termination rod | Al |
| Length of air-termination rod | 2500 mm |
| Material of supporting tube | GRP / Al |
| Length of supporting tube | 1955 mm |
| Transport length | 2500 mm |
| External diameter Ø | 50 mm |
| Length of insulation clearance | 1560 mm |
| Max. gust wind speed | 140 km/h |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Supporting Tubes for HVI long Conductor

### With air-termination tip

Supporting tube with internal sealing end and EB spring element.
Air-termination tip, StSt, Ø10 mm, length 1000 mm.



| General technical data: | |
|---|---|
| Material of air-termination tip | StSt |
| Length of air-termination tip | 1000 mm |
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1535 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D50 ... | 3200 FSP1000 IP HVI GFK AL | 4700 FSP1000 IP HVI GFK AL |
|---|---|---|
| **Part No.** | **105 330** | **105 332** |
| Material of supporting tube | GRP / Al | GRP / Al |
| Length of supporting tube | 3200 mm | 4700 mm |
| Transport length | 3200 mm | 4700 mm |
| Max. free length with air-termination tip (wall mounting) | 3500 mm | 4000 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D50 ... | 3200 FSP1000 IP HVI GFK V2A | 4700 FSP1000 IP HVI GFK V2A |
|---|---|---|
| **Part No.** | **105 314** | **105 316** |
| Material of supporting tube | GRP / StSt | GRP / StSt |
| Length of supporting tube | 3200 mm | 4700 mm |
| Transport length | 3200 mm | 4700 mm |
| Max. free length with air-termination tip (wall mounting) | 3500 mm | 4000 mm |
| PU | 1 pc(s) | 1 pc(s) |

### With air-termination rod

Supporting tube with internal sealing end and EB spring element.
Air-termination rod, Ø22/16/10 mm, length 2500 mm.



| General technical data: | |
|---|---|
| Length of air-termination rod | 2500 mm |
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1535 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D50 ... | 3200 FS22 2500 IP HVI GFK AL | 4700 FS22 2500 IP HVI GFK AL |
|---|---|---|
| **Part No.** | **105 331** | **105 333** |
| Material of air-termination rod | Al | Al |
| Material of supporting tube | GRP / Al | GRP / Al |
| Length of supporting tube | 3200 mm | 4700 mm |
| Transport length | 3200 mm | 4700 mm |
| Max. free length with air-termination rod (wall mounting) | 5000 mm | 5500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D50 ... | 3200 FS22 2500 IP HVI GFK V2A | 4700 FS22 2500 IP HVI GFK V2A |
|---|---|---|
| **Part No.** | **105 315** | **105 317** |
| Material of air-termination rod | StSt | StSt |
| Material of supporting tube | GRP / StSt | GRP / StSt |
| Length of supporting tube | 3200 mm | 4700 mm |
| Transport length | 3200 mm | 4700 mm |
| Max. free length with air-termination rod (wall mounting) | 5000 mm | 5500 mm |
| PU | 1 pc(s) | 1 pc(s) |

### With air-termination tip and side outlet

Supporting tube with internal sealing end and EB spring element.
Air-termination tip, StSt, Ø10 mm, length 1000 mm.



| General technical data: | |
|---|---|
| Material of air-termination tip | StSt |
| Length of air-termination tip | 1000 mm |
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1535 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D50 ... | 3200 FS1000 IP SA HVI GFK AL | 4700 FS1000 IP SA HVI GFK AL |
|---|---|---|
| **Part No.** | **105 325** | **105 327** |
| Material of supporting tube | GRP / Al | GRP / Al |
| Length of supporting tube | 3200 mm | 4700 mm |
| Transport length | 3200 mm | 4700 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D50 ... | 3200 FS1000 IP SA HVI GFK V2A | 4700 FS1000 IP SA HVI GFK V2A |
|---|---|---|
| **Part No.** | **105 336** | **105 338** |
| Material of supporting tube | GRP / StSt | GRP / StSt |
| Length of supporting tube | 3200 mm | 4700 mm |
| Transport length | 3200 mm | 4700 mm |
| PU | 1 pc(s) | 1 pc(s) |

### With air-termination rod and side outlet

Supporting tube with internal sealing end and EB spring element.
Air-termination rod, Ø22/16/10 mm, length 2500 mm.



| General technical data: | |
|---|---|
| Length of air-termination rod | 2500 mm |
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1535 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D50 ... | 3200 FS2500 IP SA HVI GFK AL | 4700 FS2500 IP SA HVI GFK AL |
|---|---|---|
| **Part No.** | **105 326** | **105 328** |
| Material of air-termination rod | Al | Al |
| Material of supporting tube | GRP / Al | GRP / Al |
| Length of supporting tube | 3200 mm | 4700 mm |
| Transport length | 3200 mm | 4700 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D50 ... | 3200 FS2500 IP SA HVI GFK V2A | 4700 FS2500 IP SA HVI GFK V2A |
|---|---|---|
| **Part No.** | **105 337** | **105 339** |
| Material of air-termination rod | StSt | StSt |
| Material of supporting tube | GRP / StSt | GRP / StSt |
| Length of supporting tube | 3200 mm | 4700 mm |
| Transport length | 3200 mm | 4700 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Accessories for Supporting Tubes for HVI long Conductor

### Sideways air-termination tips for supporting tubes

Fixing kit for installing lateral/horizontal air-termination tips to HVI long supporting tubes and HVI power supporting tubes. Consisting of four air-termination tips and a fixing ring.

**Note:** The additional wind load stress on the air-termination system resulting from the side-mounted air-termination tips must be taken into account!



| Type BFRS D80 B35 ... | 4FSP 10 1030 AL | 4FSP 10 1030 V2A |
|---|---|---|
| **Part No.** | **819 185** | **819 186** |
| Length of air-termination tip | 1030 mm | 1030 mm |
| Material of air-termination tip | Al | StSt |
| Material of fixing ring | Al | StSt |
| PU | 1 pc(s) | 1 pc(s) |

## Tripod for Supporting Tubes WITHOUT / WITH Side Outlet

Stands for holding HVI supporting tubes for internally/externally routed HVI Conductors in/on the supporting tube, with double clamp for connection of 2x Rd 8–10 mm. Adjustable to the roof slope up to max. 10° using a variable fixing on the base holder.

The stackable concrete bases, the plastic base plates and the base holder set for holding additional concrete bases are each available separately in the accessories.

### Tripod small

*) Only with adapter set part no. 107 399.



| Type | DBS KB D50 RA680 V2A |
|---|---|
| **Part No.** | **107 390** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 680 mm |
| Space required for tripod | 1175 x 1020 mm |
| PU | 1 pc(s) |

### Tripod large

*) Only with adapter set part no. 107 399.



| Type | DBS KB D50 RA1330 V2A |
|---|---|
| **Part No.** | **107 391** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 1330 mm |
| Space required for tripod | 2300 x 1995 mm |
| PU | 1 pc(s) |

### Four-legged stand, small

*) Only with adapter set part no. 107 399.



| Type | VBS KB D50 RA680 V2A |
|---|---|
| **Part No.** | **107 490** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 680 mm |
| Space required for tripod | 960 x 960 mm |
| PU | 1 pc(s) |

### Four-legged stand, large

*) Only with adapter set part no. 107 399.



| Type | VBS KB D50 RA1330 V2A |
|---|---|
| **Part No.** | **107 491** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 1330 mm |
| Space required for tripod | 1880 x 1880 mm |
| PU | 1 pc(s) |

## Tripod for Supporting Tubes WITHOUT Side Outlet

### Tripod, small, HDG steel

Suitable for the inner routing of the HVI Conductor.



| Type | DBS KB D40.50 RA620 STTZN | DBS KB D40.50 RA220 STTZN |
|---|---|---|
| **Part No.** | **105 351** | **105 357** |
| Material of tripod | **St/tZn** | **St/tZn** |
| Support | 40 / 50 mm | 40 / 50 mm |
| Radius | 620 mm | 220 mm |
| Number of concrete bases | 3-12 blocks, 17 kg each | 3-12 blocks, 17 kg each |
| Space required for tripod | 1300 x 1450 mm | 668 x 718 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Tripod, large, HDG steel

Suitable for the outer routing of the HVI Conductor.

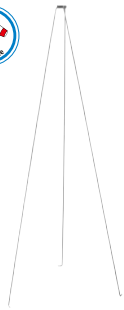


| Type | DBS KB D40.50 RA1435 STTZN |
|---|---|
| **Part No.** | **105 201** |
| Material of tripod | **St/tZn** |
| Support | 40 / 50 mm |
| Radius | 1435 mm |
| Number of concrete bases | 3-12 blocks 17 kg each |
| Space required for tripod | 2520 x 2860 mm |
| PU | 1 pc(s) |

## Accessories for Tripod for Supporting Tubes without Side Outlet

### Bracing

Brace, 3x with clamp for pipe, Ø50 mm for fixing to the tripod (part no. 105 201). Brace suitable for supporting tubes with a length of 4700 mm (e.g. part nos 105 332, 105 316, 105 333, 105 317, 105 322, 105 323, 105 565, 105 575).



| Type | ABST 3F D50 2900 V2A |
|---|---|
| **Part No.** | **105 601** |
| Material | StSt |
| Brace length | 2910 mm |
| Ø clamp | 50 mm |
| PU | 1 pc(s) |

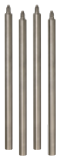
## Accessories for Tripod for Supporting Tubes without Side Outlet

### Set of base support rods for tripods



| Type | SOH 3 200 V2A |
|---|---|
| **Part No.** | **107 396** |
| For tripod | Part No. 107 390 / 107 391 |
| Number of concrete bases | 1 to 2 |
| Material | StSt |
| Diameter | 16 mm |
| Length | 200 mm |
| PU | 1 pc(s) |

### Set of base support rods for four-legged stands



| Type | SOH 4 200 V2A |
|---|---|
| **Part No.** | **107 496** |
| For four-legged stand | Part No. 107 490 / 107 491 |
| Number of concrete bases | 1 to 2 |
| Material | StSt |
| Diameter | 16 mm |
| Length | 200 mm |
| PU | 1 pc(s) |

### Adapter set

Adapter set for reducing the diameter from 50 mm to 40 mm for tripods and four-legged stands.



| Type | RED D40 V2A DBS VBS |
|---|---|
| **Part No.** | **107 399** |
| For tripod | Part No. 107 390 / 107 391 |
| For four-legged stand | Part No. 107 490 / 107 491 |
| Material | StSt |
| PU | 1 pc(s) |

### Concrete base

With fixing wedge, stackable, for erecting tripods and air-termination rods Ø16 mm, chamfered or tapered, DEHNiso spacer Ø16 mm or conductor holder (Part No. 253 279).



| Type | BES 17KG KT16 D337 SET |
|---|---|
| **Part No.** | **102 010** |
| Weight | 17 kg |
| Support | with fixing wedge Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | StSt |
| PU | 54 pc(s) |

### Base plate

To protect the roof sheeting under the concrete base. For concrete bases (Part Nos. 102 010, 102 002).



| Type | ULP KS D370 SW |
|---|---|
| **Part No.** | **102 050** |
| Outside diameter Ø | 370 mm |
| Inside diameter Ø | 360 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

## Fixing Elements for Supporting Tubes

### Fixing clamp with tensioning strap
For fixing supporting tubes to structural elements, e.g. antenna masts.



| Type | BS D50 SB50.300 V2A |
|---|---|
| **Part No.** | **105 360** |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| PU | 1 pc(s) |

### Fixing clamp with tensioning strap
With additional spacer for adjusting the sector antenna supports to the mast.



| Type BS D50 ... | DS30 SB50.300 V2A |
|---|---|
| **Part No.** | **105 361** |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| Length of spacer | 30 mm |
| PU | 1 pc(s) |

### Fixing clamp with tensioning strap
With additional long spacer for adjusting sector antenna supports to the mast.



| Type BS D50 ... | DS90 SB50.300 V2A |
|---|---|
| **Part No.** | **105 362** |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| Length of spacer | 95 mm |
| PU | 1 pc(s) |

### Wall mounting bracket for horizontal mounting, flat
For fixing supporting tubes onto the structure to be protected or the wall.



| Type | WB D50 WA V2A |
|---|---|
| **Part No.** | **105 340** |
| Material | StSt |
| Clamping range for supporting tube | 50 mm |
| Distance from wall / corner | 80 mm |
| Dimensions of fixing | 320 mm |
| Fixing | [8x] Ø5.1 / [4x] 11 x 20 mm |
| PU | 1 pc(s) |

### Wall mounting bracket for horizontal mounting, corner
For fixing supporting tubes onto the structure to be protected or the wall.



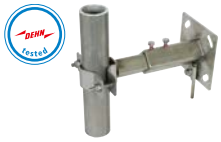
| Type | EB D50 WA V2A |
|---|---|
| **Part No.** | **105 341** |
| Material | StSt |
| Clamping range for supporting tube | 50 mm |
| Distance from wall / corner | 80 mm |
| Dimensions of fixing | 152 mm |
| Fixing | [8x] Ø5.1 / [4x] 11 x 20 mm |
| PU | 1 pc(s) |

### Wall mounting bracket for vertical mounting
For attaching supporting tubes or air-termination rods D40 / D50 to roof-mounted structures or walls.



| Type WB D40.50 ... | SE WA46 V2A | SE WA110 V2A |
|---|---|---|
| **Part No.** | **105 342** | **105 348** |
| Material of bracket | StSt | StSt |
| Fixing | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm |
| Clamping range for supporting tube | 40-50 mm | 40-50 mm |
| Distance from wall | 46 mm | 110 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Wall mounting bracket, adjustable from 150-200 mm
For attaching supporting tubes or air-termination rods D40 / D50, with double clamp for connecting 2x Rd 8-10 mm.



| Type WB D40.50 ... | V150.200 V2A |
|---|---|
| **Part No.** | **105 344** |
| Material of bracket | StSt |
| Clamping range for supporting tube | 40-50 mm |
| Distance from wall | 150-200 mm |
| Dimensions of plate | 120 x 120 x 4 mm |
| Fixing | [4x] 12 x 26 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Wall mounting bracket, adjustable from 230-1300 mm
For fixing supporting tubes or air-termination rods D40 / D50.



| General technical data: | |
|---|---|
| Material of bracket | St/tZn / StSt |
| Clamping range for supporting tube | 40-50 mm |
| Dimensions of plate | 120 x 120 x 4 mm |
| Fixing | [4x] 12 x 26 mm |

| Type WB D40.50 ... | V230.400 STTZN V2A | V400.700 STTZN V2A |
|---|---|---|
| **Part No.** | **105 347** | **105 343** |
| Distance from wall | 230-400 mm | 400-700 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type WB D40.50 ... | V700.1300 STTZN V2A |
|---|---|
| **Part No.** | **105 349** |
| Distance from wall | 700-1300 mm |
| PU | 1 pc(s) |

### Railing clamp
For pipes.



| Type | BS D40.50 D48.60 V2A |
|---|---|
| **Part No.** | **105 354** |
| Material | StSt |
| Clamping range for pipe Ø | 48-60 mm (1 1/2-2") |
| Clamping range for supporting tube | 40-50 mm |
| PU | 5 pc(s) |

### Railing clamp
For pipes.



| Type | BS D40.50 D70.90 V2A |
|---|---|
| **Part No.** | **105 355** |
| Material | StSt |
| Clamping range for pipe Ø | 70-90 mm (2 1/4-3") |
| Clamping range for supporting tube | 40-50 mm |
| PU | 1 pc(s) |

### Railing clamp
For square hollow profiles.



| Type BS D40.50 ... | 4K20.50 V2A | 4K60.120 V2A |
|---|---|---|
| **Part No.** | **105 356** | **105 376** |
| Material | StSt | StSt |
| Clamping range for square profile | 20 x 20 to 50 x 50 mm | 60 x 120 mm |
| Clamping range for supporting tube | 40-50 mm | 40-50 mm |
| PU | 5 pc(s) | 1 pc(s) |

## Mast holder, heavy version

For erecting air-termination systems on installations, such as biogas plants

The heavy version of the mast holder enables the mounting of air-termination masts with a diameter of Ø55–100 mm.



| Type | WB D55.100 SE WA150 STTZN |
|---|---|
| **Part No.** | **105 352** NEW |
| Material | **HDG steel** |
| Fixing | [4x] Ø14 mm |
| Distance from wall | 106 mm |
| Clamping range (Ø mast) | 55-100 mm |
| Material of threaded rod / nut / washer | StSt |
| PU | 1 pc(s) |

## Spacers for Omnidirectional Antennas

Spacer for DEHNiso Combi supporting tubes with HVI Conductor installed inside and/or outside the supporting tube, mounted on the antenna mast.



| General technical data: | |
|---|---|
| Material of support / square profile | **St/tZn** |
| Clamping range of supporting tube | 50 mm |
| Length of spacer | 1000 mm |

| Type AH D50 1000 ... | D55.100 STTZN | D100.150 STTZN |
|---|---|---|
| **Part No.** | **105 363** | **105 364** |
| Clamping range (Ø mast) | 55-100 mm | 100-150 mm |
| Dimensions (w1 x h1 x d1) | 140 x 120 x 55 mm | 190 x 140 x 60 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type AH D50 1000 ... | D150.190 STTZN |
|---|---|
| **Part No.** | **105 365** |
| Clamping range (Ø mast) | 150-190 mm |
| Dimensions (w1 x h1 x d1) | 230 x 180 x 70 mm |
| PU | 1 pc(s) |

Spacers for omnidirectional antennas with special lengths or any other diameters are available upon request!

## Accessories for HVI Conductor and HVI long Conductor

### Roof conductor holders for flat roofs
For fixing round conductors and strips on flat roofs with one conductor support type FB.



| Type | DLH FB 8 LO 100X100X70 |
|---|---|
| **Part No.** | **253 015** |
| Conductor routing | loose |
| Material of conductor holder | **plastic** |
| Conductor support Rd | 8 mm |
| Block | **concrete (C35/45)** |
| Weight | 1 kg |
| PU | 10 pc(s) |

### Adapter for installing the HVI light plus Conductor / HVI Conductor on flat roofs
For snapping on to the roof conductor holder type FB (part no. 253 015) and KF (part no. 253 030).



| Type | RLA 20 FB K SW | RLA 23 FB K SW |
|---|---|---|
| **Part No.** | **253 026** | **253 027** |
| Material | **plastic** | **plastic** |
| Colour | black ● | black ● |
| Conductor support Rd | 20-21 mm | 23 mm |
| PU | 50 pc(s) | 50 pc(s) |

### Roof conductor holder
For flat roofs, weight approx. 4.7 kg
Conductor holder, concrete block and base plate, for routing of the HVI light Conductor, HVI light plus Conductor, HVI Conductor on flat roofs.



| Type DLH ZS 20 23 V2A ... | 4.7KG BES180 GP300 K |
|---|---|
| **Part No.** | **253 229** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Total weight | approx. 4.7 kg |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Roof conductor holder
For flat roofs, weight approx. 8.6 kg
Conductor holder, concrete base and plastic base plate, for routing of the HVI light Conductor, HVI light plus Conductor, HVI Conductor on flat roofs.



| Type DLH ZS 20 23 V2A ... | 8.5KG KT D240 ULP |
|---|---|
| **Part No.** | **253 239** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Total weight | approx. 8.6 kg |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Conductor holder

Conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor, HVI Conductor for fixing into a base plate (Part No. 253 300) with concrete block (Part No. 253 301).



| Type | LH ZS 20 23 DS10 L75 V2A |
|---|---|
| **Part No.** | **253 289** |
| Material | StSt |
| Conductor support Rd | 20-23 mm |
| Height of conductor holder | 87 mm |
| Bolt | Ø10 mm (push-fit) |
| PU | 1 pc(s) |

## Concrete block

For stabilising the base plate.



| Type BES 4.6KG SB10 ... | 180X180X70 |
|---|---|
| **Part No.** | **253 301** |
| Material | **concrete (C35/45)** |
| Weight | 4.6 kg |
| Dimensions | 180 x 180 x 70 mm |
| PU | 24 pc(s) |

## Base plate

Base plate to hold the spacer bar (Part Nos. 253 315, 253 325) and conductor holder (Part No. 253 289) and to protect the roof sheeting under the concrete block (Part No. 253 301).



| Type | GP B10 H60 D300 KS GR |
|---|---|
| **Part No.** | **253 300** |
| Diameter Ø | 300 mm |
| Diameter Ø of lock bush | 10 mm |
| Height | 60 mm |
| Material | **plastic** |
| Colour | grey ● |
| PU | 24 pc(s) |

## Conductor holder

Conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor HVI Conductor for fixing into a concrete base with wedge (Part No. 102 075).



| Type LH ZS 20 23 ... | KT D16 L85 V2A |
|---|---|
| **Part No.** | **253 279** |
| Material | StSt |
| Conductor support Rd | 20-23 mm |
| Height of conductor holder | 125 mm |
| Bolt | Ø16 mm (wedge-fit) |
| PU | 1 pc(s) |

## Concrete base

With fixing wedge, for air-termination tips Ø10 mm, length 1000 mm or DEHNiso spacers Ø16 mm, length up to 675 mm (distance 0.8 m) or conductor holder (Part No. 253 279).



| Type BES 8.5KG ... | KT10 16 D240 SET |
|---|---|
| **Part No.** | **102 075** |
| Total weight | 8.5 kg |
| Diameter Ø | 240 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | StSt |
| PU | 120 pc(s) |

## Base plate

To protect the roof sheeting under the concrete base.
For concrete bases (Part No. 102 075, 102 003).



| Type | ULP KS D280 SW |
|---|---|
| **Part No.** | **102 060** |
| Outside diameter Ø | 280 mm |
| Inside diameter Ø | 270 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

## EB clamp

For connecting the special sheath of the HVI Conductor to the equipotential bonding.



| Type | PAK 20 AQ4 95 STTZN |
|---|---|
| **Part No.** | **405 020** |
| Material of cage clamp | **St/tZn** |
| Clamping range Ø | 20 mm |
| Terminal cross-section | 4-95 mm² |
| PU | 1 pc(s) |

## Spacer with EB element for HVI Conductor (length of variable sealing end 350-900 mm)

Spacer for establishing the variable sealing end of the HVI Conductor.
With MV clamp for connection to the equipotential bonding (Rd 16 mm / Rd 8-10 mm).
Concrete base (Part No. 102 010, weight 17 kg) and base plate (Part No. 102 050) must be ordered separately.



| Type DIDH ... | PAE 20 D16 1270 AL V2A |
|---|---|
| **Part No.** | **105 461** |
| Material of spacer | Al |
| Lenght of spacer | 1270 mm |
| Conductor support Rd | 20 mm |
| Material of conductor holder | StSt |
| Length of variable sealing end | 350-900 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Variable tripod with EB element for HVI Conductor (length of variable sealing end 900-1500 mm)



Tripod (hinged) with variable spacer for establishing the sealing end of the HVI Conductor.
With UNI earthing clamp for connecting 1x Rd 8-10 mm and 1x conductor 4-50 mm².
Adjustable to the roof inclination up to max. 10°.
The **three concrete bases** (Part No. 102 075, weight 8.5 kg) and the **base plate** (Part No. 102 060) must be **ordered separately**.

| Type V DBS RA320 ... | PAE 20 V 600 1180 V2A |
|---|---|
| **Part No.** | **105 469** |
| Material of tripod | StSt |
| Radius | 320 mm |
| Number of concrete bases | 3 (8.5 kg each) |
| Conductor support Rd | 20 mm |
| Adjustment range of spacer | 600-1180 mm |
| Length of variable sealing end | 900-1500 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Spacer for the HVI Conductor / HVI light plus Conductor



Spacer for additional mechanical fixing in the variable sealing end area.
The spacer is installed with **two** concrete bases (part no. 102 010; weight: 17 kg).
The **concrete base** and the **plastic base plate** (part no. 102 050) must be **ordered separately**.

| Type DH ZS 20 ... | D16 1270 GFK PA |
|---|---|
| **Part No.** | **106 815** |
| Material of spacer | **GRP** |
| Material of conductor holder / adapter | **PA** |
| Number of concrete bases | 2 (17 kg each) |
| Length | 1270 mm |
| Insulating clearance | 1245 mm |
| Conductor support Rd | 20-21 mm |
| Thread | M8 |
| PU | 1 pc(s) |

## Concrete base



With fixing wedge, stackable, for erecting tripods and air-termination rods Ø16 mm, chamfered or tapered, DEHNiso spacer Ø16 mm or conductor holder (Part No. 253 279).

| Type | BES 17KG KT16 D337 SET |
|---|---|
| **Part No.** | **102 010** |
| Weight | 17 kg |
| Support | with fixing wedge Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | StSt |
| PU | 54 pc(s) |

## Base plate



To protect the roof sheeting under the concrete base. For concrete bases (Part Nos. 102 010, 102 002).

| Type | ULP KS D370 SW |
|---|---|
| **Part No.** | **102 050** |
| Outside diameter Ø | 370 mm |
| Inside diameter Ø | 360 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

## Roof conductor holder



Roof conductor holder with prepunched points for bending and hooking in the roof tile and for bolting to the roof battens, for routing the HVI Conductor, HVI light plus Conductor, in gable roof surfaces.

| Type DLH ZS ... | 20 23 H55 L205 V2A |
|---|---|
| **Part No.** | **202 829** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Length of brace | 205 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Roof conductor holders for roofs with round standing seam



Roof conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor HVI Conductor for fixing to metal roofs with round standing seam.

| Type | DLH RSF ZS 20 23 V2A |
|---|---|
| **Part No.** | **202 850** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | Ø20-25 mm |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder for roofs with clamping seam (e.g. RIB-ROOF Speed 500 from Zambelli)



Roof conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor HVI Conductor for fixing to metal roofs with clamping seam.

| Type | DLH KF ZS 20 23 V2A |
|---|---|
| **Part No.** | **202 851** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | approx. 18 / 22 mm |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder for roofs with standing seam



Roof conductor holder with slotted saddle clamp for HVI light Conductor, HVI light plus Conductor HVI Conductor for fixing to metal roofs with standing seam.

| Type | DLH SF ZS 20 23 V2A |
|---|---|
| **Part No.** | **202 852** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | 0.7-8 mm |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder with connection lug

Roof conductor holder with slotted saddle clamp for HVI light Conductors, HVI Conductors and Z-shaped connection lug for riveting or screwing to metal roofs.



| Type | DLH AL ZS 20 23 V2A |
|---|---|
| **Part No.** | **202 853** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Fixing | [4x] Ø5.2 / [2x] Ø6.5 mm |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Conductor holder with tensioning strap

With conductor holder made of PA.



| Type LH ZS ... | 20 SB50.300 PA V2A | 23 SB50.300 PA V2A |
|---|---|---|
| **Part No.** | **275 330** | **275 333** |
| Material of conductor holder | **PA** | **PA** |
| Conductor support Rd | 20-21 mm | 23 mm |
| Tensioning range Ø pipe | 50-300 mm | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

## Conductor holder with tensioning strap

With metal conductor holder.



| Type LH ZS ... | 20 23 SB50.300 V2A |
|---|---|
| **Part No.** | **275 320** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Tensioning range Ø pipe | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Conductor holder for fixing with a tensioning strap

For fixing the HVI Conductor to pipes, e.g. with pipe clamp (Part No. 106 323).



| Type LH ZS ... | 20 23 SBH 25X0.3 V2A |
|---|---|
| **Part No.** | **275 319** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

## Pipe clamp

For fixing (clamping) conductor holders (e.g. Part No. 275 319).



| Type | BRS SPB25 50.300 V2A |
|---|---|
| **Part No.** | **106 323** |
| Material of head / strap | StSt |
| Clamping range Ø | 50-300 mm |
| Dimensions of strap | 1100 x 25 x 0.3 mm |
| Material of screw | StSt |
| PU | 10 pc(s) |

## Separate grip head

For combination with endless tensioning strap (Part No. 540 901) in case of larger pipe diameters.



| Type | SPK 25X0.3 V2A |
|---|---|
| **Part No.** | **106 324** |
| Material of head | StSt |
| For strap (w x d) | 25 x 0.3 mm |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| PU | 20 pc(s) |

## Tensioning strap



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| **Part No.** | **540 901** |
| Material | StSt |
| Strap dimensions (w x d) | 25 x 0.3 mm |
| Length | 100 m |
| PU | 1 pc(s) |

## Conductor holder

With thread.
For wall mounting with two-screw clamp (not for use in the sealing end range).



| Type | LH ZS 20 23 GM8 V2A | LH ZS 20 23 GM6 V2A |
|---|---|---|
| **Part No.** | **275 250** | **275 251** |
| Material of conductor holder | StSt | StSt |
| Conductor support Rd | 20-23 mm | 20-23 mm |
| Thread | M8 | M6 |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) | 25 pc(s) |

## Conductor holder

With plastic base.
For wall mounting with two-screw clamp (not for use in the sealing end range).



| Type | LH ZS 20 23 KS H10 V2A |
|---|---|
| **Part No.** | **275 259** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Thread | M8 |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Conductor holder

With slotted hole.
Wall-mounted conductor holder with two-screw clamp (not for use in the sealing end range).



| Type | LH ZS 20 23 B5.5X10 V2A |
|---|---|
| **Part No.** | **275 252** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-23 mm |
| Fixing hole | 5.5 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Conductor holder for the HVI Conductor / HVI light plus Conductor

For wall mounting and for mounting in the sealing end range.



| Type LH ZS ... | 20 H19 IGM8 GR PA | 23 H19 IGM8 GR PA |
|---|---|---|
| **Part No.** | **275 220** | **275 225** |
| Material of conductor holder | **PA** | **PA** |
| Conductor support Rd | 20-21 mm | 23 mm |
| Female thread | M8 | M8 |
| Fixing hole | 6.5 mm | 6.5 mm |
| Screw | M6 x 13 mm | M6 x 13 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) | 1 pc(s) |

## Conductor holder for the HVI Conductor / HVI light plus Conductor

For wall mounting with two-screw clamp (not for use in the sealing end range).



| Type LH ZS ... | 20 H10 B6.5X16 V2A |
|---|---|
| **Part No.** | **275 229** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-21 mm |
| Fixing hole | 6.5 x 16 mm |
| Screw | M6 x 14 mm |
| PU | 50 pc(s) |

## Conductor holder for HVI Conductor

For wall mounting with two-screw clamp (not for use in the sealing end range).



| Type LH ZS ... | 23 H10 B6.5X16 V2A |
|---|---|
| **Part No.** | **275 239** |
| Material of conductor holder | StSt |
| Conductor support Rd | 23 mm |
| Fixing hole | 6.5 x 16 mm |
| Screw | M6 x 14 mm |
| Standard | EN 62561-4 |
| PU | 1 pc(s) |

## Air-termination tip adapter

Reducing adapter for Ø22-mm fixtures for the central mounting of Ø10/16-mm air-termination rods on HVI supporting tubes.



| Type | AD 22 16 L45 AL | AD 22 10 L45 AL |
|---|---|---|
| **Part No.** | **819 895** NEW | **819 898** |
| Material | Al | Al |
| Reduction (Ø) | 22/16 mm | 22/10 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | AD 22 16 L45 V2A | AD 22 10 L45 V2A |
|---|---|---|
| **Part No.** | **819 896** | **819 897** |
| Material | NIRO | NIRO |
| Reduction (Ø) | 22/16 mm | 22/10 mm |
| PU | 10 pc(s) | 10 pc(s) |

## Sign

**Front** in German
ACHTUNG! Getrennter Blitzschutz mit HVI Leitung

**Back** in English
ATTENTION! Separated Lightning Protection with HVI conductor system




| Type HWS 300X210 AGBS ... | HVI DE EN K |
|---|---|
| **Part No.** | **480 598** |
| Material | **plastic** |
| Dimensions (l x w x d) | 300 x 210 x 1 mm |
| Fixing | [4x] Ø6.5 mm |
| Hole distance | 270 / 180 mm |
| PU | 1 pc(s) |

## Sign

**Front** in German
ACHTUNG!
Potentialausgleich

**Back** in English
ATTENTION!
Equipotential Bonding

Hole distance suitable for two-screw clamp (Part No. 480 291).




| Type | HWS 70X30 APA DE EN K |
|---|---|
| **Part No.** | **480 599** |
| Material | **plastic** |
| Dimensions (l x w x d) | 70 x 30 x 1 mm |
| Fixing | [2x] Ø6.5 mm |
| Hole distance | 38 mm |
| PU | 10 pc(s) |

## Conductor Holders for HVI Conductor in Ex Areas

The HVI Conductor is suitable for use in explosion hazardous areas of Ex zone 1 (gases, vapours, mists) as well as Ex zone 21 (dusts). The special installation conditions safely prevent electric sparks to neighbouring metal parts when lightning current flows through the HVI Conductor.

The HVI Conductor has to be installed in explosion hazardous areas in accordance with the installation instructions.

### HVI Ex W70 holder

For fixing to metal structural parts (façades) in Ex zones 1 and 21.



| Type | LH ZS 20 EX W70 BP V2A |
|---|---|
| **Part No.** | **275 440** |
| Material | StSt |
| Conductor support Rd | 20 mm |
| Distance from wall | 70 mm |
| Fixing | [4x] Ø5.1 / [2x] 7 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI Ex W200 holder

For fixing to metal structural parts (façades) in Ex zones 1 and 21.



| Type LH ZS ... | 20 EX W200 BP V2A |
|---|---|
| **Part No.** | **275 441** |
| Material | StSt |
| Conductor support Rd | 20 mm |
| Distance from wall | 200 mm |
| Fixing | [4x] Ø5.1 / [2x] 7 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI Ex busbar 500

For installing the HVI Conductor with conductor holders HVI Ex W70 holder (Part No. 275 440) on a non-conductive structure, e.g. stone, wood.



| Type | VS EX 500 V2A |
|---|---|
| **Part No.** | **275 498** |
| Material of brace | StSt |
| Fixing | [4x] Ø5.5 / [2x] 7 x 10 mm |
| Dimension (l x w x d) | 450 x 30 x 3 mm |
| PU | 10 pc(s) |

### HVI Ex P70 holder

For fixing to pipes, e.g. with pipe clamp (Part No. 106 323) in Ex zones 1 and 21.



| Type | LH ZS 20 EX P70 SBB V2A |
|---|---|
| **Part No.** | **275 444** |
| Material | StSt |
| Conductor support Rd | 20 mm |
| Distance from wall | 70 mm |
| Clamping range of tube | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI Ex P200 holder

For fixing to pipes, e.g. with pipe clamp (Part No. 106 323) in Ex zones 1 and 21.



| Type LH ZS ... | 20 EX P200 SBB V2A |
|---|---|
| **Part No.** | **275 442** |
| Material | StSt |
| Conductor support Rd | 20 mm |
| Distance from wall | 200 mm |
| Clamping range of tube | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

## Accessories for Conductor Holders for HVI Conductor in Ex Areas

### Pipe clamp

For fixing (clamping) the HVI Ex P200 holder (Part No. 275 442) to pipes.



| Type | BRS SPB25 50.300 V2A |
|---|---|
| **Part No.** | **106 323** |
| Material of head / strap | StSt |
| Clamping range Ø | 50-300 mm |
| Dimensions of strap | 1100 x 25 x 0.3 mm |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| PU | 10 pc(s) |

### Separate grip head

For combination with endless tensioning strap (Part No. 540 901) in case of larger pipe diameters.



| Type | SPK 25X0.3 V2A |
|---|---|
| **Part No.** | **106 324** |
| Material of head | StSt |
| For strap (w x d) | 25 x 0.3 mm |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| PU | 20 pc(s) |

### Tensioning strap



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| **Part No.** | **540 901** |
| Material | StSt |
| Strap dimensions (w x d) | 25 x 0.3 mm |
| Length | 100 m |
| PU | 1 pc(s) |

## Stripping tool for the HVI light Conductor / HVI light plus Conductor / HVI Conductor

Tool for stripping the semi-conductive sheath and the PE insulation of the HVI light Conductor, HVI Conductor (outer diameter 20 mm).

- The tool consists of a handle and various interchangeable stripping inserts
- The stripping length of the HVI light Conductor, HVI light plus Conductor, HVI Conductor is adjustable in steps of 0.2 mm (lock points) using the knob in the handle. The dial on the handle shows the length that is set.

**Operation**

- Position the stripping insert at the cut-off end of the conductor.
- Turn clockwise applying light pressure, the cutting operation/ stripping occurs through the tool.

The interchangeable stripping insert can be attached without tools via the bayonet coupling.

### HVI strip 20

Version for the HVI light conductor, HVI light plus Conductor and HVI Conductor (handle + stripping insert).



| Type HVI ... | STRIP 20 |
|---|---|
| Part No. | 597 220 |
| Diameter Ø conductor | 20 mm (remove the grey sheath beforehand if necessary) |
| Material of moulded part | plastic |
| Material of blade | StSt |
| PU | 1 pc(s) |

### HVI head 20

Version for HVI light Conductor, HVI light plus Conductor and HVI Conductor (stripping insert).



| Type HVI ... | HEAD 20 |
|---|---|
| Part No. | 597 120 |
| Diameter Ø conductor | 20 mm (remove the grey sheath beforehand if necessary) |
| Material of moulded part | plastic |
| Material of blade | StSt |
| PU | 1 pc(s) |

## Accessories for Stripping tool for the HVI light Conductor / HVI light plus Conductor / HVI Conductor

### Spare blades for stripping tool HVI head 20

1 pack = 4 pieces



| Type | EK HVI HEAD 20 |
|---|---|
| Part No. | 597 101 |
| Material | StSt |
| PU | 1 PAK |

### HVI head holder

Adapter with bayonet coupling for attaching the HVI head cutting head (pre-set stripping length 35 mm). Adapter can be used in a standard three-jaw chuck (Ø10 mm), e.g. with cordless screwdrivers.



| Type | HVI HH |
|---|---|
| Part No. | 597 139 |
| Material | Plastic / brass |
| PU | 1 pc(s) |

## Stripping tool for the HVI light Conductor / HVI light plus Conductor / HVI Conductor

Tool for stripping the additional grey sheath of the HVI light Conductor and HVI Conductor. DEHNhelix consists of a handle and an exchangeable bracket (depending on the conductor diameter).

### Stripping tool





| Type | AW DEHNHELIX | HVI TOOL CKS |
|---|---|---|
| Part No. | 597 230 | 597 231 NEW |
| Diameter Ø conductor | 23 mm | 8-35 mm |
| Material of moulded part | plastic | Plastic |
| Material of blade | StSt | StSt |
| Colour | black ● | black ● / red ● |
| PU | 1 pc(s) | 1 pc(s) |

## Accessories for Stripping tool for the HVI light Conductor / HVI light plus Conductor / HVI Conductor

### Spare blade for stripping tool



| Type | EK AW DEHNHELIX |
|---|---|
| Part No. | 597 130 |
| Material | StSt |
| PU | 1 pc(s) |

## Cable shears for HVI Conductors

Cable shears for easily cutting the HVI light Conductor, HVI Conductor (outer diameter 20 / 23 mm), HVI power Conductor (outer diameter 27 mm) and CUI Conductor to length.
The special design of the cable shears also allows precise cutting of stranded conductors, making it easier to attach connection elements.



| Type | HVI CUTTER 32 |
|---|---|
| Part No. | 597 032 |
| Diameter Ø conductor | up to 32 mm |
| Material of blades | tool steel (CR-Moly (SCM440)) |
| Material of handles | carbon steel (SS400) |
| Length | 600 mm |
| Colour of handles | red ● (similar to RAL 3020) |
| PU | 1 pc(s) |

## Cutting head

Cutting head for mounting the testable, insulated connection elements on high-voltage-resistant, insulated down conductors.



| Type | ISO HEAD 23 |
|---|---|
| Part No. | 597 126 NEW |
| Diameter Ø conductor | 23 mm |
| Material of moulded part | Al |
| Material of blade | Steel alloy |
| Colour | red ● |
| Dimensions | approx. 105 x 40 mm |
| PU | 1 pc(s) |

## Max. Gust wind speeds in km/h for air-termination systems.

### Tripod mounting – support tube

**Cable in the support tube**

| Part No. | Height [mm] | Number of concrete bases | Installation type outside \| inside | Tripod, small, StSt (V2A), Part No. 107 390 | | | | Tripod, large, StSt (V2A), Part No. 107 391 | | | | Four-legged stand, small, StSt (V2A), Part No. 107 490 | | | | Four-legged stand, large, StSt (V2A), Part No. 107 491 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3x | 6x | 9x | 12x | 3x | 6x | 9x | 12x | 4x | 8x | 12x | 16x | 4x | 8x | 12x | 16x |
| Al 105 325 | 4200 3.2+1 m | 0 | 1 | 101 | 132 | 168 | 198 | 129 | 177 | 237 | 237 | 129 | 183 | 237 | 237 | 174 | 237 | 237 | 237 |
| | | 1 | 0-1 | – | 112 | 137 | 159 | 112 | 147 | 181 | 209 | 111 | 149 | 187 | 216 | 144 | 201 | 230 | 230 |
| | | 2-4 | 0-1 | – | 103 | 121 | 137 | 101 | 132 | 159 | 185 | 110 | 132 | 163 | 190 | 132 | 179 | 203 | 203 |
| Al 105 330 | 4200 3.2+1 m | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| | | 1 | 0-1 | – | 112 | 137 | 159 | 112 | 147 | 181 | 209 | 111 | 149 | 187 | 216 | 144 | 201 | 230 | 230 |
| | | 2-4 | 0-1 | – | 103 | 121 | 137 | 101 | 132 | 159 | 185 | 110 | 132 | 163 | 190 | 132 | 179 | 203 | 203 |
| Al 105 326 | 5700 3.2+2.5 m | 0 | 1 | – | 112 | 137 | 159 | 112 | 147 | 184 | 189 | 110 | 149 | 189 | 189 | 144 | 189 | 189 | 189 |
| | | 1 | 0-1 | – | 103 | 121 | 137 | 101 | 129 | 155 | 174 | 100 | 132 | 159 | 174 | 129 | 174 | 174 | 174 |
| | | 2-4 | 0-1 | – | 95 | 112 | 124 | 95 | 120 | 140 | 149 | 93 | 120 | 144 | 149 | 120 | 149 | 149 | 149 |
| Al 105 331 | 5700 3.2+2.5 m | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| | | 1 | 0-1 | – | 103 | 121 | 137 | 101 | 129 | 155 | 174 | 100 | 132 | 159 | 174 | 129 | 174 | 174 | 174 |
| | | 2-4 | 0-1 | – | 95 | 112 | 124 | 95 | 120 | 140 | 149 | 93 | 120 | 144 | 149 | 120 | 149 | 149 | 149 |
| Al 105 327 | 5700 4.7+1 m | 0 | 1 | – | 98 | 112 | 129 | 97 | 124 | 147 | 174 | 93 | 124 | 150 | 155 | 124 | 166 | 200 | 200 |
| | | 1 | 0-1 | – | – | 99 | 110 | – | 105 | 124 | 137 | – | 105 | 124 | 129 | 105 | 137 | 149 | 149 |
| | | 2-4 | 0-1 | – | – | – | 100 | – | 96 | 110 | 124 | – | 93 | 110 | 116 | 97 | 121 | 135 | 135 |
| Al 105 332 | 5700 4.7+1 m | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| | | 1 | 0-1 | – | – | 99 | 110 | – | 105 | 124 | 137 | – | 105 | 124 | 129 | 105 | 137 | 149 | 149 |
| | | 2-4 | 0-1 | – | – | – | 100 | – | 96 | 110 | 124 | – | 93 | 110 | 116 | 97 | 121 | 135 | 135 |
| Al 105 328 | 7200 4.7+2.5 m | 0 | 1 | – | – | 104 | 116 | – | 110 | 132 | 149 | – | 110 | 132 | 137 | 112 | 144 | 155 | 155 |
| | | 1 | 0-1 | – | – | 93 | 103 | – | 100 | 112 | 129 | – | 99 | 116 | 120 | 100 | 124 | 137 | 137 |
| | | 2-4 | 0-1 | – | – | – | 93 | – | 93 | 105 | 117 | – | – | 105 | 108 | 93 | 116 | 126 | 126 |
| Al 105 333 | 7200 4.7+2.5 m | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| | | 1 | 0-1 | – | – | 93 | 103 | – | 100 | 112 | 129 | – | 99 | 116 | 120 | 100 | 124 | 137 | 137 |
| | | 2-4 | 0-1 | – | – | – | 93 | – | 93 | 105 | 117 | – | – | 105 | 108 | 93 | 116 | 126 | 126 |
| StSt 105 336 | 4200 3.2+1 m | 0 | 1 | 101 | 132 | 165 | 194 | 129 | 175 | 231 | 231 | 128 | 180 | 231 | 231 | 174 | 231 | 231 | 231 |
| | | 1 | 0-1 | – | 112 | 132 | 155 | 110 | 144 | 179 | 206 | 110 | 147 | 184 | 214 | 144 | 199 | 226 | 226 |
| | | 2-4 | 0-1 | – | 101 | 120 | 137 | 101 | 129 | 155 | 183 | 100 | 129 | 159 | 187 | 129 | 177 | 198 | 198 |
| StSt 105 314 | 4200 3.2+1 m | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| | | 1 | 0-1 | – | 112 | 132 | 155 | 110 | 144 | 179 | 206 | 110 | 147 | 184 | 214 | 144 | 199 | 226 | 226 |
| | | 2-4 | 0-1 | – | 101 | 120 | 135 | 101 | 129 | 155 | 183 | 100 | 129 | 159 | 187 | 129 | 177 | 198 | 198 |
| StSt 105 338 | 5700 4.7+1 m | 0 | 1 | – | 98 | 112 | 129 | 99 | 121 | 144 | 172 | 95 | 121 | 147 | 159 | 124 | 166 | 207 | 207 |
| | | 1 | 0-1 | – | – | 98 | 110 | – | 105 | 121 | 137 | – | 104 | 121 | 132 | 105 | 135 | 155 | 155 |
| | | 2-4 | 0-1 | – | – | – | 98 | – | 95 | 110 | 124 | – | 93 | 110 | 117 | 97 | 122 | 135 | 135 |
| StSt 105 316 | 5700 4.7+1 m | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| | | 1 | 0-1 | – | – | 98 | 110 | – | 105 | 121 | 137 | – | 104 | 121 | 132 | 105 | 135 | 155 | 155 |
| | | 2-4 | 0-1 | – | – | – | 98 | – | 95 | 110 | 124 | – | 93 | 110 | 117 | 97 | 122 | 135 | 135 |
| StSt 105 337 | 5700 3.2+2.5 m | 0 | 1 | – | 112 | 135 | 155 | 112 | 144 | 181 | 187 | 110 | 147 | 187 | 187 | 144 | 187 | 187 | 187 |
| | | 1 | 0-1 | – | 101 | 120 | 137 | 101 | 129 | 155 | 168 | 100 | 129 | 159 | 168 | 129 | 168 | 168 | 168 |
| | | 2-4 | 0-1 | – | 93 | 111 | 124 | 95 | 120 | 140 | 149 | 93 | 120 | 140 | 149 | 122 | 149 | 149 | 149 |
| StSt 105 315 | 5700 3.2+2.5 m | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| | | 1 | 0-1 | – | 101 | 120 | 137 | 101 | 129 | 155 | 168 | 100 | 129 | 159 | 168 | 129 | 168 | 168 | 168 |
| | | 2-4 | 0-1 | – | 93 | 111 | 124 | 95 | 120 | 140 | 149 | 93 | 120 | 140 | 149 | 122 | 149 | 149 | 149 |
| StSt 105 339 | 7200 4.7+2.5 m | 0 | 1 | – | – | 103 | 116 | – | 110 | 129 | 150 | – | 111 | 129 | 137 | 112 | 144 | 159 | 159 |
| | | 1 | 0-1 | – | – | 93 | 101 | – | 100 | 116 | 129 | – | 99 | 112 | 120 | 99 | 124 | 137 | 137 |
| | | 2-4 | 0-1 | – | – | – | 93 | – | 93 | 105 | 117 | – | – | 104 | 108 | 93 | 116 | 124 | 124 |
| StSt 105 317 | 7200 4.7+2.5 m | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| | | 1 | 0-1 | – | – | 93 | 101 | – | 100 | 116 | 129 | – | 99 | 112 | 120 | 99 | 124 | 137 | 137 |
| | | 2-4 | 0-1 | – | – | – | 93 | – | 93 | 105 | 117 | – | – | 104 | 108 | 93 | 116 | 124 | 124 |

### Special solutions

| Part No. | Height [mm] | Installation type outside \| inside | Rafter bracket, St/tZn Part No. 105 240 | Metal roof bracket, StSt Part No. 105 241 |
|---|---|---|---|---|
| 105 281 | 4550 | 0 1 | 140 | 140 |

**Max. Gust wind speeds in km/h for air-termination systems.**

## Tripod mounting – support tube

**Cable in the support tube**

| Part No. | Height [mm] | Number of concrete bases | Installation type outside \| inside | Tripod, small, St/tZn, Part No. 105 357 6x | 9x | 12x | Tripod, small, St/tZn, Part No. 105 351 6x | 9x | 12x | ... arrow arrangement Part No. 105 351 6x | 9x | 12x | Supporting tube stand Part No. 105 244 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Al 105 330 | 4200 3.2+1 m | 0 | 1 | 101 | 122 | 137 | 135 | 168 | 198 | 110 | 132 | 149 | – |
| | | 1 | 0-1 | – | 103 | 117 | 114 | 137 | 159 | 93 | 112 | 129 | 105 |
| | | 2-4 | 0-1 | – | 93 | 104 | 103 | 122 | 137 | – | 100 | 112 | 95 |
| Al 105 332 | 5700 4.,7+1 m | 0 | 1 | – | – | – | – | – | – | – | – | – | – |
| | | 1 | 0-1 | – | – | – | – | – | – | – | – | – | 124 |
| | | 2-4 | 0-1 | – | – | – | – | – | – | – | – | – | 110 |
| Al 105 331 | 5700 3.2+2.5 m | 0 | 1 | – | – | – | 116 | 137 | 159 | 93 | 112 | 129 | – |
| | | 1 | 0-1 | – | – | – | 103 | 121 | 137 | – | 99 | 112 | 172 |
| | | 2-4 | 0-1 | – | – | – | 95 | 110 | 124 | – | 93 | 104 | 149 |
| Al 105 333 | 7200 4.7+2.5 m | 0 | 1 | – | – | – | – | – | – | – | – | – | – |
| | | 1 | 0-1 | – | – | – | – | – | – | – | – | – | 112 |
| | | 2-4 | 0-1 | – | – | – | – | – | – | – | – | – | 105 |
| StSt 105 314 | 4200 3.2+1 m | 0 | 1 | 99 | 120 | 135 | 132 | 166 | 194 | 105 | 129 | 149 | – |
| | | 1 | 0-1 | – | 101 | 114 | 112 | 132 | 155 | 93 | 110 | 124 | 208 |
| | | 2-4 | 0-1 | – | – | 103 | 101 | 120 | 135 | – | 98 | 110 | 180 |
| StSt 105 316 | 5700 4.7+1 m | 0 | 1 | – | – | – | – | – | – | – | – | – | – |
| | | 1 | 0-1 | – | – | – | – | – | – | – | – | – | 124 |
| | | 2-4 | 0-1 | – | – | – | – | – | – | – | – | – | 110 |
| StSt 105 315 | 5700 3.2+2.5 m | 0 | 1 | – | – | – | 114 | 135 | 155 | 93 | 110 | 124 | – |
| | | 1 | 0-1 | – | – | – | 101 | 120 | 135 | – | 99 | 110 | 168 |
| | | 2-4 | 0-1 | – | – | – | 93 | 110 | 124 | – | – | 101 | 149 |
| StSt 105 317 | 7200 4.7+2.5 m | 0 | 1 | – | – | – | – | – | – | – | – | – | – |
| | | 1 | 0-1 | – | – | – | – | – | – | – | – | – | 116 |
| | | 2-4 | 0-1 | – | – | – | – | – | – | – | – | – | 105 |

**Cable in the support tube**

| Part No. | Height [mm] | Number of concrete bases | Installation type outside \| inside | Tripod, large, St/tZn, Part No. 105 201 3x | 6x | 9x | 12x | Tripod, large, St/tZn, and Bracing, StSt (V2A), Part No. 105 201 + 105 601 3x | 6x | 9x | 12x |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Al 105 330 | 4200 3.2+1 m | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | 112 | 144 | 178 | 204 | – | – | – | – |
| | | 2-4 | 0-1 | 104 | 132 | 155 | 184 | – | – | – | – |
| Al 105 331 | 5700 3.2+2.5 m | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | 112 | 147 | 147 | 147 | – | – | – | – |
| | | 2-4 | 0-1 | 105 | 132 | 132 | 132 | – | – | – | – |
| Al 105 332 | 5700 4.7+1 m | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | – | – | – | – | – | 108 | 124 | 140 |
| | | 2-4 | 0-1 | – | – | – | – | – | 99 | 112 | 129 |
| Al 105 333 | 7200 4.7+2.5 m | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | – | – | – | – | – | 101 | 117 | 132 |
| | | 2-4 | 0-1 | – | – | – | – | – | 93 | 108 | 121 |
| StSt 105 314 | 4200 3.2+1 m | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | 128 | 169 | 174 | – | – | – | – | – |
| | | 2-4 | 0-1 | 114 | 144 | 147 | – | – | – | – | – |
| StSt 105 315 | 5700 3.2+2.5 m | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | – | 101 | 120 | 137 | – | – | – | – |
| | | 2-4 | 0-1 | – | 93 | 111 | 124 | – | – | – | – |
| StSt 105 316 | 5700 4.7+1 m | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | – | – | – | – | – | 108 | 124 | 140 |
| | | 2-4 | 0-1 | – | – | – | – | – | 99 | 112 | 124 |
| StSt 105 317 | 7200 4.7+2.5 m | 0 | 1 | No internal installation possible | | | | | | | |
| | | 1 | 0-1 | – | – | – | – | – | 101 | 117 | 132 |
| | | 2-4 | 0-1 | – | – | – | – | – | 93 | 105 | 120 |

## Wall assembly

| Part No. | $L_{(max)}$ [mm] | Number of holders *) | Installation type outside \| inside | |
|---|---|---|---|---|
| Al 105 330 | 3500 mm *) 2 pc(s) | 0 | 1 | 237 |
| | | 1 | 0-1 | 224 |
| | | 2-4 | 0-1 | 196 |
| Al 105 332 | 4000 mm *) 3 pc(s) | 0 | 1 | 237 |
| | | 1 | 0-1 | 185 |
| | | 2-4 | 0-1 | 155 |
| Al 105 331 | 5000 mm *) 2 pc(s) | 0 | 1 | 190 |
| | | 1 | 0-1 | 174 |
| | | 2-4 | 0-1 | 155 |
| Al 105 333 | 5500 mm *) 3 pc(s) | 0 | 1 | 185 |
| | | 1 | 0-1 | 155 |
| | | 2-4 | 0-1 | 137 |
| Al 819 730 | 8500 mm *) 3 pc(s) | 0 | 1 | 160 |
| StSt 105 314 | 3500 mm *) 2 pc(s) | 0 | 1 | 233 |
| | | 1 | 0-1 | 228 |
| | | 2-4 | 0-1 | 199 |
| StSt 105 316 | 4000 mm *) 3 pc(s) | 0 | 1 | 233 |
| | | 1 | 0-1 | 188 |
| | | 2-4 | 0-1 | 159 |
| StSt 105 315 | 5000 mm *) 2 pc(s) | 0 | 1 | 188 |
| | | 1 | 0-1 | 170 |
| | | 2-4 | 0-1 | 149 |
| StSt 105 317 | 5500 mm *) 3 pc(s) | 0 | 1 | 187 |
| | | 1 | 0-1 | 155 |
| | | 2-4 | 0-1 | 140 |

# HVI power Conductor






| Technical data | HVI power Conductor (pre-assembled) | HVI power long Conductor (on a reel) | HVI power long Conductor (cut to length) |
|---|---|---|---|
| Picture |  |  |  |
| Structure | stranded | stranded | stranded |
| Cross section of the inner conductor (Cu) | 25 mm² | 25 mm² | 25 mm² |
| Colour of conductor | black | black | black |
| Outer diameter | 27 mm | 27 mm | 27 mm |
| Equivalent separation distance (air) | ≤ 90 cm | ≤ 90 cm | ≤ 90 cm |
| Equivalent separation distance (solid material) | ≤ 180 cm | ≤ 180 cm | ≤ 180 cm |
| Minimum bending radius | 270 mm black | 270 mm black | 270 mm black |
| Operating temperature | -30 °C ... +70 °C | -30 °C ... +70 °C | -30 °C ... +70 °C |
| Installation temperature | -5 °C ... +40 °C | -5 °C ... +40 °C | -5 °C ... +40 °C |
| Tensile strength | 1200 N | 1200 N | 1200 N |
| UV / weather-resistant | yes | yes | yes |
| Tested with $I_{imp}$ (10/350 µs) based on EN 62561-1 | 200 kA | 200 kA | 200 kA |
| For use in class of LPS in case of a single down conductor without current distribution ($k_c$ = 1) | I, II, III, IV | I, II, III, IV | I, II, III, IV |
| Installation in Ex zone 1 and 21 | allowed | allowed | allowed |
| Max. order length | 6 m ... 35 m | 100 m | 6 m ... 35 m / 36 m ... 80 m |
| Cable weight / 100 m | – | 73 kg | – |

## Supporting Tube with HVI power Conductor

Optically optimised installation of the HVI power Conductor inside the supporting tube creates reduced area exposed to wind.

Can be used up to an equivalent separation distance s ≤ 90 cm (in air) or s ≤ 180 cm (solid material).

The conductor length has to be stated when ordering (in steps of 0.5 m).

### HVI power Conductor inside the supporting tube with air-termination tip

Supporting tube with internal sealing end and EB spring element.
Air-termination tip, StSt, Ø10 mm, length 1000 mm.



| Type HVI P 27 L6M ... | SR3500 FSP1000 GFK V2A |
|---|---|
| **Part No.** | **819 430** |
| Material of supporting tube | **GRP / StSt** |
| Length of supporting tube | 3500 mm |
| Transport length | 3500 mm |
| Diameter Ø conductor | 27 mm |
| Colour of conductor | black ● |
| Material of conductor | Cu |
| Minimum order length | 6 m |
| Maximum order length | 35 m |
| Suitable for installation outside the supporting tube | no |
| Max. free length with air-termination tip (wall mounting) | 3500 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### HVI power Conductor inside the supporting tube with air-termination rod

Supporting tube with internal sealing end and EB spring element.
Air-termination rod, StSt, Ø22 / 16 / 10 mm, length 2500 mm.



| Type HVI P 27 L6M ... | SR3500 FS2500 GFK V2A | SR5000 FS2500 GFK V2A |
|---|---|---|
| **Part No.** | **819 431** | **819 433** |
| Material of supporting tube | **GRP / StSt** | **GRP / StSt** |
| Length of supporting tube | 3500 mm | 5000 mm |
| Transport length | 3500 mm | 5000 mm |
| Diameter Ø conductor | 27 mm | 27 mm |
| Colour of conductor | black ● | black ● |
| Material of conductor | Cu | Cu |
| Minimum order length | 6 m | 6 m |
| Maximum order length | 35 m | 35 m |
| Suitable for installation outside the supporting tube | no | no |
| Max. free length with air-termination rod (wall mounting) | 5000 mm | 5500 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

The conductor cannot be returned as it is made to order.

## Air-termination Mast with HVI power Conductor

For a maximum free length of the whole air-termination system of 8.5 m.
To be fixed with three variable supports (Part No. 105 345).

Transport length 6000 mm.

With 1x HVI power Conductor inside the supporting tube. Conductor length has be stated when ordering (steps of 0.5 m).

Maximum total length of the HVI power Conductor 11.0 m in case of class of LPS I.
Maximum total length of the HVI power Conductor 15.0 m in case of class of LPS II.
Maximum total length of the HVI power Conductor 22.5 m in case of class of LPS III.



| Type | FM 60 L11M IP HVIP L10M GFK AL STTZN |
|---|---|
| **Part No.** | **819 760** |
| Total length of air-termination mast | 11000 mm |
| Length of air-termination rod | 3000 mm |
| Length of supporting tube | 2300 mm |
| Length of mast pipe | 6000 mm |
| Diameter Ø conductor | 27 mm |
| Colour of conductor | black ● |
| Material of conductor | Cu |
| Minimum order length | 10 m |
| Maximum order length | 35 m |
| Suitable for installation outside tube | no |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Accessories for Air-termination Mast with HVI power Conductor

### Variable support for air-termination masts

Three supports should be mounted for each air-termination mast.
Clamping range of air-termination mast Ø60 mm.



| Type WB D60 ... | V250.350 STTZN |
|---|---|
| **Part No.** | **105 345** |
| Material of support | **St/tZn** |
| Adjustment range | 250-350 mm |
| Fixing holes Ø | [4x] 12 x 25 mm |
| PU | 1 pc(s) |

## Mast holder, heavy version

For erecting air-termination systems on installations, such as biogas plants

The heavy version of the mast holder enables the mounting of air-termination masts with a diameter of Ø55–100 mm.



| Type | WB D55.100 SE WA150 STTZN |
|---|---|
| **Part No.** | **105 352** NEW |
| Material | **HDG steel** |
| Fixing | [4x] Ø14 mm |
| Distance from wall | 106 mm |
| Clamping range (Ø mast) | 55-100 mm |
| Material of threaded rod / nut / washer | StSt |
| PU | 1 pc(s) |

## HVI power Conductor

High-voltage-resistant, insulated down conductor for maintaining the separation distance from conductive parts according to IEC/EN 62305-3. For use up to an equivalent separation distance s ≤ 90 cm (in air) or s ≤ 180 cm (solid material).

### HVI power Conductor (pre-assembled, installation inside the tube)

With one head piece and one connection element (enclosed loose). Minimum order length 6 m, conductor length has to be stated when ordering (in steps of 0.5 m).



| Type HVI P ... | RIV 90 27 L6M SW |
|---|---|
| Part No. | 819 160 |
| Material of conductor | Cu |
| Material of insulation | PE |
| Material of sheath | PE |
| Colour of conductor | black ● |
| Diameter Ø conductor | 27 mm |
| Minimum order length | 6 m |
| Maximum order length | 35 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### HVI power Conductor (pre-assembled, installation outside the tube) for HVI power supporting tube GRP / Al

HVI power Conductor pre-assembled for installation outside the tube with one head piece and one connection element (enclosed loose).
Connection kit for installing the HVI power Conductor on HVI power supporting tubes GRP / Al consists of threaded pins, a connection part, heat-shrinkable sleeve and fixing ring with slotted conductor holder (Ø27 mm) for the sealing end (including cable ties).
Minimum order length 6 m, conductor length has to be stated when ordering (in steps of 0.5 m).



| Type HVI P ... | RAV 90 27 L6M SW |
|---|---|
| Part No. | 819 165 |
| Material of conductor | Cu |
| Material of insulation | PE |
| Material of sheath | PE |
| Colour of conductor | black ● |
| Diameter Ø conductor | 27 mm |
| Minimum order length | 6 m |
| Maximum order length | 35 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### HVI power long Conductor (on a reel)

The HVI power long Conductor for on-site assembly is delivered in a length of 100 m on a disposable plywood reel (diameter approx. 900 mm, width approx. 485 mm), incl. an Allen key.



| Type HVI P ... | LO 90 27 L100M SW |
|---|---|
| Part No. | 819 137 |
| Material of conductor | Cu |
| Material of insulation | PE |
| Material of sheath | PE |
| Colour of conductor | black ● |
| Diameter Ø conductor | 27 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 100 m |

### HVI power long Conductor (cut to length)

Cut-to-length HVI power long Conductor for on-site assembly. The conductor is delivered as a coil (Part No. 819 163) or on a reel (Part No. 819 161).
Conductor length to be indicated when ordering (in steps of 0.5 m).



| Type HVI P ... | LO 90 27 L6...35M SW | LO 90 27 L36...80M SW |
|---|---|---|
| Part No. | 819 163 | 819 161 |
| Material of conductor | Cu | Cu |
| Material of insulation | PE | PE |
| Material of sheath | PE | PE |
| Colour of conductor | black ● | black ● |
| Diameter Ø conductor | 27 mm | 27 mm |
| Minimum order length | 6 m | 36 m |
| Maximum order length | 35 m | 80 m |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) | 1 pc(s) |

## Connection Elements for HVI power Conductor / HVI power long Conductor

### Connection kit for HVI power long Conductor Ø27 mm for installation inside the tube

Connection elements for sealing the HVI power long Conductor at both ends, for implementing the sealing end of the conductor in the supporting tube (head piece) and connection element for connection with other parts of the external lightning protection system or earth-termination system (including two heat-shrinkable sleeves).



| Type | HVI P LO ASS KF 27 V2A |
|---|---|
| **Part No.** | **819 142** |
| Material | StSt |
| Connection | bolt Ø10 mm, L 50 mm |
| Outside diameter Ø | 30 mm |
| Screw | M8x10 threaded pin mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Connection kit for HVI power long Conductor Ø27 mm for installation outside the tube

Connection kit for HVI power Conductor for installation on HVI power supporting tubes GRP / Al consisting of connection elements, threaded pins, connection part, heat-shrinkable sleeves, cable ties and fixing ring with a slotted conductor holder (Ø27 mm).



| Type | HVI P LO ASS RAV KF 27 V2A |
|---|---|
| **Part No.** | **819 149** |
| Material | StSt |
| Connection | bolt Ø10 mm, L 50 mm |
| Outside diameter Ø | 30 mm |
| Screw | M8x10 threaded pin mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### EB connection element for HVI power Conductor / HVI power long Conductor

For discharging the electric field of the HVI power Conductor (pre-assembled / on a reel) in the sealing end range.
Special slotted design to electrically contact the semi-conductive sheath.



| Type | PAE 27 AB11 V2A |
|---|---|
| **Part No.** | **410 239** |
| Material | StSt |
| Clamping range Ø | 27 mm |
| Connection hole Ø | 11 mm |
| Screw | ⬢ M10 x 20 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Accessories for Connection Elements for HVI power Conductor / HVI power long Conductor

### Fixing bolt

Fixing bolt for spanning a 50 mm² aluminium cable (Part No. 840 050) to an air-termination rod (Ø22 / Ø16 mm) or a connection plate (e.g. Part No. 819 289 or 819 288).



| Type | BB 1XB11GSM8 1XB23GSM12 AL |
|---|---|
| **Part No.** | **105 229** |
| Hole | 1x B 11 mm, 1x B 23 mm |
| Material of bolt | Al |
| Wire end ferrule | 50 mm² |
| Material of wire end ferrule | Cu/gal Sn |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

### Wire end ferrule

Wire end ferrule for securely fixing the aluminium cable with a cross-section of 50 mm² (Part No. 840 050).

1 pack = 10 pieces.



| Type | AEH 50 L22 CUGALSN |
|---|---|
| **Part No.** | **444 050** |
| Material | Cu/gal Sn |
| Cross section | 50 mm² |
| PU | 1 PAK |

### Cable tie

Cable ties for routing the various cables with the plastic holder half shells.



| Type | KB UVB 546X13 SW |
|---|---|
| **Part No.** | **819 999** |
| Length | 546 mm |
| Width | 13.2 mm |
| Material | Polyamide 6.6 |
| Design | UV-resistant |
| PU | 50 pc(s) |

# Supporting Tubes for HVI power Conductor / HVI power long Conductor

## With air-termination tip

Supporting tube with internal sealing end and EB spring element.
Air-termination tip, Al/StSt, Ø10 mm, length 1000 mm.



| General technical data: | |
|---|---|
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1800 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D50 ... | 3500 FSP1000 IA HVIP GFK AL | 5000 FSP1000 IA HVIP GFK AL |
|---|---|---|
| **Part No.** | **105 563** | **105 565** |
| Material of supporting tube | **GRP** / **Al** | **GRP** / **Al** |
| Length of supporting tube | 3500 mm | 5000 mm |
| Transport length | 3500 mm | 5000 mm |
| Suitable for installation outside the tube | yes | yes |
| Max. free length with air-termination tip (wall mounting) | 3500 mm | 4000 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D50 ... | 3500 FSP1000 IP HVIP GFK V2A | 5000 FSP1000 IP HVIP GFK V2A |
|---|---|---|
| **Part No.** | **105 320** | **105 322** |
| Material of supporting tube | **GRP** / **StSt** | **GRP** / **StSt** |
| Length of supporting tube | 3500 mm | 5000 mm |
| Transport length | 3500 mm | 5000 mm |
| Suitable for installation outside the tube | no | no |
| Max. free length with air-termination tip (wall mounting) | 3500 mm | 4000 mm |
| PU | 1 pc(s) | 1 pc(s) |

## With air-termination tip and side outlet

Supporting tube with internal sealing end and EB spring element.
Air-termination tip, Al/StSt, Ø10 mm, length 1000 mm.



| General technical data: | |
|---|---|
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1800 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D50 ... | 3500 FSP1000 IA SA HVIP GFK AL | 5000 FSP1000 IA SA HVIP GFK AL |
|---|---|---|
| **Part No.** | **105 513** | **105 515** |
| Material of supporting tube | **GRP** / **Al** | **GRP** / **Al** |
| Length of supporting tube | 3500 mm | 5000 mm |
| Transport length | 3500 mm | 5000 mm |
| Suitable for installation outside the tube | yes | yes |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D50 ... | 3500 FS1000 IP SA HVIP GFK V2A | 5000 FS1000 IP SA HVIP GFK V2A |
|---|---|---|
| **Part No.** | **105 392** | **105 394** |
| Material of supporting tube | **GRP** / **StSt** | **GRP** / **StSt** |
| Length of supporting tube | 3500 mm | 5000 mm |
| Transport length | 3500 mm | 5000 mm |
| Suitable for installation outside the tube | no | no |
| PU | 1 pc(s) | 1 pc(s) |

## With air-termination rod

Supporting tube with internal sealing end and EB spring element.
Air-termination rod, Al/StSt, Ø22 / 16 / 10 mm, length 2500 mm.



| General technical data: | |
|---|---|
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1800 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D50 ... | 3500 FS2500 IA HVIP GFK AL | 5000 FS2500 IA HVIP GFK AL |
|---|---|---|
| **Part No.** | **105 573** | **105 575** |
| Material of supporting tube | **GRP** / **Al** | **GRP** / **Al** |
| Length of supporting tube | 3500 mm | 5000 mm |
| Transport length | 3500 mm | 5000 mm |
| Suitable for installation outside the tube | yes | yes |
| Max. free length with air-termination rod (wall mounting) | 5000 mm | 5500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D50 ... | 3500 FS22 10 2500 IP HVIP GFK V2A | 5000 FS22 10 2500 IP HVIP GFK V2A |
|---|---|---|
| **Part No.** | **105 321** | **105 323** |
| Material of supporting tube | **GRP** / **StSt** | **GRP** / **StSt** |
| Length of supporting tube | 3500 mm | 5000 mm |
| Transport length | 3500 mm | 5000 mm |
| Suitable for installation outside the tube | no | no |
| Max. free length with air-termination rod (wall mounting) | 5000 mm | 5500 mm |
| PU | 1 pc(s) | 1 pc(s) |

## With air-termination rod and side outlet

Supporting tube with internal sealing end and EB spring element.
Air-termination rod, Al/StSt, Ø22 / 16 / 10 mm, length 2500 mm.



| General technical data: | |
|---|---|
| Outside diameter Ø | 50 mm |
| Length of insulating clearance | 1800 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |

| Type SR D50 ... | 3500 FS2500 IA SA HVIP GFK AL | 5000 FS2500 IA SA HVIP GFK AL |
|---|---|---|
| **Part No.** | **105 543** | **105 545** |
| Material of supporting tube | **GRP** / **Al** | **GRP** / **Al** |
| Length of supporting tube | 3500 mm | 5000 mm |
| Transport length | 3500 mm | 5000 mm |
| Suitable for installation outside the tube | yes | yes |
| PU | 1 pc(s) | 1 pc(s) |

| Type SR D50 ... | | 5000 FS2500 IP SA HVIP GFK V2A |
|---|---|---|
| **Part No.** | | **105 395** |
| Material of supporting tube | | **GRP** / **StSt** |
| Length of supporting tube | | 5000 mm |
| Transport length | | 5000 mm |
| Suitable for installation outside the tube | | no |
| PU | | 1 pc(s) |

## Accessories for Supporting Tubes for HVI power Conductor / HVI power long Conductor

### Sideways air-termination tips Al for supporting tubes



Fixing kit for installing lateral/horizontal air-termination tips to HVI long supporting tubes and HVI power supporting tubes. Consisting of four air-termination tips and a fixing ring.

**Note:** The additional wind load stress on the air-termination system resulting from the side-mounted air-termination tips must be taken into account!

| Type BFRS D80 B35 ... | 4FSP 10 1030 AL | 4FSP 10 1030 V2A |
|---|---|---|
| **Part No.** | **819 185** | **819 186** |
| Length of air-termination tip | 1030 mm | 1030 mm |
| Material of air-termination tip | Al | StSt |
| Material of fixing ring | Al | StSt |
| PU | 1 pc(s) | 1 Stk. |

## Tripod for Supporting Tubes without Side Outlet

Stands for holding HVI supporting tubes for internally/externally routed HVI Conductors in/on the supporting tube, with double clamp for connection of 2x Rd 8–10 mm. Adjustable to the roof slope up to max. 10° using a variable fixing on the base holder.

The stackable concrete bases, the plastic base plates and the base holder set for holding additional concrete bases are each available separately in the accessories.

### Tripod small



| Type | DBS KB D50 RA680 V2A |
|---|---|
| **Part No.** | **107 390** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 680 mm |
| Space required for tripod | 1175 x 1020 mm |
| PU | 1 pc(s) |

### Tripod large



| Type | DBS KB D50 RA1330 V2A |
|---|---|
| **Part No.** | **107 391** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 1330 mm |
| Space required for tripod | 2300 x 1995 mm |
| PU | 1 pc(s) |

### Four-legged stand, small



| Type | VBS KB D50 RA680 V2A |
|---|---|
| **Part No.** | **107 490** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 680 mm |
| Space required for tripod | 960 x 960 mm |
| PU | 1 pc(s) |

### Four-legged stand, large



| Type | VBS KB D50 RA1330 V2A |
|---|---|
| **Part No.** | **107 491** |
| Material of tripod | StSt |
| Support | 50 and 40*) mm |
| Radius | 1330 mm |
| Space required for tripod | 1880 x 1880 mm |
| PU | 1 pc(s) |

### Tripod, small, HDG steel

Suitable for the inner routing of the HVI Conductor.



| Type | DBS KB D40.50 RA620 STTZN | DBS KB D40.50 RA220 STTZN |
|---|---|---|
| **Part No.** | **105 351** | **105 357** |
| Material of tripod | **St/tZn** | **St/tZn** |
| Support | 40 / 50 mm | 40 / 50 mm |
| Radius | 620 mm | 220 mm |
| Number of concrete bases | 3-12 blocks, 17 kg each | 3-12 blocks, 17 kg each |
| Space required for tripod | 1300 x 1450 mm | 668 x 718 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Tripod, large, HDG steel

Suitable for the outer routing of the HVI Conductor.



| Type | DBS KB D40.50 RA1435 STTZN |
|---|---|
| **Part No.** | **105 201** |
| Material of tripod | **St/tZn** |
| Support | 40 / 50 mm |
| Radius | 1435 mm |
| Number of concrete bases | 3-12 blocks 17 kg each |
| Space required for tripod | 2520 x 2860 mm |
| PU | 1 pc(s) |

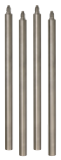
## Accessories for Tripod for Supporting Tubes without Side Outlet

### Set of base support rods for tripods



| Type | SOH 3 200 V2A |
|---|---|
| **Part No.** | **107 396** |
| For tripod | Part No. 107 390 / 107 391 |
| Number of concrete bases | 1 to 2 |
| Material | StSt |
| Diameter | 16 mm |
| Length | 200 mm |
| PU | 1 pc(s) |

### Set of base support rods for four-legged stands



| Type | SOH 4 200 V2A |
|---|---|
| **Part No.** | **107 496** |
| For four-legged stand | Part No. 107 490 / 107 491 |
| Number of concrete bases | 1 to 2 |
| Material | StSt |
| Diameter | 16 mm |
| Length | 200 mm |
| PU | 1 pc(s) |

### Adapter set

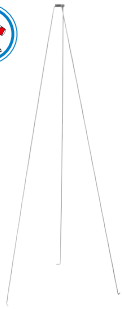
Adapter set for reducing the diameter from 50 mm to 40 mm for tripods and four-legged stands.



| Type | RED D40 V2A DBS VBS |
|---|---|
| **Part No.** | **107 399** |
| For tripod | Part No. 107 390 / 107 391 |
| For four-legged stand | Part No. 107 490 / 107 491 |
| Material | StSt |
| PU | 1 pc(s) |

### Bracing

Brace, 3x with clamp for pipe, Ø50 mm for fixing to the tripod (part no. 105 201). Brace suitable for supporting tubes with a length of 4700 mm (e.g. part nos 105 332, 105 316, 105 333, 105 317, 105 322, 105 323, 105 565, 105 575).



| Type | ABST 3F D50 2900 V2A |
|---|---|
| **Part No.** | **105 601** |
| Material | StSt |
| Brace length | 2910 mm |
| Ø clamp | 50 mm |
| PU | 1 pc(s) |

### Concrete base

With fixing wedge, stackable, for erecting tripods and air-termination rods Ø16 mm, chamfered or tapered, DEHNiso spacer Ø16 mm or conductor holder (Part No. 253 279).



| Type | BES 17KG KT16 D337 SET |
|---|---|
| **Part No.** | **102 010** |
| Weight | 17 kg |
| Support | with fixing wedge Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | StSt |
| PU | 54 pc(s) |

### Base plate

To protect the roof sheeting under the concrete base. For concrete bases (Part Nos. 102 010, 102 002).



| Type | ULP KS D370 SW |
|---|---|
| **Part No.** | **102 050** |
| Outside diameter Ø | 370 mm |
| Inside diameter Ø | 360 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

## Fixing Elements for Supporting Tubes

### Fixing clamp with tensioning strap

For fixing supporting tubes to structural elements, e.g. antenna masts.



| Type | BS D50 SB50.300 V2A |
|---|---|
| **Part No.** | **105 360** |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| PU | 1 pc(s) |

### Fixing clamp with tensioning strap

With additional spacer for adjusting the sector antenna supports to the mast.



| Type BS D50 ... | DS30 SB50.300 V2A |
|---|---|
| **Part No.** | **105 361** |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| Length of spacer | 30 mm |
| PU | 1 pc(s) |

### Fixing clamp with tensioning strap

With additional long spacer for adjusting sector antenna supports to the mast.



| Type BS D50 ... | DS90 SB50.300 V2A |
|---|---|
| **Part No.** | **105 362** |
| Material of clip | StSt |
| Clamping range for supporting tube | 50 mm |
| Clamping range for pipe Ø | 50-300 mm |
| Material of tensioning strap | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| Length of spacer | 95 mm |
| PU | 1 pc(s) |

## Wall mounting bracket for horizontal mounting, flat

For fixing supporting tubes onto the structure to be protected or the wall.



| Type | WB D50 WA V2A |
|---|---|
| Part No. | 105 340 |
| Material | StSt |
| Clamping range for supporting tube | 50 mm |
| Distance from wall / corner | 80 mm |
| Dimensions of fixing | 320 mm |
| Fixing | [8x] Ø5.1 / [4x] 11 x 20 mm |
| PU | 1 pc(s) |

## Wall mounting bracket for horizontal mounting, corner

For fixing supporting tubes onto the structure to be protected or the wall.



| Type | EB D50 WA V2A |
|---|---|
| Part No. | 105 341 |
| Material | StSt |
| Clamping range for supporting tube | 50 mm |
| Distance from wall / corner | 80 mm |
| Dimensions of fixing | 152 mm |
| Fixing | [8x] Ø5.1 / [4x] 11 x 20 mm |
| PU | 1 pc(s) |

## Accessories for Fixing Elements for Supporting Tubes

## Wall mounting bracket for vertical mounting

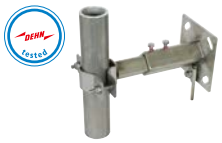
For attaching supporting tubes or air-termination rods D40 / D50 to roof-mounted structures or walls.



| Type | WB D40.50 SE WA46 V2A | WB D40.50 SE WA110 V2A |
|---|---|---|
| Part No. | 105 342 | 105 348 |
| Material of bracket | StSt | StSt |
| Fixing | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm | [8x] Ø5.1 / [4x] 7 x 10 / [2x] 11 x 20 mm |
| Clamping range for supporting tube | 40-50 mm | 40-50 mm |
| Distance from wall | 46 mm | 110 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Wall mounting bracket, adjustable from 150-200 mm

For attaching supporting tubes or air-termination rods D40 / D50, with double clamp for connecting 2x Rd 8-10 mm.



| Type | WB D40.50 V150.200 V2A |
|---|---|
| Part No. | 105 344 |
| Material of bracket | StSt |
| Clamping range for supporting tube | 40-50 mm |
| Distance from wall | 150-200 mm |
| Dimensions of plate | 120 x 120 x 4 mm |
| Fixing | [4x] 12 x 26 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Wall mounting bracket, adjustable from 230-1300 mm

For fixing supporting tubes or air-termination rods D40 / D50.



| General technical data: | |
|---|---|
| Material of bracket | St/tZn / StSt |
| Clamping range for supporting tube | 40-50 mm |
| Dimensions of plate | 120 x 120 x 4 mm |
| Fixing | [4x] 12 x 26 mm |

| Type | WB D40.50 V230.400 STTZN V2A | WB D40.50 V400.700 STTZN V2A |
|---|---|---|
| Part No. | 105 347 | 105 343 |
| Distance from wall | 230-400 mm | 400-700 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type | WB D40.50 V700.1300 STTZN V2A |
|---|---|
| Part No. | 105 349 |
| Distance from wall | 700-1300 mm |
| PU | 1 pc(s) |

## Railing clamp

For pipes.



| Type | BS D40.50 D48.60 V2A |
|---|---|
| Part No. | 105 354 |
| Material | StSt |
| Clamping range for pipe Ø | 48-60 mm (1 1/2-2'') |
| Clamping range for supporting tube | 40-50 mm |
| PU | 5 pc(s) |

## Railing clamp

For pipes.



| Type | BS D40.50 D70.90 V2A |
|---|---|
| Part No. | 105 355 |
| Material | StSt |
| Clamping range for pipe Ø | 70-90 mm (2 1/4-3'') |
| Clamping range for supporting tube | 40-50 mm |
| PU | 1 pc(s) |

## Railing clamp

For square hollow profiles.



| Type | BS D40.50 4K20.50 V2A | BS D40.50 4K60.120 V2A |
|---|---|---|
| Part No. | 105 356 | 105 376 |
| Material | StSt | StSt |
| Clamping range for square profile | 20 x 20 to 50 x 50 mm | 60 x 120 mm |
| Clamping range for supporting tube | 40-50 mm | 40-50 mm |
| PU | 5 pc(s) | 1 pc(s) |

## Spacers for Omnidirectional Antennas

Spacer for DEHNiso Combi supporting tubes with HVI Conductor installed inside and/or outside the supporting tube, mounted on the antenna mast.



| General technical data: | |
|---|---|
| Material of support / square profile | **St/tZn** |
| Clamping range of supporting tube | 50 mm |
| Length of spacer | 1000 mm |

| Type AH D50 1000 ... | D55.100 STTZN | D100.150 STTZN |
|---|---|---|
| **Part No.** | **105 363** | **105 364** |
| Clamping range (Ø mast) | 55-100 mm | 100-150 mm |
| Dimensions (w1 x h1 x d1) | 140 x 120 x 55 mm | 190 x 140 x 60 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type AH D50 1000 ... | D150.190 STTZN |
|---|---|
| **Part No.** | **105 365** |
| Clamping range (Ø mast) | 150-190 mm |
| Dimensions (w1 x h1 x d1) | 230 x 180 x 70 mm |
| PU | 1 pc(s) |

Spacers for omnidirectional antennas with special lengths or any other diameters are available upon request!

## Accessories for HVI power Conductor / HVI power long Conductor

### Roof conductor holder

For flat roofs, weight approx. 4.7 kg. Conductor holder, concrete block and base plate for installing the HVI power Conductor on flat roofs.



| Type | DLH ZS 27 V2A BES180 GP300 K |
|---|---|
| **Part No.** | **253 333** |
| Material of conductor holder | StSt |
| Conductor support Rd | 27 mm |
| Total weight | approx. 4.7 kg |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 24 pc(s) |

### Roof conductor holder

For flat roofs, weight approx. 8.6 kg. Conductor holder, concrete block and base plate for installing the HVI power Conductor on flat roofs.



| Type | DLH ZS 27 V2A 8.5KG KT D240 ULP |
|---|---|
| **Part No.** | **253 334** |
| Material of conductor holder | StSt |
| Conductor support Rd | 27 mm |
| Total weight | approx. 8.6 kg |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Conductor holder

With slotted saddle clamp for HVI power Conductor to be fixed in the concrete block (Part No. 253 301) and base plate (Part No. 253 300).



| Type | LH ZS 27 DS10 L75 V2A |
|---|---|
| **Part No.** | **253 330** |
| Material | StSt |
| Conductor support Rd | 27 mm |
| Height of conductor holder | approx. 87 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

### Concrete block

For stabilising the base plate.



| Type | BES 4.6KG SB10 180X180X70 |
|---|---|
| **Part No.** | **253 301** |
| Material | **concrete (C35/45)** |
| Weight | 4.6 kg |
| Dimensions | 180 x 180 x 70 mm |
| PU | 24 pc(s) |

### Base plate

Base plate to hold the spacer bar (Part Nos. 253 315, 253 325) and conductor holder (Part No. 253 289) and to protect the roof sheeting under the concrete block (Part No. 253 301).



| Type | GP B10 H60 D300 KS GR |
|---|---|
| **Part No.** | **253 300** |
| Diameter Ø | 300 mm |
| Diameter Ø of lock bush | 10 mm |
| Height | 60 mm |
| Material | **plastic** |
| Colour | grey |
| PU | 24 pc(s) |

### Conductor holder

With slotted saddle clamp for HVI power Conductor for mounting in the concrete block with wedge (Part No. 102 075).



| Type | LH ZS 27 KT D16 L85 V2A |
|---|---|
| **Part No.** | **253 331** |
| Material | StSt |
| Conductor support Rd | 27 mm |
| Height of conductor holder | approx. 125 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

### Concrete base

With fixing wedge, for air-termination tips Ø10, length 1000 mm or DEHNiso spacers Ø16 mm, length up to 675 mm (distance 0.8 m) or conductor holder (Part No. 253 279).



| Type | BES 8.5KG KT10 16 D240 SET |
|---|---|
| **Part No.** | **102 075** |
| Total weight | 8.5 kg |
| Diameter Ø | 240 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | StSt |
| PU | 120 pc(s) |

## Base plate

To protect the roof sheeting under the concrete base. For concrete bases (Part No. 102 075, 102 003).



| Type | ULP KS D280 SW |
|---|---|
| **Part No.** | **102 060** |
| Outside diameter Ø | 280 mm |
| Inside diameter Ø | 270 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

## Spacer with EB element for HVI power Conductor (length of variable sealing end 350-900 mm)

Spacer for establishing the variable sealing end of the HVI power Conductor.
With MV clamp for connection to the equi-potential bonding (Rd 16 mm / Rd 8-10 mm).
Concrete base (Part No. 102 010, weight 17 kg) and base plate (Part No. 102 050) must be ordered separately.



| Type | DIDH PAE 27 D16 1270 AL V2A |
|---|---|
| **Part No.** | **105 462** |
| Material of spacer | Al |
| Lenght of spacer | 1270 |
| Conductor support Rd | 27 mm |
| Material of conductor holder | StSt |
| Clamping range Rd MV clamp | 8-10 / 16 mm |
| Material of clamp | Al |
| Length of variable sealing end | 350-900 mm |
| Max. gust wind speed (1 base, 17 kg each; l = 900 mm) | 100 km/h |
| Max. gust wind speed (2 bases, 17 kg each; l = 900 mm) | 141 km/h |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Variable tripod with EB element for HVI power Conductor (length of variable sealing end 900 - 1500 mm)

Tripod (hinged) with variable spacer (small) for establishing the variable sealing end of the HVI power Conductor.
With UNI earthing clamp for connecting 1x Rd 8-10 mm and 1x conductor 4-50 mm².
Adjustable to the roof inclination up to max. 10°.
The **three concrete bases** (Part No. 102 075, weight 8.5 kg) and **base plates** (Part No. 102 060) must be **ordered separately**.



| Type | V DBS RA320 PAE 27 V 600 1180 V2A |
|---|---|
| **Part No.** | **105 468** |
| Material of tripod | StSt |
| Radius | 320 mm |
| Number of concrete bases | 3 (8.5 kg each) |
| Conductor support Rd | 27 mm |
| Adjustment range of spacer | 600-1180 mm |
| Length of variable sealing end | 900-1500 mm |
| Max. gust wind speed (3 bases, 8.5 kg each; l = 900 mm) | 170 km/h |
| Max. gust wind speed (3 bases, 8.5 kg each; l = 1500 mm) | 104 km/h |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Variable tripod with EB element for HVI power Conductor (length of variable sealing end 1500 - 1800 mm)

Tripod (hinged) with variable spacer (large) for establishing the sealing end of the HVI power Conductor.
With UNI earthing clamp for connecting 1x Rd 8-10 mm and 1x conductor 4-50 mm².
Adjustable to the roof inclination up to max. 10°.
The **three concrete bases** (Part No. 102 075, weight 8.5 kg) and the **base plates** (Part No. 102 060) must be **ordered separately**.



| Type | V DBS RA320 PAE 27 V 750 1510 V2A |
|---|---|
| **Part No.** | **105 467** |
| Material of tripod | StSt |
| Radius | 320 mm |
| Number of concrete bases | 3 (8.5 kg each) |
| Conductor support Rd | 27 mm |
| Adjustment range of spacer | 750-1510 mm |
| Length of variable sealing end | 1500-1800 mm |
| Max. gust wind speed (3 bases, each 8.5 kg; l = 1500 mm) | 104 km/h |
| Max. gust wind speed (3 bases, each 8.5 kg; l = 1800 mm) | 93 km/h |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Spacer for HVI power Conductor

Spacer for additional mechanical fixing in the variable sealing end range.
The spacer is erected with **two concrete bases** (Part No. 102 010, weight 17 kg). The **concrete bases** and **base plate** (Part No.Nr. 102 050) must be ordered separately.



| Type | DH ZS 27 30 D16 1500 GFK PA |
|---|---|
| **Part No.** | **106 814** |
| Material of spacer | **GRP** |
| Material of conductor holder / adapter | **PA** |
| Number of concrete bases | 2 (17 kg each) |
| Length | 1500 mm |
| Insulating clearance | 1475 mm |
| Conductor support Rd | 27 mm |
| Thread | M8 |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Concrete base

With fixing wedge, stackable, for erecting tripods and air-termination rods Ø16 mm, chamfered or tapered, DEHNiso spacer Ø16 mm or conductor holder (Part No. 253 279).



| Type | BES 17KG KT16 D337 SET |
|---|---|
| **Part No.** | **102 010** |
| Weight | 17 kg |
| Support | with fixing wedge Ø16 mm |
| Diameter Ø | 337 mm |
| Material | **concrete (C45/55)** |
| Material of wedge / adapter | StSt |
| PU | 54 pc(s) |

## Base plate

To protect the roof sheeting under the concrete base. For concrete bases (Part Nos. 102 010, 102 002).



| Type | ULP KS D370 SW |
|---|---|
| **Part No.** | **102 050** |
| Outside diameter Ø | 370 mm |
| Inside diameter Ø | 360 mm |
| Material | **EVA** |
| Colour | black ● |
| PU | 1 pc(s) |

## Conductor holder

With thread.
For wall mounting with two-screw conductor clamp (not for use in the sealing end range).



| Type | LH ZS 27 GM8 V2A | LH ZS 27 GM6 V2A |
|---|---|---|
| **Part No.** | **275 240** | **275 241** |
| Material of conductor holder | StSt | StSt |
| Conductor support Rd | 27 mm | 27 mm |
| Thread | M8 | M6 |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) | 25 pc(s) |

## Conductor holder

With plastic base
Conductor holder for wall mounting with two-screw clamp (not within the sealing end range).



| Type | LH ZS 27 KS H10 V2A |
|---|---|
| **Part No.** | **275 249** |
| Material of conductor holder | StSt |
| Conductor support Rd | 27 mm |
| Thread | M8 |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Conductor holder

With slot hole.
For wall mounting, with two-screw conductor clamp (not for use in the sealing end range).



| Type | LH ZS 27 B5.5X10 V2A |
|---|---|
| **Part No.** | **275 242** |
| Material of conductor holder | StSt |
| Conductor support Rd | 27 mm |
| Fixing hole | 5.5 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Saddle clamp



| Type | LH ZSUEL 30 2XB6.5 V2A |
|---|---|
| **Part No.** | **275 269** NEW |
| Conductor routing | Fixed |
| Material of conductor holder | StSt |
| Conductor support Rd | 27-30 mm |
| Fixing | [2x] Ø6,5 mm |
| PU | 25 pc(s) |

## Conductor holder with tensioning strap

For fixing the HVI power Conductor, e.g. to pipes.



| Type | LH ZS 27 SB50.300 V2A |
|---|---|
| **Part No.** | **275 339** |
| Material of conductor holder | StSt |
| Conductor support Rd | 27 mm |
| Tensioning range Ø pipe | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Conductor holder for fixing with a tensioning strap

For fixing the HVI power Conductor at pipes e.g. with pipe clamp (Part No. 106 323).



| Type | LH ZS 27 30 SBH 25X0.3 V2A |
|---|---|
| **Part No.** | **275 359** |
| Material of conductor holder | StSt |
| Conductor support Rd | 27 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Pipe clamp

For fixing (clamping) conductor holders (e.g. Part No. 275 319).



| Type | BRS SPB25 50.300 V2A |
|---|---|
| **Part No.** | **106 323** |
| Material of head / strap | StSt |
| Clamping range Ø | 50-300 mm |
| Dimensions of strap | 1100 x 25 x 0.3 mm |
| Material of screw | StSt |
| PU | 10 pc(s) |

## Separate grip head

For combination with endless tensioning strap (Part No. 540 901) in case of larger pipe diameters.



| Type | SPK 25X0.3 V2A |
|---|---|
| **Part No.** | **106 324** |
| Material of head | StSt |
| For strap (w x d) | 25 x 0.3 mm |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| PU | 20 pc(s) |

## Tensioning strap



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| **Part No.** | **540 901** |
| Material | StSt |
| Strap dimensions (w x d) | 25 x 0.3 mm |
| Length | 100 m |
| PU | 1 pc(s) |

## Roof conductor holder

With pre-punched points for bending and hooking into the roof tile and for screwing onto battens to install the HVI power Conductor on gable roofs.



| Type | DLH ZS 27 30 H55 L205 V2A |
|---|---|
| **Part No.** | **202 857** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Conductor support Rd | 27 mm |
| Length of brace | 205 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 1 pc(s) |

## Roof conductor holder for roofs with round standing seam

Roof conductor holder with slotted saddle clamp for fixing the HVI power Conductor onto metal roofs with round standing seam.



| Type | DLH RSF ZS 27 V2A |
|---|---|
| **Part No.** | **202 860** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | Ø20-25 mm |
| Conductor support Rd | 27 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder for roofs with clamping seam (e.g. RIB-ROOF Speed 500 from Zambelli)

Roof conductor holder with slotted saddle clamp for fixing the HVI power Conductor onto metal roofs with clamping seam.



| Type | DLH KF ZS 27 V2A |
|---|---|
| **Part No.** | **202 861** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | approx. 18 / 22 mm |
| Conductor support Rd | 27 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder for roofs with standing seam

Roof conductor holder with slotted saddle clamp for fixing the HVI power Conductor onto metal roofs with standing seam.



| Type | DLH SF ZS 27 V2A |
|---|---|
| **Part No.** | **202 862** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Clamping range | 0.7-8 mm |
| Conductor support Rd | 27 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Roof conductor holder with connection lug

Roof conductor holder with slotted saddle clamp for HVI power Conductor and Z-shaped connection lug for riveting or screwing to metal roofs.



| Type | DLH AL ZS 27 V2A |
|---|---|
| **Part No.** | **202 863** |
| Material of roof conductor holder | StSt |
| Material of conductor holder | StSt |
| Fixing | [4x] Ø5.2 / [2x] Ø6.5 mm |
| Conductor support Rd | 27 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

## Air-termination tip adapter

Reducing adapter for Ø22-mm fixtures for the central mounting of Ø10/16-mm air-termination rods on HVI supporting tubes.



| Type | AD 22 16 L45 AL | AD 22 10 L45 AL |
|---|---|---|
| **Part No.** | **819 895** NEW | **819 898** |
| Material | Al | Al |
| Reduction (Ø) | 22/16 mm | 22/10 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | AD 22 16 L45 V2A | AD 22 10 L45 V2A |
|---|---|---|
| **Part No.** | **819 896** | **819 897** |
| Material | NIRO | NIRO |
| Reduction (Ø) | 22/16 mm | 22/10 mm |
| PU | 10 pc(s) | 10 pc(s) |

## Conductor Holders for HVI power Conductor in Ex Areas

The HVI power Conductor is suitable for installation in explosion hazardous areas Ex zone 1 (gases, vapours, mists) as well as Ex zone 21 (dust). The special installation conditions safely prevent electric sparks to neighbouring metal parts when lightning current flows through the HVI power Conductor.
The HVI power Conductor has to be installed in accordance with the installation instructions.

### HVI power Ex W85 holder

For fixing on metal structural parts (facades) in Ex zones 1 and 21.



| Type | LH ZS 27 EX W85 BP V2A |
|---|---|
| **Part No.** | **275 450** |
| Material | StSt |
| Conductor support Rd | 27 mm |
| Distance from wall | 85 mm |
| Fixing | [4x] Ø5.1 / [2x] 7 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI power Ex W240 holder

For fixing on metal structural parts (facades) in Ex zones 1 and 21.



| Type | LH ZS 27 EX W240 BP V2A |
|---|---|
| **Part No.** | **275 451** |
| Material | StSt |
| Conductor support Rd | 27 mm |
| Distance from wall | 240 mm |
| Fixing | [4x] Ø5.1 / [2x] 7 x 10 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI power Ex busbar 500

For installing the HVI power Conductor with conductor holders HVI Ex W85 holder (Part No. 275 450) on a non-conductive structure, e.g. stone, wood.



| Type | VS EX 500 V2A |
|---|---|
| **Part No.** | **275 498** |
| Fixing | [4x] Ø5.5 / [2x] 7 x 10 mm |
| PU | 10 pc(s) |

### HVI power Ex P85 holder

For fixing to pipes, e.g. with pipe clamp (Part No. 106 323) in Ex zones 1 und 21.



| Type | LH ZS 27 EX P85 SBB V2A |
|---|---|
| **Part No.** | **275 454** |
| Material | StSt |
| Conductor support Rd | 27 mm |
| Distance from wall | 85 mm |
| Clamping range of tube | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

### HVI power Ex P240 holder

For fixing to pipes, e.g. with pipe clamp (Part No. 106 323) in Ex zones 1 and 21.



| Type | LH ZS 27 EX P240 SBB V2A |
|---|---|
| **Part No.** | **275 455** |
| Material | StSt |
| Conductor support Rd | 27 mm |
| Distance from wall | 240 mm |
| Clamping range of tube | 50-300 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 10 pc(s) |

## Accessories for Conductor Holders for HVI power Conductor in Ex Areas

### Pipe clamp

For fixing (clamping) conductor holders (e.g. Part No. 275 319).



| Type | BRS SPB25 50.300 V2A |
|---|---|
| **Part No.** | **106 323** |
| Material of head / strap | StSt |
| Clamping range Ø | 50-300 mm |
| Dimensions of strap | 1100 x 25 x 0.3 mm |
| Material of screw | StSt |
| PU | 10 pc(s) |

### Separate grip head

For combination with endless tensioning strap (Part No. 540 901) in case of larger pipe diameters.



| Type | SPK 25X0.3 V2A |
|---|---|
| **Part No.** | **106 324** |
| Material of head | StSt |
| For strap (w x d) | 25 x 0.3 mm |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| PU | 20 pc(s) |

### Tensioning strap



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| **Part No.** | **540 901** |
| Material | StSt |
| Strap dimensions (w x d) | 25 x 0.3 mm |
| Length | 100 m |
| PU | 1 pc(s) |

## Connecting components 200 kA (10/350 µs)

For use in class of LPS I and II (LPL I, II).
Clamps are tested with a 200 kA (10/350 µs) lightning impulse current, based on EN 62561-1.

### UNI disconnecting clamp for two round conductors



| Type | UTK 200 2X10 FL30 ZP V2A |
|---|---|
| Part No. | 459 200 |
| Material | StSt |
| Clamping range Rd / Rd | 10 / 10 mm |
| Clamping range Rd / Fl | 10 / 30 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### UNI disconnecting clamp for earth entry rods



| Type | UTK 200 8.10 16 ZP V2A |
|---|---|
| Part No. | 459 219 |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### Clamping piece



| Type | KS 200 B11.11 FL30X4 V2A |
|---|---|
| Part No. | 380 209 |
| Material | StSt |
| Clamping range Fl | 30 x 4 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### KS connector



| Type | KSV 200 10 FER V2A |
|---|---|
| Part No. | 301 209 |
| Material | StSt |
| Clamping range Rd | 10 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### MV clamp for round conductors



| Type | MVK 200 8.10 SKM10X30 V2A |
|---|---|
| Part No. | 390 209 |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### MV clamp for air-termination rods



| Type | MVK 200 8.10 16 SKM10X40 FSC V2A |
|---|---|
| Part No. | 392 209 |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### KS connector 100 kA (10/350 µs), one-piece, with spring washer



| Type | KSV 7.10 FER STTZN | KSV 6.10 FER CU |
|---|---|---|
| Part No. | 301 010 | 301 017 |
| Material of clamping screw | St/tZn | Cu |
| Material of clamp | ZDC | RCB |
| Clamping range Rd | 7-10 mm | 6-10 mm |
| Connection (single-wire / multi-wire) | – | 25-70 mm² |
| Type | + spring washer | + spring washer |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA *) | $I_{imp}$ 100 kA *) |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 100 pc(s) | 100 pc(s) |

### KS connector 100 kA (10/350 µs), two-piece, with spring washer



| Type | AP 2X6.10 V2A |
|---|---|
| Part No. | 301 229 |
| Material of clamping screw | StSt |
| Material of clamp | StSt |
| Clamping range Rd | 6-10 mm |
| Type | + spring washer |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA / $I_{imp}$ 50 kA *) |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Stripping Tool for HVI power Conductors

Tool for stripping the semi-conductive sheath and the PE insulation of the HVI power Conductor (outer diameter 27 mm)

- Tool consists of a of handle and various exchangeable cutting heads
- Stripping length of the HVI power Conductor is adjustable in steps of 0.2 mm (lock points) using the knob. The dial on the handle shows the length set.

**Handling**
Position the cutting head at the end of the conductor and turn clockwise with light pressure to cut / strip it.
The cutting head can be exchanged without tools via the bayonet coupling.

### HVI strip 27
For HVI power Conductors.



| Type HVI ... | STRIP 27 |
|---|---|
| **Part No.** | **597 227** |
| Diameter Ø conductor | 27 mm |
| Material of moulded part | **plastic** / **Al** |
| Material of blade | **StSt** |
| PU | 1 pc(s) |

### HVI head 27
For HVI power Conductor.



| Type HVI ... | HEAD 27 |
|---|---|
| **Part No.** | **597 127** |
| Diameter Ø conductor | 27 mm |
| Material of moulded part | **Al** |
| Material of blade | **StSt** |
| PU | 1 pc(s) |

## Accessories for Stripping Tool for HVI power Conductors

### HVI head holder
Adapter with bayonet coupling for attaching the HVI head cutting head (pre-set stripping length 35 mm).
Adapter can be used in a standard three-jaw chuck (Ø10 mm), e.g. with cordless screwdrivers.



| Type | HVI HH |
|---|---|
| **Part No.** | **597 139** |
| Material | **Plastic** / **brass** |
| PU | 1 pc(s) |

### Spare blades for HVI head 27
1 pack = 4 pieces



| Type | EK HVI HEAD 27 |
|---|---|
| **Part No.** | **597 102** |
| Material | **StSt** |
| PU | 1 PAK |

### Lateral replacement blades for HVI head 27



| Type | EK SEIT HVI HEAD 27 |
|---|---|
| **Part No.** | **597 103** |
| Material | **StSt** |
| PU | 1 pc(s) |

## Cable shears for HVI Conductors

Cable shears for easily cutting the HVI light Conductor, HVI Conductor (outer diameter 20 / 23 mm), HVI power Conductor (outer diameter 27 mm) and CUI Conductor to length.
The special design of the cable shears also allows precise cutting of stranded conductors, making it easier to attach connection elements.

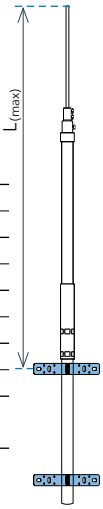


| Type | HVI CUTTER 32 |
|---|---|
| **Part No.** | **597 032** |
| Diameter Ø conductor | up to 32 mm |
| Material of blades | **tool steel** (CR-Moly (SCM440)) |
| Material of handles | **carbon steel** (SS400) |
| Length | 600 mm |
| Colour of handles | red (similar to RAL 3020) ● |
| PU | 1 pc(s) |

**Max. Gust wind speeds in km/h for air-termination systems.**

**Wall assembly**

| Part No. | $L_{(max)}$ [mm] | Number of holders *) | Installation type outside | Installation type inside | |
|---|---|---|---|---|---|
| **Al 105 563** | 3500 | 2 pc(s) *) | 0 | 1 | 202 |
| | | | 1 | 0-1 | 191 |
| **Al 105 565** | 4000 | 3 pc(s) *) | 0 | 1 | 202 |
| | | | 1 | 0-1 | 181 |
| **Al 105 573** | 5000 | 2 pc(s) *) | 0 | 1 | 170 |
| | | | 1 | 0-1 | 147 |
| **Al 105 575** | 5500 | 3 pc(s) *) | 0 | 1 | 168 |
| | | | 1 | 0-1 | 147 |
| **Al 819 760** | 8500 | 3 pc(s) *) | 0 | 1 | 147 |
| **StSt 105 320 819 430** | 3500 | 2 pc(s) *) | 0 | 1 | 234 |
| **StSt 105 322** | 4000 | 3 pc(s) *) | 0 | 1 | 233 |
| **StSt 105 321 819 431** | 5000 | 2 pc(s) *) | 0 | 1 | 163 |
| **StSt 105 323 819 433** | 5500 | 3 pc(s) *) | 0 | 1 | 166 |

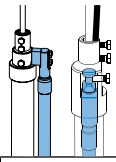


**Max. Gust wind speeds in km/h for air-termination systems.**

## Tripod mounting – support tube

**Cable in the support tube**

Installation type outside | inside



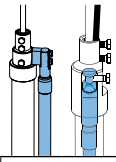
Number of concrete bases

| Part No. | Height [mm] | | | Tripod, small, StSt (V2A), Part No. **107 390** | | | | Tripod, large, StSt (V2A), Part No. **107 391** | | | | Four-legged stand, small, StSt (V2A), Part No. **107 490** | | | | Four-legged stand, large, StSt (V2A), Part No. **107 491** | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3x | 6x | 9x | 12x | 3x | 6x | 9x | 12x | 4x | 8x | 12x | 16x | 4x | 8x | 12x | 16x |
| Al | 4500 | 0 | 1 | 95 | 124 | 149 | 180 | 121 | 163 | 201 | 201 | 120 | 166 | 201 | 201 | 159 | 201 | 201 | 201 |
| **105 513** | 3.5+1 m | 1 | 0-1 | – | 104 | 124 | 140 | 103 | 132 | 159 | 189 | 99 | 132 | 166 | 190 | 132 | 182 | 190 | 190 |
| Al | 4500 | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| **105 563** | 3.5+1 m | 1 | 0-1 | – | 104 | 124 | 140 | 103 | 132 | 159 | 189 | 99 | 132 | 166 | 190 | 132 | 182 | 190 | 190 |
| Al | 6000 | 0 | 1 | – | 93 | 108 | 124 | 93 | 117 | 137 | 159 | – | 116 | 137 | 147 | 117 | 149 | 180 | 180 |
| **105 515** | 5+1 m | 1 | 0-1 | – | – | 93 | 103 | – | 100 | 112 | 129 | – | 99 | 112 | 120 | 100 | 124 | 137 | 137 |
| Al | 6000 | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| **105 565** | 5+1m | 1 | 0-1 | – | – | 93 | 103 | – | 100 | 112 | 129 | – | 99 | 112 | 120 | 100 | 124 | 137 | 137 |
| Al | 6000 | 0 | 1 | – | 108 | 129 | 147 | 105 | 137 | 168 | 168 | 105 | 137 | 168 | 168 | 137 | 168 | 168 | 168 |
| **105 543** | 3.5+2.5 m | 1 | 0-1 | – | 95 | 112 | 124 | 95 | 120 | 140 | 144 | 93 | 120 | 144 | 144 | 120 | 144 | 144 | 144 |
| Al | 6000 | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| **105 573** | 3.5+2.5 m | 1 | 0-1 | – | 95 | 112 | 124 | 95 | 120 | 140 | 144 | 93 | 120 | 144 | 144 | 120 | 144 | 144 | 144 |
| Al | 7500 | 0 | 1 | – | – | 100 | 110 | – | 105 | 124 | 140 | – | 105 | 124 | 124 | 105 | 137 | 144 | 144 |
| **105 545** | 5+2.5 m | 1 | 0-1 | – | – | – | 97 | – | 93 | 105 | 121 | – | 93 | 105 | 110 | 93 | 117 | 124 | 124 |
| Al | 7500 | 0 | 1 | No internal installation possible | | | | | | | | | | | | | | | |
| **105 575** | 5+2.5 m | 1 | 0-1 | – | – | – | 97 | – | 93 | 105 | 121 | – | 93 | 105 | 110 | 93 | 117 | 124 | 124 |
| StSt | 4500 | 0 | 1 | 95 | 121 | 147 | 176 | 122 | 159 | 201 | 231 | 120 | 165 | 221 | 231 | 159 | 231 | 231 | 231 |
| **105 392** | 3.5+1 m | | | | | | | | | | | | | | | | | | |
| StSt | 6000 | 0 | 1 | – | 93 | 108 | 122 | 95 | 117 | 137 | 159 | 93 | 117 | 137 | 163 | 120 | 159 | 193 | 230 |
| **105 394** | 5+1 m | | | | | | | | | | | | | | | | | | |
| StSt | 7500 | 0 | 1 | – | – | 100 | 111 | – | 108 | 124 | 140 | – | 105 | 124 | 140 | 110 | 237 | 155 | 155 |
| **105 395** | 5+2.5 m | | | | | | | | | | | | | | | | | | |

## Tripod mounting – support tube

**Cable in the support tube**

Installation type outside | inside



Number of concrete bases

| Part No. | Height [mm] | | | Tripod, small, St/tZn, Part No. **105 351** | | | | ... arrow arrangement Part No. **105 351** | | | | Tripod, large, St/tZn, and Bracing, StSt (V2A), Part No. **105 201 + 105 601** | | | | Supporting tube stand Part No. **105 244** |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 3x | 6x | 9x | 12x | 3x | 6x | 9x | 12x | 3x | 6x | 9x | 12x | |
| Al | 4500 | 0 | 1 | Minimum bending radius! | | 149 | 180 | Minimum bending radius! | | 121 | 137 | Installation without bracing does not make sense | | | | – |
| **105 563** | 3.5+1 m | 1 | 0-1 | – | 104 | 124 | 137 | – | – | 101 | 116 | | | | | 179 |
| Al | 6000 | 0 | 1 | Minimum bending radius! | | 129 | 147 | Minimum bending radius! | | 105 | 120 | | | | | – |
| **105 573** | 3.5+2.5 m | 1 | 0-1 | – | 95 | 110 | 124 | – | – | 93 | 105 | | | | | 144 |
| Al | 6000 | 0 | 1 | Installation without bracing does not make sense | | | | Installation without bracing does not make sense | | | | No internal installation possible | | | | – |
| **105 565** | 5+1m | 1 | 0-1 | | | | | | | | | – | 101 | 117 | 132 | 112 |
| Al | 7500 | 0 | 1 | | | | | | | | | No internal installation possible | | | | – |
| **105 575** | 5+2.5 m | 1 | 0-1 | | | | | | | | | – | 96 | 110 | 124 | 105 |
| StSt | 4500 | 0 | 1 | Minimum bending radius! | | 149 | 177 | Minimum bending radius! | | 120 | 137 | No internal installation possible | | | | No internal installation possible |
| **105 320** | 3.5+1 m | | | | | | | | | | | | | | | |
| StSt | 6000 | 0 | 1 | Minimum bending radius! | | 124 | 144 | Minimum bending radius! | | 103 | 117 | | | | | |
| **105 321** | 3.5+2.5 m | | | | | | | | | | | | | | | |



# Protection against Step and Touch Voltage



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**https://de.hn/aM3z3**

Protection against Step and Touch Voltage Page 164

# Protection against Step and Touch Voltage

IEC/EN 62305-3 points out that in special cases the risk of step and touch voltage outside a building may be extremely high near the down conductors, although there is a lightning protection system in accordance with the current state of standardisation. Special cases are, for example, if bare/uninsulated down conductors and lightning protection earth electrodes are installed near the entrance or sheltering areas of buildings with high visitor frequency, such as theatres, cinemas, shopping centres, etc. Buildings or structures with public access (e.g. shelters) which are particularly exposed (lightning endangered) may also require protection measures against step and touch voltage.

**Protection against touch voltage**

Touch voltage means a life-threatening voltage that affects a person who touches the down conductor while standing on the ground within a distance of about 1 m from the down conductor. The current flows through the hand into the body and down to the feet (see Figures 1/2).

The hazardous area for people outside of the building is defined as an area of 3 m around the down conductor and from ground level up to a height of approx. 3 m.

Effective protection measures against injuries due to touch voltage are defined according to the standard:

- Installation of an insulated (coated) down conductor providing a surge withstand capability of 100 kV at 1.2/50 µs, e.g. at least 3 mm thick cross-linked polyethylene;
- physical restrictions and/or warning signs to minimise the possibility of down conductors being touched.

The CUI conductor (CU copper Insulated) has an inner cooper conductor with a diameter of 8 mm and a high-voltage-resistant insulation.

Requirements:

- Surge withstand capability of 100 kV (1.2/50 µs)
- Prevention of creepage sparkover even during rain

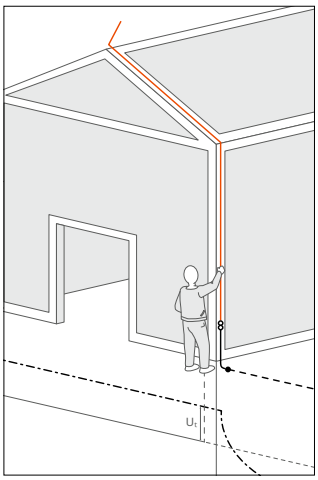



Figure 1: Schematic diagram – tough voltage $U_t$

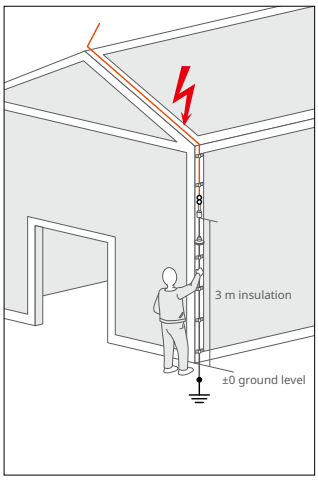



Figure 2: Protective measures

The surge withstand capability of 100 kV (1.2/50 µs) is achieved by a special cross-linked polyethylene insulation (XLPE). Unless additional measures are taken, high impulse voltages cause sparkover on insulating surfaces. This effect is known as creeping discharge. If the creeping discharge inception voltage is exceeded, a surface discharge will be initiated, which can easily spark over a distance of several metres to earthed parts.

In order to avoid the occurrence of creeping discharges even during rain, the CUI conductor additionally has a shield which keeps the conductor dry. Figure 3 shows this shield on the conductor and the drops after the rain test.

Development of the CUI conductor is based on the "rain test" according to IEC 60-1 Subclause 9 (see Figure 3).



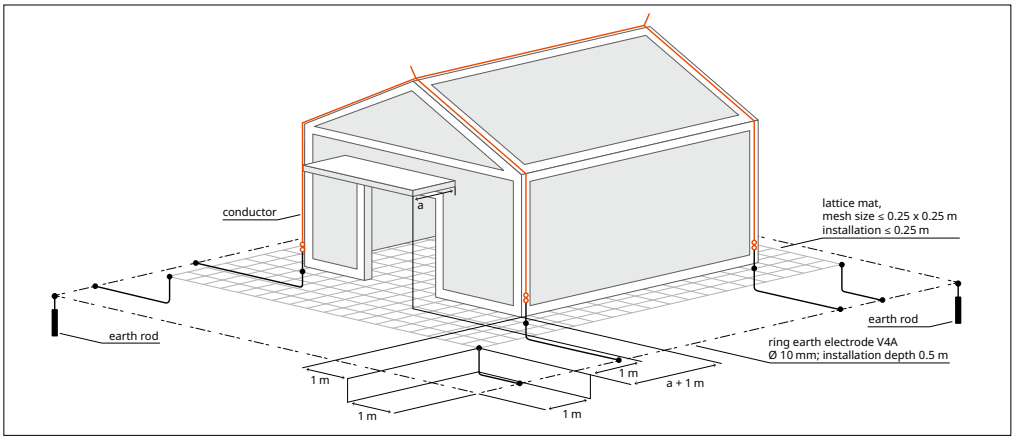
Figure 3: Rain test



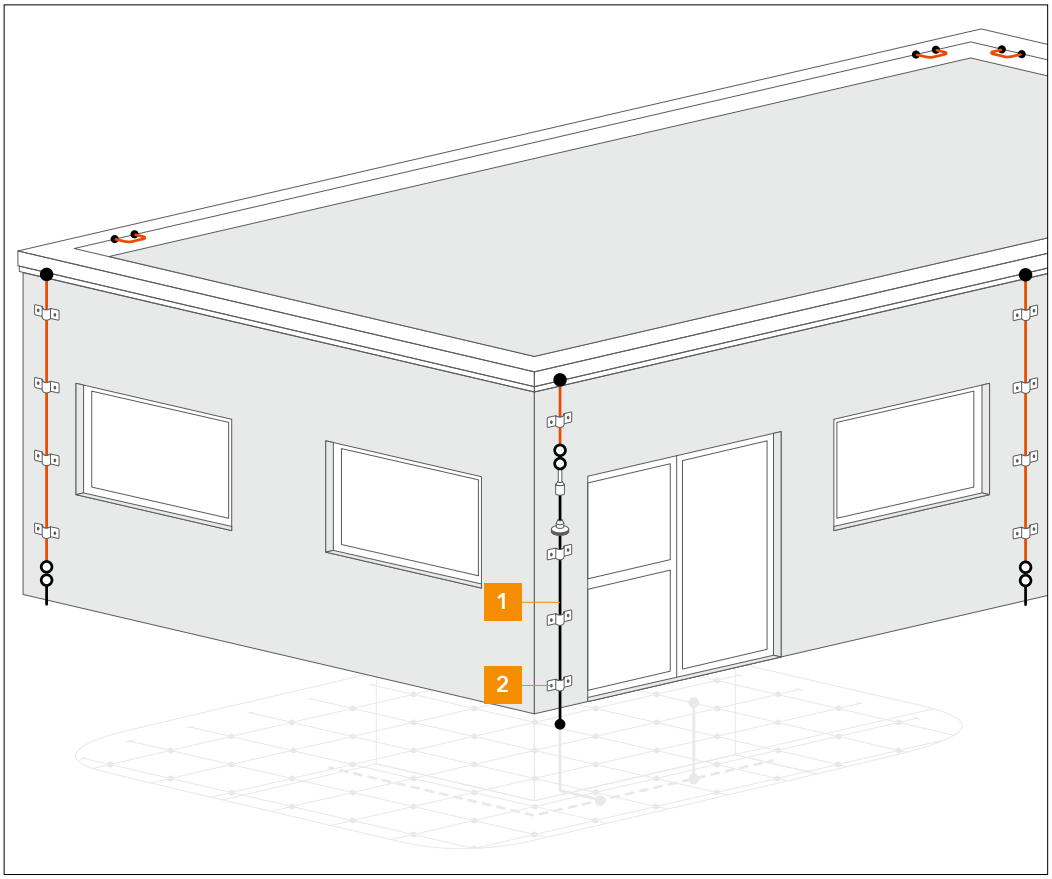
Application in the entrance area

**Protection against step voltage**

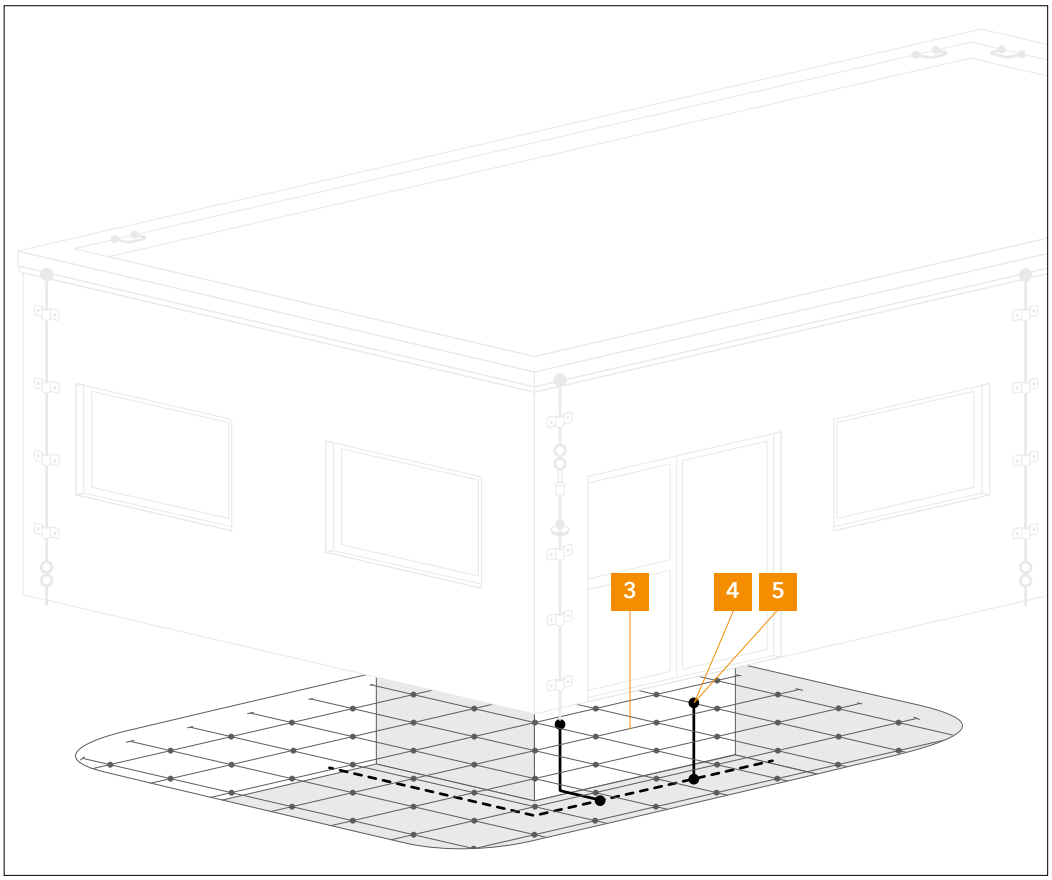
IEC/EN 62305-3 not only mentions the risk of touch voltage, but also the risk of step voltage. The risk for living beings can be reduced by protective measures. In addition to increasing the earth resistivity of the upper ground layer (ground insulation, e.g. asphalt), potential control can also be achieved by installing a close metal grid (mesh mat) in the foundation/ground in areas where people stand (max. mesh size 0.25 m x 0.25 m). In addition, a ring earth electrode should be laid 1.0 m away from the mats at a depth of 0.5 m. Lattice mats should be installed at least 1.0 m beyond the area to be protected (e.g. building boundary). If the enclosed area of the ring earth electrode is ≤ 78.5 m², at least two earth rods, should be installed. If the area is >78.5 m² one earth rod each per down conductor is required (9 m proved to be advantageous). An earth resistance of less than 10 Ω is recommended. The described protection measure is based on a maximum earth resisitivty of 2000 Ωm.



## Protection against touch voltage




## Protection against step voltage




Product

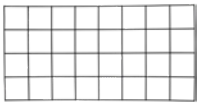
1



2



3



4



5





## CUI Conductor

Touch voltage on down conductors can be prevented by using the CUI Conductor.

The dangerous area of touch and step voltages for living beings is defined as an area of approx. 3 m around the down conductor, from ground level up to a height of approx. 3 m.

The CUI Conductor has a copper core and a high-voltage-resistant insulation.

These conductors must:

- have a impulse withstand voltage of 100 kV (1.2/50 µs)
- prevent creeping sparkover even during rain



| Type CUI L 20 GR ... | 3.5M | 5M |
|---|---|---|
| **Part No.** | **830 208** | **830 218** |
| Material of conductor | Cu | Cu |
| Material of insulation | **XLPE** | **XLPE** |
| Diameter Ø conductor | 20 mm | 20 mm |
| Standard | EN 62561-2 | EN 62561-2 |
| Colour of conductor | light grey | light grey |
| Cross-section of core | 50 mm² | 50 mm² |
| Total length | 3500 mm | 5000 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Conductor Holders for CUI Conductor

For installing the CUI conductor on walls or façades.

### Height 19 mm



| Type LH ... | ZS 20 H19 IGM8 GR PA |
|---|---|
| **Part No.** | **275 220** |
| Material of conductor holder | **PA** |
| Conductor support Rd | 20-21 mm |
| Fixing | Ø6.5 mm |
| Standard | DIN IEC/TS 62561-8 (VDE V 0185-561-8) |
| PU | 25 pc(s) |

### Height 10 mm



| Type LH ... | ZS 20 H10 B6.5X16 V2A |
|---|---|
| **Part No.** | **275 229** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20-21 mm |
| Fixing | 6.5 x 16 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

### Two-screw clamp for mounting directly on the wall



Due to the special kind of installation (without a gap), the conductor cannot be misused as a climbing aid and is therefore especially suitable for schools or kindergarten facilities.

| Type LH ... | ZSUEL 20 2XB6.5 V2A |
|---|---|
| **Part No.** | **275 129** |
| Material of conductor holder | StSt |
| Conductor support Rd | 20 mm |
| Fixing | [2x] 6.5 x 8 mm |
| PU | 10 pc(s) |

## Stripping Tool for CUI Conductors

Tool for stripping the XLPE insulated CUI Conductor (outer diameter 20 mm).

- Tool consists of a handle and an exchangeable cutting heads
- Stripping length of the CUI Conductor is adjustable in steps of 0.2 mm (lock points) using the knob in the handle. The dial on the handle shows the length set.

**Handling**
Position the cutting head at the cut-off end of the conductor and turn clockwise applying light pressure to cut/strip it.

### CUI-strip 20



| Type CUI ... | STRIP 20 |
|---|---|
| **Part No.** | **597 320** |
| Diameter Ø conductor | 20 mm |
| Material of moulded part | **plastic** |
| Material of blade | StSt |
| PU | 1 pc(s) |

### CUI-head 20

Toolless exchange of the cutting head via a bayonet coupling.



| Type CUI ... | HEAD 20 |
|---|---|
| **Part No.** | **597 020** |
| Diameter Ø conductor | 20 mm |
| Material of moulded part | **plastic** |
| Material of blade | StSt |
| PU | 1 pc(s) |

## Sign Lightning voltage

Sign warning of the hazard of direct lightning strikes, e.g. on park decks (without air-termination systems) or other areas.

### Lightning voltage

**Front** in German
"ACHTUNG! Blitzspannung
Bei Gewitter Bereich räumen / nicht betreten"

**Reverse side** in English
"ATTENTION! Lightning voltage
Clear / do not enter this area during thunderstorms"




| Type | HWS 297X210 ABS DE EN AL |
|---|---|
| **Part No.** | **480 698** |
| Material | Al |
| Dimensions (l x w x d) | 297 x 210 x 0.7 mm |
| Fixing | [4x] Ø6.5 mm |
| PU | 1 pc(s) |

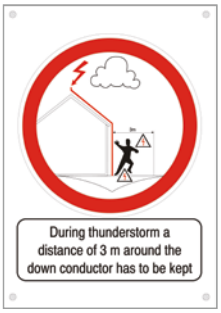
## Sign Step and touch voltage

In case of step and touch voltage hazard for living beings. In accordance with the requirements of IEC/EN 62305-3.

### Step and touch voltage

**Front** in German:
Bei Gewitter ist der Aufenthalt im Umkreis von 3 m um die Ableitung verboten!

**Reverse side** in English:
During thunderstorm a distance of 3 m around the down conductor has to be kept!

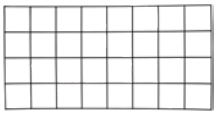



| Type | HWS 297X210 AGU3MV DE EN AL |
|---|---|
| **Part No.** | **480 699** |
| Material | Al |
| Dimensions (l x w x d) | 297 x 210 x 0.7 mm |
| Fixing | [4x] Ø6.5 mm |
| PU | 1 pc(s) |

## Potential Control

Mesh mats for potential control in shelters and entrance areas.

### Mesh mat for protection against step voltage



As per VDE/ABB leaflet "Blitzschutz von Schutzhütten" ("Lightning Protection of Shelters")

If the mesh mats are laid so they overlap, around 6x connecting clamps (with anti-corrosion tape part. no. 556 125) are required per mesh mat.
Please refer to the related installation instructions for more precise data.

**Note:**
The mesh mats are pickled and passivated in accordance with the normative requirements of DIN VDE 0151.

| Type GMA ... | 250 2000X1000X4 V4A |
|---|---|
| **Part No.** | **618 214** |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Dimensions (l x w x d) | 2000 x 1000 x 4 mm |
| Mesh size | 250 mm |
| PU | 1 pc(s) |

### Connecting clamp for mesh mats



Clamp for interconnecting mesh mats or for connecting mesh mats with earth-termination systems.

| Type | MMVK 3.5 8.10 SKM8X30 V4A | UEK 8.10 AQ3/4 M8 V4A |
|---|---|---|
| **Part No.** | **540 271** | **540 270** |
| Material | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| Clamping range Rd | 3-10 mm | – |
| Clamping range Rd / Rd | – | 8-10 / 3-4 mm |
| Clamping range Rd / Rd | – | 3-4 / 3-4 mm |
| Connection (single-wire / multi-wire) | 16 mm² | 4-50 mm² |
| Lightning impulse current carrying capability (10/350 µs) | 25 kA | 25 kA |
| Standard | based on EN 62561-1 | based on EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

## Accessories for Potential Control

### Stainless steel wire



Stainless steel wire (Rd 10 mm) for use in soil has to be made of StSt (V4A) with a molybdenum content of > 2 %, e.g. 1.457, according to EN 62561-2, IEC/EN 62305-3, DIN 18014 and DIN VDE 0151.

| General technical data: | |
|---|---|
| Diameter Ø conductor | 10 mm |
| Cross-section | 78 mm² |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 |
| Standard | EN 62561-2 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 2.9 kA |

| Type | RD 10 V4A R80M | RD 10 V4A R20M |
|---|---|---|
| **Part No.** | **860 010** | **860 020** |
| Conductor length | 80 m | 20 m |
| Coil weight | approx. 50 kg | approx. 12 kg |
| PU | 80 m | 20 m |

| Type | RD 10 V4A R50M |
|---|---|
| **Part No.** | **860 050** |
| Conductor length | 50 m |
| Coil weight | approx. 31 kg |
| PU | 50 m |

### Connection lug, straightened



For connecting the down conductors to the earth-termination system; made of corrosion-resistant stainless steel StSt.

| General technical data: | |
|---|---|
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 |
| Dimensions | Ø10 mm |
| Cross-section | 78 mm² |
| Standard | EN 62561-2 |

| Type | AF 10 V4A 1000 | AF 10 V4A 1500 |
|---|---|---|
| **Part No.** | **860 110** | **860 115** |
| Length | 1000 mm | 1500 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type | AF 10 V4A 3000 |
|---|---|
| **Part No.** | **860 130** |
| Length | 3000 mm |
| PU | 5 pc(s) |

### MV clamp



Multipurpose connecting clamp (**M**ehrzweck **V**erbindungs-Klemme) for universal use as a cross, T and parallel clamp; two-piece.

| Type | MVK 8.10 SKM10X35 V4A |
|---|---|
| **Part No.** | **390 079** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 |
| Clamping range Rd | 8-10 mm |
| Connection (solid/stranded) | 35-70 mm² |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 4.7 kA |
| PU | 50 pc(s) |

## SV clamp

Diagonal connecting clamp (**S**chräg-**V**erbinder-Klemme) for cross and T connections, screws with anti-rotation protection.



| Type | SVK 7.10 7.10 FL40 V4A |
|---|---|
| **Part No.** | **308 329** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| Clamping range Rd / Rd | 7-10 / 7-10 mm |
| Clamping range Rd / Fl | 7-10 / 30-40 mm |
| Clamping range Fl / Fl | 30-40 /30-40 mm |
| Clamping range (stranded / cable) | 35-120 mm² |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 14.0 kA |
| PU | 25 pc(s) |

## UNI disconnecting clamp

For connecting the down conductors with the earth entry rods.



| Type | UTK 8.10 8.10 ZP V2A |
|---|---|
| **Part No.** | **459 129** |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 / 8-10 mm |
| Distance of screws | 40 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Conductor holder DEHNhold

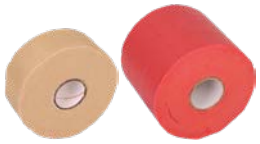
Conductor holder for fixing round conductors with slotted saddle clamp, fixed conductor routing.



| Type | LH ZS 8.10 FL20 KS KD8X40 V2A |
|---|---|
| **Part No.** | **274 160** |
| Material of conductor holder | StSt |
| Conductor support Rd | 8-10 mm |
| Conductor support Fl | 20 mm |
| Height of conductor holder | 20 mm |
| Thread of conductor holder | M8 |
| Screw | 5 x 50 mm |
| Standard | EN 62561-4 |
| PU | 50 pc(s) |

## Anti-corrosion tapes

Anti-corrosion tape for protecting underground connections, such as clamp and screw connections.
The permanently plastic anti-corrosion tape, petrolatum-coated on both sides, effectively prevents the penetration of dirt and moisture.



| General technical data: | |
|---|---|
| Material | **Petrolatum** |
| Length | 10 m |
| Tape thickness | ≥ 1.1 mm |
| Max. continuous operating temperature | 30 °C |

| Type | KSB 50 L10M | KSB 100 L10M |
|---|---|---|
| **Part No.** | **556 125** | **556 130** |
| Colour | brown / beige | brown / beige |
| Width of tape | 50 mm | 100 mm |
| Perforation spacing | – | – |
| PU | 24 pc(s) | 12 pc(s) |

| Type | KSB PERF RED 50 L10M | KSB PERF RED 100 L10M |
|---|---|---|
| **Part No.** | **557 125** | **557 130** |
| Colour | rot | rot |
| Width of tape | 50 mm | 100 mm |
| Perforation spacing | approx. 200 mm | approx. 200 mm |
| PU | 24 pc(s) | 12 pc(s) |

# Earth Mats

BS EN 13601 C101

## Earthing Lattices

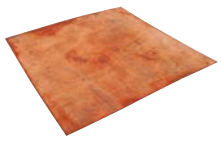
Earth plate lattice copper



| Type | EML 600X600X3 CU | EML 900X900X3 CU |
|---|---|---|
| **Part No.** | **138 110** | **138 111** |
| Material | Copper | Copper |
| Dimensions | 600 x 600 x 3 mm (0.36 m²) | 900 x 900 x 3 mm (0.81 m²) |
| Approvals | BS EN 13601 | BS EN 13601 |
| PU | 1 pc(s) | 1 pc(s) |

## Earthing Plates

Earth plate solid copper



| General technical data: | |
|---|---|
| Material | Copper |
| Approvals | BS EN 13601 |

| Type | EMP 600X600X1.5 CU | EMP 900X900X1.5 CU |
|---|---|---|
| **Part No.** | **138 115** | **138 116** |
| Dimensions | 600 x 600 x 1.5 mm (0.36 m²) | 900 x 900 x 1.5 mm (0.81 m²) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EMP 600X600X3 CU | EMP 900X900X3 CU |
|---|---|---|
| **Part No.** | **138 118** | **138 119** |
| Dimensions | 600 x 600 x 3 mm (0.36 m²) | 900 x 900 x 3 mm (0.81 m²) |
| PU | 1 pc(s) | 1 pc(s) |



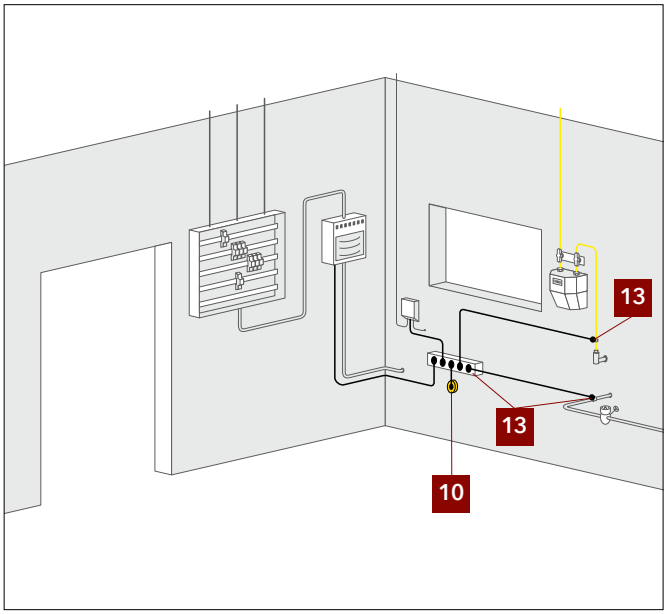
# Earthing / Equipotential Bonding

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**https://de.hn/T1eQN**

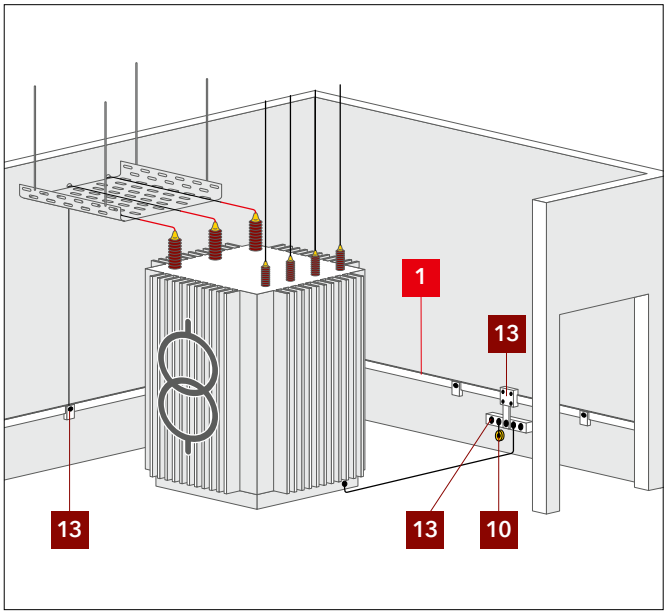

| | |
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| Exothermic Welding | Page 241 |

# Earthing / Equipotential Bonding

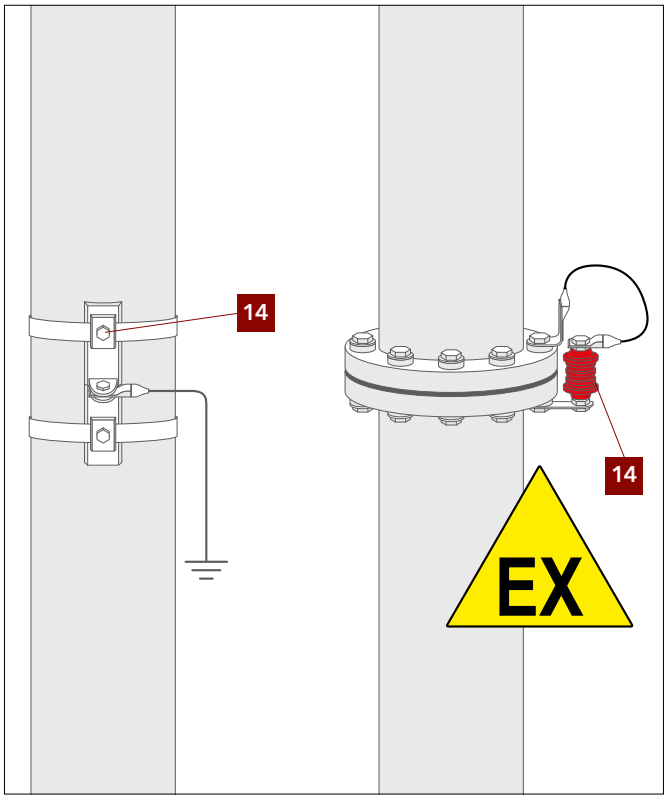
## Protective equipotential bonding via main earthing busbar




## Protective equipotential bonding in a transformer room




## Equipotential bonding in Ex areas




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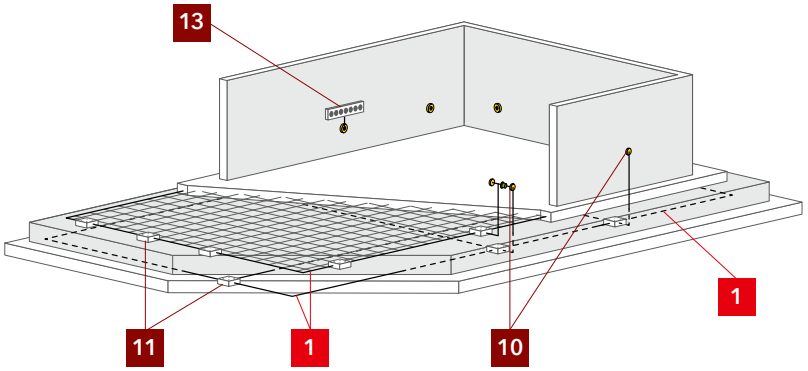
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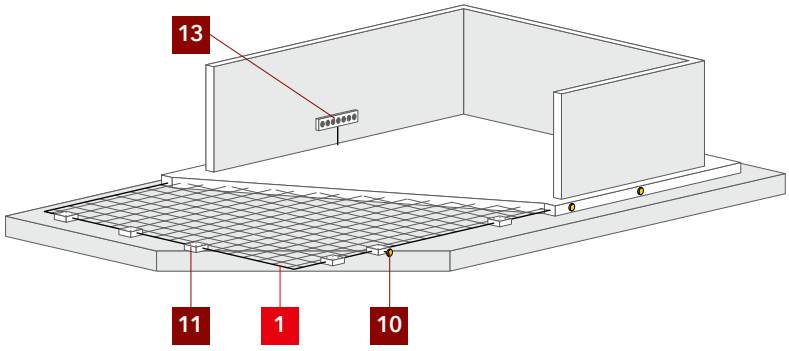
# Earthing / Equipotential Bonding

## Foundation earth electrode in accordance with DIN 18014 with lightning protection system




Insulated reinforced floor slab as black or white tank (waterproof concrete) with full perimeter insulation, dimpled membrane.

## Foundation earth electrode in accordance with DIN 18014 without lightning protection system




Reinforced floor slab, not waterproof concrete.

| Product | |
|---|---|
| 1 |  |
| 10 |  |
| 11 |  |
| 12 |  |
| 13 |  |
| 14 |  |
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| 18 |  |

# Fixed Earthing Terminal / Wall Bushings



## Fixed Earthing Terminals

For installation in concrete as a corrosion-free connection to the earth-termination system for protective equipotential bonding and / or functional equipotential bonding of the down conductor, e.g. to the reinforcement of buildings.
Please observe the following minimum screw lengths for the M10 and M12 double threads:
35 mm of M10 (thread length 40 mm)
15 mm of M12 (thread length 20 mm)

### Type M

With connecting shaft
(l = 180 mm, Ø10 mm).



| Type | EFPM M10 12 V4A L230 STTZN | EFPM M10 12 V4A L230 V2A |
|---|---|---|
| **Part No.** | **478 011** | **478 019** |
| Connection thread | M10 / M12 | M10 / M12 |
| Material of plate | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| Material of shaft | **St/tZn** | StSt |
| Connection plate Ø | 80 mm | 80 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6.5 kA | 3.9 kA |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

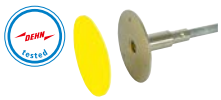
### Type M without connecting shaft



| Type | EFPM M10 12 V4A |
|---|---|
| **Part No.** | **478 012** |
| Connection thread | M10 / M12 |
| Material of plate | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Connection plate Ø | 80 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 9.3 kA (with copper cable lug) |
| Standard | EN 62561-1 |
| PU | 20 pc(s) |

### Type M, press-fitted

Connecting shaft (l = 180 mm, Ø10 mm).

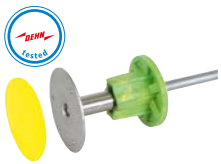


| Type | EFPM M10 12 V4A L245 VP STTZN | EFPM M10 12 V4A L245 VP V2A |
|---|---|---|
| **Part No.** | **478 041** | **478 049** |
| Connection thread | M10 / M12 | M10 / M12 |
| Material of plate | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| Material of shaft | **St/tZn** | StSt |
| Connection plate Ø | 80 mm | 80 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 3.7 kA | 3.3 kA |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

Part No. 478 049 with UL approval.

### Type M, press-fitted, with additional water barrier

Protection against water ingress along the shaft into the wall (tested according to EN 62561-5 with 5 bar compressed air and 1 bar pressure water). Suitable for waterproof concrete.



| Type | EFPM M10 12 V4A WS L245 VP STTZN |
|---|---|
| **Part No.** | **478 051** |
| Connection thread | M10 / M12 |
| Material of plate | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Material of shaft | **St/tZn** |
| Connection plate Ø | 80 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 3.7 kA |
| Material of water barrier | **PVC** |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

### Type M with MV clamp

For round conductors 8-10 mm, space-saving installation in the formwork.



| Type | EFPM M10 12 V4A MVK8.10 STTZN |
|---|---|
| **Part No.** | **478 112** |
| Connection thread | M10 / M12 |
| Material of plate | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Material of MV clamp | **St/tZn** |
| Clamp Rd / Rd clamping range | 8-10 mm |
| Connection plate Ø | 80 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 9.3 kA |
| Type | with O-ring and MV clamp |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

### Type K

With plastic ring and connecting shaft (l = 180 mm, Ø10 mm).



| Type | EFPK M10 12 V4A L230 STTZN |
|---|---|
| **Part No.** | **478 200** |
| Connection thread | M10 / M12 |
| Material of plate | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Material of shaft | **St/tZn** |
| Connection plate Ø | 46 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 6.5 kA |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## Accessories for Fixed Earthing Terminals

### Foam pad

Foam pad is attached to the yellow protective cover of the fixed earthing terminal (see installation instructions DS1476). One side adhesive, with pull-off tab.



Using the foam pad enables a position compensation of approx. 20 mm at the formwork and makes it easier to find and expose the fixed earthing terminal after concreting.

| Type | SSP D90 H20 |
|---|---|
| **Part No.** | **478 098** |
| Diameter Ø | 90 mm |
| Height | 20 mm |
| PU | 10 pc(s) |

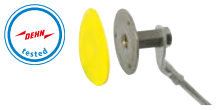
### Hexagon screws



| Type | SKS M10X35 DIN 933 V2A |
|---|---|
| **Part No.** | **561 923** NEW |
| Screw | M10x35 mm |
| Material | StSt |
| PU | 1 pc(s) |

## Fixed Earthing Terminal M16

With M16 connection thread for higher current loads (50 Hz), e.g. for connecting the ring equipotential bonding system with the earth-termination systems of power installations with nominal AC voltages over 1 kV (transformer earthing).



| Type | EFP M16 V4A SL400 |
|---|---|
| **Part No.** | **478 027** |
| Connection thread | M16 |
| Material of plate | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Material of cable | **Cu/gal Sn** |
| Cross-section of connecting cable | 70 mm² |
| Length of connecting cable | 400 mm |
| Diameter Ø connecting cable | 10.5 mm |
| Connection plate Ø | 80 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 11 kA |
| PU | 10 pc(s) |

## Fixed Earthing Terminals with flexible Connection Clamp

For installation in concrete as a flexible corrosion-free connection to the earth-termination system for protective equipotential bonding and/or functional equipotential bonding of the down conductor, e.g. to the reinforcement of buildings.



| Type UES 16 ... | L600 VK RD8 28 FL30 EFP | L1000 VK RD8 28 FL30 EFP |
|---|---|---|
| **Part No.** | **416 940** | **416 950** NEW |
| Connecting clamp material | **St/bare** | **St/bare** |
| Clamping range Rd connecting clamp | 8-28 mm | 8-28 mm |
| Clamping range Fl connecting clamp | 30 x 3-4 mm | 30 x 3-4 mm |
| Fixed earthing terminal material | StSt (V4A) | StSt (V4A) |
| Fixed earthing point terminal thread | M10 / M12 | M10 / M12 |
| Bridging cable material | Flexible copper conductor, frost-resistant | Flexible copper conductor, frost-resistant |
| Bridging cable cable length | 600 mm | 1000 mm |
| Bridging cable cable cross section | 16 mm² | 16 mm² |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

## Connecting Clamps for Fixed Earthing Terminals and Reinforcement

For connecting the reinforcement with clamping piece.

For round conductors or fixed earthing terminals with simultaneous fixing in the formwork.

Arrangement: (II) = parallel (+) = cross

### For small diameters



| Type | VK 6.22 FL40 KB6.10 BSB STBL |
|---|---|
| **Part No.** | **308 035** |
| Material | **St/bare** |
| Clamping range Rd / Rd | (+/II) 6-22 / 6-10 mm |
| Clamping range Rd / Fl | (+) 6-22 / 40 mm |
| Screw | M10 x 60 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 1.0 kA |
| PU | 25 pc(s) |

### U-clamp for large diameters



| Type | BVK 16.48 FL40 KB6.10 BSB STBL |
|---|---|
| **Part No.** | **308 046** |
| Material | **St/bare** |
| Clamping range Rd / Rd | (+/II) 16-48 / 6-10 mm |
| Clamping range Rd / Fl | (II) 16-48 / 30-40 mm |
| Screw | U-bolt M10 x 48 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 9.9 kA |
| PU | 25 pc(s) |

## Connection and bridging Device for Reinforcements

Connection and bridging device for using the reinforcing bars (longitudinal bars) of reinforced concrete supports or walls as a down conductor.

### Connection device



Special lengths possible on request.
*) For exact assignment, see test certificate.

| Type UES 16 ... | L600 VK RD8 28 FL30 EFP | L1000 VK RD8 28 FL30 EFP |
|---|---|---|
| **Part No.** | **416 940** | **416 950** NEW |
| Connecting clamp material | **St/bare** | **St/bare** |
| Clamping range Rd connecting clamp | 8-28 mm | 8-28 mm |
| Clamping range Fl connecting clamp | 30 x 3-4 mm | 30 x 3-4 mm |
| Fixed earthing terminal material | StSt (V4A) | StSt (V4A) |
| Fixed earthing point terminal thread | M10 / M12 | M10 / M12 |
| Bridging cable material | Flexible copper conductor, frost-resistant | Flexible copper conductor, frost-resistant |
| Bridging cable cable length | 600 mm | 1000 mm |
| Bridging cable cable cross section | 16 mm² | 16 mm² |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

### Bridging device



Special lengths possible on request.
*) For exact assignment, see test certificate.

| Type UES 16 ... | L600 2VK RD8 28 FL30 |
|---|---|
| **Part No.** | **416 941** |
| Connecting clamp material | **St/bare** |
| Clamping range Rd connecting clamp | 8-28 mm |
| Clamping range Fl connecting clamp | 30 x 3-4 mm |
| Bridging cable material | Flexible copper conductor, frost-resistant |
| Bridging cable cable length | 600 mm |
| Bridging cable cable cross section | 16 mm² |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## End Pieces

Screwed to the fixed earthing terminal to connect, e.g. an equipotential bonding bar or structural parts such as steel girders, etc.

### Basic design



Universal use for M10 and M12 connections, e.g. at the fixed earthing terminal.

For connection of Rd, e.g. with KS connector (Part No. 301 019), or Fl with M10 or M12 screws and nuts.

| Type ES ZF ... | 2XB18 V2A |
|---|---|
| **Part No.** | **390 499** |
| Material | StSt |
| Hole Ø | 10.5 / 12.5 mm |
| PU | 50 pc(s) |

### Design with square holes



Dimensions 11x11 mm, for connecting Rd, e.g. with KS connector (Part No. 301 019), or Fl with M10 screws and nuts.

| Type ES ZF ... | 2X11.11 1XB13 V2A |
|---|---|
| **Part No.** | **390 479** |
| Material | StSt |
| Distance of holes | 30 mm |
| Hole Ø | 13 mm |
| PU | 50 pc(s) |

### Design with holes and KS connector



With holes Ø11 mm.

| Type ES ZF ... | 2XB11 KSV 7.10 STTZN |
|---|---|
| **Part No.** | **363 010** |
| Material | **St/tZn** |
| Distance of holes | 22 mm |
| Hole Ø | 11 mm |
| Clamping range Rd | 7-10 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### Design with holes



With holes Ø11 mm.

| Type ES ZF ... | 3XB11 STTZN |
|---|---|
| **Part No.** | **363 000** |
| Material | **St/tZn** |
| Distance of holes | 22 mm |
| Hole Ø | 11 mm |
| PU | 50 pc(s) |

## Connection Clamps with Threaded Bolt

For connecting round and flat conductors to fixed earthing terminals with M10 / M12 thread (e.g. Part Nos. 478 011, 478 200) and M16 thread (Part No. 478 027). Clamps with M10 thread are also suitable for installation on the rear side of the fixed earthing terminal (without connecting shaft), e.g. to connect a flat strip.

### Heavy design M10



| Type AK ... | 7.10 FL40 GBM10X45 STTZN |
|---|---|
| **Part No.** | **478 141** |
| Material of clamp | **St/tZn** |
| Clamping range Rd / Fl | 7-10 / 30-40 mm |
| Clamping range (stranded / cable) | 35-95 mm² |
| Dimensions | 70 x 70 x 3 mm |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

### Heavy design M12



| Type AK ... | 7.10 FL40 GBM12X55 V4A |
|---|---|
| **Part No.** | **478 149** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd / Fl | 7-10 / 30-40 mm |
| Dimensions | 70 x 70 x 3 mm |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 3.3 kA |
| PU | 10 pc(s) |

### Heavy design M16



| Type AK ... | 7.10 FL40 GBM16X65 V4A |
|---|---|
| **Part No.** | **478 150** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd / Fl | 7-10 / 30-40 mm |
| Clamping range (stranded / cable) | 35-95 mm² |
| Dimensions | 70 x 70 x 3 mm |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 5.9 kA |
| PU | 10 pc(s) |

### Light design M10



| Type AK ... | ZS 8.10 FL30 GBM10X60 V4A |
|---|---|
| **Part No.** | **478 129** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd / Fl | 8-10 / 30 mm |
| Clamping range (stranded / cable) | 35-95 mm² |
| Dimensions | 58 x 30 x 2.5 mm |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 2.7 kA |
| PU | 10 pc(s) |

## Threaded Adapter

For connection to fixed earthing terminals with M10 thread, lock nut and spring washer, for use in case of perimeter insulation or thermal insulation composite systems.



| Type | GAD EFP M10 10 L130 V4A |
|---|---|
| **Part No.** | **478 699** |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Female thread | M10 x 25 mm |
| Male thread | M10 x 80 mm |
| Total length | 130 mm |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

## Wall Bushings

With MV clamp made of StSt (V4A) for round conductors 8–10 mm.
Water-pressure-tight wall bushing for leading earthing conductors / equipotential bonding conductors through brickwork or walls; with M10 threaded rod made of StSt.
For subsequent installation through borehole (Ø14 mm) or through spacer in the formwork.
Test for water pressure-tightness up to 1 bar features an installation depth of 10 m in stagnant water.



| General technical data: | |
|---|---|
| Sealings | Neoprene |
| Sealing disc Ø | 80 mm |
| Material of disc | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2.7 kA |
| Standard | EN 62561-1 |

| Type EWD MVK8.10 M10 ... | L100 300 V4A | L300 500 V4A |
|---|---|---|
| **Part No.** | **478 410** | **478 430** |
| Length of bushing (l2) | 100-300 mm | 300-500 mm |
| Length of threaded rod (l1) | 308 mm | 508 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type EWD MVK8.10 M10 ... | L500 700 V4A |
|---|---|
| **Part No.** | **478 450** |
| Length of bushing (l2) | 500-700 mm |
| Length of threaded rod (l1) | 708 mm |
| PU | 1 pc(s) |

## Water-Pressure-Tight Wall Bushings for White Tank

For installation in the formwork.
Is suitable for water-pressure-tight wall bushings; e.g. for connecting the ring earth electrode with the equipotential bonding bar or the equipotential bonding conductor in the foundation.



| General technical data: | |
|---|---|
| Material of plate | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Material of axis | **St/tZn** |
| Connection thread | M10 / 12 |
| Connection plate Ø | 80 mm |
| Standard | EN 62561-(1+5) |

| Type WD M10 12 V4A ... | DWD L200 300 STTZN | DWD L300 400 STTZN |
|---|---|---|
| **Part No.** | **478 530** | **478 540** |
| Wall thickness (l1) | 200-300 mm | 300-400 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2.6 kA | 2.4 kA |
| PU | 10 pc(s) | 4 pc(s) |

| Type WD M10 12 V4A ... | DWD L400 500 STTZN |
|---|---|
| **Part No.** | **478 550** |
| Wall thickness (l1) | 400-500 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2 kA |
| PU | 4 pc(s) |

## Sealing Collar for round and flat Conductors

Water-pressure-tight sealing collar for round conductors (Ø8-10 mm) and flat conductors (30 x 3.5 mm) with waterproof foundation slabs / walls (e.g. watertight concrete constructions).

With torque control spanner for easy tightening of the two stainless steel tensioning straps.

MPA-tested to 5.0 bar, methane-resistant, radon-safe (as per FHRK leaflet MB 101)

Waterproof concrete construction guideline: Load class 1 + 2.



| Type | DM RD8.10 FL30X3.5 D114MM TPE |
|---|---|
| **Part No.** | **478 597** |
| Sealing collar material | **Thermoplastic elastomer (TPE)** |
| Material of tensioning straps | **StSt** |
| Diameter of sealing collar | 114 mm |
| Bushing / seal, Rd. | 8-10 mm |
| Bushing / seal, Fl. | 30 x 3.5 mm |
| PU | 12 pc(s) |

## Earth Points

Earth Points connect reinforced steel bars used as down conductors to the Lightning Protection and/or Earthing System using mechanical clamps or Exo-thermic Welding. For connecting flat and stranded conductors in parallel or T connection arrangement to form a continuous network. The Clamps have a high resistance to corrosion and show high mechanical strength to ensure a lasting connection.

### Without Pre-Welded Tail, For Flat and Stranded Conductors

Earth Points for connecting to the internal rebars using either mechanical clamps or exo-thermic welding.



| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type | EP1H FLSC 20.31X2.5.6/50.95 HCA | EP2H FLSC 25X2.5.6/50.95 HCA |
|---|---|---|
| **Part No.** | **118 338** | **118 342** |
| Clamping range (Stranded / Cable) | 50 - 95 mm² | 50 - 95 mm² |
| Clamping range Fl | W (20 - 31) mm x T (2.5 - 6) mm | 25 x 2.5 - 6 mm |
| Recommended Fixings for Stranded / Cable (50 - 95 mm²) | M10 x 10 mm (Hex Head Screw) + M10 (Cable Lug) | M8 x 10 mm (Hex Head Screw) + M8 (Cable Lug) |
| Recommended Fixings for Fl T (2.5 - 4) mm | M10 x 10 mm (Hex Head Screw) | M8 x 10 mm (Hex Head Screw) |
| Recommended Fixings for Fl T (5 - 6) mm | M10 x 15 mm (Hex Head Screw) | M8 x 15 mm (Hex Head Screw) |
| Tightening Torque | 15 Nm | 15 Nm |
| PU | 8 pc(s) | 4 pc(s) |

| Type | EP2H CP FLSC 25X3/70 HCA | EP4H FLSC 25X2.5.6/50.95 HCA |
|---|---|---|
| **Part No.** | **118 349** | **118 336** |
| Clamping range (Stranded / Cable) | 70 mm² | 50 - 95 mm² |
| Clamping range Fl | 25 x 3 mm | 25 x 2.5 - 6 mm |
| Recommended Fixings for Stranded / Cable (50 - 95 mm²) | – | M8 x 10 mm (Hex Head Screw) + M8 (Cable Lug) |
| Recommended Fixings for Fl T (2.5 - 4) mm | – | M8 x 10 mm (Hex Head Screw) |
| Recommended Fixings for Fl T (5 - 6) mm | – | M8 x 15 mm (Hex Head Screw) |
| Tightening Torque | 10 Nm | 15 Nm |
| PU | 4 pc(s) | 4 pc(s) |

### With Pre-Welded Tail, For Flat and Stranded Conductors

Earth Points with pre-welded tail for connecting to the internal rebars using either mechanical clamps or exo-thermic welding.

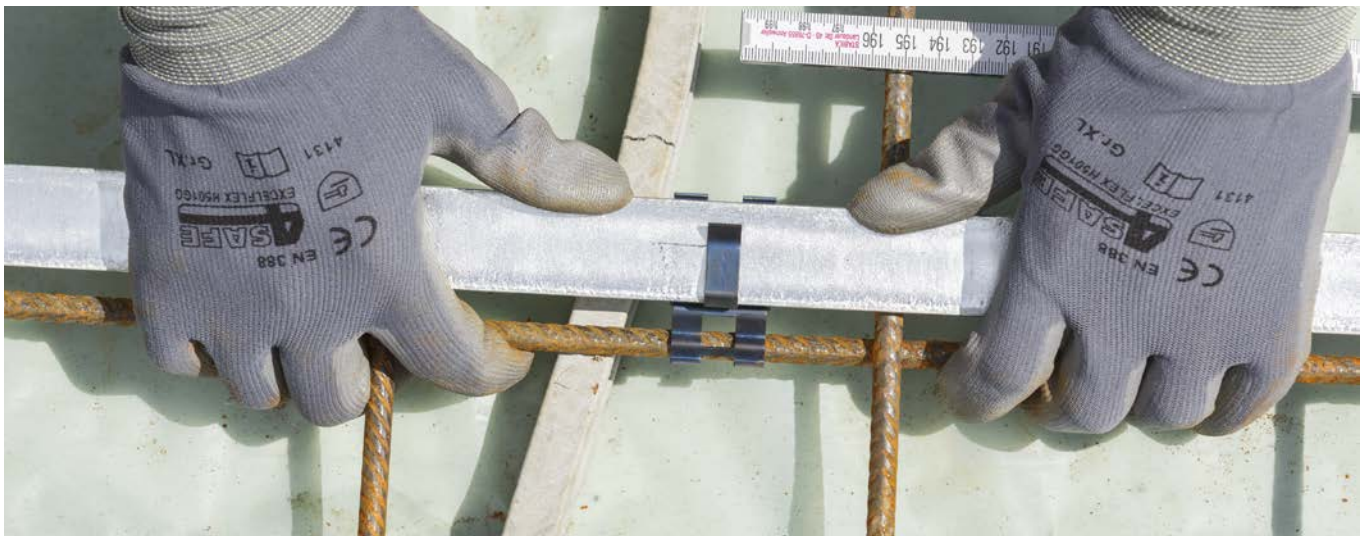


| General technical data: | |
|---|---|
| Conductor Material | Copper |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type | EP1H PWT70 FLSC 20.31X2.5.6/50.95 HCA | EP2H CP PWT70 FLSC 25X3/70 HCA |
|---|---|---|
| **Part No.** | **118 339** | **118 337** |
| Material | High Copper Alloy + Single Pre-Welded Tail (70 mm² x 500 mm, PVC Cu Cable) | High Copper Alloy + Single Pre-Welded Tail (70 mm² x 500 mm, PVC Cu Cable) |
| Clamping range (Stranded / Cable) | 50 - 95 mm² | 70 mm² |
| Clamping range Fl | W (20 - 31) mm x T (2.5 - 6) mm | 25 x 3 mm |
| Recommended Fixings for Stranded / Cable (50 - 95 mm²) | M10 x 10 mm (Hex Head Screw) + M10 (Cable Lug) | – |
| Recommended Fixings for Fl T (2.5 - 4) mm | M10 x 10 mm (Hex Head Screw) | – |
| Recommended Fixings for Fl T (5 - 6) mm | M10 x 15 mm (Hex Head Screw) | – |
| Tightening Torque | 15 Nm | 10 Nm |
| PU | 8 pc(s) | 8 pc(s) |

| Type | EP2H CP 2PWT70 FLSC 25X3/70 HCA |
|---|---|
| **Part No.** | **118 346** |
| Material | High Copper Alloy + Double Pre-Welded Tail (70 mm² x 500 mm, PVC Cu Cable) |
| Clamping range (Stranded / Cable) | 70 mm² |
| Clamping range Fl | 25 x 3 mm |
| Recommended Fixings for Stranded / Cable (50 - 95 mm²) | – |
| Recommended Fixings for Fl T (2.5 - 4) mm | – |
| Recommended Fixings for Fl T (5 - 6) mm | – |
| Tightening Torque | 10 Nm |
| PU | 8 pc(s) |

# Components for Foundation Earth Electrodes



## DEHNclip Rebar Clamp

**Nominal diameter $d_s$**



**Outer diameter $d_A$**



| The outer diameter including corrugation is approx. 1.15 x $d_s$ | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nominal diameter $d_s$ (mm) | 6 | 8 | 10 | 12 | 14 | 16 | 20 | 25 | 28 | 32 | 40 |
| Average outer diameter incl. corrugation $d_A$ (mm) | 7.1 | 9.4 | 11.8 | 14.2 | 16.5 | 18.9 | 23.6 | 29.5 | 33.1 | 37.8 | 47.2 |
| Nominal cross section ($mm^2$) | 28.3 | 50.3 | 78.5 | 113.1 | 154 | 201 | 314 | 491 | 616 | 804 | 1257 |

In accordance with DIN 18014 "Earthing systems for buildings – Planning, execution and documentation", the equipotential bonding conductor / foundation earth electrode must be connected to the reinforcement of the foundation slab every 2 metres.

For connecting reinforcing steel mesh or reinforcements with round and flat conductors.
Arrangement: (II) = parallel (+) = cross

**Quick and safe:**
The DEHNclip rebar clip for quick connection of the earth electrode to the reinforcement without tools. DEHNclip is tested for a lightning current carrying capability of 50 kA (10/350 µs) in accordance with DIN EN 62561-1.

### For connecting round conductors with the reinforcement



| General technical data: | |
|---|---|
| Material | St/bare |
| Standard | EN 62561-1 |

| Type DC BK ... | 6 RD10 STBLANK | 8 RD10 STBLANK |
|---|---|---|
| Part No. | 308 130 | 308 131 |
| Clamping range Rd* / Rd | 6-7 / 10 mm | 8-9 / 10 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2.5 kA | 2.7 kA |
| PU | 50 pc(s) | 50 pc(s) |

| Type DC BK ... | 10 RD10 STBLANK | 12 RD10 STBLANK |
|---|---|---|
| Part No. | 308 132 | 308 133 |
| Clamping range Rd* / Rd | 10 / 10 mm | 12 / 10 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2.4 kA | 2.7 kA |
| PU | 50 pc(s) | 50 pc(s) |

### For connecting flat conductors with the reinforcement



| General technical data: | |
|---|---|
| Material | St/bare |
| Standard | EN 62561-1 |

| Type DC BK ... | 6 FL30 STBLANK | 8 FL30 STBLANK |
|---|---|---|
| Part No. | 308 140 | 308 141 |
| Clamping range Rd* / Fl | 6-7 / 30 mm | 8-9 / 30 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2.0 kA | 2.3 kA |
| PU | 50 pc(s) | 50 pc(s) |

| Type DC BK ... | 10 FL30 STBLANK | 12 FL30 STBLANK |
|---|---|---|
| Part No. | 308 142 | 308 143 |
| Clamping range Rd* / Fl | 10 / 30 mm | 12 / 30 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2.3 kA | 2.3 kA |
| PU | 50 pc(s) | 50 pc(s) |

### For connecting reinforcing steel



| General technical data: | |
|---|---|
| Material | St/bare |
| Standard | EN 62561-1 |

| Type DC BK ... | 6 RD6 STBLANK | 8 RD8 STBLANK |
|---|---|---|
| Part No. | 308 134 | 308 135 |
| Clamping range Rd* / Rd* | 6-7 / 6-7 mm | 8-9 / 8-9 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2.2 kA | 2.4 kA |
| PU | 50 pc(s) | 50 pc(s) |

| Type DC BK ... | 8 RD12 STBLANK | 12 RD12 STBLANK |
|---|---|---|
| Part No. | 308 137 | 308 136 |
| Clamping range Rd* / Rd* | 8-9 / 12 mm | 12 / 12 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 2.4 kA | 2.6 kA |
| PU | 50 pc(s) | 50 pc(s) |

*) Nominal diameter $d_s$ of the reinforcement
**) For exact assignment see test certificate.

## Connecting Clamps for Reinforcements

### For T, cross and parallel connections



| Type | VK A UNI ST |
|---|---|
| **Part No.** | **308 025** |
| Material | **St/tZn** |
| Clamping range Rd / Rd | (+) 6-10 / 6-10 mm |
| Clamping range Rd / Fl | (+) 6-10 / 30 mm |
| Clamping range Fl / Fl | (II) 30 / 30 mm |
| Screw | M10 x 25 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 9 kA |
| PU | 50 pc(s) |

### For T, cross and parallel connections



| Type | VK 6.10 FL30 FL30 BSB STTZN |
|---|---|
| **Part No.** | **308 026** |
| Material | **St/tZn** |
| Clamping range Rd / Fl | (+) 6-10 / 30 mm |
| Clamping range Fl / Fl | (+ / II) 30 / 30 mm |
| Screw | M10 x 25 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 13 kA |
| PU | 25 pc(s) |

### For T and cross connections

**Note:** recommended tightening torque ≥ 10 Nm



| Type | VK A R22 F40 STBL |
|---|---|
| **Part No.** | **308 030** |
| Material | **St/bare** |
| Clamping range Rd / Fl | (+) 6-22 / 30-40 mm |
| Screw | M10 x 40 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 1.0 kA |
| PU | 50 pc(s) |

### For T, cross and parallel connections with clamping piece

For flexible connection of round conductors or for fixed earthing terminals while fixing in the formwork.



| Type | VK 6.22 FL40 KB6.10 BSB STBL |
|---|---|
| **Part No.** | **308 035** |
| Material | **St/bare** |
| Clamping range Rd / Rd | (+/II) 6-22 / 6-10 mm |
| Clamping range Rd / Fl | (+) 6-22 / 40 mm |
| Screw | M10 x 60 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 1.0 kA |
| PU | 25 pc(s) |

### U-bolt clamp for large diameters



| Type | BVK 16.48 6.10 FL40 BSB STBL |
|---|---|
| **Part No.** | **308 045** |
| Material | **St/bare** |
| Clamping range Rd / Rd | (II) 16-48 / 6-10 mm |
| Clamping range Rd / Fl | (II) 16-48 / 30-40 mm |
| Screw | U-bolt M10 x 48 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 16 kA |
| PU | 25 pc(s) |

### U-bolt clamp for large diameters with two additional clamping pieces

For cross connections of round conductors (6-10 mm) or for fixing and simultaneous connection of fixed earthing terminals.



| Type | BVK 16.48 FL40 KB6.10 BSB STBL |
|---|---|
| **Part No.** | **308 046** |
| Material | **St/bare** |
| Clamping range Rd / Rd | (+/II) 16-48 / 6-10 mm |
| Clamping range Rd / Fl | (II) 16-48 / 30-40 mm |
| Screw | U-bolt M10 x 48 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 9.9 kA |
| PU | 25 pc(s) |

### MAXI MV clamps

For T, cross and parallel connections.



| Type | MAMVK 8.16 15.25 STTZN | MAMVK 8.16 15.25 STBL |
|---|---|---|
| **Part No.** | **308 041** | **308 040** |
| Material | **St/tZn** | **St/bare** |
| Clamping range Rd / Rd | (+/II) 8-16 / 15-25 mm | (+/II) 8-16 / 15-25 mm |
| Screw | M12 x 65 mm | M12 x 65 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 6.2 kA | 10.2 kA |
| Approvals | – | UL 467 |
| Stock No. | 5999-12-362-1557 | – |
| PU | 20 pc(s) | 20 pc(s) |

### MV clamps with hexagon screw

Threaded base part.



| Type | MVK 8.10 SKM10X30 STTZN | MVK 10 SKM10X35 STTZN |
|---|---|---|
| **Part No.** | **390 050** | **391 050** |
| Material | **St/tZn** | **St/tZn** |
| Clamping range Rd | 8-10 mm | 10 mm |
| Screw | M10 x 30 mm | M10 x 35 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 7.3 kA | – |
| PU | 50 pc(s) | 50 pc(s) |

### MV clamps with hexagon screw and spring washer

Threaded base part.



| Type | MVK 8.10 SKM10X30 FSC STTZN |
|---|---|
| **Part No.** | **390 550** |
| Material | **St/tZn** |
| Clamping range Rd | 8-10 mm |
| Screw | M10 x 30 mm |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### Parallel connectors with truss head screw



| Type | PV 6.22 FRM10X40 STBLANK | PV 6.22 FRM10X40 STTZN |
|---|---|---|
| **Part No.** | **306 121** | **306 122** |
| Material | **St/bare** | **St/tZn** |
| Clamping range Rd / Rd | 6-22 / 6-22 mm | 6-22 / 6-22 mm |
| Screw | M10 x 40 mm | M10 x 40 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 6.1 kA | 6.1 kA |
| PU | 50 pc(s) | 50 pc(s) |

## Connecting Clamps for Foundation Earth Electrodes

For connecting round and flat conductors in the concrete foundation.
For T, cross and parallel connections, without having to insert the conductor.

Arrangement: (II) = parallel (+) = cross



| Type VK EH R10 F30 ... | ST | V2A |
|---|---|---|
| **Part No.** | **308 120** | **308 129** |
| Material | **St/tZn** | **StSt** |
| Clamping range Rd / Fl | (II) 10 / 30 mm | (II) 10 / 30 mm |
| Clamping range Fl / Fl | (+/II) 30 / 30 mm | (+/II) 30 / 30 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

## Connecting Clamps for Foundation Earth Electrodes and Reinforcements

For connecting round and flat conductors in the concrete foundation or reinforcing steel meshes and reinforcements with round and flat conductors.

Arrangement: (II) = parallel (+) = cross

### Connecting clamp with thrust bracket

For T, cross and parallel connections.



| Type VK ... | DB 6.20 8.10 FL30 BSB STBL | DB KR 6.20 8.10 FL30 BSB STBL |
|---|---|---|
| **Part No.** | **308 031** | **308 033** |
| Material | **St/bare** | **St/bare** |
| Clamping range Rd / Rd | (+/II) 6-20 / 8-10 mm | (+/II) 6-20 / 8-10 mm |
| Clamping range Rd / Fl | (+/II) 6-20 / 30 x 3-4 mm | (+/II) 6-20 / 30 x 3-4 mm |
| Clamping range Fl / Fl | (+/II) 30 x 3-4 / 30 x 3-4 mm | (+/II) 30 x 3-4 / 30 x 3-4 mm |
| Version | Without clamping ring | With clamping ring |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 8.4 kA | 8.4 kA |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

### Connecting clamp MAXI with thrust bracket

For T, cross and parallel connections.



| Type VK ... | DB 20.32 8.10 FL40 BSB STBL |
|---|---|
| **Part No.** | **308 036** |
| Material | **St/bare** |
| Clamping range Rd / Rd | (+/II) 20-32 / 8-10 mm |
| Clamping range Rd / Fl | (+/II) 20-32 / 40 x 4-5 mm |
| Version | With clamping ring |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 14.0 kA |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

### Connecting clamp without thrust bracket

For cross connections.



| Type VK ... | 6.20 FL30 BSB STBL |
|---|---|
| **Part No.** | **308 032** |
| Material | **St/bare** |
| Clamping range Rd / Fl | (+) 6-20 / 30 x 3-4 mm |
| Clamping range Fl / Fl | (+/II) 30 x 3-4 / 30 x 3-4 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 7.0 kA |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

### Connecting clamp MAXI without thrust bracket

For cross connections.



| Type VK ... | 20.32 FL40 BSB STBL |
|---|---|
| **Part No.** | **308 037** |
| Material | **St/bare** |
| Clamping range Rd / Fl | (+) 20-32 / 30 x 3-40 x 5 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## Anti-Corrosion Tape

For the corrosion-protective insulation and enclosure of underground connections, such as clamp and screw connections in the field of earthing and lightning protection, but also for the subsequent enclosure of welded seam areas and formed parts as well as sleeves, flanges, fittings, etc.
The petrolatum-coated lining on both sides effectively prevents the penetration of dirt and moisture.

- Quick and easy to use
- Strong adhesion
- Stays permanently plastic
- Exceptional electrical insulation
- Does not contain any substances harmful to people or the environment

### Anti-corrosion tape with perforation

Specially developed for earthing and lightning protection applications

- Backing is easy to cut with additional perforations every 20 cm
- Red colour for clearer photo documentation



| Type KSB ... | PERF RED 50 L10M | PERF RED 100 L10M |
|---|---|---|
| **Part No.** | **557 125** | **557 130** |
| Material | Petrolatum | Petrolatum |
| Colour | red ● | red ● |
| Length | 10 m | 10 m |
| Width | 50 mm | 100 mm |
| Strenght | ≥ 1.1 mm | ≥ 1.1 mm |
| Max. continuous operating temperature | 30 °C | 30 °C |
| Perforation spacing | approx. 200 mm | approx. 200 mm |
| PU | 24 pc(s) | 12 pc(s) |

### Anti-corrosion tape without perforation

Backing is easy to cut without perforation

- Standard colour brown / beige



| Type KSB ... | 50 L10M | 100 L10M |
|---|---|---|
| **Part No.** | **556 125** | **556 130** |
| Material | Petrolatum | Petrolatum |
| Colour | brown / beige ● | brown / beige ● |
| Length | 10 m | 10 m |
| Width | 50 mm | 100 mm |
| Strenght | ≥ 1.1 mm | ≥ 1.1 mm |
| Max. continuous operating temperature | 30 °C | 30 °C |
| PU | 24 pc(s) | 12 pc(s) |

## MV clamps, with locking lug

Multi-purposeconnecting clamp with locking lug for universal use as a cross clamp, T clamp and parallel clamp; two-part

- Secure locking of the MV clamp in a cross arrangement
- Time saving during installation due to screw-in technology

### With truss head screw

Multi-purpose connecting clamp for universal use as a cross clamp, T clamp and parallel clamp for aboveground and underground connections.
The locking lug is used to lock the MV clamp securely in a cross arrangement.



| Type MVK AR 8.10 ... | FRM10X40 V4A |
|---|---|
| **Part No.** | **391 070** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd | 8-10 mm |
| Screw | M10 x 40 mm |
| Material of screw / nut | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 9.8 *) kA |
| PU | 50 pc(s) |

### With hexagon screw

Multi-purpose connecting clamp for universal use as a cross clamp, T clamp and parallel clamp for aboveground and underground connections.
The locking lug is used to lock the MV clamp securely in a cross arrangement.



| Type MVK AR 8.10 ... | SKM10X40 V4A |
|---|---|
| **Part No.** | **391 079** |
| Material of clamp | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd | 8-10 mm |
| Clamping range (stranded / cable) | 35-70 mm² |
| Screw | M10 x 40 mm |
| Material of screw / nut | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Standard | EN 62561-1 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 9.8 *) kA |
| PU | 50 pc(s) |

## SV Clamps for Underground Connections

SV (angled connector) clamps for cross, parallel and T connections.



| Type | SVK 6.28 FL30 STBL |
|---|---|
| **Part No.** | **308 062** |
| Material of clamp | **St/bare** |
| Clamping range Rd / Fl | 6-28 / 30 mm |
| Standard | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 7.3 kA |
| PU | 50 pc(s) |

## SV Clamps for Aboveground and Underground Connections

SV (angled connector) clamps for cross, parallel and T connections, with anti-rotation protection of the screws.

### For flat and round conductors

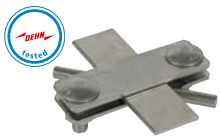


| General technical data: | |
|---|---|
| Clamping range Rd / Rd | 7-10 / 7-10 mm |
| Screw | M10 x 30 mm |
| Standard | EN 62561-1 |

| Type SVK ... | 7.10 7.10 FL30 STTZN | 7.10 7.10 FL30 V4A |
|---|---|---|
| **Part No.** | **308 220** | **308 229** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Rd / Fl | 7-10 / 30 mm | 7-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions (l1 x d1) | 94 x 4 mm | 94 x 3 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 7.3 kA | 3.2 kA |
| PU | 25 pc(s) | 25 pc(s) |

| Type SVK ... | 7.10 7.10 FL40 STTZN | 7.10 7.10 FL40 V4A |
|---|---|---|
| **Part No.** | **308 320** | **308 329** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Rd / Fl | 7-10 / 30-40 mm | 7-10 / 30-40 mm |
| Clamping range Fl / Fl | 30-40 / 30-40 mm | 30-40 / 30-40 mm |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions (l1 x d1) | 108 x 4 mm | 108 x 3 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 14.0 kA | 14.0 kA |
| PU | 25 pc(s) | 25 pc(s) |

### For one flat and round conductor or two flat conductors



| Type SVK ... | 7.10 FL30 V4A |
|---|---|
| **Part No.** | **308 249** |
| Material of clamp | StSt (V4A) |
| Clamping range Rd / Fl | 7-10 / 30 mm |
| Clamping range Fl / Fl | 30 / 30 mm |
| Screw | M10 x 30 mm |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Dimensions (l1 x d1) | 94 x 3 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

### For flat conductors



| Type SVK ... | FL30 STTZN | FL30 V4A |
|---|---|---|
| **Part No.** | **308 230** | **308 239** |
| Material of clamp | **St/tZn** | StSt (V4A) |
| Clamping range Fl / Fl | 30 / 30 mm | 30 / 30 mm |
| Screw | M10 x 30 mm | M10 x 30 mm |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Dimensions (l1 x d1) | 94 x 4 mm | 94 x 3 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 8.2 kA | 3.9 kA |
| PU | 25 pc(s) | 25 pc(s) |

### For flat conductors, round conductors and earth entry rods



| Type SVK ... | 7.10 16 FL40 STTZN |
|---|---|
| **Part No.** | **308 330** |
| Material of clamp | **St/tZn** |
| Clamping range Rd / Rd | 7-10 / 16 mm |
| Clamping range Rd / Fl | 16 / 30-40 mm |
| Screw | M10 x 30 mm |
| Dimensions (l1 x d1) | 108 x 4 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## Expansion Strap for Foundation Earth Electrodes

For leading the foundation earth electrode through the expansion joints of large foundations (several sections). It is not necessary to lead the earth electrode out of the base plate.



| Type | DB 700X30X4 V2A |
|---|---|
| **Part No.** | **308 150** |
| Material of strap | StSt |
| Dimensions of strap (l x w x d) | approx. 700 x 30 x (4 x 1) mm |
| Cross-section | 120 mm² |
| Material of block | **polystyrene** |
| Dimensions of block (l x w x d) | 180 x 85 x 45 mm |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 6 kA |
| PU | 1 pc(s) |

## Spacers

For the installation of earthing conductors in the foundation slab.
With catch lug to avoid loosening of the conductor.

### Angled and reinforced design



| Type AH FE ... | RF V G |
|---|---|
| **Part No.** | **290 001** |
| Material | **St/tZn** |
| Support Fl | 40 mm |
| Support Rd | 8-10 mm |
| Length | 300 mm |
| PU | 25 pc(s) |

### Straight design



| Type AH FE ... | RF |
|---|---|
| **Part No.** | **290 002** |
| Material | **St/tZn** |
| Support Fl | 40 mm |
| Support Rd | 8-10 mm |
| Length | 280 mm |
| PU | 50 pc(s) |

## Assembly tool

For effortless installation of clamps in hard-to-reach reinforcement layers and use as a universal extension tool.

Our assembly tool is available in three different lengths (200 mm, 400 mm, 800 mm) and can be attached to the cordless screwdriver or impact wrench as required.

It has a socket (width across flats 17) with an integrated spring-loaded magnet. The magnet makes it easy to hold and screw clamps from a distance.

Nuts can also be screwed on easily thanks to the spring mechanism. The red handle provides a firm grip and remains stable while the underlying shaft rotates.

### With square socket and magnetic socket (AF17)



Stainless steel extension tool with magnetically spring-loaded socket (AF17) and a 1/2-inch square holder for use with an impact wrench. With a red freewheel handle. Also included: O-ring and locking pin.

| General technical data: | |
|---|---|
| Holder | Square (1/2 inch) |
| Material | StSt |
| Hexagon socket width across flats | 17 mm |

| Type SA ... | 200 4KANT SN V2A | 400 4KANT SN V2A |
|---|---|---|
| **Part No.** | **597 150** NEW | **597 151** NEW |
| Length (l1) | 200 mm | 400 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SA ... | 800 4KANT SN V2A |
|---|---|
| **Part No.** | **597 152** NEW |
| Length (l1) | 800 mm |
| PU | 1 pc(s) |

### With hexagonal socket and magnetic socket (AF17)



Stainless steel extension tool with magnetically spring-loaded socket (AF17) and a hexagonal holder for use with a cordless screwdriver (chuck). With a red freewheel handle.

| General technical data: | |
|---|---|
| Holder | Hexagon |
| Material | StSt |
| Hexagon socket width across flats | 17 mm |

| Type SA ... | 200 6KANT SN V2A | 400 6KANT SN V2A |
|---|---|---|
| **Part No.** | **597 153** NEW | **597 154** NEW |
| Length (l1) | 200 mm | 400 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type SA ... | 800 6KANT SN V2A |
|---|---|
| **Part No.** | **597 155** NEW |
| Length (l1) | 800 mm |
| PU | 1 pc(s) |

## U-Bolt Clamps for Reinforcement Technology

U-Bolt clamps are used for interconnecting various sizes of earth rods, reinforcing bars (rebars), stranded cables and flat condutors.
The clamps have a high resistance to corrosion and show high mechanical strength to ensure a lasting connection.

### Earth Rods/Rebars to Flat Conductors



| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Earth Rod Material | Copper, Copper Bonded Steel, Stainless Steel |
| Clamp Fixings | Nut & Washer M10 |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type | UBC FLERRB 25X3/12.25 HCA | UBC FLERRB 25X3/12.25 HCA CU |
|---|---|---|
| **Part No.** | **138 261** | **138 265** |
| Clamping range Fl / Rod | 25 x 3 / 14.2 - 25 mm | 25 x 3 / 14.2 - 25 mm |
| Clamping range Fl / Rebar | 25 x 3 / 12 - 25 mm | 25 x 3 / 12 - 25 mm |
| Material of U-Bolt | Stainless Steel | Copper |
| Material of Clamp Fixings | Stainless Steel | Copper |
| Tightening Torque | 20 Nm | 15 Nm |
| Dimensions (l x w x h) | 62 x 25 x 70 mm | 62 x 25 x 70 mm |
| PU | 8 pc(s) | 8 pc(s) |

| Type | UBC FLER 25X3/16.25 HCA CU | UBC FLRB 25.50X3.6/25.38 HCA |
|---|---|---|
| **Part No.** | **138 148** | **138 260** |
| Clamping range Fl / Rod | 25 x 3 / 16 - 25 mm | – |
| Clamping range Fl / Rebar | 25 x 3 / 16 - 25 mm | W (25-50) x T (3-6) / 25-38 mm |
| Material of U-Bolt | Copper | Stainless Steel |
| Material of Clamp Fixings | Copper | Stainless Steel |
| Tightening Torque | 20 Nm | 20 Nm |
| Dimensions (l x w x h) | 60 x 22.5 x 70 mm | 90 x 25 x 83 mm |
| PU | 8 pc(s) | 4 pc(s) |

| Type | UBC FLRB 25.50X3.6/38.50 HCA |
|---|---|
| **Part No.** | **138 263** |
| Clamping range Fl / Rod | – |
| Clamping range Fl / Rebar | W (25-50) x T (3-6) / 38-50 mm |
| Material of U-Bolt | Stainless Steel |
| Material of Clamp Fixings | Stainless Steel |
| Tightening Torque | 20 Nm |
| Dimensions (l x w x h) | 90 x 25 x 98 mm |
| PU | 4 pc(s) |

Note: For Single Plate U-Bolt application - Stranded cables crimped using appropriate cable lugs may be connected by removing the bottom plate and fixed directly to the top plate using the clamp fixings.

### Earth Rods/Rebars to Stranded Conductors



| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Earth Rod Material | Copper, Copper Bonded Steel, Stainless Steel |
| Clamp Fixings | Nut & Washer M10 |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type | UBC ERRBSC 12.20/16.70 HCA CU | UBC ERRBSC 12.20/70.150 HCA CU |
|---|---|---|
| **Part No.** | **138 164** | **138 165** |
| Clamping range Rod / Stranded cable | 14.2 - 20 mm / 16 - 70 mm² | 14.2 - 20 mm / 70 - 150 mm² |
| Clamping range Rebar / Stranded cable | 12 - 20 mm / 16 - 70 mm² | 12 - 20 mm / 70 - 150 mm² |
| Material of U-Bolt | Copper | Copper |
| Material of Clamp Fixings | Copper | Copper |
| Tightening Torque | 15 Nm | 20 Nm |
| Dimensions (l x w x h) | 82.5 x 52 x 38 mm | 82.5 x 52 x 42 mm |
| PU | 8 pc(s) | 8 pc(s) |

| Type | UBC ERRBSC 12.20/150.300 HCA CU | UBC ERRBSC 12.20/16.70 HCA |
|---|---|---|
| **Part No.** | **138 166** | **138 170** |
| Clamping range Rod / Stranded cable | 14.2 - 20 mm / 150 - 300 mm² | 14.2 - 20 mm / 16 - 70 mm² |
| Clamping range Rebar / Stranded cable | 12 - 20 mm / 150 - 300 mm² | 12 - 20 mm / 16 - 70 mm² |
| Material of U-Bolt | Copper | Stainless Steel |
| Material of Clamp Fixings | Copper | Stainless Steel |
| Tightening Torque | 20 Nm | 20 Nm |
| Dimensions (l x w x h) | 75 x 60 x 42 mm | 82.5 x 52 x 38 mm |
| PU | 6 pc(s) | 8 pc(s) |

| Type | UBC ERRBSC 12.20/70.150 HCA | UBC ERRBSC 12.20/150.300 HCA |
|---|---|---|
| **Part No.** | **138 171** | **138 172** |
| Clamping range Rod / Stranded cable | 14.2 - 20 mm / 70 - 150 mm² | 14.2 - 20 mm / 150 - 300 mm² |
| Clamping range Rebar / Stranded cable | 12 - 20 mm / 70 - 150 mm² | 12 - 20 mm / 150 - 300 mm² |
| Material of U-Bolt | Stainless Steel | Stainless Steel |
| Material of Clamp Fixings | Stainless Steel | Stainless Steel |
| Tightening Torque | 20 Nm | 20 Nm |
| Dimensions (l x w x h) | 82.5 x 52 x 42 mm | 75 x 60 x 42 mm |
| PU | 8 pc(s) | 6 pc(s) |

| Type | UBC ERRBSC 12.25/70.300 HCA CU |
|---|---|
| **Part No.** | **138 177** |
| Clamping range Rod / Stranded cable | 14.2 - 25 mm / 70 - 300 mm² |
| Clamping range Rebar / Stranded cable | 12 - 25 mm / 70 - 300 mm² |
| Material of U-Bolt | Copper |
| Material of Clamp Fixings | Copper |
| Tightening Torque | 20 Nm |
| Dimensions (l x w x h) | – |
| PU | 4 pc(s) |

## Rebar to Rebar



| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Rebar |
| Material of U-Bolt | Stainless Steel |
| Material of Clamp Fixings | Stainless Steel |
| Tightening Torque | 20 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type | UBC RB 12.16/12.16 HCA | UBC RB 16.25/16.25 HCA |
|---|---|---|
| Part No. | 138 174 | 138 176 |
| Clamping range Rebar / Rebar | 12 - 16 / 12 - 16 mm | 16 - 25 / 16 - 25 mm |
| Clamp Fixings | Nut & Washer M10 | Nut & Washer M10 |
| Dimensions (l x w x h) | 70.4 x 52 x 35 mm | 92.4 x 60 x 38 mm |
| PU | 6 pc(s) | 6 pc(s) |

| Type | UBC RB 25.32/25.32 HCA | UBC RB 32.42/32.42 HCA |
|---|---|---|
| Part No. | 138 178 | 138 179 |
| Clamping range Rebar / Rebar | 25 - 32 / 25 - 32 mm | 32 - 42 / 32 - 42 mm |
| Clamp Fixings | Nut & Washer M10 | Nut & Washer M12 |
| Dimensions (l x w x h) | 110 x 70 x 42 mm | 135 x 88 x 55 mm |
| PU | 4 pc(s) | 2 pc(s) |

## Mulitpurpose Rebar Clamps, Stainless Steel



138187 is expected to be available for delivery in Q2/2025!

| General technical data: | |
|---|---|
| Conductor Material | Copper, Stainless Steel, Galvanised Steel |
| Material of U-Bolt | Stainless Steel |
| Clamp Fixings | Nut & Washer M8 |
| Material of Clamp Fixings | Stainless Steel |
| Tightening Torque | 15 Nm |
| Dimensions (l x w x h) | 95 x 30 x 103 mm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type | MUBC RBFLSC 12.20/25.40x3.6/50.300 STST | MUBC RBFLSC 16.25/25.40X3.6/50.300 STST |
|---|---|---|
| Part No. | 138 185 | 138 186 |
| Material | Stainless Steel | Stainless Steel |
| Clamping range Rebar / Fl | 12 - 20 mm / W (25 - 40) x T (3 - 6) mm | 16 - 25 mm / W (25 - 40) x T (3 - 6) mm |
| Clamping range Rebar / Stranded cable | 12 - 20 mm / 50 - 300 mm² | 16 - 25 mm / 50 - 300 mm² |
| Clamping range Rebar / Rebar | 12 - 20 mm / 12 - 20 mm | 16 - 25 mm / 16 - 25 mm |
| PU | 4 pc(s) | 4 pc(s) |

| Type | MUBC RBFLSC 22.32/25.40x3.6/50.300 STST |
|---|---|
| Part No. | 138 187 |
| Material | Stainless Steel |
| Clamping range Rebar / Fl | 22 - 32 mm / W (25 - 40) x T (3 - 6) mm |
| Clamping range Rebar / Stranded cable | 22 - 32 mm / 50 - 300 mm² |
| Clamping range Rebar / Rebar | 22 - 32 mm / 22 - 32 mm |
| PU | 4 pc(s) |

## Multipurpose Rebar Clamp



| Type | UBC FLERRBSC 25X3.6/25.40/50.185 HCA CU |
|---|---|
| Part No. | 138 173 |
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Clamping range Fl / Rod | 25 x 3 / 25 - 40 mm |
| Clamping range Rod / Stranded cable | 25 - 40 mm / 50 - 185 mm² |
| Clamping range Fl / Rebar | 25 x 3 / 25 - 40 mm |
| Clamping range Rebar / Stranded cable | 25 - 40 mm / 50 - 185 mm² |
| Material of U-Bolt | Copper |
| Clamp Fixings | Nut & Washer M10 |
| Material of Clamp Fixings | Copper |
| Tightening Torque | 20 Nm |
| Dimensions (l x w x h) | 83 x 83 x 110 mm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |
| PU | 2 pc(s) |

# Earthing Enhancement Compounds

**Marconite®**

By adding MARCONITE instead of the sand and aggregate used in a standard concrete mix a highly conductive concrete is formed. Used as a backfill material around the earth electrodes, it provides a conductive medium increasing the surface area of the electrode and ensuring a highly conductive path between the earth electrode and the surrounding ground. Being a concrete it provides a permanent solution.

**Bentonite®**

BENTONITE is a moisture retaining clay consisting of sodium montmorillonite. By mixing BENTONITE with water the resultant slurry will swell to many times its original dry volume. When used as a backfill material, within a borehole earth system, it will continue to absorb water from the surrounding soil thus helping provide a stable earth resistance. This is also true when the clay is used to surround earth plates and lattice mats. It strongly adheres to the earth electrodes ensuring good electrical conductivity between the electrodes and surrounding ground.

## Ad-Mixture Compounds



| Type EEC ... | MARCONITE 25KG |
|---|---|
| Part No. | 138 125 |
| Weight | 25 kg |
| PU | 1 pc(s) |

## Pre-Mixed Compounds



| Type EEC ... | BENTONITE 25KG |
|---|---|
| Part No. | 138 126 |
| Weight | 25 kg |
| PU | 1 pc(s) |

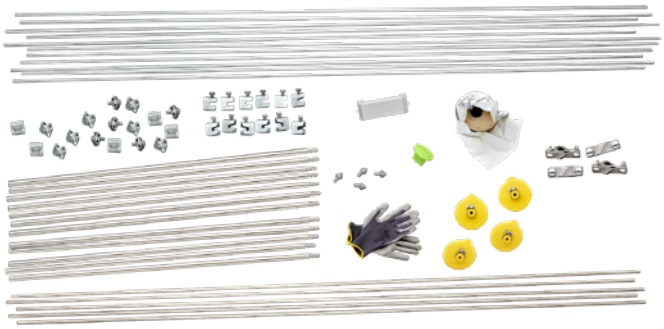


## Earthing kit

Earthing kit for use in residential buildings up to 120 m² Ground area and without lightning protection system.

### Basic earthing kit

Earthing kit content (4 packages)



| | |
|---|---|
| **Package 1:** | |
| 5x round steel, StSt V4A, Ø10 mm, L 2000 mm | |
| 11x round steel, **HDG steel**, Ø10 mm, L 2000 mm | |
| Dimensions: approx. 60 x 60 x 2000 mm | Weight: approx. 21 kg |
| **Package 2:** | |
| 4x sealing collar | |
| 4x driving spike for earth rods | |
| 4x connection bracket, StSt V4A | |
| 1x anti-corrosion tape | |
| 17x MV clamps, **HDG steel** | |
| 12x connecting clamps, **HDG steel** | |
| 1x equipotential bonding bar | |
| 1x marker for connection lug | |
| 1x glove pair (size 10) | |
| 1x installation instructions | |
| 1x test report | |
| Dimensions: approx. 240 x 180 x 50 mm | Weight: approx. 7 kg |
| **Package 3:** | |
| 6x earth rod, StSt, Ø20 mm, L 1000 mm | |
| Dimensions: approx. 40 x 60 x 1000 mm | Weight: approx. 15 kg |
| **Package 4:** | |
| 6x earth rod, StSt, Ø20 mm, L 1000 mm | |
| Dimensions: approx. 40 x 60 x 1000 mm | Weight: approx. 15 kg |

| **Type** | **ESET 1 EFH 120** |
|---|---|
| **Part No.** | **690 001** |
| Application | Residential buildings up to 120 m² of ground area |
| Standard | DIN 18014:2023-06 |
| PU | 1 pc(s) |

## Earth Rods

For setting up earthing systems for down conductors or transformer stations.

**Features:**

- No thickening of the cross-section at the coupling joint
- Self-locking coupling
- Corrosion resistance
- Easier storage and transport
- Universal use according to local soil conditions
- Constant resistance values
- Easily driven in with a vibration hammer

### Type Z

With triple knurled pin.



| **General technical data:** | | |
|---|---|---|
| Material | | **St/tZn** |
| Standard | | EN 62561-2 |

| **Type TE ...** | **20 1000 Z STTZN** | **20 1500 Z STTZN** |
|---|---|---|
| **Part No.** | **620 101** | **620 151** |
| Rod length (l1) | 1000 mm | 1500 mm |
| Diameter Ø (d1) | 20 mm | 20 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 7.9 kA | 7.9 kA |
| PU | 6 pc(s) | 6 pc(s) |

| **Type TE ...** | **25 1000 Z STTZN** | **25 1500 Z STTZN** |
|---|---|---|
| **Part No.** | **625 101** | **625 151** |
| Rod length (l1) | 1000 mm | 1500 mm |
| Diameter Ø (d1) | 25 mm | 25 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 12.3 kA | 12.3 kA |
| PU | 6 pc(s) | 6 pc(s) |

### Type AZ

With offset knurled pin.



| **Type TE ...** | **20 1000 AZ V4A** | **20 1500 AZ V4A** |
|---|---|---|
| **Part No.** | **620 903** | **620 902** |
| Material | StSt (V4A) | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 | 316Ti / 316L / 316 |
| Rod length (l1) | 1000 mm | 1500 mm |
| Diameter Ø (d1) | 20 mm | 20 mm |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 4.2 kA | 4.2 kA |
| Standard | EN 62561-2 | EN 62561-2 |
| PU | 6 pc(s) | 6 pc(s) |

## Connection Brackets

For connecting round conductors, cables and flat strips to earth rods.

### Diagonal design
Also for use with uncut earth conductors.

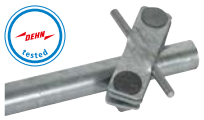


| General technical data: | |
|---|---|
| Clamping range Rd / Fl | 7-10 / -40 mm |
| Standard | EN 62561-1 |

| Type AS ... | S TE 20 7.10 FL40 STTZN | S TE 20 7.10 FL40 V4A |
|---|---|---|
| Part No. | 620 015 | 620 915 |
| Material | St/tZn | StSt (V4A) |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| Type for earth rods | Ø20 mm | Ø20 mm |
| Material No. | – | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 21.0 kA | 7.3 kA |
| PU | 20 pc(s) | 20 pc(s) |

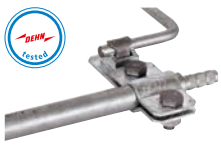
| Type AS ... | S TE 25 7.10 FL40 STTZN | S TE 25 7.10 FL40 V4A |
|---|---|---|
| Part No. | 625 015 | 649 015 |
| Material | St/tZn | StSt (V4A) |
| Clamping range (stranded / cable) | – | 35-120 mm² |
| Type for earth rods | Ø25 mm | Ø25 mm |
| Material No. | – | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 18 kA | 8 kA |
| PU | 20 pc(s) | 20 pc(s) |

### Diagonal design – especially for tubular earth rods St/tZn
Also for use with uncut earth electrodes.



| Type AS ... | S RE 27 7.10 FL40 STTZN |
|---|---|
| Part No. | 640 015 |
| Material | St/tZn |
| Clamping range Rd / Fl | 7-10 / -40 mm |
| Type for earth rods | Ø27 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### One-sided connection with KS connector



| Type AS ... | TE 20 KSV 7.10 STTZN | TE 25 KSV 7.10 STTZN |
|---|---|---|
| Part No. | 620 011 | 625 011 |
| Material | St/tZn | St/tZn |
| Clamping range Rd | 7-10 mm | 7-10 mm |
| Type for earth rods | Ø20 mm | Ø25 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 20 pc(s) | 20 pc(s) |

**Note:**
Anti-corrosion tapes (Part No. 557 125, 557 130, 556 125 and 556 130), see page xxx.

## Connection Clamps

For cross and parallel connection of round conductors, flat strips or cables to earth rods.

### For earth rods Ø20-30 mm



| Type AK ... | TE 20.30 8.12 FL40 STTZN |
|---|---|
| Part No. | 610 010 |
| Material | St/tZn |
| Clamping range Rd / Fl | 8-12.5 / -40 mm |
| Clamping range (stranded / cable) | 50-95 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 18 kA |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### For earth rods Ø20-25 mm
Connection clamp for equipotential bonding connection of pipes (e.g. antenna poles) to earth rods via a solid /stranded conductor.



| Type AK ... | 8.10 AQ4 50 TE20 25 V4A |
|---|---|
| Part No. | 540 121 |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd | 8-10 mm |
| Connection (solid /stranded) | 4-50 mm² |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

### For earth rods Ø20 mm



| Type AK ... | TE 20 7.10 FL40 V4A |
|---|---|
| Part No. | 610 020 |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd / Fl | 7-10 / -40 mm |
| Clamping range (stranded / cable) | 25-120 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 8 kA |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## Single-screw Connection Clamps

For connecting round conductors, flat strips or cables to earth rods.
For cross and parallel connection.



| Type AK ES TE 20 RD10 ... | FL30 STTZN | FL30 V4A |
|---|---|---|
| Part No. | 630 120 | 630 129 |
| Material | St/tZn | StSt (V4A) |
| Clamping range Rd / Fl | 10 / -30 x 4 mm | 10 / -30 x 4 mm |
| Clamping range of cable | 70 mm² | 70 mm² |
| Type for earth rods | Ø20 mm | Ø20 mm |
| Material No. | – | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | – | 316Ti / 316L / 316 |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 25 pc(s) | 25 pc(s) |

## Screwable earth rod

Complete system for the installation of drilled earthing systems up to 99 m by means of core drilling; e.g. in pipeline applications or also for rocky ground.

### Starter kit



Screwable earth rod starter kit
1x used for each drill hole, consisting of:
1x connector L 320 mm (part no. 621 092)
2x screwable earth rod, L 500 mm (part no. 621 050)
1x foot piece with flange Ø80 mm (part no. 621 091)
1x M16 ring nut (part no. 621 097)
1x heat-shrinkable sleeve L 140 mm (part no. 621 096)

| Type | SET STARTER KIT TE 20 M16 STTZN |
|---|---|
| **Part No.** | **621 090** |
| Earth electrode material | **HDG steel** |
| Rod length (l1) | 500 mm |
| Earth electrode diameter | 20 mm |
| PU | 1 pc(s) |

### Earth rod



Screwable earth rod, HDG steel, Ø20 mm with M16 thread for the installation of drilled earthing systems; e.g. in rocky ground or for pipeline applications.

| **General technical data:** | |
|---|---|
| Material | **HDG steel** |
| Earth electrode diameter | 20 mm |
| Thread | M16 |
| Lightning current carrying capability (10/350 µs) ($I_{imp}$) | 100 kA |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 7.4 kA |
| Standard | EN 62561-2 |

| Type | TE 20 500 M16 STTZN | TE 20 1500 M16 STTZN |
|---|---|---|
| **Part No.** | **621 050** | **621 150** |
| Rod length (l1) | 500 mm | 1500 mm |
| PU | 1 pc(s) | 6 pc(s) |

| Type | TE 20 3000 M16 STTZN |
|---|---|
| **Part No.** | **621 300** |
| Rod length (l1) | 3000 mm |
| PU | 3 pc(s) |

### Foot piece



Foot with flange plate St/tZn Ø20 mm M16 for connection at the bottom to the screwable earth rod to prevent from sinking into the soil due to own weight.

| Type | FS TE 20 100 M16 FP80 STTZN |
|---|---|
| **Part No.** | **621 091** |
| Material | **HDG steel** |
| Rod length (l1) | 100 mm |
| Earth electrode diameter | 20 mm |
| Plate diameter Ø | 80 mm |
| Thread | M16 |
| PU | 1 pc(s) |

### Connection clamp



St/galZn connection clamp for earth rod Ø20 mm with 4 contact options for cable lug via M6 screws.

| Type | AK TE 20 STGALZN |
|---|---|
| **Part No.** | **621 094** |
| Clamp material | **St/gal Zn** |
| Earth electrode diameter | 20 mm |
| Screws | 6x M6 x 10 mm ✪TX30 (4x 2.5 mm² – max. 16 mm²) [2x earth electrode / 4x connection] |
| Screw / spring washer material | StSt |
| Max. continuous current load $T_{max}$=100 °C (VDE 0101-2) | 125 A |
| PU | 1 pc(s) |

### Connector



Connector for earth rod screwable HDG steel Ø20 mm rod length 320 mm for creating tested connection options on the screwable earth rod.

| Type | AS TE 20 320 M16 STTZN |
|---|---|
| **Part No.** | **621 092** |
| Material | **HDG steel / StSt** |
| Rod length (l1) | 320 mm |
| Earth electrode diameter | 20 mm |
| Thread | M16 |
| Connection | 4x M6 x 10 mm ✪TX30 (4x 2.5 mm² – max. 16 mm²) or 1x M8 x 20 mm ⬢AF13 (Ø6–10 mm) |
| Lightning current carrying capability (10/350 µs) ($I_{imp}$) | 100 kA |
| Short-circuit current (AC 50 Hz / DC) (0.2 s; ≤ 300°C) | 5.3 kA (35 mm², stranded) |
| Max. continuous current load $T_{max}$=100 °C (VDE 0101-2) | 125 A |
| Standard | DIN EN 62561-1 |
| PU | 1 pc(s) |

## Accessories for Screwable earth rod

### Earth rod fork



Earth rod fork for the secure suspension of the screwable earth rods above the borehole.

| Type | HG TE 20 STTZN |
|---|---|
| **Part No.** | **621 095** |
| Material | **HDG steel** |
| Application note | for screwable earth rod Ø20 mm |
| Maximum static load by earth electrode | 99 m (approx. 250 kg) |
| PU | 1 pc(s) |

### Ring nut, M16, HDG steel (St/tZn)



| Type | RM M16 STTZN |
|---|---|
| **Part No.** | **621 097** |
| Inner diameter | 35 mm |
| Female thread | M16 |
| Material | **HDG steel (C15E)** |
| Load capacity (F max.) | 700 kg |
| PU | 1 pc(s) |

### Gel connecting sleeve

Gel connecting sleeve for screwable earth rod for permanent protection of the connecting cables of connector (part no. 621 092) and connection clamp (part no. 621 094) against the ingress of water or moisture.



| Type | VM EASY 5 TE M16 |
|---|---|
| **Part No.** | **621 093** |
| Outer diameter (L x W x H) | 240 x 75 x 44 mm |
| Cable diameter | 19 - 28 mm |
| Standard | Type-tested acc. to EN 50393 |
| Degree of protection | IP 68 |
| PU | 1 pc(s) |

### Heat-shrinkable sleeve, black



| Type | WSS KL D40 L140 |
|---|---|
| **Part No.** | **621 096** |
| Material | thin-walled, adhesive-coated, cross-linked polyolefin |
| Length (l) | 140 mm |
| Inner diameter (d) | 40 mm |
| Colour | black |
| PU | 1 pc(s) |

## Tubular Earth Rods

Light design, for implementing earth-termination systems for down conductors.



| Type | RE 25 1500 V4A |
|---|---|
| **Part No.** | **649 150** |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Rod length | 1500 mm |
| Diameter Ø | 25 mm |
| Standard | EN 62561-2 |
| PU | 6 pc(s) |

## Driving Spikes

For driving in the first earth rod.
The driving spikes can be used for earth rods made of steel and StSt as well as tubular earth rods.



| Type SSP TE ... | 20 TGTZN | 25 TGTZN |
|---|---|---|
| **Part No.** | **620 001** | **625 001** |
| Material | **MCI/tZn** | **MCI/tZn** |
| Type | for earth rods Ø20 mm or tubular earth rods St/tZn Ø27 mm | for earth rods Ø25 mm or tubular earth rods StSt (V4A) Ø25 mm |
| PU | 100 pc(s) | 50 pc(s) |

## Earthing Pipe with Driving Spike

With driving spike for earthing mobile objects such as vehicles, power generators, etc.



| Type | ERO SSP ASSM8 600 STTZN |
|---|---|
| **Part No.** | **646 000** |
| Material | **St/tZn** |
| Pipe Ø | 34 mm |
| Length | 600 mm |
| Screw | wing nut M8 |
| Stock No. | 5975-12-133-4342 |
| PU | 1 pc(s) |

## DEHNIT Earthing Method

For improving and stabilising the earth electrode resistance.

Highly swellable, powdery and extremely moisture retaining special clay provides a conductive earth electrode enclosure and reduces the soil resistivity.

More information at www.dehn-international.com/.



| Type | DEHNIT 25KG |
|---|---|
| **Part No.** | **573 000** |
| Material | **special clay** |
| Mixture ratio [weight proportions in kg] | 5 parts sand / 1 part DEHNIT / 0.5 parts water |
| Weight | 25 kg |
| PU | 25 kg |

*) Sand compactness assumption: 1.23 t/m³

More information at www.dehn-international.com/

## Profiled Earth Rods

For the installation of earth-termination systems e.g. for antennas or construction site distribution cabinets.

### Profile 50 x 50 x 3 mm

With connection lug and holes, e.g. for KS connector.



| General technical data: | | |
|---|---|---|
| Material | | **St/tZn** |
| Holes Ø | | [2x] 11 / [1x] 13 mm |

| Type PSE 50X50X3 ... | 1000 STTZN | 1500 STTZN |
|---|---|---|
| **Part No.** | **635 100** | **635 150** |
| Length (l1) | 1000 mm | 1500 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type PSE 50X50X3 ... | 2000 STTZN | 2500 STTZN |
|---|---|---|
| **Part No.** | **635 200** | **635 250** |
| Length (l1) | 2000 mm | 2500 mm |
| PU | 5 pc(s) | 3 pc(s) |

## Selection Guide for Hammer Inserts according to their Brand

| Brand | Type | Holder | Earth rod | | Tubular earth rods |
|---|---|---|---|---|---|
| | | | Type Z St/tZn (Ø20)<br>Type AZ V4A (Ø20) | Type Z St/tZn (Ø25) | V4A (Ø25) |
| Wacker<br>Neuson | BH 23 / BH 55 / BH 65 / BH 55rw | round Ø27 x 80 mm | 620 005<br>620 009 | 625 005<br>625 009 | 648 005 |
| | EH 50 / EH 75 / EH 22/400 / EH 23/230 / EH 24/042/200 | | | | |
| | BHF 30 | | | | |
| Atlas<br>Copco | Cobra 149 (Combi)<br>Cobra 248 | hexagon wrench size 22 x 108 mm | 620 007 | 625 007 | 648 007 |
| | Pionjär 120<br>Pionjär 130 | | | | |
| | TEX 15 PE<br>TEX 19 PE<br>TEX 23 PE | hexagon wrench size 25 x 108 mm | 620 008 | 625 008 | – |
| | TEX 15 PE<br>TEX 19 PE<br>TEX 23 PE<br>TEX 27 H<br>TEX 28 HE<br>TEX 22 PS | hexagon wrench size 28 x 160 mm | 620 019 | 625 019 | – |
| | Cobra TT<br>Cobra PRO | hexagon wrench size 32 x 160 mm | 620 010 | 625 010 | – |
| Chicago<br>Pneumatic | CP Red Hawk Rail<br>CP Red Hawk Road | | | | |
| | CP Red Hawk Drill | hexagon wrench size 22 x 108 mm | 620 007 | 625 007 | 648 007 |
| Milwaukee | K 2628 H | hexagon wrench size 28 | 620 029 | 625 029 | 648 029 |
| Bosch | GSH 27<br>**GSH 27 VC** | | | | |
| Hilti | **TE 3000 AVR**<br>(bis Modell 2021) | | | | |
| | TE 1000 AVR<br>**TE 2000 AVR**<br>**TE 2000-22** (Akku) | TE-S<br>(hexagon wrench size 22) | 620 031 | 625 031 | 648 031 |
| Other | Other | SDS-Max (Ø18 x 175 mm) | 620 030 | 625 030 | 648 009 |

our recommendation

## Hammer Inserts for Earth Rods

For driving in earth rods with a vibration hammer.

For earth rods type S and Z.
Ø20 mm (pin Ø12 mm Part No. 620...) or
Ø25 mm (pin Ø15 mm Part No. 625...)

With the Atlas Copco equipment different adapter types can be used. Please note that when placing your order.

### Design for Wacker Neuson



| Type HE TE ... | 20 R27 VH WN STBLANK | 25 R27 VH WN STBLANK |
|---|---|---|
| **Part No.** | **620 005** | **625 005** |
| Type | BHF 30 | BHF 30 |
| Adapter | round Ø27 x 80 mm | round Ø27 x 80 mm |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 200 mm | 200 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | S, Z |
| PU | 1 pc(s) | 1 pc(s) |

Special hammer insert Part No. 620 039 for earth rods Part No. 620 902 TYPE AZ StSt (V4A).

### Heavy design for Wacker Neuson



| Type HE TE ... | 20 R27 LVH WN STBLANK | 25 R27 LVH WN STBLANK |
|---|---|---|
| **Part No.** | **620 009** | **625 009** |
| Type | BH 55, BH 65, BH 55rw, EH 50, EH 75 and EH 22/400 | BH 55, BH 65, BH 55rw, EH 50, EH 75 and EH 22/400 |
| Adapter | round Ø27 x 80 mm | round Ø27 x 80 mm |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 260 mm | 260 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | Z |
| PU | 1 pc(s) | 1 pc(s) |

### Design for Atlas Copco AF 22



| Type HE TE ... | 20 SW22 VH AC STBLANK | 25 SW22 VH AC STBLANK |
|---|---|---|
| **Part No.** | **620 007** | **625 007** |
| Type | Cobra Combi, Pionjär 120+130, CP Red Hawk (Cobra Standard) | Cobra Combi, Pionjär 120+130, CP Red Hawk (Cobra Standard) |
| Adapter | hexagon, wrench size 22 x 108 mm | hexagon, wrench size 22 x 108 mm |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 240 mm | 240 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | Z |
| PU | 1 pc(s) | 1 pc(s) |

## Design for Atlas Copco AF 25



| Type HE TE ... | 20 SW25 VH AC STBLANK | 25 SW25 VH AC STBLANK |
|---|---|---|
| **Part No.** | **620 008** | **625 008** |
| Type | TEX 15 PE, 19 PE, 23 PE | TEX 15 PE, 19 PE, 23 PE |
| Adapter | hexagon, wrench size 25 x 108 mm | hexagon, wrench size 25 x 108 mm |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 240 mm | 240 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | Z |
| PU | 1 pc(s) | 1 pc(s) |

## Design for Atlas Copco AF 28



| Type HE TE ... | 20 SW28 VH AC STBLANK | 25 SW28 VH AC STBLANK |
|---|---|---|
| **Part No.** | **620 019** | **625 019** |
| Type | TEX 28 HE, 27 H, 15 PE, 19 PE, 23 PE, 22 PS | TEX 28 HE, 27 H, 15 PE, 19 PE, 23 PE, 22 PS |
| Adapter | hexagon, wrench size 28 x 160 mm | hexagon, wrench size 28 x 160 mm |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 350 mm | 350 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | Z |
| PU | 1 pc(s) | 1 pc(s) |

## Design for Atlas Copco AF 32



| Type HE TE ... | 20 SW32 VH AC STBLANK | 25 SW32 VH AC STBLANK |
|---|---|---|
| **Part No.** | **620 010** | **625 010** |
| Type | TT, PRO, MK1 | TT, PRO, MK1 |
| Adapter | hexagon, wrench size 32 x 160 mm | hexagon, wrench size 32 x 160 mm |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 350 mm | 350 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | Z, AZ |
| PU | 1 pc(s) | 1 pc(s) |

## Design for Bosch / Hilti / Milwaukee



| Type HE TE ... | 20 SW28 VH BO STBLANK | 25 SW28 VH BO STBLANK |
|---|---|---|
| **Part No.** | **620 029** | **625 029** |
| Type | GSH 27 / TE 3000 AVR (up to 2021 model) / K 2628 h | GSH 27 / TE 3000 AVR (up to 2021 model) / K 2628 h |
| Adapter | hexagon, wrench size 28 (1 $^{1}/_{8}$'') | hexagon, wrench size 28 (1 $^{1}/_{8}$'') |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 250 mm | 250 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | Z |
| PU | 1 pc(s) | 1 pc(s) |

## Design for Hilti TE-S



| Type HE TE ... | 20 TES VH HI STBLANK | 25 TES VH HI STBLANK |
|---|---|---|
| **Part No.** | **620 031** | **625 031** |
| Type | vibration / impact hammer with TE-S adapter | vibration / impact hammer with TE-S adapter |
| Adapter | hexagon, wrench size 22 | hexagon, wrench size 22 |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 280 mm | 280 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | Z |
| PU | 1 pc(s) | 1 pc(s) |

## Design for SDS-max



| Type HE TE ... | 20 SDS MAX VH STBLANK | 25 SDS MAX VH STBLANK |
|---|---|---|
| **Part No.** | **620 030** | **625 030** |
| Type | vibration / impact hammer with SDS-max adapter | vibration / impact hammer with SDS-max adapter |
| Adapter | round Ø18 x 175 mm | round Ø18 x 175 mm |
| Material | **St/bare** | **St/bare** |
| Hole (d1 x l1) | 13 x 50 mm | 16 x 55 mm |
| Length | 260 mm | 260 mm |
| Earth rod diameter | 20 mm | 25 mm |
| Earth rod type | Z, AZ | Z |
| PU | 1 pc(s) | 1 pc(s) |

Note: It is recommended to use a hammer with a minimum striking force of 26 joules. The maximum drive-in depth depends on the soil conditions.

Designs for other types of hammer available on request.

## Hammer Inserts for Tubular Earth Rods

For driving in tubular earth rods with a vibration hammer.

### Design Wacker Neuson



| Type HE RE 25 ... | R27 VH WN STBLANK |
|---|---|
| **Part No.** | **648 005** |
| Type | EH 22/400, EH 23/230, EH 24/042/200, BH 23 and BHF 30 |
| Adapter | round Ø27 x 80 mm |
| Material | **St/bare** |
| Hole (d1 x l1) | 25.6 x 39 mm |
| Length | 246 mm |
| Earth rod diameter | 25 mm |
| Earth rod type | RE |
| PU | 1 pc(s) |

### Design SDS-max



| Type HE RE 25 ... | SDS MAX VH STBLANK |
|---|---|
| **Part No.** | **648 009** |
| Type | vibration / impact hammer with SDS-max adapter |
| Adapter | round Ø18 x 175 mm |
| Material | **St/bare** |
| Hole (d1 x l1) | 25.6 x 39 mm |
| Length | 260 mm |
| Earth rod diameter | 25 mm |
| Earth rod type | RE |
| PU | 1 pc(s) |

Note: It is recommended to use a hammer with a minimum striking force of 26 joules. The maximum drive-in depth depends on the soil conditions.

### Design Bosch / Hilti / Milwaukee



| Type HE RE 25 ... | SW28 VH BO STBLANK |
|---|---|
| **Part No.** | **648 029** |
| Type | GSH 27, GSH 27 VC, TE 3000 AVR (up to 2021 model), K 2628 H |
| Adapter | hexagon AF28 |
| Material | **St/bare** |
| Hole (d1 x l1) | 25.6 x 39 mm |
| Length | 266 mm |
| Earth rod diameter | 25 mm |
| Earth rod type | RE |
| PU | 1 pc(s) |

### Design Hilti TE-S



| Type HE RE 25 ... | TES VH HI STBLANK |
|---|---|
| **Part No.** | **648 031** |
| Type | vibration / impact hammer with TE-S adapter |
| Adapter | Hilti TE-S |
| Material | **St/bare** |
| Hole (d1 x l1) | 25,6 x 39 mm |
| Length | 280 mm |
| Earth rod diameter | 25 mm |
| Earth rod type | RE |
| PU | 1 pc(s) |

Designs for other types of hammer available on request.

## Driving Heads

For driving in earth rods with a mallet.



| Type SKO TE ... | 20 STBLANK | 25 STBLANK |
|---|---|---|
| **Part No.** | **620 002** | **625 002** |
| Type of earth rod | types Z + AZ (Ø20 mm) | type Z (Ø25 mm) |
| Material | **St/bare** | **St/bare** |
| PU | 1 pc(s) | 1 pc(s) |

## Hammer Rig

For driving earth rods of 1000 mm or 1500 mm in length into the ground using a vibration hammer.

The hammer rig is delivered with a hammer slide guide.



| Type | HG TE VH STTZN |
|---|---|
| **Part No.** | **600 003** |
| Material | **St/tZn** |
| Height | 2550 mm |
| PU | 1 pc(s) |

## Hammer Support

For vibration hammers of the following brands

### Design for Wacker Neuson



| Type HA VH ... | WA BH55 BH65 BH55RW |
|---|---|
| **Part No.** | **600 035** |
| Types | BH 55, BH 65, BH 55 rw, EH 50, K 2500 H |
| Material | **St/tZn** |
| PU | 1 pc(s) |

### Design for Bosch



| Type HA VH ... | BO GSH 27 | BO GSH 27 VC |
|---|---|---|
| **Part No.** | **600 050** | **600 055** |
| Types | GSH 27 | GSH 27 VC |
| Material | **St/tZn** | **St/tZn** |
| PU | 1 pc(s) | 1 pc(s) |

### Design for Hilti



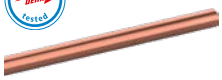
| Type HA VH ... | HI TE 3000 AVR |
|---|---|
| **Part No.** | **600 060** |
| Types | TE 3000 AVR (up to 2021 model) |
| Material | **St/tZn** |
| PU | 1 pc(s) |

## Earth Rods and Accessories

Range of Earth Rods for the installation in Lightning Protection Systems and Earthing applications in various conditions, including Couplers and other necessary accessories for installation.

### Solid Copper Earth Rods

Manufactured from high conductivity copper offering a high corrosion resistance, for applications where the soil conditions are aggressive. Internally threaded at both ends to be joined using our threaded coupling dowels.



| General technical data: | |
|---|---|
| Material | Copper |
| Internal thread size | M10 |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 |

| Type | ER 15 1200 IM10 CU | ER 15 1500 IM10 CU |
|---|---|---|
| Part No. | 138 031 | 138 035 |
| Rod Length (L) | 1200 mm | 1500 mm |
| Rod Diameter (D) | 15 mm | 15 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 15 3000 IM10 CU | ER 16 1200 IM10 CU |
|---|---|---|
| Part No. | 138 038 | 138 033 |
| Rod Length (L) | 3000 mm | 1200 mm |
| Rod Diameter (D) | 15 mm | 16 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 16 1500 IM10 CU | ER 16 3000 IM10 CU |
|---|---|---|
| Part No. | 138 050 | 138 051 |
| Rod Length (L) | 1500 mm | 3000 mm |
| Rod Diameter (D) | 16 mm | 16 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 20 1200 IM10 CU | ER 20 1500 IM10 CU |
|---|---|---|
| Part No. | 138 060 | 138 062 |
| Rod Length (L) | 1200 mm | 1500 mm |
| Rod Diameter (D) | 20 mm | 20 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 20 3000 IM10 CU |
|---|---|
| Part No. | 138 063 |
| Rod Length (L) | 3000 mm |
| Rod Diameter (D) | 20 mm |
| PU | 5 pc(s) |

### Stainless Steel Earth Rods

Manufactured from high grade stainless steel offering a very high corrosion resistance, for applications where the soil conditions are extremely aggressive. Internally threaded at both ends to be joined using our threaded coupling dowels.



| General technical data: | |
|---|---|
| Material | Stainless Steel |
| Material Grade | 316L |
| Internal thread size | M10 |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 |

| Type | ER 16 1200 IM10 STST | ER 16 1500 IM10 STST |
|---|---|---|
| Part No. | 138 032 | 138 055 |
| Rod Length (L) | 1200 mm | 1500 mm |
| Rod Diameter (D) | 16 mm | 16 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | ER 16 3000 IM10 STST | ER 20 1200 IM10 STST |
|---|---|---|
| Part No. | 138 056 | 138 034 |
| Rod Length (L) | 3000 mm | 1200 mm |
| Rod Diameter (D) | 16 mm | 20 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 20 1500 IM10 STST | ER 20 3000 IM10 STST |
|---|---|---|
| Part No. | 138 057 | 138 058 |
| Rod Length (L) | 1500 mm | 3000 mm |
| Rod Diameter (D) | 20 mm | 20 mm |
| PU | 5 pc(s) | 5 pc(s) |

### Nickel Plated Solid Copper Earth Rods

Manufactured from high conductivity copper with nickel electroplating offering a high corrosion resistance and a long service life. Internally threaded at both ends to be joined using our threaded coupling dowels.



| General technical data: | |
|---|---|
| Material | Nickel Plated Copper |
| Rod Length (L) | 1200 mm |
| Internal thread size | M10 |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 |

| Type | ER 15 1200 IM10 NI pl CU | ER 16 1200 IM10 NI pl CU |
|---|---|---|
| Part No. | 138 064 | 138 065 |
| Rod Diameter (D) | 15 mm | 16 mm |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 20 1200 IM10 NI pl CU |
|---|---|
| Part No. | 138 061 |
| Rod Diameter (D) | 20 mm |
| PU | 5 pc(s) |

### Coupling Dowels

Fittings for the installation of Solid Copper and Stainless Steel Earth Rods.



| Type | ERC IM10 STST | ERC IM10 PBRO |
|---|---|---|
| Part No. | 138 040 | 138 041 |
| Material | StSt (V4A) | Phosphor Bronze |
| Thread Size | M10 | M10 |
| For use with | Stainless Steel Earth Rods | Solid Copper Earth Rods |
| Length | 40 mm | 40 mm |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 100 pc(s) | 100 pc(s) |

## Driving Heads and Spikes

Enables an easier driving of the Earth Rods into the ground.



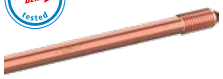
| General technical data: | |
|---|---|
| Material | StSt (V4A) |
| Thread Size | M10 |
| For use with | Solid Copper and Stain-less Steel Earth Rods |

| Type | ER DH 16 M10 ST | ER DH 20 M10 ST |
|---|---|---|
| Part No. | 138 068 | 138 069 |
| Diameter | 16 mm | 20 mm |
| PU | 50 pc(s) | 50 pc(s) |

| Type | ER SPIKE 16 M10 ST | ER SPIKE 20 M10 ST |
|---|---|---|
| Part No. | 138 072 | 138 073 |
| Diameter | 16 mm | 20 mm |
| PU | 50 pc(s) | 50 pc(s) |

## Copper-Bonded Earth Rods

Manufactured from a low carbon, high tensile strength steel core and electroplated with pure copper (99,9%). Threaded at both ends to be joined using our couplers.



| General technical data: | |
|---|---|
| Material | Copper/Steel |
| Thread Size | UNC-2A |
| Cu layer | 250 microns / 0.25 mm |

| Type | ER 14.2 1200 5/8" ST CU | ER 14.2 1500 5/8" ST CU |
|---|---|---|
| Part No. | 614 120 | 614 150 |
| Nominal diameter (T) | 5/8" : 15.87 mm | 5/8" : 15.87 mm |
| Rod Diameter (D) | 14.2 mm | 14.2 mm |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 14.2 1800 5/8" ST CU | ER 14.2 2400 5/8" ST CU |
|---|---|---|
| Part No. | 614 180 | 614 240 |
| Nominal diameter (T) | 5/8" : 15.87 mm | 5/8" : 15.87 mm |
| Rod Diameter (D) | 14.2 mm | 14.2 mm |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 & UL 467 |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 14.2 3000 5/8" ST CU | ER 17.2 1200 3/4" ST CU |
|---|---|---|
| Part No. | 614 300 | 617 120 |
| Nominal diameter (T) | 5/8" : 15.87 mm | 3/4" : 19.05 mm |
| Rod Diameter (D) | 14.2 mm | 17.2 mm |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 & UL 467 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 17.2 1800 3/4" ST CU | ER 17.2 1500 3/4" ST CU |
|---|---|---|
| Part No. | 617 180 | 617 150 |
| Nominal diameter (T) | 3/4" : 19.05 mm | 3/4" : 19.05 mm |
| Rod Diameter (D) | 17.2 mm | 17.2 mm |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 5 pc(s) | 5 pc(s) |

| Type | ER 17.2 2400 3/4" ST CU | ER 17.2 3000 3/4" ST CU |
|---|---|---|
| Part No. | 617 240 | 617 300 |
| Nominal diameter (T) | 3/4" : 19.05 mm | 3/4" : 19.05 mm |
| Rod Diameter (D) | 17.2 mm | 17.2 mm |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 & UL 467 | IEC / EN IEC / BS EN IEC 62561-2 & UL 467 |
| PU | 5 pc(s) | 5 pc(s) |

## Couplers for Copper-Bonded Earth Rods

Fittings for the installation of Copper-Bonded Earth Rods.



| Type | ERC 5/8" HCA | ERC 3/4" HCA |
|---|---|---|
| Part No. | 138 036 | 138 037 |
| Material | Silicon Bronze | Silicon Bronze |
| Thread Size | UNC-2B | UNC-2B |
| For use with | 5/8" Copper Bonded Earth Rod | 3/4" Copper Bonded Earth Rod |
| Length | 70 mm | 70 mm |
| Standards | IEC / EN IEC / BS EN IEC 62561-2 | IEC / EN IEC / BS EN IEC 62561-2 |
| PU | 15 pc(s) | 15 pc(s) |

## Driving Head and Spikes for Copper-Bonded Earth Rods

Enables an easier driving of the Earth Rods into the ground.



| General technical data: | |
|---|---|
| Material | Steel |
| For use with | Copper-Bonded Earth Rods |

| Type | ER DHE 3/4" ST | ER DHE 5/8" ST |
|---|---|---|
| Part No. | 610 234 | 610 258 |
| Thread Size | 3/4" UNC | 5/8" UNC |
| PU | 50 pc(s) | 50 pc(s) |

| Type | ER DSP 3/4" ST | ER DSP 5/8" ST |
|---|---|---|
| Part No. | 610 233 | 610 257 |
| Thread Size | 3/4" UNC | 5/8" UNC |
| PU | 50 pc(s) | 50 pc(s) |

## Earth Rod to Conductor Clamps

Earth Rod Clamps are used for interconnecting various sizes of earth rods with stranded cables and flat condutors.
The clamps have a high resistance to corrosion and show high mechanical strength to ensure a lasting connection.

### Earth Rods to Stranded Conductors



| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Earth Rod Material | Copper, Copper Bonded Steel, Stainless Steel |
| Material of Clamp Fixings | Stainless Steel |
| Tightening Torque | 12 Nm |
| Standards | IEC / EN / BS EN 62561-1 |

| Type | ERCC ERSC 14.2.16/16.95 HCA | ERCC ERSC 14.2.16/95.150 HCA |
|---|---|---|
| Part No. | 138 136 | 138 134 |
| Clamping range Rod / Stranded cable | Ø14.2 - 16 mm / 16 - 95 mm² | Ø14.2 - 16 mm / 95 - 150 mm² |
| Clamp Fixings | Hex Head Bolt M10 | Hex Head Bolt M10 x 2 Nos |
| Dimensions (l x w x h) | 25.5 x 24 x 44 mm | 26 x 46 x 51 mm |
| Classification | Class N | Class H |
| Lightning current carrying capability (10/350 µs) | limp 50 kA | limp 100 kA |
| PU | 20 pc(s) | 10 pc(s) |

| Type | ERCC ERSC 17.2.20/16.95 HCA | ERCC ERSC 17.2.20/95.150 HCA |
|---|---|---|
| Part No. | 138 137 | 138 135 |
| Clamping range Rod / Stranded cable | Ø17.2 - 20 mm / 16 - 95 mm² | Ø17.2 - 20 mm / 95 - 150 mm² |
| Clamp Fixings | Hex Head Bolt M10 | Hex Head Bolt M10 |
| Dimensions (l x w x h) | 28.5 x 24 x 50 mm | 29 x 46 x 54 mm |
| Classification | Class N | Class H |
| Lightning current carrying capability (10/350 µs) | limp 50 kA | limp 100 kA |
| PU | 20 pc(s) | 9 pc(s) |

Note: M10 x 25mm Phosphor Bronze (Bolt) can be supplied upon request.

### U-Bolt Clamp Earth Rods to Multi-Stranded Conductors



| Type UBC ERSC ... | 14.2.20/35.150 HCA |
|---|---|
| Part No. | 138 283 |
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Earth Rod Material | Copper, Copper Bonded Steel, Stainless Steel |
| Clamping range Rod / Stranded cable | Ø14.2 - 20 mm / 3 x (35 - 150 mm²) |
| Material of U-Bolt | Stainless Steel |
| Clamp Fixings | Nut & Washer M10 |
| Material of Clamp Fixings | Stainless Steel |
| Tightening Torque | 15 Nm |
| Dimensions (l x w x h) | 88 x 35 x 72 mm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |
| PU | 10 pc(s) |

### U-Bolt Clamps for Earth Rods to Stranded Conductors



| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Earth Rod Material | Copper, Copper Bonded Steel, Stainless Steel |
| Clamp Fixings | Nut & Washer M10 |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type | UBC ERRBSC 12.20/16.70 HCA CU | UBC ERRBSC 12.20/70.150 HCA CU |
|---|---|---|
| Part No. | 138 164 | 138 165 |
| Clamping range Rod / Stranded cable | Ø14.2 - 20 mm / 16 - 70 mm² | Ø14.2 - 20 mm / 70 - 150 mm² |
| Clamping range Rebar / Stranded cable | Ø12 - 20 mm / 16 - 70 mm² | Ø12 - 20 mm / 70 - 150 mm² |
| Material of U-Bolt | Copper | Copper |
| Material of Clamp Fixings | Copper | Copper |
| Tightening Torque | 15 Nm | 20 Nm |
| Dimensions (l x w x h) | 82.5 x 52 x 38 mm | 82.5 x 52 x 42 mm |
| PU | 8 pc(s) | 8 pc(s) |

| Type | UBC ERRBSC 12.20/150.300 HCA CU | UBC ERRBSC 12.20/16.70 HCA |
|---|---|---|
| Part No. | 138 166 | 138 170 |
| Clamping range Rod / Stranded cable | Ø14.2 - 20 mm / 150 - 300 mm² | Ø14.2 - 20 mm / 16 - 70 mm² |
| Clamping range Rebar / Stranded cable | Ø12 - 20 mm / 150 - 300 mm² | Ø12 - 20 mm / 16 - 70 mm² |
| Material of U-Bolt | Copper | Stainless Steel |
| Material of Clamp Fixings | Copper | Stainless Steel |
| Tightening Torque | 20 Nm | 20 Nm |
| Dimensions (l x w x h) | 75 x 60 x 42 mm | 82.5 x 52 x 38 mm |
| PU | 6 pc(s) | 8 pc(s) |

| Type | UBC ERRBSC 12.20/70.150 HCA | UBC ERRBSC 12.20/150.300 HCA |
|---|---|---|
| Part No. | 138 171 | 138 172 |
| Clamping range Rod / Stranded cable | Ø14.2 - 20 mm / 70 - 150 mm² | Ø14.2 - 20 mm / 150 - 300 mm² |
| Clamping range Rebar / Stranded cable | Ø12 - 20 mm / 70 - 150 mm² | Ø12 - 20 mm / 150 - 300 mm² |
| Material of U-Bolt | Stainless Steel | Stainless Steel |
| Material of Clamp Fixings | Stainless Steel | Stainless Steel |
| Tightening Torque | 20 Nm | 20 Nm |
| Dimensions (l x w x h) | 82.5 x 52 x 42 mm | 75 x 60 x 42 mm |
| PU | 8 pc(s) | 6 pc(s) |

| Type | UBC ERRBSC 12.25/70.300 HCA CU |
|---|---|
| Part No. | 138 177 |
| Clamping range Rod / Stranded cable | Ø14.2 - 25 mm / 70 - 300 mm² |
| Clamping range Rebar / Stranded cable | Ø12 - 25 mm / 70 - 300 mm² |
| Material of U-Bolt | Copper |
| Material of Clamp Fixings | Copper |
| Tightening Torque | 20 Nm |
| Dimensions (l x w x h) | – |
| PU | 4 pc(s) |

## Earth Rods to Flat Conductors



| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Earth Rod Material | Copper, Copper Bonded Steel, Stainless Steel |
| Clamp Fixings | Hex Head Bolt M10 |
| Material of Clamp Fixings | Stainless Steel |
| Tightening Torque | 15 Nm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type | ERCC ERFL 14.2.20/25X3 HCA | ERCC ERFL 14.2.20/25X9 HCA |
|---|---|---|
| Part No. | 138 150 | 138 151 |
| Clamping range Rod / Fl | Ø14.2 - 20 mm / 25 x 3 mm | Ø14.2 - 20 mm / 25 x 3 mm (3 nos) |
| Dimensions (l x w x h) | 46 x 36.5 x 17.5 mm | 48 x 33 x 18.5 mm |
| PU | 20 pc(s) | 20 pc(s) |

| Type | ERCC ERFL 14.2.20/25.50X3.6 HCA |
|---|---|
| Part No. | 138 152 |
| Clamping range Rod / Fl | Ø14.2 - 20 mm / W (25-50) x T (3-6) mm |
| Dimensions (l x w x h) | 61 x 55 x 20 mm |
| PU | 8 pc(s) |

## Multipurpose Earth Rod Clamp



| Type | MUBC FLERSC 25X3.6/ 14.2.20/50.150 HCA |
|---|---|
| Part No. | 138 284 |
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Earth Rod Material | Copper, Copper Bonded Steel, Stainless Steel |
| Clamping range Rod / Fl / Fl | Ø14.2 - 20 mm / 25 x 3-6 mm / 25 x 3-6 mm |
| Clamping range Rod / Fl / Stranded cable | Ø14.2 - 20 mm / 25 x 3-6 mm / 50 - 150 mm² |
| Clamping range Rod / Stranded cable / Stranded cable | Ø14.2 - 20 mm / 50 - 150 mm² / 50 - 150 mm² |
| Material of U-Bolt | Stainless Steel |
| Clamp Fixings | Nut & Washer M10 |
| Material of Clamp Fixings | Stainless Steel |
| Tightening Torque | 20 Nm |
| Dimensions (l x w x h) | 56 x 56 x 89 mm |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |
| PU | 4 pc(s) |

## U-Bolt Clamps for Earth Rods to Flat Conductors



| General technical data: | |
|---|---|
| Material | High Copper Alloy |
| Conductor Material | Copper |
| Earth Rod Material | Copper, Copper Bonded Steel, Stainless Steel |
| Clamp Fixings | Nut & Washer M10 |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type | UBC FLER 25X3/16.25 HCA CU | UBC FLERRB 25X3/12.25 HCA |
|---|---|---|
| Part No. | 138 148 | 138 261 |
| Clamping range Fl / Rod | 25 x 3 / Ø16 - 25 mm | 25 x 3 / Ø14.2 - 25 mm |
| Clamping range Fl / Rebar | 25 x 3 / Ø16 - 25 mm | 25 x 3 / Ø12 - 25 mm |
| Material of U-Bolt | Copper | Stainless Steel |
| Material of Clamp Fixings | Copper | Stainless Steel |
| Tightening Torque | 20 Nm | 20 Nm |
| Dimensions (l x w x h) | 60 x 22.5 x 70 mm | 62 x 25 x 70 mm |
| PU | 8pc(s) | 8 pc(s) |

| Type | UBC FLERRB 25X3/12.25 HCA CU |
|---|---|
| Part No. | 138 265 |
| Clamping range Fl / Rod | 25 x 3 / Ø14.2 - 25 mm |
| Clamping range Fl / Rebar | 25 x 3 / Ø12 - 25 mm |
| Material of U-Bolt | Copper |
| Material of Clamp Fixings | Copper |
| Tightening Torque | 15 Nm |
| Dimensions (l x w x h) | 62 x 25 x 70 mm |
| PU | 8 pc(s) |

Note: For Single Plate U-Bolt application - Stranded cables crimped using appropriate cable lugs may be connected by removing the bottom plate and fixed directly to the top plate using the clamp fixings.





## Equipotential Bonding Busbars K12 with Snap-on Terminals

Equipotential bonding busbars for protective and functional equipotential bonding according to IEC 60364-4-41/60364-5-54 and lightning equipotential bonding according to IEC/EN 62305-3.

- Tested according to DIN VDE 0618-1
- VDE sign
- CE sign
- Fixing frames and plastic cover, grey or black (halogen-free)
- Sealable / labelable cover
- Snap-on terminals, St/gal Zn
- With 12 contact studs

Assignment:
For Rd one contact stud each
For Fl two contact studs each.

### Standard design

Terminals for:
10 conductors 2.5-95 mm² (solid / stranded)
**or** Rd Ø10 mm
1 conductor Fl up to 30 x 4 mm.



| Type PAS ... | 11AK |
|---|---|
| **Part No.** | **563 200** |
| Material of contact rail | **Cu/gal Sn** |
| Cross section | 30 mm² |
| Fixing | [2x] 6 x 8 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### UV-stabilised design

Terminals for:
10 conductors 2.5-95 mm² (solid / stranded)
**or** Rd Ø10 mm
1 conductor Fl up to 30 x 4 mm.



| Type PAS ... | 11AK UV |
|---|---|
| **Part No.** | **563 201** |
| Material of contact rail | **Cu/gal Sn** |
| Cross section | 30 mm² |
| Fixing | [2x] 6 x 8 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Equipotential Bonding Busbar MS

For equipotential bonding.

Terminals for:
7 conductors 2.5-25 mm² (solid / stranded).
1 conductor Rd Ø7-10 mm.
1 conductor Fl up to 30 x 3.5 mm or Rd Ø8-10 mm.



| Type | PAS 9AK |
|---|---|
| **Part No.** | **563 050** |
| Contact rail | **brass** |
| Cross section | 35 mm² |
| Fixing | [4x] 6 x 9 mm |
| PU | 1 pc(s) |

## Equipotential Bonding Busbars R15 with Terminal Block System / Kit

Equipotential bonding busbars for protective and functional equipotential bonding according to IEC 60364-4-41/60364-5-54 and lightning equipotential bonding according to IEC/EN 62305-3

- Tested according to DIN VDE 0609
- 15 modules
- Grey plastic bar frames and cover (halogen-free)
- Sealable / labelable cover
- Terminal block, St/gal Zn

### Type A

Terminals for:
7 conductors 2.5-25 mm² (solid / stranded).
2 conductors 16-95 mm² (solid / stranded)
**or** Rd Ø8-10 mm.
1 conductor Fl up to 30 x 4 mm.



| Type PAS AH RK ... | 7X25 2X8.10 1XFL30 |
|---|---|
| **Part No.** | **563 010** |
| Clamping bar | **brass/gal Sn** |
| Cross section | 100 mm² |
| Fixing | [4x] 6 x 12 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Type B

Terminals for:
5 conductors 2.5-25 mm² (solid / stranded).
3 conductors 16-95 mm² (solid / stranded)
**or** Rd Ø8-10 mm.
1 conductor Fl up to 30 x 4 mm.



| Type PAS AH RK ... | 5X25 3X8.10 1XFL30 |
|---|---|
| **Part No.** | **563 020** |
| Clamping bar | **brass/gal Sn** |
| Cross section | 100 mm² |
| Fixing | [4x] 6 x 12 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Type C

Terminals for:
13 conductors 2.5-25 mm² (solid / stranded).
1 conductor 16-95 mm² (solid / stranded)
**or** Rd Ø8-10 mm.



| Type PAS AH RK ... | 13X25 1X8.10 |
|---|---|
| **Part No.** | **563 030** |
| Clamping bar | **brass/gal Sn** |
| Cross section | 100 mm² |
| Fixing | [4x] 6 x 12 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Type D

Terminals for:
7 conductors 2.5-25 mm² (solid / stranded).
2 conductors 16-95 mm² (solid / stranded)
**or** Rd Ø8-10 mm.
1 conductor Fl up to 40 x 5 mm.



| Type PAS AH RK ... | 7X25 2X8.10 1XFL40 |
|---|---|
| **Part No.** | **563 040** |
| Clamping bar | **brass/gal Sn** |
| Cross section | 100 mm² |
| Fixing | [4x] 6 x 12 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Accessories for Equipotential Bonding Busbars R15 with Terminal Block System / Kit

### Terminal block

Connection of:
1 conductor 2.5-25 mm² (solid / stranded).



| Type | RK 16 PAS |
|---|---|
| **Part No.** | **563 011** |
| Material | **St/gal Zn** |
| Modules | 1 |
| Standard | EN 62561-1 |
| PU | 200 pc(s) |

### Terminal block

Connection of:
1 conductor 16-95 mm² (solid / stranded)
**or** Rd Ø8-10 mm.



| Type | RK 95 PAS |
|---|---|
| **Part No.** | **563 013** |
| Material | **St/gal Zn** |
| Modules | 2 |
| Standard | EN 62561-1 |
| PU | 100 pc(s) |

### Terminal block

Connection of:
1 conductor Fl up to 30 x 4 mm.



| Type | RK FL30 PAS |
|---|---|
| **Part No.** | **563 012** |
| Material | **St/gal Zn** |
| Modules | 4 |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Terminal block

Connection of:
1 conductor Fl up to 40 x 5 mm.



| Type | RK FL40 PAS |
|---|---|
| **Part No.** | **563 019** |
| Material | **St/gal Zn** |
| Modules | 5 |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Clamping bar



| General technical data: | | |
|---|---|---|
| Material | | **brass/gal Sn** |
| Cross section | | 100 mm² |

| Type | KS 198 PAS | KS 398 PAS |
|---|---|---|
| **Part No.** | **563 016** | **563 017** |
| Length (l1) | 198 mm | 398 mm |
| Modules | 15 | 30 |
| Number of bar frames | 2 | 4 |
| Number of covers | 1 | 2 |
| PU | 10 pc(s) | 10 pc(s) |

| Type | KS 798 PAS |
|---|---|
| **Part No.** | **563 018** |
| Length (l1) | 798 mm |
| Modules | 60 |
| Number of bar frames | 8 |
| Number of covers | 4 |
| PU | 1 pc(s) |

### Bar frame



| Type | SB PAS RK |
|---|---|
| **Part No.** | **563 014** |
| Material | **plastic** |
| Colour | grey |
| Fixing | [2x] 6 x 12 mm |
| Modules | 2 |
| PU | 50 pc(s) |

### Cover

Snap-on / can be labelled



| Type | AH PAS RK |
|---|---|
| **Part No.** | **563 015** |
| Material | **plastic** |
| Colour | grey |
| Modules | 15 |
| PU | 10 pc(s) |

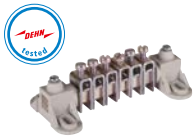
## Equipotential Bonding Busbar with Miniature Terminal Block System

Equipotential bonding busbars for protective and functional equipotential bonding according to IEC 60364-4-41/60364-5-54 in small installations.

- Tested according to DIN EN 60999-2
- Terminal block, St/gal Zn

Without cover.

Terminals for:
6 conductors 2.5-25 mm² (solid / stranded).



| Type | PAS 6RK OH |
|---|---|
| **Part No.** | **563 105** |
| Clamping bar | **brass/gal Sn** |
| Cross section | 100 mm² |
| Bar frames | **plastic** |
| Fixing | [4x] 6 x 12 mm |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

## Equipotential Bonding Busbars Industry

Equipotential bonding busbars for the protective and functional equipotential bonding according to IEC 60364-4-41/60364-5-54 (DIN VDE 0100-410/540) and lightning equipotential bonding according to IEC/EN 62305-3.
Also for use in potentially explosive atmospheres (secured against self-loosening of screws).

- With spring washer
- Insulator UP (duroplastic, red) with M10 thread
- UV-stabilised and halogen-free

### 6 terminals



| Type PAS I ... | 6AP M10 CU | 6AP M10 V2A |
|---|---|---|
| **Part No.** | **472 207** | **472 209** |
| Number of terminals | 6 | 6 |
| Material | Cu | StSt |
| Dimensions (l x w x d1) | 295 x 40 x 5 mm | 295 x 40 x 6 mm |
| Cross-section | 200 mm² | 240 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 39 kA | 8.9 kA |
| Screw | M10 x 25 mm | M10 x 25 mm |
| Material of screw / nut | StSt | StSt |
| Design | with spring washer | with spring washer |
| Material of insulator | **UP** | **UP** |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

### 8 terminals



| Type PAS I ... | 8AP M10 CU | 8AP M10 V2A |
|---|---|---|
| **Part No.** | **472 227** | **472 229** |
| Number of terminals | 8 | 8 |
| Material | Cu | StSt |
| Dimensions (l x w x d1) | 365 x 40 x 5 mm | 365 x 40 x 6 mm |
| Cross-section | 200 mm² | 240 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 39 kA | 8.9 kA |
| Screw | M10 x 25 mm | M10 x 25 mm |
| Material of screw / nut | StSt | StSt |
| Design | with spring washer | with spring washer |
| Material of insulator | **UP** | **UP** |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

### 10 terminals



| Type PAS I ... | 10AP M10 CU | 10AP M10 V2A |
|---|---|---|
| **Part No.** | **472 217** | **472 219** |
| Number of terminals | 10 | 10 |
| Material | Cu | StSt |
| Dimensions (l x w x d1) | 435 x 40 x 5 mm | 435 x 40 x 6 mm |
| Cross-section | 200 mm² | 240 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 39 kA | 8.9 kA |
| Screw | M10 x 25 mm | M10 x 25 mm |
| Material of screw / nut | StSt | StSt |
| Design | with spring washer | with spring washer |
| Material of insulator | **UP** | **UP** |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

### 12 terminals



| Type PAS I ... | 12AP M10 CU | 12AP M10 V2A |
|---|---|---|
| **Part No.** | **472 237** | **472 239** |
| Number of terminals | 12 | 12 |
| Material | Cu | StSt |
| Dimensions (l x w x d1) | 505 x 40 x 5 mm | 505 x 40 x 6 mm |
| Cross-section | 200 mm² | 240 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 39 kA | 8.9 kA |
| Screw | M10 x 25 mm | M10 x 25 mm |
| Material of screw / nut | StSt | StSt |
| Design | with spring washer | with spring washer |
| Material of insulator | **UP** | **UP** |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

Special designs available on request.

## Accessories f. Equipotential Bonding Busbars Industry

### Cover for EBB industry

Covers for EBB with insulators.



| General technical data: | |
|---|---|
| Material | StSt |

| Type | AD PAS 6AP V2A | AD PAS 8AP V2A |
|---|---|---|
| Part No. | 472 279 | 472 269 |
| Type of EBB | 6 terminals | 8 terminals |
| Dimensions (l x w x d) | 301 x 60 x 0.8 mm | 371 x 60 x 0.8 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type | AD PAS 10AP V2A | AD PAS 12AP V2A |
|---|---|---|
| Part No. | 472 289 | 472 299 |
| Type of EBB | 10 terminals | 12 terminals |
| Dimensions (l x w x d) | 441 x 60 x 0.8 mm | 511 x 60 x 0.8 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Insulator for EBB industry



| Type | IS PAS M10 |
|---|---|
| Part No. | 472 210 |
| Material | UP (thermoset) |
| Connection thread | M10 (length 12 mm) |
| Colour | rot ● |
| Dimensions (d x h) | 32 x 40 mm |
| PU | 1 pc(s) |

### Fixing kit for EBBs, HDG steel

For mounting the insulators, e.g. on walls.



| Type | BFS M10X20 PAS STTZN |
|---|---|
| Part No. | 472 201 |
| Material of screw | St/tZn |
| Screw | M10 ✪ TX25 |
| Version | Hexalobular T25 |
| Plastic dowel | Ø12 x 60 mm |
| Total length | 80 mm |
| PU | 1 pc(s) |

### Fixing kit for EBBs (stainless steel)

For mounting the insulators onto walls, for example.



| Type | BFS M10X20 PAS V2A |
|---|---|
| Part No. | 472 202 |
| Screw material | StSt |
| Screw | 45 mm ⇑ M10 x 20 mm |
| Plastic dowel | Ø12 x 60 mm |
| Total length | 80 mm |
| PU | 1 pc(s) |

## Single-Row Earthing Busbars

Earthing busbars for screwing on steel contructions, hole spacing 35 mm.

Connection possibilities:

- Flat strip with hole: with M10 flat head screws (with anti-rotation protection), nuts and spring washer
- Round conductor: with KS connector, e.g. Part No. 301 000 / 301 019 or with clamping frame, e.g. Part No. 390 150

### 1x 4 terminals



| Type ES ... | 4AP 11X11 V2A |
|---|---|
| Part No. | 472 309 |
| Material | StSt |
| Cross-section | 105 mm² |
| Connection holes | 11 x 11 mm |
| Dimensions (l x w x d1) | 232 x 30 x 3.5 mm |
| Fixing | [2x] 12 x 15 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### 1x 6 terminals



| Type ES ... | 6AP 11X11 V2A |
|---|---|
| Part No. | 472 319 |
| Material | StSt |
| Cross-section | 105 mm² |
| Connection holes | 11 x 11 mm |
| Dimensions (l x w x d1) | 292 x 30 x 3.5 mm |
| Fixing | [2x] 12 x 15 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### 1x 8 terminals



| Type ES ... | 8AP 11X11 V2A |
|---|---|
| Part No. | 472 329 |
| Material | StSt |
| Cross-section | 105 mm² |
| Connection holes | 11 x 11 mm |
| Dimensions (l x w x d1) | 352 x 30 x 3.5 mm |
| Fixing | [2x] 12 x 15 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### 1x 10 terminals



| Type ES ... | 10AP 11X11 V2A |
|---|---|
| Part No. | 472 339 |
| Material | StSt |
| Cross-section | 105 mm² |
| Connection holes | 11 x 11 mm |
| Dimensions (l x w x d1) | 412 x 30 x 3.5 mm |
| Fixing | [2x] 12 x 15 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### 1x 12 terminals



| Type ES ... | 12AP 11X11 V2A |
|---|---|
| Part No. | 472 349 |
| Material | StSt |
| Cross-section | 105 mm² |
| Connection holes | 11 x 11 mm |
| Dimensions (l x w x d1) | 472 x 30 x 3.5 mm |
| Fixing | [2x] 12 x 15 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

Special designs are available on request.

## Two-Row Earthing Busbars

Earthing busbars for screwing on steel constructions, hole spacing 50 mm.

Connection possibilities:

- Flat strip with hole: with hexagon screws M10, nuts and spring washer
- Flat strip (-40 mm) without hole: with clamping plate of disconnecting clamps, e.g. Part No. 454 100
- Round conductor: with KS connector, e.g. Part No. 301 000 / 301 019 or with clamping piece, e.g. Part No. 390 150

### 2x 2 terminals



| Type ES ... | 2X2 ASB11 STTZN | 2X2 ASB11 V2A |
|---|---|---|
| **Part No.** | **472 023** | **472 109** |
| Material | **St/tZn** | StSt |
| Cross-section | 240 mm² | 300 mm² |
| Connection bores Ø | 11 mm | 11 mm |
| Dimension s (l x w x d1) | 196 x 60 x 4 mm | 196 x 60 x 5 mm |
| Fixing | [2x] 12 x 15 mm | [2x] 12 x 15 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

### 2x 3 terminals



| Type ES ... | 2X3 ASB11 STTZN | 2X3 ASB11 V2A |
|---|---|---|
| **Part No.** | **472 022** | **472 119** |
| Material | **St/tZn** | StSt |
| Cross-section | 240 mm² | 300 mm² |
| Connection bores Ø | 11 mm | 11 mm |
| Dimension s (l x w x d1) | 242 x 60 x 4 mm | 242 x 60 x 5 mm |
| Fixing | [2x] 12 x 15 mm | [2x] 12 x 15 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

### 2x 4 terminals



| Type ES ... | 2X4 ASB11 STTZN | 2X4 ASB11 V2A |
|---|---|---|
| **Part No.** | **472 024** | **472 129** |
| Material | **St/tZn** | StSt |
| Cross-section | 240 mm² | 300 mm² |
| Connection bores Ø | 11 mm | 11 mm |
| Dimension s (l x w x d1) | 293 x 60 x 4 mm | 293 x 60 x 5 mm |
| Fixing | [2x] 12 x 15 mm | [2x] 12 x 15 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

### 2x 6 terminals



| Type ES ... | 2X6 ASB11 STTZN | 2X6 ASB11 V2A |
|---|---|---|
| **Part No.** | **472 021** | **472 139** |
| Material | **St/tZn** | StSt |
| Cross-section | 240 mm² | 300 mm² |
| Connection bores Ø | 11 mm | 11 mm |
| Dimension s (l x w x d1) | 393 x 60 x 4 mm | 393 x 60 x 5 mm |
| Fixing | [2x] 12 x 15 mm | [2x] 12 x 15 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

Special designs available on request.

## Earthing Pipe Clamps

Earthing pipe clamps for integrating pipes into the protective and functional equipotential bonding according to IEC 60364-4-41/5-54, with continuously adjustable tensioning strap.

### Type standard

For connecting 1 or 2 conductors or through-wiring, connection cross-section 4-25 mm² (solid / stranded).



| General technical data: | |
|---|---|
| Material | StSt |
| Connection (solid / stranded) | 4-25 mm² |
| Standard | EN 62561-1 |

| Type | BRS 27.60 AQ4 25 V2A | BRS 27.114 AQ4 25 V2A |
|---|---|---|
| **Part No.** | **540 910** | **540 911** |
| Clamping range pipe Ø | 27-60 mm (3/4-2'') | 27-114 mm (3/4-4'') |
| Dimensions of strap (l1 x w x d) | 240 x 25 x 0.3 mm | 410 x 25 x 0.3 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type | BRS 27.168 AQ4 25 V2A |
|---|---|
| **Part No.** | **540 912** |
| Clamping range pipe Ø | 27-168 mm (3/4-6'') |
| Dimensions of strap (l1 x w x d) | 570 x 25 x 0.3 mm |
| PU | 10 pc(s) |

### Type BRS17

For connecting 1 or 2 conductors or through-wiring, connection cross-section 2.5-10 mm² (solid).



| Type | BRS 10.27 AQ2.5 10 V2A |
|---|---|
| **Part No.** | **540 920** |
| Material | StSt |
| Clamping range pipe Ø | 10-27 mm (1/8-3/4'') |
| Dimensions of strap (l1 x w x d) | 135 x 14 x 0.3 mm |
| Connection (solid) | 2.5-10 mm² |
| PU | 10 pc(s) |

### Separate grip head

For combination with endless tensioning strap (Part No. 540 901), connection cross-section 4-25 mm² (solid / stranded).



| Type | SPK 25 BRS AQ4 25 V2A |
|---|---|
| **Part No.** | **540 900** |
| Material | StSt |
| Connection | 4-25 mm² |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Antenna Earthing

Pipe clamp for lightning equipotential bonding of pipes (e.g. antenna poles) according to IEC/EN 62305-3. With gradually adjustable tensioning strap, for connecting one or two conductors and suitable for through-wiring.

### Pipe clamps for antennas – complete

Connection for:
1 conductor Rd Ø10 mm or
1-2 conductors Rd Ø6-8 mm **or** 4-50 mm² (solid / stranded).



| Type | BRS 16.89 AK1X10 2X6.8 V2A | BRS 16.168 AK1X10 2X6.8 V2A |
|---|---|---|
| **Part No.** | **540 103** | **540 100** |
| Material | StSt | StSt |
| Clamping range pipe Ø | 16-89 mm (3/8-3'') | 16-168 mm (3/8-6'') |
| Dimensions of strap (l1 x w x d) | 330 x 25 x 0.3 mm | 570 x 25 x 0.3 mm |
| Connection (solid / stranded) | 4-50 mm² | 4-50 mm² |
| Screw | M8 x 20 mm | M8 x 20 mm |
| Material of screw | StSt | StSt |
| Standard | EN 62561-1 | EN 62561-1 |
| Stock No. | – | 5975-12-120-7744 |
| PU | 10 pc(s) | 10 pc(s) |

### Separate grip head

For combination with endless tensioning strap (Part No. 540 901).

Connection for:
1 conductor Rd Ø10 mm or
1-2 conductors Rd Ø6-8 mm **or** 4-50 mm² (solid / stranded).

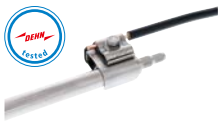


| Type | SPK 25 BRS AK1X10 2X6.8 V2A |
|---|---|
| **Part No.** | **540 110** |
| Material | StSt |
| Connection (solid / stranded) | 4-50 mm² |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

**Note:**
Endless tensioning strap (Part No. 540 901, see page 206.

### Connection clamp for earth rods

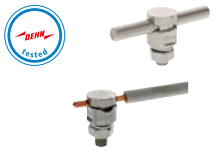
Connection clamp for equipotential bonding connection of pipes (e.g. antenna poles) to earth rods via a solid /stranded conductor.



| Type | AK 8.10 AQ4 50 TE20 25 V4A |
|---|---|
| **Part No.** | **540 121** |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| For earth rods Ø | 20-25 mm |
| Clamping range Rd | 8-10 mm |
| Connection (solid / stranded) | 4-50 mm² |
| Screw | M8 x 20 / 25 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

### UNI KS connector

Universal clamping screw connector for the lightning-current-carrying connection of round conductors and also of solid / stranded conductors, e.g. to flat profiles, downpipe clamps as well as equipotential bonding bars.



| Type | UKSV 6.10 AQ16 50 V4A |
|---|---|
| **Part No.** | **540 122** |
| Material | StSt (V4A) |
| Material No. | 1.4571 / 1.4404 / 1.4401 |
| ASTM / AISI: | 316Ti / 316L / 316 |
| Clamping range Rd | 6-10 mm |
| Connection (solid / stranded) | 16-50 mm² |
| Screw | M10 mm |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

### Gutter clamp

Gutter clamp for the lightning-current-carrying connection of the antenna earthing (e.g. 16 mm²) at the cross point with the gutter.



| Type | DRK 8.10 AQ4 50 W16.22 V2A |
|---|---|
| **Part No.** | **540 120** |
| Material | StSt |
| Clamping range bead | 16-22 mm |
| Clamping range Rd | 8-10 mm |
| Connection (solid / stranded) | 4-50 mm² |
| Screw | M8 x 20 / 25 mm |
| Material of screw | StSt |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

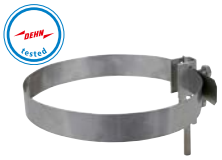
## Lightning Protection Pipe Clamp with Tines

Pipe clamp for the integration of pipes with surface protection into the lightning equipotential bonding according to IEC/EN 62305-3.
For use on surfaces (e.g. varnished or powder-coated) with a coating thickness up to 0.2 mm.

The special tines penetrate the surface protection and provide the necessary contact so that it is not necessary to remove the surface protection.

### Lightning protection pipe clamp with tines, complete

Connection for:
1 conductor Rd Ø10 mm or
1-2 conductors Rd Ø6-8 mm **or** 4-50 mm² (solid / stranded).



| Type | BRS 27.168 Z AK1X10 2X6.8 V2A |
|---|---|
| **Part No.** | **540 200** |
| Material | StSt |
| Clamping range pipe Ø | 27-168 mm (3/4-6") |
| Dimensions of strap (l1 x w x d) | 570 x 25 x 0.3 mm |
| Standard | EN 62561-1 |
| PU | 10 pc(s) |

### Grip head, separate

For combination with endless tensioning strap (Part No. 540 901).

Connection for:
1 conductor Rd Ø10 mm or
1-2 conductors Rd Ø6-8 mm **or** 4-50 mm² (solid / stranded).



| Type | SPK Z 25 BRS AK1X10 2X6.8 V2A |
|---|---|
| **Part No.** | **540 210** |
| Material | StSt |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Accessories for Grip Heads

### Endless tensioning strap

For cutting to length, e.g with snips.



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| **Part No.** | **540 901** |
| Material | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| Length | 100 m |
| PU | 1 pc(s) |

## Lightning Protection Earthing Pipe Clamps

Earthing pipe clamps for integrating pipes into the protective and functional equipotential bonding according to IEC 60364-4-41/60364-5-54 and lightning equipotential bonding according to IEC/EN 62305-3.

The clamping range (specified in mm and inch) refers to the outer diameter according to DIN EN ISO 228-1 of the pipes.

### With M10 screws

Connection for Rd 4-10 mm or conductor cross-section max. 70 mm².



| General technical data: | | |
|---|---|---|
| Material | | MCI / St/tZn |
| Standard | | EN 62561-1 |

| Type ERS ... | 21 AS4.10 TG STTZN | 27 AS4.10 TG STTZN |
|---|---|---|
| **Part No.** | **407 012** | **407 034** |
| Clamping range pipe Ø | 21 mm | 27 mm |
| Dimensions (l1 x r1) | 80 x 11 mm | 83 x 14 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type ERS ... | 34 AS4.10 TG STTZN | 42 AS4.10 TG STTZN |
|---|---|---|
| **Part No.** | **407 100** | **407 114** |
| Clamping range pipe Ø | 34 mm | 42 mm |
| Dimensions (l1 x r1) | 85 x 17.5 mm | 100 x 24.5 mm |
| PU | 10 pc(s) | 10 pc(s) |

| Type ERS ... | 48 AS4.10 TG STTZN | 60 AS4.10 TG STTZN |
|---|---|---|
| **Part No.** | **407 112** | **407 200** |
| Clamping range pipe Ø | 48 mm | 60 mm |
| Dimensions (l1 x r1) | 95 x 22 mm | 113 x 30.5 mm |
| PU | 10 pc(s) | 1 pc(s) |

### HDG steel version with hexagon screw

HDG steel, material thickness 3 mm.
Connection for flat conductor with screws and nuts, for round steel 7-10 mm, e.g. KS connector part no. 301 000 or clamping piece part no. 390 150.



| General technical data: | | |
|---|---|---|
| Material | | St/tZn |
| Standard | | EN 62561-1 |

| Type ERS ... | 17 AB11 STTZN | 21 AB11 STTZN |
|---|---|---|
| **Part No.** | **410 038** | **410 012** |
| Clamping range pipe Ø | 17 mm | 21 mm |
| Dimensions (l1 x r1) | 110 x 8.5 mm | 115 x 10.5 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type ERS ... | 27 AB11 STTZN | 34 AB11 STTZN |
|---|---|---|
| **Part No.** | **410 034** | **410 100** |
| Clamping range pipe Ø | 27 mm | 34 mm |
| Dimensions (l1 x r1) | 115 x 13.5 mm | 124 x 17 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type ERS ... | 42 AB11 STTZN | 48 AB11 STTZN |
|---|---|---|
| **Part No.** | **410 114** | **410 112** |
| Clamping range pipe Ø | 42 mm | 48 mm |
| Dimensions (l1 x r1) | 132.5 x 21 mm | 140.5 x 24 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type ERS ... | 55 AB11 STTZN | 60 AB11 STTZN |
|---|---|---|
| **Part No.** | **410 134** | **410 200** |
| Clamping range pipe Ø | 55 mm | 60 mm |
| Dimensions (l1 x r1) | 145 x 27.5 mm | 151 x 30 mm |
| PU | 1 pc(s) | 25 pc(s) |

| Type ERS ... | 76 AB11 STTZN | 89 AB11 STTZN |
|---|---|---|
| **Part No.** | **410 212** | **410 300** |
| Clamping range pipe Ø | 76 mm | 89 mm |
| Dimensions (l1 x r1) | 169 x 38 mm | 182.5 x 44.5 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Stainless steel version with hexagon screw



StSt, material thickness 2.5 mm.
Connection for flat conductor with screws and nuts, for round steel 7–10 mm, e.g. KS connector part no. 301 000 or clamping piece part no. 390 150.

| General technical data: | | |
|---|---|---|
| Material | | StSt |
| Standard | | EN 62561-1 |

| Type ERS ... | 17 AB11 V2A | 21 AB11 V2A |
|---|---|---|
| Part No. | 410 309 | 410 319 |
| Clamping range pipe Ø | 17 mm | 21 mm |
| Dimensions (l1 x r1) | 110.5 x 8.5 mm | 114.5 x 10.5 mm |
| PU | 1 pc(s) | 25 pc(s) |

| Type ERS ... | 27 AB11 V2A | 34 AB11 V2A |
|---|---|---|
| Part No. | 410 329 | 410 339 |
| Clamping range pipe Ø | 27 mm | 34 mm |
| Dimensions (l1 x r1) | 115.5 x 13.5 mm | 124 x 17 mm |
| PU | 25 pc(s) | 25 pc(s) |

| Type ERS ... | 42 AB11 V2A | 48 AB11 V2A |
|---|---|---|
| Part No. | 410 349 | 410 359 |
| Clamping range pipe Ø | 42 mm | 48 mm |
| Dimensions (l1 x r1) | 132.5 x 21 mm | 140.5 x 24 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type ERS ... | 55 AB11 V2A | 60 AB11 V2A |
|---|---|---|
| Part No. | 410 369 | 410 379 |
| Clamping range pipe Ø | 55 mm | 60 mm |
| Dimensions (l1 x r1) | 145 x 27.5 mm | 151 x 30 mm |
| PU | 25 pc(s) | 1 pc(s) |

| Type ERS ... | 76 AB11 V2A | 89 AB11 V2A |
|---|---|---|
| Part No. | 410 389 | 410 399 |
| Clamping range pipe Ø | 76 mm | 89 mm |
| Dimensions (l1 x r1) | 169 x 38 mm | 182.5 x 44.5 mm |
| PU | 1 pc(s) | 1 pc(s) |

## UNI Saddle Clamp

For integrating mounting systems, e.g. of PV installations, in the functional equipotential bonding / functional earthing (black conductor possible) and lightning equipotential bonding.

The StSt contact plate (intermediate element) allows different conductor materials (Cu, Al, St/tZn and StSt) to be connected to the normal mounting systems, e.g. to aluminium, without the risk of contact corrosion.

### With M8 screw and self-locking nut



| Type | UNI FK 8.10 KBF0.7 8 AL V2A |
|---|---|
| Part No. | 365 250 |
| Clamping range of saddle | 0.7-8 mm |
| Material of clamping bracket | Al |
| Clamping range Rd | 8-10 mm |
| Connection (solid / stranded) | 4-50 mm² |
| Material of double clamp | StSt |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## UNI Earthing Clamps

For integrating the mounting systems, e.g. of PV installations in the functional equipotential bonding / functional earthing (black conductor possible) and lightning equipotential bonding.
The StSt contact plate (intermediate element) allows different conductor materials (Cu, Al, St/tZn and StSt ) to be connected to the usual mounting systems, e.g. to aluminium, without the risk of contact corrosion.

### With M8 hammer-head bolt and self-locking nut



| Type | UEK 8.10 AQ4 50 HKSM8X25 V2A | UEK 8.10 AQ4 50 HKSM8 V2A |
|---|---|---|
| Part No. | 540 249 | 540 250 |
| Material of clamp | StSt | StSt |
| Clamping range Rd | 8-10 mm | 8-10 mm |
| Connection (solid / stranded) | 4-50 mm² | 4-50 mm² |
| Screw | Hammer-head bolt M8 x 25 mm | hammer-head bolt M8 x 30 mm |
| Material of screw / nut | StSt | StSt |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

### With M10 hammer-head bolt and self-locking nut



| Type | UEK 8.10 AQ4 50 HKSM10 V2A | UEK 8.10 AQ4 50 HKSBM10 V2A |
|---|---|---|
| Part No. | 540 260 | 540 262 |
| Material of clamp | StSt | StSt |
| Clamping range Rd | 8-10 mm | 8-10 mm |
| Connection (solid / stranded) | 4-50 mm² | 4-50 mm² |
| Screw | Hammer-head bolt (23 x 11 mm), M10 x 30 mm | Hammer-head bolt (31 x 13 mm), M10 x 30 mm |
| Material of screw / nut | StSt | StSt |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 50 pc(s) | 50 pc(s) |

### With M10 truss head screw and self-locking nut with serrated bearing



| Type | KP AQ4 50 DUL 8.10 VKL11 FRSM10 V2A |
|---|---|
| Part No. | 540 263 |
| Material of clamp | StSt |
| Clamping range Rd | 8-10 mm |
| Connection (solid / stranded) | 4-50 mm² |
| Screw | M10 x 35 mm |
| Material of screw / nut | StSt |
| PU | 10 pc(s) |

### Contact plate and double clamp (separate) with square hole for M8 screw



| Type | KP AQ4 50 DUL 8.10 VKL9 V2A |
|---|---|
| **Part No.** | **540 251** |
| Material of clamp | StSt |
| Clamping range Rd | 8-10 mm |
| Connection (solid / stranded) | 4-50 mm² |
| PU | 100 pc(s) |

### Contact plate and double clamp (separate) with square hole for M10 screw



| Type | KP AQ4 50 DUL 8.10 VKL11 V2A |
|---|---|
| **Part No.** | **540 261** |
| Material of clamp | StSt |
| Clamping range Rd | 8-10 mm |
| Connection (solid / stranded) | 4-50 mm² |
| PU | 100 pc(s) |

## Protective Spark Gap

Protective spark gap in closed design with plastic sheath for indirect connection of an overhead line roof pole to the external lightning protection system.

### DSFS

Plastic-insulated protective spark gap for indirect connection of an overhead line roof pole to the external lightning protection system.



| Type | DSFS |
|---|---|
| **Part No.** | **920 000** |
| 100% lightning impulse sparkover voltage (1.2/50 µs) ($U_{rimp}$) | ~ 25 kV |
| Nominal discharge current (8/20 µs) ($I_n$) | 25 kA |
| Power frequency sparkover voltage (50 Hz) ($U_{aw}$) | ~ 10 kV |

## Pipe Clamps for Service Entry Masts

For connecting spark gaps with service entry masts



| Type ERS ... | 76 AB11 STTZN | 89 AB11 STTZN |
|---|---|---|
| **Part No.** | **410 212** | **410 300** |
| Clamping range Ø pipe | 76 mm (2 1/2") | 89 mm (3") |
| Material | **St/tZn** | **St/tZn** |
| Hole Ø | 11 mm | 11 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

## Conductor Holders for Service Entry Masts

For fixing round conductors to service entry masts, insulated with clamp bush.



| Type LH KD 8.10 ... | D76 STTZN | D89 STTZN |
|---|---|---|
| **Part No.** | **425 076** | **425 089** |
| Clamping range Ø pipe | 76 mm | 89 mm |
| Material | **St/tZn** | **St/tZn** |
| Conductor support Rd | 8-10 mm | 8-10 mm |
| Conductor routing | fixed | fixed |
| PU | 50 pc(s) | 1 pc(s) |

## TFS / KFSU

For lightning equipotential bonding according to IEC 62305 as well as for use in IT installations according to IEC 60364-5-54.

### TFS / KFSU

Isolating spark gaps with plastic sheath and two stainless steel connections (Rd 10 mm).

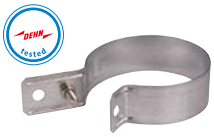


| Type | TFS | KFSU |
|---|---|---|
| **Part No.** | **923 023** | **923 021** |
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA | – |
| Class (lightning current carrying capability) | H | – |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 4 kV | ≤ 4 kV |
| Degree of protection protection | IP 65 | IP 65 |

## Downpipe Clamps

Pipe clamps for connecting downpipes to the lightning equipotential bonding according to IEC/EN 62305-3. Connection possibilities for Rd, e.g. with KS connector (Part No. 301 000) or with clamping piece (Part No. 390 150) (depending on material).

### For fixed pipe diameters



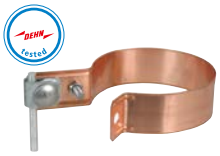
| General technical data: | | |
|---|---|---|
| Hole Ø | | 11 mm |
| Standard | | EN 62561-1 |

| Type | RRS 100 B11 STTZN | RRS 120 B11 STTZN |
|---|---|---|
| **Part No.** | **420 100** | **420 120** |
| Material | **St/tZn** | **St/tZn** |
| Clamping range pipe Ø (d1) | 100 mm | 120 mm |
| PU | 50 pc(s) | 1 pc(s) |

| Type | RRS 100 B11 CU | RRS 120 B11 CU |
|---|---|---|
| **Part No.** | **420 107** | **420 127** |
| Material | Cu | Cu |
| Clamping range pipe Ø (d1) | 100 mm | 120 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Bimetallic type

For connecting St conductors with Cu downpipes, with St/tZn clamping piece and intermediate plate (Cupal).



| Type | ZMRRS 100 KB 6.10 CU STTZN |
|---|---|
| **Part No.** | **420 207** |
| Material | **Cu / St/tZn** |
| Clamping range pipe Ø (d1) | 100 mm |
| Clamping range Rd | 6-10 mm |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Type RV, adjustable

With additional anti-rotation protection of the fixing screw and markings, predetermined bending points as well as prepunched cutting aids.



| General technical data: | |
|---|---|
| Hole Ø | 10.5 mm |
| Standard | EN 62561-1 |

| Type | RRS V 60.100 B10.5 STTZN | RRS V 60.100 B10.5 AL |
|---|---|---|
| **Part No.** | **423 010** | **423 011** |
| Material | **St/tZn** | **Al** |
| Clamping range pipe Ø (d1) | 60-100 mm | 60-100 mm |
| Length (l1) | 337 mm | 337 mm |
| PU | 50 pc(s) | 50 pc(s) |

| Type | RRS V 60.100 B10.5 CU | RRS V 60.100 B10.5 V2A |
|---|---|---|
| **Part No.** | **423 017** | **423 019** |
| Material | **Cu** | **StSt** |
| Clamping range pipe Ø (d1) | 60-100 mm | 60-100 mm |
| Length (l1) | 337 mm | 337 mm |
| PU | 1 pc(s) | 50 pc(s) |

| Type | RRS V 60.150 B10.5 STTZN | RRS V 60.150 B10.5 AL |
|---|---|---|
| **Part No.** | **423 020** | **423 021** |
| Material | **St/tZn** | **Al** |
| Clamping range pipe Ø (d1) | 60-150 mm | 60-150 mm |
| Length (l1) | 494 mm | 494 mm |
| PU | 50 pc(s) | 50 pc(s) |

| Type | RRS V 60.150 B10.5 CU | RRS V 60.150 B10.5 V2A |
|---|---|---|
| **Part No.** | **423 027** | **423 029** |
| Material | **Cu** | **StSt** |
| Clamping range pipe Ø (d1) | 60-150 mm | 60-150 mm |
| Length (l1) | 494 mm | 494 mm |
| PU | 50 pc(s) | 50 pc(s) |

## Earthing Tongs

- For connection to tank vehicles, aircraft, etc.
- For discharging static charge
- For use in hazardous areas

### Small design

Brass jaw with steel tips (Material No. 1.4104) and copper contact clip.
Connection: Flat head screw with slot or with enclosed crimped cable lug 25 mm² – M6 (Cu/gal Sn).



Part No. 546 002 may also be combined with earthing conductor. See Safety Equipment catalogue Part No. 758 216.

| Type EZ ... | 16 FL13 ASM6 STGALZN | 16 FL13 ASM6 V2A |
|---|---|---|
| **Part No.** | **546 025** | **546 002** |
| Material of tongs | **St/gal Zn** | **StSt** |
| Clamping range Rd / Fl | up to Ø16 / up to 13 mm | up to Ø16 / up to 13 mm |
| Length | 140 mm | 140 mm |
| Terminal screw | M6 x 12 mm | M6 x 16 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Large version with brass jaw without steel tips and copper contact clip.

Connection: Threaded pin with nut.



| Type EZ ... | 55 FL45 ASM10 STGALZN | 55 FL45 ASM10 V2A |
|---|---|---|
| **Part No.** | **546 000** | **546 001** |
| Material of tongs | **St/gal Zn** | **StSt** |
| Clamping range Rd / Fl | up to Ø55 / up to 45 mm | up to Ø55 / up to 45 mm |
| Length | 205 mm | 205 mm |
| Connection nut | M10 | M10 |
| PU | 1 pc(s) | 1 pc(s) |

### Large version with two brass jaws with steel tips

Connection: Threaded pin with nut.



| Type EZ ... | 55 FL45 ASM10 4KSP V2A |
|---|---|
| **Part No.** | **546 211** NEW |
| Material of tongs | **StSt** |
| Clamping range Rd / Fl | up to Ø55 / up to 45 mm |
| Length | 205 mm |
| Connection nut | M10 |
| PU | 1 pc(s) |

## Conductor Holder

Conductor holder for installing round and flat conductors for equipotential bonding,e.g. in transformer stations, processor rooms. Insulated conductor holder.



| Type | LH 6.13 FL30 B10 K GR |
|---|---|
| **Part No.** | **277 130** |
| Conductor support Rd / Fl | 6-13 / 30 x 4 mm |
| Fixing | Ø10 and 6 x 19 mm |
| Material | **plastic** |
| Colour | grey |
| PU | 50 pc(s) |

## Connection Clamp

For universal connection to the ring equipotential bonding for St/tZn, copper or stainless steel (StSt).



| Type | AK RPA V2A |
|---|---|
| **Part No.** | **563 169** |
| Conductor support Rd / Fl | Ø8-10 / 30 x 3 up to 11 mm |
| Material | StSt |
| Material (cage clamp) | **St/galZn** |
| Terminal cross section | 2.5-95 mm² |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 5.5 kA |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

## Flat Strip / Round Conductor Holders with Thrust Piece

For wall mounting.
Thrust piece with M8 screw for installing flat strips up to 11 mm and round conductors 6-10 mm.

### Distance from wall 11 mm



| General technical data: | |
|---|---|
| Fixing | Ø15 / 9 x 20 mm |
| Slot width | 12 mm |
| Material of screw | StSt |
| Standard | EN 62561-4 |

| Type FRH 11 6.10 ... | WA11 B7 STTZN | WA11 B7 CU |
|---|---|---|
| **Part No.** | **277 230** | **277 237** |
| Material of conductor holder | **St/tZn** | Cu |
| PU | 25 pc(s) | 25 pc(s) |

| Type FRH 11 6.10 ... | WA11 B7 V2A |
|---|---|
| **Part No.** | **277 239** |
| Material of conductor holder | StSt |
| PU | 25 pc(s) |

### Distance from wall 15 mm



| Type FRH 11 6.10 ... | WA15 B7 STTZN | WA15 B7 V2A |
|---|---|---|
| **Part No.** | **277 240** | **277 249** |
| Material of conductor holder | **St/tZn** | StSt |
| Fixing | 7 x 15 mm | Ø15 / 9 x 20 mm |
| Slot width | 12 mm | 12 mm |
| Material of screw | StSt | StSt |
| Pressure plate material | StSt | StSt |
| Standard | EN 62561-4 | EN 62561-4 |
| PU | 25 pc(s) | 25 pc(s) |

## Earth Bar disconnecting links

DEHN offers a range of Earth Bars Tested and Certified in accordance with the latest IEC EN 62561-1 standard and are in compliance with IEC 60364-5-54 standards and BS 7430. DEHN Earth Bars provides a common earthing point for multiple electrical installations and are a key component in both Earthing, Equipotential Bonding and Lightning Protection which helps to eliminate the risk of earth potential loops. DEHN Earth Bars are available with Single and Double Disconnecting link options which allows for quick and easy temporary disconnection from the earthing and lightning protection system to facilitate the testing of the earthing grid/rods in isolation.

### Copper and Tinned Copper

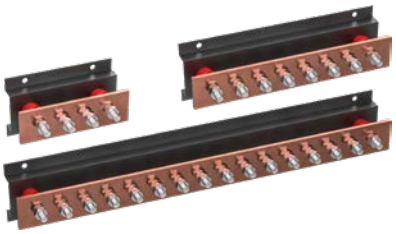


| Type EB DL M10 50X6 ... | CU | SNCU |
|---|---|---|
| **Part No.** | **118 380** | **119 998** |
| Material | Copper | Tinned Copper |
| Number of Connections | 2 | 2 |
| Dimensions W x T | 50 x 6 mm | 50 x 6 mm |
| Dimensions L x W1 x H | 116 x 95 x 90 mm | 116 x 95 x 90 mm |
| Thread size | M10 | M10 |
| Tightening Torque | 20 Nm | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No. 12 Wall Plugs (To be Purchased Separately) | Countersunk Wood Screws 1 ½" No. 12 or M8 and No. 12 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-1 | IEC / EN / BS EN 62561-1 |
| Classification | Class H | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA | $I_{imp}$ 100 kA |
| PU | 1 pc(s) | 1 pc(s) |

## Earth Bars without disconnecting link

DEHN offers a range of Earth Bars Tested and Certified in accordance with the latest IEC EN 62561-1 standard and are in compliance with IEC 60364-5-54 standards and BS 7430. DEHN Earth Bars provides a common earthing point for multiple electrical installations and are a key component in both Earthing, Equipotential Bonding and Lightning Protection which helps to eliminate the risk of earth potential loops. DEHN Earth Bars are available with Single and Double Disconnecting link options which allows for quick and easy temporary disconnection from the earthing and lightning protection system to facilitate the testing of the earthing grid/rods in isolation.

### Copper



| General technical data: | |
|---|---|
| Material | Copper |
| Dimensions W x T | 50 x 6 mm |
| Thread size | M10 |
| Tightening Torque | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No. 12 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type EB ... | 2W M10 50X6 CU | 4W M10 50X6 CU |
|---|---|---|
| Part No. | 118 900 | 118 901 |
| Number of Connections | 2 | 4 |
| Dimensions L x W1 x H | 165 x 95 x 90 mm | 235 x 95 x 90 mm |

| Type EB ... | 6W M10 50X6 CU | 8W M10 50X6 CU |
|---|---|---|
| Part No. | 118 350 | 118 351 |
| Number of Connections | 6 | 8 |
| Dimensions L x W1 x H | 305 x 95 x 90 mm | 375 x 95 x 90 mm |

| Type EB ... | 10W M10 50X6 CU | 12W M10 50X6 CU |
|---|---|---|
| Part No. | 118 352 | 118 353 |
| Number of Connections | 10 | 12 |
| Dimensions L x W1 x H | 445 x 95 x 90 mm | 515 x 95 x 90 mm |

| Type EB ... | 14W M10 50X6 CU | 16W M10 50X6 CU |
|---|---|---|
| Part No. | 118 354 | 118 907 |
| Number of Connections | 14 | 16 |
| Dimensions L x W1 x H | 585 x 95 x 90 mm | 690 x 95 x 90 mm |

| Type EB ... | 18W M10 50X6 CU | 20W M10 50X6 CU |
|---|---|---|
| Part No. | 118 908 | 118 909 |
| Number of Connections | 18 | 20 |
| Dimensions L x W1 x H | 760 x 95 x 90 mm | 830 x 95 x 90 mm |

| Type EB ... | 22W M10 50X6 CU | 24W M10 50X6 CU |
|---|---|---|
| Part No. | 118 910 | 118 911 |
| Number of Connections | 22 | 24 |
| Dimensions L x W1 x H | 935 x 95 x 90 mm | 1005 x 95 x 90 mm |

| Type EB ... | 26W M10 50X6 CU | 28W M10 50X6 CU |
|---|---|---|
| Part No. | 118 912 | 118 913 |
| Number of Connections | 26 | 28 |
| Dimensions L x W1 x H | 1075 x 95 x 90 mm | 1145 x 95 x 90 mm |

| Type EB ... | 30W M10 50X6 CU |
|---|---|
| Part No. | 118 914 |
| Number of Connections | 30 |
| Dimensions L x W1 x H | 1215 x 95 x 90 mm |

| PU (all Earth Bars) | 1 pc(s) |
|---|---|

### Tinned Copper



| General technical data: | |
|---|---|
| Material | Tinned Copper |
| Dimensions W x T | 50 x 6 mm |
| Thread size | M10 |
| Tightening Torque | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No. 12 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type EB ... | 2W M10 50X6 SNCU | 4W M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 900 | 119 901 |
| Number of Connections | 2 | 4 |
| Dimensions L x W1 x H | 165 x 95 x 90 mm | 235 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 6W M10 50X6 SNCU | 8W M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 350 | 119 351 |
| Number of Connections | 6 | 8 |
| Dimensions L x W1 x H | 305 x 95 x 90 mm | 375 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 10W M10 50X6 SNCU | 12W M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 352 | 119 353 |
| Number of Connections | 10 | 12 |
| Dimensions L x W1 x H | 445 x 95 x 90 mm | 515 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 14W M10 50X6 SNCU | 16W M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 354 | 119 907 |
| Number of Connections | 14 | 16 |
| Dimensions L x W1 x H | 585 x 95 x 90 mm | 690 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 18W M10 50X6 SNCU | 20W M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 908 | 119 909 |
| Number of Connections | 18 | 20 |
| Dimensions L x W1 x H | 760 x 95 x 90 mm | 830 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 22W M10 50X6 SNCU | 24W M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 910 | 119 911 |
| Number of Connections | 22 | 24 |
| Dimensions L x W1 x H | 935 x 95 x 90 mm | 1005 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

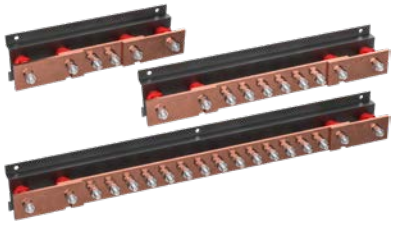
| Type EB ... | 26W M10 50X6 SNCU | 28W M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 912 | 119 913 |
| Number of Connections | 26 | 28 |
| Dimensions L x W1 x H | 1075 x 95 x 90 mm | 1145 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 30W M10 50X6 SNCU |
|---|---|
| Part No. | 119 914 |
| Number of Connections | 30 |
| Dimensions L x W1 x H | 1215 x 95 x 90 mm |
| PU | 1 pc(s) |

## Earth Bars with double disconnecting links

DEHN offers a range of Earth Bars Tested and Certified in accordance with the latest IEC EN 62561-1 standard and are in compliance with IEC 60364 – 5 - 54 standards and BS 7430. DEHN Earth Bars provides a common earthing point for multiple electrical installations and are a key component in both Earthing, Equipotential Bonding and Lightning Protection which helps to eliminate the risk of earth potential loops. DEHN Earth Bars are available with Single and Double Disconnecting link options which allows for quick and easy temporary disconnection from the earthing and lightning protection system to facilitate the testing of the earthing grid/rods in isolation.

### Copper



| General technical data: | |
|---|---|
| Material | Copper |
| Number of Disconnecting Links | 2 |
| Dimensions W x T | 50 x 6 mm |
| Thread size | M10 |
| Tightening Torque | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No. 12 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type EB ... | 2W 2DL M10 50X6 CU | 4W 2DL M10 50X6 CU |
|---|---|---|
| Part No. | 118 930 | 118 931 |
| Number of Connections | 2 | 4 |
| Dimensions L x W1 x H | 319 x 95 x 90 mm | 389 x 95 x 90 mm |

| Type EB ... | 6W 2DL M10 50X6 CU | 8W 2DL M10 50X6 CU |
|---|---|---|
| Part No. | 118 370 | 118 371 |
| Number of Connections | 6 | 8 |
| Dimensions L x W1 x H | 459 x 95 x 90 mm | 529 x 95 x 90 mm |

| Type EB ... | 10W 2DL M10 50X6 CU | 12W 2DL M10 50X6 CU |
|---|---|---|
| Part No. | 118 372 | 118 373 |
| Number of Connections | 10 | 12 |
| Dimensions L x W1 x H | 599 x 95 x 90 mm | 669 x 95 x 90 mm |

| Type EB ... | 14W 2DL M10 50X6 CU | 16W 2DL M10 50X6 CU |
|---|---|---|
| Part No. | 118 374 | 118 937 |
| Number of Connections | 14 | 16 |
| Dimensions L x W1 x H | 739 x 95 x 90 mm | 844 x 95 x 90 mm |

| Type EB ... | 18W 2DL M10 50X6 CU | 20W 2DL M10 50X6 CU |
|---|---|---|
| Part No. | 118 938 | 118 939 |
| Number of Connections | 18 | 20 |
| Dimensions L x W1 x H | 914 x 95 x 90 mm | 984 x 95 x 90 mm |

| Type EB ... | 22W 2DL M10 50X6 CU | 24W 2DL M10 50X6 CU |
|---|---|---|
| Part No. | 118 940 | 118 941 |
| Number of Connections | 22 | 24 |
| Dimensions L x W1 x H | 1089 x 95 x 90 mm | 1159 x 95 x 90 mm |

| Type EB ... | 26W M10 50X6 CU | 28W M10 50X6 CU |
|---|---|---|
| Part No. | 118 942 | 118 943 |
| Number of Connections | 26 | 28 |
| Dimensions L x W1 x H | 1229 x 95 x 90 mm | 1299 x 95 x 90 mm |

| Type EB ... | 30W 2DL M10 50X6 CU |
|---|---|
| Part No. | 118 944 |
| Number of Connections | 30 |
| Dimensions L x W1 x H | 1369 x 95 x 90 mm |

| PU (all Earth Bars) | 1 pc(s) |
|---|---|

### Tinned Copper



| General technical data: | |
|---|---|
| Material | Tinned Copper |
| Number of Disconnecting Links | 2 |
| Dimensions W x T | 50 x 6 mm |
| Thread size | M10 |
| Tightening Torque | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No. 12 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type EB ... | 2W 2DL M10 50X6 SNCU | 4W 2DL M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 930 | 119 931 |
| Number of Connections | 2 | 4 |
| Dimensions L x W1 x H | 319 x 95 x 90 mm | 389 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 6W 2DL M10 50X6 SNCU | 8W 2DL M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 370 | 119 371 |
| Number of Connections | 6 | 8 |
| Dimensions L x W1 x H | 459 x 95 x 90 mm | 529 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 10W 2DL M10 50X6 SNCU | 12W 2DL M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 372 | 119 373 |
| Number of Connections | 10 | 12 |
| Dimensions L x W1 x H | 599 x 95 x 90 mm | 669 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 14W 2DL M10 50X6 SNCU | 16W 2DL M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 374 | 119 937 |
| Number of Connections | 14 | 16 |
| Dimensions L x W1 x H | 739 x 95 x 90 mm | 844 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 18W 2DL M10 50X6 SNCU | 20W 2DL M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 938 | 119 939 |
| Number of Connections | 18 | 20 |
| Dimensions L x W1 x H | 914 x 95 x 90 mm | 984 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 22W 2DL M10 50X6 SNCU | 24W 2DL M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 940 | 119 941 |
| Number of Connections | 22 | 24 |
| Dimensions L x W1 x H | 1089 x 95 x 90 mm | 1159 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

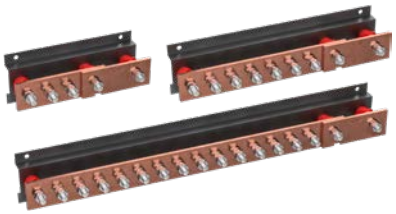
| Type EB ... | 26W 2DL M10 50X6 SNCU | 28W 2DL M10 50X6 SNCU |
|---|---|---|
| Part No. | 119 942 | 119 943 |
| Number of Connections | 26 | 28 |
| Dimensions L x W1 x H | 1229 x 95 x 90 mm | 1299 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 30W 2DL M10 50X6 SNCU |
|---|---|
| Part No. | 119 944 |
| Number of Connections | 30 |
| Dimensions L x W1 x H | 1369 x 95 x 90 mm |
| PU | 1 pc(s) |

## Earth Bars with single disconnecting link

DEHN offers a range of Earth Bars Tested and Certified in accordance with the latest IEC EN 62561-1 standard and are in compliance with IEC 60364 – 5 - 54 standards and BS 7430. DEHN Earth Bars provides a common earthing point for multiple electrical installations and are a key component in both Earthing, Equipotential Bonding and Lightning Protection which helps to eliminate the risk of earth potential loops. DEHN Earth Bars are available with Single and Double Disconnecting link options which allows for quick and easy temporary disconnection from the earthing and lightning protection system to facilitate the testing of the earthing grid/rods in isolation.

### Copper



| General technical data: | |
|---|---|
| Material | Copper |
| Number of Disconnecting Links | 1 |
| Dimensions W x T | **50 x 6 mm** |
| Thread size | M10 |
| Tightening Torque | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No 12 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type EB ... | 2W 1DL M10 50X6 CU | 4W 1DL M10 50X6 CU |
|---|---|---|
| **Part No.** | **118 915** | **118 916** |
| Number of Connections | 2 | 4 |
| Dimensions L x W1 x H | 232 x 95 x 90 mm | 302 x 95 x 90 mm |

| Type EB ... | 6W 1DL M10 50X6 CU | 8W 1DL M10 50X6 CU |
|---|---|---|
| **Part No.** | **118 360** | **118 361** |
| Number of Connections | 6 | 8 |
| Dimensions L x W1 x H | 372 x 95 x 90 mm | 442 x 95 x 90 mm |

| Type EB ... | 10W 1DL M10 50X6 CU | 12W 1DL M10 50X6 CU |
|---|---|---|
| **Part No.** | **118 362** | **118 363** |
| Number of Connections | 10 | 12 |
| Dimensions L x W1 x H | 512 x 95 x 90 mm | 582 x 95 x 90 mm |

| Type EB ... | 14W 1DL M10 50X6 CU | 16W 1DL M10 50X6 CU |
|---|---|---|
| **Part No.** | **118 364** | **118 922** |
| Number of Connections | 14 | 16 |
| Dimensions L x W1 x H | 685 x 95 x 90 mm | 757 x 95 x 90 mm |

| Type EB ... | 18W 1DL M10 50X6 CU | 20W 1DL M10 50X6 CU |
|---|---|---|
| **Part No.** | **118 366** | **118 924** |
| Number of Connections | 18 | 20 |
| Dimensions L x W1 x H | 827 x 95 x 90 mm | 897 x 95 x 90 mm |

| Type EB ... | 22W 1DL M10 50X6 CU | 24W 1DL M10 50X6 CU |
|---|---|---|
| **Part No.** | **118 925** | **118 926** |
| Number of Connections | 22 | 24 |
| Dimensions L x W1 x H | 1002 x 95 x 90 mm | 1072 x 95 x 90 mm |

| Type EB ... | 26W 1DL M10 50X6 CU | 28W 1DL M10 50X6 CU |
|---|---|---|
| **Part No.** | **118 927** | **118 928** |
| Number of Connections | 26 | 28 |
| Dimensions L x W1 x H | 1142 x 95 x 90 mm | 1212 x 95 x 90 mm |

| Type EB ... | 30W 1DL M10 50X6 CU |
|---|---|
| **Part No.** | **118 929** |
| Number of Connections | 30 |
| Dimensions L x W1 x H | 1282 x 95 x 90 mm |

| PU (all Earth Bars) | 1 pc(s) |
|---|---|

### Tinned Copper



| General technical data: | |
|---|---|
| Material | Tinned Copper |
| Number of Disconnecting Links | 1 |
| Dimensions W x T | **50 x 6 mm** |
| Thread size | M10 |
| Tightening Torque | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No 12 Wall Plugs (To be Purchased Separately) |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA |

| Type EB ... | 2W 1DL M10 50X6 SNCU | 4W 1DL M10 50X6 SNCU |
|---|---|---|
| **Part No.** | **119 915** | **119 916** |
| Number of Connections | 2 | 4 |
| Dimensions L x W1 x H | 232 x 95 x 90 mm | 302 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 6W 1DL M10 50X6 SNCU | 8W 1DL M10 50X6 SNCU |
|---|---|---|
| **Part No.** | **119 360** | **119 361** |
| Number of Connections | 6 | 8 |
| Dimensions L x W1 x H | 372 x 95 x 90 mm | 442 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 10W 1DL M10 50X6 SNCU | 12W 1DL M10 50X6 SNCU |
|---|---|---|
| **Part No.** | **119 362** | **119 363** |
| Number of Connections | 10 | 12 |
| Dimensions L x W1 x H | 512 x 95 x 90 mm | 582 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 14W 1DL M10 50X6 SNCU | 16W 1DL M10 50X6 SNCU |
|---|---|---|
| **Part No.** | **119 364** | **119 922** |
| Number of Connections | 14 | 16 |
| Dimensions L x W1 x H | 652 x 95 x 90 mm | 757 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 18W 1DL M10 50X6 SNCU | 20W 1DL M10 50X6 SNCU |
|---|---|---|
| **Part No.** | **119 366** | **119 924** |
| Number of Connections | 18 | 20 |
| Dimensions L x W1 x H | 827 x 95 x 90 mm | 897 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 22W 1DL M10 50X6 SNCU | 24W 1DL M10 50X6 SNCU |
|---|---|---|
| **Part No.** | **119 925** | **119 926** |
| Number of Connections | 22 | 24 |
| Dimensions L x W1 x H | 1002 x 95 x 90 mm | 1072 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 26W 1DL M10 50X6 SNCU | 28W 1DL M10 50X6 SNCU |
|---|---|---|
| **Part No.** | **119 927** | **119 928** |
| Number of Connections | 26 | 28 |
| Dimensions L x W1 x H | 1142 x 95 x 90 mm | 1212 x 95 x 90 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type EB ... | 30W 1DL M10 50X6 SNCU |
|---|---|
| **Part No.** | **119 929** |
| Number of Connections | 30 |
| Dimensions L x W1 x H | 1282 x 95 x 90 mm |
| PU | 1 pc(s) |

## Earth Boss

Earth Bosses are designed to provide a connection point between steel structures and the Lightning Protection and/or Earthing System. The Earth Bosses are welded onto steel structures, tanks and vessels and are wrapped with DEHN Anti-Corrosion Tape.

### Stainless Steel for Flat Conductors

Earth Bosses are designed to provide an earth connection point on a steel structure. The bosses are welded onto the steel structures, tanks, vessels and the connections are wrapped with DEHN anti-corrosion tape.



| General technical data: | |
|---|---|
| Material | Stainless Steel |
| Conductor Material | Copper |
| Clamping range Fl | **25 x 3 mm** |
| Material of screw | Stainless Steel |
| Tightening Torque | 20 Nm |
| Recommended Fixings | Welding to Structure |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type EBOSS ... | M8 D30 L40 STST | M10 D40 L30 STST | M10 D50 L50 STST |
|---|---|---|---|
| **Part No.** | **118 591** | **118 593** | **118 598** |
| Clamp Fixings | Bolt, Nut & Washer M8 | Bolt, Nut & Washer M10 | Bolt, Nut & Washer M10 |
| Nominal Diameter D | 30 mm | 40 mm | 50 mm |
| Length L | 40 mm | 30 mm | 50 mm |
| PU | 4 pc(s) | 4 pc(s) | 4 pc(s) |

Note: Other Diameters, Lengths, Thread Sizes are available on special request.

### Mild Steel for Flat Conductors

Earth Bosses are designed to provide an earth connection point on a steel structure. The bosses are welded onto the steel structures, tanks, vessels and the connections are wrapped with DEHN anti-corrosion tape.



| General technical data: | |
|---|---|
| Material | **Mild Steel** |
| Conductor Material | Copper |
| Clamping range Fl | **25 x 3 mm** |
| Material of screw | Stainless Steel |
| Tightening Torque | 20 Nm |
| Recommended Fixings | Welding to Structure |
| Standards | IEC / EN / BS EN 62561-1 |
| Classification | Class H |
| Lightning current carrying capability (10/350 µs) | limp 100 kA |

| Type EBOSS ... | M8 D30 L40 St/bare | M10 D40 L30 St/bare | M10 D50 L50 St/bare |
|---|---|---|---|
| **Part No.** | **118 571** | **118 574** | **118 587** |
| Clamp Fixings | Bolt, Nut & Washer M8 | Bolt, Nut & Washer M10 | Bolt, Nut & Washer M10 |
| Nominal Diameter D | 30 mm | 40 mm | 50 mm |
| Length L | 40 mm | 30 mm | 50 mm |
| PU | 4 pc(s) | 4 pc(s) | 4 pc(s) |

## Earth Braid Bonds

Earth Braid Bonds are suitable for applications of equipotential bonding, available in copper and tinned copper variants. The Braid Bonds are pre-terminated at both ends and are ideal for bonding metal doors or cladding, for both lightning protection and equipotential bonding.

### Copper

Earth Braid Bonds Copper.



| General technical data: | | |
|---|---|---|
| Material | | Copper |
| Hole Dia | | 11 mm |
| Recommended Fixings | | **M10 (Bolt, Nut & Washer)** |
| **Type EBB ...** | **25X3.5 L200 H11 CU** | **25X3.5 L400 H11 CU** |
| **Part No.** | **138 220** | **138 222** |
| Width W | 25 mm | 25 mm |
| Thickness T | 3.5 mm | 3.5 mm |
| Length L | 200 mm | 400 mm |
| Cross Section | 35 mm² | 35 mm² |
| PU | 25 pc(s) | 25 pc(s) |

| Type EBB ... | 30X5 L200 H11 CU | 30X5 L400 H11 CU |
|---|---|---|
| **Part No.** | **138 224** | **138 226** |
| Width W | 30 mm | 30 mm |
| Thickness T | 5 mm | 5 mm |
| Length L | 200 mm | 400 mm |
| Cross Section | 50 mm² | 50 mm² |
| PU | 20 pc(s) | 20 pc(s) |

Note: Other Diameters, Lengths, Thread Sizes are available on special request.

### Tinned Copper

Earth Braid Bonds Tinned Copper.



| General technical data: | | |
|---|---|---|
| Material | | Tinned Copper |
| Hole Dia | | 11 mm |
| Recommended Fixings | | **M10 (Bolt, Nut & Washer)** |
| **Type EBB ...** | **25X3.5 L200 H11 SNCU** | **25X3.5 L400 H11 SNCU** |
| **Part No.** | **138 200** | **138 201** |
| Width W | 25 mm | 25 mm |
| Thickness T | 3.5 mm | 3.5 mm |
| Length L | 200 mm | 400 mm |
| Cross Section | 35 mm² | 35 mm² |
| PU | 25 pc(s) | 25 pc(s) |

| Type EBB ... | 30X5 L200 H11 SNCU | 30X5 L400 H11 SNCU |
|---|---|---|
| **Part No.** | **138 202** | **138 203** |
| Width W | 30 mm | 30 mm |
| Thickness T | 5 mm | 5 mm |
| Length L | 200 mm | 400 mm |
| Cross Section | 50 mm² | 50 mm² |
| PU | 20 pc(s) | 20 pc(s) |

Note: Other Diameters, Lengths, Thread Sizes are available on special request.



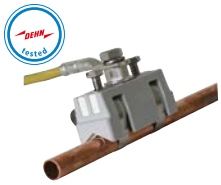
## Pipe Clamps for Ex Zones 1/21, 2/22

Pipe clamp for electrically contacting pipes in Ex zones 1 and 2 (gases, vapours, mists) as well as Ex zones 21 and 22 (dusts). Non-sparking lightning equipotential bonding according to IEC/EN 62305-3.

- For use in Ex zones 1 and 2 (gases, vapours, mists) as well as Ex zones 21 and 22 (dusts)
- Tested according to explosion group IIB
- Time-saving installation – no need to deactivate systems/areas for welding or drilling works

### Type EX BRS 27

Clamping range of Ø6-27 mm (3/4")



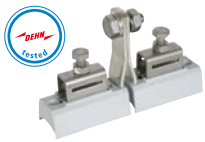
| Type | EX BRS 27 |
|---|---|
| **Part No.** | **540 821** |
| Lightning impulse current (10/350 µs) Cu Ø6-12 mm ($I_{imp}$) | 10 kA |
| Lightning impulse current (10/350 µs) Cu Ø12-27 mm (3/4") ($I_{imp}$) | 20 kA |
| Lightning impulse current (10/350 µs) Cu Ø27 mm (3/4") ($I_{imp}$) | 25 kA |
| Lightning impulse current (10/350 µs) St/tZn Ø17-27 mm (3/4") ($I_{imp}$) | 25 kA |
| Lightning impulse current (10/350 µs) StSt Ø6-12 mm ($I_{imp}$) | 10 kA |
| Lightning impulse current (10/350 µs) StSt Ø12-27 mm (3/4") ($I_{imp}$) | 12 kA |
| Lightning impulse current (10/350 µs) StSt Ø27 mm (3/4") ($I_{imp}$) | 25 kA |
| Connection | M8 |
| Clamping range pipe Ø | 6-27 mm (3/4") |
| Material of clamp body | **polyamide** |
| Material of grip head / tensioning strap | **StSt** |
| Material of contact piece | **brass/gal Sn** |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

**Note:**
Tensioning strap (Part No. 540 901, see page xxx.

With regard to corrosion resistance, it must be checked whether the materials used for the Ex pipe clamps, Ex BRS ... (e.g. Cu/galSn, brass/galSn, StSt, polyamide) can be used in the existing ambient conditions.

### Separate clamp body

For use with endless tensioning strap (Part No. 540 901), clamping ranges Ø27 (3/4") to 500 mm.



| Type | SCK EX BRS ASSM10 V2A |
|---|---|
| **Part No.** | **540 810** |
| Lightning impulse current (10/350 µs) Cu ($I_{imp}$) | 50 kA |
| Lightning impulse current (10/350 µs) St/tZn ($I_{imp}$) | 50 kA |
| Lightning impulse current (10/350 µs) StSt ($I_{imp}$) | 25 kA |
| Connection | M10 |
| Clamping range pipe Ø | 27 (3/4")-500 mm |
| Material of clamp body | **polyamide** |
| Material of grip head / tensioning strap | **StSt** |
| Material of contact piece | **Cu/gal Sn** |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

### Type EX BRS 90 / 300 / 500

Type EX BRS 90 (Part No. 540 801) clamping range Ø27 (3/4") to 89 mm (3").
Type EX BRS 300 (Part No. 540 803) clamping range Ø89 (3") to 300 mm.
Type EX BRS 500 (Part No. 540 805) clamping range Ø300 to 500 mm.



| General technical data: | |
|---|---|
| Connection | M10 |
| Material of clamp body | **polyamide** |
| Material of grip head / tensioning strap | **StSt** |
| Material of contact piece | **Cu/gal Sn** |
| Standard | EN 62561-1 |

| Type | EX BRS 90 | EX BRS 300 |
|---|---|---|
| **Part No.** | **540 801** | **540 803** |
| Lightning impulse current (10/350 µs) Cu ($I_{imp}$) | 50 kA | 50 kA |
| Lightning impulse current (10/350 µs) St/tZn ($I_{imp}$) | 50 kA | 50 kA |
| Lightning impulse current (10/350 µs) St/bare ($I_{imp}$) | – | – |
| Lightning impulse current (10/350 µs) StSt ($I_{imp}$) | 25 kA | 50 kA |
| Clamping range pipe Ø | 27-89 mm (3/4-3") | 89 (3")-300 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EX BRS 500 |
|---|---|
| **Part No.** | **540 805** |
| Lightning impulse current (10/350 µs) Cu ($I_{imp}$) | – |
| Lightning impulse current (10/350 µs) St/tZn ($I_{imp}$) | – |
| Lightning impulse current (10/350 µs) St/bare ($I_{imp}$) | 50 kA |
| Lightning impulse current (10/350 µs) StSt ($I_{imp}$) | 50 kA |
| Clamping range pipe Ø | 300-500 mm |
| PU | 1 pc(s) |

## Accessories for Pipe Clamps for Ex Zones 1/21, 2/22

### Mounting set for Ex pipe clamps



For positioning tensioning straps for pipe fastening.
For use with a bit screwdriver, power drill or manual installation.

| Type | BRS VSW |
|---|---|
| **Part No.** | **540 902** |
| Material | **Al / St/chem. Ni** |
| PU | 1 pc(s) |

## Parallel Connectors for Ex Zones 1/21, 2/22

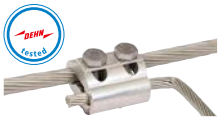
Parallel connector with spring washer for connecting round conductors/cables in Ex zones 1/21, 2/22. The clamps are secured against self-loosening in accordance with DIN EN 62305-3 Supplement 2.

### For equal and different cable diameters, small



| Type PV ... | 5.12.5 SKM8X45 GSG CUGALSN |
|---|---|
| **Part No.** | **306 105** |
| Material of clamp | **Cu/gal Sn** |
| Clamping range Rd / Rd | 5-12.5 mm |
| Clamping range (stranded / cable) | 16-95 mm² |
| Lightning impulse current (10/350 µs) (non-sparking) | 25 kA |
| Short-circuit current (50 Hz) (0.1 s) (non-sparking) | 1.65 kA |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### For equal and different cable diameters, large



| Type PV ... | 5.16 SKM10X50 GSG CUGALSN |
|---|---|
| **Part No.** | **306 106** |
| Material of clamp | **Cu/gal Sn** |
| Clamping range Rd / Rd | 5-16 mm |
| Clamping range (stranded / cable) | 16-150 mm² |
| Lightning impulse current (10/350 µs) (non-sparking) | 25 kA |
| Short-circuit current (50 Hz) (0.1 s) (non-sparking) | 1.65 kA |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

## Pipe Clamp GSG for Ex Zone 2/22

Pipe clamp for electrically contacting pipes in Ex zone 2/22. The pipe clamp is secured against self-loosening according to DIN/EN 62305-3 Supplement 2.

### Pipe clamps - Complete



| Type | BRS 27.89 AK1X10 2X6.8 GSG V2A |
|---|---|
| **Part No.** | **540 104** |
| Material | **StSt** |
| Clamping range pipe Ø | 27-89 mm (3/4-3'') |
| Dimensions of strap (l1 x w x d) | 330 x 25 x 0.3 mm |
| Connection (solid / stranded) | 4-50 mm² |
| Standard | EN 62561-1 |
| Tightening torque | ≥ 15 Nm |
| PU | 10 pc(s) |

### Separate grip head

For combination with endless tensioning strap (Part No. 540 901), connection cross-section 4-50 mm² (solid / stranded).



| Type | SPK 27.89 BRS AK1X10 2X6.8 GSG V2A |
|---|---|
| **Part No.** | **540 199** |
| Material | **StSt** |
| Connection (solid / stranded) | 4-50 mm² |
| Standard | EN 62561-1 |
| PU | 25 pc(s) |

## Accessories for Grip Head

### Endless tensioning strap

For cutting to length, e.g. with snips.



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| **Part No.** | **540 901** |
| Material | **StSt** |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| PU | 1 pc(s) |

## Clamps for Ex Zone 2/22

Clamps with spring washer for connecting round / flat conductors in Ex zone 2/22. The clamps are secured against self-loosening according to DIN EN 62305-3 Supplement 2.

### UNI disconnecting clamp 200 kA (10/350 µs) with spring washer for two round conductors



| Type | UTK 200 2X10 FL30 ZP V2A |
|---|---|
| **Part No.** | **459 200** |
| Material | StSt |
| Clamping range Rd / Rd | 10 / 10 mm |
| Clamping range Rd / Fl | 10 / 30 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### UNI disconnecting clamp 200 kA (10/350 µs) with spring washer for earth entry rods



| Type | UTK 200 8.10 16 ZP V2A |
|---|---|
| **Part No.** | **459 219** |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### Clamping piece 200 kA (10/350 µs) with spring washer



| Type | KS 200 B11.11 FL30X4 V2A |
|---|---|
| **Part No.** | **380 209** |
| Material | StSt |
| Clamping range Fl | 30 x 4 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### KS connector 200 kA (10/350 µs) with spring washer



| Type | KSV 200 10 FER V2A |
|---|---|
| **Part No.** | **301 209** |
| Material | StSt |
| Clamping range Rd | 10 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### MV clamp 200 kA (10/350 µs) with spring washer for round conductors



| Type | MVK 200 8.10 SKM10X30 V2A |
|---|---|
| **Part No.** | **390 209** |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### MV clamp 200 kA (10/350 µs) with spring washer for air-termination rods



| Type | MVK 200 8.10 16 SKM10X40 FSC V2A |
|---|---|
| **Part No.** | **392 209** |
| Material | StSt |
| Clamping range Rd / Rd | 8-10 / 16 mm |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 200 kA *) |
| Standard | based on EN 62561-1 |
| PU | 1 pc(s) |

### KS connector 100 kA (10/350 µs), one-piece, with spring washer



| Type | KSV 7.10 FER STTZN | KSV 6.10 FER CU |
|---|---|---|
| **Part No.** | **301 010** | **301 017** |
| Material of clamping screw | St/tZn | Cu |
| Material of clamp | ZDC | RCB |
| Clamping range Rd | 7-10 mm | 6-10 mm |
| Connection (single-wire / multi-wire) | – | 25-70 mm² |
| Type | + spring washer | + spring washer |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA *) | $I_{imp}$ 100 kA *) |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 100 pc(s) | 100 pc(s) |

### KS connector 100 kA (10/350 µs), two-piece, with spring washer



| Type | AP 2X6.10 V2A |
|---|---|
| **Part No.** | **301 229** |
| Material of clamping screw | StSt |
| Material of clamp | StSt |
| Clamping range Rd | 6-10 mm |
| Type | + spring washer |
| Lightning current carrying capability (10/350 µs) | $I_{imp}$ 100 kA / $I_{imp}$ 50 kA *) |
| Standard | EN 62561-1 |
| PU | 1 pc(s) |

## Connection clamps for steel girders for hazardous areas zone 2/22

Heavy design; for connection to steel structures.
All connections secured against self-loosening:

- Connection to the steel structure using adhesive-coated screws
- Round conductor connection using spring washer

### Vertical design with KS connector



| Type AK 6.10 KSV FER ... | S KBF3 18 V2A | S KBF18 35 V2A |
|---|---|---|
| **Part No.** | **372 169** | **372 179** |
| Clamping range | 3-18 mm | 18-35 mm |
| Material of clamp | StSt | StSt |
| Clamping range Rd | 6-10 mm | 6-10 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 10 pc(s) | 10 pc(s) |

### Horizontal design with KS connector



| Type AK 6.10 KSV FER ... | W KBF3 18 V2A | W KBF18 35 V2A |
|---|---|---|
| **Part No.** | **372 269** | **372 279** |
| Clamping range | 3-18 mm | 18-35 mm |
| Material of clamp | StSt | StSt |
| Clamping range Rd | 6-10 mm | 6-10 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 10 pc(s) | 10 pc(s) |

## Non-sparking, Ex equipotential bonding bar for hazardous areas of zones 1/21, 2/22

Non-sparking, Ex equipotential bonding bar for integrating metallic conductors and wires into the lightning equipotential bonding according to VDE 0185-305-3 (IEC 62305-3) as well as for protective and functional equipotential bonding according to DIN VDE 0100 Part 410/540.

### PAS EX 7(11)AP SET



For use in potentially explosive areas of Ex zones 1 and 2 (gases, vapours, mists) up to explosion group IIC as well as Ex zones 21 and 22 (dusts).

- Screws secured against self-loosening
- With the push-in adapter, only indoor use is permissible

| Type | PAS EX 7AP SET | PAS EX 11AP SET |
|---|---|---|
| **Part No.** | **472 415** | **472 425** |
| Connection Rd/Fl | 1x flat conductor 30/40 mm or 1x round conductor 10 mm | 1x flat conductor 30/40 mm or 1x round conductor 10 mm |
| Connection connecting clamp | 4x 4–16 mm² | 4x 4–16 mm² |
| Connection cable lug | 1x flexible/rigid conductor 16–95 mm² | 5x flexible/rigid conductor 16–95 mm² |
| Dimensions | 382 x 140 x 101 mm | 522 x 140 x 101 mm |
| Lightning impulse current (10/350 µs) StSt (V4A) 30x3.5 mm / 40x5 mm | 2HExIIC 75 kA (non-sparking) T4 | 2HExIIC 75 kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) St/tZn 30x3.5 mm/40x5 mm | 1HExIIC 100 kA (non-sparking) T4 | 1HExIIC 100 kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) StSt (V4A) Ø10 mm | NExIIC 50 kA (non-sparking) T4 | NExIIC 50 kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) St/tZn Ø10 mm | 2HExIIC 75 kA (non-sparking) T4 | 2HExIIC 75 kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) Cu 16-95 mm² | 1HExIIC 100 kA (non-sparking) T4 | 1HExIIC 100 kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) Cu 4-16 mm² (per core) | 3 kA (non-sparking) | 3 kA (non-sparking) |
| Nominal discharge current (8/20 µs) per line ($I_n$) Cu 4-10 mm² | 10 kA (non-sparking) | 10 kA (non-sparking) |
| Nominal discharge current (8/20 µs) per line ($I_n$) Cu 16 mm² | 15 kA (non-sparking) | 15 kA (non-sparking) |
| Max. short-circuit current (AC 50 Hz / DC / 5 s) StSt (V4A) 30x3.5 mm / 40x5 mm | 750 A / T4 | 750 A / T4 |
| Max. short-circuit current (AC 50 Hz / DC / 5 s) St/tZn 30x3.5 mm / 40x5 mm | 1500 A / T4 | 1500 A / T4 |
| Max. short-circuit current (AC 50 Hz /DC /5 s) StSt (V4A) Ø10 mm | 650 A / T4 | 650 A / T4 |
| Max. short-circuit current (AC 50 Hz / DC / 5 s) St/tZn Ø10 mm | 1000 A / T4 | 1000 A / T4 |
| Standard | IEC 62561-1 / CLC 50703-2 | IEC 62561-1 / CLC 50703-2 |
| PU | 1 pc(s) | 1 pc(s) |

## PAS EX 1+5(9)AP M10 V2A



For use in potentially explosive areas of Ex zones 1 and 2 (gases, vapours, mists) up to explosion group IIC as well as Ex zones 21 and 22 (dusts).

- Screws secured against self-loosening
- Both indoor and outdoor installation permissible

| Type | PAS EX 1+5AP M10 V2A | PAS EX 1+9AP M10 V2A |
|---|---|---|
| **Part No.** | **472 410** | **472 420** |
| Connection Fl | 1x flat conductor 30/40 mm | 1x flat conductor 30/40 mm |
| Connection cable lug | 5x flexible/rigid conductor 16–95 mm² | 9x flexible/rigid conductor 16–95 mm² |
| Dimensions | 382 x 140 x 65 mm | 522 x 140 x 65 mm |
| Lightning impulse current (10/350 µs) StSt (V4A) 30x3.5 mm / 40x5 mm | 2HExIIC 75 kA (non-sparking) T4 | 2HExIIC 75 kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) St/tZn 30x3.5 mm/40x5 mm | 1HExIIC 100 kA (non-sparking) T4 | 1HExIIC 100 kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) Cu 16-95 mm² | 1HExIIC 100 kA (non-sparking) T4 | 1HExIIC 100 kA (non-sparking) T4 |
| Max. short-circuit current (AC 50 Hz / DC / 5 s) StSt (V4A) 30x3.5 mm / 40x5 mm | 750 A / T4 | 750 A / T4 |
| Max. short-circuit current (AC 50 Hz / DC / 5 s) St/tZn 30x3.5 mm / 40x5 mm | 1500 A / T4 | 1500 A / T4 |
| Standard | IEC 62561-1 / CLC 50703-2 | IEC 62561-1 / CLC 50703-2 |
| PU | 1 pc(s) | 1 pc(s) |

In relation to corrosion resistance, it must be established whether the materials used in the PAS EX (e.g. Cu/galSn, StSt, polyamide, polyurethane ester) are able to be used within the prevailing environmental conditions.

## PAS EX 7(11)AP M10 V2A



For use in potentially explosive areas of Ex zones 1 and 2 (gases, vapours, mists) up to explosion group IIC as well as Ex zones 21 and 22 (dusts).

- Screws secured against self-loosening
- Both indoor and outdoor installation permissible

| Type | PAS EX 7AP M10 V2A | PAS EX 11AP M10 V2A |
|---|---|---|
| **Part No.** | **472 411** | **472 421** |
| Connection cable lug | 7x flexible/rigid conductor 16–95 mm² | 11x flexible/rigid conductor 16–95 mm² |
| Dimensions | 382 x 140 x 50 mm | 522 x 140 x 50 mm |
| Lightning impulse current (10/350 µs) Cu 16-95 mm² | 1HExIIC 100 kA (non-sparking) T4 | 1HExIIC 100 kA (non-sparking) T4 |
| Standard | IEC 62561-1 / CLC 50703-2 | IEC 62561-1 / CLC 50703-2 |
| PU | 1 pc(s) | 1 pc(s) |

In relation to corrosion resistance, it must be established whether the materials used in the PAS EX (e.g. Cu/galSn, StSt, polyamide, polyurethane ester) are able to be used within the prevailing environmental conditions.

## PAS EX AD 7(11) AP



Cover with distance bolts for non-sparking Ex equipotential bonding bar PAS EX. With connection numbering and label.

| Type | PAS EX AD 7 AP | PAS EX AD 11 AP |
|---|---|---|
| **Part No.** | **472 412** | **472 422** |
| Material | StSt | StSt |
| PU | 1 pc(s) | 1 pc(s) |

## PAS EX CC



Push-in adapter for non-sparking, Ex equipotential bonding bar PAS EX for convenient connection of flexible conductors. For use in potentially explosive areas of Ex zones 1 and 2 (gases, vapours, mists) up to explosion group IIC as well as Ex zones 21 and 22 (dusts). Use indoors only permissible.

| Type | PAS EX CC |
|---|---|
| **Part No.** | **472 497** |
| Lightning impulse current (10/350 µs) Cu 4-16 mm² (per core) | 3 kA (non-sparking) |
| Nominal discharge current (8/20 µs) per line ($I_n$) Cu 4-10 mm² | 10 kA (non-sparking) |
| Nominal discharge current (8/20 µs) per line ($I_n$) Cu 16 mm² | 15 kA (non-sparking) |
| PU | 1 pc(s) |

Note: Non-sparking only ensured in connection with PAS EX ...!

## PAS EX R



Adapter for non-sparking Ex equipotential bonding bar PAS EX for connecting a round conductor. For use in potentially explosive areas of Ex zones 1 and 2 (gases, vapours, mists) up to explosion group IIC as well as Ex zones 21 and 22 (dusts). Both indoor and outdoor installation permissible.

| Type | PAS EX R |
|---|---|
| **Part No.** | **472 498** |
| Lightning impulse current (10/350 µs) StSt (V4A) Ø10 mm | NExIIC 50 kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) St/tZn Ø10 mm | 2HExIIC 75 kA (non-sparking) T4 |
| Max. short-circuit current (AC 50 Hz /DC /5 s) StSt (V4A) Ø10 mm | 650 A / T4 |
| Max. short-circuit current (AC 50 Hz / DC / 5 s) St/tZn Ø10 mm | 1000 A / T4 |
| PU | 1 pc(s) |

Note: Non-sparking only ensured in connection with PAS EX ...!

## PAS EX FL



Adapter for non-sparking Ex equipotential bonding bar PAS EX for connecting a flat conductor. For use in potentially explosive areas of Ex zones 1 and 2 (gases, vapours, mists) up to explosion group IIC as well as Ex zones 21 and 22 (dusts). Both indoor and outdoor installation permissible.

| Type | PAS EX FL |
|---|---|
| **Part No.** | **472 499** |
| Lightning impulse current (10/350 µs) StSt (V4A) 30x3.5 mm / 40x5 mm | 2HExIIC 75kA (non-sparking) T4 |
| Lightning impulse current (10/350 µs) St/tZn 30x3.5 mm/40x5 mm | 1HExIIC 100 kA (non-sparking) T4 |
| Max. short-circuit current (AC 50 Hz / DC / 5 s) StSt (V4A) 30x3.5 mm / 40x5 mm | 750 A / T4 |
| Max. short-circuit current (AC 50 Hz / DC / 5 s) St/tZn 30x3.5 mm / 40x5 mm | 1500 A / T4 |
| PU | 1 pc(s) |

Note: Non-sparking only ensured in connection with PAS EX ...!

# Equipotential Bonding for Ex Areas

## PAS ... CUGALSSN



Crimped cable lug according to DIN 46235 with nickel barrier layer to avoid whisker formation.

| General technical data: | | |
|---|---|---|
| Material | | Cu/gal (Ni)Sn |
| Cable lug hole | | M10 |

| Type | PKS 16 10 CUGALNISN | PKS 25 10 CUGALNISN |
|---|---|---|
| Part No. | 472 432 | 472 433 |
| Conductor cross-section | 16 mm² | 25 mm² |
| PU | 3 pc(s) | 3 pc(s) |

| Type | PKS 35 10 CUGALNISN | PKS 50 10 CUGALNISN |
|---|---|---|
| Part No. | 472 434 | 472 435 |
| Conductor cross-section | 35 mm² | 50 mm² |
| PU | 3 pc(s) | 3 pc(s) |

| Type | PKS 70 10 CUGALNISN | PKS 95 10 CUGALNISN |
|---|---|---|
| Part No. | 472 436 | 472 437 |
| Conductor cross-section | 70 mm² | 95 mm² |
| PU | 3 pc(s) | 3 pc(s) |

Note: Non-sparking only ensured in connection with PAS EX ...!

# Equipotential Bonding Busbars for Ex Zone 2/22

Equipotential bonding busbars for protective and functional equipotential bonding according to IEC 60364-4-41/60364-5-54 and lightning equipotential bonding according to IEC/EN 62305-3. Screws are secured against self-loosening according to DIN EN 62305-3 Supplement 2 by means of a spring washer.

## 6 terminals



| Type PAS I ... | 6AP M10 CU | 6AP M10 V2A |
|---|---|---|
| Part No. | 472 207 | 472 209 |
| Material | Cu | StSt |
| Dimensions (l x w x d1) | 295 x 40 x 5 mm | 295 x 40 x 6 mm |
| Cross section | 200 mm² | 240 mm² |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 39 kA | 8.9 kA |
| Screw | M10 x 25 mm | M10 x 25 mm |
| Material of screw / nut | StSt | StSt |
| Design | with spring washer | with spring washer |
| Material of insulator | UP | UP |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

## 8 terminals



| Type PAS I ... | 8AP M10 CU | 8AP M10 V2A |
|---|---|---|
| Part No. | 472 227 | 472 229 |
| Material | Cu | StSt |
| Dimensions (l x w x d1) | 365 x 40 x 5 mm | 365 x 40 x 6 mm |
| Cross section | 200 mm² | 240 mm² |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 39 kA | 8.9 kA |
| Screw | M10 x 25 mm | M10 x 25 mm |
| Material of screw / nut | StSt | StSt |
| Design | with spring washer | with spring washer |
| Material of insulator | UP | UP |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

## 10 terminals



| Type PAS I ... | 10AP M10 CU | 10AP M10 V2A |
|---|---|---|
| Part No. | 472 217 | 472 219 |
| Material | Cu | StSt |
| Dimensions (l x w x d1) | 435 x 40 x 5 mm | 435 x 40 x 6 mm |
| Cross section | 200 mm² | 240 mm² |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 39 kA | 8.9 kA |
| Screw | M10 x 25 mm | M10 x 25 mm |
| Material of screw / nut | StSt | StSt |
| Design | with spring washer | with spring washer |
| Material of insulator | UP | UP |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

## 12 terminals



| Type PAS I ... | 12AP M10 CU | 12AP M10 V2A |
|---|---|---|
| Part No. | 472 237 | 472 239 |
| Material | Cu | StSt |
| Dimensions (l x w x d1) | 505 x 40 x 5 mm | 505 x 40 x 6 mm |
| Cross section | 200 mm² | 240 mm² |
| Short-circuit current (a.c. 50 Hz / d.c.) (1 s; ≤ 300 °C) | 39 kA | 8.9 kA |
| Screw | M10 x 25 mm | M10 x 25 mm |
| Material of screw / nut | StSt | StSt |
| Design | with spring washer | with spring washer |
| Material of insulator | UP | UP |
| Standard | EN 62561-1 | EN 62561-1 |
| PU | 1 pc(s) | 1 pc(s) |

## Accessories f. Equi. Bonding Busbars f. Ex Zone 2/22

### Cover for EBB industry



Covers for EBB with insulators.

| General technical data: | | |
|---|---|---|
| Material | | StSt |

| Type | AD PAS 6AP V2A | AD PAS 8AP V2A |
|---|---|---|
| Part No. | 472 279 | 472 269 |
| Type of EBB | 6 terminals | 8 terminals |
| Dimensions (l x w x d) | 301 x 60 x 0.8 mm | 371 x 60 x 0.8 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type | AD PAS 10AP V2A | AD PAS 12AP V2A |
|---|---|---|
| Part No. | 472 289 | 472 299 |
| Type of EBB | 10 terminals | 12 terminals |
| Dimensions (l x w x d) | 441 x 60 x 0.8 mm | 511 x 60 x 0.8 mm |
| PU | 1 pc(s) | 1 pc(s) |

### Insulator for EBB industry



| Type | IS PAS M10 |
|---|---|
| Part No. | 472 210 |
| Material / Colour | UP (thermoset) / red |
| Connection thread | M10 (length 12 mm) |
| Dimensions (d x h) | 32 x 40 mm |
| PU | 1 pc(s) |

### Fixing kit for EBBs, HDG steel



For mounting the insulators, e.g. on walls.

| Type | BFS M10X20 PAS STTZN | BFS M10X20 PAS V2A |
|---|---|---|
| Part No. | 472 201 | 472 202 |
| Material of screw | St/tZn | StSt |
| Screw | M10 TX25 | 45 mm M10 x 20 mm |
| Version | Hexalobular T25 | |
| Plastic dowel | Ø12 x 60 mm | Ø12 x 60 mm |
| Total length | 80 mm | 80 mm |
| | 1 pc(s) | 1 pc(s) |

# Equipotential Bonding on Cable Tray Systems for Ex Zone 2/22

The equipotential bonding system is mounted on cable tray systems. All conductive system parts and electrical equipment are integrated in the Ex equipotential bonding by means of equipotential bonding plates and clamps as well as a closed ring equipotential bonding conductor.

## EB clamp for cable trays and EB plate



Equipotential bonding clamp for cable trays

- Connection only with ring equipotential bonding conductor (tinned copper cable)
- For mounting on the perforated cable tray or on the equipotential bonding plate (PAP 1 / PAP 2)
- EB clamp to be mounted approx. every 0.5 m

| General technical data: | |
|---|---|
| Material | StSt |
| Material No. | 1.4301 |
| ASTM / AISI: | AISI 304 |
| Connection to PAP 1 EX KB ER or PAP 2 EX KB ER or cable tray or wide span cable tray | |
| Material of screw / nut | StSt |
| Material No. | 1.4301 |
| ASTM / AISI: | AISI 304 |
| EX zone | 2/22 |

| Type | PAK 35 M8 EX KB ER | PAK 50 M8 EX KB ER |
|---|---|---|
| **Part No.** | **306 200** | **306 201** |
| Clamping range EB ring conductor | 35 mm², **Cu/gal Sn** | 50 mm², **Cu/gal Sn** |
| Screw | M8 x 40 mm | M8 x 40 mm |
| Short-circuit current AC (50 Hz / 5 s) | 1.5 kA | – |
| Short-circuit current DC (5 s) | 250 A | – |
| PU | 50 pc(s) | 50 pc(s) |

| Type | PAK 70 M8 EX KB ER | PAK 35 M6 EX KB ER |
|---|---|---|
| **Part No.** | **306 202** | **306 204** |
| Clamping range EB ring conductor | 70 mm², **Cu/gal Sn** | 35 mm², **Cu/gal Sn** |
| Screw | M8 x 40 mm | M6 x 35 mm |
| Short-circuit current AC (50 Hz / 5 s) | 1.5 kA | – |
| Short-circuit current DC (5 s) | 250 A | – |
| PU | 50 pc(s) | 50 pc(s) |

| Type | PAK 50 M6 EX KB ER | PAK 70 M6 EX KB ER |
|---|---|---|
| **Part No.** | **306 205** | **306 206** |
| Clamping range EB ring conductor | 50 mm², **Cu/gal Sn** | 70 mm², **Cu/gal Sn** |
| Screw | M6 x 35 mm | M6 x 35 mm |
| Short-circuit current AC (50 Hz / 5 s) | – | – |
| Short-circuit current DC (5 s) | – | – |
| PU | 50 pc(s) | 50 pc(s) |

## EB clamp for wire cable trays



Equipotential bonding clamp PAK for wire cable trays

- Connection only with ring equipotential bonding conductor 35 mm², Part No. 832 838 (tinned copper cable)
- For mounting on the wire cable tray or on the EB plate (PAP 1 / PAP 2)
- EB clamp to be mounted approx. every 0.5 m

| Type | PAK 35 M8 EX GI ER |
|---|---|
| **Part No.** | **306 203** |
| Material | StSt |
| Material No. | 1.4301 |
| ASTM / AISI: | AISI 304 |
| Connection to | PAP 1 EX GI ER / PAP 2 EX GI ER or wire cable tray |
| Clamping range EB ring conductor | 35 mm², **Cu/gal Sn** |
| Screw | M8 x 40 mm |
| Material of screw / nut | StSt |
| Material No. | 1.4301 |
| ASTM / AISI: | AISI 304 |
| EX zone | 2/22 |
| Short-circuit current AC (50 Hz / 5 s) | 1.5 kA |
| Short-circuit current DC (5 s) | 250 A |
| PU | 50 pc(s) |

## EB plate for cable trays



Equipotential bonding plate for cable trays

- For attaching the equipotential bonding clamp for the ring equipotential bonding conductor (tin-plated copper cable)
- For mounting on the cable tray with side perforations

| Type | PAP 1 EX KB ER | PAP 2 EX KB ER |
|---|---|---|
| **Part No.** | **306 210** | **306 211** |
| Material | StSt | StSt |
| Material No. | 1.4301 | 1.4301 |
| ASTM / AISI: | AISI 304 | AISI 304 |
| Dimensions | 120 x 180 mm | 120 x 195 mm |
| Connection holes for EB conductor with cable lug | 3x Ø11 mm, 3x Ø9 mm, strain relief 3x cable clamp M6 | 2x Ø11 mm, 12x Ø7 mm |
| Connection possibilities for EB clamps | PAK ... EX KB ER | PAK ... EX KB ER |
| Fixing holes for cable tray | [4x] 9 x 20 / [1x] 9 x 9 mm | [4x] 9 x 20 / [1x] 9 x 9 mm |
| EX zone | 2/22 | 2/22 |
| Short-circuit current AC (50 Hz / 5 s) | 1.5 kA | 1.5 kA |
| Short-circuit current DC (5 s) | 250 A | 250 A |
| PU | 15 pc(s) | 15 pc(s) |

## EB plate for wire cable trays



Equipotential bonding plate for wire cable trays

- For attaching the equipotential bonding clamp for the ring equipotential bonding conductor (tin-plated copper cable)
- For mounting on the wire cable tray

| Type | PAP 1 EX GI ER | PAP 2 EX GI ER |
|---|---|---|
| **Part No.** | **306 212** | **306 213** |
| Material | StSt | StSt |
| Material No. | 1.4301 | 1.4301 |
| ASTM / AISI: | AISI 304 | AISI 304 |
| Dimensions | 120 x 180 mm | 120 x 195 mm |
| Connection holes for EB conductor with cable lug | 3x Ø11 mm, 3x Ø9 mm, strain relief 3x cable clamp M6 | 2x Ø11 mm, 12x Ø7 mm |
| Connection possibilities for EB clamps | PAK ... EX KB ER | PAK ... EX KB ER |
| Fixing holes for wire cable tray | wire cable tray [4x] 9 x 20 / [1x] 9 x 9 mm | [4x] 9 x 20 / [1x] 9 x 9 mm |
| EX zone | 2/22 | 2/22 |
| Short-circuit current AC (50 Hz / 5 s) | 1.5 kA | 1.5 kA |
| Short-circuit current DC (5 s) | 250 A | 250 A |
| PU | 15 pc(s) | 15 pc(s) |

## EB pipe clamps



Equipotential bonding pipe clamp (SBD 60 PAK 35)

- For connection only with ring equipotential bonding conductors (35 mm)², Part no. 832 838 (tin-plated copper cable)
- For mounting on round pipe DN50 (60 mm)
- EB clamp to be mounted approx. every 0.5 m

| Type | SBD 60 PAK 35 EX ER |
|---|---|
| **Part No.** | **306 220** |
| Material | StSt |
| Material No. | 1.4301 |
| ASTM / AISI: | AISI 304 |
| Dimensions | Ø60 mm |
| Clamping range EB ring conductor | 35 mm², Cu/gal Sn |
| EX zone | 2/22 |
| PU | 50 pc(s) |

## Cable clamp



Cable clamp as strain relief for installing copper cables on the equipotential bonding plate PAP1 EX KB ER or PAP1 EX GI ER.

| Type | MPE S 35 ER | MPE S 50/70 ER |
|---|---|---|
| **Part No.** | **306 230** | **306 231** |
| Material | StSt | StSt |
| Material No. | 1.4301 | 1.4301 |
| ASTM / AISI: | AISI 304 | AISI 304 |
| Connection to | PAP1 EX KB ER or PAP1 EX GI ER | PAP1 EX KB ER or PAP1 EX GI ER |
| Clamping range copper cable | 35 mm² | 50 or 70 mm² |
| EX zone | 2/22 | 2/22 |
| PU | 10 pc(s) | 10 pc(s) |

## Locknut



for cable clamps (MPE S 35 ER and MPE S 50/70 ER).

| Type | SM SS M6 ER |
|---|---|
| **Part No.** | **306 240** |
| Material | StSt |
| Material No. | 1.4301 |
| ASTM / AISI: | AISI 304 |
| Type | M6 |
| EX zone | 2/22 |
| PU | 20 pc(s) |

## Hexagon nut



for cable clamps (MPE S 35 ER and MPE S 50/70 ER).

| Type | SKM M6 DIN 934 V2A |
|---|---|
| **Part No.** | **505 901** |
| Material | StSt |
| Material No. | 1.4301 |
| ASTM / AISI: | AISI 304 |
| Type | M6 |
| PU | 20 pc(s) |

## Spring washer



for cable clamps (MPE S 35 ER and MPE S 50/70 ER).

| Type | FR A6 V2A |
|---|---|
| **Part No.** | **524 906** |
| Material | StSt |
| Material No. | 1.4310 |
| ASTM / AISI: | AISI 301 |
| Type | A6 |
| PU | 20 pc(s) |

# Accessories for Equipotential Bonding on Cable Tray Systems for Ex Zone 2/22

## Tinned copper cable



For use as a ring equipotential bonding conductor or equipotential bonding.

| General technical data: | |
|---|---|
| Material | Cu/gal Sn |

| Type | SEIL 7.5 CUGALSN 35Q R100M | SEIL 9 50Q CUGALSN R100M |
|---|---|---|
| **Part No.** | **832 838** | **832 839** |
| Cross-section | 35 mm² | 50 mm² |
| Cable structure qty x Ø wire | 7 x 2.5 mm | 19 x 1.8 mm |
| PU | 100 m | 100 m |

# EXFS L / EXFS KU

For bridging insulating flanges and insulating glands in cathodically protected pipe sections (e.g., pipelines or LPG plants) in hazardous areas in case of surges and lightning currents.

## EXFS L



Ex isolating spark gap for aboveground installation.

| General technical data: | |
|---|---|
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 50 kA |
| Class (lightning current carrying capability) | N |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 2.5 kV |
| Degree of protection | IP 54 |
| ATEX approvals | DEKRA 11ATEX0146 X |
| Ex marking according to EN 60079-0 and EN 60079-15: gas | II 3 G Ex nC IIC T4 Gc |
| IECEx approvals | IECEx DEK 11.0063X |
| Ex marking according to EN 60079-0 | Ex nC IIC T4 Gc |

| Type EXFS ... | L100 | L200 |
|---|---|---|
| **Part No.** | **923 060** | **923 061** |
| Cable length | 100 mm | 200 mm |
| PU | 1 pc(s) | 1 pc(s) |

## EXFS KU



Ex isolating spark gap with connecting cables for aboveground and underground installation; with water-proof sheath; can be shortened to keep cables as short as possible.

| Type EXFS ... | KU |
|---|---|
| **Part No.** | **923 019** |
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 50 kA |
| Class (lightning current carrying capability) | N |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 2.5 kV |
| Degree of protection | IP 67 |
| ATEX approvals | DEKRA 11ATEX0146 X |
| Ex marking according to EN 60079-0 and EN 60079-15: gas | II 3 G Ex nC IIC T4 Gc |
| IECEx approvals | IECEx DEK 11.0063X |
| Ex marking according to EN 60079-0 | Ex nC IIC T4 Gc |
| Cable length | 2x approx. 1500 mm |

## EXFS 100 / EXFS 100 KU

For bridging insulating flanges and insulating glands in cathodically protected pipe sections (e.g. pipelines or LPG plants) in hazardous areas in case of surges and lightning currents.

- Class (lighning current carrying capability) H (100 kA)
- Particularly low sparkover voltage
- ATEX and IECEx approvals for zone 1 and zone 21

### EXFS 100

Isolating spark gap for use in hazardous areas with plastic sheath and M10 threaded screws.



| Type EXFS ... | 100 |
|---|---|
| **Part No.** | **923 100** |
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |
| Class (lightning current carrying capability) | H |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 1.25 kV |
| Degree of protection | IP 67 |
| Approvals | UL, Inmetro |
| ATEX approvals | DEKRA 11ATEX0178 X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | II 2 G Ex db IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | II 2 D Ex tb IIIC T80 °C Db IP 66/67 |
| IECEx approvals | IECEx KEM 09.0051X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | Ex db IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | Ex tb IIIC T80 °C Db IP 66/67 |
| Inmetro approvals | TÜV 17.0698 X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | Ex db IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | Ex tb IIIC T80 °C Db IP 66/67 |
| PU | 1 pc(s) |

### EXFS 100 KU

Ex isolating spark gap with connecting cable for aboveground and underground installation; with water-proof sheath; can be shortened to keep cables as short as possible.



| Type EXFS ... | 100 KU |
|---|---|
| **Part No.** | **923 101** |
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |
| Class (lightning current carrying capability) | H |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 1.25 kV |
| Degree of protection | IP 67 |
| ATEX approvals | DEKRA 11ATEX0178 X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | II 2 G Ex d IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | II 2 D Ex tb IIIC T80 °C Db IP 66/67 |
| IECEx approvals | IECEx KEM 09.0051X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | Ex d IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | Ex tb IIIC T80°C Db IP 66/67 |
| Inmetro approvals | TÜV 17.0698 X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | Ex db IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | Ex tb IIIC T80 °C Db IP 66/67 |
| Cable length | 2x approx. 2000 mm |
| PU | 1 pc(s) |

## Accessories for EXFS 100 / EXFS 100 KU

### Angled connection brackets – IF 1 –

Angled connection bracket for EXFS ...; diameter corresponds to the bolt diameter of the flange joint; material: St/tZn.




| Type | AB EXFS IF1 W 11 | AB EXFS IF1 W 14 |
|---|---|---|
| **Part No.** | **923 311** | **923 314** |
| Borehole diameter d1 | 11 mm | 14 mm |

| Type | AB EXFS IF1 W 18 | AB EXFS IF1 W 22 |
|---|---|---|
| **Part No.** | **923 318** | **923 322** |
| Borehole diameter d1 | 18 mm | 22 mm |

| Type | AB EXFS IF1 W 26 | AB EXFS IF1 W 30 |
|---|---|---|
| **Part No.** | **923 326** | **923 330** |
| Borehole diameter d1 | 26 mm | 30 mm |

| Type | AB EXFS IF1 W 33 | AB EXFS IF1 W 36 |
|---|---|---|
| **Part No.** | **923 333** | **923 336** |
| Borehole diameter d1 | 33 mm | 36 mm |

| Type | AB EXFS IF1 W 39 | AB EXFS IF1 W 42 |
|---|---|---|
| **Part No.** | **923 339** | **923 342** |
| Borehole diameter d1 | 39 mm | 42 mm |

| Type | AB EXFS IF1 W 48 | AB EXFS IF1 W 56 |
|---|---|---|
| **Part No.** | **923 348** | **923 356** |
| Borehole diameter d1 | 48 mm | 56 mm |

| Type | | AB EXFS IF1 W 62 |
|---|---|---|
| **Part No.** | | **923 362** |
| Borehole diameter d1 | | 62 mm |

### Flat connection brackets – IF 3 –

Flat connection bracket for EXFS ...; diameter corresponds to the bolt diameter of the flange joint; material: St/tZn.




| Type | AB EXFS IF3 G 11 | AB EXFS IF3 G 14 |
|---|---|---|
| **Part No.** | **923 211** | **923 214** |
| Borehole diameter d1 | 11 mm | 14 mm |

| Type | AB EXFS IF3 G 18 | AB EXFS IF3 G 22 |
|---|---|---|
| **Part No.** | **923 218** | **923 222** |
| Borehole diameter d1 | 18 mm | 22 mm |

| Type | AB EXFS IF3 G 26 | AB EXFS IF3 G 30 |
|---|---|---|
| **Part No.** | **923 226** | **923 230** |
| Borehole diameter d1 | 26 mm | 30 mm |

| Type | AB EXFS IF3 G 33 | AB EXFS IF3 G 36 |
|---|---|---|
| **Part No.** | **923 233** | **923 236** |
| Borehole diameter d1 | 33 mm | 36 mm |

| Type | AB EXFS IF3 G 39 | AB EXFS IF3 G 42 |
|---|---|---|
| **Part No.** | **923 239** | **923 242** |
| Borehole diameter d1 | 39 mm | 42 mm |

| PU (all Connection brackets) | 1 pc(s) |
|---|---|

### EXFS 100: Connecting Cable, Cu, 25 mm²

Connecting cable for EXFS 100; two cable lugs (Ø10.5 mm) made of Cu/gal Sn, screw, nut and spring washer.



| Type AL EXFS ... | L100 KS | L200 KS | L300 KS |
|---|---|---|---|
| **Part No.** | **923 025** | **923 035** | **923 045** |
| Cable length | 100 mm | 200 mm | 300 mm |
| PU | 1 pc(s) | 1 pc(s) | 1 pc(s) |




## Lightning Strike Counter

Counter for digitally recording impulse currents.

The discharge current counter is preferably installed between the equipotential bonding bar and the earth-termination system.

### Lightning strike counter DLSC basic



| Type | DLSC 100 |
|---|---|
| **Part No.** | **599 101** NEW |
| Lightning strike counter as per GB/T 33588.6 and IEC 62561-6 | Type 1 + type 2 |
| Max. countable impulse current (10/350 µs) ($I_{imp}$) | 100 kA |
| Min. countable impulse current (10/350 µs) ($I_{imp}$) | 1 kA |
| Max. countable nominal discharge current (8/20 µs) ($I_n$) | 100 kA |
| Min. countable nominal discharge current (8/20 µs) ($I_n$) | 1 kA |
| OLED display | Electronic counter 0–999 |
| Internal power supply (battery operation) | 2x lithium battery, type CR17335 (replaceable) |
| Battery status check | OLED on the device |
| Setting device | Buttons on the device |
| Resetting function | Buttons on the device (e.g. to reset the meter reading to 0) |
| Operating temperature range ($T_U$) | -20°C to +70°C |
| Storage temperature range | -30°C to +80°C |
| For mounting on | Round/flat conductor, HVI, HVI light, HVI light plus, HVI power Conductor |
| Clamping range Rd | 8-12; 12-20 / HVI 20-27 mm |
| Clamping range Fl | 25-40 mm |
| Enclosure material: Counter | thermoplastic, grey, UL 94 V-0 |
| Enclosure material: sensor | - (integrated) |
| Installation point | Outdoor area |
| Degree of protection | IP 67 |
| Standard | IEC 62561-6 |
| Approvals | CE, GB, UKCA |
| Dimensions (l x w x h) | 202 x 90 x 59 mm |
| PU | 1 pc(s) |

## Earth Resistance Meter Metraclip Earth

For earth loop measurement.
Easy handling, high-resolution OLED display.
Automatic calibration, Bluetooth interface incl. software.



| Type | EMZ M312N METRACLIP EARTH |
|---|---|
| **Part No.** | **578 386** |
| Display | OLED display |
| Resistance measuring range | 0.01 to 1,500 ohms |
| Current measuring range | 0.2 mA to 40 A |
| Category of measurement | CAT IV 600 V |
| Inside diameter clamp | 35 mm |
| PU | 1 pc(s) |

## EP4 Continuity Tester

Continuity tester for measuring the resistance of e.g. air-termination and down conductors and subsequently installed reinforcing bars of buildings.
The tester is suited for measuring the resistance of earth-termination systems according to DIN 18014 with a test current of 200 mA.



| Type | DGP EP4 |
|---|---|
| **Part No.** | **578 370** |
| Display | digital LCD display |
| Resistance measuring range | 0.01 Ω to 2,000 kΩ |
| Measuring current | 200 mA in the range up to 10 Ω acc. to EN 61557-4 |
| Dimensions (l x w x d) | 230 x 60 x 40 mm |
| PU | 1 pc(s) |

## Case with Measuring Accessory for Continuity Tester

For storing the continuity tester and measuring accessories.

Equipment includes:

- 2 coilers with unwinding handle and 50 m measuring line, blue, with banana pin, Part No. 585 320
- 1 measuring line 0.75 mm², 3 m long, black, with banana pin on both sides, Part No. 545 020
- 1 test clamp, clamping range 2-21 mm, Part No. 588 000



| Type | DGPKO ML PK ... KL |
|---|---|
| **Part No.** | **582 620** |
| Material | **artificial leather** |
| Dimensions (l x w x h) | 370 x 130 x 220 mm |
| PU | 1 pc(s) |

Learn more about our highlights and discover our **new measuring devices**:
**https://de.hn/6Y4s2**

## Earth Resistance Measuring Equipment in a Case

The earth resistance measuring equipment in a case comes with carrying strap for easy transport.



Measuring case equipment includes:

- 1 coiler with unwinding handle and 25-m measuring line, red, with banana pin, Part No. 585 310
- 1 coiler with unwinding handle and 50 m measuring line, blue, with banana pin, Part No. 585 320
- 2 augers 350 mm long, Part No. 587 460
- 2 measuring lines, 0.75 mm², 3 m long, black, with banana pins on both sides, Part No. 545 020 (connection between earth-termination system and earth resistance meter)
- 1 measuring line, 0.75 mm², 0.5 m long, red, with banana pin on both sides, Part No. 545 010
- 1 measuring line, 0.75 mm², 0.5 m long, blue, with banana pins on both sides, Part No. 545 011 (connection between coiler and auger)
- 1 test clamp, clamping range 2-21 mm, Part No. 588 000

There is an empty compartment in the case to hold a measuring device.

| Type | EMKO ML EB PK ... KL |
|---|---|
| **Part No.** | **582 600** |
| Material | **artificial leather** |
| Dimensions (l x w x h) | 400 x 200 x 240 mm |
| PU | 1 pc(s) |

## Accessories for Earth Resistance Measuring Equipment in a Case

### Auger

As an auxiliary earth electrode and probe for measuring the earth and soil resistance. With hole for banana pin of the measuring line.



| Type | EB ASSM5 L350 TGGALZN |
|---|---|
| **Part No.** | **587 460** |
| Connection | ✹ M5 |
| Material | **MCI/gal Zn** |
| Length | 350 mm |
| PU | 1 pc(s) |

## Test clamp up to 21 mm

For measuring earth electrodes.



| Type | PK 2.21 ASSM5 TGTZN |
|---|---|
| **Part No.** | **588 000** |
| Connection | ✹ M5 |
| Material | **MCI/tZn** |
| Clamping range | 2-21 mm |
| Clamping spindle | M8 |
| PU | 1 pc(s) |

## Coiler, width 40 mm

With split plug, socket and handle.



| General technical data: | |
|---|---|
| Width | 40 mm |
| Material | **plastic** |

| Type | DH K 40 BS ML0.75 L25M RT | DH K 40 BS ML0.75 L50M RT |
|---|---|---|
| **Part No.** | **585 310** | **585 051** |
| Length of measuring line | 25 m | 50 m |
| Colour of measuring line | red ● | red ● |
| PU | 1 pc(s) | 1 pc(s) |

| Type | DH K 40 BS ML0.75 L25M BL | DH K 40 BS ML0.75 L50M BL |
|---|---|---|
| **Part No.** | **585 025** | **585 320** |
| Length of measuring line | 25 m | 50 m |
| Colour of measuring line | blue ● | blue ● |
| PU | 1 pc(s) | 1 pc(s) |

## Coiler, width 80 mm

With banana pin, socket and handle.



| Type | DH K 80 BS ML0.75 L100M RT | DH K 80 BS ML0.75 L100M BL |
|---|---|---|
| **Part No.** | **585 211** | **585 210** |
| Length of measuring line | 100 m | 100 m |
| Colour of measuring line | red ● | blue ● |
| Width | 80 mm | 80 mm |
| Material | **plastic** | **plastic** |
| PU | 1 pc(s) | 1 pc(s) |

## Coiler, empty

With socket and handle.



| Type | DH K 40 BB ASG L | DH K 80 BB ASG L |
|---|---|---|
| **Part No.** | **585 010** | **585 200** |
| Length of measuring line | 0 m | 0 m |
| Width | 40 mm | 80 mm |
| Material | **plastic** | **plastic** |
| Colour | grey ● | grey ● |
| PU | 1 pc(s) | 1 pc(s) |

## Measuring line



| Type | ML 0.75 L100M CU BL | ML 0.75 L100M CU RT |
|---|---|---|
| **Part No.** | **545 000** | **545 001** |
| Cross section | 0.75 mm² | 0.75 mm² |
| Material | **Cu** | **Cu** |
| Designation | H05V-K | H05V-K |
| Insulation | **PVC** | **PVC** |
| Colour | blue ● | red ● |
| PU | 100 m | 100 m |

## Support tool

Aluminium support tool with safety bow made of stainless steel, for concrete bases of 8.5kg and 17kg.



| Type | TG AL SB A2 BES 17KG |
|---|---|
| **Part No.** | **590 000** NEW |
| Material | Al / StSt |
| Diameter | 16 mm |
| PU | 1 pc(s) |

## Wire Straighteners

For straightening round conductors made of different materials (HDG steel, Cu and Al).

### 5 guide pulleys, with handles



| Type DRG ... | 5RO 7.10 HG STGALZN |
|---|---|
| **Part No.** | **597 004** |
| Material | **St/gal Zn** |
| Support Rd | 7-10 mm |
| Material of guide pulleys | **St/gal Zn** |
| Dimensions | approx. 180 x 290 mm |
| PU | 1 pc(s) |

### 10 guide pulleys, with handles



| Type DRG ... | 10RO 7.10 HG STGALZN |
|---|---|
| **Part No.** | **597 005** |
| Material | **St/gal Zn** |
| Support Rd | 7-10 mm |
| Material of guide pulleys | **St/gal Zn** |
| Dimensions | approx. 650 x 180 mm |
| PU | 1 pc(s) |

### 10 guide pulleys, movable on rubber wheels

With wire unwinding device, for handling coils (St/tZn, Cu and Al) with an inner diameter of 450-800 mm and widths up to 150 mm.



| Type DRG ... | 10RO 7.10 FB STTZN |
|---|---|
| **Part No.** | **597 006** |
| Material | **St/tZn** |
| Support Rd | 7-10 mm |
| Material of guide pulleys | **St/gal Zn** |
| Dimensions | approx. 1650 x 1200 mm |
| PU | 1 pc(s) |

## Straightening Tool

For bending and straightening conductors.

### Straight design



| Type RE ... | G 8.10 FL4 STBRUE |
|---|---|
| **Part No.** | **596 000** |
| Material | **St/burnished** |
| For Rd / Fl | 8-10 / -4 mm |
| Length | 260 mm |
| PU | 1 pc(s) |

### Cranked design

Wrench size 13 for screwing.



| Type RE ... | GK 8.10 SW13 STBRUE |
|---|---|
| **Part No.** | **595 000** |
| Material | **St/burnished** |
| For Rd | 8-10 mm |
| Length | 260 mm |
| PU | 1 pc(s) |

## Spider Wrench

Universal use for installing lightning protection systems. With four wrench sizes.



| Type | KSS SW10 13 17 19 STGALZN |
|---|---|
| **Part No.** | **572 000** |
| Material | **St/gal Zn** |
| Wrench size | 10, 13, 17, 19 mm |
| PU | 1 pc(s) |



## Earthing Cables with Cable Lugs open

Highly flexible copper conductor, frost-resistant, UV-stabilised.
Packing in accordance with VG 96927-11.

### Cable lug, 2x open, 2x M8 / M10



| General technical data: | |
|---|---|
| Cable cross section | 10 mm² |
| Cable lug open | 2x M8 / M10 |
| Colour | black ● |

| Type | EL10 L0.35M 2KSO 8.10 | EL10 L0.55M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 003 | 410 005 |
| Cable length (l1) | 0.35 m | 0.55 m |
| Stock No. | 6150-12-156-9107 | 6150-12-156-8386 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L0.65M 2KSO 8.10 | EL10 L1.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 006 | 410 010 |
| Cable length (l1) | 0.65 m | 1.05 m |
| Stock No. | 6150-12-156-9108 | 6150-12-156-8387 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L1.55M 2KSO 8.10 | EL10 L2.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 015 | 410 020 |
| Cable length (l1) | 1.55 m | 2.05 m |
| Stock No. | 6150-12-156-9069 | 6150-12-156-9073 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L2.55M 2KSO 8.10 | EL10 L3.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 025 | 410 030 |
| Cable length (l1) | 2.55 m | 3.05 m |
| Stock No. | 6150-12-156-9072 | 6150-12-156-9109 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L3.55M 2KSO 8.10 | EL10 L4.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 035 | 410 040 |
| Cable length (l1) | 3.55 m | 4.05 m |
| Stock No. | 6150-12-156-9071 | 6150-12-156-9070 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L5.05M 2KSO 8.10 | EL10 L6.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 050 | 410 060 |
| Cable length (l1) | 5.05 m | 6.05 m |
| Stock No. | 6150-12-156-6051 | 6150-12-156-9110 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L7.05M 2KSO 8.10 | EL10 L10.0M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 070 | 410 099 |
| Cable length (l1) | 7.05 m | 10.0 m |
| Stock No. | 6150-12-156-9111 | 6150-12-156-9112 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L14.0M 2KSO 8.10 | EL10 L15.0M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 140 | 410 150 |
| Cable length (l1) | 14.0 m | 15.0 m |
| Stock No. | 6150-12-156-6207 | 6150-12-161-4272 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L20.0M 2KSO 8.10 | EL10 L30.0M 2KSO 8.10 |
|---|---|---|
| Part No. | 410 199 | 410 299 |
| Cable length (l1) | 20.0 m | 30.0 m |
| Stock No. | 6150-12-156-9113 | 6150-12-156-9114 |
| PU | 1 pc(s) | 1 pc(s) |

### Cable lug, 2x open, 1x M8 / M10 and 1x M5 / M6



| General technical data: | |
|---|---|
| Cable cross section | 10 mm² |
| Cable lug open | 1x M8 / M10 1x M5 / M6 |
| Colour | black ● |

| Type | EL10 L0.35M 1KSO 8.10 1KSO 5.6 | EL10 L0.55M 1KSO 8.10 1KSO 5.6 |
|---|---|---|
| Part No. | 410 603 | 410 605 |
| Cable length (l1) | 0.35 m | 0.55 m |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L1.05M 1KSO 8.10 1KSO 5.6 | EL10 L1.55M 1KSO 8.10 1KSO 5.6 |
|---|---|---|
| Part No. | 410 610 | 410 615 |
| Cable length (l1) | 1.05 m | 1.55 m |
| Stock No. | – | 6150-12-308-6928 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L2.05M 1KSO 8.10 1KSO 5.6 | EL10 L2.55M 1KSO 8.10 1KSO 5.6 |
|---|---|---|
| Part No. | 410 620 | 410 625 |
| Cable length (l1) | 2.05 m | 2.55 m |
| PU | 1 pc(s) | 1 pc(s) |

| Type | | EL10 L3.05M 1KSO 8.10 1KSO 5.6 |
|---|---|---|
| Part No. | | 410 630 |
| Cable length (l1) | | 3.05 m |
| Stock No. | | 6150-12-353-5887 |
| PU | | 1 pc(s) |

## Cable lug, 2x open, 2x M8 / M10



| General technical data: | |
|---|---|
| Cable cross section | 16 mm² |
| Cable lug open | 2x M8 / M10 |
| Colour | black ● |
| Standard | EN 62561-1 |

| Type | EL16 L0.35M 2KSO 8.10 | EL16 L0.55M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 003 | 416 005 |
| Cable length (l1) | 0.35 m | 0.55 m |
| Stock No. | 6150-12-156-9115 | 6150-12-156-9085 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L0.65M 2KSO 8.10 | EL16 L1.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 006 | 416 010 |
| Cable length (l1) | 0.65 m | 1.05 m |
| Stock No. | 6150-12-156-9116 | 6150-12-156-9084 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L1.55M 2KSO 8.10 | EL16 L2.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 015 | 416 020 |
| Cable length (l1) | 1.55 m | 2.05 m |
| Stock No. | 6150-12-156-9117 | 6150-12-156-9118 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L2.55M 2KSO 8.10 | EL16 L3.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 025 | 416 030 |
| Cable length (l1) | 2.55 m | 3.05 m |
| Stock No. | 6150-12-156-9119 | 6150-12-156-9083 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L3.55M 2KSO 8.10 | EL16 L4.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 035 | 416 040 |
| Cable length (l1) | 3.55 m | 4.05 m |
| Stock No. | 6150-12-156-6208 | 6150-12-156-8388 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L5.05M 2KSO 8.10 | EL16 L6.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 050 | 416 060 |
| Cable length (l1) | 5.05 m | 6.05 m |
| Stock No. | 6150-12-156-9120 | 6150-12-156-9082 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L7.05M 2KSO 8.10 | EL16 L8.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 070 | 416 080 |
| Cable length (l1) | 7.05 m | 8.05 m |
| Stock No. | 6150-12-156-9121 | 6150-12-188-4475 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L10.05M 2KSO 8.10 | EL16 L12.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 100 | 416 120 |
| Cable length (l1) | 10.05 m | 12.05 m |
| Stock No. | 6150-12-156-9122 | 6150-12-188-4476 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L14.05M 2KSO 8.10 | EL16 L15.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 140 | 416 150 |
| Cable length (l1) | 14.05 m | 15.05 m |
| Stock No. | 6150-12-156-9123 | 6150-12-161-4273 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L20.05M 2KSO 8.10 | EL16 L22.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 200 | 416 220 |
| Cable length (l1) | 20.05 m | 22.05 m |
| Stock No. | 6150-12-156-9124 | 6150-12-188-4477 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L28.05M 2KSO 8.10 | EL16 L30.05M 2KSO 8.10 |
|---|---|---|
| Part No. | 416 280 | 416 300 |
| Cable length (l1) | 28.05 m | 30.05 m |
| Stock No. | 6150-12-188-4478 | 6150-12-156-9125 |
| PU | 1 pc(s) | 1 pc(s) |

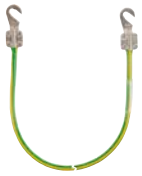
## Cable lug, 2x open, 1x M8 / M10 and 1x M5 / M6



| Type | EL16 L1.55M 1KSO 8.10 1KSO 5.6 |
|---|---|
| Part No. | 416 516 |
| Cable cross section | 16 mm² |
| Cable length (l1) | 1.55 m |
| Cable lug open | 1x M8 / M10 1x M5 / M6 |
| Colour | black ● |
| Stock No. | 6150-12-308-6607 |
| PU | 1 pc(s) |

## Cable lug, 2x open, 2x M8 / M10 green / yellow

Highly flexible copper conductor (ESY), frost-proof.



| General technical data: | |
|---|---|
| Cable cross section | 16 mm² |
| Cable lug open | 2x M8 / M10 |
| Colour | green ● / yellow ● |

| Type | EL16 L0.55M 2KSO 8.10 GG | EL16 L1.05M 2KSO 8.10 GG |
|---|---|---|
| Part No. | 417 005 | 417 010 |
| Cable length (l1) | 0.55 m | 1.05 m |
| Stock No. | 6150-12-313-5059 | 6150-12-313-5060 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L1.55M 2KSO 8.10 GG | EL16 L2.05M 2KSO 8.10 GG |
|---|---|---|
| Part No. | 417 015 | 417 020 |
| Cable length (l1) | 1.55 m | 2.05 m |
| Stock No. | 6150-12-313-5061 | 6150-12-313-5062 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L3.05M 2KSO 8.10 GG | EL16 L5.05M 2KSO 8.10 GG |
|---|---|---|
| Part No. | 417 030 | 417 050 |
| Cable length (l1) | 3.05 m | 5.05 m |
| Stock No. | 6150-12-313-5063 | 6150-12-313-5064 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L10.05M 2KSO 8.10 GG | EL16 L15.05M 2KSO 8.10 GG |
|---|---|---|
| Part No. | 417 100 | 417 115 |
| Cable length (l1) | 10.05 m | 15.05 m |
| Stock No. | 6150-12-313-5065 | 6150-12-313-5066 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L20.05M 2KSO 8.10 GG | EL16 L25.05M 2KSO 8.10 GG |
|---|---|---|
| Part No. | 417 120 | 417 125 |
| Cable length (l1) | 20.05 m | 25.05 m |
| Stock No. | 6150-12-313-5067 | 6150-12-185-8587 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L30.05M 2KSO 8.10 GG | EL16 L50.05M 2KSO 8.10 GG |
|---|---|---|
| Part No. | 417 130 | 417 150 |
| Cable length (l1) | 30.05 m | 50.05 m |
| Stock No. | 6150-12-313-5068 | 6150-12-174-2744 |
| PU | 1 pc(s) | 1 pc(s) |

Packing in accordance with specifications of the VG standards (defence equipment standards) must be explicitly indicated when ordering.

## Earthing Cables with Cable Lugs open / closed

Highly flexible copper cable, frost-resistant, UV stabilised.
Packing in accordance with VG 96927-11.

### Cable lug, 1x open M5 / M6 and 1x closed M8



| General technical data: | |
|---|---|
| Cable cross section | 10 mm² |
| Cable lug open | M5 / M6 |
| Cable lug closed | M8 |
| Hole Ø | 8.5 mm |
| Colour | black ● |

| Type | EL10 L0.35M 1KSO 5.6 1KSG 8 | EL10 L0.65M 1KSO 5.6 1KSG 8 |
|---|---|---|
| Part No. | 410 503 | 410 506 |
| Cable length (l1) | 0.35 m | 0.65 m |
| Stock No. | 6150-12-196-7302 | 6150-12-195-9694 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L1.05M 1KSO 5.6 1KSG 8 | EL10 L1.55M 1KSO 5.6 1KSG 8 |
|---|---|---|
| Part No. | 410 510 | 410 515 |
| Cable length (l1) | 1.05 m | 1.55 m |
| Stock No. | 6150-12-196-7304 | 6150-12-196-7303 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L2.05M 1KSO 5.6 1KSG 8 | EL10 L2.55M 1KSO 5.6 1KSG 8 |
|---|---|---|
| Part No. | 410 520 | 410 525 |
| Cable length (l1) | 2.05 m | 2.55 m |
| Stock No. | 6150-12-196-7606 | 6150-12-198-6807 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L3.05M 1KSO 5.6 1KSG 8 |
|---|---|
| Part No. | 410 530 |
| Cable length (l1) | 3.05 m |
| Stock No. | 6150-12-198-6808 |
| PU | 1 pc(s) |

### Cable lug, 1x open M8 / M10 and 1x closed M8



| General technical data: | |
|---|---|
| Cable cross section | 10 mm² |
| Cable lug open | M8 / M10 |
| Cable lug closed | M8 |
| Hole Ø | 8.5 mm |
| Colour | black ● |

| Type | EL10 L0.20M 1KSO 8.10 1KSG 8 | EL10 L0.35M 1KSO 8.10 1KSG 8 |
|---|---|---|
| Part No. | 410 401 | 410 403 |
| Cable length (l1) | 0.20 m | 0.35 m |
| Stock No. | 6150-12-300-9132 | 6150-12-195-9490 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L0.45M 1KSO 8.10 1KSG 8 | EL10 L0.55M 1KSO 8.10 1KSG 8 |
|---|---|---|
| Part No. | 410 404 | 410 450 |
| Cable length (l1) | 0.45 m | 0.55 m |
| Stock No. | 6150-12-192-5455 | 6150-12-197-0088 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L0.65M 1KSO 8.10 1KSG 8 | EL10 L1.05M 1KSO 8.10 1KSG 8 |
|---|---|---|
| Part No. | 410 406 | 410 411 |
| Cable length (l1) | 0.65 m | 1.05 m |
| Stock No. | 6150-12-192-5456 | 6150-12-192-5457 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L1.55M 1KSO 8.10 1KSG 8 | EL10 L2.05M 1KSO 8.10 1KSG 8 |
|---|---|---|
| Part No. | 410 415 | 410 420 |
| Cable length (l1) | 1.55 m | 2.05 m |
| Stock No. | 6150-12-192-5458 | 6150-12-198-1217 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L2.55M 1KSO 8.10 1KSG 8 | EL10 L3.05M 1KSO 8.10 1KSG 8 |
|---|---|---|
| Part No. | 410 425 | 410 430 |
| Cable length (l1) | 2.55 m | 3.05 m |
| Stock No. | 6150-12-198-6803 | 6150-12-198-6805 |
| PU | 1 pc(s) | 1 pc(s) |

### Cable lug, 1x open M8 / M10 and 1x closed M10



| General technical data: | |
|---|---|
| Cable cross section | 10 mm² |
| Cable lug open | M8 / M10 |
| Cable lug closed | M10 |
| Hole Ø | 10.5 mm |
| Colour | black ● |

| Type | EL10 L0.35M 1KSO 8.10 1KSG 10 | EL10 L0.55M 1KSO 8.10 1KSG 10 |
|---|---|---|
| Part No. | 410 413 | 410 405 |
| Cable length (l1) | 0.35 m | 0.55 m |
| Stock No. | 6150-12-196-7301 | 6150-12-196-6346 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L0.65M 1KSO 8.10 1KSG 10 | EL10 L1.05M 1KSO 8.10 1KSG 10 |
|---|---|---|
| Part No. | 410 407 | 410 410 |
| Cable length (l1) | 0.65 m | 1.05 m |
| Stock No. | 6150-12-198-7027 | 6150-12-171-2783 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L1.55M 1KSO 8.10 1KSG 10 | EL10 L2.05M 1KSO 8.10 1KSG 10 |
|---|---|---|
| Part No. | 410 416 | 410 421 |
| Cable length (l1) | 1.55 m | 2.05 m |
| Stock No. | 6150-12-198-1216 | 6150-12-198-1218 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L2.55M 1KSO 8.10 1KSG 10 | EL10 L3.05M 1KSO 8.10 1KSG 10 |
|---|---|---|
| Part No. | 410 426 | 410 431 |
| Cable length (l1) | 2.55 m | 3.05 m |
| Stock No. | 6150-12-198-6804 | 6150-12-198-6806 |
| PU | 1 pc(s) | 1 pc(s) |

## Cable lug, 1x open M5 / M6 and 1x closed M8



| Type | EL16 L0.55M 1KSO 5.6 1KSG 8 |
|---|---|
| **Part No.** | **416 505** |
| Cable cross section | 16 mm² |
| Cable length (l1) | 0.55 m |
| Cable lug open | M5 / M6 |
| Cable lug closed | M8 |
| Hole Ø | 8.5 mm |
| Colour | black ● |
| Stock No. | 6150-12-300-9131 |
| PU | 1 pc(s) |

## Cable lug, 1x open M8 / M10 and 1x closed M8



| General technical data: | |
|---|---|
| Cable cross section | 16 mm² |
| Cable lug open | M8 / M10 |
| Cable lug closed | M8 |
| Hole Ø | 8.5 mm |
| Colour | black ● |

| Type | EL16 L1.05M 1KSO 8.10 1KSG 8 | EL16 L1.55M KSO 8.10 KSG 8 |
|---|---|---|
| **Part No.** | **416 411** | **416 415** |
| Cable length (l1) | 1.05 m | 1.55 m |
| Stock No. | 6150-12-308-6934 | 6150-12-308-6981 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L2.05M 1KSO 8.10 1KSG 8 | EL16 L2.55M 1KSO 8.10 1KSG 8 |
|---|---|---|
| **Part No.** | **416 420** | **416 425** |
| Cable length (l1) | 2.05 m | 2.55 m |
| Stock No. | 6150-12-308-6933 | 6150-12-308-6932 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L3.05M 1KSO 8.10 1KSG 8 | EL16 L4.05M 1KSO 8.10 1KSG 8 |
|---|---|---|
| **Part No.** | **416 430** | **416 440** |
| Cable length (l1) | 3.05 m | 4.05 m |
| Stock No. | 6150-12-308-6931 | 6150-12-308-6930 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L5.05M 1KSO 8.10 1KSG 8 |
|---|---|
| **Part No.** | **416 450** |
| Cable length (l1) | 5.05 m |
| Stock No. | 6150-12-308-6929 |
| PU | 1 pc(s) |

## Cable lug, 1x open M8 / M10 and 1x closed M10



| General technical data: | |
|---|---|
| Cable cross section | 16 mm² |
| Cable lug open | M8 / M10 |
| Cable lug closed | M10 |
| Hole Ø | 10.5 mm |
| Colour | black ● |
| Standard | EN 62561-1 |

| Type | EL16 L0.35M 1KSO 8.10 1KSG 10 | EL16 L1.05M 1KSO 8.10 1KSG 10 |
|---|---|---|
| **Part No.** | **416 403** | **416 410** |
| Cable length (l1) | 0.35 m | 1.05 m |
| Stock No. | – | 6150-12-308-6941 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L1.55M 1KSO 8.10 1KSG 10 | EL16 L2.05M 1KSO 8.10 1KSG 10 |
|---|---|---|
| **Part No.** | **416 416** | **416 421** |
| Cable length (l1) | 1.55 m | 2.05 m |
| Stock No. | 6150-12-308-6940 | 6150-12-308-6939 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L2.55M 1KSO 8.10 1KSG 10 | EL16 L3.05M 1KSO 8.10 1KSG 10 |
|---|---|---|
| **Part No.** | **416 426** | **416 431** |
| Cable length (l1) | 2.55 m | 3.05 m |
| Stock No. | 6150-12-309-6938 | 6150-12-308-6937 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L4.05M 1KSO 8.10 1KSG 10 | EL16 L5.05M 1KSO 8.10 1KSG 10 |
|---|---|---|
| **Part No.** | **416 441** | **416 451** |
| Cable length (l1) | 4.05 m | 5.05 m |
| Stock No. | 6150-12-308-6936 | 6150-12-308-6935 |
| PU | 1 pc(s) | 1 pc(s) |

Packing in accordance with specifications of the VG standards (defence equipment standards) must be explicitly indicated when ordering.

## Earthing Cables with Cable Lugs closed

Highly flexible copper cable, frost-resistant, UV stabilised.
Packing in accordance with VG 96927-11.

### Cable lug, 2x closed M10



| General technical data: | |
|---|---|
| Cable cross section | 10 mm² |
| Cable lug closed | 2x M10 |
| Hole Ø | 10.5 mm |
| Colour | black ● |

| Type | EL10 L0.35M 2KSG 10 | EL10 L0.55M 2KSG 10 |
|---|---|---|
| Part No. | 410 903 | 410 905 |
| Cable length (l1) | 0.35 m | 0.55 m |
| Stock No. | 6150-12-198-1948 | 6150-12-198-6809 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L0.65M 2KSG 10 | EL10 L1.05M 2KSG 10 |
|---|---|---|
| Part No. | 410 906 | 410 910 |
| Cable length (l1) | 0.65 m | 1.05 m |
| Stock No. | 6150-12-198-6810 | 6150-12-198-1482 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L1.55M 2KSG 10 | EL10 L2.05M 2KSG 10 |
|---|---|---|
| Part No. | 410 915 | 410 920 |
| Cable length (l1) | 1.55 m | 2.05 m |
| Stock No. | 6150-12-168-2696 | 6150-12-168-2695 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL10 L2.55M 2KSG 10 | EL10 L3.05M 2KSG 10 |
|---|---|---|
| Part No. | 410 925 | 410 930 |
| Cable length (l1) | 2.55 m | 3.05 m |
| Stock No. | 6150-12-168-2694 | – |
| PU | 1 pc(s) | 1 pc(s) |

### Cable lug, 2x closed M10



| General technical data: | |
|---|---|
| Cable cross section | 16 mm² |
| Cable lug closed | 2x M10 |
| Hole Ø | 10.5 mm |
| Colour | black ● |
| Standard | EN 62561-1 |

| Type | EL16 L0.35M 2KSG 10 | EL16 L0.55M 2KSG 10 |
|---|---|---|
| Part No. | 416 903 | 416 905 |
| Cable length (l1) | 0.35 m | 0.55 m |
| Stock No. | 6150-12-198-6812 | 6150-12-198-6813 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L0.65M 2KSG 10 | EL16 L1.05M 2KSG 10 |
|---|---|---|
| Part No. | 416 906 | 416 910 |
| Cable length (l1) | 0.65 m | 1.05 m |
| Stock No. | 6150-12-198-6814 | 6150-12-168-9942 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L1.55M 2KSG 10 | EL16 L2.05M 2KSG 10 |
|---|---|---|
| Part No. | 416 915 | 416 920 |
| Cable length (l1) | 1.55 m | 2.05 m |
| Stock No. | 6150-12-168-2693 | 6150-12-198-6815 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L2.55M 2KSG 10 | EL16 L3.05M 2KSG 10 |
|---|---|---|
| Part No. | 416 925 | 416 930 |
| Cable length (l1) | 2.55 m | 3.05 m |
| Stock No. | 6150-12-198-6816 | 6150-12-198-1483 |
| PU | 1 pc(s) | 1 pc(s) |

| Type | EL16 L7.05M 2KSG 10 |
|---|---|
| Part No. | 416 970 |
| Cable length (l1) | 7.05 m |
| Stock No. | 6150-12-168-2692 |
| PU | 1 pc(s) |

Packing in accordance with specifications of the VG standards (defence equipment standards) must be explicitly indicated when ordering.

## Earthing Cables with Cable Lug / Pin Cable Lug

Made of highly flexible copper conductor, frost-resistant, UV-stabilised.
Packing in accordance with VG 96927-11.

### Cable lug, 1x open and pin cable lug size 10



| Type | EL10 L2.05M 1KSO 8.10 1SKS 10 |
|---|---|
| **Part No.** | **410 720** |
| Cable cross section | 10 mm² |
| Cable length (l1) | 2.05 m |
| Cable lug open | M8 / M10 |
| Pin cable lug | size 10 (w = 4.3) |
| Colour | black ● |
| Stock No. | 6150-12-308-6979 |
| PU | 1 pc(s) |

### Cable lug, 1x open and pin cable lug size 16



| Type | EL16 L1.55M 1KSO 8.10 1SKS 16 |
|---|---|
| **Part No.** | **416 016** |
| Cable cross section | 16 mm² |
| Cable length (l1) | 1.55 m |
| Cable lug open | M8 / M10 |
| Pin cable lug | size 16 (w = 5.8) |
| Colour | black ● |
| Stock No. | 6150-12-178-9673 |
| PU | 1 pc(s) |

### Cable lug, 1x closed and pin cable lug size 10



| Type | EL10 L0.65M 1KSG 8 1SKS 10 |
|---|---|
| **Part No.** | **410 606** |
| Cable cross section | 10 mm² |
| Cable length (l1) | 0.65 m |
| Cable lug closed | M8 |
| Pin cable lug | size 10 (w = 4.3) |
| Colour | black ● |
| Stock No. | 6150-12-304-4604 |
| PU | 1 pc(s) |

Packing in accordance with specifications of the VG standards (defence equipment standards) must be explicitly indicated when ordering.

## Earthing Cable Lugs

For mounting on site with integrated strain relief (second half of clamping part).
Please observe the following parameters for mounting:

- Stripping approx. 15 mm
- Wire end ferrule acc. to DIN 46228
- Tightening torque of the locking nut screws ≥ 3 Nm

### Open M5 / M6



| Type | EKSO 5.6 AQ6 16 CUGALZN |
|---|---|
| **Part No.** | **444 006** |
| Cable cross section | 6-16 mm² |
| Cable lug fitting | M5 / M6 |
| Material | **Cu/gal Sn** |
| Stock No. | 5940-12-156-9126 |
| PU | 100 pc(s) |

### Open M8 / M10



| Type | EKSO 8.10 AQ6 16 CUGALZN |
|---|---|
| **Part No.** | **444 010** |
| Cable cross section | 6-16 mm² |
| Cable lug fitting | M8 / M10 |
| Material | **Cu/gal Sn** |
| Stock No. | 5940-12-152-3867 |
| PU | 100 pc(s) |

### Closed M8



| Type | EKSG 8 AQ6 16 CUGALZN |
|---|---|
| **Part No.** | **444 008** |
| Cable cross section | 6-16 mm² |
| Cable lug fitting | M8 |
| Material | **Cu/gal Sn** |
| Stock No. | 5940-12-156-9128 |
| PU | 1 pc(s) |

### Closed M10



| Type | EKSG 10 AQ6 16 CUGALZN |
|---|---|
| **Part No.** | **444 009** |
| Cable cross section | 6-16 mm² |
| Cable lug fitting | M10 |
| Material | **Cu/gal Sn** |
| Stock No. | 5940-12-156-9127 |
| PU | 1 pc(s) |

Packing in accordance with specifications of the VG standards (defence equipment standards) must be explicitly indicated when ordering.

## Earthing Clamps

For connecting earthing conductors to pipes.

### Small design



| Type EK ... | 4.45 AQ6 16 TGTZN |
|---|---|
| **Part No.** | **435 805** |
| Material of clamp body | **MCI/tZn** |
| Material of spindle | **St/gal Zn** |
| Clamping range pipe Ø | 4-45 mm ($^3/_8$-1 $^1/_4$'') |
| Connection cross-section | 6-16 mm² |
| Stock No. | 5999-12-156-9129 |
| PU | 1 pc(s) |

### Large design



| Type EK ... | 12.60 AQ6 16 TGTZN |
|---|---|
| **Part No.** | **435 803** |
| Material of clamp body | **MCI/tZn** |
| Material of spindle | **St/gal Zn** |
| Clamping range pipe Ø | 12-60 mm ($^1/_2$-2'') |
| Connection cross-section | 6-16 mm² |
| Stock No. | 5999-12-156-2656 |
| PU | 1 pc(s) |

Packing in accordance with specifications of the VG standards (defence equipment standards) must be explicitly indicated when ordering.

## Antenna earthing – telecommunication systems

Pipe clamp for lighning equipotential bonding of pipes (e.g. antenna poles) according to IEC/EN 62305-3.

With gradually adjustable tensioning strap, for connecting one or two conductors and suitable for through-wiring.

### Antenna pipe clamps (complete)

Connection of:
1 conductor Rd Ø10 mm or
1-2 conductors Rd Ø6-8 mm **or**
4-50 mm² (solid / stranded).



| Type | BRS 16.89 AK1X10 2X6.8 V2A | BRS 16.168 AK1X10 2X6.8 V2A |
|---|---|---|
| **Part No.** | **540 103** | **540 100** |
| Material | StSt | StSt |
| Clamping range pipe Ø | 16-89 mm ($^3/_8$-3'') | 16-168 mm ($^3/_8$-6'') |
| Screw | M8 x 20 mm | M8 x 20 mm |
| Material of screw | StSt | StSt |
| Dimensions of strap (l1 x w x d) | 330 x 25 x 0.3 mm | 570 x 25 x 0.3 mm |
| Standard | EN 62561-1 | EN 62561-1 |
| Stock No. | – | 5975-12-120-7744 |
| PU | 10 pc(s) | 10 pc(s) |

### Separate grip head

For combination with endless tensioning strap (Part No. 540 901).
Connection of:
1 conductor Rd Ø10 mm or
1-2 conductors Rd Ø6-8 mm **or**
4-50 mm² (solid / stranded).



| Type | SPK 25 BRS AK1X10 2X6.8 V2A |
|---|---|
| **Part No.** | **540 110** |
| Material | StSt |
| Screw | M8 x 20 mm |
| Material of screw | StSt |
| Standard | EN 62561-1 |
| PU | 50 pc(s) |

### Endless tensioning strap

For cutting to length, e.g. with snips.



| Type | SPB 25X0.3 L100M V2A |
|---|---|
| **Part No.** | **540 901** |
| Material | StSt |
| Dimensions of strap (w x d) | 25 x 0.3 mm |
| PU | 1 pc(s) |

## Earthing Busbars

With slot and anti-rotation protection, for fixing to the earthing pipe.

### 3 connections



| Type ESS ... | 3P M10X35 STTZN |
|---|---|
| **Part No.** | **465 801** |
| Material of busbar | **St/tZn** |
| Length | 181 mm |
| Screw | M10 x 35 mm |
| Stock No. | 5940-12-156-8385 |
| PU | 1 pc(s) |

### 5 connections



| Type ESS ... | 5P M10X35 STTZN |
|---|---|
| **Part No.** | **466 192** |
| Material of busbar | **St/tZn** |
| Length | 290 mm |
| Screw | M10 x 35 mm |
| Stock No. | 5940-12-188-4931 |
| PU | 1 pc(s) |

Packing in accordance with specifications of the VG standards (defence equipment standards) must be explicitly indicated when ordering.

## Earthing Spikes

For earthing mobile objects such as vehicles, power generators, etc.



| Type ES 50X50X3 ... | 450 V2A | 600 V2A |
|---|---|---|
| **Part No.** | **634 145** | **634 160** |
| Material of profile | **St/tZn** | **St/tZn** |
| Profile | 50 x 50 x 3 mm | 50 x 50 x 3 mm |
| Length (l1) | 450 mm | 600 mm |
| Screw | M8 x 40 mm | M8 x 40 mm |
| Nut | wing nut M8 | wing nut M8 |
| Stock No. | 5975-12-382-6412 | – |
| PU | 1 pc(s) | 1 pc(s) |

## Anchoring Pole

For guying rod sections and batten shears, e.g. when traversing telecommunication cables.



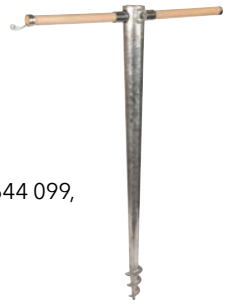
| Type | AP L405 TGTZN |
|---|---|
| **Part No.** | **466 203** |
| Material of profile | **MCI/tZn** |
| Profile | 25 x 25 x 3.6 mm |
| Length | 405 mm |
| Design | hole Ø28 mm |
| Stock No. | 4030-12-320-9037 |
| PU | 1 pc(s) |

## Earthing Pipe with Drilling Spiral

For earthing mobile objects such as vehicles, power generators, etc.
Detachable turning handle.

**Consisting of:**

- Turning handle (Part No. 462 058, military name VG 96953 T10 AB001, stock No. 5975-12-133-7084)
- Earthing pipe (Part No. 462 060, military name VG 96953 T10 AA001, stock No. 5975-12-133-7271)
- Clamp body with knurled screw (Part No. 644 099, military name VG 96953 T10 AC001, stock No. 5975-12-399-5493)



| Type | ERO BSP ASSM10 1000 STTZN |
|---|---|
| **Part No.** | **644 000** |
| Material | **St/tZn** |
| Length | 1000 mm |
| Screw | M10 x 35 mm |
| Stock No. | 5975-12-120-0006 |
| PU | 1 pc(s) |

## Telecommunication Earth Bars

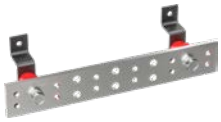
Telecommunication Earth Bars in Tinned and Copper Variants, the Earth Bars comply with EN / BS EN 50310 standards for Telecomm. bonding networks for building and other structures.

### Copper



| Type | TEB 50X6.35 CU | TMEB 100X6.35 CU |
|---|---|---|
| **Part No.** | **118 917** | **118 918** |
| Material | **Copper** | **Copper** |
| Dimensions W x T | 50 x 6.35 mm | 100 x 6.35 mm |
| Dimensions L x W1 x H | 315 x 110 x 83 mm | 508 x 160 x 83 mm |
| Tightening Torque | 20 Nm | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No 12 Wall Plugs (To be Purchased Separately) | Countersunk Wood Screws 1 ½" No. 12 or M8 and No 12 Wall Plugs (To be Purchased Separately) |
| Standards | Complies with EN / BS EN 50310 | Complies with EN / BS EN 50310 |
| PU | 1 pc(s) | 1 pc(s) |

### Tinned Copper



| Type | TEB 50X6.35 SNCU | TMEB 100x6.35 SNCU |
|---|---|---|
| **Part No.** | **119 917** | **119 918** |
| Material | **Tinned Copper** | **Tinned Copper** |
| Dimensions W x T | 50 x 6.35 mm | 50 x 6.35 mm |
| Dimensions L x W1 x H | 315 x 110 x 83 mm | 508 x 160 x 83 mm |
| Tightening Torque | 20 Nm | 20 Nm |
| Recommended Fixings | Countersunk Wood Screws 1 ½" No. 12 or M8 and No 12 Wall Plugs (To be Purchased Separately) | Countersunk Wood Screws 1 ½" No. 12 or M8 and No 12 Wall Plugs (To be Purchased Separately) |
| Standards | Complies with EN / BS EN 50310 | Complies with EN / BS EN 50310 |
| PU | 1 pc(s) | 1 pc(s) |



## Earthing system for railways

Our DEHN railway earthing system has proven itself in traffic engineering as it has been specifically developed for earthing the reinforcement of concrete parts in the vicinity of high-voltage electrical installations. It is used for establishing equipotential bonding of concrete structures and conducting short-circuit currents if the contact wire breaks.
For this purpose, DEHN provides the user with a range of earthing bridges and earthing connectors, which, due to variable end end caps and connection elements, represent a comprehensive modular system with various possible combinations.
Our DEHN railway earthing systems are approved by DB Netz AG.

### Stainless steel earthing bridges



The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway line applications. The stainless steel earthing bridge ensures this via a defined welding seam to the earthing conductor. This earthing bridge also has a technical approval from DB Netz AG and can be reliably used in planning.

| General technical data: | |
|---|---|
| Material of connection element | StSt |
| Material No. | 1.4301 |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Thread | M16 |
| Diameter of connection plate | 50 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 37 |

| Type D ... | BEB 0 - 63 / EBS 15-03-19 | BEB 0 - 70 / EBS 15-03-19 |
|---|---|---|
| **Part No.** | **419 000** | **419 001** |
| Total height | 63 mm | 70 mm |
| Installation height | 55 mm | 62 mm |
| PU | 1 pc(s) | 1 pc(s) |

| Type D ... | BEB 0 - 77 / EBS 15-03-19 |
|---|---|
| **Part No.** | **419 002** |
| Total height | 77 mm |
| Installation height | 69 mm |
| PU | 1 pc(s) |

**Note:**
Depending on the order, the D BEB 0 earthing bridges can be manufactured up to an H dimension of 100 mm without losing their approval from DB Netz AG.

### Stainless steel earthing bridges D BEB 16



The earthing bridges are designed for earthing, return circuits and equipotential bonding in railway line applications. The stainless steel earthing bridge ensures this via a defined welding seam to the earthing conductor. This earthing bridge also has the technical approval of DB Netz AG and can be used there without hesitation in planning.

| Type D ... | BEB 16 - 105 / 3 EBS 15-03-19-38 |
|---|---|
| **Part No.** | **419 160** NEW |
| Material of connection element | StSt |
| Material No. | 1.4301 |
| Angle material | **St** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Thread | M16 |
| Diameter of connection plate | 40 mm |
| Angle dimensions (l x w x d) | 50 x 50 x 5 mm |
| Total height | 105 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 38 |
| PU | 8 pc(s) |

### Flat steel earthing bridges D BEB 1



The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway line applications. This version is installed flush with the surface and the flat steel is welded to the earthing reinforcement via a defined welding seam. This earthing bridge also has a technical approval from DB Netz AG and can therefore be reliably used in planning.

| Type D ... | BEB 1 / EBS 15-03-19 | BEB 1 - L100 / EBS 15-03-19 |
|---|---|---|
| **Part No.** | **419 010** | **419 500** |
| Material of plate | StSt | StSt |
| Material No. | 1.4301 | 1.4301 |
| Material of socket | **St / Cu** | **St / Cu** |
| Material of flat steel | **S235** | **S235** |
| Short-circuit current | > 25 kA | > 25 kA |
| Test current | 40 kA / 100 ms | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA | 12.6 kA |
| Thread | M16 | M16 |
| Diameter of connection plate | 50 mm | 50 mm |
| Dimensions of flat steel | 400 x 40 x 5 mm | 100 x 40 x 5 mm |
| Total height | 58 mm | 58 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 30 | 3 Ebs 15.03.19 - 30 |
| PU | 1 pc(s) | 1 pc(s) |

## Flat steel earthing bridges D BEB 1-L



The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway line applications. This version is installed flush with the surface and the flat steel is welded to the earthing reinforcement via a defined welding seam. This earthing bridge also has a technical approval from DB Netz AG and can therefore be reliably used in planning.

| Type D ... | BEB 1-L / EBS 15-03-19 |
|---|---|
| **Part No.** | **419 011** |
| Material of plate | StSt |
| Material No. | 1.4301 |
| Material of socket | **St / Cu** |
| Material of flat steel | **S235** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Thread | M16 |
| Diameter of connection plate | 50 mm |
| Dimensions of flat steel | 402 x 40 x 5 mm |
| Total height | 58 mm |
| Installation height | 410 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 30 |
| PU | 1 pc(s) |

## Flat steel earthing bridges D BEB 1-NR



The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway line applications. This version is installed flush with the surface and the flat steel is welded to the earthing reinforcement via a defined welding seam. This earthing bridge also has a technical approval from DB Netz AG and can therefore be reliably used in planning.

| Type D ... | BEB 1-NR / EBS 15-03-19 |
|---|---|
| **Part No.** | **419 012** |
| Material of connection element | StSt |
| Material No. | 1.4301 |
| Material of flat steel | **S235** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Thread | M16 |
| Diameter of connection plate | 50 mm |
| Dimensions of flat steel | 400 x 50 x 5 mm |
| Total height | 63 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 36 |
| PU | 1 pc(s) |

## Reinforcing steel earthing bridges D BEB 2



The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway line applications. This version is installed flush with the surface and welded to the earthing reinforcement with the angled reinforcing steel, particularly in installation situations where space is critical. This earthing bridge also has a technical approval from DB Netz AG and can therefore be reliably used in planning.

| Type D ... | BEB 2 / EBS 15-03-19 |
|---|---|
| **Part No.** | **419 020** |
| Material of plate | StSt |
| Material No. | 1.4301 |
| Material of socket | **St / Cu** |
| Material of shaft | **reinforcing steel B500B** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Thread | M16 |
| Diameter of connection plate | 50 mm |
| Diameter of reinforcing steel | 16 mm |
| Installation height | 160 mm |
| Length | 400 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 31 |
| PU | 1 pc(s) |

## Reinforcing steel earthing bridges D BEB 3



The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway line applications. This version is installed flush with the surface and welded to the earthing reinforcement with the straight reinforcing steel. This earthing bridge also has a technical approval from DB Netz AG and can therefore be reliably used in planning.

| Type D ... | BEB 3 / EBS 15-03-19 |
|---|---|
| **Part No.** | **419 030** |
| Material of plate | StSt |
| Material No. | 1.4301 |
| Material of socket | **St / Cu** |
| Material of shaft | **reinforcing steel B500B** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Thread | M16 |
| Diameter of connection plate | 50 mm |
| Diameter of reinforcing steel | 16 mm |
| Length | 400 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 31 |
| PU | 1 pc(s) |

## Copper cable earthing bridges D BEB 4 / 5 *)



The earthing bridges are designed for earthing, return circuits and equipotential bonding in railway line applications. This version is installed flush with the surface, and with the copper-plated steel lug pressed on to the copper cable welded to the earthing reinforcement. The flexibility of the cable simplifies installation in the reinforcement for the user. The special FLEX versions are especially well suited for installation situations where space is critical – ultra flexible fine stranded copper cables are used here. These earthing bridges also have the technical approval of DB Netz AG and can be used there without hesitation in planning.

| **General technical data:** | |
|---|---|
| Material of plate | StSt |
| Material No. | 1.4301 |
| Material of socket | **St / Cu** |
| Material of lug | **St / Cu** |
| Material of cable | **Cu** |
| Standard | Ril 997.0205A01 |
| Thread | M16 |
| Diameter of connection plate | 50 mm |
| Dimensions of lug | 80 x 30 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 32 |

| **Type D ...** | **BEB 4 / EBS 15-03-19** | **BEB 4-FLEX / EBS 15-03-19** |
|---|---|---|
| **Part No.** | **419 040** | **419 041** |
| Short-circuit current | ≤ 25 kA | ≤ 25 kA |
| Test current | 25 kA / 100 ms | 25 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 7.9 kA | 7.9 kA |
| Cable | NYY-O | H07V-K |
| Cable cross-section | 70 mm² | 70 mm² |
| Cable diameter | 17 mm | 17 mm |
| Length | 500 mm | 500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 5 / EBS 15-03-19** | **BEB 5-FLEX / EBS 15-03-19** |
|---|---|---|
| **Part No.** | **419 050** | **419 051** |
| Short-circuit current | > 25 kA | > 25 kA |
| Test current | 40 kA / 100 ms | 40 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA | 12.6 kA |
| Cable | NYY-O | H07V-K |
| Cable cross-section | 95 mm² | 95 mm² |
| Cable diameter | 19 mm | 19 mm |
| Length | 500 mm | 500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 5 - L700 / EBS 15-03-19** | **BEB 5 - L1000 / EBS 15-03-19** |
|---|---|---|
| **Part No.** | **419 501** | **419 502** |
| Short-circuit current | > 25 kA | > 25 kA |
| Test current | 40 kA / 100 ms | 40 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA | 12.6 kA |
| Cable | NYY-O | NYY-O |
| Cable cross-section | 95 mm² | 95 mm² |
| Cable diameter | 19 mm | 19 mm |
| Length | 700 mm | 1000 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 5 - L1500 / EBS 15-03-19** | **BEB 5 - L2000 / EBS 15-03-19** |
|---|---|---|
| **Part No.** | **419 503** | **419 504** |
| Short-circuit current | > 25 kA | > 25 kA |
| Test current | 40 kA / 100 ms | 40 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA | 12.6 kA |
| Cable | NYY-O | NYY-O |
| Cable cross-section | 95 mm² | 95 mm² |
| Cable diameter | 19 mm | 19 mm |
| Length | 1500 mm | 2000 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Copper cable earthing bridges D BEB 6 / 7 *)



The earthing bridges are designed for earthing, return circuits and equipotential bonding in railway line applications. This version is used as an earthing bushing of components, with it being installed flush with the surface on both sides. The flexibility of the cable simplifies installation in the reinforcement for the user. The special FLEX versions are especially well suited for installation situations where space is critical – ultra flexible fine stranded copper cables are used here. These earthing bridges also have the technical approval of DB Netz AG and can be used there without hesitation in planning.

| **General technical data:** | |
|---|---|
| Material of plate | StSt |
| Material No. | 1.4301 |
| Material of socket | **St / Cu** |
| Material of cable | **Cu** |
| Standard | Ril 997.0205A01 |
| Thread | M16 |
| Diameter of connection plate | 50 mm |
| Length | 500 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 33 |

| **Type D ...** | **BEB 6 / EBS 15-03-19** | **BEB 6-FLEX / EBS 15-03-19** |
|---|---|---|
| **Part No.** | **419 060** | **419 061** |
| Short-circuit current | ≤ 25 kA | ≤ 25 kA |
| Test current | 25 kA / 100 ms | 25 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 7.9 kA | 7.9 kA |
| Cable | NYY-O | H07V-K |
| Cable cross-section | 70 mm² | 70 mm² |
| Cable diameter | 17 mm | 17 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 7 / EBS 15-03-19** | **BEB 7-FLEX / EBS 15-03-19** |
|---|---|---|
| **Part No.** | **419 070** | **419 071** |
| Short-circuit current | > 25 kA | > 25 kA |
| Test current | 40 kA / 100 ms | 40 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA | 12.6 kA |
| Cable | NYY-O | H07V-K |
| Cable cross-section | 95 mm² | 95 mm² |
| Cable diameter | 19 mm | 19 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Reinforcing steel earthing bridges D BEB 8



The earthing bridges are designed for earthing, current return circuits and equipotential bonding in railway line applications. This version is installed flush with the surface and the reinforcing steel is welded to the earthing reinforcement. The sockets mounted on both ends allow effective and economical component feed-through. This earthing bridge also has a technical approval from DB Netz AG and can therefore be reliably used in planning.

| **Type D ...** | **BEB 8 / EBS 15-03-19** |
|---|---|
| **Part No.** | **419 080** |
| Material of plate | StSt |
| Material No. | 1.4301 |
| Material of socket | **St / Cu** |
| Material of shaft | **reinforcing steel B500B** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Thread | M16 |
| Diameter of connection plate | 50 mm |
| Diameter of reinforcing steel | 16 mm |
| Length | 500 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 33 |
| PU | 1 pc(s) |

## Copper cable earthing bridges D BEB 9 / 10 *)



The earthing bridges are designed for earthing, return circuits and equipotential bonding in railway line applications. This version establishes a non-visible connection within the concrete due to the copper-plated steel lugs that are pressed onto the copper cable being welded to the earthing reinforcement. The flexibility of the cable simplifies installation in the reinforcement for the user. The special FLEX versions are especially well suited for installation situations where space is critical – ultra flexible fine stranded copper cables are used here. These earthing bridges also have the technical approval of DB Netz AG and can be used there without hesitation in planning.

| **General technical data:** | |
|---|---|
| Material of lug | **St / Cu** |
| Material of cable | **Cu** |
| Standard | Ril 997.0205A01 |
| Dimensions of lug | 80 x 30 mm |
| DB drawing No. | 3 Ebs 15.03.19 - 33 |

| **Type D ...** | **BEB 9 / EBS 15-03-19** | **BEB 9-FLEX / EBS 15-03-19** |
|---|---|---|
| **Part No.** | **419 090** | **419 091** |
| Short-circuit current | ≤ 25 kA | ≤ 25 kA |
| Test current | 25 kA / 100 ms | 25 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 7.9 kA | 7.9 kA |
| Cable | NYY-O | H07V-K |
| Cable cross-section | 70 mm² | 70 mm² |
| Cable diameter | 17 mm | 17 mm |
| Length | 500 mm | 500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 10 / EBS 15-03-19** | **BEB 10-FLEX / EBS 15-03-19** |
|---|---|---|
| **Part No.** | **419 100** | **419 101** |
| Short-circuit current | > 25 kA | > 25 kA |
| Test current | 40 kA / 100 ms | 40 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA | 12.6 kA |
| Cable | NYY-O | H07V-K |
| Cable cross-section | 95 mm² | 95 mm² |
| Cable diameter | 19 mm | 19 mm |
| Length | 500 mm | 500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 10 - L800 / EBS 15-03-19** |
|---|---|
| **Part No.** | **419 505** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Cable | NYY-O |
| Cable cross-section | 95 mm² |
| Cable diameter | 19 mm |
| Length | 800 mm |
| PU | 1 pc(s) |

*) Special lengths are available on request:
up to 500 mm total length in steps of 50 mm and
from 500 mm total length in steps of 100 mm.

## Earthing bridge for earthing large pipes D BEB 11 *)



The earthing bridges are designed for earthing, return circuits and equipotential bonding in railway line applications. The version for earthing large pipes is intended for use with pile and large pipe foundations. The product consists of a copper cable with a pressed-on sleeve and stainless steel connection plate with integrated boreholes for the formwork fixing at one end, and a cable lug at the opposite end. The cable lug is used to establish a short-circuit-resistant connection to the pile or large pipe foundation. The flexibility of the cable simplifies installation in the reinforcement for the user. This earthing bridge also has the technical approval of DB Netz AG and can be used there without hesitation in planning.

| **Type D ...** | **BEB 11 / EBS 15-03-27** | **BEB 11 - L1000 / EBS 15-03-27** |
|---|---|---|
| **Part No.** | **419 110** | **419 506** |
| Material of plate | **StSt** | **StSt** |
| Material No. | 1.4301 | 1.4301 |
| Material of socket | **St / Cu** | **St / Cu** |
| Material of cable lug | **Cu/gal Sn** | **Cu/gal Sn** |
| Material of cable | **Cu** | **Cu** |
| Short-circuit current | ≤ 25 kA | ≤ 25 kA |
| Test current | 25 kA / 100 ms | 25 kA / 100 ms |
| Standard | Ril 997.0205A01 | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 7.9 kA | 7.9 kA |
| Thread | M16 | M16 |
| Diameter of connection plate | 50 mm | 50 mm |
| Cable | NYY-O | NYY-O |
| Cable cross-section | 70 mm² | 70 mm² |
| Cable diameter | 17 mm | 17 mm |
| Borehole cable lug | 13 mm | 13 mm |
| Length | 500 mm | 1000 mm |
| DB drawing No. | 4 Ebs 15.03.27 - 2 | 4 Ebs 15.03.27 - 2 |
| PU | 1 pc(s) | 1 pc(s) |

## Steel cable earthing connector D BEB 26 *)



The earthing connectors are designed for earthing, return circuits and equipotential bonding in railway line applications. The halogen-free (sheathed) version D BEB 26 – for the external connection of earthing points or other parts to be earthed – consists of a steel cable as an earthing conductor and is thus a preventive anti-theft measure. This earthing connector also has the technical approval of DB Netz AG and can be used there without hesitation in planning.

| **Type D ...** | **BEB 26 / EBS 15-03-17** |
|---|---|
| **Part No.** | **419 260** |
| Material of cable lug | **Cu/gal Sn** |
| Material of rope | **St** |
| Short-circuit current | ≤ 25 kA |
| Test current | 25 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 7.9 kA |
| Rope | **1-12-12 B 350 sZ PE** |
| Rope cross-section | ≥ 95 mm² |
| Design | halogen-free |
| Cable diameter | 17 mm |
| Borehole cable lug | 17 mm |
| Length | 500 mm |
| DB drawing No. | 3 Ebs 15.03.17 - 11 |
| PU | 1 pc(s) |

## CuStAl cable earthing connection D BEB 29 *)



The earthing connectors are designed for earthing, return circuits and equipotential bonding in railway line applications. The halogen-free version D BEB 29 / the halogen-free and flame-retardant version D BEB 29-NF – for the external connection of earth connection points and other connection elements – is designed with a cable lug version for M16 connections. These earthing connectors consist of a copper-steel-aluminium cable, thus representing a preventive anti-theft measure. These earthing connectors also have the technical approval of DB Netz AG and can be used there without hesitation in planning. With the halogen-free and flame-retardant version, use in tunnels is possible as per EU regulations.

| **General technical data:** | |
|---|---|
| Material of cable lug | **Cu/gal Sn** |
| Material of cable | **CuStAl** |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 12.6 kA |
| Cable cross-section | ≥ 70 mm² |
| Cable diameter | 17 mm |
| DB drawing No. | 4 Ebs 15.03.17 - 6 (Bayka) |

| **Type D ...** | **BEB 29 / EBS 15-03-17** | **BEB 29-NF / EBS 15-03-17** |
|---|---|---|
| **Part No.** | **419 290** | **419 291** |
| Cable | **(N)2X RF CuStAl** | **B2ca RF CuStAl** |
| Design | halogen-free | halogen-free and flame-retardant |
| Borehole cable lug | 17 mm | 17 mm |
| Design cable lug | – | – |
| Length | 500 mm | 500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 29 - L350 / EBS 15-03-17** | **BEB 29 - L800 / EBS 15-03-17** |
|---|---|---|
| **Part No.** | **419 507** | **419 508** |
| Cable | **(N)2X RF CuStAl** | **(N)2X RF CuStAl** |
| Design | halogen-free | halogen-free |
| Borehole cable lug | 17 mm | 17 mm |
| Design cable lug | – | – |
| Length | 350 mm | 800 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 29 M12 M16 / EBS 15-03-17** | **BEB 29-NF M12 M16 / EBS 15-03-17** |
|---|---|---|
| **Part No.** | **419 511** | **419 512** |
| Cable | **(N)2X RF CuStAl** | **B2ca RF CuStAl** |
| Design | halogen-free | halogen-free and flame-retardant |
| Borehole cable lug | 13 mm for M12 and 17 mm for M16 | 13 mm for M12 and 17 mm for M16 |
| Design cable lug | – | – |
| Length | 500 mm | 500 mm |
| PU | 1 pc(s) | 1 pc(s) |

| **Type D ...** | **BEB 29 R / EBS 15-03-17** | **BEB 29 L / EBS 15-03-17** |
|---|---|---|
| **Part No.** | **419 513** | **419 514** |
| Cable | **(N)2X RF CuStAl** | **(N)2X RF CuStAl** |
| Design | halogen-free | halogen-free |
| Borehole cable lug | 17 mm | 17 mm |
| Design cable lug | rotated 90° right | rotated 90° left |
| Length | 500 mm | 500 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Earthing connector for earthing large pipes D BEB 40 *)



The earthing connectors are designed for earthing, return circuits and equipotential bonding in railway line applications. The version for earthing large pipes is designed for use with pile and large pipe foundations. The product consists of a steel cable with a copper-plated steel lug at one end and a cable lug at the other end. A heat-shrinkable sleeve at the welding lug end prevents water from penetrating the steel cable. The steel cable is therefore a preventative anti-theft measure. This earthing connector also has the technical approval of DB Netz AG and can be used there without hesitation in planning.

| **Type D ...** | **BEB 40 / EBS 15-03-25** |
|---|---|
| **Part No.** | **419 400** |
| Material of lug | **St / Cu** |
| Material of cable lug | **Cu/gal Sn** |
| Material of rope | **St** |
| Short-circuit current | ≤ 25 kA |
| Test current | 25 kA / 100 ms |
| Standard | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300°C) | 7.9 kA |
| Rope cross-section | 95 mm² |
| Cable diameter | 17 mm |
| Dimensions of lug | 80 x 30 mm |
| Borehole cable lug | 17 mm |
| Length | 500 mm |
| DB drawing No. | 4 Ebs 15.03.25 - 4 |
| PU | 1 pc(s) |

*) Special lengths are available on request:
up to 500 mm total length in steps of 50 mm and
from 500 mm total length in steps of 100 mm.

## Adhesive pad

The adhesive pad is used to fix railway earthing products to the formwork by means of an adhesive connection. The adhesive pad can be stuck to the StSt connection plate of D BEB 0 and is then connected to the formwork itself.



| Type D ... | KLP D50 BEB |
|---|---|
| **Part No.** | **419 900** |
| Diameter | 50 mm |
| PU | 1 pc(s) |

## Earthing sticker

The earthing sticker is a spare part for marking installed railway earthing products. It is simply stuck to the StSt connection plate. This kind of marking can be used for earthing bridges D BEB 1 to 8 as well as for the D BEB 11 version for earthing large pipes if the sticker applied in the factory has fallen off or is damaged.




| Type D ... | EAK D50 BEB |
|---|---|
| **Part No.** | **419 901** |
| Diameter | 50 mm |
| PU | 1 pc(s) |

## Hexagon screw



| Type D ... | SKS M16X30 V4A |
|---|---|
| **Part No.** | **419 902** |
| Material | StSt (V4A) |
| Thread | M16 x 30 mm |
| PU | 1 pc(s) |

## Hexagon nut



| Type D ... | SKM M16 V4A |
|---|---|
| **Part No.** | **419 903** |
| Material | StSt (V4A) |
| Thread | M16 |
| PU | 1 pc(s) |

## Washer



| Type D ... | SCH A17 V4A |
|---|---|
| **Part No.** | **419 904** |
| Material | StSt (V4A) |
| Outer diameter | 30 mm |
| Inner diameter | 17 mm |
| PU | 1 pc(s) |

# Short-circuit wire on fences/gabions with accessories

Objects in the area where the overhead contact line breaks that do not have sufficient short-circuit current carrying capacity put people and installations at risk. These conductive bodies, e.g., metal boundaries or fences, must be equipped with an additional, sufficiently dimensioned conductors. This is done using a short-circuit wire. It is installed on fences or boundaries and triggers a defined short-circuit in the event of a broken overhead contact line. Short-circuit wires are also used in tunnel building and for noise barriers. The necessary installation accessories, like the press connector and conductor holder, round off the full package.

## Short-circuit wire

Short-circuit wire for use with short-circuit currents less than 15 kA with a diameter of 10 mm and for use with short-circuit currents greater than 15 kA with a diameter of 16 mm. The short-circuit wires meet the requirements of Ril 997.0205.



| General technical data: | | |
|---|---|---|
| Material | | **HDG steel** |
| DB drawing No. | | 3 EBS 15.03.42 |

| Type | RD 10 STTZN L2950 / 3 EBS 15.03.42 | FS 16 2000 STTZN |
|---|---|---|
| **Part No.** | **419 752** | **483 200** |
| Diameter | 10 mm | 16 mm |
| Length (l1) | 2950 mm | 2000 mm |
| Standard | Ril 997.0204/0205 | Ril 997.0204/0205, DIN EN 62561-2 |
| PU | 10 pc(s) | 1 pc(s) |

| Type | RD 16 STTZN L5950 / 3 EBS 15.03.42 |
|---|---|
| **Part No.** | **419 753** |
| Diameter | 16 mm |
| Length (l1) | 5950 mm |
| Standard | Ril 997.0204/0205 |
| PU | 1 pc(s) |

## Conductor holder

Conductor holder for fixing short-circuit wires to stone gabions and steel grid fences.



| Type | PH 6.22 FRM10X40 FR STTZN/3 EBS 15.03.44 | LH DQ 16 KBG 4.8 W STTZN/3 EBS 15.03.47 |
|---|---|---|
| **Part No.** | **419 751** | **419 750** |
| Clamp material | **HDG steel** | **HDG steel** |
| Clamp Rd / Rd clamping range | 6-22 mm | – |
| Bar clamping range | – | 4-8 mm |
| Clamping range Rd | – | 10-16 mm |
| Screw | M10 x 40 | M8 x 25 mm, M8 x 35 mm |
| Material of screw / nut | – | StSt |
| Screw / spring washer material | StSt | – |
| Material of nut / washer | StSt | – |
| Material thickness | – | 3 mm |
| Design with | – | Spring washer and spherical washer |
| DB drawing No. | 3 EBS 15.03.44 | 3 EBS 15.03.47 |
| Standard | Ril 997.0204/0205 | Ril 997.0204/0205 |
| PU | 50 pc(s) | 50 pc(s) |

## Press connector

Aluminium press connector for connecting railway earthing conductors as per 4 EBS 15.03.43.



| General technical data: | |
|---|---|
| Material | Al |
| Press insert | See EBS drawing |
| Pressing force as per | 3 Ebgw 05.30 |
| DB drawing No. | 4 EBS 15.03.43 |
| Standard | Ril 997.0204/0205 |

| Type | PRV RD10 RD10 L133 AL / 4 EBS 15.03.43 | PRV RD16 RD16 L143 AL / 4 EBS 15.03.43 |
|---|---|---|
| **Part No.** | **419 760** | **419 761** |
| Short-circuit wire / short-circuit wire connection | Ø10 mm / Ø10 mm | Ø16 mm / Ø16 mm |
| Earthing cable / short-circuit wire connection | – | – |
| Outer diameter | 25 mm | 32 mm |
| Inner diameter | 13 mm | 17 mm |
| Length (l1) | 133 mm | 143 mm |
| DB no. | 987845 | 1449223 |
| PU | 3 pc(s) | 3 pc(s) |

| Type | PRV RD10 110 L133 AL / 4 EBS 15.03.43 | PRV RD16 110 L143 AL / 4 EBS 15.03.43 |
|---|---|---|
| **Part No.** | **419 762** | **419 763** |
| Short-circuit wire / short-circuit wire connection | – | – |
| Earthing cable / short-circuit wire connection | 100/110 mm² / Ø10 mm | 100/110 mm² / Ø16 mm |
| Outer diameter | 25 mm | 32 mm |
| Inner diameter | 11/13 mm | 15/17 mm |
| Length (l1) | 133 mm | 143 mm |
| DB no. | 987879 | 1449206 |
| PU | 3 pc(s) | 3 pc(s) |

## Railway earthing cable

Aluminium railway earthing cable as per EBS 15.03.17-3 with visual identification using blue stripes.



| Type | EK 110 L25M AL / 3 EBS 15.03.17-3 | EK 110 L50M AL / 3 EBS 15.03.17-3 |
|---|---|---|
| **Part No.** | **419 758** | **419 759** |
| Material of conductor | AlMg(St) | AlMg(St) |
| Sheath material | PVC | PVC |
| Colour of conductor | black ● (with blue ● longitudinal stripes) | black ● (with blue ● longitudinal stripes) |
| Cross-section of core (stranded) | 110 mm² | 110 mm² |
| Cable length (coil) | 25 m | 50 m |
| Coating characteristics | UV-stabilised and weather resistant | UV-stabilised and weather resistant |
| DB no. | 965121 | 965121 |
| DB drawing No. | 3 EBS 15.03.17-3 | 3 EBS 15.03.17-3 |
| Standard | Ril 997.0204/0205 | Ril 997.0204/0205 |
| PU | 1 pc(s) | 1 pc(s) |

## Bell mouth cable lugs

Aluminium bell mouth cable lug as per 3 EBS 15.03.22-1, available in versions M10 / M12 for railway earthing cables.



| Type | GKS 110 12 AL / 3 EBS 15.03.22-1 | GKS 110 16 AL / 3 EBS 15.03.22-1 |
|---|---|---|
| **Part No.** | **419 765** | **419 766** |
| Material | Al | Al |
| Outer diameter | 25 mm | 25 mm |
| Inner diameter | 22 mm | 22 mm |
| Length (l1) | 119 mm | 119 mm |
| Material of conductor | AlMgSt | AlMgSt |
| Sheath material | (N)A(St)YY-O | (N)A(St)YY-O |
| Conductor cross-section | 110 mm² | 110 mm² |
| Cable lug hole | 13 mm (M12) | 17 mm (M16) |
| Press insert | See EBS drawing | See EBS drawing |
| Pressing force as per | 3 Ebgw 05.30 | 3 Ebgw 05.30 |
| DB no. | 1219081 | 1219082 |
| DB drawing No. | 3 EBS 15.03.22-1 | 3 EBS 15.03.22-1 |
| Standard | Ril 997.0204/0205 | Ril 997.0204/0205 |
| PU | 3 pc(s) | 3 pc(s) |

## Bare steel strip

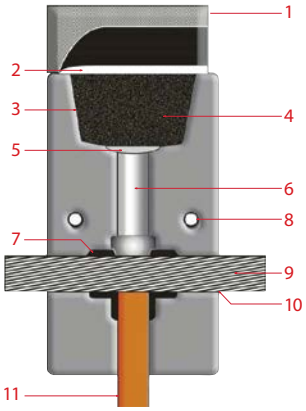


| Type BA ... | 50X4 ST R30M |
|---|---|
| **Part No.** | **810 503** NEW |
| Width | 50 mm |
| Thickness | 4 mm |
| Cross-section | 200 mm² |
| Material | St/bare (S235 JR) |
| Short-circuit current | > 25 kA |
| Test current | 40 kA / 100 ms |
| Standard | DIN EN 62561-2 (VDE 0185-561-2) |
| Guideline | Ril 997.0205A01 |
| Short-circuit current (AC 50 Hz / DC) (1 s; ≤ 300 °C) | 14 kA |
| Coil weight | approx. 50 kg |
| Length tolerance | +/- 5% |
| PU | 30 m |



## The Exothermic Welding Process

The exothermic welding process, also known as thermite welding and alumina-thermic welding is a simple, self-contained method of forming high quality electrical connections of various metals such as copper to copper, copper to steel and steel to steel.
Connections are made inside a semi-permanent graphite mold, using the high temperature reaction of powdered copper oxide and aluminum.
The process is simple as it is effective. The method employs an exothermic reaction to create heat, usually triggered by a flint/spark igniter, which ignites and then melts the copper welding powder. The molten copper welding powder becomes the welding material, covering the metals to be connected. The metals themselves melt under the heat of the welding material, and then set as a full molecular bond with the copper welding material. The melting or fusing temperature rating of the joint is up to 2.000 °C.




1. Mould Cover
2. Starting Powder
3. Mould Cup
4. Weldmetal Powder
5. Steel Retaining Disc
6. Tap Hole
7. Weld Chamber
8. Locating Pin
9. Cable (conductor)
10. Earth Rod
11. Conductor Area

This method does not need an external source of power or heat to operate. The connections will not loosen over time or deteriorate with age. The connection's current carrying capability is similar to that of a conductor. In other words, there is no increase in resistance in an exothermically welded connection as there is in most pressure connections. In addition, this is a low labor cost procedure with no special skills requirement.
The molds are designed to complete 50-60 connections, depending on the care given to the mold during usage, transport and storage.

## Main Components

The exothermic welding process is carried out by using Graphite Molds, Welding Powders, Handle Clamps and various safety and ignition tools.

## Molds

A graphite mold is used for exothermic welding connections. The mold controls the direction and speed of the molten weld metal flow and the formation of the weld. The graphite used is a high temperature type that lasts for an average of 50 or more welding connections under normal usage.



## Weldmetals

Weldmetals consists of copper oxide, aluminum and flux in powder form. The powders are packed into plastic containers and the quantity is pre-determined by the factory for specific connections. The weldmetal is packed under the white cap of the container and the ignition powder is packed under the red cap.

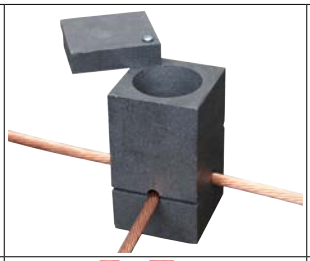
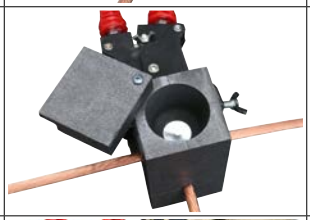


## Handle clamps & Tools

Handle clamps are used to fix the mold during welding process. As the mold gets very hot during the welding process, the securing clamp and screws secure the mold to the handle clamp. special tools kit are in general used to ignite the powder, clean the mold after each weld in addition to personal safety gloves



## Welding Process in 4 steps

| | | |
|---|---|---|
| 1. |  | **Step 1:** Clean the conductors to be welded. Place the cables into position in the mold. |
| 2. |  | **Step 2:** Close the handle clamp to lock the mold. Place the disk into position in the mold. |
| 3. |  | **Step 3:** Place the weld metal into the mold. Sprinkle the starting powder over the weld metal and on the lip of the mold. |
| 4. |  | **Step 4:** Close the cover and ignite using flint ignitor. Open the mold after the metal solidifies. Remove the slag from the mold before making the next connection. |

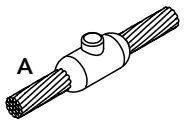
DEHN provide molds to suit all connections, some of which are displayed in this section of our catalogue. For other specifications, please contact your local partner.

## Exothermic moulds

The DEHN Graphite Mould is used for welding connections. The mould controls the direction and speed of the molten weld metal flow and the formation of the weld. The graphite used is a high temperature type that lasts for an average of 50 or more welding connection under normal usage.
Mounted on the side of the mould is the name plate indicating the size of the conductors, type of connection and the size of the weld metal to be used.

**Note:**
1. No alteration whatsoever may be done to the mould.
2. Mould must be absolutely dry used.
3. Water or moisture are dangerous in molten metal environment.

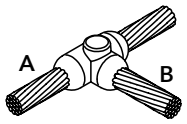
### Cable to cable "Straight" joint




| General technical data: | |
|---|---|
| Material | **Carbon graphite** |
| Temperature withstand | **2000 °C** |
| Price key | D |

| Type | MCCS050 | MCCS070 | MCCS120 |
|---|---|---|---|
| **Part No.** | **148 210** | **148 211** | **148 212** |
| Size | 50 mm² (A) | 70 mm² (A) | 120 mm² (A) |
| PU | 1 pc(s) | 1 pc(s) | 1 pc(s) |

### Cable to cable "T" joint




| General technical data: | |
|---|---|
| Material | **Carbon graphite** |
| Temperature withstand | **2000 °C** |
| Price key | D |

| Type | MCCT025/025 | MCCT050/016 |
|---|---|---|
| **Part No.** | **148 140** | **148 141** |
| Size | 25 mm² (A) to 25 mm² (B) | 50 mm² (A) to 16 mm² (B) |
| PU | 1 pc(s) | 1 pc(s) |

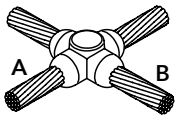
| Type | MCCT050/035 | MCCT050/050 |
|---|---|---|
| **Part No.** | **148 142** | **148 143** |
| Size | 50 mm² (A) to 35 mm² (B) | 50 mm² (A) to 50 mm² (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MCCT070/050 | MCCT070/070 |
|---|---|---|
| **Part No.** | **148 144** | **148 145** |
| Size | 70 mm² (A) to 50 mm² (B) | 70 mm² (A) to 70 mm² (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MCCT095/070 | MCCT120/070 |
|---|---|---|
| **Part No.** | **148 146** | **148 147** |
| Size | 95 mm² (A) to 70 mm² (B) | 120 mm² (A) to 70 mm² (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MCCT120/120 |
|---|---|
| **Part No.** | **148 148** |
| Size | 120 mm² (A) to 120 mm² (B) |
| PU | 1 pc(s) |

### Cable to cable "Cross" joint



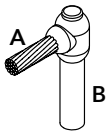

| General technical data: | |
|---|---|
| Material | **Carbon graphite** |
| Temperature withstand | **2000 °C** |
| Price key | D |

| Type | MCCX050/050 | MCCX070/050 |
|---|---|---|
| **Part No.** | **148 150** | **148 151** |
| Size | 50 mm² (A) to 50 mm² (B) | 70 mm² (A) to 50 mm² (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MCCX120/050 | MCCX120/070 |
|---|---|---|
| **Part No.** | **148 152** | **148 153** |
| Size | 120 mm² (A) to 50 mm² (B) | 120 mm² (A) to 70 mm² (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MCCX120/120 |
|---|---|
| **Part No.** | **148 154** |
| Size | 120 mm² (A) to 120 mm² (B) |
| PU | 1 pc(s) |

### Cable to earth rod "L" joint




| General technical data: | |
|---|---|
| Material | **Carbon graphite** |
| Temperature withstand | **2000 °C** |
| Price key | D |

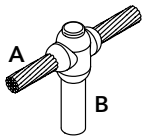
| Type | MERL017.2/016 | MERL017.2/035 |
|---|---|---|
| **Part No.** | **148 120** | **148 121** |
| Size | 16 mm² (A) to 3/4" rod (B) | 35 mm² (A) to 3/4" rod (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MERL017.2/070 | MERL017.2/120 |
|---|---|---|
| **Part No.** | **148 122** | **148 123** |
| Size | 70 mm² (A) to 3/4" rod (B) | 120 mm² (A) to 3/4" rod (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MERL014.2/070 |
|---|---|
| **Part No.** | **148 124** |
| Size | 70 mm² (A) to 5/8" rod (B) |
| PU | 1 pc(s) |

Suitable copper-bonded rod connections - for connections to solid copper and stainless steel rods, please enquire with our sales office.
Thread of copperbonded rod must be removed prior to welding.

### Cable to earth rod "T" joint



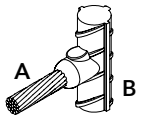

| General technical data: | |
|---|---|
| Material | **Carbon graphite** |
| Temperature withstand | **2000 °C** |
| Price key | D |

| Type | MERT017.2/050 | MERT017.2/070 |
|---|---|---|
| **Part No.** | **148 130** | **148 131** |
| Size | 50 mm² (A) to 3/4" rod (B) | 70 mm² (A) to 3/4" rod (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MERT014.2/070 |
|---|---|
| **Part No.** | **148 132** |
| Size | 70 mm² (A) to 5/8" rod (B) |
| PU | 1 pc(s) |

Suitable copper-bonded rod connections - for connections to solid copper and stainless steel rods, please enquire with our sales office.
Thread of copperbonded rod must be removed prior to welding.

## Cable to reinforcement "T" joint



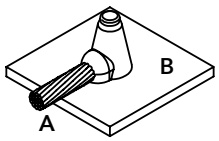

| General technical data: | |
|---|---|
| Material | **Carbon graphite** |
| Temperature withstand | **2000 °C** |
| Price key | D |

| Type | MCRV/35 | MCRV/50 |
|---|---|---|
| **Part No.** | **148 110** | **148 111** |
| Size | 35 mm² (A) to 10-40 mm (B) | 50 mm² (A) to 10-40 mm (B) |
| PU | 1 pc(s) | 1 pc(s) |

| Type | MCRV/70 | MCRV/95 |
|---|---|---|
| **Part No.** | **148 112** | **148 113** |
| Size | 70 mm² (A) to 10-40 mm (B) | 95 mm² (A) to 10-40 mm (B) |
| PU | 1 pc(s) | 1 pc(s) |

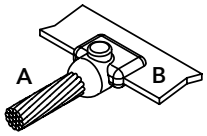
| Type | MCRV/120 |
|---|---|
| **Part No.** | **148 114** |
| Size | 120 mm² (A) to 10-40 mm (B) |
| PU | 1 pc(s) |

## Cable to steel surface joint




| Type | MCS1H050 | MCS1H070 |
|---|---|---|
| **Part No.** | **148 100** | **148 101** |
| Size | 50 mm² (A) to steel (B) | 70 mm² (A) to steel (B) |
| Material | **Carbon graphite** | **Carbon graphite** |
| Temperature withstand | **2000 °C** | **2000 °C** |
| Price key | D | D |
| PU | 1 pc(s) | 1 pc(s) |

## Cable to bar "T" joint

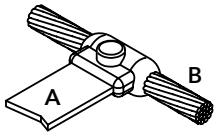



| General technical data: | |
|---|---|
| Material | **Carbon graphite** |
| Temperature withstand | **2000 °C** |
| Price key | D |

| Type | MBCT070/025X3 | MBCT240/050X6 |
|---|---|---|
| **Part No.** | **148 200** | **148 201** |
| Size | 70 mm² (A) to 25 x 3 mm (B) | 240 mm² (A) to 50 x 6 mm (B) |
| PU | 1 pc(s) | 1 pc(s) |

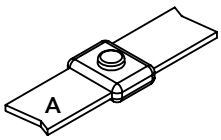
| Type | MBCT300/050X6 |
|---|---|
| **Part No.** | **148 202** |
| Size | 300 mm² (A) to 50 x 6 mm (B) |
| PU | 1 pc(s) |

## Bar to cable "T" joint



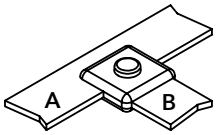

| Type | MCBT050/025X3 | MCBT070/025X3 |
|---|---|---|
| **Part No.** | **148 160** | **148 161** |
| Size | 25 x 3 mm (A) to 50 mm² (B) | 25 x 3 mm (A) to 70 mm² (B) |
| Material | **Carbon graphite** | **Carbon graphite** |
| Temperature withstand | **2000 °C** | **2000 °C** |
| Price key | D | D |
| PU | 1 pc(s) | 1 pc(s) |

## Bar to bar "Straight" joint



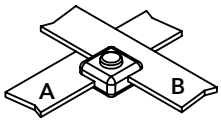

| Type | MB3B25X3 | MB3B50X6 |
|---|---|---|
| **Part No.** | **148 180** | **148 181** |
| Size | 25 x 3 mm (A) | 50 x 6 mm (A) |
| Material | **Carbon graphite** | **Carbon graphite** |
| Temperature withstand | **2000 °C** | **2000 °C** |
| Price key | D | E |
| PU | 1 pc(s) | 1 pc(s) |

## Bar to bar "T" joint




| Type | MB5B25X3/25X3 | MB5B50X6/50X6 |
|---|---|---|
| **Part No.** | **148 190** | **148 191** |
| Size | 25 x 3 mm (A) to 25 x 3 mm (B) | 50 x 6 mm (A) to 50 x 6 mm (B) |
| Material | **Carbon graphite** | **Carbon graphite** |
| Temperature withstand | **2000 °C** | **2000 °C** |
| Price key | D | E |
| PU | 1 pc(s) | 1 pc(s) |

## Bar to bar "Cross" joint




| Type | MB4B25X3/25X3 | MB4B50X6/50X6 |
|---|---|---|
| **Part No.** | **148 170** | **148 171** |
| Size | 25 x 3 mm (A) to 25 x 3 mm (B) | 50 x 6 mm (A) to 50 x 6 mm (B) |
| Material | **Carbon graphite** | **Carbon graphite** |
| Temperature withstand | **2000 °C** | **2000 °C** |
| Price key | D | E |
| PU | 1 pc(s) | 1 pc(s) |

## Exothermic powders

DEHN Weld Metal is a mixture of copper oxide and aluminium, packaged by size in individual plastic tubes.
Depending on the required connection type and conductor specifications, varying weld metal sizes will be required.



### Weld Metal

| Type | XWM045REG | XWM065REG |
|---|---|---|
| **Part No.** | **148 010** | **148 011** |
| Powder weight per tube | 45 g | 65 g |
| Tubes per box | 20 | 10 |
| Powder weight per box | 900 g | 650 g |
| PU | 1 pc(s) | 1 pc(s) |

| Type | XWM090REG | XWM115REG |
|---|---|---|
| **Part No.** | **148 012** | **148 013** |
| Powder weight per tube | 90 g | 115 g |
| Tubes per box | 10 | 10 |
| Powder weight per box | 900 g | 1150 g |
| PU | 1 pc(s) | 1 pc(s) |

| Type | XWM150REG | XWM200REG |
|---|---|---|
| **Part No.** | **148 014** | **148 015** |
| Powder weight per tube | 150 g | 200 g |
| Tubes per box | 10 | 10 |
| Powder weight per box | 1500 g | 2000 g |
| PU | 1 pc(s) | 1 pc(s) |

| Type | XWM250REG |
|---|---|
| **Part No.** | **148 016** |
| Powder weight per tube | 250 g |
| Tubes per box | 10 |
| Powder weight per box | 2500 g |
| PU | 1 pc(s) |

## Handle clamps

Mould securing clamp and screw, if eye bolt is screwed out (anti-clock wise) handle clamp will tighten mould clamping.
Handle clamps are an essential part of the welding process for the following reasons:

1. Handle clamps have a vice grip type locking arrangement which allows the operator to free his hands.
2. When repetitive welding takes place the mould becomes far too hot to handle (wear your safety gloves).
3. Mould securing clamps hold hot mould parts to the handle clamp securely, allowing easy cleaning.

### Clamps for moulds

Handle Clamps such as the one shown below are required for most molds. Two types of clamp are offered, as shown in table below. For some molds, specialized frames with handles are required.

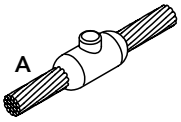


| Type | GHC/1 | GHC/2 |
|---|---|---|
| **Part No.** | **148 998** | **148 999** |
| Description | For mould Typ D | For mould Typ E |
| Application | To clamp the mould correctly for welding | To clamp the mould correctly for welding |
| Pack dimension | 270 x 120 x 85 mm | 280 x 115 x 100 mm |
| PU | 1 pc(s) | 1 pc(s) |

## Selection Guide

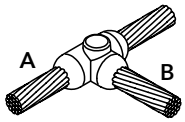
DEHN provide molds to suit all connections, some of which are displayed in this section of our catalogue.
Bolded Part No. are in stock, all other can be ordered on demand.
For more specification please contact your local partner.

### Cable to cable "Straight" joint



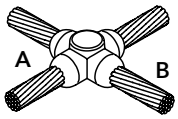

| Part No. | Conductor Size "A" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|
| 148 213 | 16 mm² | 32 | No. 148 998 | D |
| 148 214 | 25 mm² | 32 | No. 148 998 | D |
| 148 215 | 35 mm² | 32 | No. 148 998 | D |
| **148 210** | **50 mm²** | **45** | **No. 148 998** | **D** |
| **148 211** | **70 mm²** | **65** | **No. 148 998** | **D** |
| 148 216 | 95 mm² | 90 | No. 148 998 | D |
| **148 212** | **120 mm²** | **115** | **No. 148 998** | **D** |
| 148 217 | 150 mm² | 115 | No. 148 998 | D |
| 148 218 | 185 mm² | 150 | No. 148 998 | D |
| 148 219 | 240 mm² | 200 | No. 148 998 | D |
| 148 410 | 300 mm² | 250 | No. 148 998 | D |
| 148 411 | 400 mm² | 2 x 150 | No. 148 999 | E |

### Cable to cable "T" joint



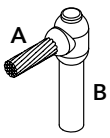

| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 149 | 16 mm² | 16 mm² | 45 | No. 148 998 | D |
| **148 140** | **25 mm²** | **25 mm²** | **45** | **No. 148 998** | **D** |
| 148 340 | 35 mm² | 25 mm² | 45 | No. 148 998 | D |
| 148 341 | 35 mm² | 35 mm² | 45 | No. 148 998 | D |
| **148 141** | **50 mm²** | **16 mm²** | **45** | **No. 148 998** | **D** |
| 148 342 | 50 mm² | 25 mm² | 65 | No. 148 998 | D |
| **148 142** | **50 mm²** | **35 mm²** | **65** | **No. 148 998** | **D** |
| **148 143** | **50 mm²** | **50 mm²** | **90** | **No. 148 998** | **D** |
| 148 343 | 70 mm² | 25 mm² | 65 | No. 148 998 | D |
| 148 344 | 70 mm² | 35 mm² | 65 | No. 148 998 | D |
| **148 144** | **70 mm²** | **50 mm²** | **90** | **No. 148 998** | **D** |
| **148 145** | **70 mm²** | **70 mm²** | **90** | **No. 148 998** | **D** |
| 148 345 | 95 mm² | 35 mm² | 90 | No. 148 998 | D |
| 148 346 | 95 mm² | 50 mm² | 90 | No. 148 998 | D |
| **148 146** | **95 mm²** | **70 mm²** | **90** | **No. 148 998** | **D** |
| 148 347 | 95 mm² | 95 mm² | 115 | No. 148 998 | D |
| 148 348 | 120 mm² | 50 mm² | 90 | No. 148 998 | D |
| **148 147** | **120 mm²** | **70 mm²** | **90** | **No. 148 998** | **D** |
| 148 349 | 120 mm² | 95 mm² | 150 | No. 148 998 | D |
| **148 148** | **120 mm²** | **120 mm²** | **150** | **No. 148 998** | **D** |
| 148 540 | 150 mm² | 70 mm² | 90 | No. 148 998 | D |
| 148 541 | 150 mm² | 95 mm² | 150 | No. 148 998 | D |
| 148 542 | 150 mm² | 120 mm² | 150 | No. 148 998 | D |
| 148 543 | 150 mm² | 150 mm² | 200 | No. 148 998 | D |
| 148 544 | 185 mm² | 95 mm² | 150 | No. 148 998 | D |
| 148 545 | 185 mm² | 120 mm² | 200 | No. 148 998 | D |
| 148 546 | 185 mm² | 150 mm² | 200 | No. 148 998 | D |
| 148 547 | 185 mm² | 185 mm² | 200 | No. 148 998 | D |
| 148 548 | 240 mm² | 120 mm² | 200 | No. 148 998 | D |
| 148 549 | 240 mm² | 150 mm² | 200 | No. 148 998 | D |
| 148 740 | 240 mm² | 185 mm² | 200 | No. 148 998 | D |
| 148 741 | 240 mm² | 240 mm² | 2 x 150 | No. 148 999 | E |
| 148 742 | 300 mm² | 185 mm² | 250 | No. 148 998 | D |
| 148 743 | 300 mm² | 240 mm² | 2 x 200 | No. 148 999 | E |
| 148 744 | 300 mm² | 300 mm² | 2 x 200 | No. 148 999 | E |

## Cable to cable "Cross" joint



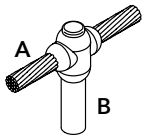

| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 155 | 16 mm² | 16 mm² | 45 | No. 148 998 | D |
| 148 156 | 25 mm² | 25 mm² | 45 | No. 148 998 | D |
| 148 157 | 35 mm² | 25 mm² | 65 | No. 148 998 | D |
| 148 158 | 35 mm² | 35 mm² | 65 | No. 148 998 | D |
| 148 159 | 50 mm² | 25 mm² | 90 | No. 148 998 | D |
| 148 350 | 50 mm² | 35 mm² | 90 | No. 148 998 | D |
| **148 150** | **50 mm²** | **50 mm²** | **90** | **No. 148 998** | **D** |
| 148 351 | 70 mm² | 25 mm² | 115 | No. 148 998 | D |
| 148 352 | 70 mm² | 35 mm² | 115 | No. 148 998 | D |
| **148 151** | **70 mm²** | **50 mm²** | **115** | **No. 148 998** | **D** |
| 148 353 | 70 mm² | 70 mm² | 115 | No. 148 998 | D |
| 148 354 | 95 mm² | 35 mm² | 115 | No. 148 998 | D |
| 148 355 | 95 mm² | 50 mm² | 115 | No. 148 998 | D |
| 148 356 | 95 mm² | 70 mm² | 150 | No. 148 998 | D |
| 148 357 | 95 mm² | 95 mm² | 150 | No. 148 998 | D |
| **148 152** | **120 mm²** | **50 mm²** | **150** | **No. 148 998** | **D** |
| **148 153** | **120 mm²** | **70 mm²** | **150** | **No. 148 998** | **D** |
| 148 358 | 120 mm² | 95 mm² | 200 | No. 148 998 | D |
| **148 154** | **120 mm²** | **120 mm²** | **200** | **No. 148 998** | **D** |
| 148 359 | 150 mm² | 70 mm² | 150 | No. 148 998 | D |
| 148 550 | 150 mm² | 95 mm² | 200 | No. 148 998 | D |
| 148 551 | 150 mm² | 120 mm² | 250 | No. 148 998 | D |
| 148 552 | 150 mm² | 150 mm² | 250 | No. 148 998 | D |
| 148 553 | 185 mm² | 70 mm² | 200 | No. 148 998 | D |
| 148 554 | 185 mm² | 95 mm² | 200 | No. 148 998 | D |
| 148 555 | 185 mm² | 120 mm² | 250 | No. 148 998 | D |
| 148 556 | 185 mm² | 150 mm² | 250 | No. 148 998 | D |
| 148 557 | 185 mm² | 185 mm² | 2 x 250 | No. 148 999 | E |
| 148 558 | 240 mm² | 120 mm² | 2 x 150 | No. 148 999 | E |
| 148 559 | 240 mm² | 150 mm² | 2 x 200 | No. 148 999 | F |
| 148 750 | 240 mm² | 185 mm² | 2 x 200 | No. 148 999 | F |
| 148 751 | 240 mm² | 240 mm² | 2 x 250 | No. 148 999 | F |
| 148 752 | 300 mm² | 300 mm² | 3 x 200 | No. 148 999 | E |

## Cable to earth rod "L" joint



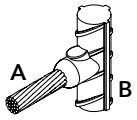

| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 520 | 16 mm² | Ø14.2 mm | 65 | No. 148 998 | D |
| 148 125 | 25 mm² | Ø14.2 mm | 65 | No. 148 998 | D |
| 148 126 | 35 mm² | Ø14.2 mm | 65 | No. 148 998 | D |
| 148 127 | 50 mm² | Ø14.2 mm | 90 | No. 148 998 | D |
| **148 124** | **70 mm²** | **Ø14.2 mm** | **90** | **No. 148 998** | **D** |
| 148 128 | 95 mm² | Ø14.2 mm | 90 | No. 148 998 | D |
| 148 129 | 120 mm² | Ø14.2 mm | 90 | No. 148 998 | D |
| 148 320 | 150 mm² | Ø14.2 mm | 115 | No. 148 998 | D |
| 148 321 | 185 mm² | Ø14.2 mm | 115 | No. 148 998 | D |
| 148 322 | 240 mm² | Ø14.2 mm | 150 | No. 148 998 | D |
| **148 120** | **16 mm²** | **Ø17.2 mm** | **65** | **No. 148 998** | **D** |
| 148 323 | 25 mm² | Ø17.2 mm | 65 | No. 148 998 | D |
| **148 121** | **35 mm²** | **Ø17.2 mm** | **65** | **No. 148 998** | **D** |
| 148 324 | 50 mm² | Ø17.2 mm | 90 | No. 148 998 | D |
| **148 122** | **70 mm²** | **Ø17.2 mm** | **90** | **No. 148 998** | **D** |
| 148 325 | 95 mm² | Ø17.2 mm | 90 | No. 148 998 | D |
| **148 123** | **120 mm²** | **Ø17.2 mm** | **90** | **No. 148 998** | **D** |
| 148 326 | 150 mm² | Ø17.2 mm | 115 | No. 148 998 | D |
| 148 327 | 185 mm² | Ø17.2 mm | 115 | No. 148 998 | D |
| 148 328 | 240 mm² | Ø17.2 mm | 150 | No. 148 998 | D |
| 148 329 | 300 mm² | Ø17.2 mm | 200 | No. 148 998 | D |

## Cable to earth rod "T" joint



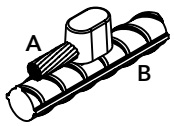

| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 133 | 16 mm² | Ø14.2 mm | 90 | No. 148 998 | D |
| 148 134 | 25 mm² | Ø14.2 mm | 90 | No. 148 998 | D |
| 148 135 | 35 mm² | Ø14.2 mm | 90 | No. 148 998 | D |
| 148 136 | 50 mm² | Ø14.2 mm | 90 | No. 148 998 | D |
| **148 132** | **70 mm²** | **Ø14.2 mm** | **115** | **No. 148 998** | **D** |
| 148 137 | 95 mm² | Ø14.2 mm | 115 | No. 148 998 | D |
| 148 138 | 120 mm² | Ø14.2 mm | 150 | No. 148 998 | D |
| 148 139 | 150 mm² | Ø14.2 mm | 200 | No. 148 998 | D |
| 148 330 | 185 mm² | Ø14.2 mm | 200 | No. 148 998 | D |
| 148 331 | 240 mm² | Ø14.2 mm | 250 | No. 148 998 | D |
| 148 332 | 16 mm² | Ø17.2 mm | 90 | No. 148 998 | D |
| 148 333 | 25 mm² | Ø17.2 mm | 90 | No. 148 998 | D |
| 148 334 | 35 mm² | Ø17.2 mm | 90 | No. 148 998 | D |
| **148 130** | **50 mm²** | **Ø17.2 mm** | **115** | **No. 148 998** | **D** |
| **148 131** | **70 mm²** | **Ø17.2 mm** | **115** | **No. 148 998** | **D** |
| 148 335 | 95 mm² | Ø17.2 mm | 115 | No. 148 998 | D |
| 148 336 | 120 mm² | Ø17.2 mm | 150 | No. 148 998 | D |
| 148 337 | 150 mm² | Ø17.2 mm | 200 | No. 148 998 | D |
| 148 338 | 185 mm² | Ø17.2 mm | 200 | No. 148 998 | D |
| 148 339 | 240 mm² | Ø17.2 mm | 250 | No. 148 998 | D |
| 148 530 | 300 mm² | Ø17.2 mm | 2 x 150 | No. 148 999 | E |

## Cable to reinforcing "T" joint



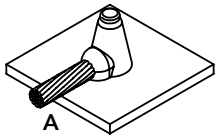

| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 115 | 16 mm² | Ø10-40 mm | 45 | No. 148 998 | D |
| 148 116 | 25 mm² | Ø10-40 mm | 45 | No. 148 998 | D |
| **148 110** | **35 mm²** | **Ø10-40 mm** | **45** | **No. 148 998** | **D** |
| **148 111** | **50 mm²** | **Ø10-40 mm** | **65** | **No. 148 998** | **D** |
| **148 112** | **70 mm²** | **Ø10-40 mm** | **90** | **No. 148 998** | **D** |
| **148 113** | **95 mm²** | **Ø10-40 mm** | **90** | **No. 148 998** | **D** |
| **148 114** | **120 mm²** | **Ø10-40 mm** | **115** | **No. 148 998** | **D** |

## Cable to reinforcing joint



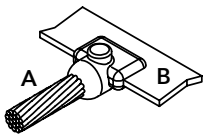

| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 220 | 16 mm² | Ø10-40 mm | 45 | No. 148 998 | D |
| 148 221 | 25 mm² | Ø10-40 mm | 45 | No. 148 998 | D |
| 148 222 | 35 mm² | Ø10-40 mm | 45 | No. 148 998 | D |
| 148 223 | 50 mm² | Ø10-40 mm | 90 | No. 148 998 | D |
| 148 224 | 70 mm² | Ø10-40 mm | 90 | No. 148 998 | D |
| 148 225 | 95 mm² | Ø10-40 mm | 90 | No. 148 998 | D |
| 148 226 | 120 mm² | Ø10-40 mm | 90 | No. 148 998 | D |

## Cable to steel surface joint



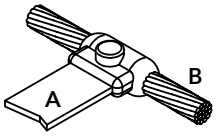

| Part No. | Conductor Size "A" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|
| 148 102 | 16 mm² | 25 | GHC/CP/75 | A |
| 148 103 | 25 mm² | 32 | GHC/CP/75 | A |
| 148 104 | 35 mm² | 32 | GHC/CP/75 | A |
| **148 100** | **50 mm²** | **45** | **GHC/CP/75** | **B** |
| **148 101** | **70 mm²** | **65** | **GHC/CP/75** | **B** |
| 148 105 | 95 mm² | 90 | GHC/CP/100 | D |
| 148 106 | 120 mm² | 115 | GHC/CP/100 | D |
| 148 107 | 150 mm² | 150 | GHC/CP/100 | D |
| 148 108 | 185 mm² | 200 | GHC/CP/100 | D |
| 148 109 | 240 mm² | 200 | GHC/CP/100 | D |
| 148 300 | 300 mm² | 250 | GHC/CP/100 | D |

## Cable to bar "T" joint



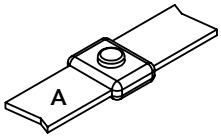

| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 601 | 16 mm² | 25 x 3 mm | 32 | No. 148 998 | D |
| 148 203 | 25 mm² | 25 x 3 mm | 45 | No. 148 998 | D |
| 148 204 | 35 mm² | 25 x 3 mm | 45 | No. 148 998 | D |
| 148 205 | 50 mm² | 25 x 3 mm | 45 | No. 148 998 | D |
| **148 200** | **70 mm²** | **25 x 3 mm** | **65** | **No. 148 998** | **D** |
| 148 206 | 70 mm² | 25 x 4 mm | 65 | No. 148 998 | D |
| 148 207 | 70 mm² | 25 x 6 mm | 90 | No. 148 998 | D |
| 148 208 | 95 mm² | 25 x 4 mm | 90 | No. 148 998 | D |
| 148 209 | 95 mm² | 25 x 5 mm | 90 | No. 148 998 | D |
| 148 400 | 95 mm² | 25 x 6 mm | 115 | No. 148 998 | D |
| 148 401 | 120 mm² | 25 x 5 mm | 115 | No. 148 998 | D |
| 148 402 | 120 mm² | 25 x 6 mm | 115 | No. 148 998 | D |
| 148 403 | 120 mm² | 30 x 5 mm | 115 | No. 148 998 | D |
| 148 404 | 150 mm² | 25 x 6 mm | 115 | No. 148 998 | D |
| 148 405 | 150 mm² | 30 x 5 mm | 115 | No. 148 998 | D |
| 148 406 | 150 mm² | 40 x 5 mm | 115 | No. 148 998 | D |
| 148 407 | 185 mm² | 31 x 6 mm | 150 | No. 148 998 | D |
| 148 408 | 185 mm² | 40 x 5 mm | 150 | No. 148 998 | D |
| 148 409 | 185 mm² | 50 x 5 mm | 150 | No. 148 998 | D |
| 148 600 | 240 mm² | 50 x 5 mm | 200 | No. 148 998 | D |
| **148 201** | **240 mm²** | **50 x 6 mm** | **250** | **No. 148 998** | **D** |
| **148 202** | **300 mm²** | **50 x 6 mm** | **2 x 150** | **No. 148 999** | **E** |

## Bar to cable "T" joint



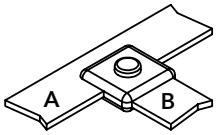

| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 162 | 20 x 2 mm | 16 mm² | 45 | No. 148 998 | D |
| 148 163 | 20 x 3 mm | 16 mm² | 45 | No. 148 998 | D |
| 148 164 | 25 x 3 mm | 16 mm² | 65 | No. 148 998 | D |
| 148 165 | 20 x 2 mm | 25 mm² | 45 | No. 148 998 | D |
| 148 166 | 20 x 3 mm | 25 mm² | 45 | No. 148 998 | D |
| 148 167 | 25 x 3 mm | 25 mm² | 65 | No. 148 998 | D |
| 148 168 | 20 x 2 mm | 35 mm² | 45 | No. 148 998 | D |
| 148 169 | 20 x 3 mm | 35 mm² | 45 | No. 148 998 | D |
| 148 360 | 25 x 3 mm | 35 mm² | 65 | No. 148 998 | D |
| 148 361 | 20 x 3 mm | 50 mm² | 45 | No. 148 998 | D |
| 148 362 | 25 x 2 mm | 50 mm² | 65 | No. 148 998 | D |
| **148 160** | **25 x 3 mm** | **50 mm²** | **65** | **No. 148 998** | **D** |
| 148 363 | 50 x 3 mm | 50 mm² | 150 | No. 148 998 | D |
| **148 161** | **25 x 3 mm** | **70 mm²** | **90** | **No. 148 998** | **D** |
| 148 364 | 25 x 4 mm | 70 mm² | 115 | No. 148 998 | D |
| 148 365 | 25 x 6 mm | 70 mm² | 115 | No. 148 998 | D |
| 148 366 | 50 x 3 mm | 70 mm² | 200 | No. 148 998 | D |
| 148 367 | 25 x 4 mm | 95 mm² | 150 | No. 148 998 | D |
| 148 368 | 25 x 5 mm | 95 mm² | 150 | No. 148 998 | D |
| 148 369 | 25 x 6 mm | 95 mm² | 150 | No. 148 998 | D |
| 148 560 | 50 x 3 mm | 95 mm² | 200 | No. 148 998 | D |
| 148 561 | 25 x 5 mm | 120 mm² | 150 | No. 148 998 | D |
| 148 562 | 25 x 6 mm | 120 mm² | 150 | No. 148 998 | D |
| 148 563 | 30 x 5 mm | 120 mm² | 200 | No. 148 998 | D |
| 148 564 | 50 x 3 mm | 120 mm² | 200 | No. 148 998 | D |
| 148 565 | 25 x 6 mm | 150 mm² | 200 | No. 148 998 | D |
| 148 566 | 30 x 5 mm | 150 mm² | 200 | No. 148 998 | D |
| 148 567 | 40 x 5 mm | 150 mm² | 250 | No. 148 998 | D |
| 148 568 | 31 x 6 mm | 185 mm² | 250 | No. 148 998 | D |
| 148 569 | 40 x 5 mm | 185 mm² | 250 | No. 148 999 | E |
| 148 760 | 50 x 5 mm | 185 mm² | 2 x 150 | No. 148 999 | E |
| 148 761 | 50 x 5 mm | 240 mm² | 2 x 150 | No. 148 999 | E |
| 148 762 | 50 x 6 mm | 240 mm² | 2 x 200 | No. 148 999 | E |
| 148 763 | 50 x 6 mm | 300 mm² | 2 x 250 | No. 148 999 | E |
| 148 764 | 50 x 8 mm | 300 mm² | 2 x 250 | No. 148 999 | E |

## Bar to bar "Straight" joint



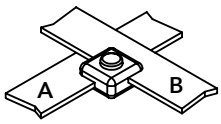

| Part No. | Conductor Size "A" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|
| 148 182 | 20 x 3 mm | 45 | No. 148 998 | D |
| **148 180** | **25 x 3 mm** | **65** | **No. 148 998** | **D** |
| 148 183 | 25 x 4 mm | 90 | No. 148 998 | D |
| 148 184 | 25 x 5 mm | 90 | No. 148 998 | D |
| 148 185 | 25 x 6 mm | 115 | No. 148 998 | D |
| 148 186 | 30 x 3 mm | 65 | No. 148 998 | D |
| 148 187 | 30 x 4 mm | 90 | No. 148 998 | D |
| 148 188 | 30 x 5 mm | 115 | No. 148 998 | D |
| 148 189 | 38 x 3 mm | 90 | No. 148 998 | D |
| 148 380 | 38 x 5 mm | 150 | No. 148 998 | D |
| 148 381 | 38 x 6 mm | 200 | No. 148 998 | D |
| 148 382 | 40 x 3 mm | 90 | No. 148 998 | D |
| 148 383 | 40 x 4 mm | 115 | No. 148 998 | D |
| 148 384 | 40 x 5 mm | 150 | No. 148 998 | D |
| 148 385 | 40 x 6 mm | 200 | No. 148 998 | D |
| 148 386 | 50 x 3 mm | 150 | No. 148 999 | E |
| 148 387 | 50 x 4 mm | 200 | No. 148 999 | E |
| 148 388 | 50 x 5 mm | 200 | No. 148 999 | E |
| **148 181** | **50 x 6 mm** | **250** | **No. 148 999** | **E** |
| 148 389 | 50 x 8 mm | 2 x 150 | No. 148 999 | E |

## Bar to bar "T" joint




| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 192 | 20 x 3 mm | 20 x 3 mm | 45 | No. 148 998 | D |
| **148 190** | **25 x 3 mm** | **25 x 3 mm** | **65** | **No. 148 998** | **D** |
| 148 193 | 25 x 4 mm | 25 x 4 mm | 90 | No. 148 998 | D |
| 148 194 | 25 x 6 mm | 25 x 6 mm | 115 | No. 148 998 | D |
| 148 195 | 30 x 2 mm | 30 x 2 mm | 65 | No. 148 998 | D |
| 148 196 | 30 x 3 mm | 30 x 3 mm | 65 | No. 148 998 | D |
| 148 197 | 30 x 4 mm | 30 x 4 mm | 90 | No. 148 998 | D |
| 148 198 | 30 x 5 mm | 30 x 5 mm | 115 | No. 148 998 | D |
| 148 199 | 38 x 3 mm | 38 x 3 mm | 90 | No. 148 998 | D |
| 148 390 | 38 x 5 mm | 38 x 5 mm | 150 | No. 148 998 | D |
| 148 391 | 38 x 6 mm | 38 x 6 mm | 200 | No. 148 998 | D |
| 148 392 | 40 x 3 mm | 40 x 3 mm | 90 | No. 148 998 | D |
| 148 393 | 40 x 4 mm | 40 x 4 mm | 115 | No. 148 998 | D |
| 148 394 | 40 x 5 mm | 40 x 5 mm | 150 | No. 148 998 | D |
| 148 395 | 40 x 6 mm | 40 x 6 mm | 200 | No. 148 998 | D |
| 148 396 | 50 x 3 mm | 50 x 3 mm | 150 | No. 148 999 | E |
| 148 397 | 50 x 4 mm | 50 x 4 mm | 200 | No. 148 999 | E |
| 148 398 | 50 x 5 mm | 50 x 5 mm | 200 | No. 148 999 | E |
| **148 191** | **50 x 6 mm** | **50 x 6 mm** | **250** | **No. 148 999** | **E** |

## Bar to bar "Cross" joint




| Part No. | Conductor Size "A" | Conductor Size "B" | Powder Size | Handle Clamp Required | Price Key of Mould |
|---|---|---|---|---|---|
| 148 172 | 20 x 3 mm | 20 x 3 mm | 65 | No. 148 998 | D |
| **148 170** | **25 x 3 mm** | **25 x 3 mm** | **65** | **No. 148 998** | **D** |
| 148 173 | 25 x 4 mm | 25 x 4 mm | 90 | No. 148 998 | D |
| 148 174 | 25 x 5 mm | 25 x 5 mm | 90 | No. 148 998 | D |
| 148 175 | 25 x 6 mm | 25 x 6 mm | 115 | No. 148 998 | D |
| 148 176 | 30 x 3 mm | 30 x 3 mm | 115 | No. 148 998 | D |
| 148 177 | 30 x 4 mm | 30 x 4 mm | 115 | No. 148 998 | D |
| 148 178 | 30 x 5 mm | 30 x 5 mm | 115 | No. 148 998 | D |
| 148 179 | 38 x 3 mm | 38 x 3 mm | 150 | No. 148 998 | D |
| 148 370 | 38 x 5 mm | 38 x 5 mm | 150 | No. 148 998 | D |
| 148 371 | 38 x 6 mm | 38 x 6 mm | 200 | No. 148 998 | D |
| 148 372 | 40 x 3 mm | 40 x 3 mm | 200 | No. 148 998 | D |
| 148 373 | 40 x 4 mm | 40 x 4 mm | 200 | No. 148 998 | D |
| 148 374 | 40 x 5 mm | 40 x 5 mm | 200 | No. 148 998 | D |
| 148 375 | 40 x 6 mm | 40 x 6 mm | 200 | No. 148 998 | D |
| 148 376 | 50 x 3 mm | 50 x 3 mm | 200 | No. 148 999 | E |
| 148 377 | 50 x 4 mm | 50 x 4 mm | 200 | No. 148 999 | E |
| 148 378 | 50 x 5 mm | 50 x 5 mm | 200 | No. 148 999 | E |
| **148 171** | **50 x 6 mm** | **50 x 6 mm** | **200** | **No. 148 999** | **E** |

## Handle Clamp



| Part No. | Description | Min. Order Quantity |
|---|---|---|
| **148 998** | **Standard handle clamp** | **1** |
| **148 999** | **Larger handle clamp** | **1** |
| 148 997 | Chain support handle clamps | 1 |

## Exothermic Weld Metal



| Part No. | Item Description | Cartridges per Box |
|---|---|---|
| 148 017 | Exothermic Weld Metal 15 g | 20 |
| 148 018 | Exothermic Weld Metal 25 g | 20 |
| 148 019 | Exothermic Weld Metal 32 g | 20 |
| **148 010** | **Exothermic Weld Metal 45 g** | **20** |
| **148 011** | **Exothermic Weld Metal 65 g** | **10** |
| **148 012** | **Exothermic Weld Metal 90 g** | **10** |
| **148 013** | **Exothermic Weld Metal 115 g** | **10** |
| **148 014** | **Exothermic Weld Metal 150 g** | **10** |
| **148 015** | **Exothermic Weld Metal 200 g** | **10** |
| **148 016** | **Exothermic Weld Metal 250 g** | **10** |

## Toolset



| Part No. | Item Description | Content |
|---|---|---|
| 148 988 | Toolset complete | Plastic Tool Box |
| | | Mould Scraper 34 |
| | | Mould Scraper 55 |
| | | Mould Scraper 65 |
| | | Mould Cleaning Brush |
| | | Conductor Cleaning Brush |
| | | Flint Ignitor Gun |
| | | Sealing Putty, 160 mm long, 500 g |



# Surge Protection


| | |
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| Surge Protection for Power Supply Systems | Page 259 |
| Surge Protection for Information Technology Systems | Page 307 |
| Surge Protection for Lightning Equipotential Bonding | Page 355 |

# Planned Safety

Failure of technical installations and systems in residential and functional buildings is very unpleasant and expensive. Therefore, faultless operation of devices must be ensured both during normal operation and thunderstorms. The number of annually registered lightning activities in Germany has remained at a constantly high level over many years. The damage statistics of insurance companies clearly show that there are deficits in terms of lightning and surge protection measures both in the private and commercial sector (Figure 1). With a professional approach, suitable protective measures can be implemented. The lightning protection zone concept, for example, enables planners, installers and operators of buildings and installations to consider, implement and monitor various protective measures. In this way, all relevant devices, equipment and systems can be reliably protected at an economically justifiable cost.

## Sources of interference

Surges occurring during a thunderstorm are caused by direct / nearby lightning strikes or remote lightning strikes (Figure 2 and Figure 3). Direct or nearby lightning strikes are lightning strikes to a building, its surroundings or electrically conductive systems entering the building (e.g. low-voltage supply, telecommunication and data lines). The resulting impulse currents and impulse voltages as well as the associated electromagnetic field are particularly dangerous for the devices and installations to be protected with regard to the amplitude and energy content involved. In case of a direct or nearby lightning strike, surges are caused by the voltage drop at the conventional earthing impedance Rst and the resulting potential rise of the building in relation to the remote earth (Figure 3, case 2). This represents the highest load for electrical installations in buildings.

The characteristic parameters of the impulse current that flows (peak value, rate of current rise, charge, specific energy) can be described by the 10/350 µs impulse current wave form and are defined in international, European and national standards as the test current for components and devices for protection against direct lightning strikes (Figure 4).

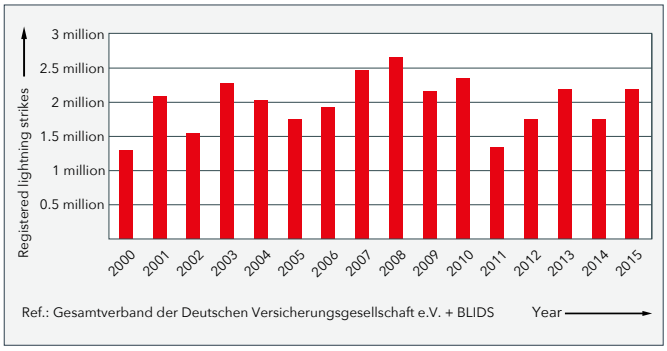



Figure 1: Lightning activity registered in Germany from 2000 to 2015.

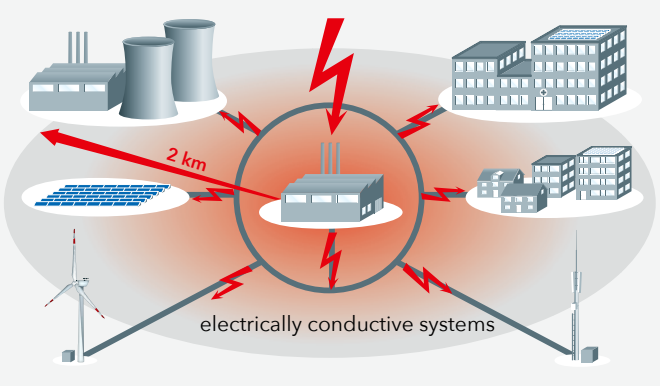



Figure 2: General risks for buildings and installations resulting from lightning strikes.

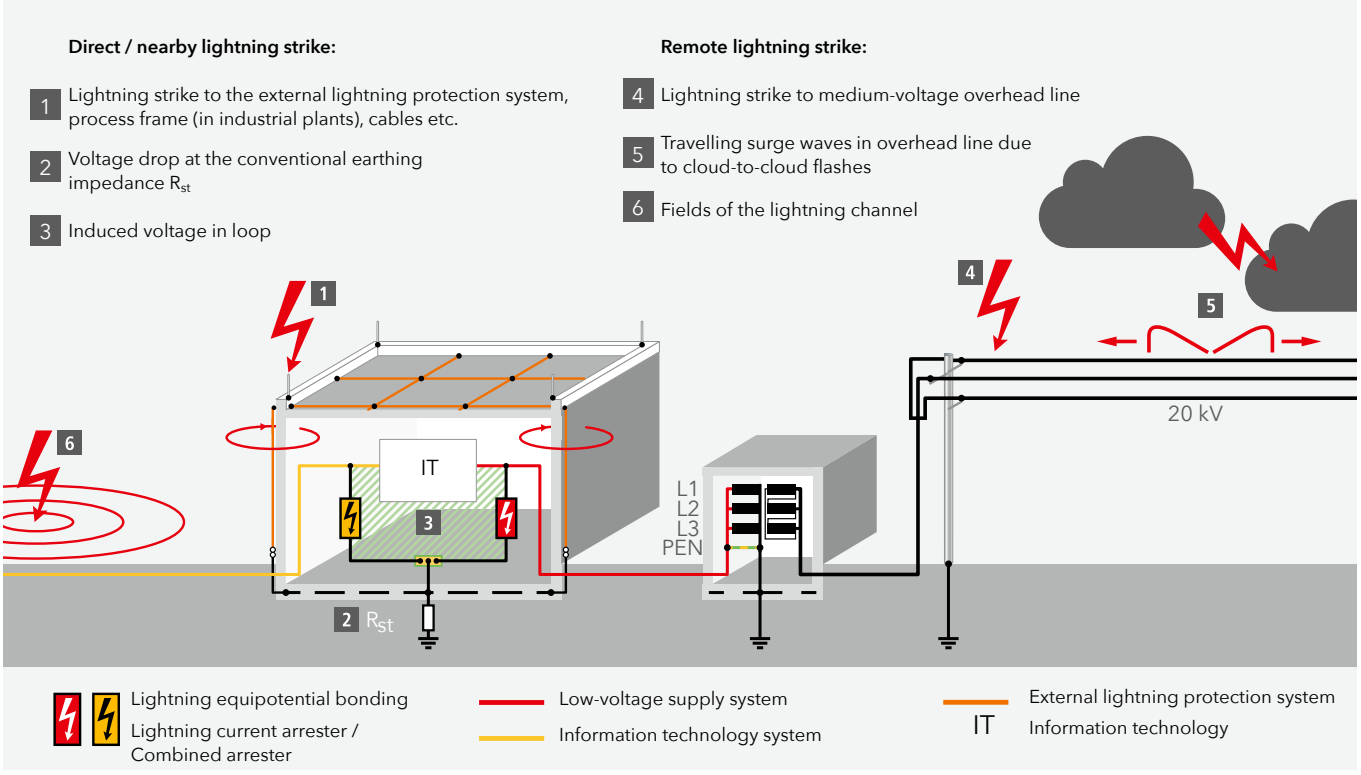



Figure 3: Causes of surges during lightning discharges.

In addition to the voltage drop at the conventional earthing impedance, surges are generated in the electrical installation of a building and the systems and devices connected to it due to the inductive effect of the electromagnetic lightning field (Figure 3, case 3). The energy of these induced surges and of the resulting impulse currents is far lower than the energy of a direct lightning impulse current and is therefore described by a 8/20 µs impulse current wave form (Figure 4). Components and devices that do not have to conduct currents resulting from direct lightning strikes are therefore tested with such 8/20 µs impulse currents.

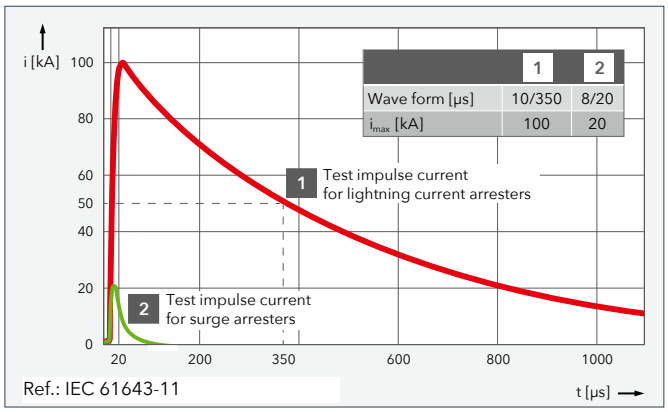



Figure 4: Test impulse currents for lightning current and surge arresters.

### Protection scheme

Lightning strikes are described as remote if they occur a long distance from the object to be protected, strike medium-voltage overhead lines or their surroundings or occur as cloud-to-cloud lightning discharges (Figure 3, cases 4, 5, 6). Similar to induced surges, the effects of remote lightning strikes on the electrical installation of a building are handled by devices and components which have been dimensioned according to 8/20 µs impulse current waves. Surges caused by switching operations (SEMP) are, for example, generated by:

- Disconnection of inductive loads (e.g. transformers, reactors, motors)
- Arc ignition and interruption (e.g. arc welding equipment)
- Tripping of fuses

The effects of switching operations in the electrical installation of a building can also be simulated by impulse currents of 8/20 µs wave form under test conditions. To ensure continuous availability of complex power supply and information technology systems even in case of direct lightning interference, further surge protection measures for electrical and electronic installations and devices based on a lightning protection system for the building are required. It is important to take all causes of surges into account. To do so, the lightning protection zone concept as described in IEC 62305-4 is applied (Figure 5).

### Lightning protection zone concept

The building is divided into different endangered zones. These zones help to define the necessary protection measures, in particular the lightning and surge protection devices and components. An EMC-based (EMC = electromagnetic compatibility) lightning protection zone concept includes external lightning protection (air-termination system, down-conductor system, earth-termination system), equipotential bonding, spatial shielding and surge protection for the power supply and information technology systems. Definitions apply as classified in Table 1.

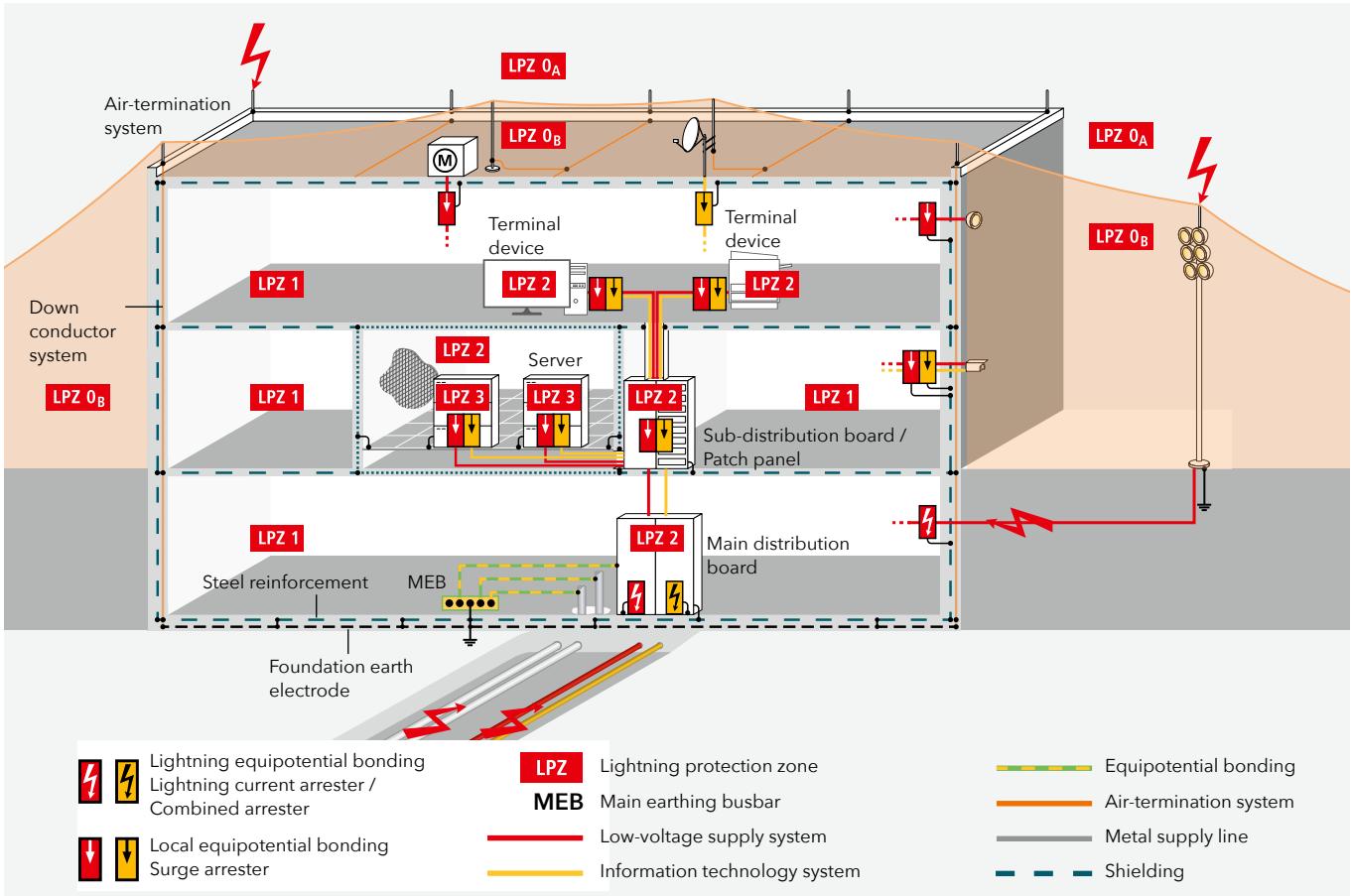



Figure 5: Overall view of a lightning protection zone concept.

# Planned Safety

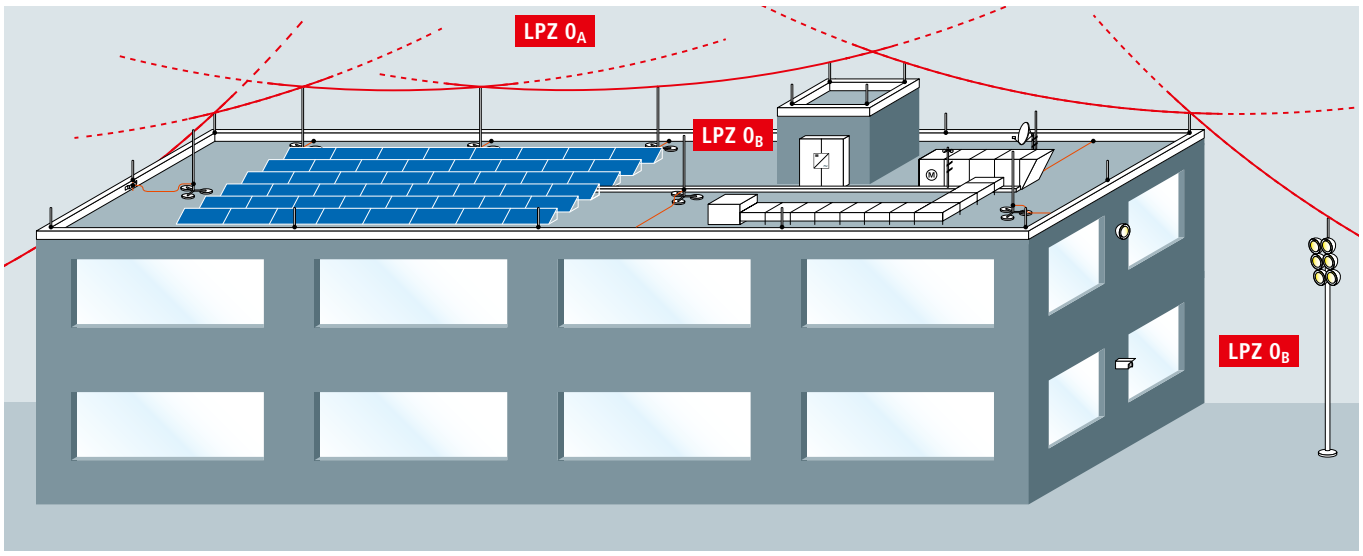



Figure 5.1: Transition from LPZ $0_A$ to LPZ $0_B$

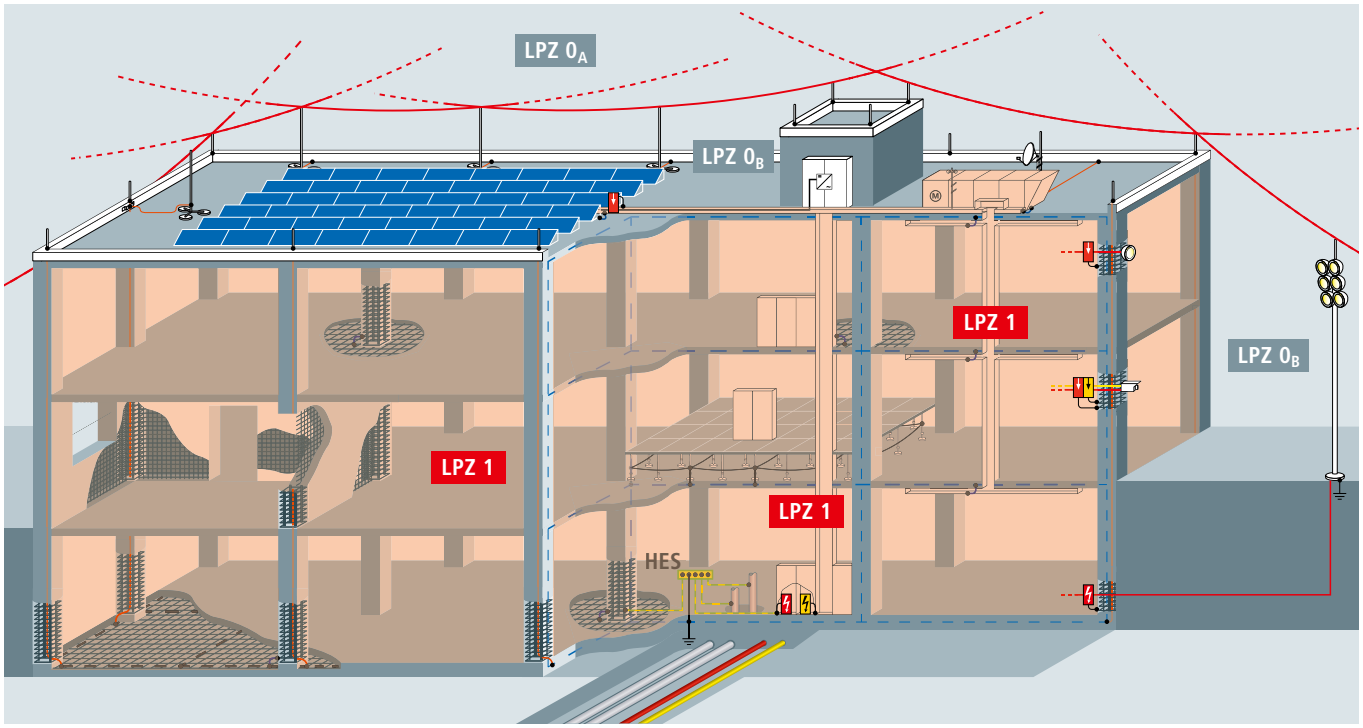



Figure 5.2: Transitions from LPZ $0_A$ to LPZ 1 and LPZ $0_B$ to LPS 1

According to the requirements and loads placed on surge protective devices, they are categorised as lightning current arresters, surge arresters and combined arresters. The highest requirements are placed on the discharge capacity of lightning current arresters and combined arresters used at the transition from lightning protection zone $0_A$ to 1 or $0_A$ to 2. These arresters must be capable of conducting partial lightning currents of 10/350 µs wave form without being destroyed in order to prevent the ingress of destructive partial lightning currents into the electrical installation of a building. At the transition point from LPZ $0_B$ to 1 or downstream of the lightning current arrester at the transition point from LPZ 1 to 2 and higher, surge arresters are used to protect against surges. Their task is both to reduce the residual energy of the upstream protection stages even further and to limit the surges induced or generated in the installation itself.

The lightning and surge protective measures at the boundaries of the lightning protection zones described above are equally applicable to power supply and information technology systems. All measures described in the EMC-based lightning protection zone concept help to achieve continuous availability of electrical and electronic devices and installations.

**For more detailed technical information, DEHN offers a "Lightning Protection Guide" which can be downloaded at www.dehn-international.com/en/downloads.**

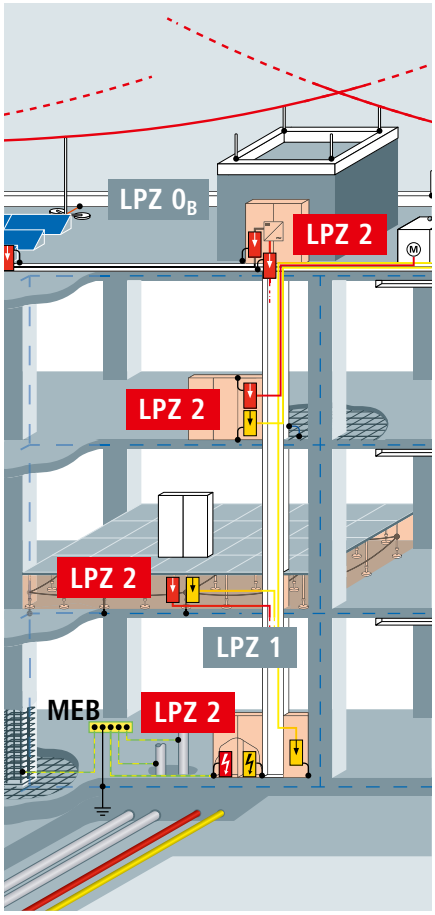



Figure 5.3: Transition from LPZ 1 to LPZ 2

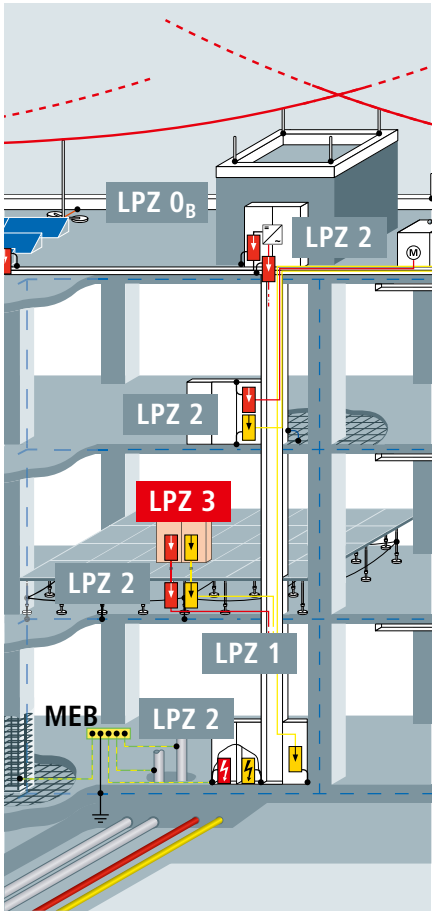
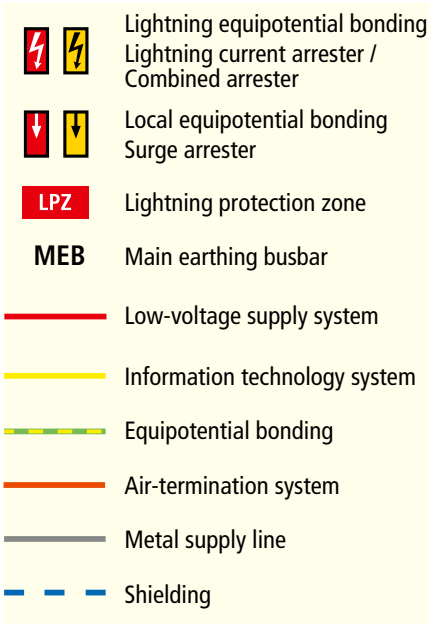



Figure 5.4: Transition from LPZ 2 to LPZ 3




**IEC 62305-4**

**Outer zones:**

LPZ 0 Zone where the threat is due to the unattenuated lightning electromagnetic field and where the internal systems may be subjected to full or partial lightning surge current.

LPZ 0 is subdivided into:

LPZ $0_A$ Zone where the threat is due to the direct lightning flash and the full lightning electromagnetic field. The internal systems may be subjected to full lightning surge current.

LPZ $0_B$ Zone protected against direct lightning flashes but where the threat is the full lightning electromagnetic field. The internal systems may be subjected to partial lightning surge currents.

**Inner zones** (protected against direct lightning flashes):

LPZ 1 Zone where the surge current is limited by current sharing and isolating interfaces and/or by SPDs at the boundary. Spatial shielding may attenuate the lightning electromagnetic field.

LPZ 2 ... n Zone where the surge current may be further limited by current sharing and isolating interfaces and/or by additional SPDs at the boundary. Additional spatial shielding may be used to further attenuate the lightning electromagnetic field.

Table 1: Definition of lightning protection zones.

# Terms and Definitions

## Surge Protective Devices (SPDs)

Surge protective devices are devices consisting mainly of voltage-controlled resistors (varistors, suppressor diodes) and / or spark gaps (discharge paths). Surge protective devices are used to protect other electrical equipment and installations against impermissibly high surges and / or to establish equipotential bonding.

**Surge protective devices are classified:**

a) according to their **use** into:

- Surge protective devices for power supply systems and equipment (Red / Line product family)
  – according to IEC 61643-11 in type 1 / 2 / 3 SPDs
  – according to IEC 61643-11 in class I / II / III SPDs
- Surge protective devices for IT systems and equipment (Yellow / Line product family) for protecting modern electronic systems in telecommunications and signal-processing networks with nominal voltages up to 1000 V a.c. [root-mean-square value (rms)] and 1500 V d.c. against the indirect and direct effects of lightning strikes and other transients.
  – according to IEC 61643-21, IEC 61643-21
- Isolating spark gaps for earth-termination systems or equipotential bonding (Red / Line product family)
- Surge protective devices for use in photovoltaic installations (Red / Line product family) for nominal voltage ranges up to 1500 V
  – according to IEC 50539-11 as type 1 / 2 SPDs

b) according to their **impulse current discharge capacity** and protective effect into:

- Lightning current arresters / Coordinated lightning current arresters for interference resulting from direct or nearby lightning strikes for protecting installations and equipment [for use at the boundaries between lightning protection zones (LPZ) $0_A$ and 1).
- Surge arresters
  for remote lightning strikes, switching overvoltages as well as electrostatic discharges for protecting installations, equipment and terminal devices (for use at the boundaries downstream of LPZ $0_B$).
- Combined lightning current and surge arresters
  for interference resulting from direct or nearby lightning strikes for protecting installations, equipment and terminal devices (for use at the boundaries between $0_A$ and 1 as well as $0_A$ and 2).

## Technical data

The technical data of surge protective devices comprise information defining their conditions of use according to:

- use (e.g. installation, power supply conditions, temperature)
- performance in case of interference (e.g. impulse current discharge capacity, follow current extinguishing capability, voltage protection level, response time)
- performance during operation (e.g. nominal current, attenuation, insulation resistance)
- performance in case of failure (e.g. backup fuse, disconnection device, fail-safe, remote signalling option).

**actiVsense**
The actiVsense tecahnology is integrated in universal combined arresters for protecting information technology installations and devices. The arrester automatically detects the signal voltage applied and optimally adapts the voltage protection level to it. This makes the arrester universally applicable at different interfaces and provides the best possible protection for the devices and system circuits connected to it in case of failure.

**Breaking capacity, follow current extinguishing capability $I_{fi}$**
The breaking capacity is the uninfluenced (prospective) r.m.s. value of the mains follow current which can automatically be extinguished by the surge protective device when connecting $U_C$. It can be verified in an operating duty test according to IEC 61643-11.

**Categories according to IEC 61643-21**
A number of impulse voltages and impulse currents are described in IEC 61643-21 for testing the current carrying capability and voltage limitation of impulse interference. Table 3 of this standard puts these into categories and provides preferred values. In Table 2 of the IEC 61643-22 standard the sources of transients are assigned to the different impulse categories according to the decoupling mechanism. Category C2 includes inductive coupling (surges), category D1 galvanic coupling (lightning currents). The relevant category is specified in the technical data.
DEHN surge protective devices surpass the values in the specified categories. Therefore, the exact value for the impulse current carrying capability is indicated by the nominal discharge current (8/20 µs) and the lightning impulse current (10/350 µs).

**Combination wave $U_{OC}$**
A combination wave is generated by a hybrid generator (1.2/50 µs, 8/20 µs) with a fictitious impedance of 2 Ω. The open-circuit voltage of this generator is referred to as $U_{OC}$. $U_{OC}$ is a preferred indicator for type 3 arresters since only these arresters may be tested with a combination wave (according to IEC 61643-11).

**Cut-off frequency $f_G$**
The cut-off frequency defines the frequency-dependent behaviour of an arrester. The cut-off frequency is equivalent to the frequency which induces an insertion loss ($a_E$) of 3 dB under certain test conditions (see IEC 61643-21). Unless otherwise indicated, this value refers to a 50 Ω system.

**Degree of protection**
The IP degree of protection corresponds to the protection categories described in IEC/EN 60529.

**Direct Current Disconnection**
When using surge arresters in d.c. applications, disconnection must be reliably ensured even if there are no zero crossings. The specifically developed DC Disconnection (DCD) technology acts as a wedge similar to a blocking valve and interrupts the direct current. Consequently, the devices of the DEHNguard SE DC series are capable of safely interrupting direct currents, thus preventing fire damage caused by d.c. switching arcs.

**Disconnecting time $t_a$**
The disconnecting time is the time which passes until the power supply is automatically disconnected in case of a failure of the circuit or equipment to be protected. The disconnecting time is an application-specific value resulting from the intensity of the fault current and the characteristics of the protective device.

**Energy coordination of SPDs**
Energy coordination is the selective and coordinated interaction of cascaded protection elements (= SPDs) of an overall lightning and surge protection concept. This means that the total load of the lightning impulse current is split between the SPDs according to their energy carrying capability. If energy coordination does not work, downstream SPDs are not sufficiently relieved by the upstream SPDs as they intervene too late, insufficiently or not at all. Consequently, downstream SPDs as well as the terminal equipment to be protected may be destroyed.
DIN CLC/TS 61643-12 describes how to verify energy coordination. Spark-gap-based type 1 SPDs offer considerable advantages due to their voltage-switching characteristic (see WAVE BREAKER FUNCTION).

**Follow current extinguishing capability $I_{fi}$**
Prospective short-circuit current that an SPD is able to interrupt independently without disconnection (source: IEC 61643-11).

**Frequency range**
The frequency range represents the transmission range or cut-off frequency of an arrester depending on the described attenuation characteristics.

**Insertion loss**
With a given frequency, the insertion loss of a surge protective device is defined by the relation of the voltage value at the place of installation before and after installing the surge protective device. Unless otherwise indicated, the value refers to a 50 Ω system.

**Integrated backup fuse**
According to the product standard for SPDs, overcurrent protective devices/backup fuses must be used. This, however, requires additional space in the distribution board, additional cable lengths, which should be as short as possible according to IEC 60364-5-53, additional installation time (and costs) and dimensioning of the fuse. A fuse integrated in the arrester ideally suited for the impulse currents involved eliminates all these disadvantages. The space gain, lower wiring effort, integrated fuse monitoring and the increased protective effect due to shorter connecting cables are clear advantages of this concept which is integrated in the DEHNvenCI, DEHNbloc Maxi S, DEHNguard … CI and V(A) NH product families.

**LifeCheck**
Repeated discharge processes which exceed the specification of the device can overload arresters in information technology systems. In order to ensure high system availability, arresters should therefore be subjected to systematic tests. LifeCheck allows quick and easy testing of arresters.

**Lightning impulse current $I_{imp}$**
The lightning impulse current is a standardised impulse current curve with a 10/350 µs wave form. Its parameters (peak value, charge, specific energy) simulate the load caused by natural lightning currents. Lightning current and combined arresters must be capable of discharging such lightning impulse currents several times without being destroyed.

**Mains-side overcurrent protection/arrester backup fuse**
Overcurrent protective device (e.g. fuse or circuit breaker) located outside of the arrester on the infeed side to interrupt the power-frequency follow current as soon as the breaking capacity of the surge protective device is exceeded. No additional backup fuse is required since the backup fuse is already integrated in the SPD (see relevant section).

**Maximum continuous operating voltage $U_C$**
The maximum continuous operating voltage (maximum permissible operating voltage) is the r.m.s. value of the maximum voltage which may be connected to the corresponding terminals of the surge protective device during operation. This is the maximum voltage on the arrester in the defined non-conducting state, which reverts the arrester back to this state after it has tripped and discharged. The value of $U_C$ depends on the nominal voltage of the system to be protected and the installer's specifications (IEC 60364-5-53).

**Maximum continuous operating voltage $U_{CPV}$ for a photovoltaic (PV) system**
Value of the maximum d.c. voltage that may be permanently applied to the terminals of the SPD. To ensure that $U_{CPV}$ is higher than the maximum open-circuit voltage of the PV system in case of all external influences (e.g. ambient temperature, solar radiation intensity), $U_{CPV}$ must be higher than this maximum open-circuit voltage by a factor of 1.2 (according to IEC 61643-32). This factor of 1.2 ensures that the SPDs are not incorrectly dimensioned.

**Maximum discharge current $I_{max}$**
The maximum discharge current is the maximum peak value of the 8/20 µs impulse current which the device can safely discharge.

**Maximum transmission capacity**
The maximum transmission capacity defines the maximum high-frequency power which can be transmitted via a coaxial surge protective device without interfering with the protection component.

# Terms and Definitions

**Nominal discharge current $I_n$**
The nominal discharge current is the peak value of a 8/20 µs impulse current for which the surge protective device is rated in a certain test programme and which the surge protective device can discharge several times.

**Nominal load current (nominal current) $I_L$**
The nominal load current is the maximum permissible operating current which may permanently flow through the corresponding terminals.

**Nominal voltage $U_N$**
The nominal voltage stands for the nominal voltage of the system to be protected. The value of the nominal voltage often serves as type designation for surge protective devices for information technology systems. It is indicated as an r.m.s. value for a.c. systems.

**N-PE arrester**
Surge protective devices exclusively designed for installation between the N and PE conductor.

**Operating temperature range $T_U$**
The operating temperature range indicates the range in which the devices can be used. For non-self-heating devices, it is equal to the ambient temperature range. The temperature rise for self-heating devices must not exceed the maximum value indicated.

**Permanent short-circuit current $I_k$**
The r.m.s. value of the short-circuit current in low-voltage or high-voltage three-phase systems which remains after all compensation processes [based on IEC 60909-0].

**Protective circuit**
Protective circuits are multi-stage, cascaded protective devices. The individual protection stages may consist of spark gaps, varistors, semiconductor elements and gas discharge tubes (see energy coordination).

**Protective conductor current $I_{PE}$**
The protective conductor current is the current which flows through the PE connection when the surge protective device is connected to the maximum continuous operating voltage $U_C$, according to the installation instructions and without load-side consumers.

**Remote signalling contact**
A remote signalling contact allows easy remote monitoring and indication of the operating state of the device. It features a three-pole terminal in the form of a floating changeover contact. This contact can be used as a break and/or make contact and can thus be easily integrated in the building control system, controller of the switchgear cabinet, etc.

**Response time $t_A$**
Response times mainly characterise the response performance of individual protection elements used in arresters. Depending on the rate of rise du/dt of the impulse voltage or di/dt of the impulse current, the response times may vary within certain limits.

**Return loss**
In high-frequency applications, the return loss refers to how many parts of the "leading" wave are reflected at the protective device (surge point). This is a direct measure of how well a protective device is attuned to the characteristic impedance of the system.

**SCI technology**
Direct currents (d.c.) flow on the generator side of a PV system. The surge protective devices used on the generator side can be overloaded due to different scenarios (e.g. impulse load, insulation faults) and must not endanger the PV system. However, insufficient d.c. disconnection capability in a PV system may cause fire. Conventional surge arresters only feature a disconnector in the form of a simple break contact mechanism which is typically used for a.c. devices. Due to the lacking zero crossing of the d.c. source, a d.c. arc may persist and cause fire. The SCI technology patented by DEHN with active arc extinction is an ideal solution. In case of overload, a contact is opened and a short-circuit is generated (short circuit). Thus, any switching arc which may arise is actively, quickly and safely extinguished. The PV fuse integrated in the short-circuit path immediately trips after the arc has been extinguished and ensures safe electrical isolation (interruption) (see also pages 293-295). Thus, all PV arresters from DEHN combine surge protection, fire protection and personal protection in a single device.

**Series resistance**
Resistance in the direction of the signal flow between the input and output of an arrester. The series resistance is normally used to coordinate the protection stages in a multi-stage SPD.

**Shield attenuation**
Relationship between the power fed into a coaxial cable and the power radiated from the cable through the phase conductor.

**Short-circuit withstand capability**
The short-circuit withstand capability is the value of the prospective power-frequency short-circuit current handled by the surge protective device when the relevant maximum backup fuse is connected upstream.

**Short-circuit current rating $I_{SCCR}$**
Maximum prospective short-circuit current for which the SPD alone or in conjunction with its disconnectors is rated (source: IEC 61643-11).

**Short-circuit rating $I_{SCPV}$ of an SPD in a photovoltaic (PV) system**
Maximum uninfluenced short-circuit current which the SPD, alone or in conjunction with its disconnection devices, is able to withstand.

**Temporary overvoltage (TOV)**
Temporary overvoltage may be present at the surge protective device for a short period of time due to a fault in the high-voltage system. This must be clearly distinguished from a transient caused by a lightning strike or a switching operation, which last no longer than about 1 ms. The amplitude $U_T$

and the duration of this temporary overvoltage are specified in IEC 61643-11 (200 ms, 5 s or 120 min.) and are individually tested for the relevant SPDs according to the system configuration (TN, TT, etc.). The SPD can either a) reliably fail (TOV safety) or b) be TOV-resistant (TOV withstand), meaning that it is completely operational during and following temporary overvoltages.

**Thermal disconnector**
Surge protective devices for use in power supply systems equipped with voltage-controlled resistors (varistors) mostly feature an integrated thermal disconnector that disconnects the surge protective device in case of overload and indicates this operating state. The disconnector responds to the "current heat" generated by an overloaded varistor and disconnects the surge protective device if a certain temperature is exceeded. The disconnector is designed to disconnect the overloaded surge protective device in time to prevent a fire. It is not intended to ensure protection against indirect contact. The function of these thermal disconnectors can be tested by means of a simulated overload/ageing of the arresters.

**Total discharge current $I_{total}$**
Current which flows through the PE, PEN or earth connection of a multipole SPD during the total discharge current test. This test is used to determine the total load if current simultaneously flows through several protective paths of a multipole SPD. This parameter is decisive for the total discharge capacity which is reliably handled by the sum of the individual paths of an SPD.

**Voltage protection level $U_P$**
The voltage protection level of a surge protective device is the maximum instantaneous value of the voltage at the terminals of a surge protective device, determined from the standardised individual tests:

- Lightning impulse sparkover voltage 1.2/50 µs (100%)
- Sparkover voltage with a rate of rise of 1 kV/µs
- Measured limit voltage at a nominal discharge current $I_n$

The voltage protection level characterises the capability of a surge protective device to limit surges to a residual level. The voltage protection level defines the installation location with regard to the overvoltage category in power supply systems. For surge protective devices to be used in information technology systems, the voltage protection level must be adapted to the immunity level of the equipment to be protected (IEC 61000-4-5).

**Wave breaker function**
Due to the technical design of type 1 SPDs, energy coordination of SPDs varies considerably. Experience has shown that even small amplitudes of the 10/350 µs lightning impulse current can overload and even destroy downstream SPDs if varistor-based type 1 lightning current arresters are used. In case of spark-gap-based type 1 arresters, in contrast, virtually all the current flows through the type 1 arrester. Similar to a wave breaker the energy is reduced to an acceptable level. The advantage is that the time to half value of the 10/350 µs impulse current is reduced due to the reduction of the impulse time and the switching behaviour of type 1 SPDs. This considerably relieves downstream SPDs.
All devices of the DEHN Red/Line and Yellow/Line product families are energy-coordinated. Moreover, all type 1 arresters of the Red/Line family are based on spark gaps and thus feature this WAVE BREAKER FUNCTION.

**Yellow/Line SPD class**
All DEHN arresters for use in information technology systems are categorised into a Yellow/Line SPD class and are marked with the corresponding symbol in the data sheet and on the rating plate (see page 309).

# Definition of Symbols

| Symbol | Definition |
|---|---|
| NEW | **New products** |
| ! | **Discontinued products** |

| Symbol | Definition | Red / Line |
|---|---|---|
| RAC | **RAC technology**<br>Type 1 + 2 combined arresters with Rapid Arc Control (RAC) spark gap technology stand out on account of their minimal residual energy. This means maximum safety and optimum care for downstream electronic terminal equipment. RAC spark gap technology is the next evolutionary step for the type 1 arresters within the Red/Line family and continues to be based on the wave breaker functional principle. |
| ACI | **ACI technology**<br>A further development of CI technology, ACI technology consists of a switch/spark gap combination connected in series with a heavyduty varistor. This ensures the simple design and safe operation of the surge protective device. Other features are safe dimensioning, TOV withstand, a connection cross-section of only 6 mm² Cu and zero leakage current. Surge arresters with ACI technology offer maximum safety and system availability. |
| CI | **Integrated backup fuse**<br>Reduced space requirements, lower installation costs, faster wiring and shorter connecting cable lengths are clear advantages of this concept used for the DEHNvenCI, DEHNbloc Maxi S, DEHNguard … CI and V(A) NH product series. |
| SCI | **SCI technology**<br>The patented SCI technology with active arc extinction allows to actively, quickly and safely extinguish a possible switching arc in case of overload. The PV fuse integrated in the short-circuit path trips immediately after the arc has been extinguished, thus ensuring safe electrical isolation (interruption). Consequently, all PV arresters from DEHN combine surge protection, fire protection and personal protection in a single device. |
| WBF | **Wave breaker function**<br>If a spark-gap-based type 1 arrester is used, the total current flows through the type 1 arrester during the discharge process. Similar to a wave breaker, the energy is mitigated to a sufficiently low level, thus considerably relieving downstream SPDs. The WAVE BREAKER function is integrated in all spark-gap-based type 1 arresters of the Red/Line series. |
| DCD | **Direct Current Disconnection**<br>When using surge arresters in d.c. applications, disconnection must be reliably ensured even if there are no zero crossings. The specifically developed DC Disconnection (DCD) technology acts as a wedge similar to a blocking valve and interrupts the direct current. Consequently, the devices of the DEHNguard SE DC series are capable of safely interrupting direct currents, thus preventing fire damage caused by d.c. switching arcs. |

| Symbol | Definition | Yellow / Line |
|---|---|---|
| 3in1 | **Compact 3-in-1 protection**<br>This arrester allows 3 interfaces to be protected by means of a single device, resulting in reduced space requirements, faster wiring and lower installation costs. |
| IP66 | **IP66**<br>Surge arrester for Ethernet / PoE++ applications in an IP66 enclosure for safe use in harsh environments (water and dust). |
| | **LifeCheck**<br>Monitoring of the protection components for thermal load as well as the integrated status indication for protection modules for use in information technology systems allows easy testing and maintenance. |
| | **RFID LifeCheck**<br>RFID LifeCheck makes it possible to easily and quickly test arresters for information technology systems. It permanently monitors the condition of the arrester and detects electrical and thermal load on all protection components. |
| | **Discharge capacity of an SPD** (according to the categories from IEC 61643-21) |
| TYPE 1 | Impulse D1 (10/350 µs), lightning impulse current 0.5 to 2.5 kA/line ⇨ exceeds the discharge capacity of TYPE 2 – TYPE 4 |
| TYPE 2 | Impulse C2 (8/20 µs), increased impulse load 1 to 5 kA/line ⇨ exceeds the discharge capacity of TYPE 3 – TYPE 4 |
| TYPE 3 | Impulse C1 (8/20 µs), impulse load 0.25 to 1 kA/line ⇨ exceeds the discharge capacity of TYPE 4 |
| TYPE 4 | Load < TYPE 3 |
| | **Protective effect of an SPD** (limitation below the test levels according to IEC 61000-4-5) |
| P1 | Required test level of the terminal device: 1 or higher |
| P2 | Required test level of the terminal device: 2 or higher |
| P3 | Required test level of the terminal device: 3 or higher |
| P4 | Required test level of the terminal device: 4 |
| ⊕ | **Energy coordination** (with another Yellow/Line SPD)<br>SPD with decoupling impedance, suitable for coordination with an SPD marked with ↄ |
| ↄ | SPD is suitable for coordination with an SPD with decoupling impedance ⊕ |

# Surge Protection for Power Supply Systems

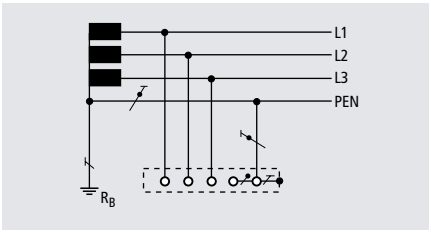


Find the right product quickly and easily:
**https://www.dehn-international.com/en/selection-guides-and-configurators**

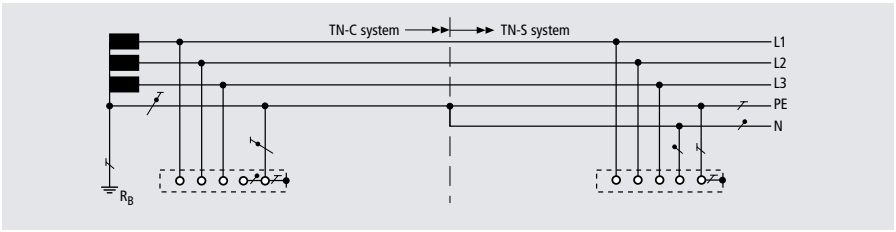

| | |
|---|---|
| Combined Arresters – Type 1 + Type 2 | Page 261 |
| Combined Arresters – Type 1 + Type 2 for PV Systems | Page 265 |
| Coordinated Lightning Current Arresters – Type 1 | Page 266 |
| Accessory for Arresters – Type 1 | Page 269 |
| Coordinated Lightning Current Arresters – Type 1 for d.c. Applications | Page 269 |
| Lightning Current Arresters – Type 1 | Page 270 |
| N-PE Lightning Current Arresters | Page 271 |
| Surge Arresters – Type 2 | Page 272 |
| Surge Arresters – Type 2 for PV Systems | Page 293 |
| Surge Arresters – Type 3 | Page 296 |
| Measuring Devices and Accessories | Page 300 |

# International Power Supply Systems

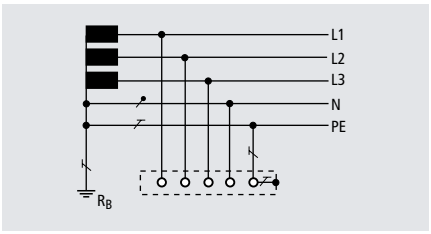
## International system configurations* according to IEC 60364-1



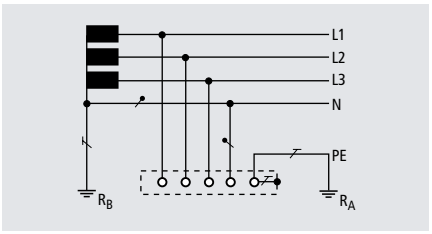

**TN-C system** 230 / 400 V



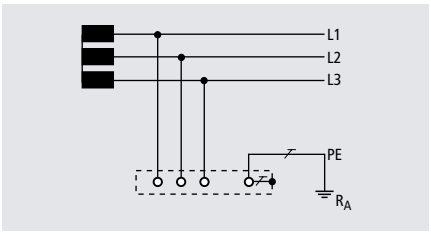

**TN-C-S system** 230 / 400 V




**TN-S system** 230 / 400 V

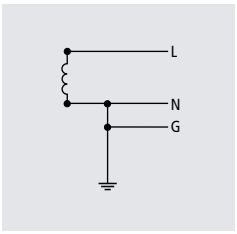



**TT system** 230 / 400 V



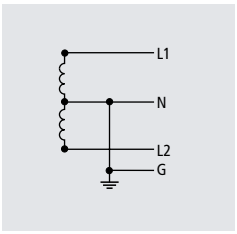

**IT system** 230 V

## Further international system configurations*

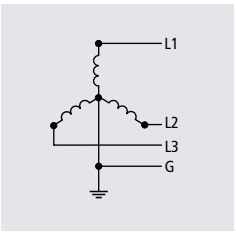



**Single-phase; 3 wire**

(1 Ph, 2 W + G)
110 V
120 V
220 V
240 V

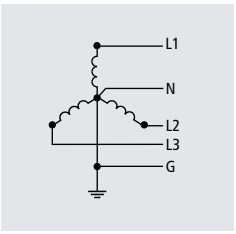



**Single-phase; 4 wire**
**Split Phase or Edison**
(1 Ph, 3 W + G)
120 V / 240 V



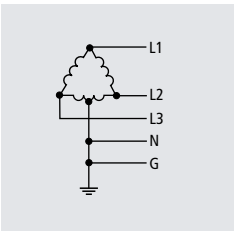

**Three-phase; 4 wire**

(3 Ph Y, 3 W + G)
480 V

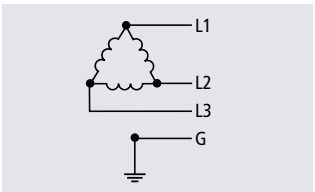



**Three-phase; 5 wire**

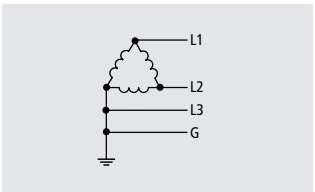
(3 Ph Y, 4 W + G)
120 V / 208 V
277 V / 480 V



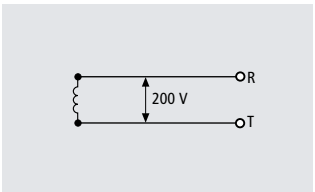

**Three-phase; 5 wire**
**Delta "Highleg"**
(3 Ph Δ, 4 W + G)
120 V / 240 V




**Three-phase; 4 wire**
**Delta "Ungrounded"**
(3 Ph Δ, 3 W + G)
240 V
480 V

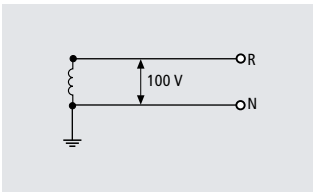



**Three-phase; 4 wire**
**Delta "Grounded Corner"**
(3 Ph Δ, 3 W + G)
240 V
480 V



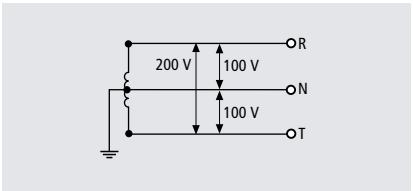

**Single-phase; 2 wire**

(1 Ph, 2 W)
200 V

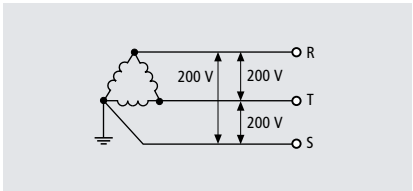



**Single-phase; 2 wire**

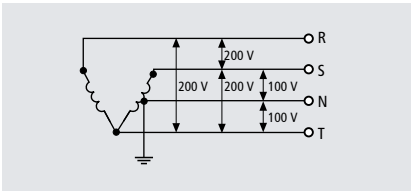
(1 Ph, 2 W)
100 V




**Single-phase; 3 wire**
(1 Ph, 3 W)
100 V / 200 V



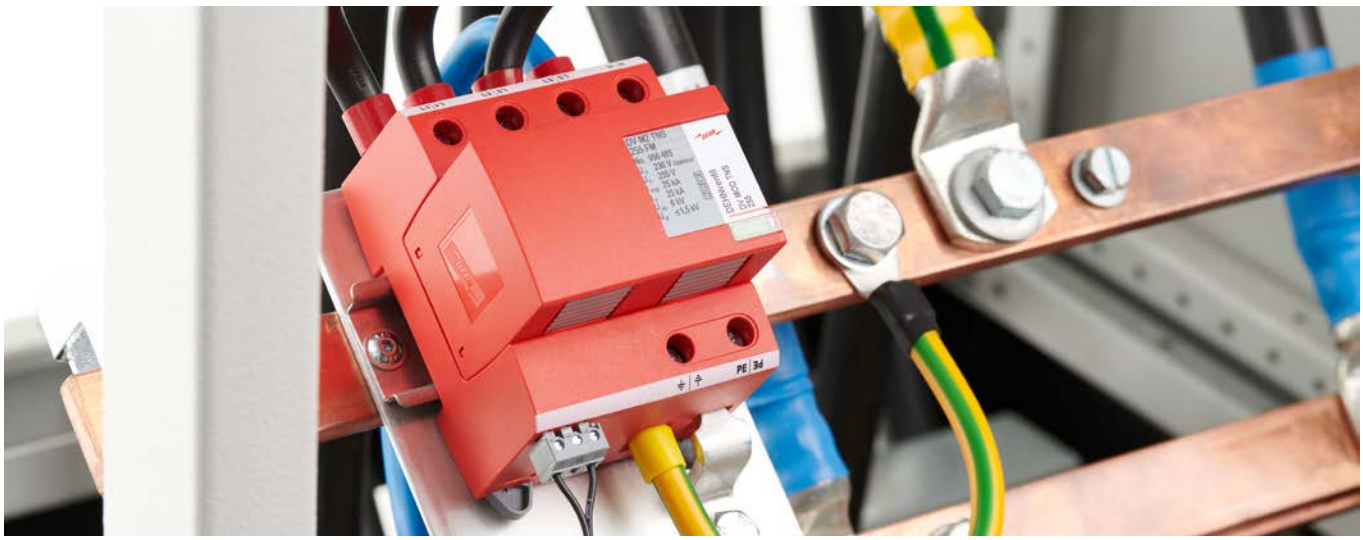

**Three-phase; 3 wire**
(3 Ph, 3 W)
200 V




**Three-phase + single-phase**

100 V / 200 V; 200 V

* System according to the earth connection (according to IEC 60364-1)





## DEHNventil modular

Multipole, modular combined arrester for protecting low-voltage consumer installations against surges with a follow current extinguishing capability of 100 $kA_{rms}$, also in case of direct lightning strikes.

### DEHNventil M2 TNC FM

Modular combined arrester for TN-C systems.



| Type DV M2 ... | TNC 255 FM |
|---|---|
| **Part No.** | **956 305** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 + type 3 / class I + class II + class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3-PEN] ($I_{total}$) | 75 kA |
| Lightning impulse current (10/350 µs) [L-PEN] ($I_{imp}$) | 25 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ | 250 A gG |
| Approvals | VDE, KEMA, UL |
| Type of remote signalling contact | yes / changeover contact |
| Extended technical data: Use in switchgear installations with prospective short-circuit currents of more than 50 $kA_{rms}$ | |
| – Max. prospective short-circuit current | 100 $kA_{rms}$ (220 $kA_{peak}$) |

### DEHNventil M2 TNS FM

Modular combined arrester for TN-S systems.



| Type DV M2 ... | TNS 255 FM |
|---|---|
| **Part No.** | **956 405** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 + type 3 / class I + class II + class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 100 kA |
| Lightning impulse current (10/350 µs) [L, N-PE] ($I_{imp}$) | 25 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ | 250 A gG |
| Approvals | VDE, KEMA, UL |
| Type of remote signalling contact | yes / changeover contact |
| Extended technical data: Use in switchgear installations with prospective short-circuit currents of more than 50 $kA_{rms}$ | |
| – Max. prospective short-circuit current | 100 $kA_{rms}$ (220 $kA_{peak}$) |

### DEHNventil M2 TT FM

Modular combined lightning current and surge arrester for TT and TN-S systems (3+1 configuration).



| Type DV M2 ... | TT 255 FM |
|---|---|
| **Part No.** | **956 315** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 + type 3 / class I + class II + class III |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 100 kA |
| Lightning impulse current (10/350 µs) [L-N]/[N-PE] ($I_{imp}$) | 25 / 100 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ | 250 A gG |
| Approvals | VDE, KEMA, UL |
| Type of remote signalling contact | yes / changeover contact |
| Extended technical data: Use in switchgear installations with prospective short-circuit currents of more than 50 $kA_{rms}$ | |
| – Max. prospective short-circuit current | 100 $kA_{rms}$ (220 $kA_{peak}$) |
| Supplementary data: | |
| – Voltage protection level [L-PE] ($U_P$) | 1.8 kV |

### DEHNventil M2 TN FM

Modular combined arrester for single-phase TN systems.



| Type DV M2 ... | TN 255 FM |
|---|---|
| **Part No.** | **956 205** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 + type 3 / class I + class II + class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L+N-PE] ($I_{total}$) | 50 kA |
| Lightning impulse current (10/350 µs) [L, N-PE] ($I_{imp}$) | 25 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ | 250 A gG |
| Approvals | VDE, KEMA, UL |
| Type of remote signalling contact | yes / changeover contact |
| Extended technical data: Use in switchgear installations with prospective short-circuit currents of more than 50 $kA_{rms}$ | |
| – Max. prospective short-circuit current | 100 $kA_{rms}$ (220 $kA_{peak}$) |

## DEHNventil M2 TT 2P FM

Modular combined lightning current and surge arrester for single-phase TT and TN systems (1+1 configuration).



| Type DV M2 ... | TT 2P 255 FM |
|---|---|
| Part No. | 956 115 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 + type 3 / class I + class II + class III |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L+N-PE] ($I_{total}$) | 50 kA |
| Lightning impulse current (10/350 µs) [L-N]/[N-PE] ($I_{imp}$) | 25 / 50 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ | 250 A gG |
| Approvals | VDE, KEMA, UL |
| Type of remote signalling contact | yes / changeover contact |
| Extended technical data: Use in switchgear installations with prospective short-circuit currents of more than 50 $kA_{rms}$ | |
| – Max. prospective short-circuit current | 100 $kA_{rms}$ (220 $kA_{peak}$) |
| Supplementary data: | |
| – Voltage protection level [L-PE] ($U_P$) | 1.8 kV |

## DEHNventil M2 880 FM

Kit consisting of pluggable lightning and surge arresters, including insulated module wiring bar for use in inverter systems with active anti-PID with maximum DC offset of 750 V DC. Wiring of the earthing systems in accordance with IEC 60364-4-44, Table 44.A1 – RE and Z as well as RE and RA connected.



| Type DV M2 ... | 880 FM |
|---|---|
| Part No. | 961 151 NEW |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 880 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [1,2-3] ($I_{imp}$) | 12.5 kA |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ | 160 A gG |
| Type of remote signalling contact | yes / changeover contact |
| Supplementary data: | |
| – Anti-PID voltage ($U_{1-3}$ + $U_{PID}$) | 508 $V_{AC}$ + 750 $V_{DC}$ – withstand |

# Protection module for DEHNventil modular

DV MOD ...: Spark-gap-based protection module for all devices of the modular DEHNventil series

## RAC Spark Gap Protection Module

RAC spark-gap-based protection modules



| General technical data: | | |
|---|---|---|
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V | |
| | | |
| Type DV MOD ... | TNC 255 | TNS 255 |
| Part No. | 956 030 | 956 040 |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 75 kA | 100 kA |
| | | |
| Type DV MOD ... | TT 255 | TN 255 |
| Part No. | 956 031 | 956 020 |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA | 50 kA |
| | | |
| Type DV MOD ... | | TT 2P 255 |
| Part No. | | 956 011 |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | | 25 kA |

# DEHNvenCI

Single-pole combined lightning current and surge arrester with integrated backup fuse ensures maximum system availability. For protecting low-voltage consumer installations against surges and even direct lightning strikes.

## DEHNvenCI 255 (FM)

Single-pole combined lightning current and surge arrester with an integrated backup fuse capable of carrying lightning currents for use in 230 / 400 V systems; FM version with floating remote signalling contact.



| Type DVCI 1 ... | 255 | 255 FM |
|---|---|---|
| Part No. | 961 200 | 961 205 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II | type 1 + type 2 / class I + class II |
| Maximum continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 25 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | integrated backup fuse | integrated backup fuse |
| Approvals | KEMA | KEMA |
| Type of remote signalling contact | – | changeover contact |
| Extended technical data: For use in switchgear installations with prospective short-circuit currents of more than 50 $kA_{rms}$ (tested by the German VDE) | | |
| – Max. prospective short-circuit current | 100 $kA_{rms}$ (220 $kA_{peak}$) | 100 $kA_{rms}$ (220 $kA_{peak}$) |

## Accessories for DEHNvenCI

### MVS for two-module enclosures, single-phase, four-pole

Modular wiring clip for TT systems, insulated, single-phase, four-pole with connection clamp up to 50 mm².



| Type | MVS 1 4 8 TT |
|---|---|
| Part No. | 900 849 |
| Dimensions | 166 x 38.1 x 22 mm |
| Connection clamp | 10–50 mm (solid or stranded) / 6–35 mm² (flexible with wire end ferrule) |
| Max. lightning current (10/350 µs) based on DIN EN 61643-11 ($I_{imp}$) | 100 kA |

### Earthing clip for two-module enclosures, single-phase, two-pole

Earthing clip for connecting the earth terminal of e.g. two SPDs with two-module enclosure to earth, with terminal.



| Type | EB 1 2 5 |
|---|---|
| Part No. | 900 419 |
| Dimensions | 34 x 77 x 28 mm |
| Terminal | up to 25 mm² |

### Earthing clip for two-module enclosures, single-phase, three-pole

Earthing clip for connecting the earth terminal of e.g. three SPDs with two-module enclosure to earth, with terminal.



| Type | EB DG 1000 1 3 |
|---|---|
| Part No. | 900 411 |
| Dimensions | 34 x 112 x 28 mm |
| Terminal | up to 25 mm² |

### Earthing clip for two-module enclosures, single-phase, four-pole

Earthing clip for connecting the earth terminal of e.g. four SPDs with two-module enclosure to earth, with terminal.



| Type | EB 1 4 9 |
|---|---|
| Part No. | 900 417 |
| Dimensions | 34 x 148 x 28 mm |
| Terminal | up to 25 mm² |

## DEHNshield

Application-optimised multipole combined lightning current and surge arrester which fulfils the minimum requirements on the lightning current discharge capacity according to IEC 60364-5-53 and ensures compact lightning equipotential bonding including protection of terminal equipment.

### DEHNshield TNC

Application-optimised and prewired combined lightning current and surge arrester for TN-C systems with a nominal voltage of 230 / 400 V (3+0 configuration).



| Type DSH ... | TNC 255 |
|---|---|
| **Part No.** | **941 300** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 37.5 kA |
| Lightning impulse current (10/350 µs) [L-PEN] ($I_{imp}$) | 12.5 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE, UL |

### DEHNshield TNC FM

Application-optimised and prewired combined lightning current and surge arrester for TN-C systems with a nominal voltage of 230 / 400 V (3+0 configuration); with floating remote signalling contact.



| Type DSH ... | TNC 255 FM |
|---|---|
| **Part No.** | **941 305** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3-PEN] ($I_{total}$) | 37.5 kA |
| Lightning impulse current (10/350 µs) [L-PEN] ($I_{imp}$) | 12.5 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE |
| Type of remote signalling contact | changeover contact |

### DEHNshield TNC Basic FM

Application-optimised and prewired combined lightning current and surge arrester for TN-C systems for use in the main power supply system (3+0 configuration) in case of residential buildings without external lightning protection system (also in case of buildings supplied by overhead lines); with floating remote signalling contact.



| Type DSH ... | B TNC 255 FM |
|---|---|
| **Part No.** | **941 306** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3-PEN] ($I_{total}$) | 22.5 kA |
| Lightning impulse current (10/350 µs) [L-PEN] ($I_{imp}$) | 7.5 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | VDE |
| Type of remote signalling contact | changeover contact |

### DEHNshield TNS

Application-optimised and prewired combined lightning current and surge arrester for TN-S systems with a nominal voltage of 230 / 400 V (4+0 configuration).



| Type DSH ... | TNS 255 |
|---|---|
| **Part No.** | **941 400** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 50 kA |
| Lightning impulse current (10/350 µs) [L, N-PE] ($I_{imp}$) | 12.5 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE, UL |

### DEHNshield TNS FM

Application-optimised and prewired combined lightning current and surge arrester for TN-S systems with a nominal voltage of 230 / 400 V (4+0 configuration); with floating remote signalling contact.



| Type DSH ... | TNS 255 FM |
|---|---|
| **Part No.** | **941 405** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 50 kA |
| Lightning impulse current (10/350 µs) [L, N-PE] ($I_{imp}$) | 12.5 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE |
| Type of remote signalling contact | changeover contact |

### DEHNshield TNS Basic FM

Application-optimised and prewired combined lightning current and surge arrester for TN-S systems for use in the main power supply system (4+0 configuration) in case of residential buildings without external lightning protection system (also in case of buildings supplied by overhead lines); with floating remote signalling contact.



| Type DSH ... | B TNS 255 FM |
|---|---|
| **Part No.** | **941 406** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 30 kA |
| Lightning impulse current (10/350 µs) [L, N-PE] ($I_{imp}$) | 7.5 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | VDE |
| Type of remote signalling contact | changeover contact |

## DEHNshield TT

Application-optimised and prewired combined lightning current and surge arrester for TT and TN-S systems with a nominal voltage of 230 / 400 V (3+1 configuration).



| Type DSH ... | TT 255 |
|---|---|
| **Part No.** | **941 310** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 50 kA |
| Lightning impulse current (10/350 µs) [L-N]/[N-PE] ($I_{imp}$) | 12.5 / 50 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE, UL |
| Extended technical data: | |
| Voltage protection level [L-PE] ($U_P$) | 2.0 kV |

## DEHNshield TT FM

Application-optimised and prewired combined lightning current and surge arrester for TT and TN-S systems with a nominal voltage of 230 / 400 V (3+1 configuration); with floating signalling contact.



| Type DSH ... | TT 255 FM |
|---|---|
| **Part No.** | **941 315** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 50 kA |
| Lightning impulse current (10/350 µs) [L-N]/[N-PE] ($I_{imp}$) | 12.5 / 50 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE |
| Type of remote signalling contact | changeover contact |
| Extended technical data: | |
| Voltage protection level [L-PE] ($U_P$) | 2.0 kV |

## DEHNshield TT Basic FM

Application-optimised and prewired combined lightning current and surge arrester for TT and TN-S systems for use in the main power supply system (3+1 configuration) for residential buildings without external lightning protection (also for buildings supplied by overhead lines); with floating remote signalling contact.



| Type DSH ... | B TT 255 FM |
|---|---|
| **Part No.** | **941 316** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 30 kA |
| Lightning impulse current (10/350 µs) [L-N]/[N-PE] ($I_{imp}$) | 7.5 / 30 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | VDE |
| Type of remote signalling contact | changeover contact |
| Extended technical data: | |
| Voltage protection level [L-PE] ($U_P$) | 2.0 kV |

## DEHNshield TN

Application-optimised and prewired combined lightning current and surge arrester for single-phase TN systems with a nominal voltage of 230 V (2+0 configuration).



| Type DSH ... | TN 255 |
|---|---|
| **Part No.** | **941 200** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L+N-PE] ($I_{total}$) | 25 kA |
| Lightning impulse current (10/350 µs) [L, N-PE] ($I_{imp}$) | 12.5 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 /≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE, UL |

## DEHNshield TN FM

Application-optimised and prewired combined lightning current and surge arrester for single-phase TN systems with a nominal voltage of 230 V (2+0 configuration); with floating remote signalling contact.



| Type DSH ... | TN 255 FM |
|---|---|
| **Part No.** | **941 205** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L+N-PE] ($I_{total}$) | 25 kA |
| Lightning impulse current (10/350 µs) [L, N-PE] ($I_{imp}$) | 12.5 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 /≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE |
| Type of remote signalling contact | changeover contact |

## DEHNshield TN Basic FM

Application-optimised and prewired combined lightning current and surge arrester for single-phase TN systems for use in the main power supply system (2+0 configuration) in case of residential buildings without external lightning protection system (also in case of buildings supplied by overhead lines); with floating remote signalling contact.



| Type DSH ... | B TN 255 FM |
|---|---|
| **Part No.** | **941 206** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L+N-PE] ($I_{total}$) | 15 kA |
| Lightning impulse current (10/350 µs) [L, N-PE] ($I_{imp}$) | 7.5 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 /≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Type of remote signalling contact | changeover contact |

## DEHNshield TT 2P

Application-optimised and prewired combined lightning current and surge arrester for single-phase TT and TN systems with a nominal voltage of 230 V (1+1 configuration).



| Type DSH ... | TT 2P 255 |
|---|---|
| **Part No.** | **941 110** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L+N-PE] ($I_{total}$) | 25 kA |
| Lightning impulse current (10/350 µs) [L-N]/[N-PE] ($I_{imp}$) | 12.5 / 25 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE, UL |
| Extended technical data: | |
| Voltage protection level [L-PE] ($U_P$) | 2.0 kV |

## DEHNshield TT 2P FM

Application-optimised and prewired combined lightning current and surge arrester for single-phase TT and TN systems with a nominal voltage of 230 V (1+1 configuration); with floating remote signalling contact.



| Type DSH ... | TT 2P 255 FM |
|---|---|
| **Part No.** | **941 115** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L+N-PE] ($I_{total}$) | 25 kA |
| Lightning impulse current (10/350 µs) [L-N]/[N-PE] ($I_{imp}$) | 12.5 / 25 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Approvals | KEMA, VDE |
| Type of remote signalling contact | changeover contact |
| Extended technical data: | |
| Voltage protection level [L-PE] ($U_P$) | 2.0 kV |

## DEHNshield TT 2P Basic FM

Application-optimised and prewired combined lightning current and surge arrester for single-phase TT and TN systems for use in the main power supply system (1+1 configuration) in case of residential buildings without external lightning protection system (also in case of buildings supplied by overhead lines); with floating remote signalling contact.



| Type DSH ... | B TT 2P 255 FM |
|---|---|
| **Part No.** | **941 116** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) [L+N-PE] ($I_{total}$) | 15 kA |
| Lightning impulse current (10/350 µs) [L-N]/[N-PE] ($I_{imp}$) | 7.5 / 15 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |
| Type of remote signalling contact | changeover contact |
| Extended technical data: | |
| Voltage protection level [L-PE] ($U_P$) | 2.0 kV |

## DEHNcharge

Prewired, two-pole combined arrester specially designed to protect large DC battery storage systems up to a system voltage of 1,500 V.



| Type | DCG T1 BATT 1500 FM |
|---|---|
| **Part No.** | **900 095** NEW |
| SPD based on IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage DC [DC+/DC-] ($U_C$) | ≤ 1500 V |
| Max. continuous operating voltage (DC) [(DC+/DC-) --> PE] ($U_C$) | ≤ 750 V |
| Short-circuit withstand capability (t ≤ 5.83 ms) ($I_{SCCR}$) | 100 kA |
| Total discharge current (10/350 µs) [DC+/DC- -> PE] ($I_{total}$) | 10 kA |
| Lightning impulse current (10/350 µs) [DC+ -> PE/DC- -> PE] ($I_{imp}$) | 5 kA |
| Voltage protection level [(DC+/DC-) -> PE] ($U_P$) | < 3 kV |
| Voltage protection level [DC+ -> DC-] ($U_P$) | < 6 kV |
| Type of remote signalling contact | Changeover contact |

## DEHNcombo ... for PV Systems

Prewired two-pole combined lightning current and surge arrester with three-step d.c. switching device for use in PV systems up to 1500 V.

### DEHNcombo YPV ...

Combined lightning current and surge arrester for use in photovoltaic power supply systems up to 1500 V d.c.



| Type DCB YPV ... | 1200 | 1500 |
|---|---|---|
| **Part No.** | **900 070** | **900 071** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 1 + type 2 / class I + class II | type 1 + type 2 / class I + class II |
| Max. PV voltage [DC+ -> DC-] ($U_{CPV}$) | ≤ 1200 V | ≤ 1500 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA | 10 kA |
| Total discharge current (10/350 µs) [DC+/DC- -> PE] ($I_{total}$) | 12.5 kA | 12.5 kA |
| Lightning impulse current (10/350 µs) [DC+ -> PE/DC- -> PE] ($I_{imp}$) | 6.25 kA | 6.25 kA |
| Voltage protection level [(DC+/DC-) -> PE] ($U_P$) | < 3.8 kV | < 4.5 kV |
| Approvals | KEMA, UL | KEMA, UL |

### DEHNcombo YPV ... FM

Combined lightning current and surge arrester for use in photovoltaic power supply systems up to 1500 V d.c.; with floating remote signalling contact.



| Type DCB YPV ... | 1200 FM | 1500 FM |
|---|---|---|
| **Part No.** | **900 075** | **900 076** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 1 + type 2 / class I + class II | type 1 + type 2 / class I + class II |
| Max. PV voltage [DC+ -> DC-] ($U_{CPV}$) | ≤ 1200 V | ≤ 1500 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA | 10 kA |
| Total discharge current (10/350 µs) [DC+/DC- -> PE] ($I_{total}$) | 12.5 kA | 12.5 kA |
| Lightning impulse current (10/350 µs) [DC+ -> PE/DC- -> PE] ($I_{imp}$) | 6.25 kA | 6.25 kA |
| Voltage protection level [(DC+/DC-) -> PE] ($U_P$) | < 3.8 kV | < 4.5 kV |
| Approvals | KEMA, UL | KEMA, UL |
| Type of remote signalling contact | | Changeover contact |





## DEHNsolid

Coordinated and spark-gap-based single-pole lightning current arrester for busbar installation for protecting low-voltage consumer installations against surges and even direct lightning strikes with an extremely high lightning current discharge capacity up to 200 kA.

### DEHNsolid 1 255

Coordinated single-pole lightning current arrester for use in 230 / 400 V systems; for installation on busbars or mounting plates.



| Type | DSO 1 255 |
|---|---|
| **Part No.** | **900 230** |
| Classification according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 200 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV |
| Max. mains-side overcurrent protection | 160 A gG |

## DEHNbloc Maxi

Coordinated lightning current arrester (NH00 design) for protecting low-voltage consumer's installations against surges and even direct lightning strikes.

### DEHNbloc Maxi NH00 255

Coordinated single-pole lightning current arrester in NH00 design for TN-C and TN-S systems with a nominal voltage of 230 / 400 V.



| Type | DBM NH00 255 |
|---|---|
| **Part No.** | **900 255** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 25 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ | 315 A gG |

## DEHNbloc modular for North America

The modular DEHNbloc MU series are UL 1449 4th Ed. Type 1 Component Assembly and therefore ready for an easy installation into many electrical products. The very high discharge current capacity of 75 kA (10x350 µs) due to DEHN's patented lightning arrester gap technology enables the SPD to resist powerful lightning strikes and therefore protect your electrical system and gear. The DEHNbloc three-pole has also remote contacts and a visual non-power consuming status indication for each plug-in protection module.

### DEHNbloc MU 3PY ... 3W+G

DIN rail mount, pluggable lightning current arrester consisting of a base part and plug-in protection modules for application in 3 Phase Wye electrical systems



| Type DB MU 3PY ... | 208 3W+G R | 480 3W+G R |
|---|---|---|
| **Part No.** | **908 505** | **908 506** |
| SPD classification acc. to ANSI/UL 1449 4th Ed. | Type 1 Component Assembly SPD | Type 1 Component Assembly SPD |
| Max. continuous operating voltage [L-G] / [L-L] (MCOV) | 150 V a.c. / 260 V a.c. | 320 V a.c. / 555 V a.c. |
| Lightning impulse current (10x350 µs) ($I_{imp}$) | 35 kA | 25 kA |
| Voltage protection rating [L-G] / [L-L] (VPR) | 1500 $V_{pk}$ / 2500 $V_{pk}$ | 1800 $V_{pk}$ / 3000 $V_{pk}$ |
| Approvals | UL | UL |
| Remote status contact | Floating (dry), Form C (SPDT) | Floating (dry), Form C (SPDT) |

## Protection module for DEHNbloc modular

DB M MOD ...: Spark-gap-based protection module suitable for all DEHNbloc M arresters

### DB M Spark-Gap-Based Protection Module

Spark-gap-based protection module for DEHNbloc M ...



| Type DB M MOD ... | 150 | 255 | 320 |
|---|---|---|---|
| **Part No.** | **961 001** | **961 002** | **961 003** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V | 255 V | 320 V |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 35 kA | 50 kA | 50 kA |

## DEHNbloc modular

Coordinated and modular single-pole lightning current arrester for protecting low-voltage consumer´s installations against surges and even direct lightning strikes.

### DEHNbloc M 1 ...

Coordinated and modular single-pole lightning current arrester with a high discharge capacity.



| General technical data: | | | |
|---|---|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I | | |

| Type DB M 1 ... | 150 | 255 | 320 |
|---|---|---|---|
| Part No. | 961 110 | 961 120 | 961 130 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 255 V (50 / 60 Hz) | 320 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 35 kA | 50 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 2.5 kV | ≤ 2.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ ($t_a$ ≤ 0.2 s) | – | 500 A gG | 315 A gG |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ ($t_a$ ≤ 5 s) | – | 315 A gG | 315 A gG |
| Max. backup fuse (L) up to $I_K$ = 35 $kA_{rms}$ ($t_a$ ≤ 0.2 s) | 500 A gG | – | – |
| Max. backup fuse (L) up to $I_K$ = 35 $kA_{rms}$ ($t_a$ ≤ 5 s) | 315 A gG | – | – |
| Approvals | UL, CSA | VDE, KEMA, UL | UL |

### DEHNbloc M 1 ... FM

Coordinated and modular single-pole lightning current arrester with a high discharge capacity; with remote signalling contact for monitoring system (floating changeover contact).



| General technical data: | | | |
|---|---|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I | | |

| Type DB M 1 ... | 150 FM | 255 FM | 320 FM |
|---|---|---|---|
| Part No. | 961 115 | 961 125 | 961 135 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 255 V (50 / 60 Hz) | 320 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 35 kA | 50 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 2.5 kV | ≤ 2.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ ($t_a$ ≤ 0.2 s) | – | 500 A gG | 315 A gG |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ ($t_a$ ≤ 5 s) | – | 315 A gG | 315 A gG |
| Max. backup fuse (L) up to $I_K$ = 35 $kA_{rms}$ ($t_a$ ≤ 0.2 s) | 500 A gG | – | – |
| Max. backup fuse (L) up to $I_K$ = 35 $kA_{rms}$ ($t_a$ ≤ 5 s) | 315 A gG | – | – |
| Approvals | UL, CSA | VDE, KEMA, UL | UL |

## DEHNbloc Maxi 1 CI 440 / 760 FM

Coordinated lightning current arrester with integrated backup fuse for high voltage levels ensues maximum system availability. For protecting low-voltage consumer installations against surges and even direct lightning strikes.

### DEHNbloc Maxi 1 CI 440 FM

Coordinated single-pole lightning current arrester with integrated backup fuse for 400 / 690 V TN systems and 400 V IT systems; with remote signalling contact for monitoring device (floating changeover contact).



| Type DBM 1 CI ... | 440 FM |
|---|---|
| Part No. | 961 146 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Maximum continuous operating voltage (a.c.) ($U_C$) | 440 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 35 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV |
| Max. mains-side overcurrent protection | not required |
| Type of remote signalling contact | changeover contact |

### DEHNbloc Maxi 1 CI 760 FM

Coordinated single-pole lightning current arrester with integrated backup fuse for 690 V TN / IT systems; with remote signalling contact for monitoring device (floating changeover contact).



| Type DBM 1 CI ... | 760 FM |
|---|---|
| Part No. | 961 176 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Maximum continuous operating voltage (a.c.) ($U_C$) | 760 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 35 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Max. mains-side overcurrent protection | not required |
| Type of remote signalling contact | changeover contact |

## Accessories for DEHNbloc Maxi 1 CI 440 / 760 FM

### Earthing clip for three-module enclosures, single-phase, three-pole

Earthing clip for connecting the earth terminal of e.g. three SPDs with three-module enclosure to earth, with terminal.



| Type | EB 1 3 10 |
|---|---|
| Part No. | 900 461 |
| Dimensions | 34 x 158 x 28 mm |
| Terminal | up to 25 $mm^2$ |

### Earthing clip for three-module enclosures, single-phase, four-pole

Earthing clip for connecting the earth terminal of e.g. four SPDs with three-module enclosure to earth, with terminal.



| Type | EB 1 4 13 |
|---|---|
| Part No. | 900 462 |
| Dimensions | 34 x 212 x 28 mm |
| Terminal | up to 25 $mm^2$ |

## DEHNbloc Maxi 440 / 760

Coordinated lightning current arrester for high voltage levels for protecting low-voltage consumer´s installations against surges and even direct lightning strikes.

### DEHNbloc Maxi 1 440 (FM)

Coordinated single-pole lightning current arrester for use in 400 / 690 V systems; FM version with floating remote signalling contact.



| Type DBM 1 ... | 440 | 440 FM |
|---|---|---|
| Part No. | 961 140 | 961 145 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V | 440 V |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 35 kA | 35 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV | ≤ 2.5 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ ($t_a$ ≤ 0.2 s) | 500 A gG | 500 A gG |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ ($t_a$ ≤ 5 s) | 250 A gG | 250 A gG |
| Approvals | UL, CSA | UL, CSA |
| Type of remote signalling contact | – | changeover contact |

### DEHNbloc Maxi 1 760 FM

Coordinated single-pole lightning current arrester for use in 690 V systems; with remote signalling contact for monitoring device (floating changeover contact).



| Type DBM 1 ... | 760 FM |
|---|---|
| Part No. | 961 175 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 760 V |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 25 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Max. backup fuse (L) up to $I_K$ = 25 $kA_{rms}$ ($t_a$ ≤ 5 s) | 250 A gG |
| Approvals | UL, CSA |
| Type of remote signalling contact | changeover contact |

## Accessories for DEHNbloc Maxi 440 / 760

### MVS for two-module enclosures, single-phase, four-pole

Modular wiring clip for TT systems, insulated, single-phase, four-pole with connection clamp up to 50 mm².



| Type | MVS 1 4 8 TT |
|---|---|
| Part No. | 900 849 |
| Dimensions | 166 x 38.1 x 22 mm |
| Connection clamp | 10–50 mm (solid or stranded) / 6–35 mm² (flexible with wire end ferrule) |
| Max. lightning current (10/350 µs) based on DIN EN 61643-11 ($I_{imp}$) | 100 kA |

### Earthing clip for two-module enclosures, single-phase, three-pole

Earthing clip for connecting the earth terminal of e.g. three SPDs with two-module enclosure to earth, with terminal.



| Type | EB DG 1000 1 3 |
|---|---|
| Part No. | 900 411 |
| Dimensions | 34 x 112 x 28 mm |
| Terminal | up to 25 mm² |

### Earthing clip for two-module enclosures, single-phase, four-pole

Earthing clip for connecting the earth terminal of e.g. four SPDs with two-module enclosure to earth, with terminal.



| Type | EB 1 4 9 |
|---|---|
| Part No. | 900 417 |
| Dimensions | 34 x 148 x 28 mm |
| Terminal | up to 25 mm² |

## DEHNbloc Maxi S

Coordinated lightning current arrester with integrated backup fuse for busbars for protecting low-voltage consumer´s installations against surges and even direct lightning strikes.

### DEHNbloc Maxi 1 255 S

Coordinated single-pole lightning current arrester with integrated backup fuse for busbar installation in 230 / 400 V systems.



| Type | DBM 1 255 S |
|---|---|
| Part No. | 900 220 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 25 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV (including 80 cm connecting cable) |
| Max. mains-side overcurrent protection | not required |
| Operating state indication | by optical fibre cables via DSI E 3 |

## DEHNsignal

Remote signalling device for Red/Line surge protective devices with interface "DEHNsignal DV..." with floating changeover contact and optical fibre output.

### DEHNsignal E 3



Receiver module for optical transmission for selective operating state indication / centralised fault indication of three coordinated DEHNbloc Maxi S and, where appropriate, DEHNgap Maxi S lightning current arresters in five-wire systems.

| Type | DSI E 3 |
|---|---|
| **Part No.** | **910 631** |
| Supply voltage (a.c.) ($U_N$) | 230 V |
| Power input (P) | < 550 mW |
| Backup fuse for supply voltage | 16 A gG or C 16 A |
| Signal input | 3x via optical fibre plug-in system (LWL ST DSI) |
| Type of remote signalling contact | floating changeover contact |
| Test standards | EN 61010-1:1993 and EN 61010-1/A2:1995 |

## Accessories for DEHNsignal

### LWL ST DSI



Plug for plastic optical fibre cables.

| Type | LWL ST DSI |
|---|---|
| **Part No.** | **910 641** |
| Diameter | 2.2 mm |

### LWL DSI 18M



18 metres of plastic optical fibre cable, preferably for use with DEHNbloc Maxi S.

| Type | LWL DSI 18M |
|---|---|
| **Part No.** | **910 642** |
| Diameter | 2.2 mm |
| Length | 18 m |



## DEHNsecure modular

For protecting d.c. consumer installations against surges and even direct lightning strikes.

### DEHNsecure M 1 ...



Coordinated and modular single-pole lightning current arrester for d.c. applications.

| General technical data: | | |
|---|---|---|
| Lightning impulse current (10/350 µs) ($I_{imp}$) | | 25 kA |
| Max. mains-side overcurrent protection | | 250 A gG |
| Extended technical data: | | **when used in safety lighting systems** |

| Type DSE ... | M 1 60 | M 1 220 |
|---|---|---|
| **Part No.** | **971 121** | **971 120** |
| SPD classification according to EN 61643-11 / IEC 61643-11 | type 1 / class I | type 1 / class I |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V | 220 V |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 2.5 kV |
| Approvals | UL | – |
| - Max. continuous operating voltage (AC) ($U_C$) | – | – |

| Type DSE ... | M 1 242 |
|---|---|
| **Part No.** | **971 122** |
| SPD classification according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (d.c.) ($U_C$) | 242 V |
| Voltage protection level ($U_P$) | ≤ 2.5 kV |
| Approvals | – |
| - Max. continuous operating voltage (AC) ($U_C$) | 255 V |

### DEHNsecure M 1 ... FM



Coordinated and modular single-pole lightning current arrester for d.c. applications; with remote signalling contact for monitoring device (floating changeover contact).

| General technical data: | | |
|---|---|---|
| Lightning impulse current (10/350 µs) ($I_{imp}$) | | 25 kA |
| Max. mains-side overcurrent protection | | 250 A gG |
| Type of remote signalling contact | | **changeover contact** |
| Extended technical data: | | **when used in safety lighting systems** |

| Type DSE ... | M 1 60 FM | M 1 220 FM |
|---|---|---|
| **Part No.** | **971 126** | **971 125** |
| SPD classification according to EN 61643-11 / IEC 61643-11 | type 1 / class I | type 1 / class I |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V | 220 V |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 2.5 kV |
| Approvals | UL | – |
| - Max. continuous operating voltage (AC) ($U_C$) | – | – |

| Type DSE ... | M 1 242 FM |
|---|---|
| **Part No.** | **971 127** |
| SPD classification according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (d.c.) ($U_C$) | 242 V |
| Voltage protection level ($U_P$) | ≤ 2.5 kV |
| Approvals | – |
| - Max. continuous operating voltage (AC) ($U_C$) | 255 V |

## … – Type 1 for d.c. Applications

### DEHNsecure M 2P … (FM)

Coordinated and modular two-pole lightning current arrester for d.c. applications up to 60 V (1+1 configuration); FM version with floating remote signalling contact.



| Type DSE … | M 2P 60 | M 2P 60 FM |
|---|---|---|
| **Part No.** | **971 221** | **971 226** |
| SPD classification according to EN 61643-11 / IEC 61643-11 | type 1 / class I | type 1 / class I |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V | 60 V |
| Lightning impulse current (10/350 µs) (DC+/DC- -> DC-/DC+) / (DC-/DC+ -> ⏚) ($I_{imp}$) | 25 / 50 kA | 25 / 50 kA |
| Voltage protection level (DC+/DC- -> DC-/DC+) / (DC-/DC+ -> ⏚) ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 250 A gG | 250 A gG |
| Approvals | UL | UL |
| Type of remote signalling contact | – | changeover contact |

### DEHNsecure NG 2P 60 FM

Coordinated and modular two-pole lightning current arrester for DC applications up to 60 V (1+1 configuration); FM version with floating remote signalling contact.



| Type DSE … | NG 2P 60 FM |
|---|---|
| **Part No.** | **971 222** |
| SPD classification according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V |
| Lightning impulse current (10/350 µs) (DC+/DC- -> DC-/DC+) / (DC-/DC+ -> ⏚) ($I_{imp}$) | 25 / 50 kA |
| Voltage protection level (DC+/DC- -> DC-/DC+) / (DC-/DC+ -> ⏚) ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 250 A gG |
| Type of remote signalling contact | changeover contact |

## Protection module for DEHNsecure modular

DSE MOD …: Spark-gap-based protection module for all devices of the modular DEHNsecure series.

### DSE M Spark-Gap-Based Protection Module

Spark-gap-based protection module



| General technical data: | | | |
|---|---|---|---|
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 25 kA | | |
| **Type DSE MOD …** | **60** | **220** | **242** |
| **Part No.** | **971 001** | **971 002** | **971 003** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V | 220 V | 242 V |

### DSE PE Spark-Gap-Based Protection Module

Spark-gap-based protection module



| Type DSE MOD … | PE 60 |
|---|---|
| **Part No.** | **971 010** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 50 kA |

### DSE MOD 60

Spark-gap-based protection module



| Type DSE MOD … | NG 2P 60 |
|---|---|
| **Part No.** | **971 004** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 25 kA |

## Lightning Current Arresters – Type 1



## DEHNbloc

Lightning current arrester for protecting low-voltage consumer's installations against surges and even direct lightning strikes.

### DEHNbloc H

Modular single-pole lightning current arrester with a high discharge capacity for use in 230 / 400 V systems.



| Type | DBH M 1 255 |
|---|---|
| **Part No.** | **961 122** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 50 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ ($t_a$ ≤ 0.2 s) | 500 A gG |
| Max. backup fuse (L) up to $I_K$ = 50 $kA_{rms}$ ($t_a$ ≤ 5 s) | 315 A gG |

## Accessories for DEHNbloc

### DB H Spark-Gap-Based Protection Module

Spark-gap-based protection module



| Type | DBH MOD 255 |
|---|---|
| **Part No.** | **961 022** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |



## DEHNgap

N-PE lightning current arrester for protecting low-voltage consumer's installations against surges and even direct lightning strikes, particularly for use in TT systems.

### DEHNgap M 255 (FM)

Coordinated and modular single-pole N-PE lightning current arrester; FM version with floating remote signalling contact.



| Type | DGP M 255 | DGP M 255 FM |
|---|---|---|
| Part No. | 961 101 | 961 105 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA | 100 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.5 kV |
| Approvals | VDE, KEMA, UL | VDE, KEMA, UL |
| Type of remote signalling contact | – | changeover contact |

### DEHNgap Maxi 1 255 S

Coordinated single-pole N-PE lightning current arrester for busbars.



| Type | DGPM 1 255 S |
|---|---|
| Part No. | 900 050 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV (including 80 cm connecting cable) |
| Operating state monitoring | via DEHNsignal DSI E 3 |

### DEHNgap Maxi 1 255 (FM)

Coordinated single-pole N-PE lightning current arrester; FM version with floating remote signalling contact.



| Type | DGPM 1 255 | DGPM 1 255 FM |
|---|---|---|
| Part No. | 961 180 | 961 185 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA | 100 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.5 kV |
| Type of remote signalling contact | – | changeover contact |

### DEHNgap Maxi 440 (FM)

Coordinated single-pole N-PE lightning current arrester; FM version with floating remote signalling contact.



| Type | DGPM 440 | DGPM 440 FM |
|---|---|---|
| Part No. | 961 160 | 961 165 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V (50 / 60 Hz) | 440 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA | 100 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV | ≤ 2.5 kV |
| Approvals | UL | UL |
| Type of remote signalling contact | – | changeover contact |

### DEHNgap H M 255

Modular single-pole N-PE lightning current arrester.



| Type | DGPH M 255 |
|---|---|
| Part No. | 961 102 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 1 / class I |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |

## Protection module for DEHNgap modular

DGP M ...: Spark-gap-based protection module for all devices of the modular DEHNgap M series

### DGP M – 100 kA N-PE Spark-Gap-Based Protection Module

N-PE spark-gap-based protection module for all devices of the modular DEHNgap M family.



| Type | DGP M MOD 255 |
|---|---|
| Part No. | 961 010 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |

### DGPH M – 100 kA N-PE Spark-Gap-Based Protection Module

N-PE spark-gap-based protection module for all devices of the modular DEHNgap H M family.



| Type | DGPH MOD 255 |
|---|---|
| Part No. | 961 020 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |






## DEHNguard modular with Advanced Circuit Interruption (Safe Dimensioning)

Modular multipole surge arrester with new "Advanced Circuit Interruption" (ACI) technology in the protection module consisting of a switch / spark gap combination. For protecting low-voltage consumer installations against surges.

### DEHNguard MP TNS ACI ... FM

Modular surge arrester with Advanced Circuit Interruption (ACI) for TN-S systems.



| Type DG ... | MP TNS ACI 275 FM |
|---|---|
| **Part No.** | **942 440** NEW |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage AC [L-PE] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Voltage protection level [L-PE] / [N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Additional external fuse | no |
| Temporary overvoltage (TOV) ($U_T$) – Characteristic | 335 V / 5 sec. – withstand |
| Temporary overvoltage (TOV) ($U_T$) – Characteristic | 440 V / 120 min. – withstand |
| Leakage current | no leakage current |
| Approvals | KEMA, VDE |

### DEHNguard MP TT ACI ... FM

Modular surge arrester with Advanced Circuit Interruption (ACI) for TT and TN-S systems (3+1 configuration).



| Type DG ... | MP TT ACI 275 FM |
|---|---|
| **Part No.** | **942 341** NEW |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | 40 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | 40 kA |
| Voltage protection level [L-N] / [N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Additional external fuse | no |
| Temporary overvoltage (TOV) [L-N] ($U_T$) – Characteristic | 335 V / 5 sec. – withstand |
| Temporary overvoltage (TOV) [L-N] ($U_T$) – Characteristic | 440 V / 120 min. – withstand |
| Temporary overvoltage (TOV) [N-PE] ($U_T$) – Characteristic | 1200 V / 200 ms – withstand |
| Leakage current | no leakage current |
| Approvals | KEMA, VDE |

### DEHNguard M TNC ACI 275 FM

Modular surge arrester with Advanced Circuit Interruption (ACI) for TN-C systems.



| Type DG ... | M TNC ACI 275 FM |
|---|---|
| **Part No.** | **952 330** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Additional external fuse | not required |
| Temporary overvoltage (TOV) ($U_T$) – Characteristic | 440 V / 120 min. – withstand |
| Leakage current | no leakage current |
| Approvals | KEMA |

### DEHNguard M TNS ACI 275 FM

Modular surge arrester with Advanced Circuit Interruption (ACI) for TN-S systems.



| Type DG ... | M TNS ACI 275 FM |
|---|---|
| **Part No.** | **952 440** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage AC [L-PE] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Voltage protection level [L-PE] / [N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Additional external fuse | not required |
| Temporary overvoltage (TOV) ($U_T$) – Characteristic | 440 V / 120 min. – withstand |
| Leakage current | no leakage current |
| Approvals | KEMA |

## DEHNguard M TT ACI ... FM

Modular surge arrester with Advanced Circuit Interruption (ACI) for TT and TN-S systems (3+1 configuration).



| Type DG ... | M TT ACI 275 FM | M TT ACI 385 FM |
|---|---|---|
| **Part No.** | **952 341** | **952 342** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 20 kA | 20 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | – | 40 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | – | 120 kA |
| Voltage protection level [L-N] / [N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Additional external fuse | not required | not required |
| Temporary overvoltage (TOV) [L-N] ($U_T$) – Characteristic | 440 V / 120 min. – withstand | 440 V / 120 min. – withstand |
| Temporary overvoltage (TOV) [N-PE] ($U_T$) – Characteristic | 1200 V / 200 ms – withstand | 1200 V / 200 ms – withstand |
| Leakage current | no leakage current | no leakage current |
| Approvals | KEMA | KEMA |

## DEHNguard M TN ACI 275 FM

Modular surge arrester with Advanced Circuit Interruption (ACI) for single-phase 230 V-TN systems.



| Type DG ... | M TN ACI 275 FM |
|---|---|
| **Part No.** | **952 220** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage AC [L-PE] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Voltage protection level [L-PE] / [N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Additional external fuse | not required |
| Temporary overvoltage (TOV) ($U_T$) – Characteristic | 440 V / 120 min. – withstand |
| Leakage current | no leakage current |
| Approvals | KEMA |

## DEHNguard M TT 2P ACI ... FM

Modular surge arrester with Advanced Circuit Interruption (ACI) for single-phase 230 V-TT and TN systems (1+1 configuration).



| Type DG ... | M TT 2P ACI 275 FM | M TT 2P ACI 385 FM |
|---|---|---|
| **Part No.** | **952 121** | **952 122** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 20 kA | 20 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | – | 40 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | – | 120 kA |
| Voltage protection level [L-N] / [N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Additional external fuse | not required | not required |
| Temporary overvoltage (TOV) [L-N] ($U_T$) – Characteristic | 440 V / 120 min. – withstand | 440 V / 120 min. – withstand |
| Temporary overvoltage (TOV) [N-PE] ($U_T$) – Characteristic | 1200 V / 200 ms – withstand | 1200 V / 200 ms – withstand |
| Leakage current | no leakage current | no leakage current |
| Approvals | KEMA | KEMA |

## DEHNguard S ACI ... FM

Pluggable single-pole surge arrester consisting of a base part and plug-in protection module; with Advanced Circuit Interruption (ACI).



| Type DG ... | S ACI 275 FM | S ACI 385 FM |
|---|---|---|
| **Part No.** | **952 100** | **952 113** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V (50 / 60 Hz) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | – | 40 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.5 kV |
| Additional external fuse | not required | not required |
| Temporary overvoltage (TOV) ($U_T$) – Characteristic | 440 V / 120 min. – withstand | 440 V / 120 min. – withstand |
| Leakage current | no leakage current | no leakage current |
| Approvals | KEMA | KEMA |

## Accessories for DEHNguard modular with Advanced Circuit Interruption (Safe Dimensioning)

### Switch / Spark Gap Protection Module for DEHNguard ACI



| Type | DG MOD ACI 275 | DG MOD ACI 385 |
|---|---|---|
| **Part No.** | **952 024** | **952 028** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V | 385 V |

### Spark-gap Based Protection Module for DEHNguard M ACI



| Type | DG MOD A NPE |
|---|---|
| **Part No.** | **952 022** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V |

### N-PE Spark-Gap-Based Protection Module for DEHNguard M ACI



| Type | DG MOD H A NPE |
|---|---|
| **Part No.** | **952 083** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V |

## DEHNguard SE CI with Integrated Backup Fuse

For industrial applications with a rated voltage of 400/690 V. Combines surge protection and backup fuse in a single component. Available in 2 versions: industry and wind power.

### DEHNguard SE CI 440 FM

Pluggable single-pole surge arrester comprising a base part and a plug-in protection module; with integrated backup fuse and remote signalling contact for monitoring unit (floating changeover contact).



| Type DG SE CI ... | 440 FM |
|---|---|
| **Part No.** | **952 920** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 12.5 kA |
| Voltage protection level ($U_P$) | ≤ 2 kV |
| Max. mains-side overcurrent protection | not required |
| Type of remote signalling contact | changeover contact |

### DEHNguard SE CI WE 440 FM

Pluggable single-pole surge arrester with a rated varistor voltage $U_{mov}$ = 750 V a.c.; comprising a base part and a plug-in protection module; with integrated backup fuse and remote signalling contact for monitoring unit (floating changeover contact).



| Type DG SE CI ... | WE 440 FM |
|---|---|
| **Part No.** | **952 923** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V (50 / 60 Hz) |
| Rated varistor voltage (a.c.) ($U_{mov}$) | 750 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 12.5 kA |
| Voltage protection level ($U_P$) | ≤ 3 kV |
| Max. mains-side overcurrent protection | not required |
| Type of remote signalling contact | changeover contact |

## Accessories for DEHNguard SE CI with Integrated Backup Fuse

### Varistor-based Protection Module for DEHNguard SE CI (WE)



| Type | DG MOD E CI 440 | DG MOD E CI WE 440 |
|---|---|---|
| **Part No.** | **952 926** | **952 927** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 440 V | 440 V |
| Rated varistor voltage (a.c.) ($U_{mov}$) | 440 V | 750 V |

## DEHNguard modular

Modular multipole surge arrester with a functional design. For protecting low-voltage consumer´s installations against surges.

### DEHNguard MP TNS ...

Modular surge arrester for use in TN-S systems.



| Type DG ... | MP TNS 275 |
|---|---|
| **Part No.** | **942 400** NEW |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 + type 3 / class II + class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | KEMA, VDE |

### DEHNguard MP TNS ... FM

Modular surge arrester for use in TN-S systems; with floating remote signalling contact.



| Type DG ... | MP TNS 275 FM |
|---|---|
| **Part No.** | **942 405** NEW |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 + type 3 / class II + class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | KEMA, VDE |
| Type of remote signalling contact | changeover contact |

### DEHNguard MP TT ...

Modular surge arrester for use in TT and TN-S systems (3+1 configuration).



| Type DG ... | MP TT 275 |
|---|---|
| **Part No.** | **942 310** NEW |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 + type 3 / class II + class III |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | KEMA, VDE |

### DEHNguard MP TT ... FM

Modular surge arrester for use in TT and TN-S systems (3+1 configuration); with floating remote signalling contact.



| Type DG ... | MP TT 275 FM |
|---|---|
| **Part No.** | **942 315** NEW |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 + type 3 / class II + class III |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | KEMA, VDE |
| Type of remote signalling contact | changeover contact |

## DEHNguard M TNC ...

Modular surge arrester for use in TN-C systems (3+0 configuration).



| General technical data: | | |
|---|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | | type 2 / class II |
| Max. discharge current (8/20 µs) ($I_{max}$) | | 40 kA |
| Max. mains-side overcurrent protection | | 125 A gG |

| Type DG ... | M TNC 150 | M TNC 275 |
|---|---|---|
| Part No. | 952 313 | 952 300 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Voltage protection level ($U_P$) | ≤ 0.7 kV | ≤ 1.5 kV |
| Approvals | KEMA, UL | KEMA, VDE, UL |

| Type DG ... | M TNC 385 | M TNC 440 |
|---|---|---|
| Part No. | 952 314 | 952 303 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 385 V (50 / 60 Hz) | 440 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection level ($U_P$) | ≤ 1.75 kV | ≤ 2 kV |
| Approvals | KEMA, UL | KEMA, UL |

## DEHNguard M TNC ... FM

Modular surge arrester for use in TN-C systems (3+0 configuration); with floating changeover contact.



| General technical data: | | |
|---|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | | type 2 / class II |
| Max. discharge current (8/20 µs) ($I_{max}$) | | 40 kA |
| Max. mains-side overcurrent protection | | 125 A gG |
| Type of remote signalling contact | | changeover contact |

| Type DG ... | M TNC 150 FM | M TNC 275 FM |
|---|---|---|
| Part No. | 952 318 | 952 305 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Voltage protection level ($U_P$) | ≤ 0.7 kV | ≤ 1.5 kV |
| Approvals | KEMA, UL | KEMA, VDE, UL |

| Type DG ... | M TNC 385 FM | M TNC 440 FM |
|---|---|---|
| Part No. | 952 319 | 952 308 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 385 V (50 / 60 Hz) | 440 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection level ($U_P$) | ≤ 1.75 kV | ≤ 2 kV |
| Approvals | KEMA, UL | KEMA, UL |

## DEHNguard M TNS ...

Modular surge arrester for use in TN-S systems (4+0 configuration).



| General technical data: | | |
|---|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | | type 2 / class II |
| Max. discharge current (8/20 µs) ($I_{max}$) | | 40 kA |
| Max. mains-side overcurrent protection | | 125 A gG |

| Type DG ... | M TNS 150 | M TNS 275 |
|---|---|---|
| Part No. | 952 403 | 952 400 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 0.7 / ≤ 0.7 kV | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | KEMA, UL | KEMA, VDE, UL |

| Type DG ... | M TNS 385 |
|---|---|
| Part No. | 952 404 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.75 / ≤ 1.75 kV |
| Approvals | KEMA, UL |

## DEHNguard M TNS ... FM

Modular surge arrester for use in TN-S systems (4+0 configuration); with floating changeover contact.



| General technical data: | | |
|---|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | | type 2 / class II |
| Max. discharge current (8/20 µs) ($I_{max}$) | | 40 kA |
| Max. mains-side overcurrent protection | | 125 A gG |
| Type of remote signalling contact | | changeover contact |

| Type DG ... | M TNS 150 FM | M TNS 275 FM |
|---|---|---|
| Part No. | 952 408 | 952 405 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 0.7 / ≤ 0.7 kV | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | KEMA, UL | KEMA, VDE, UL |

| Type DG ... | M TNS 385 FM |
|---|---|
| Part No. | 952 409 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 1.75 / ≤ 1.75 kV |
| Approvals | KEMA, UL |

## DEHNguard M H TT ... (FM)

Modular surge arrester with a high total discharge capacity in the N-PE path for TT and TN-S systems (3+1 configuration); meets increased safety requirements by higher discharge capability; with floating remote signalling contact.



| Type DG ... | M H TT 275 | M H TT 275 FM |
|---|---|---|
| **Part No.** | **952 381** | **952 385** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 20 kA | 20 kA |
| Nominal discharge current (8/20 µs) [N-PE] ($I_n$) | 80 kA | 80 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | 40 kA | 40 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | 120 kA | 120 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | KEMA | KEMA |
| Type of remote signalling contact | – | changeover contact |

## DEHNguard M TT ...

Modular surge arrester for use in TT and TN-S systems (3+1 configuration).



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Max. mains-side overcurrent protection | 125 A gG |

| Type DG ... | M TT 150 | M TT 275 |
|---|---|---|
| **Part No.** | **952 323** | **952 310** |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 0.7 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | – | KEMA, VDE, UL |

| Type DG ... | M TT 320 | M TT 385 |
|---|---|---|
| **Part No.** | **952 320** | **952 311** |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 320 V (50 / 60 Hz) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.75 / ≤ 1.5 kV |
| Approvals | KEMA | KEMA, UL |

## DEHNguard M TT ... FM

Modular surge arrester for use in TT and TN-S systems (3+1 configuration); with floating remote signalling contact.



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Max. mains-side overcurrent protection | 125 A gG |
| Type of remote signalling contact | changeover contact |

| Type DG ... | M TT 150 FM | M TT 275 FM |
|---|---|---|
| **Part No.** | **952 328** | **952 315** |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 0.7 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | UL | KEMA, VDE, UL |

| Type DG ... | M TT 320 FM | M TT 385 FM |
|---|---|---|
| **Part No.** | **952 325** | **952 316** |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 320 V (50 / 60 Hz) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.75 / ≤ 1.5 kV |
| Approvals | KEMA | KEMA, UL |

| Type DG ... | M TT 385/305 FM |
|---|---|
| **Part No.** | **952 332** NEW |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.75 / ≤ 1.5 kV |
| Approvals | KEMA, UL |

## DEHNguard M TN ...

Modular surge arrester for use in single-phase TN systems (2+0 configuration).



| Type DG ... | M TN 150 | M TN 275 |
|---|---|---|
| **Part No.** | **952 201** | **952 200** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 0.7 / ≤ 0.7 kV | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | KEMA, UL | KEMA, VDE, UL |

## DEHNguard M TN ... FM

Modular surge arrester for use in single-phase TN systems (2+0 configuration); with floating remote signalling contact.



| Type DG ... | M TN 150 FM | M TN 275 FM |
|---|---|---|
| Part No. | 952 206 | 952 205 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Voltage protection level [L-PE]/[N-PE] ($U_P$) | ≤ 0.7 / ≤ 0.7 kV | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side over-current protection | 125 A gG | 125 A gG |
| Approvals | KEMA, UL | KEMA, VDE, UL |
| Type of remote signalling contact | changeover contact | changeover contact |

## DEHNguard M H TT 2P ... (FM)

Modular surge arrester with a high total discharge capacity in the N-PE path for TT and TN systems (1+1 configuration); meets increased safety requirements by higher discharge capability; with floating remote signalling contact.



| Type DG ... | M H TT 2P 275 | M H TT 2P 275 FM |
|---|---|---|
| Part No. | 952 181 | 952 185 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 20 kA | 20 kA |
| Nominal discharge current (8/20 µs) [N-PE] ($I_n$) | 80 kA | 80 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | 40 kA | 40 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | 120 kA | 120 kA |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | KEMA | KEMA |
| Type of remote signalling contact | – | changeover contact |

## DEHNguard M TT 2P ...

Modular surge arrester for use in single-phase TT and TN systems (1+1 configuration).



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Max. mains-side overcurrent protection | 125 A gG |

| Type DG ... | M TT 2P 275 | M TT 2P 320 |
|---|---|---|
| Part No. | 952 110 | 952 130 |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) | 320 V (50 / 60 Hz) |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | KEMA, VDE, UL | KEMA |

| Type DG ... | M TT 2P 385 |
|---|---|
| Part No. | 952 111 |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 385 V (50 / 60 Hz) |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.75 / ≤ 1.5 kV |
| Approvals | KEMA |

## DEHNguard M TT 2P ... FM

Modular surge arrester for use in single-phase TT and TN systems (1+1 configuration); with floating remote signalling contact.



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Max. mains-side overcurrent protection | 125 A gG |
| Type of remote signalling contact | changeover contact |

| Type DG ... | M TT 2P 275 FM | M TT 2P 320 FM |
|---|---|---|
| Part No. | 952 115 | 952 135 |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) | 320 V (50 / 60 Hz) |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.5 / ≤ 1.5 kV | ≤ 1.5 / ≤ 1.5 kV |
| Approvals | KEMA, VDE, UL | KEMA |

| Type DG ... | M TT 2P 385 FM |
|---|---|
| Part No. | 952 116 |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 385 V (50 / 60 Hz) |
| Voltage protection level [L-N]/[N-PE] ($U_P$) | ≤ 1.75 / ≤ 1.5 kV |
| Approvals | KEMA |

## Accessories for DEHNguard modular

### N-PE Spark-Gap-Based Protection Module for DEHNguard M TT ...

N-PE spark-gap-based protection module for two-pole and four-pole DEHNguard DG M TT ... surge arresters.



| Type | DG MOD NPE |
|---|---|
| Part No. | 952 050 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |

## DEHNguard M WE ... (FM)

Modular surge arrester (3+0 configuration) with a rated varistor voltage $U_{mov}$ = 750 V a.c.; FM version with floating remote signalling contact.



| Type DG ... | M WE 600 | M WE 600 FM |
|---|---|---|
| **Part No.** | **952 302** | **952 307** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 600 V (50 / 60 Hz) | 600 V (50 / 60 Hz) |
| Rated varistor voltage ($U_{mov}$) | 750 V | 750 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 25 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 3 kV | ≤ 3 kV |
| Max. mains-side over-current protection | 100 A gG | 100 A gG |
| Approvals | KEMA, UL | KEMA, UL |
| Type of remote signalling contact | – | changeover contact |

## Accessories for DEHNguard modular

### Varistor-Based Protection Module

Varistor-based protection module for DEHNguard M ... and DEHNguard S ... surge arresters.



| Type | DG MOD 150 | DG MOD 275 |
|---|---|---|
| **Part No.** | **952 012** | **952 010** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V | 275 V |

| Type | DG MOD 320 | DG MOD 385 |
|---|---|---|
| **Part No.** | **952 013** | **952 014** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 320 V | 385 V |

| Type | DG MOD 440 |
|---|---|
| **Part No.** | **952 015** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V |

### Varistor-Based Protection Module for DEHNguard M (S) WE

Varistor-based protection module for DEHNguard M WE ... and DEHNguard S WE ... surge arresters with a rated varistor voltage $U_{mov}$ = 750 V a.c.



| Type | DG MOD 750 |
|---|---|
| **Part No.** | **952 017** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 600 V |

### N-PE Spark-Gap-Based Protection Module for DEHNguard M H TT ...

N-PE spark-gap-based protection module with a high discharge capacity for two-pole and four-pole DEHNguard DG M H TT ... surge arresters.



| Type | DG MOD H NPE |
|---|---|
| **Part No.** | **952 081** |
| Max. continuous operating a.c. voltage ($U_C$) | 255 V |

## DEHNguard 5 kA

Multipole surge arrester with a space-saving design. For protecting low voltage consumer's installations against surges. For installation in conformity with the lightning protection zone concept at the boundaries from $0_B$ – 1 and higher. Type 2 SPD according to EN 61643-11

### DEHNguard TT 2P 5 275

Compact surge arrester for single-phase TT and TN systems (1+1 circuit)



| Type DG TT ... | 2P 5 275 |
|---|---|
| **Part No.** | **900 450** |
| SPD according to EN 61643-11 | type 2 |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Max. continuous operating voltage (a.c.) [N-PE] ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 5 kA |
| Nominal discharge current (8/20 µs) [N-PE] ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | 15 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | MCB C 63 A |

### DEHNguard TT 5 275

Compact surge arrester for TT and TN-S systems (3+1 circuit)



| Type DG TT ... | 5 275 |
|---|---|
| **Part No.** | **900 455** |
| SPD according to EN 61643-11 | type 2 |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Max. continuous operating voltage (a.c.) [N-PE] ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 5 kA |
| Nominal discharge current (8/20 µs) [N-PE] ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | 15 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | MCB C 63 A |

### DEHNguard TT 2P 5 275 NL

Compact surge arrester for single-phase TT and TN systems (1+1 circuit)



| Type DG TT ... | 2P 5 275 NL |
|---|---|
| **Part No.** | **900 458** |
| SPD according to EN 61643-11 | type 2 |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Max. continuous operating voltage (a.c.) [N-PE] ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 5 kA |
| Nominal discharge current (8/20 µs) [N-PE] ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | 15 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | MCB C 63 A |

### DEHNguard TT 5 275 NL

Compact surge arrester for TT and TN-S systems (3+1 circuit)



| Type DG TT ... | 5 275 NL |
|---|---|
| **Part No.** | **900 459** |
| SPD according to EN 61643-11 | type 2 |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Max. continuous operating voltage (a.c.) [N-PE] ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 5 kA |
| Nominal discharge current (8/20 µs) [N-PE] ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | 15 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | MCB C 63 A |

## DEHNguard S

Modular single-pole surge arrester with a functional design.
For protecting low-voltage consumer's installations against surges.

### DEHNguard S ...

Pluggable single-pole surge arrester consisting of a base part and a plug-in protection module.



| General technical data: | | |
|---|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | | type 2 / class II |

| Type DG S ... | 48 | 75 |
|---|---|---|
| Part No. | 952 078 | 952 071 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 48 V (50 / 60 Hz) | 75 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 7.5 kA | 10 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 25 kA | 40 kA |
| Voltage protection level ($U_P$) | ≤ 0.33 kV | ≤ 0.4 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | – | KEMA, VDE, UL, CSA |

| Type DG S ... | 150 | 275 |
|---|---|---|
| Part No. | 952 072 | 952 070 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Voltage protection level ($U_P$) | ≤ 0.7 kV | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | KEMA, VDE, UL, CSA | KEMA, VDE, UL,CSA |

| Type DG S ... | 320 | 385 |
|---|---|---|
| Part No. | 952 073 | 952 074 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 320 V (50 / 60 Hz) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.75 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | KEMA, VDE, UL, CSA | KEMA, VDE, UL, CSA |

| Type DG S ... | 440 | 600 |
|---|---|---|
| Part No. | 952 075 | 952 076 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V (50 / 60 Hz) | 600 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 30 kA |
| Voltage protection level ($U_P$) | ≤ 2 kV | ≤ 2.5 kV |
| Max. mains-side overcurrent protection | 125 A gG | 100 A gG |
| Approvals | KEMA, VDE, UL, CSA | KEMA, VDE, UL, CSA |

### DEHNguard S ... FM

Pluggable single-pole surge arrester consisting of a base part and a plug-in protection module; with floating remote signalling contact.



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Type of remote signalling contact | changeover contact |

| Type DG S ... | 48 FM | 75 FM |
|---|---|---|
| Part No. | 952 098 | 952 091 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 48 V (50 / 60 Hz) | 75 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 7.5 kA | 10 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 25 kA | 40 kA |
| Voltage protection level ($U_P$) | ≤ 0.33 kV | ≤ 0.4 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | – | KEMA, VDE, UL, CSA |
| Stock No. | – | – |

| Type DG S ... | 150 FM | 275 FM |
|---|---|---|
| Part No. | 952 092 | 952 090 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Voltage protection level ($U_P$) | ≤ 0.7 kV | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | KEMA, VDE, UL, CSA | KEMA, VDE, UL, CSA |
| Stock No. | – | – |

| Type DG S ... | 320 FM | 385 FM |
|---|---|---|
| Part No. | 952 093 | 952 094 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 320 V (50 / 60 Hz) | 385 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.75 kV |
| Max. mains-side overcurrent protection | 125 A gG | 125 A gG |
| Approvals | KEMA, VDE, UL, CSA | KEMA, VDE, UL, CSA |
| Stock No. | – | 5920-12-384-8848 |

| Type DG S ... | 440 FM | 600 FM |
|---|---|---|
| Part No. | 952 095 | 952 096 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V (50 / 60 Hz) | 600 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 30 kA |
| Voltage protection level ($U_P$) | ≤ 2 kV | ≤ 2.5 kV |
| Max. mains-side overcurrent protection | 125 A gG | 100 A gG |
| Approvals | KEMA, VDE, UL, CSA | KEMA, VDE, UL, CSA |
| Stock No. | – | – |

### DEHNguard S WE 600 (FM)



Pluggable single-pole surge arrester with a rated varistor voltage $U_{mov}$ = 750 V a.c., consisting of base part and a plug-in protection module; FM version with floating remote signalling contact.

| Type DG S ... | WE 600 | WE 600 FM |
|---|---|---|
| Part No. | 952 077 | 952 097 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 600 V (50 / 60 Hz) | 600 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 25 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 3 kV | ≤ 3 kV |
| Max. mains-side overcurrent protection | 100 A gG | 100 A gG |
| Approvals | KEMA, UL, CSA | KEMA, UL, CSA |
| Type of remote signalling contact | – | changeover contact |

## Accessories for DEHNguard S

### Varistor-Based Protection Module



Varistor-based protection module for DEHNguard M ... and DEHNguard S ... surge arresters.

| Type | DG MOD 48 | DG MOD 75 |
|---|---|---|
| Part No. | 952 018 | 952 011 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 48 V | 75 V |

| Type | DG MOD 150 | DG MOD 275 |
|---|---|---|
| Part No. | 952 012 | 952 010 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 150 V | 275 V |

| Type | DG MOD 320 | DG MOD 385 |
|---|---|---|
| Part No. | 952 013 | 952 014 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 320 V | 385 V |

| Type | DG MOD 440 | DG MOD 600 |
|---|---|---|
| Part No. | 952 015 | 952 016 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V | 600 V |

### Varistor-Based Protection Module for DEHNguard M (S) WE



Varistor-based protection module for DEHNguard M WE ... and DEHNguard S WE ... surge arresters with a rated varistor voltage $U_{mov}$ = 750 V a.c.

| Type | DG MOD 750 |
|---|---|
| Part No. | 952 017 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 600 V |

## DEHNguard S ... VA

Modular single-pole surge arrester with leakage-current-free series connection of a varistor and a spark gap. For protecting low-voltage consumer´s installations against surges.

### DEHNguard S VA



Modular single-pole surge arrester with a varistor connected in series with a spark gap in the pluggable protection module.

| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 20 kA |
| Max. mains-side overcurrent protection | 100 A gG |

| Type DG S ... | 75 VA | 275 VA |
|---|---|---|
| Part No. | 952 080 | 952 082 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 75 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Voltage protection level ($U_P$) | ≤ 1.1 kV | ≤ 1.5 kV |

| Type DG S ... | 385 VA |
|---|---|
| Part No. | 952 084 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 385 V (50 / 60 Hz) |
| Voltage protection level ($U_P$) | ≤ 1.75 kV |

### DEHNguard S VA FM



Modular single-pole surge arrester with a varistor connected in series with a spark gap in the pluggable protection module; with floating remote signalling contact.

| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 20 kA |
| Max. mains-side overcurrent protection | 100 A gG |

| Type DG S ... | 75 VA FM | 275 VA FM |
|---|---|---|
| Part No. | 952 085 | 952 087 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 75 V (50 / 60 Hz) | 275 V (50 / 60 Hz) |
| Voltage protection level ($U_P$) | ≤ 1.1 kV | ≤ 1.5 kV |

| Type DG S ... | 385 VA FM |
|---|---|
| Part No. | 952 089 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 385 V (50 / 60 Hz) |
| Voltage protection level ($U_P$) | ≤ 1.75 kV |

## Accessories for DEHNguard S ... VA

### Varistor-Based Protection Module for DEHNguard S ... VA



Protection module for DEHNguard S ... VA arresters comprising a varistor connected in series with a spark gap.

| Type | DG MOD 75 VA | DG MOD 275 VA |
|---|---|---|
| Part No. | 952 025 | 952 027 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 75 V | 275 V |

| Type | DG MOD 385 VA |
|---|---|
| Part No. | 952 029 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 385 V |

## DEHNguard SE H ... FM

Single-pole surge arrester with integrated "Lifetime Indication" early warning system.
For protecting low-voltage consumer's installations against surges.

### DEHNguard SE H 1000 FM



Pluggable single-pole surge arrester comprising a base part and a plug-in protection module; with floating remote signalling contact.

| Type DG SE H 1000 ... | FM |
|---|---|
| **Part No.** | **952 938** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 1000 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 4.5 kV |
| Max. mains-side overcurrent protection | 100 A gG |
| Operating state / fault indication | green / red |
| Type of remote signalling contact | changeover contact |

### DEHNguard SE H 1000 VA FM



Pluggable single-pole surge arrester comprising a base part and a plug-in protection module; with floating remote signalling contact. Series connection of a varistor and a gas discharge tube.

| Type DG SE H 1000 ... | VA FM |
|---|---|
| **Part No.** | **952 940** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 1000 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 5 kV |
| Max. mains-side overcurrent protection | 100 A gG |
| Operating state / fault indication | green / red |
| Approvals | UL |
| Type of remote signalling contact | changeover contact |
| Supplementary data: | |
| - Sparkover voltage gas discharge tube ($U_{agmin}$) | 2200 V |

## Accessories for DEHNguard SE H ... FM

### Varistor-Based Protection Module for DEHNguard SE H ... FM



| Type | DG MOD E H 1000 | DG MOD E H 1000 VA |
|---|---|---|
| **Part No.** | **952 908** | **952 918** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 1000 V | 1000 V |

### Earthing Clip for 1.5-module Enclosures, single-phase, two-pole



Earthing clip for connecting the earth terminal of e.g. two SPDs with 1.5-module enclosure to earth, with terminal.

| Type | EB 1 2 1.5 |
|---|---|
| **Part No.** | **900 460** |
| Dimensions | 34 x 60 x 28 mm |
| Terminal | up to 25 mm² |

### Earthing Clip for 1.5-module Enclosures, single-phase, three-pole



Earthing clip for connecting the earth terminal of e.g. three SPDs with 1.5-module enclosure to earth, with terminal.

| Type | EB 1 3 1.5 |
|---|---|
| **Part No.** | **900 418** |
| Dimensions | 34 x 85 x 28 mm |
| Terminal | up to 25 mm² |

### Earthing Clip for 1.5-module Enclosures, single-phase, four-pole



Earthing clip for connecting the earth terminal of e.g. four SPDs with 1.5-module enclosure to earth, with terminal.

| Type | EB 1 4 1.5 |
|---|---|
| **Part No.** | **900 429** |
| Dimensions | 34 x 112 x 28 mm |
| Terminal | up to 25 mm² |

## DEHNguard modular for North America

The pre-assembled, modular DEHNguard SU/MU devices with UL 1449 (VZCA 2 & 8) approval are the perfect choice for protecting your electrical systems and devices. The installation of the DEHNguard SU/MU does not require any additional overcurrent protection and has a short-circuit withstand capability (SCCR) of 200 kA.

### DEHNguard MU 3PY ... 3W+G



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Phase Wye electrical systems

| General technical data: | |
|---|---|
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA |
| Max. mains-side overcurrent protection | Not needed |
| Approvals | UL, CSA |
| Extended technical data: | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA |

| Type DG ... | MU 3PY 208 3W+G | MU 3PY 480 3W+G |
|---|---|---|
| **Part No.** | **908 300** | **908 314** |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 180 V a.c. / 360 V a.c. | 385 V a.c. / 770 V a.c. |
| Voltage protection rating [L-G] / [L-L] (VPR) | 600 $V_{pk}$ / 1200 $V_{pk}$ | 1200 $V_{pk}$ / 2500 $V_{pk}$ |

| Type DG ... | MU 3PY 600 3W+G |
|---|---|
| **Part No.** | **908 301** |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 510 V a.c. / 1020 V a.c. |
| Voltage protection rating [L-G] / [L-L] (VPR) | 1500 $V_{pk}$ / 3000 $V_{pk}$ |

## DEHNguard MU 3PY ... 3W+G R



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Phase Wye electrical systems; has floating Form C (SPDT) remote status contacts

| General technical data: | |
|---|---|
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA |
| Max. mains-side overcurrent protection | Not needed |
| Approvals | UL, CSA |
| Remote status contact | Floating (dry), Form C (SPDT) |
| Extended technical data: | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA |

| Type DG ... | MU 3PY 208 3W+G R | MU 3PY 480 3W+G R |
|---|---|---|
| Part No. | 908 305 | 908 319 |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 180 V a.c. / 360 V a.c. | 385 V a.c. / 770 V a.c. |
| Voltage protection rating [L-G] / [L-L] (VPR) | 600 $V_{pk}$ / 1200 $V_{pk}$ | 1200 $V_{pk}$ / 2500 $V_{pk}$ |

| Type DG ... | MU 3PY 600 3W+G R |
|---|---|
| Part No. | 908 306 |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 510 V a.c. / 1020 V a.c. |
| Voltage protection rating [L-G] / [L-L] (VPR) | 1500 $V_{pk}$ / 3000 $V_{pk}$ |

## DEHNguard MU 3PD ... 3W+G



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Phase Delta electrical systems

| Type DG ... | MU 3PD 480 3W+G | MU 3PD 240 3W+G |
|---|---|---|
| Part No. | 908 350 | 908 351 |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 550 V a.c. / 1100 V a.c. | 275 V a.c. / 550 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection rating [L-G] / [L-L] (VPR) | 1800 $V_{pk}$ / 3000 $V_{pk}$ | 800 $V_{pk}$ / 1500 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed | Not needed |
| Approvals | UL, CSA | UL, CSA |
| Extended technical data: | | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA | 50 kA |

## DEHNguard MU 3PD ... 3W+G R



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Phase Delta electrical systems; has floating Form C (SPDT) remote status contacts

| Type DG ... | MU 3PD 480 3W+G R | MU 3PD 240 3W+G R |
|---|---|---|
| Part No. | 908 355 | 908 356 |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 550 V a.c. / 1100 V a.c. | 275 V a.c. / 550 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection rating [L-G] / [L-L] (VPR) | 1800 $V_{pk}$ / 3000 $V_{pk}$ | 800 $V_{pk}$ / 1500 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed | Not needed |
| Approvals | UL, CSA | UL, CSA |
| Remote status contact | Floating (dry), Form C (SPDT) | Floating (dry), Form C (SPDT) |
| Extended technical data: | | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA | 50 kA |

## DEHNguard MU 3PY ... 4W+G



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Phase Wye Systems

| General technical data: | |
|---|---|
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA |
| Max. mains-side overcurrent protection | Not needed |
| Approvals | UL, CSA |
| Extended technical data: | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA |

| Type DG ... | MU 3PY 208 4W+G | MU 3PY 480 4W+G |
|---|---|---|
| Part No. | 908 340 | 908 341 |
| Max. continuous operating voltage AC [L-N] / [L-G] / [L-L] / [N-G] (MCOV) | 180 V a.c. / 360 V a.c. / 360 V a.c. / 180 V a.c. | 385 V a.c. / 565 V a.c. / 770 V a.c./ 180 V a.c. |
| Voltage protection rating [L-N] / [L-G] / [L-L] / [N-G] (VPR) | 600 $V_{pk}$ / 1200 $V_{pk}$ / 1200 $V_{pk}$ / 600 $V_{pk}$ | 1200 $V_{pk}$ / 1800 $V_{pk}$ / 2500 $V_{pk}$ / 600 $V_{pk}$ |

| Type DG ... | MU 3PY 600 4W+G |
|---|---|
| Part No. | 908 342 |
| Max. continuous operating voltage AC [L-N] / [L-G] / [L-L] / [N-G] (MCOV) | 510 V a.c. / 690 V a.c. / 1020 V a.c. / 180 V a.c. |
| Voltage protection rating [L-N] / [L-G] / [L-L] / [N-G] (VPR) | 1500 $V_{pk}$ / 2000 $V_{pk}$ / 3000 $V_{pk}$ / 600 $V_{pk}$ |

## DEHNguard MU 3PY ... 4W+ G R



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Phase Wye Systems; has floating Form C (SPDT) remote status contacts

| General technical data: | |
|---|---|
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA |
| Max. mains-side overcurrent protection | Not needed |
| Approvals | UL, CSA |
| Remote status contact | Floating (dry), Form C (SPDT) |
| Extended technical data: | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA |

| Type DG ... | MU 3PY 208 4W+G R | MU 3PY 480 4W+G R |
|---|---|---|
| Part No. | 908 345 | 908 346 |
| Max. continuous operating voltage AC [L-N] / [L-G] / [L-L] / [N-G] (MCOV) | 180 V a.c. / 360 V a.c. / 360 V a.c. / 180 V a.c. | 385 V a.c. / 565 V a.c. / 770 V a.c. / 180 V a.c. |
| Voltage protection rating [L-N] / [L-G] / [L-L] / [N-G] (VPR) | 600 $V_{pk}$ / 1200 $V_{pk}$ / 1200 $V_{pk}$ / 600 $V_{pk}$ | 1200 $V_{pk}$ / 1800 $V_{pk}$ / 2500 $V_{pk}$ / 600 $V_{pk}$ |

| Type DG ... | MU 3PY 600 4W+G R |
|---|---|
| Part No. | 908 347 |
| Max. continuous operating voltage AC [L-N] / [L-G] / [L-L] / [N-G] (MCOV) | 510V a.c. / 690 V a.c. / 1020 V a.c. / 180 V a.c. |
| Voltage protection rating [L-N] / [L-G] / [L-L] / [N-G] (VPR) | 1500 $V_{pk}$ / 2000$_{pk}$ V / 3000$_{pk}$ V / 600 $V_{pk}$ |

## DEHNguard MU 3PH ... 4W+G



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Phase High-leg Delta Systems

| Type DG ... | MU 3PH 240 4W+G | MU 3PH 480 4W+G |
|---|---|---|
| Part No. | 908 343 | 908 344 |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-N] / [H-N] / [L-G] / [H-G] / [L-L] / [L-H] / [N-G] | 230 V a.c. / 275 V a.c. / 410 V a.c. / 455 V a.c. / 460 V a.c. / 505 V a.c. / 180 V a.c. | 385V a.c. / 510 V a.c. / 565 V a.c. / 690 V a.c. / 770 V a.c. / 895 V a.c. / 180 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection rating [L-N] / [H-N] / [L-G] / [H-G] / [L-L] / [L-H] / [N-G] (VPR) | 700 $V_{pk}$ / 800 $V_{pk}$ / 1200 $V_{pk}$ / 1500 $V_{pk}$ / 1500 $V_{pk}$ / 1500 $V_{pk}$ / 600 $V_{pk}$ | 1200 $V_{pk}$ / 1500 $V_{pk}$ / 1800 $V_{pk}$ / 2000 $V_{pk}$ / 2500 $V_{pk}$ / 2500 $V_{pk}$ / 600 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed | Not needed |
| Approvals | UL, CSA | UL, CSA |
| Extended technical data: | | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA | 50 kA |

## DEHNguard MU 3PH ... 4W+G R



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Phase High-leg Delta Systems; has floating Form C (SPDT) remote status contacts

| Type DG ... | MU 3PH 240 4W+G R | MU 3PH 480 4W+G R |
|---|---|---|
| Part No. | 908 348 | 908 349 |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-N] / [H-N] / [L-G] / [H-G] / [L-L] / [L-H] / [N-G] | 230 V a.c. / 275 V a.c. / 410 V a.c. / 455 V a.c. / 460 V a.c. / 505 V a.c. / 180V a.c. | 385 V a.c. / 510 V a.c. / 565 V a.c. / 690 V a.c. / 770 V a.c. / 895 V a.c. / 180 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection rating [L-N] / [H-N] / [L-G] / [H-G] / [L-L] / [L-H] / [N-G] (VPR) | 700 $V_{pk}$ / 800 $V_{pk}$ / 1200 $V_{pk}$ / 1500 $V_{pk}$ / 1500 $V_{pk}$ / 1500 $V_{pk}$ / 600 $V_{pk}$ | 1200 $V_{pk}$ / 1500 $V_{pk}$ / 1800 $V_{pk}$ / 2000 $V_{pk}$ / 2500 $V_{pk}$ / 2500 $V_{pk}$ / 600 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed | Not needed |
| Approvals | UL, CSA | UL, CSA |
| Remote status contact | Floating (dry), Form C (SPDT) | Floating (dry), Form C (SPDT) |
| Extended technical data: | | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA | 50 kA |

## DEHNguard MU SP ... 3W+G



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in Split Phase systems

| Type DG ... | MU SP 240 3W+G | MU SP 480 3W+G |
|---|---|---|
| Part No. | 908 190 | 908 192 |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 230 V a.c. / 460 V a.c. | 385 V a.c. / 770 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection rating [L-G] / [L-L] (VPR) | 700 $V_{pk}$ / 1500 $V_{pk}$ | 1200 $V_{pk}$ / 2500 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed | Not needed |
| Approvals | UL, CSA | UL, CSA |
| Extended technical data: | | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA | 50 kA |

## DEHNguard MU SP ... 3W+G R



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in Split Phase systems; has floating Form C (SPDT) remote status contacts

| Type DG ... | MU SP 240 3W+G R | MU SP 480 3W+G R |
|---|---|---|
| **Part No.** | **908 195** | **908 197** |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 230 V a.c. / 460 V a.c. | 385 V a.c. / 770 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection rating [L-G] / [L-L] (VPR) | 700 $V_{pk}$ / 1500 $V_{pk}$ | 1200 $V_{pk}$ / 2500 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed | Not needed |
| Approvals | UL, CSA | UL, CSA |
| Remote status contact | Floating (dry), Form C (SPDT) | Floating (dry), Form C (SPDT) |
| Extended technical data: | | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA | 50 kA |

## DEHNguard MU SPN ... 3W+G



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in Split Phase systems

| Type DG ... | MU SPN 240 3W+G |
|---|---|
| **Part No.** | **908 214** |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-N] / [L-G] / [L-L] / [N-G] (MCOV) | 180 V a.c. / 360 V a.c. / 360 V a.c. / 180 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA |
| Voltage protection rating [L-N] / [L-G] / [L-L] / [N-G] (VPR) | 600 $V_{pk}$ / 1200 $V_{pk}$ / 1200 $V_{pk}$ / 600 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed |
| Approvals | UL, CSA |
| Extended technical data: | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA |

## DEHNguard MU SPN ... 3W+G R



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in 3 Split Phase systems; has floating Form C (SPDT) remote status contacts

| Type DG ... | MU SPN 240 3W+G R |
|---|---|
| **Part No.** | **908 219** |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-N] / [L-G] / [L-L] / [N-G] (MCOV) | 180 V a.c. / 360 V a.c. / 360 V a.c. / 180 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA |
| Voltage protection rating [L-N] / [L-G] / [L-L] / [N-G] (VPR) | 600 $V_{pk}$ / 1200 $V_{pk}$ / 1200 $V_{pk}$ / 600 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed |
| Approvals | UL, CSA |
| Remote status contact | Floating (dry), Form C (SPDT) |
| Extended technical data: | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA |

## DEHNguard MU CGD ... 3W+G



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in Corner Grounded Delta systems

| Type DG ... | MU CGD 240 3W+G | MU CGD 480 3W+G |
|---|---|---|
| **Part No.** | **908 203** | **908 204** |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 275 V a.c. / 550 V a.c. | 550 V a.c. / 1100 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection rating [L-G] / [L-L] (VPR) | 800 $V_{pk}$ / 1500 $V_{pk}$ | 1800 $V_{pk}$ / 3000 $V_{pk}$ |
| Max. mains-side overcurrent protection | Not needed | Not needed |
| Approvals | UL, CSA | UL, CSA |
| Extended technical data: | | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA | 50 kA |

## DEHNguard MU CGD ... 3W+G R



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection modules for application in Corner Grounded Delta systems; has floating Form C (SPDT) remote status contacts

| Type DG ... | MU CGD 240 3W+G R | MU CGD 480 3W+G R |
|---|---|---|
| **Part No.** | **908 208** | **908 209** |
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly | Type 4-1 Component Assembly |
| Max. continuous operating voltage AC [L-G] / [L-L] (MCOV) | 275 V a.c. / 550 V a.c. | 550 V a.c. / 1100 V a.c. |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA | 20 kA |
| Voltage protection rating [L-G] / [L-L] (VPR) | 800 $V_{pk}$ / 1500 $V_{pk}$ | 1800 V / 3000 V |
| Max. mains-side overcurrent protection | Not needed | Not needed |
| Approvals | UL, CSA | UL, CSA |
| Remote status contact | Floating (dry), Form C (SPDT) | Floating (dry), Form C (SPDT) |
| Extended technical data: | | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA | 50 kA |

## DEHNguard SU 1P ...



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection module for application in Single Phase electrical systems

| General technical data: | |
|---|---|
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA |
| Max. mains-side overcurrent protection | Not needed |
| Approvals | UL, CSA |
| Extended technical data: | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA |

| Type DG ... | SU 1P 120 | SU 1P 240 | SU 1P 347 |
|---|---|---|---|
| **Part No.** | **908 070** | **908 074** | **908 076** |
| Max. continuous operating voltage AC (MCOV) | 230 Vac | 385 Vac | 510 Vac |
| Voltage protection rating (VPR) | 700 $V_{pk}$ | 1200 $V_{pk}$ | 1500 $V_{pk}$ |

## DEHNguard SU 1P ... R



DIN rail mount, pluggable surge arrester consisting of a base part and plug-in protection module for application in Single Phase electrical systems; has floating Form C (SPDT) remote status contacts

| General technical data: | |
|---|---|
| SPD as per ANSI/UL 1449 | Open-Type 1 SPD |
| SPD as per CSA-C22.2 no. 269.1 | Type 4-1 Component Assembly |
| Nominal discharge current (8x 20 µs) ($I_n$) | 20 kA |
| Max. mains-side overcurrent protection | Not needed |
| Approvals | UL, CSA |
| Remote status contact | Floating (dry), Form C (SPDT) |
| Extended technical data: | |
| Max. discharge current (8/20) ($I_{max}$) | 50 kA |

| Type DG ... | SU 1P 120 R | SU 1P 240 R | SU 1P 347 R |
|---|---|---|---|
| Part No. | 908 090 | 908 094 | 908 096 |
| Max. continuous operating voltage AC (MCOV) | 230 Vac | 385 Vac | 510 Vac |
| Voltage protection rating (VPR) | 700 $V_{pk}$ | 1200 $V_{pk}$ | 1500 $V_{pk}$ |

## Protection module for DEHNguard M UL series

The DEHNguard SU/MU products are modular so that in the rare event that a module is damaged, it is easy to replace without rewiring the SPD. The modules and the terminal block base are keyed to prevent an errors during installation and are shock & vibration tolerant tested to the EN 60068 international standard.

### Varistor-Based Protection Module



Varistor-based protection module for DEHNguard MU ... and DEHNguard SU ... surge arresters.

| General technical data: | |
|---|---|
| Nominal discharge current (8/20 µs) ( $I_n$) | 20 kA |
| Max. discharge current ($I_{max}$) | 50 kA |

| Type DG PLU ... | 180 | 230 | 275 |
|---|---|---|---|
| Part No. | 908 011 | 908 012 | 908 010 |
| Max. continuous operating voltage AC (MCOV) | 180 Vac | 230 Vac | 275 Vac |

| Type DG PLU ... | 385 | 510 | 550 |
|---|---|---|---|
| Part No. | 908 014 | 908 013 | 908 015 |
| Max. continuous operating voltage AC (MCOV) | 385 Vac | 510 Vac | 550 Vac |

## SPD+POP+MCB / POP+MCB / POP

Compact surge arrester for transient and power frequency overvoltages with integrated miniature circuit breaker
For installation in conformity with the lightning protection zone concept at the boundaries from $0_B$ – 1 and higher
Type 2 SPD according to EN 61643-11
Comprehensive protection against transients and power frequency overvoltages (SPD+POP 2/4 255 C..)

- Fulfils the requirements of EN 50550 "Power frequency overvoltage protective device"
- Prewired complete unit, individual devices do not have to be additionally wired
- Easy installation and retrofitting thanks to low space requirements
- High reliability due to "Thermo Dynamic Control" monitoring system integrated in the SPD
- Application-optimised discharge capacity of 5 kA ($I_n$) / 15 kA ($I_{max}$) (8/20 µs) per pole
- Energy coordination with other arresters of the Red/Line series
- Operating state / fault indication by green / red indicator flag in the inspection window of the SPD

### Two-pole SPD+POP+MCB



| General technical data: | |
|---|---|
| Number of poles | 1P + N |
| Nominal a.c. voltage ($U_N$) | 230 V |

| Type SPD+POP 2 255... | C25 | C32 | C40 |
|---|---|---|---|
| Part No. | 900 780 | 900 781 | 900 782 |
| SPD | | | |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 5 kA | 5 kA | 5 kA |
| MCB | | | |
| Tripping characteristic | C | C | C |
| Nominal alternating current ($I_n$) | 25 A | 32 A | 40 A |

### Four-pole SPD+POP+MCB



| General technical data: | |
|---|---|
| Number of poles | 3P + N |
| Nominal a.c. voltage ($U_N$) | 230 / 400 V |

| Type SPD+POP 4 255 ... | C25 | C32 | C40 | C63 |
|---|---|---|---|---|
| Part No. | 900 785 | 900 786 | 900 787 | 900 788 |
| SPD | | | | |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 5 kA | 5 kA | 5 kA | 5 kA |
| MCB | | | | |
| Tripping characteristic | C | C | C | C |
| Nominal alternating current ($I_n$) | 25 A | 32 A | 40 A | 63 A |

### Two-pole POP+MCB



| General technical data: | |
|---|---|
| Number of poles | 1P + N |
| Nominal a.c. voltage ($U_N$) | 230 V |

| Type POP 2 255 ... | C25 | C32 | C40 |
|---|---|---|---|
| Part No. | 900 760 | 900 761 | 900 762 |
| MCB | | | |
| Tripping characteristic | C | C | C |
| Nominal alternating current ($I_n$) | 25 A | 32 A | 40 A |

### Four-pole POP+MCB



| General technical data: | |
|---|---|
| Number of poles | 3P + N |
| Nominal a.c. voltage ($U_N$) | 230 / 400 V |

| Type POP 4 255 ... | C25 | C32 | C40 | C63 |
|---|---|---|---|---|
| Part No. | 900 765 | 900 766 | 900 767 | 900 768 |
| MCB | | | | |
| Tripping characteristic | C | C | C | C |
| Nominal alternating current ($I_n$) | 25 A | 32 A | 40 A | 63 A |

## DEHNcord

Single-pole, two-pole or three-pole surge protective device with monitoring and disconnection device. For protecting low-voltage consumer installations against surges.

### DEHNcord 3P TT 275 FM

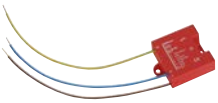
Compact three-phase arrester for TT and TN-S systems.



| Type | DCOR 3P TT 275 FM |
|---|---|
| **Part No.** | **900 439** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 + type 3 / class II + class III |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 350 V |
| Nominal discharge current (8/20 µs) [L-N] ($I_n$) | 10 kA |
| Max. discharge current (8/20 µs) [L-N] ($I_{max}$) | 20 kA |
| Nominal discharge current (8/20 µs) [N-PE] ($I_n$) | 10 kA |
| Max. discharge current (8/20 µs) [N-PE] ($I_{max}$) | 40 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Voltage protection level [N-PE] ($U_P$) | ≤ 1.5 kV |
| Approvals | KEMA |

### DEHNcord L 2P

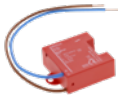
Two-pole surge arrester for all installation systems (1+1 configuration) and luminaires of protection class I; compact design.



| Type | DCOR L 2P 275 | DCOR L 2P 320 |
|---|---|---|
| **Part No.** | **900 430** | **900 432** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) | 320 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV | ≤ 1.75 kV |
| Voltage protection level [N-PE] ($U_P$) | ≤ 1.5 kV | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | 25 A gG | 25 A gG |
| Approvals | KEMA | KEMA |

### DEHNcord L 1P

Single-pole surge arrester for luminaires of protection class II; compact design.



| Type | DCOR L 1P 275 | DCOR L 1P 320 |
|---|---|---|
| **Part No.** | **900 431** | **900 433** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) | 320 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV | ≤ 1.75 kV |
| Max. mains-side overcurrent protection | 25 A gG | 25 A gG |
| Approvals | KEMA | KEMA |

### DEHNcord L 2P SN1864

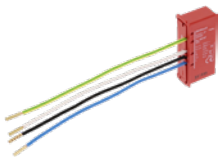
Surge arrester for luminaires of protection class II; compact design. With disconnection in the event of a fault.



| Type | DCOR L 2P SN1864 |
|---|---|
| **Part No.** | **999 906** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | B 16 A |

### DEHNcord L 2P SN1860

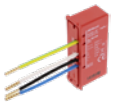
Surge arrester for all installation systems; compact design. With disconnection of the load circuit in the event of a fault.



| Type | DCOR L 2P SN1860 |
|---|---|
| **Part No.** | **999 937** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Voltage protection level [N-PE] ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | B 16 A |

### DEHNcord L 2P 275 SO LTG

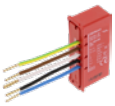
Surge arrester for all installation systems; compact design. With disconnection of the load circuit in the event of a fault.



| Type | DCOR L 2P 275 SO LTG |
|---|---|
| **Part No.** | **900 446** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Voltage protection level [N-PE] ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | B 16 A |
| Approvals | KEMA |

### DEHNcord L 3P 275 SO LTG

Three-pole surge arrester for all installation systems; compact design. With disconnection of the load circuit in the event of a fault and protection of the control phase.



| Type | DCOR L 3P 275 SO LTG |
|---|---|
| **Part No.** | **900 445** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Voltage protection level [N-PE] ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | B 16 A |
| Approvals | KEMA |

## SK EK480 G2S-2d LM DCOR

The EK480 fuse box is a high-quality product from Langmatz which stands out for its excellent workmanship and tried and tested features. The EK480 series meets all mechanical and electrical requirements and standards. This ensures the effective protection of luminaires with high-quality electronics against surges resulting from switching operations or nearby lightning strikes.



| Type SK EK480 ... | G2S-2d LM DCOR |
|---|---|
| **Part No.** | **900 443** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating a.c. voltage [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Voltage protection level [N-PE] ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | B 16 A |
| For masts with an inside diameter from | 89 mm |
| Dimensions | 276 x 81 x 70 mm |
| Clamping technology | incoming: sliding clamp technology / outgoing: spring clamp technology |
| Max. cross-section of connectable cable | 1 - 3 cables (4 or 5 x 16 mm²) |
| Outgoing terminals | max. 2.5 mm² |

## DEHNcord L 2P 275 SO LT

Two-pole surge arrester for TNC systems; compact design. With disconnection of the load circuit in the event of a fault and protection of the control phase.



| Type | DCOR L 2P 275 SO LT |
|---|---|
| **Part No.** | **900 435** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-PEN] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-PEN] ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | B 16 A |
| Approvals | KEMA |

## DEHNcord L 3P 275 SO IP

Three-pole surge arrester for all installation systems; compact design. IP 65 degree of protection. With disconnection of the load circuit in the event of a fault and protection of the control phase.



| Type | DCOR L 3P 275 SO IP |
|---|---|
| **Part No.** | **900 447** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Voltage protection level [N-PE] ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | B 16 A |

## DEHNcord L 2P 275 SO IP

Two-pole arrester for all installation systems; compact design. IP 65 degree of protection. With disconnection of the load circuit in the event of a fault.



| Type | DCOR L 2P 275 SO IP |
|---|---|
| **Part No.** | **900 448** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Voltage protection level [N-PE] ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | B 16 A |

## DEHNcord R 3P

Surge arrester for electric Venetian blinds; compact design.



| Type | DCOR R 3P 275 |
|---|---|
| **Part No.** | **900 449** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 275 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 2.5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 5 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Connector | Hirschmann STAK 3 / STAS 3 |

# DEHNgap C S

N-PE surge arrester with a functional design. For protecting low-voltage consumer´s installations against surges particularly in TT systems.

## DEHNgap C S (FM)

N-PE surge arrester; FM version with floating remote signalling contact.



| Type DGP C ... | S | S FM |
|---|---|---|
| **Part No.** | **952 030** | **952 035** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.5 kV |
| Approvals | KEMA, VDE, UL | KEMA, VDE, UL |
| Type of remote signalling contact | – | changeover contact |

## Accessories for DEHNgap C S

## N-PE Spark-Gap-Based Protection Module for DEHNgap C S

N-PE spark-gap-based protection module for single-pole N-PE surge arresters of type DEHNgap DGP C S ... .



| Type | DGP C MOD |
|---|---|
| **Part No.** | **952 060** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |

## DEHNguard ME/SE DC … (FM)

Modular combined arrester for protecting d.c. consumer installations.

### DEHNguard ME DC … FM

Modular combined arrester for DC applications; with floating remote signalling contact.



| Type DG … | ME DC Y 950 FM |
|---|---|
| Part No. | 972 146 |
| SPD analogous to EN 61643-11 / IEC 61643-11 | type 1 + type 2 / class I + class II |
| Max. continuous operating voltage (d.c.) ($U_C$) | 950 V |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA |
| Nominal discharge current (8/20 µs) ($I_n$) | 12.5 kA |
| Voltage protection level [DC+ -> DC-] ($U_P$) | ≤ 4 kV |
| Voltage protection level [(DC+/DC-) --> PE] ($U_P$) | ≤ 3.2 kV |
| Max. short circuit withstand capability ($I_{SCCR}$) | 500 A / 170 ms |
| Approvals | UL |
| Type of remote signalling contact | changeover contact |

### DEHNguard SE DC …

Modular single-pole surge arrester for d.c. applications.



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Nominal discharge current (8/20 µs) ($I_n$) | 12.5 kA |
| Short-circuit withstand capability for max. mains-side overcurrent protection (d.c.) ($I_{SCCR}$) | 25 kA |

| Type DG … | SE DC 60 | SE DC 242 |
|---|---|---|
| Part No. | 972 110 | 972 120 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V | 242 V |
| Voltage protection level ($U_P$) | ≤ 0.5 kV | ≤ 1.25 kV |
| Short-circuit withstand capability without backup fuse (d.c.) ($I_{SCCR}$) | 300 A | 300 A |
| Max. mains-side overcurrent protection | 35 A gG | 35 A gG |

| Type DG … | SE DC 550 | SE DC 900 |
|---|---|---|
| Part No. | 972 130 | 972 140 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 550 V | 900 V |
| Voltage protection level ($U_P$) | ≤ 2.0 kV | ≤ 3.0 kV |
| Short-circuit withstand capability without backup fuse (d.c.) ($I_{SCCR}$) | 200 A | 100 A |
| Max. mains-side overcurrent protection | 35 A gG | 80 A gPV |

## Accessories for DEHNguard ME/SE DC … (FM)

### Earthing Clip for 1.5-module Enclosures, single-phase, two-pole

Earthing clip for connecting the earth terminal of e.g. two SPDs with 1.5-module enclosure to earth, with terminal.



| Type | EB 1 2 1.5 |
|---|---|
| Part No. | 900 460 |
| Dimensions | 34 x 60 x 28 mm |
| Terminal | up to 25 mm² |

### DEHNguard SE DC … FM

Modular single-pole surge arrester for d.c. applications; with floating remote signalling contact.



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Nominal discharge current (8/20 µs) ($I_n$) | 12.5 kA |
| Short-circuit withstand capability for max. mains-side overcurrent protection (d.c.) ($I_{SCCR}$) | 25 kA |
| Type of remote signalling contact | changeover contact |

| Type DG … | SE DC 60 FM | SE DC 242 FM |
|---|---|---|
| Part No. | 972 115 | 972 125 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V | 242 V |
| Voltage protection level ($U_P$) | ≤ 0.5 kV | ≤ 1.25 kV |
| Short-circuit withstand capability without backup fuse (d.c.) ($I_{SCCR}$) | 300 A | 300 A |
| Max. mains-side overcurrent protection | 35 A gG | 35 A gG |

| Type DG … | SE DC 550 FM | SE DC 900 FM |
|---|---|---|
| Part No. | 972 135 | 972 145 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 550 V | 900 V |
| Voltage protection level ($U_P$) | ≤ 2.0 kV | ≤ 3.0 kV |
| Short-circuit withstand capability without backup fuse (d.c.) ($I_{SCCR}$) | 200 A | 100 A |
| Max. mains-side overcurrent protection | 35 A gG | 80 A gPV |

## Accessories for DEHNguard ME/SE DC … (FM)

### Varistor-Based Protection Module for DEHNguard ME DC



| Type | DG MOD DC Y 500 |
|---|---|
| Part No. | 972 050 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 950 V |

### Spark-Gap Based Protection Module for DEHNguard ME DC



| Type | DGP MOD DC Y 500 |
|---|---|
| Part No. | 972 051 |
| Max. continuous operating voltage DC ($U_C$) | 950 V |

### Varistor-Based Protection Module for DEHNguard SE DC



| Type | DG MOD E DC 60 | DG MOD E DC 242 |
|---|---|---|
| Part No. | 972 010 | 972 020 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V | 242 V |

| Type | DG MOD E DC 550 | DG MOD E DC 900 |
|---|---|---|
| Part No. | 972 030 | 972 040 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 550 V | 900 V |

## DEHNguard PCB

Single-pole base for DEHNguard protection modules for easily integrating a type 2 arrester directly on the PCBs of devices to provide surge protection.

### DEHNguard PCB PV SCI ...



Single-pole base for DEHNguard modules to be mounted on the PCBs of devices.

| General technical data: | |
|---|---|
| For mounting on | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) |

| Type DG PCB ... | PV SCI 300 | PV SCI 500 |
|---|---|---|
| Part No. | 952 653 | 952 651 |
| Associated protection module | DG MOD PV SCI 300 (Part No. 952 053) | DG MOD PV SCI 500 (Part No. 952 051) |
| Max. continuous operating voltage (d.c.) (module) | 300 V | 500 V |

| Type DG PCB ... | PV SCI 600 |
|---|---|
| Part No. | 952 654 |
| Associated protection module | DG MOD PV SCI 600 (Part No. 952 054) |
| Max. continuous operating voltage (d.c.) (module) | 600 V |

### DEHNguard PCB PV SCI ... FM



Single-pole base for DEHNguard modules to be mounted on the PCBs of devices, with remote signalling contact for the monitoring system (floating changeover contact).

| General technical data: | |
|---|---|
| For mounting on | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) |
| Type of remote signalling contact | changeover contact |

| Type DG PCB ... | PV SCI 300 FM | PV SCI 500 FM |
|---|---|---|
| Part No. | 952 753 | 952 751 |
| Associated protection module | DG MOD PV SCI 300 (Part No. 952 053) | DG MOD PV SCI 500 (Part No. 952 051) |
| Max. continuous operating voltage (d.c.) (module) | 300 V | 500 V |

| Type DG PCB ... | PV SCI 600 FM |
|---|---|
| Part No. | 952 754 |
| Associated protection module | DG MOD PV SCI 600 (Part No. 952 054) |
| Max. continuous operating voltage (d.c.) (module) | 600 V |

### DEHNguard PCB PV ...



Single-pole base for DEHNguard modules to be mounted on the PCBs of devices.

| General technical data: | |
|---|---|
| For mounting on | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) |

| Type DG PCB ... | PV 300 | PV 500 |
|---|---|---|
| Part No. | 952 643 | 952 641 |
| Associated protection module | DG MOD PV 300 (Part No. 952 043) | DG MOD PV 500 (Part No. 952 041) |
| Max. continuous operating voltage (d.c.) (module) | 300 V | 500 V |

| Type DG PCB ... | PV 600 |
|---|---|
| Part No. | 952 644 |
| Associated protection module | DG MOD PV 600 (Part No. 952 044) |
| Max. continuous operating voltage (d.c.) (module) | 600 V |

### DEHNguard PCB PV ... FM



Single-pole base for DEHNguard modules to be mounted on the PCBs of devices, with remote signalling contact for the monitoring system (floating changeover contact).

| General technical data: | |
|---|---|
| For mounting on | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) |
| Type of remote signalling contact | changeover contact |

| Type DG PCB ... | PV 300 FM | PV 500 FM |
|---|---|---|
| Part No. | 952 743 | 952 741 |
| Associated protection module | DG MOD PV 300 (Part No. 952 043) | DG MOD PV 500 (Part No. 952 041) |
| Max. continuous operating voltage (d.c.) (module) | 300 V | 500 V |

| Type DG PCB ... | PV 600 FM |
|---|---|
| Part No. | 952 744 |
| Associated protection module | DG MOD PV 600 (Part No. 952 044) |
| Max. continuous operating voltage (d.c.) (module) | 600 V |

### DEHNguard PCB ...



Single-pole base for DEHNguard modules to be mounted on the PCBs of devices.

| Type DG PCB ... | 275 | 385 |
|---|---|---|
| Part No. | 952 610 | 952 614 |
| Associated protection module | DG MOD 275 (Part No. 952 010) | DG MOD 385 (Part No. 952 014) |
| Max. continuous operating voltage (a.c.) (module) | 275 V | 385 V |
| For mounting on | directly soldered into PCB | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) | IP 20 (protection module plugged in) |

### DEHNguard PCB ... FM



Single-pole base for DEHNguard modules to be mounted on the PCBs of devices, with remote signalling contact for the monitoring system (floating changeover contact).

| Type DG PCB ... | 275 FM | 385 FM |
|---|---|---|
| Part No. | 952 710 | 952 714 |
| Associated protection module | DG MOD 275 (Part No. 952 010) | DG MOD 385 (Part No. 952 014) |
| Max. continuous operating voltage (a.c.) (module) | 275 V | 385 V |
| For mounting on | directly soldered into PCB | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) | IP 20 (protection module plugged in) |
| Type of remote signalling contact | changeover contact | changeover contact |

### DEHNguard PCB NPE (FM)



Single-pole base for DEHNguard modules to be mounted on the PCBs of devices, with remote signalling contact for the monitoring system (floating changeover contact).

| Type DG PCB ... | NPE | NPE FM |
|---|---|---|
| Part No. | 952 650 | 952 750 |
| Associated protection module | DG MOD NPE (Part No. 952 050) | DG MOD NPE (Part No. 952 050) |
| Max. continuous operating voltage (a.c.) (module) | 255 V | 255 V |
| For mounting on | directly soldered into PCB | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) | IP 20 (protection module plugged in) |
| Type of remote signalling contact | – | changeover contact |

## DEHNguard PCB PV I ... FM



Single-pole base with increased clearance and creepage distance between the power contacts and the remote signalling contact. For installation on the PCBs of devices to accommodate DEHNguard modules, with remote signalling contact for the monitoring system (floating changeover contact).

| General technical data: | |
|---|---|
| For mounting on | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) |
| Type of remote signalling contact | changeover contact |

| Type DG PCB ... | PV I 500 FM | PV I 600 FM |
|---|---|---|
| Part No. | 952 941 | 952 948 |
| Associated protection module | DG MOD PV 500 (Part No. 952 041) | DG MOD H PV 600 (Part No. 952 048) |
| Max. continuous operating voltage (d.c.) (module) | 500 V | 600 V |

| Type DG PCB ... | PV I 750 FM |
|---|---|
| Part No. | 952 949 |
| Associated protection module | DG MOD H PV 750 (Part No. 952 049) |
| Max. continuous operating voltage (d.c.) (module) | 750 V |

## DEHNguard PCB PVSCI I ...FM



Single-pole base with increased clearance and creepage distance between the power contacts and the remote signalling contact. For installation on the PCBs of devices to accommodate DEHNguard modules, with remote signalling contact for the monitoring system (floating changeover contact).

| Type DG PCB ... | PVSCI I 500FM |
|---|---|
| Part No. | 952 951 |
| Associated protection module | DG MOD PV SCI 500 (Part No. 952 051) |
| Max. continuous operating voltage (d.c.) (module) | 500 V |
| For mounting on | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) |
| Type of remote signalling contact | changeover contact |

## DEHNguard PCB I ... FM



Single-pole base with increased clearance and creepage distance between the power contacts and the remote signalling contact. For installation on the PCBs of devices to accommodate DEHNguard modules, with remote signalling contact for the monitoring system (floating changeover contact).

| Type DG PCB ... | I 275 FM |
|---|---|
| Part No. | 952 910 |
| Associated protection module | DG MOD 275 (Part No. 952 010) |
| Max. continuous operating voltage (a.c.) (module) | 275 V |
| For mounting on | directly soldered into PCB |
| Degree of protection | IP 20 (protection module plugged in) |
| Type of remote signalling contact | changeover contact |

# Protection module for DEHNguard M, ... S and DEHNgap C S

DG MOD...: Replacement protection modules fitting for all devices of the modular DEHNguard series.

## Switch-Spark Gap Protection Module for DEHNguard M ACI



| Type | DG MOD ACI 275 |
|---|---|
| Part No. | 952 024 |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V |

## Spark-Gap-Based Protection Module for DEHNguard M ACI



| Type | DG MOD A NPE |
|---|---|
| Part No. | 952 022 NEW |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |

## Varistor-based Protection Module for DEHNguard SE CI ...



| Type | DG MOD E CI 440 | DG MOD E CI WE 440 |
|---|---|---|
| Part No. | 952 926 | 952 927 |
| Nominal discharge current (8/20 µs) ($I_n$) | 12.5 kA | 12.5 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V | 440 V |
| Rated varistor voltage ($U_{mov}$) | 440 V | 750 V |

## Varistor-based Protection Module for DEHNguard M and DEHNguard S



| Type | DG MOD 48 | DG MOD 75 | DG MOD 150 |
|---|---|---|---|
| Part No. | 952 018 | 952 011 | 952 012 |
| Nominal discharge current (8/20 µs) ($I_n$) | 7.5 kA | 10 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 25 kA | 40 kA | 40 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 48 V | 75 V | 150 V |

| Type | DG MOD 275 | DG MOD 320 | DG MOD 385 |
|---|---|---|---|
| Part No. | 952 010 | 952 013 | 952 014 |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA | 40 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V | 320 V | 385 V |

| Type | DG MOD 440 | DG MOD 600 |
|---|---|---|
| Part No. | 952 015 | 952 016 |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 30 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 440 V | 600 V |

## Varistor-Based Protection Module for DEHNguard M (S) WE



| Type | DG MOD 750 |
|---|---|
| Part No. | 952 017 |
| Nominal discharge current (8/20 µs) ($I_n$) | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 25 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 600 V |
| Rated varistor voltage ($U_{mov}$) | 750 V |

## N-PE Spark-Gap-Based Protection Module for DEHNguard M ACI

N-PE spark-gap-based protection module for two-pole and four-pole DEHNguard DG M TT (2P) ACI ... .



| Type | DG MOD H A NPE |
|---|---|
| Part No. | 952 083 |
| Nominal discharge current (8/20 µs) ($I_n$) | 80 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 120 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 275 V |

## N-PE Spark-Gap-Based Protection Module for DEHNguard M H TT ...



| Type | DG MOD H NPE |
|---|---|
| Part No. | 952 081 |
| Nominal discharge current (8/20 µs) ($I_n$) | 80 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 120 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |

## N-PE Spark-Gap-Based Protection Module for DEHNguard M TT ...



| Type | DG MOD NPE |
|---|---|
| Part No. | 952 050 |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |

## N-PE Spark-Gap-Based Protection Module for DEHNgap C S



| Type | DGP C MOD |
|---|---|
| Part No. | 952 060 |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |

## Varistor and Spark-Gap-Based Protection Module for DEHNguard S ... VA



| General technical data: | |
|---|---|
| Nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 20 kA |

| Type | DG MOD 75 VA | DG MOD 275 VA |
|---|---|---|
| Part No. | 952 025 | 952 027 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 75 V | 275 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 100 V | 350 V |

| Type | DG MOD 385 VA |
|---|---|
| Part No. | 952 029 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 385 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 500 V |

## Varistor-based Protection Module for DEHNguard M YPV



| Type | DG MOD H PV 600 | DG MOD H PV 750 |
|---|---|---|
| Part No. | 952 048 | 952 049 |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Max. continuous operating voltage (d.c.) ($U_C$) | 600 V | 750 V |

## Varistor-Based Protection Module for DEHNguard M YPV SCI and DEHNguard S PV SCI



| Type | DG MOD PV SCI 500 | DG MOD PV SCI 600 |
|---|---|---|
| Part No. | 952 051 | 952 054 |
| Nominal discharge current (8/20 µs) ($I_n$) | 12.5 kA | 12.5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 25 kA | 25 kA |
| Max. continuous operating voltage (d.c.) ($U_C$) | 500 V | 600 V |

## Varistor-Based Protection Module for DEHNguard M YPV and DEHNguard S PV



| Type | DG MOD PV 500 | DG MOD PV 600 |
|---|---|---|
| Part No. | 952 041 | 952 044 |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 30 kA |
| Max. continuous operating voltage (d.c.) ($U_C$) | 500 V | 600 V |

## Varistor-Based Protection Module for DEHNguard SE H ...



| Type | DG MOD E H 1000 | DG MOD E H 1000 VA |
|---|---|---|
| Part No. | 952 908 | 952 918 |
| Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 15 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 40 kA | 40 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 1000 V | 1000 V |

## Varistor-based Protection Module for DEHNguard SE DC



| General technical data: | |
|---|---|
| Nominal discharge current (8/20 µs) ($I_n$) | 12.5 kA |

| Type | DG MOD E DC 60 | DG MOD E DC 242 |
|---|---|---|
| Part No. | 972 010 | 972 020 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V | 242 V |

| Type | DG MOD E DC 550 | DG MOD E DC 900 |
|---|---|---|
| Part No. | 972 030 | 972 040 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 550 V | 900 V |

## DEHNguard 1000

Compact single-pole surge arrester for continuous operating voltages up to 1000 V AC. For protecting low-voltage consumer's installations against surges.

### DEHNguard 1000 (FM)

Compact single-pole surge arrester; FM version with floating remote signalling contact.



| Type DG ... | 1000 | 1000 FM |
|---|---|---|
| **Part No.** | **950 102** | **950 112** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 1000 V (50 / 60 Hz) | 1000 V (50 / 60 Hz) |
| Max. discharge current (8/20 µs) ($I_{max}$) | 30 kA | 30 kA |
| Voltage protection level ($U_p$) | ≤ 4.2 kV | ≤ 4.2 kV |
| Max. overcurrent protection | 100 A aM | 100 A aM |
| Max. overcurrent protection at U ≤ 690 V a.c. | 125 A gG | 125 A gG |
| Approvals | UL | UL |
| Type of remote signalling contact | – | changeover contact |

## Accessories for DEHNguard 1000

### Earthing Clip for two-module Enclosures, single-phase, two-pole



Earthing clip for connecting the earth terminal of e.g. two SPDs with two-module enclosure to earth, with terminal.

| Type | EB 1 2 5 |
|---|---|
| **Part No.** | **900 419** |
| Dimensions | 34 x 77 x 28 mm |
| Terminal | up to 25 mm² |

### Earthing Clip for two-module Enclosures, single-phase, three-pole



Earthing clip for connecting the earth terminal of e.g. three SPDs with two-module enclosure to earth, with terminal.

| Type | EB DG 1000 1 3 |
|---|---|
| **Part No.** | **900 411** |
| Dimensions | 34 x 112 x 28 mm |
| Terminal | up to 25 mm² |

### Earthing Clip for two-module Enclosures, single-phase, four-pole



Earthing clip for connecting the earth terminal of e.g. four SPDs with two-module enclosure to earth, with terminal.

| Type | EB 1 4 9 |
|---|---|
| **Part No.** | **900 417** |
| Dimensions | 34 x 148 x 28 mm |
| Terminal | up to 25 mm² |

## V NH / VA NH

Surge arrester with NH design and integrated backup fuse. For protecting low-voltage consumer´s installations against surges.

### V NH00 (FM)

Varistor-based surge arrester with integrated backup fuse for use in NH00 fuse holders, optionally available with special indicator for remote signalling.



| Type | V NH00 280 | V NH00 280 FM |
|---|---|---|
| **Part No.** | **900 261** | **900 263** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 280 V (50 / 60 Hz) | 280 V (50 / 60 Hz) |
| Max. discharge current (8/20 µs) ($I_{max}$) | 30 kA | 30 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | not required | not required |
| Indicator for remote signalling | – | tripping distance of 7 mm |

### V NH1

Varistor-based surge arrester with integrated backup fuse for use in NH1 fuse holders.



| Type | V NH1 280 |
|---|---|
| **Part No.** | **900 270** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 280 V (50 / 60 Hz) |
| Max. discharge current (8/20 µs) ($I_{max}$) | 30 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | not required |

### VA NH00 (FM)

Surge arrester based on a series-connected varistor and spark gap with integrated backup fuse; for use in NH00 fuse holders, optionally available with special indicator for remote signalling.



| Type | VA NH00 280 | VA NH00 280 FM |
|---|---|---|
| **Part No.** | **900 262** | **900 264** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | Type 2 / Class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 280 V (50 / 60 Hz) | 280 V (50 / 60 Hz) |
| Max. discharge current (8/20 µs) ($I_{max}$) | 20 kA | 20 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | not required | not required |
| Indicator for remote signalling | – | tripping distance of 7 mm |

### VA NH1

Surge arrester based on a series-connected varistor and spark gap with integrated backup fuse; for use in NH1 fuse holders.



| Type | VA NH1 280 |
|---|---|
| **Part No.** | **900 271** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II |
| Max. continuous operating voltage (a.c.) ($U_C$) | 280 V (50 / 60 Hz) |
| Max. discharge current (8/20 µs) ($I_{max}$) | 20 kA |
| Voltage protection level ($U_P$) | ≤ 1.5 kV |
| Max. mains-side overcurrent protection | not required |

## DEHNguard modular YPV ... FM

Modular multipole surge arrester with three-step d.c. switching device for PV systems up to 1500 V as pre-wired complete unit.

### DEHNguard M YPV ... FM

Modular multipole surge arrester for PV systems with remote signalling contact for monitoring device (floating changeover contact).



| Type DG M YPV ... | 1200 FM | 1500 FM |
|---|---|---|
| **Part No.** | **952 565** | **952 567** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1170 V | 1500 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA | 10 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 20 kA | 15 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 40 kA | 40 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV | ≤ 5 kV |
| Approvals | UL, KEMA | UL, KEMA |
| Type of remote signalling contact | changeover contact | changeover contact |

## Accessories for DEHNguard modular YPV ... FM

### Varistor-Based Protection Module for DEHNguard M YPV



| Type | DG MOD H PV 600 | DG MOD H PV 750 |
|---|---|---|
| **Part No.** | **952 048** | **952 049** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 600 V | 750 V |

## DEHNguard modular (Y)PV SCI ...

Modular multipole surge arrester (prewired complete unit) with three-step d.c. switching device for use in PV systems up to 1200 V.

### DEHNguard M YPV SCI ...

Modular multipole surge arrester with three-step d.c. switching device for use in PV systems



| Type DG M ... | YPV SCI 1000 | YPV SCI 1200 |
|---|---|---|
| **Part No.** | **952 510** | **952 512** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1000 V | 1200 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA | 10 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA | 12.5 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 25 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV | ≤ 4.5 kV |
| Approvals | KEMA, UL, CSA | KEMA, CSA |

### DEHNguard M YPV SCI ... FM

Modular multipole surge arrester with three-step d.c. switching device for use in PV systems; with remote signalling contact for monitoring device (floating changeover contact).



| Type DG M ... | YPV SCI 1000 FM | YPV SCI 1200 FM |
|---|---|---|
| **Part No.** | **952 515** | **952 517** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1000 V | 1200 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA | 10 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA | 12.5 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 25 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV | ≤ 4.5 kV |
| Approvals | KEMA, UL, CSA | KEMA, CSA |
| Type of remote signalling contact | changeover contact | changeover contact |

### DEHNguard M PV2 SCI ... (FM)

Modular multipole surge arrester with three-step d.c. switching device for protecting two MPP inputs; for use in PV systems up to 1000 V; FM version with floating remote signalling contact.



| Type DG M ... | PV2 SCI 1000 | PV2 SCI 1000 FM |
|---|---|---|
| **Part No.** | **952 514** | **952 519** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1000 V | 1000 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA | 10 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA | 12.5 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 25 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV | ≤ 4 kV |
| Approvals | UL, KEMA | UL, KEMA |
| Type of remote signalling contact | – | changeover contact |

### DEHNguard M SN1868

Modular multipole surge arrester with three-step d.c. switching device for protecting 3 MPP inputs; for PV systems with remote signalling contact for monitoring device (floating changeover contact).



| Type DG M ... | PV2 SCI SN1868 FM |
|---|---|
| **Part No.** | **999 799** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1000 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 25 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Approvals | UL, KEMA |
| Type of remote signalling contact | changeover contact |

## Accessories for DEHNguard modular (Y)PV SCI ...

### Varistor-Based Protection Module for DEHNguard M (S) (Y)PV SCI



Protection module with integrated back-up fuse for DEHNguard M (Y)PV SCI ... arresters comprising a varistor connected in parallel with a short-circuiting device.

| Type | DG MOD PV SCI 500 | DG MOD PV SCI 600 |
|---|---|---|
| **Part No.** | **952 051** | **952 054** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 500 V | 600 V |

### Varistor-Based Protection Module for DEHNguard M (S) (Y)PV SCI



| Type | DG MOD PV 500 | DG MOD PV 600 |
|---|---|---|
| **Part No.** | **952 041** | **952 044** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 500 V | 600 V |

## DEHNguard modular E (Y)PV SCI 1500

Modular multipole surge arrester with three-step d.c. switching device for PV systems up to 1500 V.

### DEHNguard ME YPV SCI 1500 (FM)



Modular multipole surge arrester with three-step d.c. switching device for PV systems.

| Type DG ME YPV ... | SCI 1500 | SCI1500 FM |
|---|---|---|
| **Part No.** | **952 520** | **952 525** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 2 / class II | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1500 V | 1500 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA | 10 kA |
| Total discharge current (8/20 µs) ($I_{total}$) | 25 kA | 25 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA | 12.5 kA |
| Voltage protection level ($U_P$) | ≤ 6 kV | ≤ 6 kV |
| Approvals | KEMA, UL | KEMA, UL |
| Type of remote signalling contact | – | changeover contact |

## Accessories for DEHNguard modular E (Y)PV SCI 1500

### Varistor-Based Protection Module for DEHNguard ME YPV SCI and DEHNguard SE PV SCI



Varistor-based protection module for DEHNguard ME YPV SCI 1500 (FM) and DEHNguard SE PV SCI 1500 (FM)

| Type | DG MOD E PV SCI 750 |
|---|---|
| **Part No.** | **952 056** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 750 V |

## DEHNguard YPV SCI ... – compact

Multipole surge arrester with three-step d.c. switching device for use in PV systems up to 1000 V.

### DEHNguard compact YPV SCI ...



Multipole surge arrester with three-step d.c. switching device for use in PV systems

| Type DG YPV SCI ... | 600 | 1000 |
|---|---|---|
| **Part No.** | **950 531** | **950 530** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 600 V | 1000 V |
| Short-circuit current rating ($I_{SCPV}$) | 1000 A | 1000 A |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA | 12.5 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 25 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV | ≤ 4 kV |
| Approvals | KEMA, UL | KEMA, UL |

### DEHNguard compact YPV SCI ... FM



Multipole surge arrester with three-step d.c. switching device for use in PV systems, with remote signalling contact for monitoring device (floating changeover contact).

| Type DG YPV SCI ... | 600 FM | 1000 FM |
|---|---|---|
| **Part No.** | **950 536** | **950 535** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 600 V | 1000 V |
| Short-circuit current rating ($I_{SCPV}$) | 1000 A | 1000 A |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA | 12.5 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 25 kA | 25 kA |
| Voltage protection level ($U_P$) | ≤ 2.5 kV | ≤ 4 kV |
| Approvals | KEMA, UL | KEMA, UL |
| Type of remote signalling contact | changeover contact | changeover contact |

## DEHNcube PV

Multipole surge arrester with three-step d.c. switching device and IP65 degree of protection for use in PV systems up to 1000 V.

### DEHNcube YPV SCI 1000 1M

Two-pole surge arrester with IP 65 degree of protection and three-step d.c. switching device for PV inverters for protecting one MPP input.



| Type DCU … | YPV SCI 1000 1M |
|---|---|
| **Part No.** | **900 910** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1000 V |
| Short-circuit current rating ($I_{SCPV}$) | 1 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 25 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Degree of protection | IP 65 |

### DEHNcube YPV SCI 1000 2M

Four-pole surge arrester with IP 65 degree of protection and three-step d.c. switching device for PV inverters for protecting two MPP inputs.



| Type DCU … | YPV SCI 1000 2M |
|---|---|
| **Part No.** | **900 920** |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1000 V |
| Short-circuit current rating ($I_{SCPV}$) | 1 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 12.5 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 25 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Degree of protection | IP 65 |

### DEHNcube 2 YPV 1100 1M 2S

Generator junction box for PV systems of up to 1100 V DC for protecting one MPP input and two strings.
With surge protection and push-in terminals for the input and output.



| Type DCU … | 2 YPV 1100 1M 2S |
|---|---|
| **Part No.** | **900 913** NEW |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1100 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Degree of protection | IP 65 |

### DEHNcube 2 YPV 1100 2M 1S

Generator junction box for PV systems of up to 1100 V DC for protecting two MPP inputs and one string.
With surge protection and push-in terminals for the input and output.



| Type DCU … | 2 YPV 1100 2M 1S |
|---|---|
| **Part No.** | **900 921** NEW |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1100 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Degree of protection | IP 65 |

### DEHNcube 2 YPV 1100 2M 2S

Generator junction box for PV systems of up to 1100 V DC for protecting two MPP inputs and two strings.
With surge protection and push-in terminals for the input and output.



| Type DCU … | 2 YPV 1100 2M 2S |
|---|---|
| **Part No.** | **900 923** NEW |
| SPD according to EN 61643-31 / IEC 61643-31 | type 2 / class II |
| Max. PV voltage ($U_{CPV}$) | 1100 V |
| Short-circuit current rating ($I_{SCPV}$) | 10 kA |
| Nominal discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_n$) | 20 kA |
| Max. discharge current (8/20 µs) [(DC+/DC-) --> PE] ($I_{max}$) | 40 kA |
| Voltage protection level ($U_P$) | ≤ 4 kV |
| Degree of protection | IP 65 |

## Connecting Cable for DEHNcube

Preassambled connecting cables for easy and quick connection of DEHNcube DCU YPV SCI 1000 … surge arresters to the equipment of the photovoltaic generator they are supposed to protect.

### Y Connecting Cable for DEHNcube

Allows to collect one PV string and connect it to DEHNcube and the inverter.



| Type | AL DCU Y PV L3X1000 |
|---|---|
| **Part No.** | **900 945** |
| For connecting | 1 string cable |
| Cable cross-section | 6 mm² |
| Cable material | Copper |
| Degree of protection | IP 65 |
| Length | 3x 1000 mm |




## DEHNrail modular

Modular two-pole surge protective device with a functional design.
For protecting the power supply circuit of industrial electronics equipment against transient surges in switchgear cabinets.

### DEHNrail M 2P ...

Two-pole surge arrester consisting of a base part and a plug-in protection module.



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. mains-side overcurrent protection | 25 A gG or B 25 A |
| Approvals | KEMA, VDE, UL, CSA |

| Type DR M 2P ... | 30 | 60 |
|---|---|---|
| Part No. | 953 201 | 953 202 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 30 V (50 / 60 Hz) | 60 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 30 V | 60 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 1 kA | 1 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 2 kA | 2 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 180 / ≤ 630 V | ≤ 350 / ≤ 730 V |

| Type DR M 2P ... | 75 | 150 |
|---|---|---|
| Part No. | 953 203 | 953 204 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 75 V (50 / 60 Hz) | 150 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 75 V | 150 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 2 kA | 2 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 4 kA | 4 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 400 / ≤ 730 V | ≤ 640 / ≤ 800 V |

| Type DR M 2P ... | 255 |
|---|---|
| Part No. | 953 200 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 255 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |

### DEHNrail M 2P ... FM

Two-pole surge arrester consisting of a base part and a plug-in protection module; with floating remote signalling contact.



| General technical data: | |
|---|---|
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. mains-side overcurrent protection | 25 A gG or B 25 A |
| Approvals | KEMA, VDE, UL, CSA |
| Type of remote signalling contact | changeover contact |

| Type DR M 2P ... | 30 FM | 60 FM |
|---|---|---|
| Part No. | 953 206 | 953 207 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 30 V (50 / 60 Hz) | 60 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 30 V | 60 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 1 kA | 1 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 2 kA | 2 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 180 / ≤ 630 V | ≤ 350 / ≤ 730 V |

| Type DR M 2P ... | 75 FM | 150 FM |
|---|---|---|
| Part No. | 953 208 | 953 209 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 75 V (50 / 60 Hz) | 150 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 75 V | 150 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 2 kA | 2 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 4 kA | 4 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 400 / ≤ 730 V | ≤ 640 / ≤ 800 V |

| Type DR M 2P ... | 255 FM |
|---|---|
| Part No. | 953 205 |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 255 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |

## DEHNrail M 2P SN1802

Two-pole surge arrester consisting of a base part and a plug-in protection module. Can be used for systems with a load current up to 32 A.



| Type DR M 2P ... | 255 SN1802 |
|---|---|
| Part No. | 953 228 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 255 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | 32 A gG or B 32 A |

Protection module upon request

## DEHNrail M 2P SN1803FM

Two-pole surge arrester consisting of a base part and a plug-in protection module; with floating remote signalling contact. Can be used for systems with a load current up to 32 A.



| Type DR M 2P ... | 255 SN1803FM |
|---|---|
| Part No. | 953 229 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Max. continuous operating voltage (d.c.) ($U_C$) | 255 V |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | 32 A gG or B 32 A |
| Type of remote signalling contact | changeover contact |

Protection module upon request

## DEHNrail modular, multipole

Modular four-pole surge protective device for protecting the power supply circuit of 230 / 400 V industrial electronics equipment against transient surges in switchgear cabinets.

## DEHN rail M 4P ... (FM)

Four-pole surge arrester consisting of a base part and a plug-in protection module for 230 / 400 V systems; FM version with floating remote signalling contact.



| Type DR M 4P ... | 255 | 255 FM |
|---|---|---|
| Part No. | 953 400 | 953 405 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 / 440 V (50 / 60 Hz) | 255 / 440 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA | 3 kA |
| Total discharge current (8/20 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 8 kA | 8 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1000 / ≤ 1500 V | ≤ 1000 / ≤ 1500 V |
| Max. mains-side overcurrent protection | 25 A gG or B 25 A | 25 A gG or B 25 A |
| Approvals | KEMA, VDE | KEMA, VDE |
| Type of remote signalling contact | – | changeover contact |

## DEHNrail M 4P SN1872 FM

Four-pole surge arrester consisting of a base part and a plug-in protection module; with floating remote signalling contact. Can be used for systems with a fusing up to 32 A.



| Type DR M 4P ... | 255 SN1872 FM |
|---|---|
| Part No. | 953 406 |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 / 440 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L1+L2+L3+N-PE] ($I_{total}$) | 8 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1000 / ≤ 1500 V |
| Max. mains-side overcurrent protection | 32 A gG oder B 32 A |
| Type of remote signalling contact | changeover contact |

## Protection module for DEHNrail modular

DR MOD…: Replacement protection modules for all devices of the modular DEHNrail series.

### Protection Module for DEHNrail M 2P

Protection module with integrated Y protection circuit.



| Type DR MOD ... | 30 | 60 |
|---|---|---|
| Part No. | 953 011 | 953 012 |
| Nominal discharge current (8/20 µs) ($I_n$) | 1 kA | 1 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 2 kA | 2 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 30 V | 60 V |

| Type DR MOD ... | 75 | 150 |
|---|---|---|
| Part No. | 953 013 | 953 014 |
| Nominal discharge current (8/20 µs) ($I_n$) | 2 kA | 2 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 4 kA | 4 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 75 V | 150 V |

| Type DR MOD ... | 255 |
|---|---|
| Part No. | 953 010 |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |

### Protection Module for DEHNrail M 4P

Four-pole protection module with integrated protective circuit.



| Type DR MOD ... | 4P 255 | 4P 255 SN1871 |
|---|---|---|
| Part No. | 953 020 | 953 021 |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 8 kA | 8 kA |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V | 255 V |

## SPS Protector

For protecting the power supply circuit of 230 V industrial electronics equipment (e.g. programmable logic controls (PLCs)) against transient surges and high-frequency interference voltages.

### SPS Protector

Surge arrester with interference suppressor filter for single-phase 230 V TT and TN systems; with floating remote signalling contact.



| Type | SPS PRO |
|---|---|
| **Part No.** | **912 253** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal load current (a.c.) ($I_L$) | 3 A |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 800 / ≤ 1000 V |
| Type of remote signalling contact | break contact |

## Mains Filter

For protecting the power supply circuit of industrial electronics equipment (e.g. programmable logic controls (PLCs)) against high-frequency interference voltages.

### NF 10

Mains filter for protection against balanced and unbalanced interferences.



| Type | NF 10 |
|---|---|
| **Part No.** | **912 254** |
| Nominal voltage (a.c.) ($U_N$) | 230 V |
| Nominal load current (a.c.) ($I_L$) | 10 A |
| Attenuation for f = 1 MHz, balanced | > 64 dB |
| Attenuation for f = 1 MHz, unbalanced | > 69 dB |

## DEHNsafe

For protecting terminal equipment against transient surges. For installation into electrical installation systems, e.g. cable ducts or flush-type boxes.

### DEHNsafe

Surge protective device for use in cable ducts and flush-type boxes. For single-phase 230 V TT and TN systems.



| Type | DSA 230 LA |
|---|---|
| **Part No.** | **924 370** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | B 16 A |
| Fault indication | red light + acoustic signal |
| Operating state indication | green light |

## Accessories for DEHNsafe

### Central Covering Plate

Single unit, alpha exclusive.



| Type | ZAP STW |
|---|---|
| **Part No.** | **924 329** |
| Colour | studio white |

### Cover Frame

Single unit, alpha exclusive.



| Type | AR1 STW |
|---|---|
| **Part No.** | **924 328** |
| Colour | studio white |

## NSM Protector

Earthed socket outlet with integrated surge protection for protecting electronic equipment against surges. For installation into electrical installation systems. German utility patent.

### NSM PRO

Socket outlet with integrated surge protection for single-phase 230 V TT and TN systems.



| Type | NSM PRO TW |
|---|---|
| **Part No.** | **924 335** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | B 16 A |
| Fault indication | red light |
| Operating state indication | green light |
| DELTA Profil line | titanium white |

## Accessories for NSM Protector

### AR1 Cover Frame

Single unit, suitable for NSM Protector.



| Type | AR1 TW |
|---|---|
| **Part No.** | **924 336** |
| Type | DELTA profil, titanium white |

## STC Module

For protecting electronic devices against surges.
For use with standard earthed socket outlets.

### STC 230

Two-pole surge arrester for single-phase 230 V TT and TN systems is snapped on earthed socket outlets.



| Type | STC 230 |
|---|---|
| **Part No.** | **924 350** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | B 16 A |
| Fault indication | acoustic signal on |

## VC 280 2

For protecting (electronic) terminal equipment against transient overvoltages. For installation into the enclosure or directly into the device to be protected. German utility patent.

### VC 280 2

Mains module with integrated surge protection and floating break contact for installation into the terminal equipment to be protected.



| Type | VC 280 2 |
|---|---|
| **Part No.** | **900 471** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 280 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | B 16 A |
| Fault indication | remote signalling contact (break contact) |

## DEHNflex

For protecting terminal equipment against transient overvoltages. For installation into electrical installation systems, e.g. flush-mounted systems, cable ducts and flush-type boxes. German utility patent for DEHNflex A / ... D.

### DEHNflex M

Surge arrester for single-phase 230 V TT and TN systems for use in all installation systems of terminal equipment; compact dimensions.



| Type DFL ... | M 255 |
|---|---|
| **Part No.** | **924 396** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 1.5 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 3 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | B 16 A |
| Fault indication | acoustic signal on |
| Dimensions | 30 x 50 x 11 mm |

### DEHNflex A

Surge arrester for single-phase 230 V TT and TN systems for use in all installation systems of terminal equipment; with test function; compact dimensions.



| Type DFL ... | A 255 |
|---|---|
| **Part No.** | **924 389** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | B 16 A |
| Fault indication | acoustic signal on |
| Dimensions | 36 x 46 x 19 mm |

### DEHNflex D

Surge arrester for single-phase 230 V TT and TN systems for use in all installation systems of terminal equipment; allows series connection; with test function; compact dimensions.



| Type DFL ... | D 255 |
|---|---|
| **Part No.** | **924 395** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1250 / ≤ 1500 V |
| Max. mains-side overcurrent protection | B 16 A |
| Fault indication | acoustic signal on |
| Dimensions | 36 x 46 x 19 mm |

## DEHNprotector

Adapters for protecting the power supply circuit of electronic devices against transient overvoltages (DEHNpro 230 Protector).

### DPRO 230 Protector

Adapter with integrated surge protection and child lock.



| Type | DPRO 230 |
|---|---|
| **Part No.** | **909 230** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] / [L/N-PE] ($U_P$) | ≤ 1350 / ≤ 1500 V |
| Max. mains-side overcurrent protection | B 16 A |
| Fault indication | red light |
| Operating state indication | green light |

## SFL Protector

Multiple socket outlet (six-way) for protecting the power supply circuit of electronic devices against transient overvoltages as well as high-frequency interference voltages.

### SFL PRO 6X

Surge protective multiple socket outlet with mains filter.



| Type SFL PRO ... | 6X |
|---|---|
| **Part No.** | **909 250** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level ($U_P$) | ≤ 1.6 kV |
| Max. mains-side overcurrent protection | B 16 A |
| Number of socket outlets | 6 |

### SFL PRO 19"

Surge protective multiple socket outlet with mains filter for 482.6 mm (19 inches) data cabinets.



| Type SFL PRO ... | 6X 19" |
|---|---|
| **Part No.** | **909 251** |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal discharge current (8/20 µs) ($I_n$) | 3 kA |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level ($U_P$) | ≤ 1.6 kV |
| Max. mains-side overcurrent protection | B 16 A |
| Number of socket outlets | 6 |





## DEHNrecord SD

Multi-functional power quality measuring device according to IEC 61000-4-30 class A for analysing and evaluating power quality as per EN 50160 deep inside the low-voltage system.

### DRC SD 1 1

Multifunctional measurement and analysis device for monitoring voltage quality



| Type DRC SD ... | 1 1 |
|---|---|
| **Part No.** | **910 920** NEW |
| PQ measuring method as per EN 61000-4-30:2015 | Class A |
| Power supply ($U_B$) | 230 $V_{AC}$ (50 Hz) via L1 of the measuring voltage |
| Nominal input voltage range | 230 / 400 $V_{AC}$ |
| Input voltage range | 185–265 $V_{AC}$ |

### DRC SD 2 1

Multifunctional measurement and analysis device for monitoring voltage quality



| Type DRC SD ... | 2 1 |
|---|---|
| **Part No.** | **910 921** NEW |
| PQ measuring method as per EN 61000-4-30:2015 | Class A |
| Power supply ($U_B$) | 24 $V_{DC}$ |
| Nominal input voltage range | 24 $V_{DC}$ SELV (max. 3 W) |
| Input voltage range | 18–30 $V_{DC}$ |

### DRC SD ICS 100

With the DEHNrecord SD ICS, impulse currents of up to 100 kA can be detected on insulated cables.



| Type DRC SD ... | ICS 100 |
|---|---|
| **Part No.** | **910 935** NEW |
| Impulse current measuring range (8/20 µs to 10/350 µs) | up to 100 kA |
| Amplitude resolution | 100 A |
| Sampling rate | 1 µs |
| Recording time | Max. 5 sec. |
| Amplitude trigger threshold | Parametrizable via internal Web server |
| Frequency bandwidth (-3 dB) (BW) | 3 kHz |
| Positioning error ($\varepsilon_L$) | < +/-1% |
| Connecting cable length | 3 m |

## DRC SD SCS 100

Split-core current transformer for electronic measurement of alternating current (AC) with galvanic isolation between the primary circuit (power) and secondary circuit (measurement) up to 300 V CAT III.



| Type DRC SD ... | SCS 100 |
|---|---|
| **Part No.** | **910 936** NEW |
| Accuracy class | 1 (IEC 61869-2) |
| Nominal primary current ($I_{Pr}$) | 100 A |
| Expanded primary current ($I_{ePr}$) | 120 A |
| Thermal rated short-time current ($I_{th}$) | Max. 6 kA @ 50 Hz; 60 x IPr (1 s) kA |
| Dynamic nominal current ($I_{dyn}$) | Max. 3 kA @ 50 Hz; 60 x IPr (1 s) kA |
| Nominal frequency ($f_r$) | 50 Hz |
| Frequency bandwidth (-3 dB) (BW) | min. 1.5 kHz |
| Max. cable diameter | 16 mm |
| Connecting cable length | 1 m |

## DRC SD RCS 1000

Rogowski coil current transformer for electronic measurement of alternating current (AC) with galvanic isolation between the primary circuit (power) and secondary circuit (measurement) up to 1,000 V CAT III.



| Type DRC SD ... | RCS 1000 3M | RCS 1000 1M |
|---|---|---|
| **Part No.** | **910 937** NEW | **910 938** NEW |
| Accuracy class | 1 (IEC 61869-2) | 1 (IEC 61869-2) |
| Nominal primary current ($I_{Pr}$) | 1000 A | 1000 A |
| Expanded primary current ($I_{ePr}$) | 2000 A | 2000 A |
| Nominal frequency ($f_r$) | 50 Hz | 50 Hz |
| Frequency bandwidth (-3 dB) (BW) | 3 kHz | 3 kHz |
| Positioning error ($\varepsilon_L$) | < +/-1% | < +/-1% |
| Max. cable diameter | 95 mm | 95 mm |
| Connecting cable length | 3 m | 1 m |

## Accessories for DEHNrecord SD

### MVS three-phase, six-pole



| Type | MVS 3 6 6 |
|---|---|
| **Part No.** | **900 595** |
| Type | Three-phase |
| Number of contact studs | 6 |
| Max. installation length | 6 Standard DIN module(s) |
| Nominal cross-section | 16 mm² |

### MVS, four-phase, eight-pole



| Type | MVS 4 8 8 |
|---|---|
| **Part No.** | **900 850** |
| Type | Four-phase |
| Number of contact studs | 8 |
| Max. installation length | 8 Standard DIN module(s) |
| Nominal cross-section | 10 mm² |

## DIN Rail Mounted Power Supply Unit

Robust power supply in the DIN-rail-mounted enclosure with single-phase, wide-range input for operation in a wide variety of supply systems. The operating state indication on the front side signals the availability of the output voltage. Supply of stationary condition-monitoring devices from the DEHNrecord product range (DRC SCM XT / DRC MCM XT / DRC IRCM / DRC SD 2 1).



| Type | PSU DC24 30W |
|---|---|
| **Part No.** | **910 499** |
| Input voltage range | AC 85-264 V; DC 120-373 V |
| Frequency | 44-66 Hz; 0 Hz |
| Input current ($I_e$) | 0.7 A at AC 110 V / 0.5 A at AC 230 V |
| Output nominal voltage ($U_a$) | DC 24 V (SELV) |
| Output current ($I_a$) | 1.3 A at DC 24 V, max. 0.9 A at any installation position |
| Recommended backup fuse | circuit breaker 10 A, 16 A, characteristic B, C |
| Standards / regulations | EN 60950, EN 61204-3, UL 60950, UL 508, GL |

## DEHNdetect

- Prevention of subsequent damage
- Reduction of maintenance / repair costs
- Reduction of downtimes

### Data logger DDT DL



| Type DDT ... | DL |
|---|---|
| **Part No.** | **915 000** |
| Measuring range impulse current ($I_{imp}$ 10/350µs) | 500 A - 250 kA |
| Measuring range long stroke current ($I_{cc}$) | 60 A - 2.0 kA |
| Digital outputs | 4 (30 V / 0.5 A DC; 30 V / 0.3 A AC) |
| Communication | via LTE, Ethernet, Modbus TCP |
| For mounting on | 35 mm DIN rail according to EN 60715 |

### Data logger DDT DL TCP



| Type DDT ... | DL TCP |
|---|---|
| **Part No.** | **915 001** |
| Measuring range impulse current ($I_{imp}$ 10/350µs) | 500 A - 250 kA |
| Measuring range long stroke current ($I_{cc}$) | 60 A - 2.0 kA |
| Digital outputs | 4 (30 V / 0.5 A DC; 30 V / 0.3 A AC) |
| Communication | via Ethernet, Modbus TCP |
| For mounting on | 35 mm DIN rail according to EN 60715 |

## Blade detection unit DDT BDU



| Type DDT ... | BDU |
|---|---|
| **Part No.** | **915 051** |
| Voltage supply | battery (3.6 V AA), service life min. 5 years |
| Trigger level ($I_{cc}$) | ≤ 100 A |
| Trigger level ($I_{imp}$ 10/350µs) | 5 kA |
| Installation | via glueing, clamping |
| Communication with data logger | via ZigBee |

## Measuring coil DDT ICC



| General technical data: | |
|---|---|
| **Measuring coil** | |
| Size | up to 20 m |
| Measuring range impulse current ($I_{imp}$ 10/350µs) | 500 A - 250 kA |
| Measuring range long stroke current ($I_{cc}$) | 60 A - 2.0 kA |
| For mounting on | the relevant wind turbine |
| **Measuring integrator** | |
| Connection to measuring coils | via BNC cable*) |
| Connection to data logger | via SUB-D cable*) |
| For mounting on | 35 mm DIN rails acc. to EN 60715 |

| Type DDT ... | ICC IMP 5M | ICC IMP 9M |
|---|---|---|
| **Part No.** | **915 105** | **915 109** |
| Coil length | 5 m | 9 m |

| Type DDT ... | ICC IMP 11M | ICC IMP 13M |
|---|---|---|
| **Part No.** | **915 111** | **915 113** |
| Coil length | 11 m | 13 m |

| Type DDT ... | ICC IMP 15M | ICC IMP 17M |
|---|---|---|
| **Part No.** | **915 115** | **915 117** |
| Coil length | 15 m | 17 m |

| Type DDT ... | ICC IMP 20M |
|---|---|
| **Part No.** | **915 120** |
| Coil length | 20 m |

*) accessory, must be ordered separately.

# Impulse Counter

For registering the discharge processes of protective devices in DIN-rail-mounted enclosure (3 modules).

## P 4 Impulse Counter



| Type | IPC P4 |
|---|---|
| **Part No.** | **910 513** |
| Lightning counter according to GB/T 33588.6 and EN/IEC 62561-6 | type 1 + type 2 |
| Max. impulse discharge current counted ($I_{imp}$) | 100 kA |
| Min. impulse discharge current counted ($I_{imp}$) | 5 kA |
| Max. discharge current counted ($I_n$) | 100 kA |
| Min. discharge current counted ($I_n$) | 1 kA |
| OLED display | electronic counter 0-999 |
| Power supply | DC 9-36V, with 1 Lithium manganese dioxide battery inside for backup power |
| Resetting device | button on the device for resetting the counter to 0 |
| Dimensions (sensor) | inner Ø: 14 mm |
| Accessories included in delivery | sensor, cable tie (for fixing the sensor) |

*) Battery is not included in the scope of delivery. Battery type CR17335 is recommended.

# SPD Test Device

For testing the sparkover voltage of surge arresters. The specimen is connected via the included test cables or special test adapters.

## PM 20

Combined device for testing the sparkover voltage of surge arresters (with gas discharge tubes / varistors / Zener diodes). Storage bag and measuring accessories included.



| Type | PM 20 |
|---|---|
| **Part No.** | **910 511** |
| Nominal voltage ($U_N$) | 8-12 V d.c. |
| Test parameter: Test voltage | max. 1200 V d.c. |
| Test parameter: Test current (reference voltage) | 1 mA d.c., constant |
| Measured value indication | alphanumeric, eight-digit LCD |
| Accessories included in delivery | 2 test leads (each 1 m long), 2 safety tapping test clips, 1 plug-in power supply unit (230 V a.c.), 1 storage bag |

## DEHNpanel

Remote visual indication for surge protective devices with a remote signalling contact for installation into switchgear cabinets.

### DPAN L

Visual indicator for surge protective devices installed in switchgear cabinets.



| Type | DPAN L |
|---|---|
| **Part No.** | **910 200** |
| Voltage supply | 2x 1.5 V lithium batteries, size AA |
| Operating state / fault indication | green LED (flashing) / red LED (flashing) |
| Flashing frequency | 0.1 s on / 1.3 s off |
| Degree of protection (front / rear side) | IP 40 / IP 20 |
| Mounting dimensions | 92 x 45 mm |
| Dimensions | 96 x 48 x 75 mm |

## Wiring Accessories DK

- Allows changing of the wiring level
- For a lightning current suitable installation of arrester combinations

### Feed-Through Terminal DK 25

Feed-through terminal for busbar wiring.



| Type | DK 25 |
|---|---|
| **Part No.** | **952 699** |
| Nominal voltage (a.c. / d.c.) ($U_N$) | 500 V |
| Nominal load current (a.c.) ($I_L$) | 100 A |
| Lightning impulse current (10/350 µs) | 100 kA |
| Cross-sectional area (min.) | 1.5 mm² solid / flexible |
| Cross-sectional area (max.) | 25 mm² stranded / 16 mm² flexible |

## Wiring Accessories STAK

Allows EMC-optimised feed-through wiring according to DIN VDE 0100-534

### STAK 25 Pin-shaped Terminal

Pin-shaped terminal for EMC-optimised through-wiring of lightning current and surge arresters according to IEC 60364-5-53.



| Type STAK ... | 25 |
|---|---|
| **Part No.** | **952 589** |
| Nominal voltage (a.c. / d.c.) ($U_N$) | 600 V |
| Max. PV voltage ($U_{CPV}$) when used in combination with DEHNguard M YPV ... | 1200 V |
| Lightning impulse current (10/350 µs) | 25 kA |
| Discharge current (8/20 µs) | 50 kA |
| Cross-sectional area (min.) | 1.5 mm² solid / flexible |
| Cross-sectional area (max.) | 25 mm² stranded / 16 mm² flexible |
| Type of connection | front |

### STAK 3X16 Pin-shaped Terminal

Pin-shaped terminal for EMC-optimised through-wiring of lightning current and surge arresters according to IEC 60364-5-53.



| Type STAK ... | 3X16 |
|---|---|
| **Part No.** | **900 588** |
| Nominal voltage (a.c. / d.c.) ($U_N$) | 690 V / 1500 V |
| Load current at V-wiring | 80 A |
| Lightning impulse current (10/350 µs) | 25 kA |
| Cross-sectional area (min.) | 1.5 mm² solid / flexible |
| Cross-sectional area (max.) | 16 mm² stranded / 10 mm² flexible |
| Type of connection | front |

### STAK 2X16 Pin-shaped Terminal

Pin-shaped terminal for EMC-optimised through-wiring of lightning current and surge arresters according to IEC 60364-5-53.



| Type STAK ... | 2X16 |
|---|---|
| **Part No.** | **900 589** |
| Lightning impulse current (10/350 µs) | 25 kA |
| Cross-sectional area (min.) | 2x 1.5 mm² |
| Cross-sectional area (max.) | 2x max. 16 mm² |
| Type of connection | front (double terminal) |

## Insulating Enclosures

Insulating enclosure for the installation of surge protective devices.

- Degree of protection: IP 54 and IP 65
- With transparent cover
- Grey enclosure

### IGA 10 V2 IP54

Lightning-current-tested insulating enclosure with a max. capacity of ten modules; with grommet flange for 11 EPDM cables (Ø5-30 mm) and three mounted M20 grommet openings with lock nut; ideally suited for series connection.



| Type IGA ... | 10 V2 IP54 |
|---|---|
| Part No. | 902 315 |
| Degree of protection | IP 54 |
| Type | lightning-current-tested |
| Number of cable entries | 4x for cables Ø5-7mm;<br>3x for cables Ø7-10 mm;<br>2x for cables Ø10-14 mm or Ø15-30 mm each;<br>3x for cables Ø8-13 mm |
| Capacity | 10 modules, DIN 43880 |
| Dimensions (W x H x D) | 200 x 300 x 132 mm |
| Cover | sealable |

### IGA 7 IP54

Lightning-current-tested insulating enclosure with a max. capacity of seven modules; with EPDM grommet flange for two cables (Ø1-25 mm) and three mounted M20 grommet openings with lock nut; ideally suited for series connection.



| Type IGA ... | 7 IP54 |
|---|---|
| Part No. | 902 314 |
| Degree of protection | IP 54 |
| Type | lightning-current-tested |
| Number of cable entries | 2x for cables Ø1-25 mm;<br>3x for cables Ø8-13 mm |
| Capacity | 7 modules, DIN 43880 |
| Dimensions (W x H x D) | 175 x 250 x 100 mm |
| Cover | sealable |

### IGA 6 IP54

Lightning-current-tested insulating enclosure for arresters with a capacity of six modules; with knockouts for cable entry and plug-in glands; ideally suited for feed-through wiring.



| Type IGA ... | 6 IP54 |
|---|---|
| Part No. | 902 485 |
| Degree of protection | IP 54 |
| Type | lightning-current-tested |
| Number of cable entries | 2 plug-in glands for cables Ø8-23 mm (M32 knockout) |
| Capacity | 6 modules, DIN 43880 |
| Dimensions (W x H x D) | 165 x 255 x 115 mm |
| Cover | sealable |

### IGA 12 IP54

Insulating enclosure for arresters with a capacity of 12 modules; with integrated, elastic seal membrane for cable entry; ideally suited for feed-through wiring.



| Type IGA ... | 12 IP54 |
|---|---|
| Part No. | 902 471 |
| Degree of protection | IP 54 |
| Number of cable entries | 8x for cables Ø7-12 mm;<br>8x for cables Ø7-14 mm;<br>4x for cables Ø12-20 mm;<br>1x for cables Ø16.5-29 mm (top and bottom) |
| PE / N quantity x cross-section | 3x 25 mm², 12x 4 mm², Cu |
| Capacity | 12 modules, DIN 43880 |
| Dimensions (W x H x D) | 295 x 333 x 129 mm |

### IGA 12 IP65

Insulating enclosure for arresters with a capacity of 12 modules; with integrated, elastic seal membrane for cable entry; ideally suited for feed-through wiring.



| Type IGA ... | 12 IP65 |
|---|---|
| Part No. | 902 316 |
| Degree of protection | IP 65 |
| Type | lightning-current-tested |
| Number of cable entries | 8x for cables Ø7-12 mm;<br>8x for cables Ø7-14 mm;<br>4x for cables Ø12-20 mm;<br>1x for cables Ø16.5-29 mm (top and bottom) |
| PE / N quantity x cross-section | 3x 25 mm², 12x 4 mm², Cu |
| Capacity | 12 modules, DIN 43880 |
| Dimensions (W x H x D) | 295 x 333 x 129 mm |

### IGA 24 IP54

Insulating enclosure for arresters with a capacity of 2x 12 modules; with integrated, elastic seal membrane for cable entry; ideally suited for feed-through wiring.



| Type IGA ... | 24 IP54 |
|---|---|
| Part No. | 902 472 |
| Degree of protection | IP 54 |
| Number of cable entries | 8x for cables Ø7-12 mm;<br>8x for cables Ø7-14 mm;<br>4x for cables Ø12-20 mm;<br>1x for cables Ø16.5-29 mm (top and bottom) |
| PE / N quantity x cross-section | 6x 25 mm², 24x 4 mm², Cu |
| Capacity | 24 modules (2x 12 modules), DIN 43880 |
| Dimensions (W x H x D) | 295 x 458 x 129 mm |

## Accessories for Insulating Enclosures

### Sealing Device

For sealing between the lower and upper part of IGA 12 and IGA 24 insulating enclosures (doors can be sealed without additional part).



| Type | PLOV IGA 12 24 |
|---|---|
| Part No. | 902 317 |
| Material | aluminium |

## Earthing clip / modular wiring system

Busbars for earth-side (single-phase) connection, connection between neutral conductor N and N' (two-phase) and phase-side connection (three-phase and four-phase).

### MVS single-phase, two-pole

For connecting the earth terminal of e.g. 2 DEHNguard S surge arresters to earth.



| Type | MVS 1 2 |
|---|---|
| Part No. | 900 617 |
| Type | single-phase |
| Number of contact studs | 2 |
| Max. installation length | 2 module(s) |
| Nominal cross-section | 16 mm² |

### MVS single-phase, three-pole

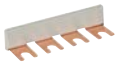
For connecting the earth terminal of e.g. 3 DEHNguard S surge arresters to earth.



| Type | MVS 1 3 |
|---|---|
| Part No. | 900 615 |
| Type | single-phase |
| Number of contact studs | 3 |
| Max. installation length | 3 module(s) |
| Nominal cross-section | 16 mm² |

### MVS single-phase, four-pole

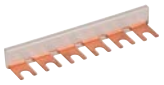
For connecting the earth terminal of e.g. 4 DEHNguard S surge arresters to earth.



| Type | MVS 1 4 |
|---|---|
| Part No. | 900 610 |
| Type | single-phase |
| Number of contact studs | 4 |
| Max. installation length | 4 module(s) |
| Nominal cross-section | 16 mm² |

### MVS single-phase, six-pole

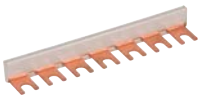
For connecting the earth terminal of e.g. 3 type 1 SPDs with two-module enclosure to earth.



| Type | MVS 1 6 |
|---|---|
| Part No. | 900 815 |
| Type | single-phase |
| Number of contact studs | 6 |
| Max. installation length | 6 module(s) |
| Nominal cross-section | 16 mm² |

### MVS single-phase, seven-pole

For connecting the earth terminal of e.g. 3 DEHNbloc Maxi and 1 DEHNgap Maxi in 3+1 configuration to earth.



| Type | MVS 1 7 |
|---|---|
| Part No. | 900 848 |
| Type | single-phase |
| Number of contact studs | 7 |
| Max. installation length | 7 module(s) |
| Nominal cross-section | 16 mm² |

### MVS single-phase, eight-pole

For connecting the earth terminal of e.g. 4 DEHNbloc Maxi lightning current arresters to earth.



| Type | MVS 1 8 |
|---|---|
| Part No. | 900 611 |
| Type | single-phase |
| Number of contact studs | 8 |
| Max. installation length | 8 module(s) |
| Nominal cross-section | 16 mm² |

### MVS three-phase, six-pole, 6 Modules

For phase-side connection of surge arresters.



| Type | MVS 3 6 6 |
|---|---|
| Part No. | 900 595 |
| Type | three-phase |
| Number of contact studs | 6 |
| Max. installation length | 6 module(s) |
| Nominal cross-section | 16 mm² |

### MVS three-phase, six-pole, 9 Modules

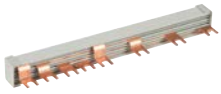
For phase-side connection of three-pole surge arresters to fuse holders (for 1.5-module enclosures).



| Type | MVS 3 6 9 |
|---|---|
| Part No. | 900 839 |
| Type | three-phase |
| Number of contact studs | 6 |
| Max. installation length | 9 module(s) |
| Nominal cross-section | 16 mm² |

### MVS four-phase, eight-pole

For phase-side connection of DIN rail mounted devices to DEHNventil M TNS and TT.



| Type | MVS 4 8 8 |
|---|---|
| Part No. | 900 850 NEW |
| Type | four-phase |
| Number of contact studs | 8 |
| Max. installation length | 8 module(s) |
| Nominal cross-section | 10 mm² |

### MVS single-phase, four-pole, 8 Modules

Modular wiring clip for TT systems, insulated, single-phase, four-pole with connection clamp up to 50 mm².



| Type | MVS 1 4 8 TT |
|---|---|
| Part No. | 900 849 NEW |
| Type | Single-phase |
| Number of contact studs | 4 |
| Dimensions | 166 x 38.1 x 22 mm |
| Max. lightning current (10/350 µs) based on DIN EN 61643-11 ($I_{imp}$) | 100 kA |
| Material of the electrical conductor | E-Cu-ETP |
| Insulation material | PC |
| Cross-sectional area of the feed terminal | 10–50 mm (solid or stranded) / 6–35 mm² (flexible with wire end ferrule) |
| Max. tightening torque of the clamping screw | 7 Nm |
| Insulated design | Yes |

## Earthing Clip for 1.5-module Enclosures, single-phase, two-pole



Earthing clip for connecting e.g. two SPDs with 1.5-module enclosure, with terminal.

| Type | EB 1 2 1.5 |
|---|---|
| **Part No.** | **900 460** |
| Type | single-phase |
| Number of contact studs | 2 |
| Dimensions | 34 x 60 x 28 mm |
| Material | copper and tin-plated brass |
| Terminal | up to 25 mm² |

## Earthing Clip for two-module Enclosures, single-phase, three-pole



Earthing clip for connecting e.g. three SPDs with two-module enclosure, with terminal.

| Type | EB DG 1000 1 3 |
|---|---|
| **Part No.** | **900 411** |
| Type | single-phase |
| Number of contact studs | 3 |
| Dimensions | 34 x 112 x 28 mm |
| Material | copper and tin-plated brass |
| Terminal | up to 25 mm² |

## Earthing Clip for 1.5-module Enclosures, single-phase, three-pole



Earthing clip for connecting e.g. three SPDs with 1.5-module enclosure, with terminal.

| Type | EB 1 3 1.5 |
|---|---|
| **Part No.** | **900 418** |
| Type | single-phase |
| Number of contact studs | 3 |
| Dimensions | 34 x 85 x 28 mm |
| Material | copper and tin-plated brass |
| Terminal | up to 25 mm² |

## Earthing Clip for two-module Enclosures, single-phase, four-pole



Earthing clip for connecting e.g. four SPDs in a two-module enclosure, with terminal.

| Type | EB 1 4 9 |
|---|---|
| **Part No.** | **900 417** |
| Type | single-phase |
| Number of contact studs | 4 |
| Dimensions | 34 x 148 x 28 mm |
| Material | copper and tin-plated brass |
| Terminal | up to 25 mm² |

## Earthing Clip for 1.5-module Enclosures, single-phase, four-pole



Earthing clip for connecting e.g. four SPDs with 1.5-module enclosure, with terminal.

| Type | EB 1 4 1.5 |
|---|---|
| **Part No.** | **900 429** |
| Type | single-phase |
| Number of contact studs | 4 |
| Dimensions | 34 x 112 x 28 mm |
| Material | copper and tin-plated brass |
| Terminal | up to 25 mm² |

## Earthing Clip for three-module Enclosures, single-phase, three-pole



Earthing clip for connecting e.g. three SPDs with three-module enclosure, with terminal.

| Type | EB 1 3 10 |
|---|---|
| **Part No.** | **900 461** |
| Type | single-phase |
| Number of contact studs | 3 |
| Dimensions | 34 x 158 x 28 mm |
| Material | copper and tin-plated brass |
| Terminal | up to 25 mm² |

## Earthing Clip for two-module Enclosures, single-phase, two-pole



Earthing clip for connecting e.g. two SPDs with two-module enclosure, with terminal.

| Type | EB 1 2 5 |
|---|---|
| **Part No.** | **900 419** |
| Type | single-phase |
| Number of contact studs | 2 |
| Dimensions | 34 x 77 x 28 mm |
| Material | copper and tin-plated brass |
| Terminal | up to 25 mm² |

## Earthing Clip for three-module Enclosures, single-phase, four-pole



Earthing clip for connecting e.g. four SPDs with three-module enclosure, with terminal.

| Type | EB 1 4 13 |
|---|---|
| **Part No.** | **900 462** |
| Type | single-phase |
| Number of contact studs | 4 |
| Dimensions | 34 x 212 x 28 mm |
| Material | copper and tin-plated brass |
| Terminal | up to 25 mm² |

# Surge Protection for Information Technology Systems

Find the right product quickly and easily:
**https://www.dehn-international.com/en/selection-guides-and-configurators**


| | |
|---|---|
| Pluggable SPDs – DIN Rail Mounted | Page 310 |
| Compact SPDs – DIN Rail Mounted | Page 324 |
| SPDs for LSA Technology | Page 330 |
| SPDs for Field Devices | Page 336 |
| SPDs for Telecommunication and Data Networks | Page 339 |
| SPDs for Building Systems | Page 341 |
| SPDs for SUB-D Connection | Page 343 |
| SPDs for Coaxial Connection | Page 344 |
| Shield Connection Systems and Enclosures | Page 348 |
| Measuring and Test Devices | Page 351 |

# SPDs for Information Technology Systems



## Use of arresters

The application guide CLC TS 61643-22 / IEC 61643-22 describes principles for selecting and using arresters. It defines basic requirements on the loads with which arresters are tested for using arresters at the different zone transitions of the lightning protection zone concept according to IEC / EN 62305. The protection components at the different lightning protection zones must therefore cope with with defined pulse categories.

| Lightning protection zone | LPZ 0 / 1 | LPZ 1 / 2 | LPZ 2 / 3 |
|---|---|---|---|
| Entrance point into the building | D1 | | |
| Sub-distribution board | | C2 | |
| Terminal device | | | C1 |

Impulse category requirements for SPDs for information technology applications according to the lightning protection zone concept

## Selection of arresters for information technology systems

The following must be observed when selecting arresters:

- Protective effect
  [Yellow/Line SPD class (discharge capacity and voltage protection level)]
- System parameters
  (system voltage, nominal current and transmission parameters)
- Installation environment
  (design, connection conditions and approvals)

The selection guide according to interface / signal on **dehn-international.com/en/selection-guides-and-configurators** facilitates the selection of the right arrester.

To make the selection of arresters easier for the user, the SPD class (TYPE classification) for Yellow/Line arresters is based on that of arresters (Red/Line) for power supply systems. However, so-called combined arresters can also be used universally at the different lightning protection zones. Consequently, the different impulse categories (D1, C2, C1) for the arresters are specified according to their possible point of use.

| LPZ | EN / IEC 61643-21 | EN / IEC 61643-11 |
|---|---|---|
| 0/1 | D1 \| 0.5 … 2,5 kA (10/350 µs) | Type 1 / I |
| 1/2 | C2 \| 1 … 5 kA (8/20 µs) | Type 2 / II |
| 2/3 | C1 \| 0.25 … 1 kA (8/20 µs) | Type 3 / III |

Impulse categories and arrester classification for arresters in information technology and power supply systems

## Relevant product standard for arresters:

IEC / DIN EN 61643-21
Low-voltage surge protective devices – Part 21: Surge protective devices connected to telecommunications and signalling networks – Performance requirements and testing methods.

## Discharge capacity

According to IEC / EN 61643-21 arresters must be tested with at least one impulse voltage and impulse current from the table below with the specified quantity of impulses. Further tests may be performed – even with different impulse values or quantities. The max. voltage level measured during the test(s) at the output of the device is specified as voltage protection level $U_P$. Category C above all represents interference impulses with a steep rate of rise and low energy, while interference impulses of category D are supposed to simulate high energy loads caused by injected partial lightning currents. The relevant category is specified in the technical data of the arresters [see discharge capacity ($I_n$, $I_{imp}$) and voltage protection level ($U_P$)].

| Category | Type of test | Impulse voltage | Impulse current | Minimum quantity of impulses | Test for |
|---|---|---|---|---|---|
| C1 | fast rate of rise | 0.5 to 2 kV, 1.2/50 µs | 0.25 to 1 kA, 8/20 µs | 300 | Surge C2 arrester |
| C2 | | 2 to 10 kV, 1.2/50 µs | 1 to 5 kA, 8/20 µs | 10 | |
| C3 | | ≥ 1 kV, 1 kV/µs | 10 to 100 A, 10/1000 µs | 300 | |
| D1 | high energy | ≥ 1 kV | 0.5 to 2.5 kA, 10/350 µs | 2 | Lightning current arrester / Combined lightning current and surge arrester |

Impulse voltages and currents (preferred values) for determining the voltage-limiting characteristics (excerpt from Table 3 of IEC / EN 61643-21)

## Immunity of terminal equipment to be protected

During electromagnetic compatibility (EMC) tests, electrical and electronic equipment (devices) must have a certain immunity to conducted interferences (surges). The requirements on the immunity and the test set-up are described in IEC / EN 61000-4-5.

Since the devices are used in different electromagnetic environments, they must have different immunities. The immunity of a device depends on the test level. To classify the different immunities of terminal equipment, test levels are subdivided into four different levels (1 to 4). Test level 1 places the lowest requirement on the immunity of terminal equipment. The test level is specified in the arrester documentation or can be requested from the manufacturer of the arrester.

| Test levels 1 – 4 according to EN 61000-4-5 | Corresponds to the charging voltage of the test generator |
|---|---|
| 1 | 0.5 kV |
| 2 | 1 kV |
| 3 | 2 kV |
| 4 | 4 kV |

## Protective effect of arresters

Yellow/Line arresters for use in information technology systems are capable of limiting conducted interference to a safe level so that the immunity of the terminal equipment is not exceeded. For example, an arrester with a let-through value below the EMC test values of the terminal device must be selected for a terminal device tested with test level 2: Impulse voltage < 1 kV in combination with an impulse current of some amperes (depending on the coupling network).

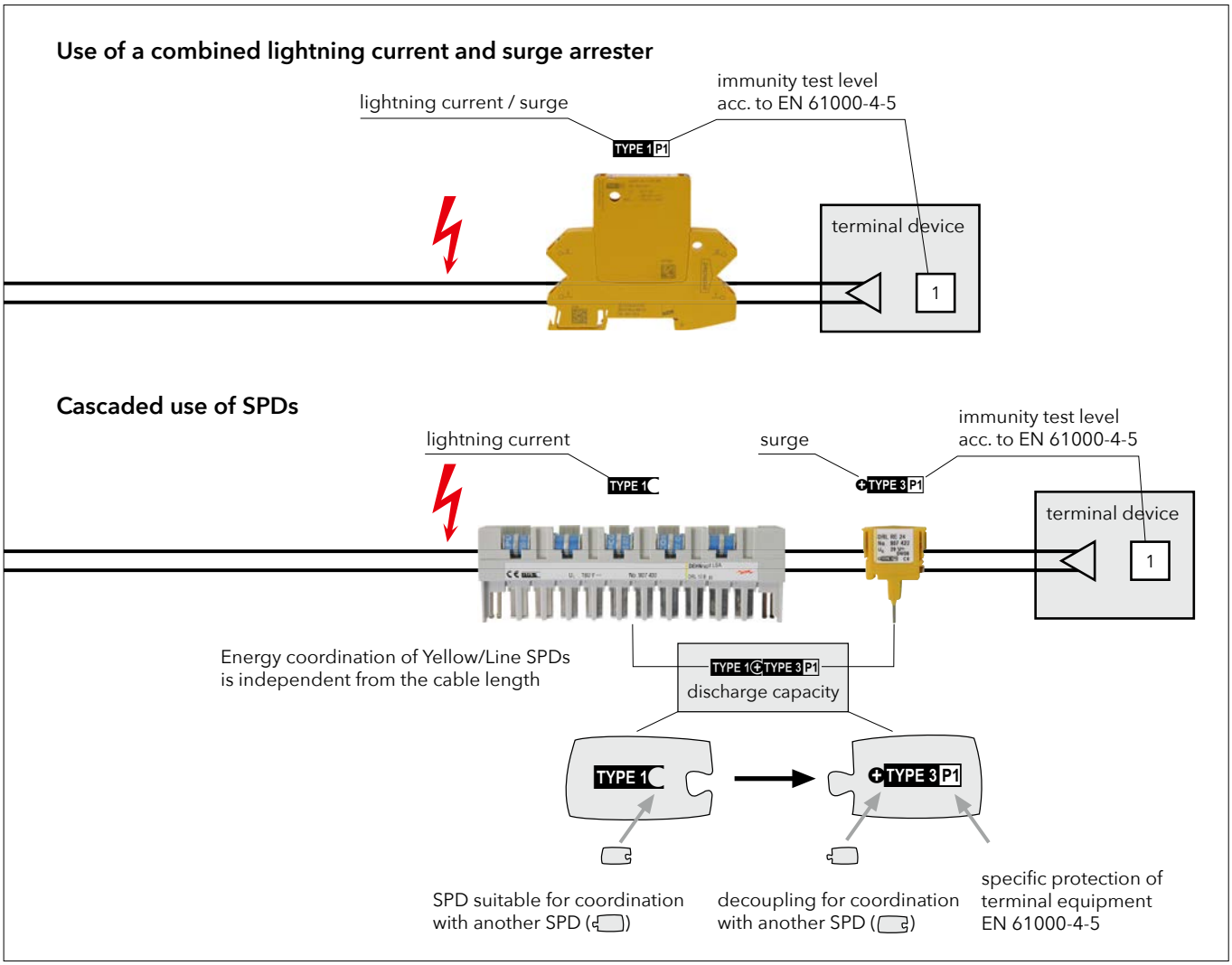
# Yellow/Line SPD Classes – Symbols

All SPDs of the Yellow/Line family for use in information technology systems are assigned to a Yellow/Line SPD class and marked with a symbol in the technical data sheet and on their rating plates.

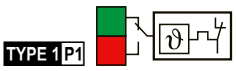
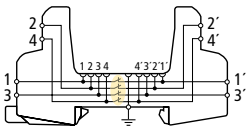
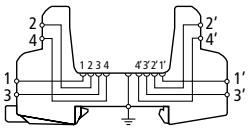
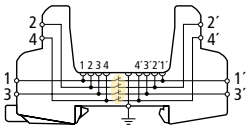
The symbol for the Yellow/Line SPD class graphically combines three important characteristics of the SPD and can be a single symbol or a combination of individual symbols:

| Characteristics | Single symbol | Definition |
|---|---|---|
| **Discharge capacity of an SPD** (according to the categories from IEC / EN 61643-21) | TYPE 1 | Impulse D1 (10/350), lightning impulse current 0.5 to 2.5 kA/line ⇨ exceeds the discharge capacity of TYPE 2 – TYPE 4 |
| | TYPE 2 | Impulse C2 (8/20), increased impulse load 1 to 5 kA/line ⇨ exceeds the discharge capacity of TYPE 3 – TYPE 4 |
| | TYPE 3 | Impulse C1 (8/20), impulse load 0.25 to 1 kA/line ⇨ exceeds the discharge capacity of TYPE 4 |
| | TYPE 4 | Load < TYPE 3 |
| **Protective effect of an SPD** (limitation below the test levels according to EN 61000-4-5) | P1 | Required test level of the terminal device: 1 or higher |
| | P2 | Required test level of the terminal device: 2 or higher |
| | P3 | Required test level of the terminal device: 3 or higher |
| | P4 | Required test level of the terminal device: 4 or higher |
| **Energy coordination** (with another Yellow/Line SPD) | ⊕ | SPD with decoupling impedance, suitable for coordination with an SPD marked with ↄ. |
| | ↄ | SPD is suitable for coordination with an SPD with decoupling impedance ⊕. |

**Examples of energy-coordinated SPDs according to the Yellow/Line SPD class:**



# Pluggable SPDs – DIN Rail Mounted

| Type | Basic circuit diagram / Symbol | Product | Part No. | Page |
|---|---|---|---|---|
| **BLITZDUCTORconnect – Modular** | | | | |
| **BCO ML2 ...**<br>▪ Combined lightning current and surge arrester with a modular design<br>▪ With push-in connection technology and signal disconnection<br>▪ With vibration-proof secR module locking mechanism<br>▪ Integrated LifeCheck and visual status indication |  |  | **927 2XX** | 311 |
| **BCO ML2 BD EX 24**<br>▪ Surge arrester with a modular design for hazardous areas<br>▪ With push-in connection technology and signal disconnection<br>▪ With vibration-proof secR module locking mechanism<br>▪ Integrated LifeCheck and visual status indication |  |  | **927 284** | 312 |
| **Base Parts BXT BAS / BSP BAS 4** | | | | |
| **BXT BAS**<br>▪ Universal base part for protection modules of the BLITZDUCTOR XT / XTU and BLITZDUCTOR SP series<br>▪ No signal disconnection if the protection module is removed<br>▪ Connection of up to four lines |  |  | **920 300** | 315 |
| **BSP BAS 4**<br>▪ Universal base part for protection modules of the BLITZDUCTOR XT / XTU and BLITZDUCTOR SP series<br>▪ Signal disconnection if the protection module is removed<br>▪ Connection of up to four lines |  |  | **926 304** | 315 |
| **BLITZDUCTOR XT** | | | | |
| **BXT ML ...**<br>▪ Combined lightning current and surge arrester modules<br>▪ With integrated LifeCheck<br>▪ Two-pole and four-pole versions |  |  | **920 XXX** | 316 |
| **BXT M2 BD HC5A 24**<br>▪ Combined lightning current and surge arrester module for protecting 1 pair of unearthed signal circuits<br>▪ Optimal for protecting DC signal circuits up to a nominal current of 5 A<br>▪ For controlling motor-driven actuators with high starting and operating currents |  |  | **920 296** | 319 |
| **BLITZDUCTOR XTU** | | | | |
| **BXTU ML ...**<br>▪ Universal lightning current and surge arrester modules<br>▪ With integrated LifeCheck<br>▪ With integrated actiVsense technology<br>▪ Two-pole and four-pole versions |  |  | **920 349**<br>**920 249** | 320<br>320 |
| **BXT BAS EX**<br>▪ Universal base part for protection modules of the BLITZDUCTOR XT Ex (i) series<br>▪ No signal disconnection if the protection module is removed<br>▪ Connection of up to four lines |  |  | **920 301** | 320 |
| **BXT ML ...**<br>▪ Surge arrester modules for hazardous areas<br>▪ With integrated LifeCheck<br>▪ Two-pole and four-pole versions |  |  | **920 XXX** | 321 |

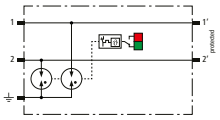
## BLITZDUCTORconnect – Modular

- Combined lightning current and surge arrester with a modular design and integrated visual status indication
- Push-in connection technology and signal disconnection
- With vibration-proof secR module locking mechanism
- Intrinsically safe version for hazardous areas

### BCO ML2 B 180

Space-saving, modular lightning current arrester with a width of 6 mm and push-in connection technology with status indication for protecting two single lines for lightning equipotential bonding as well as indirect earthing of shielded cables. With signal disconnection for maintenance purposes.



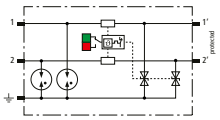


| Type BCO ... | ML2 B 180 |
|---|---|
| **Part No.** | **927 210** |
| SPD class | TYPE 1 |
| Nominal voltage ($U_N$) | 180 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 0 ohm(s) |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL |

### BCO ML2 BE

Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting two single lines sharing a common reference potential as well as unbalanced interfaces. With signal disconnection for maintenance purposes.





| General technical data: | |
|---|---|
| SPD class | TYPE 1P1 |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |

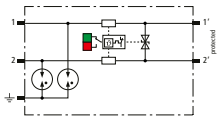
| Type BCO ... | ML2 BE 12 | ML2 BE 24 |
|---|---|---|
| **Part No.** | **927 222** | **927 224** |
| Nominal voltage ($U_N$) | 12 V | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 15 V | 33 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.75 A |
| Series resistance per line | 1 ohm(s) | 1 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 1.4 MHz | 3.4 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL, CSA, ATEX, IECEx, CCC, SIL |

| Type BCO ... | ML2 BE 48 | ML2 BE 180 |
|---|---|---|
| **Part No.** | **927 225** | **927 227** NEW |
| Nominal voltage ($U_N$) | 48 V | 180 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 54 V | 180 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.5 A |
| Series resistance per line | 1 ohm(s) | 1.8 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 5 MHz | 10 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL |

### BCO ML2 BD

Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting one pair of unearthed balanced interfaces. With signal disconnection for maintenance purposes.





| General technical data: | |
|---|---|
| SPD class | TYPE 1P2 |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |

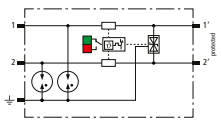
| Type BCO ... | ML2 BD 12 | ML2 BD 24 |
|---|---|---|
| **Part No.** | **927 242** | **927 244** |
| Nominal voltage ($U_N$) | 12 V | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 15 V | 36 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.75 A |
| Series resistance per line | 1 ohm(s) | 1 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 2.6 MHz | 5.8 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL, CSA, ATEX, IECEx, CCC, SIL |

| Type BCO ... | ML2 BD 48 | ML2 BD 180 |
|---|---|---|
| **Part No.** | **927 245** | **927 247** NEW |
| Nominal voltage ($U_N$) | 48 V | 180 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 56 V | 180 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.5 A |
| Series resistance per line | 1 ohm(s) | 1.8 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 3.6 MHz | 10 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL |

### BCO ML2 BE HF

Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting two single lines of high-frequency transmissions sharing a common reference potential as well as unbalanced interfaces. With signal disconnection for maintenance purposes.



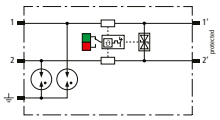


| Type BCO ... | ML2 BE HF 5 | ML2 BE HF 24 |
|---|---|---|
| **Part No.** | **927 270** | **927 274** NEW |
| SPD class | TYPE 1P1 | TYPE 1P1 |
| Nominal voltage ($U_N$) | 5 V | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 8.5 V | 36 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.75 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| Series resistance per line | 1 ohm(s) | 1 ohm(s) |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL |

## BCO ML2 BD HF

Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting one pair of unearthed high-frequency bus systems as well as balanced interfaces. With signal disconnection for maintenance purposes.



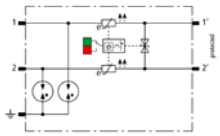


| Type BCO ... | ML2 BD HF 5 | ML2 BD HF 24 |
|---|---|---|
| **Part No.** | **927 271** | **927 275** NEW |
| SPD class | TYPE 1 P2 | TYPE 1 P2 |
| Nominal voltage ($U_N$) | 5 V | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 8.5 V | 36 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.75 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| Series resistance per line | 1 ohm(s) | 1 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 100 MHz | 100 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL |

## BCO ML2 BPD 24

Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting one pair in 24 V DC systems. Also suitable for use with earthed negative pole; integrated PTC resistors allow for secure resetting of the arrester after interference in the system circuit with short-circuit currents of up to 40 A. With signal disconnection for maintenance purposes.



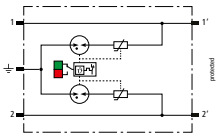


| Type BCO ... | ML2 BPD 24 |
|---|---|
| **Part No.** | **927 214** NEW |
| SPD class | TYPE 1 P2 |
| Nominal voltage ($U_N$) | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V |
| Nominal current at 70 °C ($I_L$) | 0.1 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 10 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 4.5 MHz |
| Approvals | UL |

## BCO ML2 MVG 230

Space-saving, modular surge arrester with a width of 6 mm and push-in connection technology with status indication for protecting 2 lines of stranded unearthed signal interfaces with a nominal voltage of 230 V. With signal disconnection for maintenance purposes.
Meets, amongst other things, the requirements for signalling systems in the railway industry (e.g. DB RIL 819.0808 railway directive).

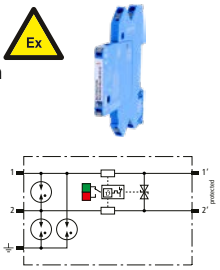




| Type BCO ... | ML2 MVG 230 |
|---|---|
| **Part No.** | **927 290** NEW |
| SPD class | TYPE 2 P3 |
| Nominal voltage ($U_N$) | 230 V |
| Nominal current at 80 °C ($I_L$) | 3 A |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 6 kA |
| Series resistance per line | 0 ohm(s) |
| Approvals | SIL |

## BCO ML2 BD EX 24

Space-saving, modular combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting one pair of intrinsically safe measuring circuits and bus systems, meets FISCO requirements. Insulation strength > 500 V line-ground. With signal disconnection for maintenance purposes.

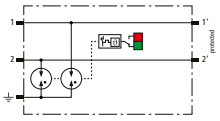


| Type BCO ... | ML2 BD EX 24 |
|---|---|
| **Part No.** | **927 284** |
| SPD class | TYPE 1 P2 |
| Nominal voltage ($U_N$) | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 36 V |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 1 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 3.5 MHz |
| Approvals | ATEX, IECEx, CCC |

## BCO MOD ML2 B

Protection module with a width of 6 mm for BLITZDUCTORconnect lightning current arrester with status inidication for protecting two single lines for lightning equipotential bonding as well as indirect earthing of shielded cables.

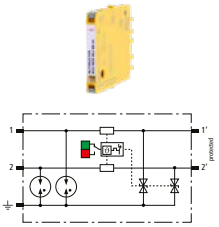




| Type BCO ... | MOD ML2 B 180 |
|---|---|
| **Part No.** | **927 010** |
| SPD class | TYPE 1 |
| Nominal voltage ($U_N$) | 180 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 0 ohm(s) |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL |

## BCO MOD ML2 BE

Protection module with a width of 6 mm for BLITZDUCTORconnect combined arrester with status inidication for protecting two single lines sharing a common reference potential as well as unbalanced interfaces.



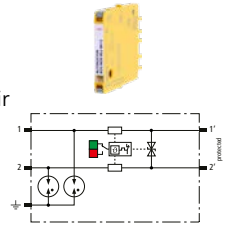
| General technical data: | |
|---|---|
| SPD class | TYPE 1 P1 |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |

| Type BCO ... | MOD ML2 BE 12 | MOD ML2 BE 24 |
|---|---|---|
| Part No. | 927 022 | 927 024 |
| Nominal voltage ($U_N$) | 12 V | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 15 V | 33 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.75 A |
| Series resistance per line | 1 ohm(s) | 1 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 1.4 MHz | 3.4 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL, CSA, ATEX, IECEx, CCC, SIL |

| Type BCO ... | MOD ML2 BE 48 | MOD ML2 BE 180 |
|---|---|---|
| Part No. | 927 025 | 927 027 NEW |
| Nominal voltage ($U_N$) | 48 V | 180 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 54 V | 180 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.5 A |
| Series resistance per line | 1 ohm(s) | 1.8 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 5 MHz | 10 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL, SIL |

## BCO MOD ML2 BD

Protection module with a width of 6 mm for BLITZDUCTORconnect combined arrester with status inidication for protecting one pair of unearthed balanced interfaces.



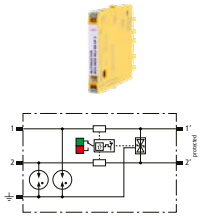
| General technical data: | |
|---|---|
| SPD class | TYPE 1 P2 |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |

| Type BCO ... | MOD ML2 BD 12 | MOD ML2 BD 24 |
|---|---|---|
| Part No. | 927 042 | 927 044 |
| Nominal voltage ($U_N$) | 12 V | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 15 V | 36 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.75 A |
| Series resistance per line | 1 ohm(s) | 1 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 2.6 MHz | 5.8 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL, CSA, ATEX, IECEx, CCC, SIL |

| Type BCO ... | MOD ML2 BD 48 | MOD ML2 BD 180 |
|---|---|---|
| Part No. | 927 045 | 927 047 NEW |
| Nominal voltage ($U_N$) | 48 V | 180 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 56 V | 180 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.5 A |
| Series resistance per line | 1 ohm(s) | 1.8 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 3.6 MHz | 10 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL, SIL |

## BCO MOD ML2 BE HF

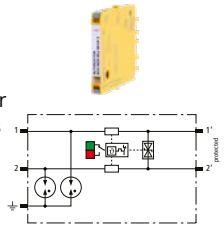
Protection module with a width of 6 mm for BLITZDUCTORconnect combined arrester with status inidication for protecting two single lines of high-frequency transmissions sharing a common reference potential as well as unbalanced interfaces.



| Type BCO ... | MOD ML2 BE HF 5 | MOD ML2 BE HF 24 |
|---|---|---|
| Part No. | 927 070 | 927 074 NEW |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Nominal voltage ($U_N$) | 5 V | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 8.5 V | 36 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.75 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| Series resistance per line | 1 ohm(s) | 1 ohm(s) |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL, SIL |

## BCO MOD ML2 BD HF

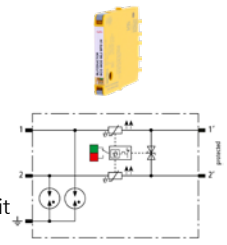
Protection module with a width of 6 mm for BLITZDUCTORconnect combined arrester with status inidication for protecting one pair of unearthed high-frequency bus systems as well as balanced interfaces.



| Type BCO ... | MOD ML2 BD HF 5 | MOD ML2 BD HF 24 |
|---|---|---|
| Part No. | 927 071 | 927 075 NEW |
| SPD class | TYPE 1 P2 | TYPE 1 P2 |
| Nominal voltage ($U_N$) | 5 V | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 8.5 V | 36 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A | 0.75 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| Series resistance per line | 1 ohm(s) | 1 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 100 MHz | 100 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL | UL, SIL |

## BCO MOD ML2 BPD

Combined arrester protection module with a width of 6 mm for BLITZDUCTORconnect with status indication for protecting one pair in 24 V DC systems. Also suitable for use with an earthed negative pole. Integrated PTC resistors allow for secure resetting of the arrester after interference in the system circuit with short-circuit currents of up to 40 A.

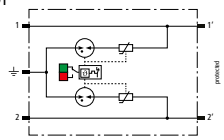


| Type BCO ... | MOD ML2 BPD 24 |
|---|---|
| Part No. | 927 014 NEW |
| SPD class | TYPE 1 P2 |
| Nominal voltage ($U_N$) | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V |
| Nominal current at 70 °C ($I_L$) | 0.1 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 10 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 4.5 MHz |
| Approvals | UL, SIL |

## BCO MOD ML2 MVG 230



Surge arrester protection module with a width of 6 mm for BLITZDUCTORconnect with status indication for protecting 2 lines of stranded unearthed signal interfaces with a nominal voltage of 230 V.
Meets, amongst other things, the requirements for signalling systems in the railway industry (e.g. DB RIL 819.0808 railway directive).

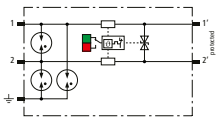


| Type BCO ... | MOD ML2 MVG 230 |
|---|---|
| **Part No.** | **927 090** NEW |
| SPD class | TYPE 2 P3 |
| Nominal voltage ($U_N$) | 230 V |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 6 kA |
| Series resistance per line | 0 ohm(s) |
| Approvals | SIL |

## BCO MOD ML2 BD EX 24



Protection module with a width of 6 mm for BLITZDUCTORconnect combined arresters with status indication for protecting one pair of intrinsically safe measuring circuits and bus systems, meets FISCO requirements. Insulation strength > 500 V line-ground.



| Type BCO ... | MOD ML2 BD EX 24 |
|---|---|
| **Part No.** | **927 084** |
| SPD class | TYPE 1 P2 |
| Nominal voltage ($U_N$) | 24 V |
| Max. continuous operating voltage (d.c.) ($U_C$) | 36 V |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 1 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 3.5 MHz |
| Approvals | ATEX, IECEx, CCC, SIL |

## Accessories for BLITZDUCTORconnect – Modular

### Earthing Module



Space-saving earthing module with base part in a width of 6 mm and push-in connection technology for defined equipotential bonding of all wires connected to the base part. For direct earthing of 2 cable cores that are not being used actively. With signal disconnection for maintenance purposes.

| Type | BCO M2 E |
|---|---|
| **Part No.** | **927 318** NEW |
| D1 total lightning impulse current (10/350 µs) ($I_{imp}$) | 3 kA |
| Operating temperature range ($T_U$) | -40°C to +80°C |
| Degree of protection (plugged in) | IP 20 |

### PARTITION EXI



Special installation conditions have to be taken into account when using the BLITZDUCTORconnect surge protective devices in intrinsically safe electric circuits. According to EN 60079-11; 2007 (VDE 0170-7), a minimum clearance must be maintained between intrinsically safe and non-intrinsically safe signal circuits (connecting parts, e.g. connection clamps) of ≥ 50 mm! When using the Ex i partition of type PARTITION EXI, this clearance is also maintained if the surge protective devices are arranged directly next to one other. Ideally suited for use in conjunction with DRC IRCM for condition monitoring of BCO modules.
(1 pack = 2 pieces)

| Type | PARTITION EXI |
|---|---|
| **Part No.** | **910 797** |
| Colour | blue |
| For mounting on | 35 mm DIN rails acc. to EN 60715 |

### DRC IRCM



Condition monitoring unit DEHNrecord, set for DIN rail mounted devices with integrated visual transmitter/receiver and visual reverse unit for monitoring the condition of BCO/DPA arresters with LifeCheck. Visual arrester status indication via LED group display in combination with remote signalling contact (break contact).

| Type | DRC IRCM |
|---|---|
| **Part No.** | **910 710** |
| Input voltage range (d.c.) ($U_{IN}$) | 6-35 V DC |
| Max. rated current consumption ($I_{IN}$) | ≤ 10 mA |
| Operating temperature range ($T_U$) | -30 °C ... +70 °C |
| Approvals | UL |

## Accessories for BLITZDUCTORconnect – Modular

### DIN Rail Mounted Power Supply Unit



Robust power supply in the DIN-rail-mounted enclosure with single-phase, wide-range input for operation in a wide variety of supply systems. The operating state indication on the front side signals the availability of the output voltage. Supply of stationary condition-monitoring devices from the DEHNrecord product range (DRC SCM XT / DRC MCM XT / DRC IRCM / DRC SD 2 1).

| Type | PSU DC24 30W |
|---|---|
| **Part No.** | **910 499** |
| Input voltage range | AC 85-264 V;<br>DC 120-373 V |
| Frequency | 44-66 Hz; 0 Hz |
| Input current ($I_e$) | 0.7 A at AC 110 V /<br>0.5 A at AC 230 V |
| Output nominal voltage ($U_a$) | DC 24 V (SELV) |
| Output current ($I_a$) | 1.3 A at DC 24 V, max.<br>0.9 A at any installation position |
| Recommended backup fuse | circuit breaker 10 A,<br>16 A, characteristic B, C |
| Standards / regulations | EN 60950, EN 61204-3,<br>UL 60950, UL 508, GL |

## BLITZDUCTORconnect base part

Two-pole arrester base for installation on printed circuit boards by means of soldering process for BLITZDUCTORconnect modules. With integrated remote signalling contact (floating changeover contact) for the condition monitoring of the protection modules.

### BCO BAS PCB FM



Two-pole arrester base for installation on printed circuit boards by means of soldering process for BLITZDUCTORconnect modules. With integrated remote signalling contact (floating changeover contact) for the condition monitoring of the protection modules.

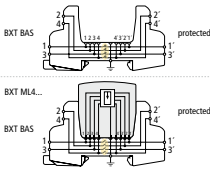
| Type | BCO BAS PCB FM |
|---|---|
| **Part No.** | **927 305** NEW |
| Associated protection module | BCO MOD ... |
| Installation on | Directly soldered onto the printed circuit board |
| Degree of protection | IP 20 (with plug-in protection module) |
| Remote signalling contacts / type of contact | Changeover contact |

## BLITZDUCTOR – Base Parts

- Universal base parts for protection modules of the BLITZDUCTOR XT/XTU/SP series
- Two base parts with or without signal disconnection if the protection module is removed
- Connection of up to four lines

### BXT BAS





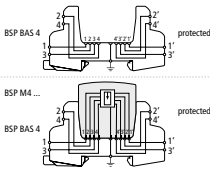

The BLITZDUCTOR XT base part is an extremely space-saving and universal four-pole **feed-through terminal** for the insertion of a protection module **without** signal disconnection if the protection module is removed. The snap-in mechanism at the supporting foot of the base part allows the protection module to be safely earthed via the DIN rail. Since no components of the protective circuit are situated in the base part, maintenance is only required for the protection modules.

| Type | BXT BAS |
|---|---|
| **Part No.** | **920 300** |
| For mounting on | 35 mm DIN rails acc. to EN 60715 |
| Cross-sectional area, solid | 0.08-4 mm² |
| Cross-sectional area, flexible | 0.08-2.5 mm² |
| Tightening torque (terminals) | 0.4 Nm |
| Earthing via | 35 mm DIN rails acc. to EN 60715 |
| Approvals | CSA, UL, ATEX, IECEx *) |

*) only in connection with an approved protection module

### BSP BAS 4






The BLITZDUCTOR SP base part is an extremely space-saving and universal four-pole **terminal** for the insertion of a protection module **with** signal disconnection if the protection module is removed. The snap-in mechanism at the supporting foot of the base part allows the protection module to be safely earthed via the DIN rail. Since no components of the protective circuit are situated in the base part, maintenance operation is only required for the protection modules.

| Type | BSP BAS 4 |
|---|---|
| **Part No.** | **926 304** |
| For mounting on | 35 mm DIN rails acc. to EN 60715 |
| Cross-sectional area, solid | 0.08-4 mm² |
| Cross-sectional area, flexible | 0.08-2.5 mm² |
| Tightening torque (terminals) | 0.4 Nm |
| Earthing via | 35 mm DIN rails acc. to EN 60715 |
| Approvals | UL, CSA |

*) only in connection with an approved protection module

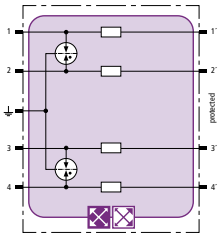
## BLITZDUCTOR XT – Protection Modules

- Combined lightning current and surge arrester modules
- With integrated RFID LifeCheck
- Two-pole and four-pole versions available

### BXT ML4 B 180

Space-savings four-pole lightning current arrester module with RFID LifeCheck feature for almost all applications. For use in connection with downstream TYPE 2 P1 surge arresters or combined lightning current and surge arresters with a lower or equal voltage level. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



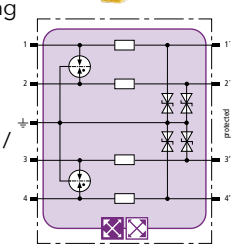


| Type BXT … | ML4 B 180 |
|---|---|
| Part No. | 920 310 |
| SPD class | TYPE 1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current at 45 °C ($I_L$) | 1.2 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 0.4 ohm(s) |
| Approvals | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL |

### BXT ML4 BE 5 – BE 180

Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting four single lines sharing a common reference potential as well as unbalanced interfaces. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.





| General technical data: | |
|---|---|
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |

| Type BXT … | ML4 BE 5 | ML4 BE 12 |
|---|---|---|
| Part No. | 920 320 | 920 322 |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6 V | 15 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A | 0.75 A |
| Series resistance per line | 1.0 ohm(s) | 1.8 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 1.0 MHz | 2.7 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

| Type BXT … | ML4 BE 24 | ML4 BE 36 |
|---|---|---|
| Part No. | 920 324 | 920 336 |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V | 45 V |
| Nominal current at 45 °C ($I_L$) | 0.75 A | 1.8 A |
| Series resistance per line | 1.8 ohm(s) | 0.43 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 6.8 MHz | 3.8 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

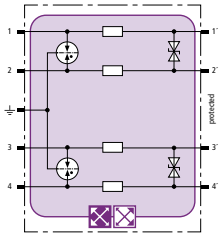
| Type BXT … | ML4 BE 48 | ML4 BE 60 |
|---|---|---|
| Part No. | 920 325 | 920 326 |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 54 V | 70 V |
| Nominal current at 45 °C ($I_L$) | 0.75 A | 1.0 A |
| Series resistance per line | 1.8 ohm(s) | 1.0 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 8.7 MHz | 9.0 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

| Type BXT … | ML4 BE 180 |
|---|---|
| Part No. | 920 327 |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A |
| Series resistance per line | 1.0 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 25.0 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

### BXT ML4 BD 5 – BD 180

Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting two pairs of unearthed balanced interfaces. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.





| General technical data: | |
|---|---|
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |

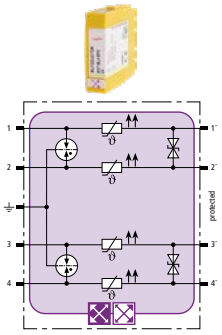
| Type BXT … | ML4 BD 5 | ML4 BD 12 |
|---|---|---|
| Part No. | 920 340 | 920 342 |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.0 V | 15 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A | 1.0 A |
| Series resistance per line | 1.0 ohm(s) | 1.0 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 1.0 MHz | 2.8 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

| Type BXT … | ML4 BD 24 | ML4 BD 48 |
|---|---|---|
| Part No. | 920 344 | 920 345 |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V | 54 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A | 1.0 A |
| Series resistance per line | 1.0 ohm(s) | 1.0 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 7.8 MHz | 8.7 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

| Type BXT … | ML4 BD 60 | ML4 BD 180 |
|---|---|---|
| Part No. | 920 346 | 920 347 |
| SPD class | TYPE 1 P1 | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 70 V | 180 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A | 0.75 A |
| Series resistance per line | 1.0 ohm(s) | 1.8 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 11.0 MHz | 25.0 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML4 BPD 24

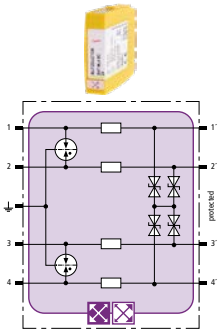
Space-saving combined arrester module with RFID LifeCheck for protecting two pairs in 24 V d.c. systems. Can also be used for systems with earthed negative poles. Integrated PTC resistors allow to reliably reset the arrester after the system circuit has been affected by short-circuit currents up to 40 A.



| Type BXT ... | ML4 BPD 24 |
|---|---|
| Part No. | 920 314 |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V |
| Nominal current at 70 °C ($I_L$) | 0.1 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | typ. 10 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 4 MHz |
| Approvals | SIL |

## BXT ML4 BC 5 / 24

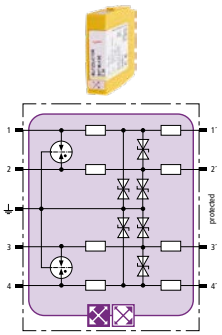
Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting up to four unearthed single lines sharing a common reference potential. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML4 BC 5 | ML4 BC 24 |
|---|---|---|
| Part No. | 920 350 | 920 354 |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.0 V | 33 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A | 0.75 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Series resistance per line | 1.0 ohm(s) | 1.8 ohm(s) |
| Approvals | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML4 BE C 12 / 24

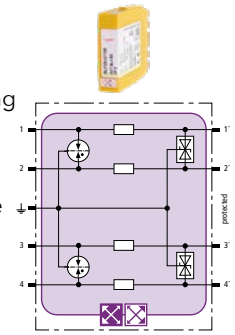
Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting two pairs of balanced interfaces with diode protective circuit at the input, current loops (TTY) and optocoupler inputs. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML4 BE C 12 | ML4 BE C 24 |
|---|---|---|
| Part No. | 920 362 | 920 364 |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 15 V | 33 V |
| Nominal current at 80 °C ($I_L$) | 0.1 A | 0.1 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Series resistance per line | 13.8 ohm(s) | 28.8 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 0.85 MHz | 1.7 MHz |
| Approvals | ATEX, IECEx, CSA & USA Hazloc, SIL | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML4 BE HF 5

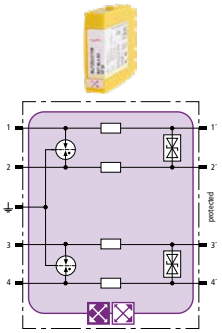
Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting four single lines sharing a common reference potential as well as high-frequency transmissions without galvanic isolation. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML4 BE HF 5 |
|---|---|
| Part No. | 920 370 |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.0 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 1.0 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 100.0 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

## BXT ML4 BD HF 5 / 24

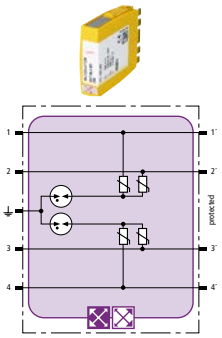
Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting two pairs of unearthed high-frequency bus systems or two-wire video transmission systems. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML4 BD HF 5 | ML4 BD HF 24 |
|---|---|---|
| Part No. | 920 371 | 920 375 |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.0 V | 33 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A | 1.0 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Series resistance per line | 1.0 ohm(s) | 1.0 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 100.0 MHz | 100.0 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML4 MY 110 / 250

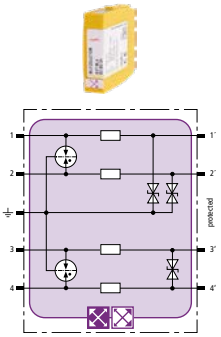
Space-saving surge arrester module with RFID LifeCheck for protecting four lines of stranded signal interfaces. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML4 MY 110 | ML4 MY 250 |
|---|---|---|
| Part No. | 920 388 | 920 389 |
| SPD class | TYPE 2 P2 | TYPE 2 P3 |
| Max. continuous operating voltage (d.c.) line-line ($U_C$) | 170 V | 620 V |
| Max. continuous operating voltage (d.c.) line-PG ($U_C$) | 85 V | 320 V |
| Nominal current at 80 °C ($I_L$) | 3.0 A | 3.0 A |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| Cut-off frequency line-line ($f_G$) | 4.5 MHz | 20.0 MHz |
| Approvals | SIL | SIL |

## BXT ML4 BE BD 24

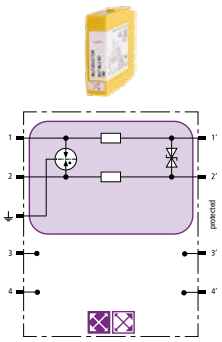
Space-saving surge arrester module with RFID LifeCheck for protecting two single lines with common reference potential as well as unbalanced interfaces and one pair of unearthed balanced interfaces. LifeCheck detects thermal or electrical overload after which the arrester has to be replaced. The status is indicated contactlessly by DEHNrecord LC / MCM.



| Type BXT … | ML4 BE BD 24 |
|---|---|
| Part No. | 920 334 |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V |
| Nominal current at 45 °C ($I_L$) | 0.75 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |

## BXT ML2 BD 180

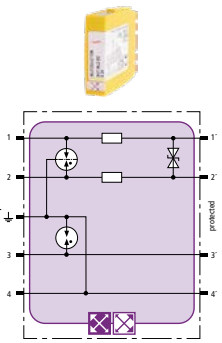
Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting one pair of unearthed balanced interfaces. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT … | ML2 BD 180 |
|---|---|
| Part No. | 920 247 |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current at 45 °C ($I_L$) | 0.75 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 1.8 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 25.0 MHz |
| Approvals | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML2 BD S 5 – BD S 48

Space-saving combined arrester module with RFID LifeCheck for protecting 1 pair of unearthed symmetrical interfaces, either direct or indirect shield earthing If LifeCheck detects thermal and electrical overloads after which the arrester has to be replaced. This status is indicated contactlessly by DEHNrecord LC / SCM / MCM.



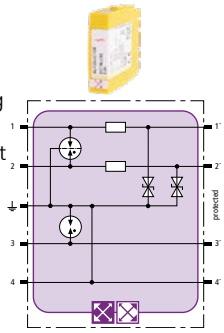
| General technical data: | |
|---|---|
| SPD class | TYPE 1 P1 |
| Nominal current at 45 °C ($I_L$) | 1.0 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 9 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 1.0 ohm(s) |

| Type BXT … | ML2 BD S 5 | ML2 BD S 12 |
|---|---|---|
| Part No. | 920 240 | 920 242 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.0 V | 15 V |
| Cut-off frequency line-line ($f_G$) | 1.0 MHz | 2.8 MHz |
| Approvals | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL |

| Type BXT … | ML2 BD S 24 | ML2 BD S 48 |
|---|---|---|
| Part No. | 920 244 | 920 245 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V | 54 V |
| Cut-off frequency line-line ($f_G$) | 7.8 MHz | 8.7 MHz |
| Approvals | CSA, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML2 BE S 5 – BE S 48

Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting two single lines sharing a common reference potential as well as unbalanced interfaces, with direct or indirect shield earthing. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| General technical data: | |
|---|---|
| SPD class | TYPE 1 P1 |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 9 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |

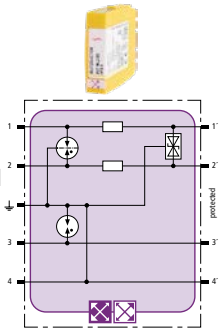
| Type BXT … | ML2 BE S 5 | ML2 BE S 12 |
|---|---|---|
| Part No. | 920 220 | 920 222 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.0 V | 15 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A | 0.75 A |
| Series resistance per line | 1.0 ohm(s) | 1.8 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 1.0 MHz | 2.7 MHz |
| Approvals | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL | CSA, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

| Type BXT … | ML2 BE S 24 | ML2 BE S 36 |
|---|---|---|
| Part No. | 920 224 | 920 226 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V | 45 V |
| Nominal current at 45 °C ($I_L$) | 0.75 A | 1.8 A |
| Series resistance per line | 1.8 ohm(s) | 0.43 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 6.8 MHz | 3.8 MHz |
| Approvals | CSA, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | UL 497B, SIL |

| Type BXT … | ML2 BE S 48 |
|---|---|
| Part No. | 920 225 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 54 V |
| Nominal current at 45 °C ($I_L$) | 0.75 A |
| Series resistance per line | 1.8 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 8.7 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML2 BE HFS 5

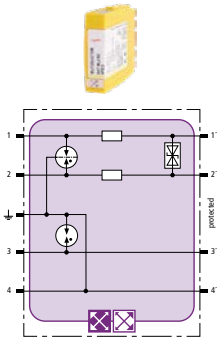
Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting one pair of high-frequency transmissions without galvanic isolation, with direct or indirect shield earthing. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT … | ML2 BE HFS 5 |
|---|---|
| Part No. | 920 270 |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.0 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 9 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 1.0 ohm(s) |
| Cut-off frequency line-PG ($f_G$) | 100.0 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

## BXT ML2 BD HFS 5

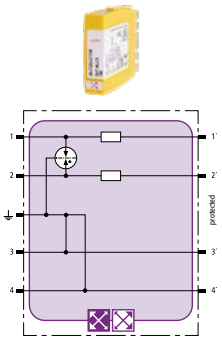
Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting one pair of unearthed high-frequency bus systems or video transmission systems, with direct or indirect shield earthing. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML2 BD HFS 5 |
|---|---|
| Part No. | 920 271 |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.0 V |
| Nominal current at 45 °C ($I_L$) | 1.0 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 9 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 1.0 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 100.0 MHz |
| Approvals | CSA, UL 497B, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

## BXT ML2 B 180

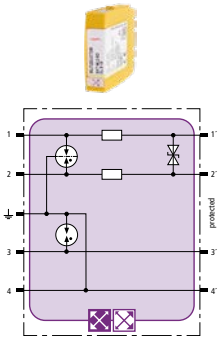
Space-saving two-pole lightning current arrester module with RFID LifeCheck and shield earthing for almost all applications. For use in conjunction with downstream TYPE 2 P1 surge arresters or combined lightning current and surge arresters with a lower or equal voltage level. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML2 B 180 |
|---|---|
| Part No. | 920 211 |
| SPD class | TYPE 1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current at 45 °C ($I_L$) | 1.2 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 0.4 ohm(s) |
| Approvals | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML2 BD DL S 15

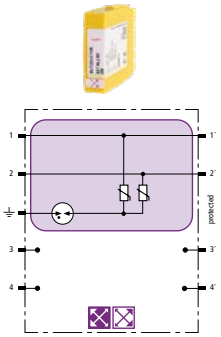
Space-saving combined lightning current and surge arrester module with RFID LifeCheck for protecting one pair of unearthed balanced interfaces, which specifically fulfils the requirements of Dupline buses, direct or indirect shield earthing. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML2 BD DL S 15 |
|---|---|
| Part No. | 920 243 |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 17 V |
| Nominal current at 70 °C ($I_L$) | 0.4 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 9 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 2.2 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 2.7 MHz |
| Approvals | ATEX, IECEx, CSA & USA Hazloc, SIL |

## BXT ML2 MY 250

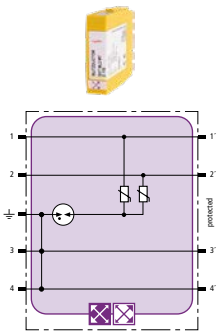
Space-saving surge arrester module with RFID LifeCheck for protecting two lines of stranded signal interfaces up to 250 V a.c. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML2 MY 250 |
|---|---|
| Part No. | 920 289 |
| SPD class | TYPE 2 P3 |
| Max. continuous operating voltage (d.c.) line-line ($U_C$) | 620 V |
| Max. continuous operating voltage (d.c.) line-PG ($U_C$) | 320 V |
| Nominal current at 80 °C ($I_L$) | 3.0 A |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Cut-off frequency line-line ($f_G$) | 20.0 MHz |
| Approvals | SIL |

## BXT ML2 MY E 110

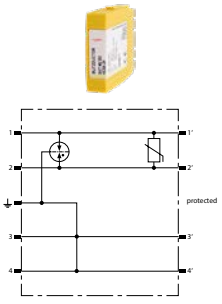
Space-saving surge arrester module with RFID LifeCheck for protecting two pairs of stranded signal interfaces. If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by the DEHNrecord LC / SCM / MCM reader.



| Type BXT ... | ML2 MY E 110 |
|---|---|
| Part No. | 920 288 |
| SPD class | TYPE 2 P2 |
| Max. continuous operating voltage (d.c.) line-line ($U_C$) | 170 V |
| Max. continuous operating voltage (d.c.) line-PG ($U_C$) | 85 V |
| Nominal current at 80 °C ($I_L$) | 3.0 A |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Series resistance per line | 0 ohm(s) |
| Cut-off frequency line-line ($f_G$) | 4.5 MHz |
| Approvals | SIL |

## BXT M2 BD HC5A 24

Space-saving combined arrester module for protecting one pair of unearthed balanced interfaces. Module is adapted to interfaces with direct currents up to 5 A, e.g. for the controller of motor-driven actuators with high starting and operating currents.



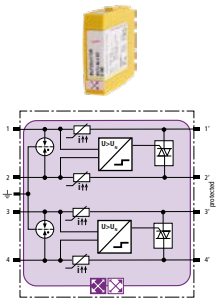
| Type BXT ... | M2 BD HC5A 24 |
|---|---|
| Part No. | 920 296 |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 36 V |
| Nominal current ($I_L$) | 5 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 0 ohm(s) |
| Approvals | SIL |

## BLITZDUCTOR XTU – Protection modules with RFID LifeCheck

- Universal lightning current and surge arrester modules
- With integrated RFID LifeCheck
- With integrated actiVsense technology
- Two-pole and four-pole versions available

### BXTU ML4 BD 0-180

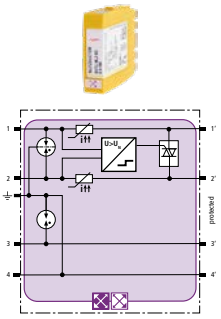
Space-saving combined lightning current and surge arrester module with actiVsense technology and RFID LifeCheck for protecting two pairs (same or different operating voltage) of balanced interfaces with galvanic isolation. Automatically detects the operating voltage of the useful signal and optimally adapts the voltage protection level to it.



| Type BXTU ... | ML4 BD 0-180 |
|---|---|
| **Part No.** | **920 349** |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Permissible superimposed signal voltage ($U_{signal}$) | ≤ +/- 5 V |
| Cut-off frequency line-line ($U_{signal}$, balanced 100 ohms) ($f_G$) | 50 MHz |
| Nominal current at 80 °C (equal to max. short-circuit current) ($I_L$) | 100 mA |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | ≤ 10 ohms; typically 7.5 ohms |
| Approvals | CSA, UL, SIL |

### BXTU ML2 BD S 0-180

Space-saving combined lightning current and surge arrester module with actiVsense technology and RFID LifeCheck for protecting one pair, direct or indirect shield earthing. Automatically detects the operating voltage of the useful signal and optimally adapts the voltage protection level to it.



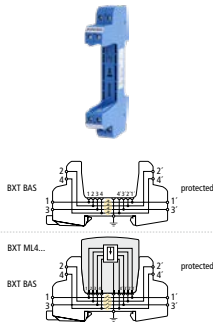
| Type BXTU ... | ML2 BD S 0-180 |
|---|---|
| **Part No.** | **920 249** |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Permissible superimposed signal voltage ($U_{signal}$) | ≤ +/- 5 V |
| Cut-off frequency line-line ($U_{signal}$, balanced 100 ohms) ($f_G$) | 50 MHz |
| Nominal current at 80 °C (equal to max. short-circuit current) ($I_L$) | 100 mA |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 9 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | ≤ 10 ohms; typically 7.5 ohms |
| Approvals | CSA, UL, SIL |

## BLITZDUCTOR XT Ex (i) – Base Part

- Universal base part for protection modules of the BLITZDUCTOR XT Ex (i) series
- No signal disconnection if the protection module is removed
- Connection of up to four lines

### BXT BAS EX

BLITZDUCTOR XT base part for use as an extremely space-saving and universal four-pole feed-through terminal for intrinsically safe circuits for the insertion of the protection module, no signal disconnection if the protection module is removed. The snap-in mechanism at the supporting foot of the base part allows the device to be safely earthed via the DIN rail. Since no components of the protective circuit are situated in the base part, only the protection modules need to be serviced.




| Type | BXT BAS EX |
|---|---|
| **Part No.** | **920 301** |
| For mounting on | 35 mm DINs rails acc. to EN 60715 |
| Cross-sectional area, solid | 0.08-4 mm² |
| Cross-sectional area, flexible | 0.08-2.5 mm² |
| Tightening torque (terminals) | 0.4 Nm |
| Earthing via | 35 mm DIN rails acc. to EN 60715 |
| Approvals | UL 497B, CSA, ATEX, IECEx, CCC, Inmetro *) |

*) only in connection with an approved protection module

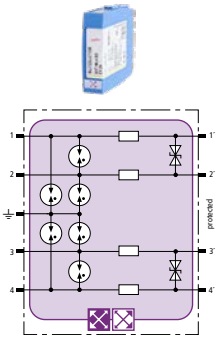
## BLITZDUCTOR XT Ex (i) – Protection Modules

- Surge arrester for use in hazardous areas
- Versions with and without integrated LifeCheck
- Two-pole and four-pole versions available




### BXT ML4 BD EX 24

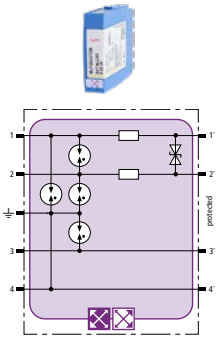
Space-saving surge arrester module with RFID LifeCheck for protecting two pairs in intrinsically safe measuring circuits and bus systems, meets FISCO requirements. ATEX. Insulation strength > 500 V line-earth.
If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by DEHNrecord LC / SCM / MCM.



| Type BXT ... | ML4 BD EX 24 |
|---|---|
| **Part No.** | **920 381** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 33 V |
| Max. input current acc. to EN 60079-11 ($I_i$) | 0.5 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 4 kA |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Cut-off frequency line-line ($f_G$) | 7.7 MHz |
| Approvals *) | CSA, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL, Inmetro, UKCA |

### BXT ML2 BD S EX 24

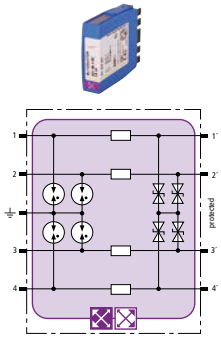
Space-saving surge arrester module with RFID LifeCheck for protecting one pair in intrinsically safe measuring circuits and bus systems, direct or indirect shield earthing. Insulation strength > 500 V line-earth.
If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by DEHNrecord LC / SCM / MCM.



| Type BXT ... | ML2 BD S EX 24 |
|---|---|
| **Part No.** | **920 280** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 33 V |
| Max. input current acc. to EN 60079-11 ($I_i$) | 0.5 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 4 kA |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency line-line ($f_G$) | 6 MHz |
| Approvals *) | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL, Inmetro, UKCA |

### BXT ML4 BC EX 24

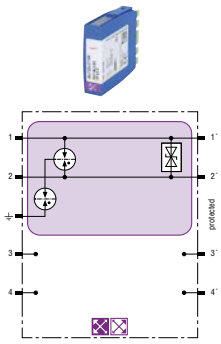
Space-saving surge arrester module with RFID LifeCheck for protecting up to four unearthed single lines sharing a common reference potential in intrinsically safe measuring circuits, meets FISCO requirements. ATEX. Insulation strength > 500 V line-earth.
If LifeCheck detects thermal or electrical overload, the arrester has to be replaced. This status is indicated contactlessly by DEHNrecord LC / SCM / MCM.



| Type BXT ... | ML4 BC EX 24 |
|---|---|
| **Part No.** | **920 384** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 33 V |
| Max. input current acc. to EN 60079-11 ($I_i$) | 0.5 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 4 kA |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Cut-off frequency line-line ($f_G$) | 6.4 MHz |
| Approvals *) | CSA, ATEX, IECEx, CCC, CSA & USA Hazloc, SIL, Inmetro, UKCA |

### BXT ML2 BD HF EX 6

Space-saving surge arrester module with RFID LifeCheck for protecting one pair in intrinsically safe measuring circuits and RS485 bus systems. Insulation strength > 500 V line-earth.
If LifeCheck detects thermal and electrical overload, the arrester has to be replaced. This status is indicated contactlessly by DEHNrecord LC / SCM / MCM.



| Type BXT ... | ML2 BD HF EX 6 |
|---|---|
| **Part No.** | **920 538** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 6 V |
| Max. input current acc. to EN 60079-11 ($I_i$) | 4.8 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency line-line ($f_G$) | 100 MHz |
| Approvals *) | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL, Inmetro, UKCA |

## ITAK Ex (i)

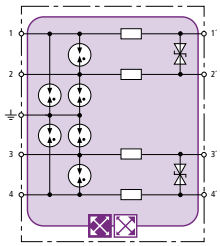
Prewired surge arrester unit mounted in the connection box for protecting intrinsically safe measuring circuits.




### ITAK EXI BXT

Prewired BXT ML4 BD EX 24 and BXT BAS EX surge arrester unit completely mounted in a junction box for intrinsically safe measuring circuits, meets FISCO requirements.





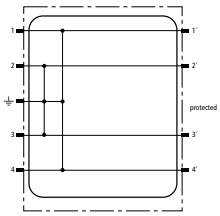
| Type | ITAK EXI BXT 24 |
|---|---|
| **Part No.** | **989 408** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 33 V |
| Max. input current acc. EN 60079-11 ($I_i$) | 0.5 A |
| Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Cut-off frequency line-line ($f_G$) | 7.7 MHz |
| Degree of protection | IP 65 |
| Approvals for installed BXT | CSA, ATEX, IECEx, CSA & USA Hazloc, SIL |

## Accessories for XT / XTU / XT Ex (i)

### Earthing Module

The plugged-in earthing module connects all lines connected to the BLITZDUCTOR SP / XT / XTU base part to the equipotential bonding. It directly earths unused cable cores that are already connected to the base part.

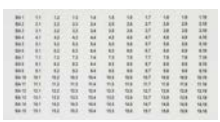





| Type | BXT M4 E |
|---|---|
| **Part No.** | **920 308** |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| Plugs into | base part |

### Labelling System BA1-BA15

2x 165 adhesive labels for labelling DRC MCM XT monitoring devices with the bus address (BA1 to BA15) and BXT modules with consecutive numbers (1.1-1.10 to 15.1-15.10).

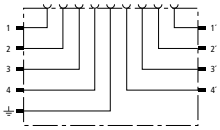


| Type | BS BA1 BA15 BXT |
|---|---|
| **Part No.** | **920 398** |
| Dimensions (W x H) | 13 x 7 mm |

### Test / Disconnection Module

The plugged-in test / disconnection module interrupts the cable run of the lines connected to the BLITZDUCTOR SP / XT / XTU base part and leads them to a test socket at the front of the module. This allows to carry out measurements in the installation without removing the lines from the base part.





| Type | BXT M4 T |
|---|---|
| **Part No.** | **920 309** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current at 80 °C ($I_L$) | 1.0 A |
| Volume resistance | 0.1 ohms |
| Plugs into | base part |
| Test sockets | gold-plated, 1 mm |
| Accessories | 2 measuring lines (1 m), protective bag |

### EMC Spring Terminals

Two spring terminals for the protected and unprotected side of a BLITZDUCTOR SP / XT / XTU arrester for permanent low-impedance shield contact with a shielded signal line. Insulating cap for indirect shield earthing (BXT only), cable ties and insulating strips included. Can be used for the types BXT(U) ML2 ...S ... / BSP M2 ... (only direct shield earthing).



| Type | SAK BXT LR |
|---|---|
| **Part No.** | **920 395** |
| D1 Lightning impulse current (10/350 µs) | 5 kA |
| Plugs into | terminal BXT BAS / BSP BAS 4 |
| Accessories | insulating caps, cable ties, insulating strips |

### Partition

Special installation instructions have to be observed when using BLITZDUCTOR XT Ex (i) surge protective devices in intrinsically safe circuits.
In accordance with EN 60079-11; 2007 (VDE 0170-7), a minimum distance (clearance) of ≥ 50 mm must be maintained between intrinsically and non-intrinsically safe circuits (connecting parts, e.g. terminals)!
When using the Ex i partition of type TW DRC MCM EX, this clearance is also maintained if the surge protective devices are arranged directly next to one other.
Ideally suited for use in conjunction with the DRC MCM XT for the condition monitoring of BXT modules. (1 pack = 2 pieces)



| Type | TW DRC MCM EX |
|---|---|
| **Part No.** | **910 697** |
| For mounting on | 35 mm DIN rails according to EN 60715 |

## Accessories for BLITZDUCTOR SP / XT / XTU

### DRC MCM XT

DIN rail mounted device with integrated RFID LifeCheck sensor for condition monitoring of max. 10 BXT / BXTU arresters with RFID LifeCheck. An RS485 interface allows to interconnect up to 15 DRC MCM XT.



| Type | DRC MCM XT |
|---|---|
| **Part No.** | **910 695** |
| Colour | grey |

### DRC SCM XT

DIN rail mounted device with integrated RFID LifeCheck sensor for condition monitoring of max. 10 BXT / BXTU arresters with RFID LifeCheck.



| Type | DRC SCM XT |
|---|---|
| **Part No.** | **910 696** |
| Colour | grey |

### DRC LC M3+

Portable device with RFID LifeCheck sensor for flexible use. Fast and easy testing of arresters with RFID LifeCheck. Documentation via PC database.



| Type | DRC LC M3+ |
|---|---|
| **Part No.** | **910 653** |
| Dimensions of storage case | 340 x 275 x 83 mm |

### DRC LC M1+

Portable device with RFID LifeCheck sensor for flexible use. Fast and easy testing of arresters with RFID LifeCheck.



| Type | DRC LC M1+ |
|---|---|
| **Part No.** | **910 655** |
| Dimensions of storage case | 275 x 230 x 83 mm |

### RFID LifeCheck Sensor for DRC BXT

Snap-on RFID LifeCheck sensor and test module for use as spare part / extension for portable RFID LifeCheck test devices.



| Type | LCS DRC BXT |
|---|---|
| **Part No.** | **910 652** |
| For testing | BLITZDUCTOR XT ML |

### DIN Rail Mounted Power Supply Unit

Robust power supply in the DIN-rail-mounted enclosure with single-phase, wide-range input for operation in a wide variety of supply systems. The operating state indication on the front side signals the availability of the output voltage. Supply of stationary condition-monitoring devices from the DEHNrecord product range (DRC SCM XT / DRC MCM XT / DRC IRCM / DRC SD 2 1).



| Type | PSU DC24 30W |
|---|---|
| **Part No.** | **910 499** |
| Input voltage range | AC 85-264 V;<br>DC 120-373 V |
| Frequency | 44-66 Hz; 0 Hz |
| Input current ($I_e$) | 0.7 A at AC 110 V /<br>0.5 A at AC 230 V |
| Output nominal voltage ($U_a$) | DC 24 V (SELV) |
| Output current ($I_a$) | 1.3 A at DC 24 V, max.<br>0.9 A at any installation position |
| Recommended backup fuse | circuit breaker 10 A,<br>16 A, characteristic B, C |
| Standards / regulations | EN 60950, EN 61204-3,<br>UL 60950, UL 508, GL |

### USB Interface Converter of Type USB NANO 485

USB NANO 485 converts between USB and RS485 signals and is specifically designed for two-wire RS485 buses. LEDs indicate the operating state (yellow), Rx (green) and Tx (red). Due to its compact dimensions, USB NANO 485 is ideally suited for use with notebooks, however, stationary use is also possible.



| Type | USB NANO 485 |
|---|---|
| **Part No.** | **910 486** |
| Version | with LED indication |

# Compact SPDs – DIN Rail Mounted



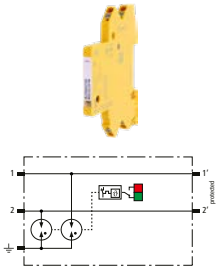
| Type | Basic circuit diagram / Symbol | Product | Part No. | Page |
|---|---|---|---|---|
| **BLITZDUCTORconnect – Compact** | | | | |
| **BCO CL2 ...**<br>▪ Combined lightning current and surge arrester in a compact enclosure<br>▪ With push-in connection technology<br>▪ Integrated LifeCheck and visual status indication | TYPE 1 P1 |  | **927 9XX** | 325 |
| **BCO CL2 BD EX 24**<br>▪ Surge arrester in a compact enclosure for hazardous areas<br>▪ With push-in connection technology<br>▪ Integrated LifeCheck and visual status indication | TYPE 1 P2 Ex |  | **927 984** | 326 |
| **DEHNvario** | | | | |
| **DVR 2 BY S 150 FM**<br>▪ Combined lightning current and surge arrester in a compact enclosure<br>▪ For voice alarm and loudspeaker applications<br>▪ With remote signalling contact | TYPE 1 P2 |  | **928 430** | 328 |
| **DVR BNC RS485 230**<br>▪ 3-in-1 surge arrester in a compact enclosure<br>▪ Protects 230V / RS485 / coaxial signal interfaces<br>▪ With push-in connection technology | TYPE 2 P2 |  | **928 440** | 328 |
| **BLITZDUCTOR VT** | | | | |
| **BVT ...**<br>▪ Lightning current and surge arrester in a compact enclosure<br>▪ Wide range of solutions for d.c. supply systems and<br>▪ data interfaces<br>▪ With screw terminals | TYPE 1 P1 |  | **918 401**<br>**918 422**<br>**918 409**<br>**918 411** | 328<br>329<br>329<br>329 |
| **BVT KKS ...**<br>▪ Combined lightning current and surge arrester in a compact enclosure<br>▪ Solutions for cathodic protection applications<br>▪ With screw terminals | TYPE 1 P1 |  | **918 420**<br>**918 421** | 329<br>329 |

## BLITZDUCTORconnect – Compact

- Combined lightning current and surge arrester with a compact design and integrated visual status indication
- Push-in connection technology
- Intrinsically safe version for use in hazardous areas

### BCO CL2 B 180

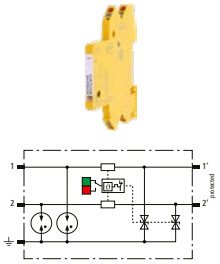
Space-saving, compact lightning current arrester with a width of 6 mm and push-in connection technology with status indication for protecting two single lines for lightning equipotential bonding as well as indirect earthing of shielded cables.



| Type BCO ... | CL2 B 180 |
|---|---|
| Part No. | 927 910 |
| SPD class | TYPE 1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current ($I_L$) | 1.2 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 0 ohms |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL |

### BCO CL2 BE

Space-saving, compact combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting two single lines sharing a common reference potential as well as unbalanced interfaces.



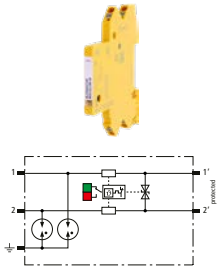
| General technical data: | | |
|---|---|---|
| SPD class | | TYPE 1 P1 |
| Nominal current at 70 °C ($I_L$) | | 0.75 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | | 10 kA |
| Series resistance per line | | 1 ohms |
| Approvals | | UL, CSA, ATEX, IECEx, CCC, SIL |

| Type BCO ... | CL2 BE 12 | CL2 BE 24 |
|---|---|---|
| Part No. | 927 922 | 927 924 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 15 V | 33 V |
| Cut-off frequency line-line ($f_G$) | 1.4 MHz | 3.4 MHz |

| Type BCO ... | CL2 BE 48 |
|---|---|
| Part No. | 927 925 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 54 V |
| Cut-off frequency line-line ($f_G$) | 5 MHz |

### BCO CL2 BD

Space-saving, compact combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting one pair of unearthed balanced interfaces.



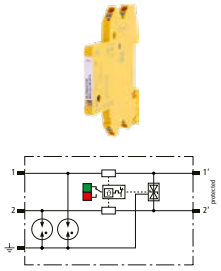
| General technical data: | |
|---|---|
| SPD class | TYPE 1 P2 |
| Nominal current at 70 °C ($I_L$) | 0.75 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 1 ohms |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL |

| Type BCO ... | CL2 BD 12 | CL2 BD 24 |
|---|---|---|
| Part No. | 927 942 | 927 944 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 15 V | 36 V |
| Cut-off frequency line-line ($f_G$) | 2.6 MHz | 5.8 MHz |

| Type BCO ... | CL2 BD 48 |
|---|---|
| Part No. | 927 945 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 56 V |
| Cut-off frequency line-line ($f_G$) | 7.2 MHz |

### BCO CL2 BE HF

Space-saving, compact combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting two single lines of high-frequency transmissions sharing a common reference potential as well as unbalanced interfaces.

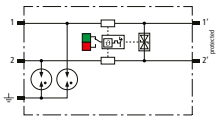


| Type BCO ... | CL2 BE HF 5 |
|---|---|
| Part No. | 927 970 |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 8.5 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 1 ohms |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL |

## BCO CL2 BD HF

Space-saving, compact combined arrester with a width of 6 mm and push-in connection technology with status indication for protecting one pair of unearthed high-frequency bus systems as well as balanced interfaces.



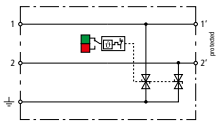


| Type BCO ... | CL2 BD HF 5 |
|---|---|
| Part No. | 927 971 |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 8.5 V |
| Nominal current at 70 °C ($I_L$) | 0.75 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 1 ohms |
| Cut-off frequency line-line ($f_G$) | 100 MHz |
| Approvals | UL, CSA, ATEX, IECEx, CCC, SIL |

## BCO CL2 E

Space-saving, compact surge arrester with a width of 6 mm and push-in connection technology with status indication. Finely limiting, single-stage surge protection with powerful diodes for protecting two single cores sharing a common reference potential as well as unbalanced interfaces.





| General technical data: | | |
|---|---|---|
| SPD class | | TYPE 3 P1 |
| Nominal current at 60 °C ($I_L$) | | 10 A |
| Series resistance per line | | 0 ohms |
| Approvals | | UL |

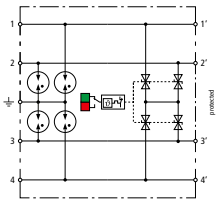
| Type BCO ... | CL2 E 12 | CL2 E 24 |
|---|---|---|
| Part No. | 927 987 NEW | 927 988 NEW |
| Max. continuous operating voltage (d.c.) ($U_C$) | 15 V | 33 V |
| C1 Total nominal discharge current (8/20 µs) ($I_n$) | 3 kA | 1.2 kA |

| Type BCO ... | CL2 E 48 |
|---|---|
| Part No. | 927 989 NEW |
| Max. continuous operating voltage (d.c.) ($U_C$) | 58 V |
| C1 Total nominal discharge current (8/20 µs) ($I_n$) | 0.8 kA |

## BCO CL4 BC

Space-saving, compact combined arrester with a width of 12 mm and push-in connection technology with status indication for protecting unearthed 4-conductor measuring circuits for IT systems and measuring and control systems.



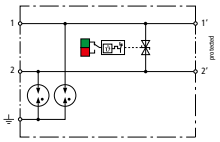


| Type BCO ... | CL4 BC 24 |
|---|---|
| Part No. | 927 954 NEW |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 36 V |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 2.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 0 ohms |
| Approvals | UL |

## BCO CL2 BD HC10A 24

Space-saving, compact combined arrester with a width of 12 mm and push-in connection technology with status indication for protecting one pair in unearthed DC supplies for IT systems and measuring and control circuits.

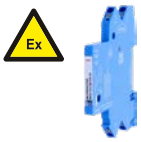


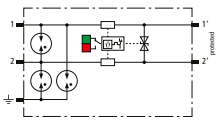


| Type BCO ... | CL2 BD HC10A 24 |
|---|---|
| Part No. | 927 408 NEW |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 45 V |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 2.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 0 ohms |
| Approvals | UL, SIL |

## BCO CL2 BD EX 24

Space-saving, compact surge arrester with a width of 6 mm and push-in connection technology with status indication for protecting one pair of intrinsically safe measuring circuits and bus systems, meets FISCO requirements. Insulation strength > 500 V line-ground.



| Type BCO ... | CL2 BD EX 24 |
|---|---|
| Part No. | 927 984 |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 36 V |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 1 ohms |
| Cut-off frequency line-line ($f_G$) | 3.5 MHz |
| Approvals | ATEX, IECEx, CCC, SIL |

## Accessories for BLITZDUCTORconnect – Compact

### Earthing Module



Space-saving earthing module with base part in a width of 6 mm and push-in connection technology for defined equipotential bonding of all wires connected to the base part. For direct earthing of 2 cable cores that are not being used actively. With signal disconnection for maintenance purposes.

| Type | BCO M2 E |
|---|---|
| **Part No.** | **927 318** NEW |
| D1 total lightning impulse current (10/350 µs) ($I_{imp}$) | 3 kA |
| Operating temperature range ($T_U$) | -40°C to +80°C |
| Degree of protection (plugged in) | IP 20 |

### DIN Rail Mounted Power Supply Unit



Robust power supply in the DIN-rail-mounted enclosure with single-phase, wide-range input for operation in a wide variety of supply systems. The operating state indication on the front side signals the availability of the output voltage. Supply of stationary condition-monitoring devices from the DEHNrecord product range (DRC SCM XT / DRC MCM XT / DRC IRCM / DRC SD 2 1).

| Type | PSU DC24 30W |
|---|---|
| **Part No.** | **910 499** |
| Input voltage range | AC 85-264 V; DC 120-373 V |
| Frequency | 44-66 Hz; 0 Hz |
| Input current ($I_e$) | 0.7 A at AC 110 V / 0.5 A at AC 230 V |
| Output nominal voltage ($U_a$) | DC 24 V (SELV) |
| Output current ($I_a$) | 1.3 A at DC 24 V, max. 0.9 A at any installation position |
| Recommended backup fuse | circuit breaker 10 A, 16 A, characteristic B, C |
| Standards / regulations | EN 60950, EN 61204-3, UL 60950, UL 508, GL |

### PARTITION EXI



Special installation conditions have to be taken into account when using the BLITZDUCTORconnect surge protective devices in intrinsically safe electric circuits. According to EN 60079-11; 2007 (VDE 0170-7), a minimum clearance must be maintained between intrinsically safe and non-intrinsically safe signal circuits (connecting parts, e.g. connection clamps) of ≥ 50 mm! When using the Ex i partition of type PARTITION EXI, this clearance is also maintained if the surge protective devices are arranged directly next to one other. Ideally suited for use in conjunction with DRC IRCM for condition monitoring of BCO modules.
(1 pack = 2 pieces)

| Type | PARTITION EXI |
|---|---|
| **Part No.** | **910 797** |
| Colour | blue |
| For mounting on | 35 mm DIN rails acc. to EN 60715 |

### DRC IRCM



Condition monitoring unit DEHNrecord, set for DIN rail mounted devices with integrated visual transmitter/receiver and visual reverse unit for monitoring the condition of BCO/DPA arresters with LifeCheck. Visual arrester status indication via LED group display in combination with remote signalling contact (break contact).

| Type | DRC IRCM |
|---|---|
| **Part No.** | **910 710** |
| Input voltage range (d.c.) ($U_{IN}$) | 6-35 V DC |
| Max. rated current consumption ($I_{IN}$) | ≤ 10 mA |
| Operating temperature range ($T_U$) | -30 °C ... +70 °C |
| Approvals | UL, CSA, ATEX, IECEx, CCC |

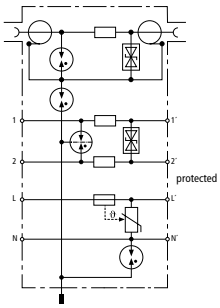
## DEHNvario

Compact combined arrester for protecting electroacoustic systems (e.g. voice alarm systems, loudspeaker systems).

### DVR BNC RS485 230

Compact 3-in-1 surge arrester for protecting analogue camera systems. Protection of the video signal (BNC connection), a data signal (RS485) and a voltage supply (230 V a.c.). Direct plug-in technology allows fast conductor connection without tools. Easy replacement of the arrester is ensured by the integrated terminal units which can be released and then removed from the enclosure. Integrated overload indication (230 V).



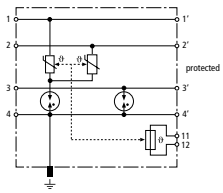



| Type DVR ... | BNC RS485 230 |
|---|---|
| **Part No.** | **928 440** |
| **Video (BNC)** | |
| SPD class | TYPE 2 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.4 V |
| Nominal current ($I_L$) | 0.1 A |
| C2 Nominal discharge current (8/20 µs) shield-PG ($I_n$) | 10 kA |
| Insertion loss at 300 MHz (75 ohms) | ≤ 3.0 dB |
| Connection (input / output) | BNC socket / BNC socket |
| **Dates (RS485)** | |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 8 V |
| Nominal current ($I_L$) | 0.5 A |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency line-line ($f_G$) | 100 MHz |
| **Voltage supply (230 V)** | |
| SPD class | type 2 / class II |
| Max. continuous operating voltage (a.c.) [L-N] ($U_C$) | 255 V (50 / 60 Hz) |
| Max. continuous operating voltage (a.c.) [N-PE] ($U_C$) | 255 V (50 / 60 Hz) |
| Nominal current ($I_L$) | 10 A |
| Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Max. discharge current (8/20 µs) ($I_{max}$) | 10 kA |
| Voltage protection level [L-N] ($U_P$) | ≤ 1.5 kV |
| Voltage protection level [N-PE] ($U_p$) | ≤ 1.5 kV |

### DVR 2 BY S 150 FM

Compact combined arrester for protecting electroacoustic systems (e.g. voice alarm systems, loudspeaker systems). Protection of one galvanically isolated pair; direct or indirect shield earthing. Direct plug-in technology allows fast conductor connection without tools. Easy replacement of the arrester is ensured by the integrated terminal units which can be released and then removed from the enclosure. Integrated remote signalling contact (break contact).






| Type DVR ... | 2 BY S 150 FM |
|---|---|
| **Part No.** | **928 430** |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 150 V |
| Nominal current at 70 °C ($I_L$) | 10 A |
| Nominal current at 80 °C ($I_L$) | 7 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 2.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 22.5 kA |
| Cut-off frequency line-line ($f_G$) | 1.4 MHz |

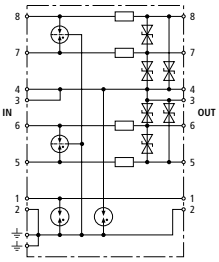
## BLITZDUCTOR VT

Compact DIN rail mounted protection for devices with screw terminals for stranded conductors

### BVT RS485

Surge arrester for a wide range of applications, e.g. for balanced four-wire RS485/422 interfaces or temperature sensors. Direct or indirect shield earthing, connection of a signal ground (SG).



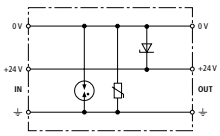



| Type BVT ... | RS485 5 |
|---|---|
| **Part No.** | **918 401** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6 V |
| Nominal current ($I_L$) | 0.5 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 0.8 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | 1.8 ohms |
| Cut-off frequency line-line ($f_G$) | 1.7 MHz |
| Approvals | CSA |

## BVT AVD

Surge arresters with improved voltage protection levels for EMC protection of electronic components with d.c. voltage supply. Ideally suited for Siemens PLCs. Since a unipolar diode is used, the polarity of the operating voltage must be observed.



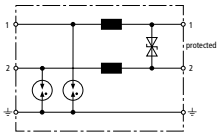



| Type BVT ... | AVD 24 |
|---|---|
| **Part No.** | **918 422** |
| SPD class | TYPE 3 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 35 V |
| Nominal current at 80 °C ($I_L$) | 10 A |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 2 kA |

## BVT ALD

Energy-coordinated, DIN rail mounted combined lightning current and surge arrester for protecting unearthed d.c. power supply systems.



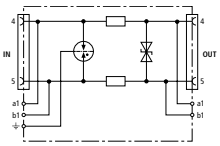



| Type BVT ... | ALD 60 |
|---|---|
| **Part No.** | **918 409** |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 65 V |
| Nominal current at 80 °C ($I_L$) | 4 A |
| Nominal current at 45 °C ($I_L$) | 7 A |
| Backup fuse if | $U_N \geq 45$ V and $I_L \geq 1$ A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 2.5 kA |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 22 µH |
| Approvals | UL |

## BVT TC

Energy-coordinated and leakage-current-free surge arrester for a/b lines, ISDN $U_{k0}$ or ADSL with RJ45 connections and additional screw terminals. Pinning of the RJ45 sockets is compatible with RJ11/12. The parallel screw terminals are more robust than the RJ45 sockets and increase the total nominal discharge current to 10 kA.



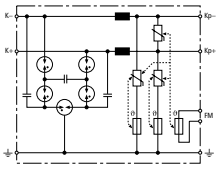



| Type BVT ... | TC 1 |
|---|---|
| **Part No.** | **918 411** |
| SPD class | TYPE 2 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 170 V |
| Nominal current ($I_L$) | 0.2 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 5 kA |
| Series resistance per line | 4.7 ohms |
| Cut-off frequency line-line ($f_G$) | 17 MHz |

## BVT KKS ALD

Energy coordinated combined arrester for protecting the rectifier in the protective circuit (red colour). Pluggable remote signalling contact (break contact) for overload indication (temperature monitoring of the varistors). Installation in sheet metal housing recommended. Low impulse sparkover voltage due to capacitive control.



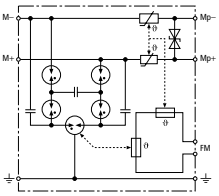



| Type BVT ... | KKS ALD 75 |
|---|---|
| **Part No.** | **918 420** |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 75 V |
| Nominal current ($I_L$) | 12 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 3.5 kA |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 7 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 40 kA |
| Series resistance per line | 5 µH |
| Cut-off frequency line-line ($f_G$) | 1 MHz |
| Type of remote signalling contact | break contact |

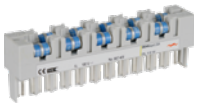
## BVT KKS APD

Energy coordinated combined arrester for protecting the voltage measuring circuit (yellow colour). Pluggable remote signalling contact (break contact) for overload indication (temperature monitoring of the discharge paths). Installation in sheet metal housing recommended. Low impulse sparkover voltage due to capacitive control.






| Type BVT ... | KKS APD 36 |
|---|---|
| **Part No.** | **918 421** |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 36.8 V |
| Nominal current ($I_L$) | 0.05 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 3.5 kA |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 7 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 40 kA |
| Series resistance per line | 55 ohms |
| Type of remote signalling contact | break contact |

| Description | Type | Product | Part No. | Page |
|---|---|---|---|---|
| **Lightning current / surge arresters** | | | | |
| ▪ Lightning current carrying DRL plug-in SPD block can be easily plugged into LSA disconnection blocks of 2/10 type<br>▪ Versions with / without fail-safe function / visual indication<br>▪ Modularly expandable with a DRL protective plug to a combined lightning current and surge arrester<br>▪ With integrated disconnection block contacts | **DRL 10 B 180**<br>**DRL 10 B 180 FSD** |  | **907 400**<br>**907 401** | 331<br>331 |
| ▪ Protective plug for one pair inserted through the earthing frame into the DRL plug-in SPD block<br>▪ Energy-coordinated with DRL plug-in SPD block<br>▪ Low voltage protection level for application-specific protection of terminal equipment | **DRL ...** |  | **907 421**<br>–<br>**907 470** | 331<br>–<br>332 |
| ▪ Earthing module inserted through the earthing frame into the LSA disconnection block<br>▪ Fast replacement when retrofitting a DEHNrapid LSA protection module | **EM 2 DRL** |  | **907 496** | 333 |
| ▪ Snap-on earthing frame for earthing and mounting DRL protective plugs on a 10-pair disconnection block or the lightning current carrying DRL plug-in SPD block | **EF 10 DRL** |  | **907 498** | 333 |
| **Surge arresters** | | | | |
| ▪ Powerful SPD block can be easily plugged into LSA disconnection blocks of 2/10 type<br>▪ Versions with / without fail-safe function / visual indication | **DPL 10 G3 110**<br>**DPL 10 G3 110 FSD** |  | **907 214**<br>**907 216** | 333<br>333 |
| **DEHN enclosure for equipotential bonding** | | | | |
| ▪ Lightning current carrying earthing system for arresters and shield connection<br>▪ Pre-mounted mounting frame<br>▪ Lockable enclosure | **DPG LSA ... P** |  | **906 100**<br>–<br>**906 103** | 334 |
| **Routing module for disconnection blocks with LSA spring-loaded terminal** | | | | |
| ▪ DIN rail mounted routing module for disconnection blocks<br>▪ Equipped with LSA disconnection block and spring-loaded terminals for variable wire connection<br>▪ Routing of different wire diameters | **TL2 10DA CC** |  | **907 991** | 335 |

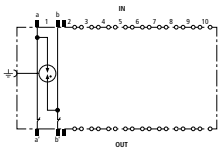
# DEHNrapid LSA – Lightning Current / Surge Arrester

Lightning current arrester, surge arrester or combined lightning current and surge arrester that can be plugged into LSA disconnection blocks of series 2. The integrated disconnection block contacts in the 10-pair plug-in SPD block allow for protected testing, disconnecting or patching in systems or the attachment of one-pair surge arresters.

## DRL 10 B



Lightning current carrying DRL plug-in SPD block (10 pairs) with three-pole gas discharge tubes for almost all applications. Expandable to a combined lightning current and surge arrester by means of a DRL protective plug. The integrated disconnection block contacts allow testing, measuring and patching with plugged-in protection.

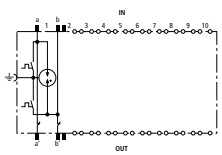



| Type DRL ... | 10 B 180 |
|---|---|
| **Part No.** | **907 400** |
| SPD class | TYPE 1 C |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current ($I_L$) | 0.4 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | ≤ 0.005 ohms |
| Plugs into | LSA disconnection block 2/10 |

## DRL 10 B FSD



Lightning current carrying DRL plug-in SPD block (10 pairs) for almost all applications. Expandable to a combined lightning current and surge arrester by means of a DRL protective plug. The integrated disconnection block contacts allow testing, measuring and patching with plugged-in protection. The three-pole gas discharge tubes have a fail-safe function with visual fault indication.

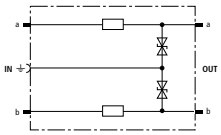



| Type DRL ... | 10 B 180 FSD |
|---|---|
| **Part No.** | **907 401** |
| SPD class | TYPE 1 C |
| Fault indication | visual, colour change |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current ($I_L$) | 0.4 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Series resistance per line | ≤ 0.005 ohms |
| Plugs into | LSA disconnection block 2/10 |

## DRL RE



Protective plug (one pair), energy-coordinated with DRL plug-in SPD block, for use as single-stage protective device for terminal equipment with decoupling impedances. Ideally suited for signal circuits sharing a common reference potential. Earthing via EF 10 DRL. For disconnection blocks or DRL plug-in SPD blocks only.




| General technical data: | |
|---|---|
| SPD class | TYPE 3 P1 |
| D1 Total lightning impulse current (10/350 µs) in combination with DRL 10 B... ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) in combination with DRL 10 B... ($I_n$) | 10 kA |
| Plugs into | LSA disconnection block 2/10 or DRL 10 B ... plug-in SPD block |

| Type DRL ... | RE 12 | RE 24 |
|---|---|---|
| **Part No.** | **907 421** | **907 422** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 14 V | 28 V |
| Nominal current ($I_L$) | 0.4 A | 0.4 A |
| Series resistance per line | 4.7 ohms | 4.7 ohms |
| Cut-off frequency line-PG ($f_G$) | 2.7 MHz | 4.5 MHz |

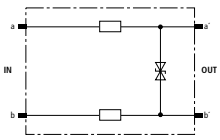
| Type DRL ... | RE 48 | RE 60 |
|---|---|---|
| **Part No.** | **907 423** | **907 424** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 54 V | 70 V |
| Nominal current ($I_L$) | 0.4 A | 0.4 A |
| Series resistance per line | 6.8 ohms | 6.8 ohms |
| Cut-off frequency line-PG ($f_G$) | 7.35 MHz | 10.5 MHz |

| Type DRL ... | RE 180 |
|---|---|
| **Part No.** | **907 425** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current ($I_L$) | 0.1 A |
| Series resistance per line | 4.7 ohms |
| Cut-off frequency line-PG ($f_G$) | 42 MHz |

## DRL RD

Protective plug (one pair), energy-coordinated with DRL plug-in SPD block, for use as single-stage protective device for terminal equipment. Low voltage protection level line-line for unearthed interfaces. To be mounted into EF 10 DRL. Installation recommended only in combination with DRL plug-in SPD block.






| General technical data: | |
|---|---|
| SPD class | TYPE 3 P1 |
| Nominal current ($I_L$) | 0.4 A |
| D1 Total lightning impulse current (10/350 µs) in combination with DRL 10 B... ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) in combination with DRL 10 B... ($I_n$) | 10 kA |
| Plugs into | LSA disconnection block 2/10 or DRL 10 B ... plug-in SPD block |

| Type DRL ... | RD 12 | RD 24 |
|---|---|---|
| **Part No.** | **907 441** | **907 442** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 14 V | 28 V |
| Series resistance per line | 2.2 ohms | 2.2 ohms |
| Cut-off frequency line-line ($f_G$) | 2.7 MHz | 5.4 MHz |

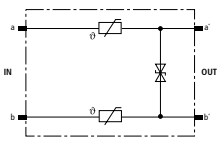
| Type DRL ... | RD 48 | RD 60 |
|---|---|---|
| **Part No.** | **907 443** | **907 444** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 54 V | 70 V |
| Series resistance per line | 4.7 ohms | 4.7 ohms |
| Cut-off frequency line-line ($f_G$) | 7.8 MHz | 11 MHz |

| Type DRL ... | RD 110 |
|---|---|
| **Part No.** | **907 445** |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Series resistance per line | 4.7 ohms |
| Cut-off frequency line-line ($f_G$) | 20 MHz |

## DRL PD

Protective plug (one pair), energy-coordinated with DRL plug-in SPD block, for use as single-stage protective device for terminal equipment. Low voltage protection level line-line and integrated overcurrent protection for ADSL, ISDN $U_{k0}$ or a/b lines. To be mounted into EF 10 DRL. Installation recommended only in combination with DRL plug-in SPD block.



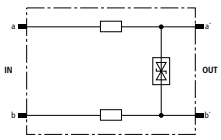



| Type DRL ... | PD 180 |
|---|---|
| **Part No.** | **907 430** |
| SPD class | TYPE 3 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current ($I_L$) | 0.1 A |
| D1 Total lightning impulse current (10/350 µs) in combination with DRL 10 B... ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) in combination with DRL 10 B... ($I_n$) | 10 kA |
| Series resistance per line | 10 ohms +/- 15% |
| Cut-off frequency line-line ($f_G$) | 61 MHz |
| Plugs into | LSA disconnection block 2/10 or DRL 10 B... plug-in SPD block |

## DRL HD

Protective plug (one pair), energy-coordinated with DRL plug-in SPD block, for use as single-stage protective device for terminal equipment for high-frequency transmissions such as G.703 or ISDN $U_{2m}$, $S_{2m}$ and $S_0$. To be mounted into EF 10 DRL. Installation recommended only in combination with DRL plug-in SPD block.





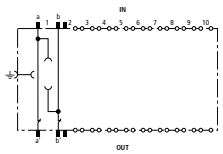

| Type DRL ... | HD 24 |
|---|---|
| **Part No.** | **907 470** |
| SPD class | TYPE 3 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 28 V |
| Nominal current ($I_L$) | 0.4 A |
| D1 Total lightning impulse current (10/350 µs) in combination with DRL 10 B... ($I_{imp}$) | 5 kA |
| C2 Total nominal discharge current (8/20 µs) in combination with DRL 10 B... ($I_n$) | 10 kA |
| Series resistance per line | 4.7 ohms |
| Plugs into | LSA disconnection block 2/10 or DRL 10 B... plug-in SPD block |

# Accessories for DEHNrapid LSA

## Plug-in SPD Block (without SPDs)

Plug-in SPD block (without SPDs) for 1 to max. 10 three-pole GDT 230 B3 ... gas discharge tubes. Also suitable for DRL protective plugs with earthing frame.






| Type | BM 10 DRL |
|---|---|
| **Part No.** | **907 499** |
| Plugs into | LSA disconnection blocks |
| Earthing via | mounting frame |

## Gas Discharge Tube

High-capacity replacement gas discharge tube for DRL 10 or BM 10 DRL. Three-pole version with common arcing chamber for a constant voltage protection level line-line and line-ground.



| Type | GDT 230 B3 FSD |
|---|---|
| **Part No.** | **907 219** |
| Integrated into Part No. | 907 401 |
| Visual fault indication | yes |
| Fail-safe spring | yes |
| D1 Total lightning impulse current (10/350 µs) | 5 kA |

### Gas Discharge Tube



High-capacity replacement gas discharge tubes for DRL 10 or BM 10 DRL. Three-pole version with common arcing chamber for a constant voltage protection level line-line and line-ground.

| Type | GDT 230 B3 |
|---|---|
| **Part No.** | **907 218** |
| Integrated into Part No. | 907 400 |
| D1 Total lightning impulse current (10/350 µs) | 5 kA |

### Earthing Frame



Snap-on earthing frame for earthing and installation of max. 10 DRL protection modules. Plugs into a 10-pair disconnection block or DRL plug-in SPD block.

| Type | EF 10 DRL |
|---|---|
| **Part No.** | **907 498** |
| Plugs into | LSA disconnection blocks or DRL plug-in SPD block |
| Earthing via | mounting frame or DRL plug-in SPD block |

### Label Holder



Universal label holder made of stainless steel for clear identification of LSA connections. Can be snapped onto DEHNrapid LSA plug-in SPD blocks, earthing frames with protective plugs or mounting frames with LSA blocks of the 2/10 series.

| Type | SR DRL |
|---|---|
| **Part No.** | **907 497** |
| Plugs into | DRL B, EF DRL, LSA blocks 2/10 (profile, with earth connecting clip) |

### Earthing Module



Plugged into the EF 10 DRL earthing frame, the earthing module connects a pair placed on an LSA disconnection block to the equipotential bonding. Its function is to directly earth unused cable cores that are placed on the LSA disconnection block. The earthing module must not be used in combination with the DRL 10 B... plug-in SPD block.

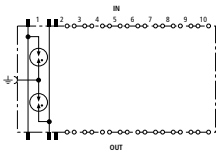
| Type | EM 2 DRL |
|---|---|
| **Part No.** | **907 496** |
| D1 Total lightning impulse current (10/350 µs) | 5 kA |
| Plugs into | TL2 10DA ... |
| Earthing via | EF 10 DRL |
| Material | **zinc die-casting** |

## DPL 10 G3

- Pluggable arresters for LSA systems of the 2/10 series.
- Proctection block version for 10 pairs with individually replaceable protection elements.

### DPL 10 G3






Plug-in SPD block for ten pairs with three-pole gas discharge tubes for almost all applications. FSD arresters feature a fail-safe function and an additional visual indication when the fail-safe function has been activated. Thus, it can be immediately identified whether an arrester has to be replaced.

| Type DPL 10 G3 ... | 110 | 110 FSD |
|---|---|---|
| **Part No.** | **907 214** | **907 216** |
| SPD class | TYPE 2 | TYPE 2 |
| Fault indication | – | visual, colour change |
| Max. continuous operating voltage (d.c.) ($U_c$) | 180 V | 180 V |
| Nominal current ($I_L$) | 0.4 A | 0.4 A |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |

## Accessories for DPL 10 G3

### Gas Discharge Tube



High-capacity replacement gas discharge tubes for DPL 10 G3. Three-pole version with common arcing chamber for a constant voltage protection level line-line and line-ground.

| Type | GDT 230 G3 | GDT 230 G3 FSD |
|---|---|---|
| **Part No.** | **907 208** | **907 217** |
| Integrated into Part No. | 907 214 | 907 216 |
| Visual fault indication | – | yes |
| Fail-safe spring | – | yes |

## DEHN Enclosure for Equipotential Bonding

DPG are lockable metal enclosures for installing wiring and protection components. Available in four different sizes, the lightning current carrying enclosures additionally feature terminals for integrating surge arresters and shields into the equipotential bonding system.

### DPG LSA

DPG LSA is a completely premounted enclosure system with LSA mounting frame and allows optimised use of arresters and shield connection systems (constant force spring).



| General technical data: | | |
|---|---|---|
| Degree of protection | | IP 40 |

| Type DPG LSA ... | 30 P | 60 P |
|---|---|---|
| Part No. | 906 100 | 906 101 |
| Carrying capacity of connection elements D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 15 kA | 30 kA |
| LSA mounting frame for | 1x 3 blocks 2/10 | 1x 6 blocks 2/10 |
| Wire guides | 1 pc(s). | 2 pc(s). |
| Dimensions W x H x D | 240 x 260 x 130 mm | 240 x 350 x 130 mm |

| Type DPG LSA ... | 120 P | 220 P |
|---|---|---|
| Part No. | 906 102 | 906 103 |
| Carrying capacity of connection elements D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 50 kA | 50 kA |
| LSA mounting frame for | 2x 6 blocks 2/10 | 2x 11 blocks 2/10 |
| Wire guides | 2 pc(s). | 3 pc(s). |
| Dimensions W x H x D | 330 x 350 x 130 mm | 330 x 500 x 130 mm |

## Accessories for DEHN Enclosure for Equipotential Bonding

### Self-bonding Rubber Tape

Roll with 9 m self-bonding rubber tape to be wrapped around constant force springs for permanent corrosion protection.



| Type | SKB 19 9M SW |
|---|---|
| Part No. | 919 030 |
| Colour | Black ● |

### Constant Force Spring



Constant force springs allow solderless shield connections for equipotential bonding or lightning equipotential bonding. They can be installed subsequently without interrupting the cable shield or requiring tools for installation. Approved for nuclear installations according to TÜV Certificate No. T12-04-ETL003 (TÜV = German Technical Inspectorate).

| General technical data: | |
|---|---|
| Material | StSt |

| Type | SA KRF 10 V2A | SA KRF 15 V2A |
|---|---|---|
| Part No. | 919 031 | 919 032 |
| Clamping range | 4-10 mm | 9-15 mm |

| Type | SA KRF 22 V2A | SA KRF 29 V2A |
|---|---|---|
| Part No. | 919 033 | 919 034 |
| Clamping range | 14-22 mm | 18.5-29 mm |

| Type | SA KRF 37 V2A |
|---|---|
| Part No. | 919 035 |
| Clamping range | 23.5-37 mm |

## Accessories for LSA Technology

- Proven insulation displacement method
- 45° angled blades in the disconnection block ensure a minimum change in cross-section
- Enhanced stability of the conductor
- Enhanced corrosion resistance
- Further accessories available on request

### Mounting Frame

Mounting frame for 10 LSA blocks of the 2/10 series, total width: 104.5 mm



| Type | MB2 10 LSA |
|---|---|
| **Part No.** | **907 995** |
| Dimensions | 223 x 105 x 42 mm |

### Insertion Tool

Insertion tool with sensor for LSA technology for connecting the wires and simultaneously cutting them to the required length. With fold-out extraction hook and blade.



| Type | AW2 LSA |
|---|---|
| **Part No.** | **907 994** |
| Colour | White O |

### Terminal Block

Series 2 for LSA technology for inseparably connecting 10 pairs each on the cable and routing side. Accommodates DPL 10 G3 arresters. Parallel protective circuit only.



| Type | AL2 10DA LSA |
|---|---|
| **Part No.** | **907 997** |
| Test standards | DIN 47608-1, -2 |
| Diameter of solid conductors | 0.40-0.80 mm |
| Conductor diameter with insulation | 0.70-1.50 mm |

### Disconnection Block

Series 2 for LSA technology for connecting 10 pairs each on the cable and routing side. Protection is provided between the disconnection contacts as soon as DRL components are plugged in. DPL 10 G3 arresters can also be plugged into the disconnection block.



| Type | TL2 10DA LSA |
|---|---|
| **Part No.** | **907 996** |
| Test standards | DIN 47608-1, -2 |
| Approvals | compliance with DTAG TS 0272/96 |
| Diameter of solid conductors | 0.40-0.80 mm |
| Conductor diameter with insulation | 0.70-1.50 mm |

### Earthing Plug

Series 2 for LSA technology for connecting up to 38 earth drain wires or unused signal cores. With earth wire and M4 ring cable lug.



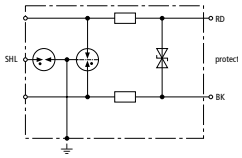
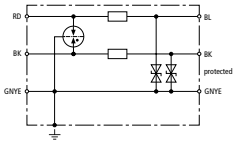
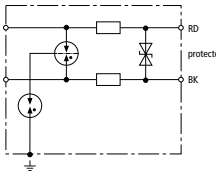
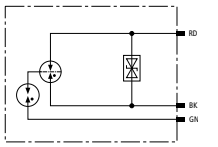
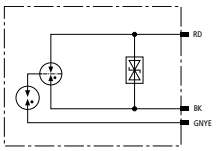
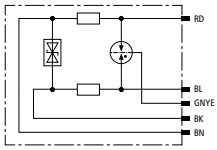
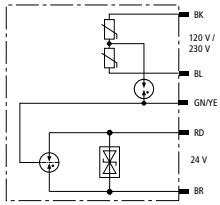
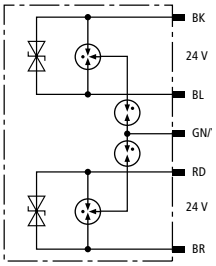
| Type | EL2 38EA LSA |
|---|---|
| **Part No.** | **907 993** |
| Earthing via | earthing conductor with M4 ring cable lug |
| Diameter of solid conductors | 0.40 - 0.80 mm |
| Conductor diameter with insulation | 0.70 - 1.50 mm |
| Colour | red ● |

### Routing Module for Disconnection Blocks with LSA Spring-Loaded Terminal

DIN rail mounted routing module with LSA disconnection block of the 2/10 series as well as spring-loaded terminals for variable wire connection. DPL and DEHNrapid LSA surge arresters can be plugged into the routing module.



| Type | TL2 10DA CC |
|---|---|
| **Part No.** | **907 991** |
| Carrying capacity of connection components D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA |
| For mounting on | 35 mm DIN rails acc. to EN 60715 |
| Connection (input / output) | spring or LSA / spring or LSA |
| Earthing via | DIN rail / flat connector 6.3 mm |
| Diameter of solid conductors | 0.40-0.80 mm |
| Conductor diameter with insulation | 0.70-1.60 mm |

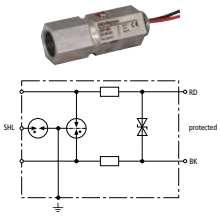
| Description / Type | Basic circuit diagram | Product | Part No. | Page |
|---|---|---|---|---|
| **DEHNpipe MD / ME** | | | | |
| **DPI MD**<br>▪ For one balanced interface<br>▪ Direct or indirect shield earthing<br>▪ Nominal voltage: 24 V<br>▪ For series connection<br>▪ With M20 x 1.5 thread (female/male) |  |  | **929 941** | 337 |
| **DPI ME**<br>▪ For one unbalanced interface<br>▪ Nominal voltage: 24 V<br>▪ For series connection<br>▪ With 1/2-14 NPT thread (male/male) |  |  | **929 921** | 337 |
| **DEHNpipe MD Ex (i)** | | | | |
| **DPI MD EX**<br>▪ For one balanced interface<br>▪ Nominal voltage: 24 V<br>▪ For series connection<br>▪ With M20 x 1.5 or 1/2-14 NPT thread |  |  | **929 960**<br>**929 965** | 337<br>337 |
| **DEHNpipe CD Ex (i)** | | | | |
| **DPI CD EXI**<br>▪ For one balanced interface<br>▪ Nominal voltage: 24 V<br>▪ For parallel connection<br>▪ With M20 x 1.5 or 1/2-14 NPT thread |  |  | **929 961**<br>**929 963** | 337<br>337 |
| **DEHNpipe CD Ex (d)** | | | | |
| **DPI CD EXD 24**<br>▪ For one balanced interface<br>▪ Nominal voltage: 24 V<br>▪ For parallel connection<br>▪ With M20 x 1.5 or 1/2-14 NPT thread |  |  | **929 962**<br>**929 964** | 337<br>337 |
| **DPI CD HF EXD 5**<br>▪ For one balanced interface<br>▪ Nominal voltage: 5 V<br>▪ For series connection<br>▪ With M20 x 1.5 thread |  |  | **929 971** | 337 |
| **DPI CD EXD 230 24**<br>▪ For one balanced interface and one 120/230 V power supply system<br>▪ Nominal voltage: 24 V and 120/230 V<br>▪ For parallel connection<br>▪ With M20 x 1.5 or 1/2-14 NPT thread |  |  | **929 969**<br>**929 970** | 338<br>338 |
| **DEHNpipe CD Ex (i) + Ex (d)** | | | | |
| **DPI CD EXI+D 2x24**<br>▪ For two balanced interfaces<br>▪ Nominal voltage: 24 V<br>▪ For parallel connection<br>▪ With M20 x 1.5 or1/2-14 NPT thread |  |  | **929 950**<br>**929 951** | 338<br>338 |

## DEHNpipe

Surge arrester for outdoor use to be screwed onto two-wire field devices. Stainless steel. Installation up to a degree of protection of IP 67.

### DPI MD

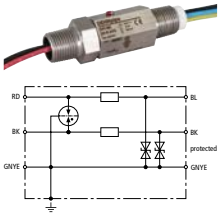
Energy-coordinated two-stage arrester, no leakage currents to earth, for 4-20 mA interfaces with M20 x 1.5 thread (female/male). Direct, indirect or no shield earthing. Cable gland available as an accessory.




| Type DPI ... | MD 24 M 2S |
|---|---|
| **Part No.** | **929 941** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 34.8 V |
| Nominal current ($I_L$) | 0.5 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency line-line ($f_G$) | 14 MHz |
| For mounting on (field / device side) | M20 x 1.5 female thread / M20 x 1.5 male thread |
| Approvals | SIL |

### DPI ME

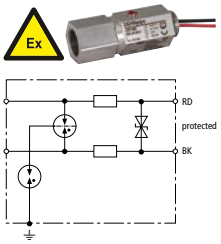
Energy-coordinated two-stage arrester with gas discharge tube and diodes to earth. For unbalanced interfaces with 1/2 -14 NPT thread (male/male). The earthing conductor is led through the surge arrester.




| Type DPI ... | ME 24 N A2G |
|---|---|
| **Part No.** | **929 921** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 34.8 V |
| Nominal current ($I_L$) | 0.5 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| For mounting on (field / device side) | 1/2-14 NPT male thread / 1/2-14 NPT male thread |
| Approvals | UL, SIL |

### DPI MD EX

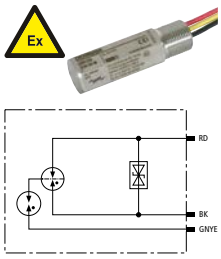
Energy-coordinated two-stage surge arrester with low-capacitance protective circuit for protecting intrinsically safe measuring circuits and bus systems, meets FISCO requirements. Insulation strength > 500 V to earth. Cable glands must be ordered separately.




| Type DPI ... | MD EX 24 M 2 | MD EX 24 N 2 |
|---|---|---|
| **Part No.** | **929 960** | **929 965** |
| SPD class | TYPE 2 P1 | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 34.8 V | 34.8 V |
| Nominal current ($I_L$) | 0.5 A | 0.5 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| Cut-off frequency line-line ($f_G$) | 7 MHz | 7 MHz |
| For mounting on (field / device side) | M20 x 1.5 female thread / M20 x 1.5 male thread | 1/2-14 NPT female thread / 1/2-14 NPT male thread |
| Approvals | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | ATEX, IECEx, CCC, SIL |

### DPI CD EXI

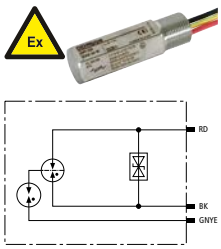
Surge arrester with a low-capacitance protective circuit for protecting intrinsically safe measuring circuits and bus systems, meets FISCO requirements. Insulation strength > 500 V to earth.




| Type DPI ... | CD EXI 24 M | CD EXI 24 N |
|---|---|---|
| **Part No.** | **929 961** | **929 963** |
| SPD class | TYPE 2 P1 | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 32 V | 32 V |
| Nominal current ($I_L$) | 0.55 A | 0.55 A |
| D1 Lightning impulse current (10/350 µs) line-PG ($I_{imp}$) | 1 kA | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| Cut-off frequency line-line ($f_G$) | 67 MHz | 67 MHz |
| For mounting on (field / device side) | M20 x 1.5 male thread | 1/2-14 NPT male thread |
| Approvals | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

### DPI CD EXD

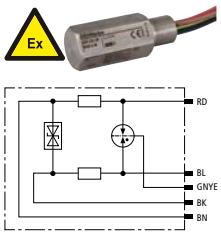
Flameproof surge arrester with a low-capacitance protective circuit for protecting measuring circuits and bus systems in potentially explosive atmospheres. Insulation strength > 500 V to earth. Certified to CSA and USA Hazloc standards.




| Type DPI ... | CD EXD 24 M | CD EXD 24 N |
|---|---|---|
| **Part No.** | **929 962** | **929 964** |
| SPD class | TYPE 2 P1 | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 32 V | 32 V |
| Nominal current ($I_L$) | 0.55 A | 0.55 A |
| D1 Lightning impulse current (10/350 µs) line-PG ($I_{imp}$) | 1 kA | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| Cut-off frequency line-line ($f_G$) | 67 MHz | 67 MHz |
| For mounting on (field / device side) | M20 x 1.5 male thread | 1/2-14 NPT male thread |
| Approvals | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

### DPI CD HF EXD

Flameproof surge arrester with an energy-coordinated low-capacitance protective circuit for protecting measuring circuits and bus systems in potentially explosive atmospheres.

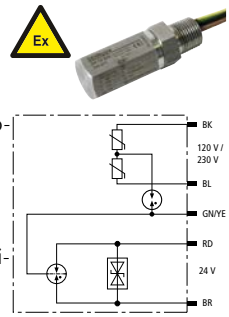



| Type DPI ... | CD HF EXD 5 M |
|---|---|
| **Part No.** | **929 971** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6 V |
| Nominal current at 80 °C ($I_L$) | 0.1 A |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Cut-off frequency line-line ($f_G$) | 100 MHz |
| For mounting on (field / device side) | M20 x 1.5 male thread |
| Approvals | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

## DPI CD EXD 230 24

Flameproof surge arrester for the data and power side for protecting one 120 / 230 V power supply system and one 24 V data interface of field devices in potentially explosive areas (zones 1 and 2).
Additional safety due to fault-proof Y circuit for 120 / 230 V power supply systems.

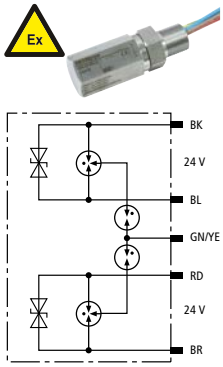
II 2 G Ex d IIC T5/T6 version universally applicable in hazardous zones 1 and 2. Certified to CSA and USA Hazloc standards.




| Type DPI ... | CD EXD 230 24 M | CD EXD 230 24 N |
|---|---|---|
| **Part No.** | **929 969** | **929 970** |
| SPD class | TYPE 2 P2 | TYPE 2 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 32 V | 32 V |
| Nominal current at 80 °C ($I_L$) | 0.55 A | 0.55 A |
| D1 Lightning impulse current (10/350 µs) line-PG ($I_{imp}$) | 1 kA | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA | 10 kA |
| For mounting on (field / device side) | M20 x 1.5 male thread | 1/2-14 npt male thread |
| Approvals | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

## DPI CD EXI+D 2X24

Flameproof surge arrester for protecting two 24 V interfaces in potentially explosive atmospheres.




| Type DPI ... | CD EXI+D 2X24 M | CD EXI+D 2X24 N |
|---|---|---|
| **Part No.** | **929 950** | **929 951** |
| SPD class | TYPE 2 P1 | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 36 V | 36 V |
| Nominal current ($I_L$) | 0.55 A | 0.55 A |
| D1 Lightning impulse current (10/350 µs) line-PG ($I_{imp}$) | 1.5 kA | 1.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| For mounting on (field / device side) | M20 x 1.5 male thread | 1/2-14 NPT male thread |
| Approvals | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL | ATEX, IECEx, CCC, CSA & USA Hazloc, SIL |

# Accessories for DEHNpipe

## EMC Cable Gland

Brass gland with shield connection



| Type | KV S M20 MS 9.5 |
|---|---|
| **Part No.** | **929 982** |
| Sealing range (Rd) | 6.5-9.5 mm |
| Shield diameter | 3.2-6.5 mm |
| For mounting on | M20 x 1.5 |
| Degree of protection | IP 68 |

## Cable Gland

Brass gland without shield connection



| Type | KV M20 MS 10.5 |
|---|---|
| **Part No.** | **929 984** |
| Sealing range (Rd) | 7.0-10.5 mm |
| For mounting on | M20 x 1.5 |
| Degree of protection | IP 68 |

## Brass Earthing Ring

Earthing ring made of nickel-plated brass, for externally earthing DPI devices.



| Type | ER DPI M20 |
|---|---|
| **Part No.** | **929 996** |
| For mounting on | DPI M20 x 1.5 |

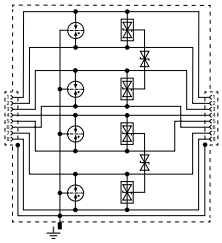
# DEHNpatch – Arrester for Data Networks and Ethernet Applications

DEHNpatch devices fulfil various requirements and can be used universally for Ethernet, Industrial Ethernet, Power over Ethernet (IEEE 802.3 compliant up to PoE++ / 4PPoE) as well as general applications in structured cabling of up to 10 Gbit.

## DPA CLE IP66



Universal surge arrester for GBit Ethernet applications, Power over Ethernet (IEEE 802.3 compliant up to PoE++ / 4PPoE) and similar applications in structured cabling systems up to class E in indoor and outdoor areas in an IP66 rated enclosure impervious to dust and water. Protection of all pairs with gas discharge tubes and one adapted filter matrix for each pair. Fully shielded surge protective solution with RJ 45 sockets. Universal mounting bracket for pole and wall mounting.
External accessories: Tensioning straps for pole mounting

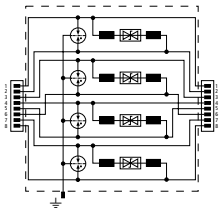


| Type DPA … | CLE IP66 |
|---|---|
| Part No. | 929 221 |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) pair-pair (PoE) ($U_c$) | 60 V |
| Nominal current ($I_L$) | 1 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 0.8 kA |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 4 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency ($f_G$) | 250 MHz |
| Degree of protection (with installed cables) | IP 66 |
| Connection (input / output) | RJ45 socket / RJ45 socket |
| Approvals | UL, CSA |

## DPA M CAT6

Universal arrester for Industrial Ethernet, Power over Ethernet (IEEE 802.3 compliant up to PoE++ / 4PPoE) and similar applications in structured cabling systems according to Cat. 6 and class $E_A$ up to 500 MHz. Fully shielded type with patch cable for DIN rail mounting (up to 10 Gbit Ethernet).



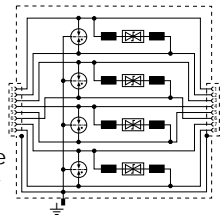


| Type DPA … | M CAT6 RJ45S 48 |
|---|---|
| Part No. | 929 100 |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 48 V |
| Max. continuous operating voltage (d.c.) pair-pair (PoE) ($U_c$) | 57 V |
| Nominal current ($I_L$) | 1 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 1 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency ($f_G$) | 250 MHz |
| Connection (input / output) | RJ45 connecting line / RJ45 connecting line |

## DEHNpatch class EA NEW



Universal, space-saving combined arrester of 19 mm in width and RJ45 connection system with status indication for simple maintenance. Protection of applications in structured cabling according to class $E_A$ to 500 MHz; e.g. industrial Ethernet, data distributors, digital camera systems, Power over Ethernet (IEEE 802.3 compliant to 4PPoE) and Ethernet-based interfaces in general. Protection of all pairs through powerful gas discharge tubes and protective diodes between signal cores and pairs. Fully shielded adapter design with RJ45 sockets for DIN rail mounting. With additional screw connection on the enclosure for an optional earth connection.

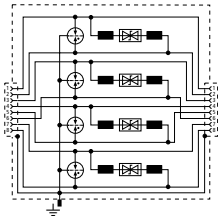


| Type DPA … | CL8 EA 4PPOE |
|---|---|
| Part No. | 929 161 NEW |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 3.3 V |
| Max. continuous operating voltage (d.c.) pair-pair (PoE) ($U_c$) | 58 V |
| Nominal current ($I_L$) | 1.5 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 0.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency ($f_G$) | 500 MHz |
| Connection (input / output) | RJ45 socket / RJ45 socket |
| Approvals | GHMT |

## DEHNpatch Class E



Universal arrester for Industrial Ethernet, Power over Ethernet (IEEE 802.3 compliant up to PoE++ / 4PPoE) and similar applications in structured cabling systems according to class E up to 250 MHz. Protection of all pairs by means of powerful gas discharge tubes and one adapted filter matrix per pair. Fully shielded type with sockets for DIN rail mounting (up to 1 Gbit Ethernet).

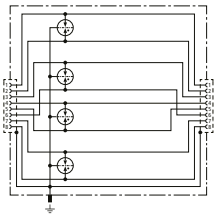


| Type DPA … | M CLE RJ45B 48 |
|---|---|
| Part No. | 929 121 |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 48 V |
| Max. continuous operating voltage (d.c.) pair-pair (PoE) ($U_c$) | 57 V |
| Nominal current ($I_L$) | 1 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 0.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency ($f_G$) | 250 MHz |
| Connection (input / output) | RJ45 socket / RJ45 socket |
| Approvals | CSA, UL |

## DEHNpatch Class D NEW

Universal, space-saving lightning current arrester of 19 mm in width and RJ45 connection system for lightning equipotential bonding. Protection of applications in structured cabling according to class S to 100 MHz; e.g. industrial Ethernet, data distributors, digital camera systems, Power over Ethernet (IEEE 802.3 compliant to 4PPoE) and Ethernet-based interfaces in general. Protection of all pairs through powerful gas discharge tubes. Fully shielded adapter design with RJ45 sockets for DIN rail mounting. With additional screw connection on the enclosure for an optional earth connection.



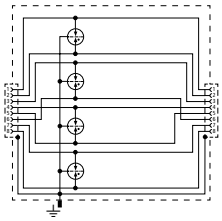


| Type DPA ... | C8 D 4PPOE |
|---|---|
| **Part No.** | **929 166** NEW |
| SPD class | TYPE 1 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 3.3 V |
| Max. continuous operating voltage (d.c.) pair-pair (PoE) ($U_c$) | 58 V |
| Nominal current ($I_L$) | 1.5 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 0.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency ($f_G$) | 100 MHz |
| Connection (input / output) | RJ45 socket / RJ45 socket |

## DEHNpatch Class D

Universal arrester for Industrial Ethernet, Power over Ethernet (IEEE 802.3 compliant up to PoE++ / 4PPoE) and similar applications in structured cabling systems according to class D up to 100 MHz. Protection of all pairs by powerful gas discharge tubes. DIN rail mounted adapter type with sockets.





| Type DPA ... | M CLD RJ45B 48 |
|---|---|
| **Part No.** | **929 126** |
| SPD class | TYPE 2 P2 |
| Max. continuous operating voltage (d.c.) ($U_c$) | 48 V |
| Max. continuous operating voltage (d.c.) pair-pair (PoE) ($U_c$) | 57 V |
| Nominal current ($I_L$) | 1 A |
| D1 Lightning impulse current (10/350 µs) per line ($I_{imp}$) | 0.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency ($f_G$) | 100 MHz |
| Connection (input / output) | RJ45 socket / RJ45 socket |
| Approvals | UL |

**Suitable test devices can be found on page 351.**



## Accessories for DEHNpatch – Arrester for Data Networks and Ethernet Applications

### DPA MOD IRCM

Installation accessories for using the DEHNpatch CL8 EA 4PPOE arrester with the DRC IRCM remote signalling unit for the monitoring and remote signalling of the arrester state.



| Type | DPA MOD IRCM |
|---|---|
| **Part No.** | **929 309** NEW |
| Suitable for | DPA CL8 EA 4PPOE |

### Lightning Protection Pipe Clamp with Tines

Fixing on elements of any cross-section with clamping screw (M8).



| Type | BRS 27.168 Z AK1X10 2X6.8 V2A |
|---|---|
| **Part No.** | **540 200** |
| Clamping range Ø pipe | 27-168 mm (3/4-6'') |
| Material (conductor holder) | StSt |
| Connection Rd | 1-2 x 6-8 mm / 1 x 10 mm |
| Connection (solid / stranded) | 4-50 mm² |

### Tensioning Strap for Pole Mounting

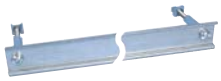
Fixing on elements of any cross-section with clamping screw (M8).



| Type | LH 6.8 SB50.150 SPSM8 V2A |
|---|---|
| **Part No.** | **200 039** |
| Clamping range Ø pipe | 50-150 mm |
| Material (conductor holder) | StSt |

### Mounting Set for DEHNpatch

The set comprises a DIN rail for up to 24 DEHNpatch devices and different distance bolts with sliding nuts for installation into data distributors. To save space, the DIN rail can be mounted at the distributor panel or even upstream of the mounting sections in a 19" grid dimension.



| Type | MS DPA |
|---|---|
| **Part No.** | **929 199** |
| Mounting in | 19" cabinets |

### 482.6 mm (19 inch) Universal DIN Rail Carrier

For 19" technology (3 rack units) or wall mounting.
DIN rail can be mounted vertically or horizontally.



| Type | MF DR 3RU 19" |
|---|---|
| **Part No.** | **929 335** |
| Dimensions | 3 vertical modules |
| Enclosure material | aluminium/zinc sheet / StSt |

### Mounting Set DEHNpatch and DEHNgate

DIN rail mounting set for DEHNpatch and DEHNgate. For individual installation of the arresters.



| Type | MS EB DPA DGA |
|---|---|
| **Part No.** | **929 200** |
| Material (earthing clip) | St/gal Zn |
| Material (flat receptable) | CuZn / Sn |
| Connection cross-section | 0.5-1.5 mm² |

# SPDs for Building Systems

| Description | Type | Product | Part No. | Page |
|---|---|---|---|---|
| **DEHNprotector** | | | | |
| ▪ Combined adapter for protecting the power and data side of a terminal device<br>▪ Different versions for protecting different interfaces<br>▪ With visual operating state / fault indication | **DPRO 230 TV**<br>**DPRO 230 NT**<br>**DPRO 230 LAN100** |  | **909 300**<br>**909 310**<br>**909 321** | 342<br>342<br>342 |
| **BUStector** | | | | |
| ▪ Surge arrester for protecting KNX / EIB systems<br>▪ Optimally adapted to KNX / EIB systems<br>▪ EIBA-approved | **BT 24** |  | **925 001** | 342 |
| **DEHNbox** | | | | |
| ▪ Compact surge arrester in a surface-mounted plastic enclosure<br>▪ Powerful protection for telecommunication interfaces at the boundaries from LPZ $0_A$ to 2<br>▪ Suitable for wall mounting IP20 | **DBX TC B 180** |  | **922 220** | 343 |
| **DEHNbox actiVsense** | | | | |
| ▪ Wall-mounted universal lightning current and surge arrester<br>▪ Integrated actiVsense technology<br>▪ Easy installation and retrofitting | **DBX U4 KT BD S 0-180** |  | **922 400** | 343 |

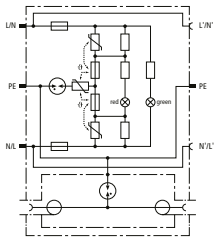
## DEHNprotector – Combined Adapter

Combined surge protective adapter for plugging into earthed socket outlets, with visual operating state and fault indication.

### DPRO 230 TV

Combined surge protection for the power and antenna side of TV, radio or satellite receivers. With visual operating state and fault indication and integrated child safety mechanism





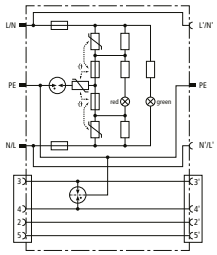

| Type DPRO 230 ... | TV |
|---|---|
| **Part No.** | **909 300** |
| **Protection of the data side** | |
| SPD class | TYPE 2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 60 V |
| C2 Nominal discharge current (8/20 µs) line-shield (PE) ($I_n$) | 5 kA |
| Insertion loss 0-2400 MHz | ≤ 1.5 dB |
| Connection (input / output) | F socket / F socket |

| Type DPRO 230 ... | TV |
|---|---|
| **Part No.** | **909 300** |
| **Protection of the power side** | |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] ($U_p$) | ≤ 1.35 kV |
| Max. mains-side overcurrent protection | 16 A gL/gG or B 16 A |

### DPRO 230 NT

Combined surge protection for the power and data side of a digital network termination (NT) (IP telephony), especially telecommunication interfaces up to VVDSL and G.fast (up 1 Gbit/s). With visual operating state and fault indication and an integrated child lock on the power side.





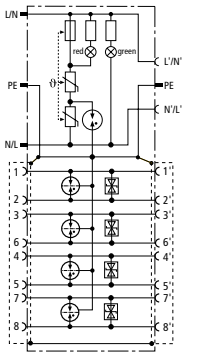

| Type DPRO 230 ... | NT |
|---|---|
| **Part No.** | **909 310** |
| **Protection of the data side** | |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Lightning impulse current (10/350 µs) per line D1 ($I_{imp}$) | 1 kA |
| C2 Nominal discharge current (8/20 µs) per line ($I_n$) | 2.5 kA |
| Cut-off frequency ($f_G$) | 220 MHz |
| Connection (input / output) | RJ12 socket / RJ12 socket |

| Type DPRO 230 ... | NT |
|---|---|
| **Part No.** | **909 310** |
| **Protection of the power side** | |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] ($U_p$) | ≤ 1.35 kV |
| Max. mains-side overcurrent protection | B 16 A |

### DPRO 230 LAN100

Combined surge protection for the power side and data input for protecting LAN components. Protection of all pairs for Ethernet pin assignment.
It meets the requirements for channel class D in accordance with EN 50173 and is thus suitable for 1000 Base-T (Gigabit Ethernet). With visual operating state and fault indication and integrated child safety mechanism.






| Type DPRO 230 ... | LAN100 |
|---|---|
| **Part No.** | **909 321** |
| **Protection of the data side** | |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 3.3 V |
| Lightning impulse current (10/350 µs) per line D1 ($I_{imp}$) | 0.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Cut-off frequency ($f_G$) | 180 MHz |
| Connection (input / output) | shielded RJ45 socket / shielded RJ45 socket |

| Type DPRO 230 ... | LAN100 |
|---|---|
| **Part No.** | **909 321** |
| **Protection of the power side** | |
| SPD according to EN 61643-11 / IEC 61643-11 | type 3 / class III |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V (50 / 60 Hz) |
| Total discharge current (8/20 µs) [L+N-PE] ($I_{total}$) | 5 kA |
| Voltage protection level [L-N] ($U_p$) | ≤ 1.25 kV |
| Max. mains-side overcurrent protection | B 16 A |

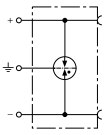
## BUStector

Surge arrester for KNX / EIB buses with connecting leads

### BT

Surge arrester with KNX bus terminal design, adapted to the immunity of KNX / EIB systems. EIBA-certified.





| Type | BT 24 |
|---|---|
| **Part No.** | **925 001** |
| SPD class | TYPE 2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 45 V |
| Nominal current ($I_L$) | 6 A |
| D1 Lightning impulse current (10/350 µs) per line | 1 kA |
| C2 Nominal discharge current per line ($I_n$) | 5 kA |
| Cut-off frequency line-line ($f_G$) | 70 MHz |
| Approvals | EIBA-Zertifizierung Nr. Z 32/1399/95 |

# SPDs for Building Systems

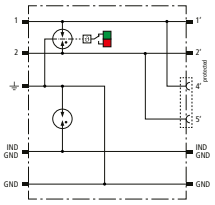
## DEHNbox

Compact combined arrester with status display and quick connection technology in a surface-mounted plastic enclosure for protecting telecommunication (VDSL, VVDSL, SVVDSL and G.Fast) and information technology interfaces.

### DBX TC B 180



Space-saving, compact surge arrester in a surface-mounted plastic enclosure with push-in connection technology and status indication for protecting one pair of unearthed balanced interfaces, particularly telecommunication interfaces up to VVDSL and G.fast (up to 1 Gbit/s). Direct / indirect shield earthing possible. Connection of a pair or a patch cable with RJ45 plug at the output.
Tests by Deutsche Telekom Technik GmbH confirm compatibility with vectoring VDSL (VVDSL), super vectoring VDSL (SVVDSL) and G.Fast.

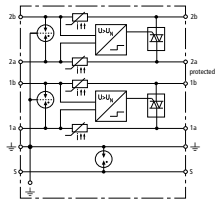


| Type DBX ... | TC B 180 |
|---|---|
| **Part No.** | **922 220** |
| SPD class | TYPE 1 P2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Nominal current at 40°C ($I_L$) | 1 A |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 7.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | 0 ohms |

### DBX U4 KT BD S 0-180



Compact combined lightning current and surge arrester in a surface-mounted plastic enclosure with actiVsense technology for protecting two pairs with the same or a different signal voltage of galvanically isolated balanced interfaces. Direct or indirect shield earthing.



| Type DBX ... | U4 KT BD S 0-180 |
|---|---|
| **Part No.** | **922 400** |
| SPD class | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V |
| Permissible superimposed signal voltage ($U_{signal}$) | ≤ +/- 5 V |
| Cut-off frequency line-line ($U_{signal}$, balanced 100 ohms) ($f_G$) | 50 MHz |
| Nominal current $I_L$ (equals max. short-circuit current) | 100 mA |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 10 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Series resistance per line | ≤ 9 ohms; typically 7.9 ohms |
| Dimensions (L x W x H) | 93 x 93 x 55 mm |

## Accessories for DEHNbox

### TAE-F connecting cable



TAE-F connecting cable with TAE-F plug on RJ11 plug

| Type | ASL DBX TAE F |
|---|---|
| **Part No.** | **922 020** |
| Conductor length | 3 m |
| Type of connection | TAE-F / RJ11 |

# SPDs for SUB-D Connection

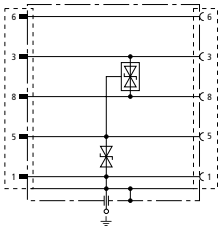
## FS

Surge arrester, SUB-D socket/pin.
Alternative pinning available on request for the USD series.

### FS 9E PB



Surge arrester for Profibus-DP. 9-pin SUB-D version, pin 6 unprotected for the programming interface.



| Type | FS 9E PB 6 |
|---|---|
| **Part No.** | **924 017** |
| SPD class | TYPE 4 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 7 V |
| C1 Nominal discharge current (8/20 µs) line-line ($I_n$) | 0.2 kA |
| C1 Nominal discharge current (8/20 µs) line-SG ($I_n$) | 0.2 kA |
| C1 Nominal discharge current (8/20 µs) SG-PG ($I_n$) | 0.4 kA |
| Cut-off frequency ($f_G$) | 90 MHz |
| Connection (input / output) | SUB-D 9 plug / SUB-D 9 socket |

# SPDs for Coaxial Connection

| Description | Type | Product | Part No. | Page |
|---|---|---|---|---|
| **UGKF BNC** | | | | |
| ▪ Easily adaptable<br>▪ With indirect shield earthing to avoid ground loops<br>▪ Protection of video cameras | **UGKF BNC** |  | **929 010** | 345 |
| **DEHNgate BNC VC** | | | | |
| ▪ Easily adaptable<br>▪ For DIN rail or wall mounting<br>▪ With direct or indirect shield earthing | **DGA BNC VCD**<br>**DGA BNC VCID** |  | **909 710**<br>**909 711** | 345<br>345 |
| **DEHNgate FF / GF / GFF TV** | | | | |
| ▪ Combinable system of lightning current and surge arresters<br>▪ With F connection for 75-ohm satellite and broadband cable systems<br>▪ Integrated measuring output | **DGA FF TV**<br>**DGA GF TV**<br>**DGA GFF TV** |  | **909 703**<br>**909 704**<br>**909 705** | 345<br>345<br>345 |
| **DEHNgate 5X FF TV** | | | | |
| ▪ Compact surge arrester for satellite systems<br>▪ Optimal five-channel protection for 75-ohm antenna splitters and multi-switches<br>▪ Fulfils the shielding requirements of class A acc. to EN 50083-2 | **DGA FF5 TV** |  | **909 706** | 345 |
| **DEHNgate G** | | | | |
| ▪ Compact dimensions<br>▪ Wide transmission range<br>▪ With SMA, BNC or N connection | **DGA G SMA**<br>**DGA G BNC**<br>**DGA G N** |  | **929 039**<br>**929 042**<br>**929 044** | 346<br>346<br>346 |
| **DEHNgate AG** | | | | |
| ▪ Exchangeable gas discharge tube<br>▪ Long endurance | **DGA AG BNC**<br>**DGA AG N** |  | **929 043**<br>**929 045** | 346<br>346 |
| **DEHNgate LG / L4** | | | | |
| ▪ Wide transmission range for multi-frequency applications<br>▪ Integrated quarterwave technology<br>▪ With 7/16 or N connection | **DGA LG 7 16 MFA**<br>**DGA L4 7 16 S**<br>**DGA L4 7 16 MFA** |  | **929 146**<br>**929 047**<br>**929 148** | 346<br>346<br>346 |

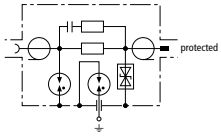
## UGKF

Surge arrester designed as cable adapter for coaxial systems such as video and camera systems

### UGKF BNC

Two-stage surge arrester with indirect shield earthing for protecting video cameras and Arcnet with BNC connection to avoid ground loops.






| Type | UGKF BNC |
|---|---|
| **Part No.** | **929 010** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 8 V |
| Nominal current ($I_L$) | 0.1 A |
| C2 Nominal discharge current (8/20 µs) line-shield ($I_n$) | 2.5 kA |
| Insertion loss at 300 MHz (50 ohms) | ≤ 3 dB |
| Return loss at 40 MHz (50 ohms) | ≥ 20 dB |
| Insertion loss at 265 MHz (75 ohms) | ≤ 3 dB |
| Return loss at 40 MHz (75 ohms) | ≥ 20 dB |
| Approvals | CSA, UL |

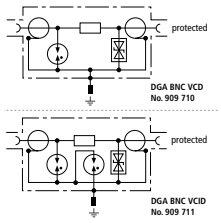
## DEHNgate – SPDs for Coaxial Connection

Lightning current / surge arrester with a cable adapter design for coaxial systems such as CCTV, cell sites and antenna systems

### DGA BNC VC

The space-saving surge arrester with BNC socket can be mounted on DIN rails for protecting video and camera systems. Available with direct (VCD) or indirect shield connection (VCID) depending on the type to avoid ground loops.



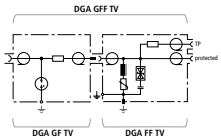



| Type DGA ... | BNC VCD | BNC VCID |
|---|---|---|
| **Part No.** | **909 710** | **909 711** |
| SPD class | TYPE 2 P1 | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 6.4 V | 6.4 V |
| Nominal current ($I_L$) | 0.1 A | 0.1 A |
| D1 Lightning impulse current (10/350 µs) ($I_{imp}$) | 1 kA | 1 kA |
| C2 Nominal discharge current (8/20 µs) line-shield ($I_n$) | 5 kA | 5 kA |
| Frequency range | 0-300 MHz | 0-300 MHz |
| Connection (input / output) | BNC socket / BNC socket | BNC socket / BNC socket |
| Approvals | CSA, UL | CSA, UL |

### DGA TV

DGA ... TV arresters with F connection for remote supply protect 75-ohm satellite and broadband cable systems and fulfil the high shielding requirements of class A according to EN 50083-2. They allow space-saving installation in all common TV and satellite applications and are available as lightning current arresters, surge arresters and combined lightning current and surge arresters with integrated measuring output for checking the system.






| General technical data: | |
|---|---|
| Nominal current ($I_L$) | 2 A |

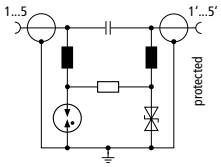
| Type DGA ... | FF TV | GF TV |
|---|---|---|
| **Part No.** | **909 703** | **909 704** |
| SPD class | TYPE 3 P1 | TYPE 1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 24 V | 60 V |
| D1 Lightning impulse current (10/350 µs) ($I_{imp}$) | 0.2 kA | 2.5 kA |
| C2 Nominal discharge current (8/20 µs) ($I_n$) | 1.5 kA | 10 kA |
| Frequency range | d.c. / 5-3000 MHz | 0-2400 MHz |
| Connection (input / output) | F socket / F socket | F socket / F plug |

| Type DGA ... | GFF TV |
|---|---|
| **Part No.** | **909 705** |
| SPD class | TYPE 1 TYPE 3 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 24 V |
| D1 Lightning impulse current (10/350 µs) ($I_{imp}$) | 2.5 kA |
| C2 Nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Frequency range | d.c. / 5-2400 MHz |
| Connection (input / output) | F socket / F socket |

### DGA FF5 TV

Five-channel surge arrester for 75-ohm antenna systems. Special design for SAT antenna splitters and multi-switches. The arrester fulfils the shielding requirements of class A acc. to EN 50083-2. Fixing material and EB conductor included in delivery.

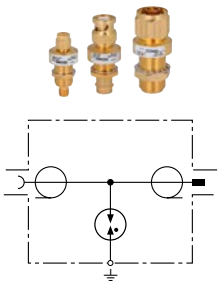





| Type DGA ... | FF5 TV |
|---|---|
| **Part No.** | **909 706** |
| SPD class | TYPE 2 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 20 V |
| Nominal current ($I_L$) | 0.4 A |
| D1 Lightning impulse current (10/350 µs) ($I_{imp}$) | 0.5 kA |
| D1 Total lightning impulse current (10/350 µs) ($I_{imp}$) | 2.5 kA |
| C2 Nominal discharge current (8/20 µs) ($I_n$) | 2.5 kA |
| C2 Total nominal discharge current (8/20 µs) ($I_n$) | 10 kA |
| Frequency range | 47-2200 MHz |
| Connection (input / output) | F socket / F socket |

## DGA G

Surge arrester for remote supply with integrated gas discharge tube. Ideally suited for wireless applications for the coaxial interfaces of devices and antennas. Available with SMA, BNC or N connection for bushing installation.



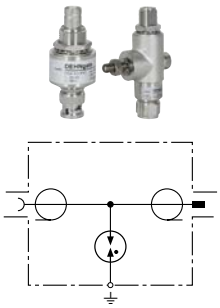
| General technical data: | |
|---|---|
| SPD class | TYPE 2 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 135 V |
| D1 Lightning impulse current (10/350 µs) ($I_{imp}$) | 1 kA |
| C2 Nominal discharge current (8/20 µs) ($I_n$) | 5 kA |

| Type DGA ... | G SMA | G BNC |
|---|---|---|
| **Part No.** | **929 039** | **929 042** |
| Nominal current ($I_L$) | 2 A | 3.5 A |
| Max. transmission capacity | 60 W | 25 W |
| Frequency range | 0-5.8 GHz | 0-4 GHz |
| Connection | SMA socket / SMA plug | BNC socket / BNC plug |

| Type DGA ... | G N |
|---|---|
| **Part No.** | **929 044** |
| Nominal current ($I_L$) | 6 A |
| Max. transmission capacity | 60 W |
| Frequency range | 0-5.8 GHz |
| Connection | N socket / N plug |

## DGA AG

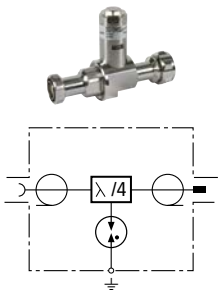
Arrester suitable for remote supply with exchangeable gas discharge tube. Long endurance due to minimum contact erosion resulting from the large-area contact surface of the gas discharge tube.



| Type DGA ... | AG BNC | AG N |
|---|---|---|
| **Part No.** | **929 043** | **929 045** |
| SPD class | TYPE 1 | TYPE 1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 180 V | 180 V |
| Nominal current ($I_L$) | 3.5 A | 6 A |
| Max. transmission capacity | 150 W | 150 W |
| D1 Lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA | 5 kA |
| C2 Nominal discharge current (8/20 µs) ($I_n$) | 20 kA | 20 kA |
| Frequency range | 0-1 GHz | 0-2.5 GHz |
| Connection | BNC socket / BNC plug | N socket / N plug |

## DGA LG

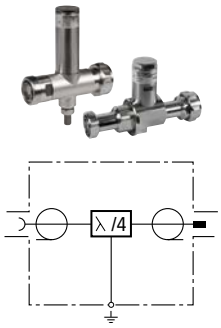
Quarter-wave arrester with spark gap for remote supply protects multi-frequency applications (multi-carrier systems) due to minimum passive intermodulation. Broadband device for all 4+3G and LTE services.




| Type DGA ... | LG 7 16 MFA |
|---|---|
| **Part No.** | **929 146** |
| SPD class | TYPE 1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 65 V |
| Nominal current ($I_L$) | 13 A |
| Max. transmission capacity | 1500 W |
| D1 Lightning impulse current (10/350 µs) ($I_{imp}$) | 5 kA |
| C2 Nominal discharge current (8/20 µs) ($I_n$) | 20 kA |
| Frequency range | 690 MHz-2.7 GHz |
| Connection | 7/16 socket / 7/16 plug |

## DGA L4

Combined lightning current and surge arrester with maintenance-free quarter-wave technology for multi-frequency applications (multi-carrier systems). The arrester is also capable of discharging high partial lightning currents. No remote supply as the arrester represents an electrical short-circuit for low-frequency signals. Broadband device for all 4+3G services.




| Type DGA ... | L4 7 16 S | L4 7 16 MFA |
|---|---|---|
| **Part No.** | **929 047** | **929 148** |
| SPD class | TYPE 1 P1 | TYPE 1 P1 |
| Max. continuous operating voltage (d.c.) ($U_C$) | 0 V | 0 V |
| Nominal current ($I_L$) | 0 A | 0 A |
| Max. transmission capacity | 3000 W | 1500 W |
| D1 Lightning impulse current (10/350 µs) ($I_{imp}$) | 25 kA | 40 kA |
| C2 Nominal discharge current (8/20 µs) ($I_n$) | 50 kA | 80 kA |
| Frequency range | 380-512 MHz | 690 MHz-2.7 GHz |
| Connection | 7/16 socket / 7/16 plug | 7/16 socket / 7/16 plug |

## Accessories for DEHNgate – SPDs for Coaxial Connection

### Mounting Set DEHNpatch and DEHNgate



DIN rail mounting set for DEHNpatch and DEHNgate. For individual installation of the arresters.

| Type | MS EB DPA DGA |
|---|---|
| **Part No.** | **929 200** |
| Material (earthing clip) | **St/gal Zn** |
| Material (flat receptable) | **CuZn / Sn** |
| Connection cross-section | 0.5-1.5 mm² |

### Gas Discharge Tube for DEHNgate



Lightning current carrying replacement gas discharge tube for DEHNgate arresters. High quality with extremely low capacitance.

| General technical data: | |
|---|---|
| Lightning impulse current carrying capability (10/350 µs) | 5 kA |

| Type | GDT DGA 90 | GDT DGA 230 |
|---|---|---|
| **Part No.** | **929 497** | **929 498** |

| Type | GDT DGA 470 |
|---|---|
| **Part No.** | **929 499** |

### Cable Lug with Earthing Conductor



Cable lug with highly flexible black copper earthing conductor for earthing DEHNgate arresters (Part Nos. 929 043, 929 044 or 929 045).

| Type | EL 16 B17 |
|---|---|
| **Part No.** | **929 096** |
| Colour | Black ● |
| Length | 1000 mm |

### Earthing Block 4xF



Four-pole earthing block with F sockets for equipotential bonding of satellite cable shields or DGA GF TV lightning current arresters.

| Type | EB 4 F |
|---|---|
| **Part No.** | **929 095** |
| D1 Lightning impulse current (10/350 µs) | 10 kA |

### Fixing bracket for DEHNgate



Suitable for the installation of a DEHNgate, part no. 929 045, 929 146, 929 047, 929 148. Drill hole Ø11 mm.

| Type | BW90 B11 B5.1 6.5 11 V2A |
|---|---|
| **Part No.** | **106 310** |
| Material | StSt |

### Fixing bracket for DEHNgate



Suitable for installing a DEHNgate arrester (Part Nos. 929 043 - 929 045), anti-rotation borehole (Ø16 mm).

| Type | BW90 B16 B5.1 6.5 11 V2A |
|---|---|
| **Part No.** | **106 314** |
| Material | StSt |

### Fixing bracket for HF Arresters



With three boreholes for three different sizes of DEHNgate,
e.g. 1x 929 042 + 1x 929 057 + 1x (929 043, 929 044, 929 045 or 929 059).

| Type | BW90 B17 21 16 V2A |
|---|---|
| **Part No.** | **106 329** |
| Material | StSt |

### Equipotential Bonding Busbar for industrial Use



Suitable for 3x DEHNgate (Part Nos. 929 045, 929 047, 929 146, 929 148).

| Type | PAS I 6AP M10 V2A |
|---|---|
| **Part No.** | **472 209** |
| Material | StSt |

### Earthing Conductor, open / closed Cable Lugs



Cable lug 1x open (M8/M10) and 1x closed (M8), can be combined with Part Nos. 106 310, 106 314, 106 329 and 472 209.

| Type | EL16 L1.05M 1KSO 8.10 1KSG 8 |
|---|---|
| **Part No.** | **416 411** |
| Colour | Black ● |
| Length | 1050 mm |
| Stock No. | 6150-12-308-6934 |

# Shield Connection Systems and Enclosures

| Description | Type | Product | Part No. | Page |
|---|---|---|---|---|
| **Shield connection on anchor bars** | | | | |
| ▪ Shield terminals for earthing cable shields on anchor bars<br>▪ Different versions for different cable diameters<br>▪ Lightning current carrying system | **SAK ... AS V4A** |  | **308 403**<br>–<br>**308 408** | 349 |
| ▪ Mounting rail for earthing and fixing shield terminals<br>▪ Can be cut to length according to requirements | **AS SAK 1000 V2A** |  | **308 421** | 349 |
| **Shield connection on DIN rails** | | | | |
| ▪ Shield terminals for earthing cable shields on DIN rails<br>▪ Different versions for different cable diameters<br>▪ Lightning current carrying system | **SAK 6.5 SN MS**<br>**SAK 11 SN MS** |  | **919 010**<br>**919 011** | 349<br>349 |
| ▪ DIN rail mounted rail support<br>▪ Low-impedance connection of the shield terminals to the DIN rail via the busbar | **SH1 18X3 ST** |  | **919 012** | 349 |
| ▪ Busbar for shield terminals<br>▪ Can be mounted onto busbar supports<br>▪ Can be cut to length according to requirements | **SN 18X3 CU 1000** |  | **919 016** | 349 |
| **Shield connection for cables** | | | | |
| ▪ Constant force spring for solderless shield connection for equipotential bonding<br>▪ Different versions for different cable diameters<br>▪ Lightning current carrying system | **SA KRF ... V2A** |  | **919 031**<br>–<br>**919 038** | 350 |
| **Enclosure** | | | | |
| ▪ Aluminium enclosure for DIN rail mounted devices<br>▪ IP 65 degree of protection<br>▪ Version for arresters for use in intrinsically safe measuring circuits Ex (i) | **ALGA 5**<br><br>**ALGA 5X** |  <br>  | **906 055**<br><br>**906 058** | 350<br><br>350 |

## Shield Connection on Anchor Bars

Shield connection system for anchor bars which is capable of carrying lightning currents. A slipping spring element compensates the yield of the cable materials used.

### Shield Terminals



Shield terminals for earthing cable shields on anchor bars. Suitable for lightning equipotential bonding. Can be subsequently installed without interrupting the cable shield or requiring tools for installation.



| General technical data: | |
|---|---|
| Lightning impulse current carrying capability (10/350 µs) | 10 kA |
| Material | StSt |
| For mounting on | anchor bars |

| Type | SAK 10 AS V4A | SAK 14 AS V4A |
|---|---|---|
| Part No. | 308 403 | 308 404 |
| Clamping range (Rd) | 5-10 mm | 8-14 mm |
| Dimensions (W x L x H) | 16 x 40 x 48 mm | 19.5 x 40 x 50 mm |

| Type | SAK 18 AS V4A | SAK 21 AS V4A |
|---|---|---|
| Part No. | 308 405 | 308 406 |
| Clamping range (Rd) | 13-18 mm | 17-21 mm |
| Dimensions (W x L x H) | 24 x 40 x 56 mm | 29 x 40 x 59 mm |

| Type | SAK 26 AS V4A | SAK 33 AS V4A |
|---|---|---|
| Part No. | 308 407 | 308 408 |
| Clamping range (Rd) | 19-26 mm | 25-33 mm |
| Dimensions (W x L x H) | 36.5 x 40 x 74 mm | 45 x 40 x 82 mm |

### Anchor Bar



Mounting rail for earthing and fixing shield terminals.



| Type | AS SAK 1000 V2A |
|---|---|
| Part No. | 308 421 |
| Material | StSt |
| Dimensions (W x L x H) | 29 x 1000 x 15 mm |

### Insulated Busbar Support



Insulated busbar support for fixing AS SAK 1000 V2A anchor bars, with M4 threaded bushing.



| Type | ST AS SAK K |
|---|---|
| Part No. | 308 425 |
| Material | plastic |

### Terminal



For connecting equipotential bonding conductors to AS SAK 1000 V2A anchor bars.



| Type | AK 16 AS SAK MS |
|---|---|
| Part No. | 308 411 |
| Cross-sectional area, solid | 16 mm² |
| For mounting on | anchor bars |

## Shield Connection on DIN Rails

DIN rail mounted shield connection system which is capable of carrying lightning currents, particularly suited for smaller cables. Slipping spring element compensates the yield of the cable materials.

### Shield Terminals



Shield terminals for earthing cable shields on busbars (18x3). Suitable for lightning equipotential bonding. Can be subsequently installed without interrupting the cable shield or requiring tools for installation.



| Type | SAK 6.5 SN MS | SAK 11 SN MS |
|---|---|---|
| Part No. | 919 010 | 919 011 |
| Lightning impulse current carrying capability (10/350 µs) | 5 kA | 5 kA |
| Clamping range (Rd) | 1.5-6.5 mm | 5-11 mm |
| Material | nickel-plated brass | nickel-plated brass |
| For mounting on | SN 18x3 CU 1000 | SN 18x3 CU 1000 |
| Dimensions (W x L x H) | 10 x 25 x 40 mm | 17 x 25 x 47 mm |

### Busbar



Mounting rail for shield terminals. Can be mounted onto busbar supports.



| Type | SN 18X3 CU 1000 |
|---|---|
| Part No. | 919 016 |
| Material | tin-plated copper |
| For mounting on | busbar supports |
| Dimensions (W x L x H) | 18 x 1000 x 3 mm |

### Rail Support with One-Sided Contact

Rail support suitable for DIN rail mounting. Low-impedance connection of the shield terminals to the DIN rail via the busbar.



| Type | SH1 18X3 ST |
|---|---|
| Part No. | 919 012 |
| Version | one-sided contact |
| Material | tin-plated steel |
| For mounting on | 35 mm DIN rails acc. to EN 60715 |

### Insulated Rail Support



Insulated rail support for DIN rail mounting or screw connection.



| Type | SH 18X3 K |
|---|---|
| Part No. | 919 014 |
| Material | plastic |
| Colour | black ● |
| For mounting on | DIN rails or mounting plates |

### Terminal



Particularly suited for indirect shield earthing.



| Type | AK 35 SN 18X3 GG |
|---|---|
| Part No. | 919 015 |
| Cross-sectional area | 35 mm² |
| For mounting on | busbars |

## Shield Connection for Cables

Extremely space-saving shield connection system in the form of a constant force spring. A spring element compensates the yield of the cable materials used.

### Constant Force Spring

Constant force springs allow solderless shield connections for equipotential bonding or lightning equipotential bonding. They can be installed subsequently without interrupting the cable shield or requiring tools for installation.



| General technical data: | |
|---|---|
| Lightning impulse current carrying capability (10/350 µs) | 10 kA |
| Colour | bare surface |
| For mounting on | cable shields |

| Type | SA KRF 10 V2A | SA KRF 15 V2A |
|---|---|---|
| Part No. | 919 031 | 919 032 |
| Clamping range (Rd) | 4-10 mm | 9-15 mm |

| Type | SA KRF 22 V2A | SA KRF 29 V2A |
|---|---|---|
| Part No. | 919 033 | 919 034 |
| Clamping range (Rd) | 14-22 mm | 18.5-29 mm |

| Type | SA KRF 37 V2A | SA KRF 50 V2A |
|---|---|---|
| Part No. | 919 035 | 919 036 |
| Clamping range (Rd) | 23.5-37 mm | 31-50 mm |

| Type | SA KRF 70 V2A | SA KRF 94 V2A |
|---|---|---|
| Part No. | 919 037 | 919 038 |
| Clamping range (Rd) | 44-70 mm | 58-94 mm |

### Self-bonding Rubber Tape

Roll with 9 m self-bonding rubber tape to be wrapped around constant force springs for permanent corrosion protection.



| Type | SKB 19 9M SW |
|---|---|
| Part No. | 919 030 |
| Colour | black ● |
| Tape dimensions (W x L) | 19 mm x 9 m |

## Enclosure and Protective Conductor Terminal

- High-quality accessories
- Suitable for DIN rail mounted arresters

### Aluminium Enclosure

For the installation of DIN rail mounted devices. With two M20 brass glands.



| Type | ALGA 5 |
|---|---|
| Part No. | 906 055 |
| Degree of protection | IP 65 |
| For mounting on | walls |
| Dimensions (W x H x D) | 100 x 200 x 81 mm |
| Enclosure material | Al |

### Aluminium Enclosure for Ex(i) Surge Arresters

With four plastic glands M20 x 1.5, sealable, pressure compensating grommets.



| Type | ALGA 5 X |
|---|---|
| Part No. | 906 058 |
| Degree of protection | IP 65 |
| For mounting on | walls |
| Dimensions (W x H x D) | 160 x 100 x 85 mm |
| Enclosure material | Al |

### Protective Conductor Terminal

For earthing DIN rails



| Type | SLK 16 |
|---|---|
| Part No. | 910 099 |
| Cross-sectional area, flexible | 6-16 mm² |
| Cross-sectional area, solid | 6-25 mm² |
| For mounting on | DIN rails acc. to EN 60715 |
| Enclosure material | polyamide 6.6 |

# Measuring and Test Devices

| Description | Type | Product | Part No. | Page |
|---|---|---|---|---|
| **Condition Monitoring System LifeCheck for BLITZDUCTORconnect** | | | | |
| ▪ Condition monitoring of BLITZDUCTORconnect arresters with integrated LifeCheck<br>▪ Fast and easy installation and initial operation (no addressing of arresters)<br>▪ Remote signalling via floating remote signalling contact (nc) | **DRC IRCM** |  | **910 710** | 352 |
| **Condition Monitoring System with RFID LifeCheck** | | | | |
| ▪ Condition monitoring of BLITZDUCTOR XT arresters with RFID LifeCheck<br>▪ Monitoring of up to 10 BXT via a DRC MCM XT and networking of up to 15 DRC MCM XT<br>▪ Remote signalling via remote signalling contact (no/nc) or optional RS485 interface | **DRC MCM XT** |  | **910 695** | 352 |
| ▪ Condition monitoring of BLITZDUCTOR XT arresters with RFID LifeCheck<br>▪ Monitoring of up to 10 BXT<br>▪ Remote signalling via remote signalling contact (nc) | **DRC SCM XT** |  | **910 696** | 352 |
| **DEHNrecord Alert** | | | | |
| ▪ Communication of the arrester status via Modbus TCP / RTU<br>▪ Monitoring of up to 4 arresters (e.g. Red/Line) via remote signalling contact and up to 150 BLITZDUCTOR XT arresters<br>▪ Integration of the remote signalling contacts of further functional modules in the monitoring system | **DRC AL MODBUS** |  | **910 694** | 353 |
| ▪ Condition monitoring of BLITZDUCTOR XT arresters with RFID LifeCheck<br>▪ Monitoring of up to 10 BXT via a DRC MCM AL XT and networking of up to 15 DRC MCM AL XT<br>▪ Communication of the arrester status to a higher-level control system via DRC AL MODBUS | **DRC MCM AL XT** |  | **910 698** | 353 |
| **RFID LifeCheck SPD Test Devices** | | | | |
| ▪ Portable arrester test device for preventive maintenance of BLITZDUCTOR XT modules<br>▪ Possibility of addressing and reseting BLITZDUCTOR XT modules for monitoring via DRC MCM/SCM XT<br>▪ Interface and software for database-based testing and documentation | **DRC LC M3+** |  | **910 653** | 353 |
| ▪ Portable arrester test device for preventive maintenance of BLITZDUCTOR XT modules<br>▪ Fast and easy testing of arresters with RFID LifeCheck<br>▪ Simple and intuitive operations | **DRC LC M1+** |  | **910 655** | 353 |
| **SPD Test Device** | | | | |
| ▪ Combined device for testing the sparkover voltage of surge arresters<br>▪ Preventive testing of Red/Line and Yellow/Line arresters<br>▪ Suitable for routine testing of surge protective devices | **PM 20** |  | **910 511** | 354 |

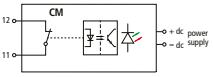
## LifeCheck condition monitoring system

- Condition monitoring of BLITZDUCTORconnect and DEHNpatch arresters with integrated LifeCheck
- Quick and simple installation and initial operation (without addressing arresters)
- Remote signalling via floating remote signalling contact (break contact)

### DRC IRCM

Condition monitoring unit DEHNrecord, set for DIN rail mounted devices with integrated visual transmitter/receiver and visual reverse BLITZDUCTORconnect arresters and DEHNpatch with LifeCheck. Visual arrester status indication via LED group display in combination with remote signalling contact (break contact).






| Type | DRC IRCM |
|---|---|
| **Part No.** | **910 710** |
| Input voltage range (d.c.) ($U_{IN}$) | 6-35 V d.c. |
| Max. rated current consumption ($I_{IN}$) | ≤ 10 mA |
| Operating temperature range ($T_U$) | -30 °C ... +70 °C |
| Approvals | UL, CSA, ATEX, IECEx, CCC |

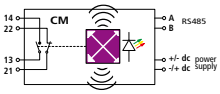
## Condition Monitoring System with RFID LifeCheck Sensor

Maximum protection and availability of installations due to permanent condition monitoring of LifeCheck-equipped arresters.

### DRC MCM XT

DIN rail mounted device with integrated RFID LifeCheck sensor for condition monitoring of max. 10 BLITZDUCTOR XT / XTU arresters with RFID LifeCheck technology. Visual operating state indication via three-coloured LED in conjunction with remote signalling contact (break or make contact). Up to 15 DRC MCM XT can be monitored via the integrated RS485 interface in a system with up to 150 BLITZDUCTOR XT/ XTU arresters. The free "Status Display and Service Console" software can be optionally used via an RS485 interface converter. The software allows PC-based remote indication of the condition of all monitored arresters. Download: www.dehn-international.com (Service section)



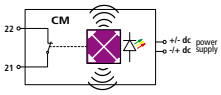



| Type DRC ... | MCM XT |
|---|---|
| **Part No.** | **910 695** |
| Input voltage range (d.c.) ($U_{IN}$) | 18-48 V |
| Max. rated current consumption ($I_{IN}$) | 100 mA |
| RFID transmission frequency | 125 kHz |
| Type of remote signalling contact | make (no) and break contact (nc) |
| Delivery includes | base part, monitoring module, quick guide and labelling system |

### DRC SCM XT

DIN rail mounted device with integrated RFID LifeCheck sensor for condition monitoring of up to ten BLITZDUCTOR XT / XTU arresters with RFID LifeCheck technology. Visual operating state indication via three-colour LED combined with remote signalling function (break contact).






| Type DRC ... | SCM XT |
|---|---|
| **Part No.** | **910 696** |
| Input voltage range (d.c.) ($U_{IN}$) | 18-48 V |
| Max. rated current consumption ($I_{IN}$) | 100 mA |
| RFID transmission frequency | 125 kHz |
| Type of remote signalling contact | break contact (nc) |
| Delivery includes | base part, monitoring module, quick guide and labelling system |

## Accessories for Condition Monitoring System with RFID LifeCheck Sensor

### DIN Rail Mounted Power Supply Unit

Robust power supply in the DIN-rail-mounted enclosure with single-phase, wide-range input for operation in a wide variety of supply systems. The operating state indication on the front side signals the availability of the output voltage. Supply of stationary condition-monitoring devices from the DEHNrecord product range (DRC SCM XT / DRC MCM XT / DRC IRCM / DRC SD 2 1).



| Type | PSU DC24 30W |
|---|---|
| **Part No.** | **910 499** |
| Input voltage range | AC 85-264 V; DC 120-373 V |
| Frequency | 44-66 Hz; 0 Hz |
| Input current ($I_e$) | 0.7 A at AC 110 V / 0.5 A at AC 230 V |
| Output nominal voltage ($U_a$) | DC 24 V (SELV) |
| Output current ($I_a$) | 1.3 A at DC 24 V, max. 0.9 A at any installation position |
| Recommended backup fuse | circuit breaker 10 A, 16 A, characteristic B, C |
| Standards / regulations | EN 60950, EN 61204-3, UL 60950, UL 508, GL |

### USB Interface Converter of Type USB NANO 485

USB NANO 485 converts between USB and RS485 signals and is specifically designed for two-wire RS-485 buses. LEDs indicate the operating state (yellow), Rx (green) and Tx (red). Due to its compact dimensions, USB NANO 485 is ideally suited for use with notebooks, however, stationary use is also possible.



| Type | USB NANO 485 |
|---|---|
| **Part No.** | **910 486** |
| Version | with LED indication |

### Labelling System BA1-BA15

2x 165 adhesive labels for labelling DRC MCM XT monitoring devices with the bus address.



| Type | BS BA1 BA15 BXT |
|---|---|
| **Part No.** | **920 398** |
| Colour | transparent |

### Partition

Allows devices of the BXT family for non-intrinsically safe circuits to be positioned directly next to intrinsically safe circuits (clearance ≥ 50 mm).
For DRC MCM XT and DRC SCM XT;
(1 pack = 2 pieces).



| Type | TW DRC MCM EX |
|---|---|
| **Part No.** | **910 697** |
| Colour | blue |
| For mounting on | 35 mm DIN rails acc. to EN 60715 |

## DEHNrecord Alert

DEHNrecord Alert sends status reports on surge protective devices (SPDs) via Modbus TCP/RTU to an evaluation system. It enables transmission to devices like notebooks, tablets, smartphones and PCs or to the system control room.

### DRC AL MODBUS

Compact DIN rail mounted device for the transmission of SPD status information, e.g. functional status, part number of SPD and part numbers of the replacement modules via Modbus RTU/TCP.



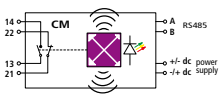


| Type DRC ... | AL MODBUS |
|---|---|
| **Part No.** | **910 694** |
| Input voltage range (d.c.) ($U_{IN}$) | 11-28 V |
| Max. power | 600 mW |
| Inputs | 4 universally applicable remote signalling contacts and up to 150 BLITZDUCTOR XT via DRC MCM AL XT (910 698) |
| Communication | Modbus RTU/TCP |

### DRC MCM AL XT

DIN rail mounted device with integrated LifeCheck sensor for condition monitoring of max. 10 LifeCheck-equipped BLITZDUCTOR XT / XTU arresters. Transmission of the status of the bus address and BXT part numbers to the DEHNrecord Alert communication unit.






| Type DRC ... | MCM AL XT |
|---|---|
| **Part No.** | **910 698** |
| Input voltage range (d.c.) ($U_{IN}$) | 18-48 V |
| Max. rated current consumption ($I_{IN}$) | 100 mA |
| RFID transmission frequency | 125 kHz |
| Physical interface | RS 485 |
| Delivery includes | base part, monitoring module, quick guide and labelling system |

## RFID LifeCheck SPD Test Devices

SPD test devices for preventive maintenance of arresters with integrated LifeCheck.

### DRC LC M3+

Portable device with RFID LifeCheck sensor for flexible use. For the quick inspection of arresters with RFID LifeCheck. Equipped with visual and acoustic indication. Also equipped with USB port and PC database software for the PC-supported management of specimens and the documentation of test results. The DRC LC M3+ is equipped with a snap-on RFID LifeCheck sensor. The hand-held equipment also supports the parameterisation of the arresters for condition monitoring.



| Type DRC LC ... | M3+ |
|---|---|
| **Part No.** | **910 653** |
| Voltage supply (included in delivery) | lithium-ion battery |
| RFID transmission frequency | 125 kHz |
| Measured value indication | beep and LCD |
| Delivery includes | hand-held device, BXT LifeCheck sensor, battery charger, USB cable, test module for reference, software CD, storage case |
| Dimensions of the storage case | 340 x 275 x 83 mm |

### DRC LC M1+

Portable device with LifeCheck sensor for flexible use. For quickly and easily checking arresters with RFIDLifeCheck. Operation and charge indication and the result indication of the LifeCheck test are provided through LEDs. The DRC LC M1+ is equipped with an RFIDsnap-on LifeCheck sensor.



| Type DRC LC ... | M1+ |
|---|---|
| **Part No.** | **910 655** |
| Voltage supply (included in delivery) | lithium-polymer battery |
| RFID transmission frequency | 125 kHz |
| Measured value indication | LED |
| Delivery includes | hand-held device, BXT LifeCheck sensor, power supply unit with country-specific adapters, USB cable, test module for reference, storage case |
| Dimensions of the storage case | 275 x 230 x 83 mm |

## Accessories for RFID LifeCheck SPD Test Devices

### RFID LifeCheck Sensor for DRC BXT

Snap-on RFID LifeCheck sensor and test module for use as spare part / extension for portable RFID LifeCheck test devices.



| Type | LCS DRC BXT |
|---|---|
| **Part No.** | **910 652** |
| For testing | BLITZDUCTOR XT ML |

## SPD Test Device

For testing the sparkover voltage of surge arresters. The specimen is connected via the included test cables or special test adapters.

### PM 20

Combined device for testing the spark-over voltage of surge arresters (with gas discharge tubes / varistors / Zener diodes). Storage bag and measuring accessories included.



| Type | PM 20 |
|---|---|
| **Part No.** | **910 511** |
| Nominal voltage (d.c.) ($U_N$) | 8-12 V d.c. |
| Test parameter: Test voltage | max. 1200 V d.c. |
| Measured value indication | alphanumeric, eight-digit LCD |
| Accessories included in delivery | 2 test leads (each 1 m long), 2 safety tapping test clips, 1 plug-in power supply unit (230 V a.c.), 1 storage bag |
| Dimensions of the storage bag | 300 x 110 x 110 mm |

## Accessories for SPD Test Device

### PA BXT Test Adapter

To be connected to PM 10 / PM 20. For inserting and testing protection modules.



| Type | PA BXT |
|---|---|
| **Part No.** | **910 508** |
| For protection modules | BLITZDUCTOR XT / SP / CT |

# Lightning Equipotential Bonding

## Isolating Spark Gaps and Components

You will find products for equipotential bonding under: **Lightning Protection / Earthing, page 198-225**


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# Isolating Spark Gaps

## Isolating Spark Gaps

For lightning equipotential bonding according to IEC 62305 as well as for use in IT installations according to IEC 60364-5-54.

### TFS / KFSU

Isolating spark gaps with plastic sheath and two stainless steel connections (Rd 10 mm).



| Typee | TFS | KFSU |
|---|---|---|
| **Part No.** | | **923 021** |
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA | – |
| Class (lightning current carrying capability) | H | – |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 4 kV | ≤ 4 kV |
| Degree of protection protection | IP 65 | IP 65 |

## EXFS Coaxial Connection Box

Connection box for coaxial connection of the integrated Ex isolating spark gap for bridging insulating joints and flanges in cathodically protected pipe sections of pipelines.

### Coaxial Connection Box with EXFS 100

Coaxial connection of isolating spark gaps with a low sparkover voltage for lightning equipotential bonding according to IEC 62305.



| Type | NAK SN4631 |
|---|---|
| **Part No.** | **999 990** |
| Isolating spark gap acc. to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |
| Nominal discharge current (8/20 µs) ($I_n$) | 100 kA |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 1.25 kV |
| Degree of protection protection | IP 67 (UV-resistant) |

## EXFS L / EXFS KU

For bridging insulating flanges and insulating glands in cathodically protected pipe sections (e.g., pipelines or LPG plants) in hazardous areas in case of surges and lightning currents.

### EXFS L

Ex isolating spark gap for aboveground installation.



| General technical data: | |
|---|---|
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 50 kA |
| Class (lightning current carrying capability) | N |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 2.5 kV |
| Degree of protection | IP 54 |
| ATEX approvals | DEKRA 11ATEX0146 X |
| Ex marking according to EN 60079-0 and EN 60079-15: gas | II 3 G Ex nC IIC T4 Gc |
| IECEx approvals | IECEx DEK 11.0063X |
| Ex marking according to EN 60079-0 | Ex nC IIC T4 Gc |

| Type EXFS ... | L100 | L200 |
|---|---|---|
| **Part No.** | **923 060** | **923 061** |
| Cable length | 100 mm | 200 mm |

| Typee EXFS ... | L300 |
|---|---|
| **Part No.** | **923 062** |
| Cable length | 300 mm |

### EXFS KU

Ex isolating spark gap with connecting cables for aboveground and underground installation; with water-proof sheath; can be shortened to keep cables as short as possible.



| Type EXFS ... | KU |
|---|---|
| **Part No.** | **923 019** |
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 50 kA |
| Class (lightning current carrying capability) | N |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 2.5 kV |
| Degree of protection | IP 67 |
| ATEX approvals | DEKRA 11ATEX0146 X |
| Ex marking according to EN 60079-0 and EN 60079-15: gas | II 3 G Ex nC IIC T4 Gc |
| IECEx approvals | IECEx DEK 11.0063X |
| Ex marking according to EN 60079-0 | Ex nC IIC T4 Gc |
| Cable length | 2x approx. 1500 mm |

## EXFS 100 / EXFS 100 KU

For bridging insulating flanges and insulating glands in cathodically protected pipe sections (e.g. pipelines or LPG plants) in hazardous areas in case of surges and lightning currents.

- Class (lighning current carrying capability) H (100 kA)
- Particularly low sparkover voltage
- ATEX and IECEx approvals for zone 1 and zone 21

### EXFS 100

Isolating spark gap for use in hazardous areas with plastic sheath and M10 threaded screws.



| Type EXFS ... | 100 |
|---|---|
| **Part No.** | **923 100** |
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |
| Class (lightning current carrying capability) | H |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 1.25 kV |
| Degree of protection | IP 67 |
| Approvals | UL, Inmetro |
| ATEX approvals | DEKRA 11ATEX0178 X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | II 2 G Ex db IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | II 2 D Ex tb IIIC T80 °C Db IP 66/67 |
| IECEx approvals | IECEx KEM 09.0051X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | Ex db IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | Ex tb IIIC T80 °C Db IP 66/67 |
| Inmetro approvals | TÜV 17.0698 X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | Ex db IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | Ex tb IIIC T80 °C Db IP 66/67 |

### EXFS 100 KU

Ex isolating spark gap with connecting cable for aboveground and underground installation; with water-proof sheath; can be shortened to keep cables as short as possible.



| Type EXFS ... | 100 KU |
|---|---|
| **Part No.** | **923 101** |
| Isolating spark gap according to EN 62561-3 / IEC 62561-3 | yes |
| Lightning impulse current (10/350 µs) ($I_{imp}$) | 100 kA |
| Class (lightning current carrying capability) | H |
| Rated impulse sparkover voltage ($U_{r\,imp}$) | ≤ 1.25 kV |
| Degree of protection | IP 67 |
| Approvals | Inmetro |
| ATEX approvals | DEKRA 11ATEX0178 X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | II 2 G Ex d IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | II 2 D Ex tb IIIC T80 °C Db IP 66/67 |
| IECEx approvals | IECEx KEM 09.0051X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | Ex d IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | Ex tb IIIC T80°C Db IP 66/67 |
| Inmetro approvals | TÜV 17.0698 X |
| Ex marking according to EN 60079-0 and EN 60079-1: gas | Ex db IIC T6 Gb |
| Ex marking according to EN 60079-0 and EN 60079-31: dust | Ex tb IIIC T80 °C Db IP 66/67 |
| Cable length | 2x approx. 2000 mm |

## Accessories for EXFS 100 / EXFS 100 KU

### Angled connection brackets – IF 1 –

Angled connection bracket for EXFS ...; diameter corresponds to the bolt diameter of the flange joint; material: St/tZn.




| Type | AB EXFS IF1 W 11 | AB EXFS IF1 W 14 |
|---|---|---|
| **Part No.** | **923 311** | **923 314** |
| Borehole diameter d1 | 11 mm | 14 mm |

| Type | AB EXFS IF1 W 18 | AB EXFS IF1 W 22 |
|---|---|---|
| **Part No.** | **923 318** | **923 322** |
| Borehole diameter d1 | 18 mm | 22 mm |

| Type | AB EXFS IF1 W 26 | AB EXFS IF1 W 30 |
|---|---|---|
| **Part No.** | **923 326** | **923 330** |
| Borehole diameter d1 | 26 mm | 30 mm |

| Type | AB EXFS IF1 W 33 | AB EXFS IF1 W 36 |
|---|---|---|
| **Part No.** | **923 333** | **923 336** |
| Borehole diameter d1 | 33 mm | 36 mm |

| Type | AB EXFS IF1 W 39 | AB EXFS IF1 W 42 |
|---|---|---|
| **Part No.** | **923 339** | **923 342** |
| Borehole diameter d1 | 39 mm | 42 mm |

| Type | AB EXFS IF1 W 48 | AB EXFS IF1 W 56 |
|---|---|---|
| **Part No.** | **923 348** | **923 356** |
| Borehole diameter d1 | 48 mm | 56 mm |

| Type | | AB EXFS IF1 W 62 |
|---|---|---|
| **Part No.** | | **923 362** |
| Borehole diameter d1 | | 62 mm |

### Flat connection brackets – IF 3 –

Flat connection bracket for EXFS ...; diameter corresponds to the bolt diameter of the flange joint; material: St/tZn.




| Type | AB EXFS IF3 G 11 | AB EXFS IF3 G 14 |
|---|---|---|
| **Part No.** | **923 211** | **923 214** |
| Borehole diameter d1 | 11 mm | 14 mm |

| Type | AB EXFS IF3 G 18 | AB EXFS IF3 G 22 |
|---|---|---|
| **Part No.** | **923 218** | **923 222** |
| Borehole diameter d1 | 18 mm | 22 mm |

| Type | AB EXFS IF3 G 26 | AB EXFS IF3 G 30 |
|---|---|---|
| **Part No.** | **923 226** | **923 230** |
| Borehole diameter d1 | 26 mm | 30 mm |

| Type | AB EXFS IF3 G 33 | AB EXFS IF3 G 36 |
|---|---|---|
| **Part No.** | **923 233** | **923 236** |
| Borehole diameter d1 | 33 mm | 36 mm |

| Type | AB EXFS IF3 G 39 | AB EXFS IF3 G 42 |
|---|---|---|
| **Part No.** | **923 239** | **923 242** |
| Borehole diameter d1 | 39 mm | 42 mm |

### EXFS 100: Connecting Cable, Cu, 25 mm²

Connecting cable for EXFS 100; two cable lugs (Ø10.5 mm) made of Cu/gal Sn, screw, nut and spring washer.



| Type | AL EXFS L100 KS | AL EXFS L200 KS |
|---|---|---|
| **Part No.** | **923 025** | **923 035** |
| Cable length | 100 mm | 200 mm |

| Type | | AL EXFS L300 KS |
|---|---|---|
| **Part No.** | | **923 045** |
| Cable length | | 300 mm |

# Decoupling devices

## Voltage-controlled smart decoupling device VCSD

Voltage-controlled decoupler for protecting widely distributed and highly networked systems (e.g. pipelines). With adjustable response threshold and integrated control and analysis interface.

### VCSD 40 IP65

Voltage-controlled smart decoupling device with adjustable response threshold for flexible use in a wide range of systems.



| Type | VCSD 40 IP65 |
|---|---|
| **Part No.** | **923 401** |
| Transient discharge current (10/350 µs) | 100 kA |
| Transient discharge current (8/20 µs) | 100 kA |
| Temporary discharge current (16.7 Hz, 50 Hz, 60 Hz) | 1.1 $kA_{rms}$ (up to 200 ms) *1) |
| Temporary discharge current (16.7 Hz, 50 Hz, 60 Hz) | 500 $A_{rms}$ (up to 1 s) |
| Long-duration discharge current (16.7 Hz, 50 Hz, 60 Hz) | 45 $A_{rms}$ (permanently) *2) |
| Long-duration limiting voltage (a.c.$_{rms}$) (> 200 ms) | max. 50 V (adjustable from 3 to 50 V) |
| Degree of protection | IP 65 |
| Dimensions | 400 x 300 x 150 mm |

*1) Derating depends on the "biasing current" (long-duration discharge current) and on the ambient temperature
*2) Derating depends on the ambient temperature; see operating and installation instructions

## Accessories for Voltage-controlled smart decoupling device VCSD

### DGP M – 100 kA N-PE Spark-Gap-Based Protection Module

N-PE spark-gap-based protection module for all devices of the modular DEHNgap M family.



| Type | DGP M MOD 255 |
|---|---|
| **Part No.** | **961 010** |
| Max. continuous operating voltage (a.c.) ($U_C$) | 255 V |

## Decoupling device DASD

Powerful, capacitive decoupling device for protecting widely distributed and highly networked systems (e.g. pipelines). With integrated test socket and fail-safe functioning. Can also be used for outdoor installation.

### DASD 45 LP 100 T



| Type | DASD 45 LP 100 T |
|---|---|
| **Part No.** | **923 402** |
| Transient discharge current (10/350 µs) | 75 kA |
| Transient discharge current (8/20 µs) | 100 kA |
| Temporary discharge current (16.7 Hz, 50 Hz, 60 Hz) | 5.0 $kA_{rms}$ (up to 40 ms) |
| Temporary discharge current (16.7 Hz, 50 Hz, 60 Hz) | 3.7 $kA_{rms}$ (up to 200 ms) |
| Temporary discharge current (16.7 Hz, 50 Hz, 60 Hz) | 2.0 $kA_{rms}$ (up to 600 ms) |
| Long-duration discharge current (16.7 Hz, 50 Hz, 60 Hz) | 45 $A_{rms}$ |
| Transient limiting voltage (up to 1 ms) | ≤ 1.35 kV |
| Long-duration limiting voltage (> 600 ms) | ≤ 3 V |

## Accessories for Decoupling device DASD

### Retaining Device for Decoupler

Retaining device for decoupler DASD 45 LP 100 T.



| Type | HA SB DASD 45 D110 |
|---|---|
| **Part No.** | **923 403** NEW |
| Material mounting support | Al |
| Dimensions mounting support (l x w x h) | 353 x 35 x 30 mm |
| Fixing | [13x] 15 x 6 mm |
| Material of tensioning strap | **StSt** |

## Voltage Limiting Devices

Spark-gap-based voltage limiting device for use in electric railways.

### SDS 1

Voltage limiting device for a power-frequency sparkover voltage ≤ 940 V.



| Type SDS ... | 1 |
|---|---|
| **Part No.** | **923 110** |
| VLD Typee (EN 50122-1) | VLD-F |
| Power frequency sparkover voltage ($U_{aw}$) | ≤ 940 V |
| d.c. sparkover voltage ($U_{ag}$) | 700 V -14% ... +28% |
| Impulse sparkover voltage | ≤ 1400 V (1 kV/µs) |
| Self-extinguishing capability | 300 A / 65 V |
| Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x | 5 kA |
| Lightning current withstand capability (10/350 µs) | 100 kA |
| Safe short-circuit due to welding of the electrodes in case of alternating currents | ≥ 2.5 kA / 1000 V / 30 ms, ≥ 1.5 kA / 1000 V / 100 ms |
| Safe short-circuit due to welding of the electrodes in case of direct currents | ≥ 750 A / 250 ms |
| Short-circuit withstand capability | 25 $kA_{rms}$ / 100 ms; 36 $kA_{rms}$ / 75 ms |
| Long-term current | 1 $kA_{rms}$ for t ≤ 120 s |
| Leakage current ($I_{lc}$) | < 1 µA for 100 V d.c. |
| Operating temperature range ($T_U$) | -40 °C ... +80 °C |
| To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx | |
| Approvals | EBA |
| DB drawing No. | 4 Ebs 15.13.20 Sheet 2 |

### SDS 2

Voltage limiting device for a d.c. sparkover voltage of 350 V.



| Type SDS ... | 2 |
|---|---|
| **Part No.** | **923 117** |
| VLD Typee (EN 50122-1) | VLD-F |
| d.c. sparkover voltage ($U_{ag}$) | 350 V +/- 20 % |
| Impulse sparkover voltage | ≤ 900 V (1 kV/µs) |
| Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x | 2 kA |
| Lightning current withstand capability (10/350 µs) | 25 kA |
| Safe short-circuit due to welding of the electrodes in case of direct currents | ≥ 600 A / 250 ms |
| Short-circuit withstand capability | 25 $kA_{rms}$ / 100 ms; 36 $kA_{rms}$ / 75 ms |
| Long-term current | 1 $kA_{rms}$ for t ≤ 120 s |
| Leakage current ($I_{lc}$) | < 1 µA for 100 V d.c. |
| Operating temperature range ($T_U$) | -40 °C ... +80 °C |
| To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx | |

## Accessories for Voltage Limiting Devices

### Mast adapter for SDS voltage-limiting devices

For installation on the mast profile of overhead contact line masts with Fl 8-12 mm.



| Type | MA SDS M12 |
|---|---|
| **Part No.** | **723 199** |
| Lightning current carrying capability (10/350 µs) | 25 kA |
| Short-circuit withstand capability | 21 $kA_{rms}$ / 30 ms |
| Long-term current | 1 $kA_{rms}$ at t ≤ 120 s |
| Leakage current ($I_{lc}$) | < 1 µA at 100 V d.c. |
| Dimensions of the threaded pin | M12 |
| Material | Brass |
| Degree of protection of the inner enclosure | IP 67 |

### SDS 3

Voltage limiting device for a d.c. sparkover voltage of 550 V.



| Type SDS ... | 3 |
|---|---|
| **Part No.** | **923 116** |
| VLD Typee (EN 50122-1) | VLD-F |
| d.c. sparkover voltage ($U_{ag}$) | 550 V +/- 20 % |
| Impulse sparkover voltage | ≤ 1000 V (1 kV/µs) |
| Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x | 2.5 kA |
| Lightning current withstand capability (10/350 µs) | 25 kA |
| Short-circuit withstand capability | 25 $kA_{rms}$ / 100 ms |
| Operating temperature range ($T_U$) | -40 °C ... +80 °C |
| To be mounted with mast adapter MA SDS M12 or SIEMENS Nr. 8WL6503-xx | |

### SDS 4

Voltage limiting device for a d.c. sparkover voltage of 230 V.



| Type SDS ... | 4 |
|---|---|
| **Part No.** | **923 118** |
| VLD Typee (EN 50122-1) | VLD-F |
| d.c. sparkover voltage ($U_{ag}$) | 230 V +/- 20% |
| Impulse sparkover voltage | ≤ 650 V (1 kV/µs) |
| Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x | 2.5 kA |
| Lightning current withstand capability (10/350 µs) | 25 kA |
| Impulse current discharge capacity (8/20 µs) 0.1x / 0.5x / 1x | 20 kA |
| Safe short-circuit due to welding of the electrodes in case of direct currents | ≥ 600 A / 250 ms |
| Short-circuit withstand capability | 25 $kA_{rms}$ / 100 ms; 36 $kA_{rms}$ / 75 ms |
| Long-term current | 1 $kA_{rms}$ for t ≤ 120 s |
| Leakage current ($I_{lc}$) | < 1 µA for 100 V d.c. |
| Operating temperature range ($T_U$) | -40 °C ... +80 °C |
| To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx | |

### SDS 5

Voltage limiting device for a d.c. sparkover voltage of 120 V.



| Type SDS ... | 5 |
|---|---|
| **Part No.** | **923 119** |
| VLD Typee (EN 50122-1) | VLD-F |
| d.c. sparkover voltage ($U_{ag}$) | 120 V +/- 20 % |
| Impulse sparkover voltage | ≤ 600 V (1 kV/µs) |
| Lightning current discharge capacity (10/350 µs) 0.1x / 0.5x / 1x | 2 kA |
| Lightning current withstand capability (10/350 µs) | 25 kA |
| Impulse current discharge capacity (8/20 µs) 0.1x / 0.5x / 1x | 20 kA |
| Safe short-circuit due to welding of the electrodes in case of direct currents | ≥ 600 A / 250 ms |
| Short-circuit withstand capability | 25 $kA_{rms}$ / 100 ms; 36 $kA_{rms}$ / 75 ms |
| Long-term current | 1 $kA_{rms}$ for t ≤ 120 s |
| Leakage current ($I_{lc}$) | < 1 µA for 100 V d.c. |
| Operating temperature range ($T_U$) | -40 °C ... +80 °C |
| To be mounted with mast adapter MA SDS M12 or SIEMENS No. 8WL6503-xx | |

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|---|---|---|---|---|---|
| 100 100 | 019119 | 01 01 01 01 | 1.64 kg | 10 pc(s) | 77 |
| 100 150 | 019140 | 01 01 01 01 | 2.44 kg | 10 pc(s) | 77 |
| 101 000 | 094505 | 01 01 01 01 | 212 g | 20 pc(s) | 77/92 |
| 101 001 | 105539 | 01 07 01 01 | 600 g | 1 pc(s) | 102 |
| 101 007 | 128705 | 01 01 01 01 | 700 g | 20 pc(s) | 77 |
| 101 009 | 128699 | 01 01 01 01 | 600 g | 20 pc(s) | 77/92 |
| 101 010 | 138698 | 01 01 01 01 | 208 g | 10 pc(s) | 93 |
| 101 110 | 138704 | 01 01 01 01 | 305 g | 1 pc(s) | 93 |
| 102 002 | 105126 | 01 01 01 01 | 17.02 kg | 54 pc(s) | 86 |
| 102 003 | 105133 | 01 01 01 01 | 8.52 kg | 120 pc(s) | 87 |
| 102 010 | 057814 | 01 01 01 01 | 17.62 kg | 54 pc(s) | 83/86 |
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| 102 010 | 057814 | 01 01 01 01 | 17.62 kg | 54 pc(s) | 137/150 |
| 102 010 | 057814 | 01 01 01 01 | 17.62 kg | 54 pc(s) | 153 |
| 102 012 | 105089 | 01 01 01 01 | 17.10 kg | 54 pc(s) | 83/86 |
| 102 019 | 111059 | 01 01 01 01 | 30 g | 54 pc(s) | 87 |
| 102 050 | 045996 | 01 01 01 01 | 217 g | 1 pc(s) | 87/120 |
| 102 050 | 045996 | 01 01 01 01 | 217 g | 1 pc(s) | 133/137 |
| 102 050 | 045996 | 01 01 01 01 | 217 g | 1 pc(s) | 150/154 |
| 102 060 | 094987 | 01 01 01 01 | 140 g | 1 pc(s) | 87/119 |
| 102 060 | 094987 | 01 01 01 01 | 140 g | 1 pc(s) | 136/153 |
| 102 075 | 094215 | 01 01 01 01 | 8.46 kg | 120 pc(s) | 87/119 |
| 102 075 | 094215 | 01 01 01 01 | 8.46 kg | 120 pc(s) | 136/152 |
| 102 340 | 105119 | 01 01 01 01 | 17.82 kg | 54 pc(s) | 86 |
| 103 013 | 129818 | 01 01 01 02 | 228 kg | 1 pc(s) | 90 |
| 103 016 | 129825 | 01 01 01 02 | 230 kg | 1 pc(s) | 90 |
| 103 019 | 129832 | 01 01 01 02 | 310 kg | 1 pc(s) | 90 |
| 103 022 | 129849 | 01 01 01 02 | 452 kg | 1 pc(s) | 90 |
| 103 025 | 129856 | 01 01 01 02 | 550 kg | 1 pc(s) | 90 |
| 103 030 | 129917 | 01 01 01 02 | 2620 kg | 1 pc(s) | 91 |
| 103 031 | 129924 | 01 01 01 02 | 4900 kg | 1 pc(s) | 91 |
| 103 040 | 129894 | 01 01 01 02 | 22.90 kg | 1 pc(s) | 91 |
| 103 041 | 129900 | 01 01 01 02 | 38 kg | 1 pc(s) | 91 |
| 103 121 | 112711 | 01 01 01 02 | 33 kg | 1 pc(s) | 90 |
| 103 122 | 112728 | 01 01 01 02 | 33.20 kg | 1 pc(s) | 90 |
| 103 123 | 112735 | 01 01 01 02 | 37.60 kg | 1 pc(s) | 90 |
| 103 124 | 112742 | 01 01 01 02 | 37.60 kg | 1 pc(s) | 90 |
| 103 125 | 112759 | 01 01 01 02 | 42.20 kg | 1 pc(s) | 90 |
| 103 126 | 112841 | 01 01 01 02 | 42.40 kg | 1 pc(s) | 90 |
| 103 210 | 066311 | 01 01 01 01 | 480 g | 10 pc(s) | 78 |
| 103 211 | 078529 | 01 01 01 01 | 480 g | 10 pc(s) | 78 |
| 103 220 | 066328 | 01 01 01 01 | 760 g | 10 pc(s) | 78 |
| 103 221 | 078536 | 01 01 01 01 | 760 g | 10 pc(s) | 78 |
| 103 230 | 066335 | 01 01 01 01 | 1.02 kg | 10 pc(s) | 78 |
| 103 231 | 078543 | 01 01 01 01 | 1.02 kg | 10 pc(s) | 78 |
| 103 240 | 066342 | 01 01 01 01 | 1.30 kg | 10 pc(s) | 78 |
| 103 241 | 081857 | 01 01 01 01 | 1.30 kg | 10 pc(s) | 78 |
| 103 250 | 093485 | 01 01 01 01 | 1.52 kg | 10 pc(s) | 78 |
| 103 251 | 093515 | 01 01 01 01 | 1.52 kg | 10 pc(s) | 78 |
| 103 260 | 093492 | 01 01 01 01 | 1.85 kg | 10 pc(s) | 78 |
| 103 261 | 093522 | 01 01 01 01 | 1.73 kg | 10 pc(s) | 78 |
| 103 280 | 093508 | 01 01 01 01 | 2.40 kg | 10 pc(s) | 78 |
| 103 410 | 105775 | 01 01 01 01 | 360 g | 10 pc(s) | 78/92 |
| 103 417 | 128682 | 01 01 01 01 | 1.20 kg | 10 pc(s) | 78 |
| 103 419 | 128651 | 01 01 01 01 | 1.10 kg | 10 pc(s) | 78 |
| 103 420 | 105782 | 01 01 01 01 | 500 g | 10 pc(s) | 78 |
| 103 429 | 128668 | 01 01 01 01 | 1.60 kg | 10 pc(s) | 78 |
| 103 430 | 105799 | 01 01 01 01 | 570 g | 10 pc(s) | 78 |
| 103 439 | 128675 | 01 01 01 01 | 2.05 kg | 10 pc(s) | 78 |
| 103 440 | 105805 | 01 01 01 01 | 800 g | 10 pc(s) | 78 |
| 103 449 | 128798 | 01 01 01 01 | 2.57 kg | 10 pc(s) | 78 |
| 103 450 | 105812 | 01 01 01 01 | 900 g | 10 pc(s) | 78 |
| 103 460 | 105829 | 01 01 01 01 | 1.10 kg | 10 pc(s) | 78 |
| 103 480 | 105836 | 01 01 01 01 | 1.30 kg | 10 pc(s) | 78 |
| 104 150 | 028487 | 01 01 01 01 | 820 g | 10 pc(s) | 77 |
| 104 200 | 056343 | 01 01 01 01 | 1.08 kg | 10 pc(s) | 77 |
| 104 250 | 056350 | 01 01 01 01 | 1.40 kg | 10 pc(s) | 77 |
| 104 300 | 056367 | 01 01 01 01 | 1.68 kg | 10 pc(s) | 77 |
| 104 600 | 076556 | 01 01 01 01 | 3.32 kg/Stk | 1 pc(s) | 77 |
| 104 903 | 030497 | 01 02 01 01 | 1.60 kg | 1 pc(s) | 47 |
| 104 905 | 030503 | 01 02 01 01 | 2.38 kg | 10 pc(s) | 47 |
| 104 906 | 082854 | 01 02 01 01 | 3.20 kg | 1 pc(s) | 47 |
| 105 071 | 101456 | 01 01 01 05 | 694 g | 1 pc(s) | 103/105 |
| 105 079 | 100183 | 01 01 01 05 | 96 g | 1 pc(s) | 103/105 |
| 105 140 | 112650 | 01 01 01 05 | 653 g | 1 pc(s) | 89/123 |
| 105 160 | 113022 | 01 01 01 05 | 506 g | 1 pc(s) | 89/123 |
| 105 161 | 118324 | 01 01 01 05 | 667 g | 1 pc(s) | 122 |
| 105 162 | 146433 | 01 01 01 05 | 600 g | 1 pc(s) | 89/106 |
| 105 162 | 146433 | 01 01 01 05 | 600 g | 1 pc(s) | 123 |
| 105 163 | 248281 | 01 01 01 05 | 586 g | 1 pc(s) | 89 |
| 105 170 | 151192 | 01 01 01 01 | 4.17 kg | 1 pc(s) | 84 |
| 105 171 | 151215 | 01 01 01 01 | 5.60 kg | 1 pc(s) | 84 |
| 105 172 | 151239 | 01 01 01 01 | 7.20 kg | 1 pc(s) | 84 |
| 105 173 | 151253 | 01 01 01 01 | 8.60 kg | 1 pc(s) | 84 |
| 105 174 | 151277 | 01 01 01 01 | 10.14 kg | 1 pc(s) | 84 |
| 105 175 | 151208 | 01 01 01 01 | 4.40 kg | 1 pc(s) | 84 |
| 105 176 | 151222 | 01 01 01 01 | 6 kg | 1 pc(s) | 84 |
| 105 177 | 151246 | 01 01 01 01 | 7.45 kg | 1 pc(s) | 84 |
| 105 178 | 151260 | 01 01 01 01 | 9 kg | 1 pc(s) | 84 |
| 105 179 | 151284 | 01 01 01 01 | 10.40 kg | 1 pc(s) | 84 |
| 105 185 | 481411 | 01 01 01 01 | 3.80 kg | 1 pc(s) | 82 |
| 105 186 | 481435 | 01 01 01 01 | 5.89 kg | 1 pc(s) | 82 |
| 105 188 | 481442 | 01 01 01 01 | 8.88 kg | 1 pc(s) | 82 |
| 105 190 | 152045 | 01 01 01 01 | 9.20 kg | 1 pc(s) | 84 |
| 105 191 | 152052 | 01 01 01 01 | 12.60 kg | 1 pc(s) | 84 |
| 105 192 | 152069 | 01 01 01 01 | 16.20 kg | 1 pc(s) | 84 |
| 105 193 | 152076 | 01 01 01 01 | 19.40 kg | 1 pc(s) | 84 |
| 105 194 | 152083 | 01 01 01 01 | 22.40 kg | 1 pc(s) | 84 |
| 105 195 | 152090 | 01 01 01 01 | 10 kg | 1 pc(s) | 84 |
| 105 196 | 152106 | 01 01 01 01 | 14.30 kg | 1 pc(s) | 84 |
| 105 197 | 152113 | 01 01 01 01 | 16.80 kg | 1 pc(s) | 84 |
| 105 198 | 152120 | 01 01 01 01 | 20 kg | 1 pc(s) | 84 |
| 105 199 | 152137 | 01 01 01 01 | 23.60 kg | 1 pc(s) | 84 |
| 105 200 | 095908 | 01 01 01 07 | 9.60 kg | 1 pc(s) | 85/107 |
| 105 201 | 095915 | 01 01 01 07 | 17.23 kg | 1 pc(s) | 107/133 |
| 105 201 | 095915 | 01 01 01 07 | 17.23 kg | 1 pc(s) | 149 |
| 105 229 | 280625 | 01 07 01 01 | 89 g | 10 pc(s) | 130/147 |
| 105 240 | 135116 | 01 07 01 02 | 7.23 kg | 1 pc(s) | 123 |
| 105 241 | 361225 | 01 07 01 01 | 4.66 kg | 1 pc(s) | 87/124 |
| 105 243 | 506855 | 01 50 50 01 | 5.62 kg | 1 pc(s) | 86 |
| 105 244 | 503069 | 01 01 01 07 | 9.50 kg | 1 pc(s) | 86 |
| 105 245 | 135383 | 01 07 01 02 | 1.16 kg | 1 pc(s) | 123 |
| 105 246 | 135390 | 01 07 01 02 | 1.14 kg | 1 pc(s) | 123 |
| 105 281 | 260962 | 01 07 01 01 | 4 kg | 1 pc(s) | 131 |
| 105 300 | 098534 | 01 01 01 05 | 5.20 kg | 1 pc(s) | 104 |
| 105 301 | 098541 | 01 01 01 05 | 7.23 kg | 1 pc(s) | 104 |
| 105 302 | 100077 | 01 01 01 05 | 10.20 kg | 1 pc(s) | 104 |
| 105 306 | 106024 | 01 01 01 05 | 5.23 kg | 1 pc(s) | 105 |
| 105 314 | 157781 | 01 07 01 01 | 10.10 kg | 1 pc(s) | 131 |
| 105 315 | 157804 | 01 07 01 01 | 12 kg | 1 pc(s) | 131 |
| 105 316 | 157798 | 01 07 01 01 | 15.60 kg | 1 pc(s) | 131 |
| 105 317 | 157811 | 01 07 01 01 | 17.12 kg | 1 pc(s) | 131 |
| 105 320 | 152373 | 01 07 01 03 | 10.60 kg | 1 pc(s) | 148 |
| 105 321 | 152397 | 01 07 01 03 | 12.20 kg | 1 pc(s) | 148 |
| 105 322 | 152380 | 01 07 01 03 | 15.80 kg | 1 pc(s) | 148 |
| 105 323 | 152403 | 01 07 01 03 | 16.30 kg | 1 pc(s) | 148 |
| 105 325 | 157828 | 01 07 01 01 | 5.42 kg | 1 pc(s) | 131 |
| 105 326 | 157842 | 01 07 01 01 | 5.82 kg | 1 pc(s) | 132 |
| 105 327 | 157835 | 01 07 01 01 | 8.15 kg | 1 pc(s) | 131 |
| 105 328 | 157859 | 01 07 01 01 | 8.34 kg | 1 pc(s) | 132 |
| 105 330 | 152496 | 01 07 01 01 | 5.60 kg | 1 pc(s) | 131 |
| 105 331 | 152502 | 01 07 01 01 | 6.12 kg | 1 pc(s) | 131 |
| 105 332 | 152519 | 01 07 01 01 | 8.25 kg | 1 pc(s) | 131 |
| 105 333 | 152526 | 01 07 01 01 | 8.51 kg | 1 pc(s) | 131 |
| 105 336 | 157866 | 01 07 01 01 | 9.90 kg | 1 pc(s) | 131 |
| 105 337 | 157880 | 01 07 01 01 | 11.64 kg | 1 pc(s) | 132 |
| 105 338 | 157873 | 01 07 01 01 | 15.13 kg | 1 pc(s) | 131 |

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| 105 339 | 157897 | 01 07 01 01 | 16.90 kg | 1 | pc(s) | 132 |
| 105 340 | 098794 | 01 01 01 05 | 618 g | 1 | pc(s) | 105/134 |
| 105 340 | 098794 | 01 01 01 05 | 618 g | 1 | pc(s) | 151 |
| 105 341 | 098800 | 01 01 01 05 | 607 g | 1 | pc(s) | 105/134 |
| 105 341 | 098800 | 01 01 01 05 | 607 g | 1 | pc(s) | 151 |
| 105 342 | 111141 | 01 01 01 05 | 514 g | 1 | pc(s) | 89/105 |
| 105 342 | 111141 | 01 01 01 05 | 514 g | 1 | pc(s) | 122/134 |
| 105 342 | 111141 | 01 01 01 05 | 514 g | 1 | pc(s) | 151 |
| 105 343 | 118515 | 01 01 01 05 | 3.60 kg | 1 | pc(s) | 89/105 |
| 105 343 | 118515 | 01 01 01 05 | 3.60 kg | 1 | pc(s) | 123/134 |
| 105 343 | 118515 | 01 01 01 05 | 3.60 kg | 1 | pc(s) | 151 |
| 105 344 | 147300 | 01 01 01 05 | 1.52 kg | 1 | pc(s) | 89/105 |
| 105 344 | 147300 | 01 01 01 05 | 1.52 kg | 1 | pc(s) | 123/134 |
| 105 344 | 147300 | 01 01 01 05 | 1.52 kg | 1 | pc(s) | 151 |
| 105 345 | 110489 | 01 01 01 05 | 3.60 kg | 1 | pc(s) | 128/145 |
| 105 347 | 278554 | 01 01 01 05 | 2.42 kg | 1 | pc(s) | 89/105 |
| 105 347 | 278554 | 01 01 01 05 | 2.42 kg | 1 | pc(s) | 123/134 |
| 105 347 | 278554 | 01 01 01 05 | 2.42 kg | 1 | pc(s) | 151 |
| 105 348 | 287013 | 01 01 01 05 | 540 g | 1 | pc(s) | 89/105 |
| 105 348 | 287013 | 01 01 01 05 | 540 g | 1 | pc(s) | 122/134 |
| 105 348 | 287013 | 01 01 01 05 | 540 g | 1 | pc(s) | 151 |
| 105 349 | 288614 | 01 01 01 05 | 5.80 kg | 1 | pc(s) | 89/105 |
| 105 349 | 288614 | 01 01 01 05 | 5.80 kg | 1 | pc(s) | 123/134 |
| 105 349 | 288614 | 01 01 01 05 | 5.80 kg | 1 | pc(s) | 151 |
| 105 351 | 238916 | 01 01 01 07 | 11.50 kg | 1 | pc(s) | 85/133 |
| 105 351 | 238916 | 01 01 01 07 | 11.50 kg | 1 | pc(s) | 149 |
| 105 352 | 502727 | 01 01 01 05 | 5.36 kg | 1 | pc(s) | 90/135 |
| 105 352 | 502727 | 01 01 01 05 | 5.36 kg | 1 | pc(s) | 145 |
| 105 354 | 098725 | 01 01 01 05 | 617 g | 5 | pc(s) | 89/106 |
| 105 354 | 098725 | 01 01 01 05 | 617 g | 5 | pc(s) | 123/134 |
| 105 354 | 098725 | 01 01 01 05 | 617 g | 5 | pc(s) | 151 |
| 105 355 | 098732 | 01 01 01 05 | 690 g | 1 | pc(s) | 106/134 |
| 105 355 | 098732 | 01 01 01 05 | 690 g | 1 | pc(s) | 151 |
| 105 356 | 098749 | 01 01 01 05 | 562 g | 5 | pc(s) | 106/135 |
| 105 356 | 098749 | 01 01 01 05 | 562 g | 5 | pc(s) | 151 |
| 105 357 | 527829 | 01 01 01 07 | 8.01 kg | 1 | pc(s) | 85/133 |
| 105 357 | 527829 | 01 01 01 07 | 8.01 kg | 1 | pc(s) | 149 |
| 105 360 | 099777 | 01 01 01 05 | 358 g | 1 | pc(s) | 106/134 |
| 105 360 | 099777 | 01 01 01 05 | 358 g | 1 | pc(s) | 150 |
| 105 361 | 102033 | 01 01 01 05 | 385 g | 1 | pc(s) | 106/134 |
| 105 361 | 102033 | 01 01 01 05 | 385 g | 1 | pc(s) | 150 |
| 105 362 | 110496 | 01 01 01 05 | 467 g | 1 | pc(s) | 106/134 |
| 105 362 | 110496 | 01 01 01 05 | 467 g | 1 | pc(s) | 150 |
| 105 363 | 106031 | 01 01 01 05 | 8.87 kg | 1 | pc(s) | 135/152 |
| 105 364 | 106048 | 01 01 01 05 | 10.85 kg | 1 | pc(s) | 135/152 |
| 105 365 | 106055 | 01 01 01 05 | 14.63 kg | 1 | pc(s) | 135/152 |
| 105 374 | 493308 | 01 05 01 02 | 263 g | 1 | pc(s) | 82 |
| 105 375 | 493315 | 01 05 01 02 | 334 g | 1 | pc(s) | 82 |
| 105 376 | 115545 | 01 01 01 05 | 660 g | 1 | pc(s) | 106/135 |
| 105 376 | 115545 | 01 01 01 05 | 660 g | 1 | pc(s) | 151 |
| 105 392 | 157903 | 01 07 01 03 | 10.20 kg | 1 | pc(s) | 148 |
| 105 394 | 157910 | 01 07 01 03 | 15.10 kg | 1 | pc(s) | 148 |
| 105 395 | 157934 | 01 07 01 03 | 17.12 kg | 1 | pc(s) | 148 |
| 105 400 | 094383 | 01 01 01 01 | 13.40 kg | 1 | pc(s) | 79 |
| 105 440 | 099692 | 01 01 01 05 | 7.64 kg | 1 | pc(s) | 104 |
| 105 450 | 094413 | 01 01 01 01 | 13.80 kg | 1 | pc(s) | 79 |
| 105 455 | 099715 | 01 01 01 05 | 11.45 kg | 1 | pc(s) | 104 |
| 105 461 | 381520 | 01 07 01 01 | 821 g | 1 | pc(s) | 136 |
| 105 462 | 381537 | 01 07 01 03 | 830 g | 1 | pc(s) | 153 |
| 105 466 | 484900 | 01 07 01 04 | 667 g | 1 | pc(s) | 119 |
| 105 467 | 381599 | 01 07 01 03 | 4.10 kg | 1 | pc(s) | 153 |
| 105 468 | 381582 | 01 07 01 03 | 3.65 kg | 1 | pc(s) | 153 |
| 105 469 | 381575 | 01 07 01 01 | 3.64 kg | 1 | pc(s) | 137 |
| 105 470 | 100138 | 01 01 01 05 | 14.65 kg | 1 | pc(s) | 104 |
| 105 500 | 094420 | 01 01 01 01 | 15 kg | 1 | pc(s) | 79 |
| 105 513 | 270282 | 01 07 01 03 | 5 kg | 1 | pc(s) | 148 |
| 105 515 | 271821 | 01 07 01 03 | 7.84 kg | 1 | pc(s) | 148 |
| 105 525 | 241985 | 01 01 01 01 | 3.40 kg | 1 | pc(s) | 79 |
| 105 530 | 242029 | 01 01 01 01 | 3.80 kg | 1 | pc(s) | 79 |
| 105 531 | 535893 | 01 01 01 01 | 11 kg | 1 | pc(s) | 79 |
| 105 535 | 242043 | 01 01 01 01 | 4.10 kg | 1 | pc(s) | 79 |
| 105 536 | 535909 | 01 01 01 01 | 11.80 kg | 1 | pc(s) | 79 |
| 105 543 | 271845 | 01 07 01 03 | 6.24 kg | 1 | pc(s) | 148 |
| 105 545 | 271876 | 01 07 01 03 | 8.72 kg | 1 | pc(s) | 148 |
| 105 550 | 094437 | 01 01 01 01 | 15.20 kg | 1 | pc(s) | 79 |
| 105 563 | 271937 | 01 07 01 03 | 5.54 kg | 1 | pc(s) | 148 |
| 105 565 | 271944 | 01 07 01 03 | 7.92 kg | 1 | pc(s) | 148 |
| 105 573 | 271975 | 01 07 01 03 | 6.40 kg | 1 | pc(s) | 148 |
| 105 575 | 272026 | 01 07 01 03 | 8.74 kg | 1 | pc(s) | 148 |
| 105 600 | 094444 | 01 01 01 01 | 29.40 kg | 1 | pc(s) | 80 |
| 105 601 | 142336 | 01 01 01 01 | 6 kg | 1 | pc(s) | 107/133 |
| 105 601 | 142336 | 01 01 01 01 | 6 kg | 1 | pc(s) | 150 |
| 105 650 | 094451 | 01 01 01 01 | 30 kg | 1 | pc(s) | 80 |
| 105 672 | 494473 | 01 07 01 04 | 2.50 kg | 1 | pc(s) | 116 |
| 105 673 | 494497 | 01 07 01 04 | 2.77 kg | 1 | pc(s) | 116 |
| 105 674 | 494503 | 01 07 01 04 | 3.50 kg | 1 | pc(s) | 116 |
| 105 675 | 494510 | 01 07 01 04 | 3.77 kg | 1 | pc(s) | 116 |
| 105 677 | 500044 | 01 07 01 04 | 3.30 kg | 1 | pc(s) | 116 |
| 105 678 | 500051 | 01 07 01 04 | 3.57 kg | 1 | pc(s) | 116 |
| 105 688 | 499775 | 01 07 01 04 | 4.74 kg | 1 | pc(s) | 116 |
| 105 700 | 094468 | 01 01 01 01 | 31.20 kg | 1 | pc(s) | 80 |
| 105 710 | 500969 | 01 01 01 01 | 11.58 kg | 1 | pc(s) | 83 |
| 105 711 | 500976 | 01 01 01 01 | 13.32 kg | 1 | pc(s) | 83 |
| 105 712 | 500983 | 01 01 01 01 | 15.74 kg | 1 | pc(s) | 83 |
| 105 713 | 501041 | 01 01 01 01 | 25.82 kg | 1 | pc(s) | 83 |
| 105 714 | 501058 | 01 01 01 01 | 19.38 kg | 1 | pc(s) | 83 |
| 105 715 | 501065 | 01 01 01 01 | 29.88 kg | 1 | pc(s) | 83 |
| 105 716 | 501072 | 01 01 01 01 | 28.81 kg | 1 | pc(s) | 83 |
| 105 750 | 094475 | 01 01 01 01 | 31.40 kg | 1 | pc(s) | 80 |
| 105 800 | 094338 | 01 01 01 01 | 32.60 kg | 1 | pc(s) | 80 |
| 105 850 | 094482 | 01 01 01 01 | 32.80 kg | 1 | pc(s) | 80 |
| 105 900 | 240766 | 01 01 01 01 | 33.29 kg | 1 | pc(s) | 80 |
| 105 910 | 256941 | 01 01 01 01 | 53 kg | 1 | pc(s) | 80 |
| 105 911 | 256958 | 01 01 01 01 | 54 kg | 1 | pc(s) | 80 |
| 105 922 | 240520 | 01 01 01 01 | 97.31 kg | 1 | pc(s) | 81 |
| 105 923 | 242081 | 01 01 01 01 | 98.31 kg | 1 | pc(s) | 81 |
| 105 924 | 242104 | 01 01 01 01 | 103.31 kg | 1 | pc(s) | 81 |
| 106 090 | 100190 | 01 01 01 06 | 470 g | 1 | pc(s) | 98 |
| 106 100 | 092907 | 01 01 01 06 | 545 g | 1 | pc(s) | 98 |
| 106 105 | 100206 | 01 01 01 06 | 658 g | 1 | pc(s) | 98 |
| 106 115 | 100213 | 01 01 01 06 | 488 g | 1 | pc(s) | 98 |
| 106 120 | 092945 | 01 01 01 06 | 552 g | 1 | pc(s) | 98 |
| 106 123 | 100220 | 01 01 01 06 | 686 g | 1 | pc(s) | 98 |
| 106 125 | 099517 | 01 01 01 06 | 1.15 kg | 10 | pc(s) | 99 |
| 106 126 | 093324 | 01 01 01 06 | 82 g | 20 | pc(s) | 99 |
| 106 127 | 093317 | 01 01 01 06 | 228 g | 20 | pc(s) | 99 |
| 106 128 | 123731 | 01 01 01 06 | 131 g | 20 | pc(s) | 99 |
| 106 129 | 123748 | 01 01 01 06 | 135 g | 20 | pc(s) | 99 |
| 106 150 | 092914 | 01 01 01 06 | 340 g | 1 | pc(s) | 99 |
| 106 160 | 092938 | 01 01 01 06 | 286 g | 1 | pc(s) | 99 |
| 106 165 | 100237 | 01 01 01 06 | 242 g | 1 | pc(s) | 100 |
| 106 170 | 097285 | 01 01 01 06 | 310 g | 1 | pc(s) | 100 |
| 106 175 | 100244 | 01 01 01 06 | 448 g | 1 | pc(s) | 100 |
| 106 178 | 100251 | 01 01 01 06 | 260 g | 1 | pc(s) | 100 |
| 106 180 | 097292 | 01 01 01 06 | 326 g | 1 | pc(s) | 100 |
| 106 185 | 100268 | 01 01 01 06 | 465 g | 1 | pc(s) | 100 |
| 106 207 | 127623 | 01 01 01 06 | 493 g | 10 | pc(s) | 102 |
| 106 210 | 127630 | 01 01 01 06 | 625 g | 10 | pc(s) | 102 |
| 106 217 | 128811 | 01 01 01 06 | 280 g | 10 | pc(s) | 102 |
| 106 220 | 128828 | 01 01 01 06 | 410 g | 10 | pc(s) | 102 |
| 106 225 | 100299 | 01 01 01 06 | 684 g | 1 | pc(s) | 98 |
| 106 226 | 098930 | 01 01 01 06 | 722 g | 1 | pc(s) | 98 |
| 106 228 | 100305 | 01 01 01 06 | 878 g | 1 | pc(s) | 98 |
| 106 245 | 100336 | 01 01 01 06 | 561 g | 1 | pc(s) | 99 |
| 106 246 | 098954 | 01 01 01 06 | 608 g | 1 | pc(s) | 99 |
| 106 248 | 100343 | 01 01 01 06 | 762 g | 1 | pc(s) | 99 |
| 106 301 | 096806 | 01 01 01 06 | 50 g | 20 | pc(s) | 100 |
| 106 309 | 129276 | 01 01 01 06 | 100 g | 20 | pc(s) | 100 |
| 106 310 | 096813 | 01 01 01 06 | 100 g | 20 | pc(s) | 100/347 |
| 106 311 | 096820 | 01 01 01 06 | 150 g | 20 | pc(s) | 100 |
| 106 312 | 098756 | 01 01 01 05 | 327 g | 5 | pc(s) | 101 |

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| 106 314 | 136304 | 04 02 08 50 | 100 g | 1 | pc(s) | 347 |
| 106 315 | 096943 | 01 01 01 06 | 98 g | 20 | pc(s) | 100 |
| 106 316 | 096844 | 01 01 01 06 | 244 g | 1 | pc(s) | 100 |
| 106 319 | 124820 | 01 01 01 06 | 271 g | 1 | pc(s) | 102 |
| 106 320 | 149434 | 01 01 01 06 | 48 g | 20 | pc(s) | 101 |
| 106 321 | 096851 | 01 01 01 06 | 121 g | 10 | pc(s) | 101 |
| 106 322 | 097308 | 01 01 01 06 | 146 g | 10 | pc(s) | 101 |
| 106 323 | 097315 | 01 01 01 06 | 110 g | 10 | pc(s) | 101/121 |
| 106 323 | 097315 | 01 01 01 06 | 110 g | 10 | pc(s) | 138/140 |
| 106 323 | 097315 | 01 01 01 06 | 110 g | 10 | pc(s) | 154/156 |
| 106 324 | 099074 | 01 01 01 06 | 48 g | 20 | pc(s) | 101/121 |
| 106 324 | 099074 | 01 01 01 06 | 48 g | 20 | pc(s) | 138/140 |
| 106 324 | 099074 | 01 01 01 06 | 48 g | 20 | pc(s) | 154/156 |
| 106 325 | 096929 | 01 01 01 06 | 222 g | 10 | pc(s) | 101 |
| 106 326 | 096936 | 01 01 01 06 | 337 g | 1 | pc(s) | 101 |
| 106 328 | 099098 | 01 01 01 05 | 547 g | 1 | pc(s) | 107 |
| 106 329 | 107182 | 04 02 08 50 | 143 g | 1 | pc(s) | 347 |
| 106 331 | 100367 | 01 01 01 05 | 715 g | 1 | pc(s) | 107 |
| 106 340 | 096868 | 01 01 01 06 | 104 g | 20 | pc(s) | 102 |
| 106 341 | 096875 | 01 01 01 06 | 104 g | 20 | pc(s) | 102 |
| 106 342 | 096882 | 01 01 01 06 | 104 g | 20 | pc(s) | 102 |
| 106 352 | 096905 | 01 01 01 06 | 375 g | 10 | pc(s) | 100/106 |
| 106 353 | 096912 | 01 01 01 06 | 466 g | 1 | pc(s) | 101/106 |
| 106 812 | 104907 | 01 07 01 01 | 435 g | 1 | pc(s) | 120 |
| 106 814 | 381483 | 01 07 01 03 | 673 g | 1 | pc(s) | 153 |
| 106 815 | 381506 | 01 07 01 01 | 538 g | 1 | pc(s) | 119/137 |
| 106 852 | 119307 | 01 07 01 02 | 229 g | 1 | pc(s) | 120 |
| | | | | | | |
| 107 390 | 478466 | 01 01 01 07 | 7.22 kg | 1 | pc(s) | 85/132 |
| 107 390 | 478466 | 01 01 01 07 | 7.22 kg | 1 | pc(s) | 149 |
| 107 391 | 478473 | 01 01 01 07 | 15.60 kg | 1 | pc(s) | 85/132 |
| 107 391 | 478473 | 01 01 01 07 | 15.60 kg | 1 | pc(s) | 149 |
| 107 396 | 478442 | 01 07 01 01 | 934 g | 1 | pc(s) | 85/133 |
| 107 396 | 478442 | 01 07 01 01 | 934 g | 1 | pc(s) | 150 |
| 107 399 | 478411 | 01 06 01 01 | 644 g | 1 | pc(s) | 85/86 |
| 107 399 | 478411 | 01 06 01 01 | 644 g | 1 | pc(s) | 133/150 |
| 107 490 | 478480 | 01 01 01 07 | 9.85 kg | 1 | pc(s) | 85/132 |
| 107 490 | 478480 | 01 01 01 07 | 9.85 kg | 1 | pc(s) | 149 |
| 107 491 | 478497 | 01 01 01 07 | 17.57 kg | 1 | pc(s) | 85/132 |
| 107 491 | 478497 | 01 01 01 07 | 17.57 kg | 1 | pc(s) | 149 |
| 107 496 | 478459 | 01 07 01 01 | 1.25 kg | 1 | pc(s) | 85/133 |
| 107 496 | 478459 | 01 07 01 01 | 1.25 kg | 1 | pc(s) | 150 |
| | | | | | | |
| 108 009 | 133686 | 01 01 01 03 | 288 g | 1 | pc(s) | 93 |
| | | | | | | |
| 110 000 | 021440 | 01 01 01 03 | 20 g | 50 | pc(s) | 93 |
| 110 017 | 021457 | 01 01 01 03 | 28 g | 10 | pc(s) | 93 |
| | | | | | | |
| 117 165 | 498242 | 01 08 03 01 | 10 g | 50 | pc(s) | 39 |
| 117 166 | 498259 | 01 08 03 01 | 10 g | 50 | pc(s) | 39 |
| 117 185 | 498174 | 01 08 03 01 | 10 g | 50 | pc(s) | 39 |
| 117 186 | 498181 | 01 08 03 01 | 13 g | 50 | pc(s) | 39 |
| 117 430 | 483989 | 01 08 01 01 | 795 g | 10 | pc(s) | 94 |
| 117 431 | 483996 | 01 08 01 01 | 950 g | 10 | pc(s) | 94 |
| 117 432 | 484009 | 01 08 01 01 | 1.57 kg | 10 | pc(s) | 94 |
| 117 433 | 484016 | 01 08 01 01 | 2.35 kg | 10 | pc(s) | 94 |
| 117 434 | 484023 | 01 08 01 01 | 3.12 kg | 10 | pc(s) | 94 |
| 117 435 | 539341 | 01 08 01 01 | 4.68 kg | 5 | pc(s) | 94 |
| 117 439 | 484078 | 01 08 01 01 | 345 g | 20 | pc(s) | 94 |
| 117 440 | 484085 | 01 08 01 01 | 410 g | 20 | pc(s) | 94 |
| 117 441 | 484092 | 01 08 01 01 | 680 g | 20 | pc(s) | 94 |
| 117 442 | 483927 | 01 08 01 01 | 160 g | 25 | pc(s) | 94 |
| 117 443 | 483934 | 01 08 01 01 | 255 g | 10 | pc(s) | 94 |
| 117 444 | 483941 | 01 08 01 01 | 490 g | 10 | pc(s) | 94 |
| 117 445 | 481190 | 01 08 01 01 | 730 g | 10 | pc(s) | 94 |
| 117 446 | 481206 | 01 08 01 01 | 965 g | 10 | pc(s) | 94 |
| 117 447 | 483958 | 01 08 01 01 | 70 g | 25 | pc(s) | 94 |
| 117 448 | 483965 | 01 08 01 01 | 110 g | 20 | pc(s) | 94 |
| 117 449 | 483972 | 01 08 01 01 | 215 g | 20 | pc(s) | 94 |
| 117 465 | 520110 | 01 08 03 01 | 360 g | 4 | pc(s) | 94 |
| 117 466 | 357471 | 01 08 03 01 | 118 g | 4 | pc(s) | 94 |
| 117 471 | 536777 | 01 08 03 01 | 183 g | 1 | pc(s) | 95 |
| 117 473 | 536227 | 01 08 03 01 | 186 g | 4 | pc(s) | 94 |
| | | | | | | |
| 118 010 | 298798 | 01 08 03 01 | 10 g | 100 | pc(s) | 44 |
| 118 011 | 298804 | 01 08 03 01 | 10 g | 100 | pc(s) | 44 |
| 118 024 | 505238 [1)] | 01 08 03 01 | 7 g | 100 | pc(s) | 44 |
| 118 025 | 505245 [1)] | 01 08 03 01 | 7 g | 100 | pc(s) | 44 |
| 118 049 | 496842 | 01 08 03 01 | 75 g | 50 | pc(s) | 44 |
| 118 059 | 298965 | 01 08 03 01 | 115 g | 50 | pc(s) | 44 |
| 118 071 | 357426 | 01 08 03 01 | 20 g | 50 | pc(s) | 44 |
| 118 073 | 357433 | 01 08 03 01 | 20 g | 50 | pc(s) | 44 |
| 118 075 | 497047 | 01 08 03 01 | 4 g | 100 | pc(s) | 45 |
| 118 076 | 497054 | 01 08 03 01 | 4 g | 100 | pc(s) | 45 |
| 118 077 | 476219 | 01 08 03 01 | 50 g | 50 | pc(s) | 44 |
| 118 083 | 476240 | 01 08 03 01 | 60 g | 50 | pc(s) | 44 |
| 118 085 | 299009 | 01 08 03 01 | 15 g | 100 | pc(s) | 45 |
| 118 086 | 497030 | 01 08 03 01 | 14 g | 100 | pc(s) | 45 |
| 118 162 | 497139 | 01 08 03 01 | 70 g | 50 | pc(s) | 38 |
| 118 163 | 497177 | 01 08 03 01 | 95 g | 50 | pc(s) | 38 |
| 118 164 | 497184 | 01 08 03 01 | 125 g | 50 | pc(s) | 38 |
| 118 165 | 357822 | 01 08 03 01 | 28 g | 50 | pc(s) | 38 |
| 118 202 | 476271 | 01 08 04 01 | 120 g | 15 | pc(s) | 74 |
| 118 208 | 497382 | 01 08 04 01 | 230 g | 15 | pc(s) | 74 |
| 118 209 | 357464 | 01 08 04 01 | 50 g | 15 | pc(s) | 74 |
| 118 218 | 497528 | 01 08 04 01 | 104 g | 15 | pc(s) | 74 |
| 118 219 | 476301 | 01 08 04 01 | 400 g | 15 | pc(s) | 74 |
| 118 252 | 497603 | 01 08 04 01 | 65 g | 12 | pc(s) | 75 |
| 118 256 | 498136 | 01 08 04 01 | 232 g | 5 | pc(s) | 75 |
| 118 268 | 497573 | 01 08 04 01 | 420 g | 4 | pc(s) | 75 |
| 118 272 | 515932 | 01 08 04 01 | 70 g | 20 | pc(s) | 76 |
| 118 273 | 515949 | 01 08 04 01 | 65 g | 20 | pc(s) | 76 |
| 118 275 | 515956 | 01 08 04 01 | 30 g | 20 | pc(s) | 76 |
| 118 281 | 476349 | 01 08 04 01 | 170 g | 12 | pc(s) | 75 |
| 118 283 | 476363 | 01 08 04 01 | 210 g | 12 | pc(s) | 75 |
| 118 285 | 497597 | 01 08 04 01 | 200 g | 2 | pc(s) | 75 |
| 118 286 | 497610 | 01 08 04 01 | 100 g | 10 | pc(s) | 75 |
| 118 313 | 520905 | 01 08 04 01 | 110 g | 20 | pc(s) | 76 |
| 118 314 | 536531 | 01 08 04 01 | 160 g | 15 | pc(s) | 76 |
| 118 315 | 520912 | 01 08 04 01 | 130 g | 15 | pc(s) | 76 |
| 118 336 | 520059 | 01 08 06 01 | 350 g | 4 | pc(s) | 177 |
| 118 337 | 520042 | 01 08 06 01 | 740 g | 8 | pc(s) | 177 |
| 118 338 | 520035 | 01 08 06 01 | 150 g | 8 | pc(s) | 177 |
| 118 339 | 520080 | 01 08 06 01 | 500 g | 8 | pc(s) | 177 |
| 118 342 | 520097 | 01 08 06 01 | 270 g | 4 | pc(s) | 177 |
| 118 346 | 520073 | 01 08 06 01 | 1.12 kg | 8 | pc(s) | 177 |
| 118 349 | 520066 | 01 08 06 01 | 390 g | 4 | pc(s) | 177 |
| 118 350 | 299405 | 01 08 05 01 | 1.90 kg | 1 | pc(s) | 209 |
| 118 351 | 299412 | 01 08 05 01 | 2.33 kg | 1 | pc(s) | 209 |
| 118 352 | 299429 | 01 08 05 01 | 2.77 kg | 1 | pc(s) | 209 |
| 118 353 | 299436 | 01 08 05 01 | 3.50 kg | 1 | pc(s) | 209 |
| 118 354 | 299443 | 01 08 05 01 | 3.94 kg | 1 | pc(s) | 209 |
| 118 360 | 299450 | 01 08 05 01 | 2.49 kg | 1 | pc(s) | 211 |
| 118 361 | 299467 | 01 08 05 01 | 2.93 kg | 1 | pc(s) | 211 |
| 118 362 | 299474 | 01 08 05 01 | 3.36 kg | 1 | pc(s) | 211 |
| 118 363 | 299481 | 01 08 05 01 | 4.09 kg | 1 | pc(s) | 211 |
| 118 364 | 299498 | 01 08 05 01 | 4.52 kg | 1 | pc(s) | 211 |
| 118 366 | 472280 | 01 08 05 01 | 5.85 kg | 1 | pc(s) | 211 |
| 118 370 | 299504 | 01 08 05 01 | 3.11 kg | 1 | pc(s) | 210 |
| 118 371 | 309319 | 01 08 05 01 | 3.54 kg | 1 | pc(s) | 210 |
| 118 372 | 309326 | 01 08 05 01 | 3.98 kg | 1 | pc(s) | 210 |
| 118 373 | 309333 | 01 08 05 01 | 4.70 kg | 1 | pc(s) | 210 |
| 118 374 | 357853 | 01 08 05 01 | 5.55 kg | 1 | pc(s) | 210 |
| 118 380 | 299528 | 01 08 05 01 | 780 g | 1 | pc(s) | 208 |
| 118 411 | 520677 | 01 08 01 01 | 450 g | 2 | pc(s) | 95 |
| 118 412 | 520684 | 01 08 01 01 | 150 g | 2 | pc(s) | 95 |
| 118 413 | 536050 | 01 08 01 01 | 440 g | 2 | pc(s) | 95 |
| 118 464 | 536661 | 01 08 01 01 | 345 g | 1 | pc(s) | 95 |
| 118 465 | 536678 | 01 08 01 01 | 125 g | 1 | pc(s) | 95 |
| 118 466 | 535695 | 01 08 01 01 | 370 g | 1 | pc(s) | 95 |
| 118 467 | 535688 | 01 08 01 01 | 130 g | 1 | pc(s) | 95 |

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| 118 471 | 535701 | 01 08 03 01 | 575 g | 1 | pc(s) | 95 |
| 118 472 | 536234 | 01 08 03 01 | 20 g | 15 | pc(s) | 95 |
| 118 473 | 535718 | 01 08 03 01 | 486 g | 4 | pc(s) | 94 |
| 118 478 | 476776 | 01 08 03 01 | 460 g | 2 | pc(s) | 95 |
| 118 479 | 536203 | 01 08 03 01 | 150 g | 2 | pc(s) | 95 |
| 118 571 | 536579 | 01 08 06 01 | 225 g | 4 | pc(s) | 212 |
| 118 574 | 536067 | 01 08 06 01 | 310 g | 4 | pc(s) | 212 |
| 118 587 | 536074 | 01 08 06 01 | 820 g | 4 | pc(s) | 212 |
| 118 591 | 536647 | 01 08 06 01 | 230 g | 4 | pc(s) | 212 |
| 118 593 | 475663 | 01 08 06 01 | 340 g | 4 | pc(s) | 212 |
| 118 598 | 536654 | 01 08 06 01 | 820 g | 4 | pc(s) | 212 |
| 118 606 | 497689 | 01 08 04 01 | 190 g | 1 | pc(s) | 75 |
| 118 620 | 497702 | 01 08 04 01 | 80 g | 1 | pc(s) | 75 |
| 118 628 | 536241 | 01 08 04 01 | 190 g | 9 | pc(s) | 75 |
| 118 634 | 497535 | 01 08 04 01 | 408 g | 5 | pc(s) | 75 |
| 118 635 | 497542 | 01 08 04 01 | 760 g | 2 | pc(s) | 75 |
| 118 900 | 472150 | 01 08 05 01 | 1.08 kg | 1 | pc(s) | 209 |
| 118 901 | 472167 | 01 08 05 01 | 1.46 kg | 1 | pc(s) | 209 |
| 118 907 | 472174 | 01 08 05 01 | 4.37 kg | 1 | pc(s) | 209 |
| 118 908 | 472181 | 01 08 05 01 | 5.21 kg | 1 | pc(s) | 209 |
| 118 909 | 472198 | 01 08 05 01 | 5.69 kg | 1 | pc(s) | 209 |
| 118 910 | 472204 | 01 08 05 01 | 6.47 kg | 1 | pc(s) | 209 |
| 118 911 | 472211 | 01 08 05 01 | 6.95 kg | 1 | pc(s) | 209 |
| 118 912 | 472228 | 01 08 05 01 | 7.42 kg | 1 | pc(s) | 209 |
| 118 913 | 472235 | 01 08 05 01 | 7.90 kg | 1 | pc(s) | 209 |
| 118 914 | 472242 | 01 08 05 01 | 8.37 kg | 1 | pc(s) | 209 |
| 118 915 | 472259 | 01 08 05 01 | 1.61 kg | 1 | pc(s) | 211 |
| 118 916 | 472266 | 01 08 05 01 | 2.05 kg | 1 | pc(s) | 211 |
| 118 917 | 537132 | 01 08 04 01 | 810 g | 1 | pc(s) | 233 |
| 118 918 | 537149 | 01 08 04 01 | 2.70 kg | 1 | pc(s) | 233 |
| 118 922 | 472273 | 01 08 05 01 | 5.37 kg | 1 | pc(s) | 211 |
| 118 924 | 472297 | 01 08 05 01 | 6.32 kg | 1 | pc(s) | 211 |
| 118 925 | 472303 | 01 08 05 01 | 7.10 kg | 1 | pc(s) | 211 |
| 118 926 | 472310 | 01 08 05 01 | 7.57 kg | 1 | pc(s) | 211 |
| 118 927 | 472327 | 01 08 05 01 | 8.09 kg | 1 | pc(s) | 211 |
| 118 928 | 472334 | 01 08 05 01 | 8.52 kg | 1 | pc(s) | 211 |
| 118 929 | 472341 | 01 08 05 01 | 9.01 kg | 1 | pc(s) | 211 |
| 118 930 | 472358 | 01 08 05 01 | 2.23 kg | 1 | pc(s) | 210 |
| 118 931 | 472365 | 01 08 05 01 | 2.67 kg | 1 | pc(s) | 210 |
| 118 937 | 472372 | 01 08 05 01 | 6.03 kg | 1 | pc(s) | 210 |
| 118 938 | 472389 | 01 08 05 01 | 6.50 kg | 1 | pc(s) | 210 |
| 118 939 | 472396 | 01 08 05 01 | 6.98 kg | 1 | pc(s) | 210 |
| 118 940 | 472402 | 01 08 05 01 | 7.76 kg | 1 | pc(s) | 210 |
| 118 941 | 472419 | 01 08 05 01 | 8.23 kg | 1 | pc(s) | 210 |
| 118 942 | 472426 | 01 08 05 01 | 8.71 kg | 1 | pc(s) | 210 |
| 118 943 | 472433 | 01 08 05 01 | 9.19 kg | 1 | pc(s) | 210 |
| 118 944 | 472440 | 01 08 05 01 | 9.66 kg | 1 | pc(s) | 210 |
| 119 350 | 474277 | 01 08 05 01 | 1.90 kg | 1 | pc(s) | 209 |
| 119 351 | 474284 | 01 08 05 01 | 2.33 kg | 1 | pc(s) | 209 |
| 119 352 | 474291 | 01 08 05 01 | 2.77 kg | 1 | pc(s) | 209 |
| 119 353 | 474307 | 01 08 05 01 | 3.50 kg | 1 | pc(s) | 209 |
| 119 354 | 474314 | 01 08 05 01 | 3.94 kg | 1 | pc(s) | 209 |
| 119 360 | 474222 | 01 08 05 01 | 2.49 kg | 1 | pc(s) | 211 |
| 119 361 | 474239 | 01 08 05 01 | 2.93 kg | 1 | pc(s) | 211 |
| 119 362 | 474246 | 01 08 05 01 | 3.36 kg | 1 | pc(s) | 211 |
| 119 363 | 474253 | 01 08 05 01 | 4.09 kg | 1 | pc(s) | 211 |
| 119 364 | 474260 | 01 08 05 01 | 4.52 kg | 1 | pc(s) | 211 |
| 119 366 | 474215 | 01 08 05 01 | 5.85 kg | 1 | pc(s) | 211 |
| 119 370 | 474321 | 01 08 05 01 | 3.11 kg | 1 | pc(s) | 210 |
| 119 371 | 474338 | 01 08 05 01 | 3.54 kg | 1 | pc(s) | 210 |
| 119 372 | 474345 | 01 08 05 01 | 3.98 kg | 1 | pc(s) | 210 |
| 119 373 | 488205 | 01 08 05 01 | 4.70 kg | 1 | pc(s) | 210 |
| 119 374 | 474352 | 01 08 05 01 | 5.55 kg | 1 | pc(s) | 210 |
| 119 900 | 472457 | 01 08 05 01 | 1.08 kg | 1 | pc(s) | 209 |
| 119 901 | 472464 | 01 08 05 01 | 1.46 kg | 1 | pc(s) | 209 |
| 119 907 | 472471 | 01 08 05 01 | 4.37 kg | 1 | pc(s) | 209 |
| 119 908 | 472488 | 01 08 05 01 | 5.21 kg | 1 | pc(s) | 209 |
| 119 909 | 472495 | 01 08 05 01 | 5.69 kg | 1 | pc(s) | 209 |
| 119 910 | 472501 | 01 08 05 01 | 6.47 kg | 1 | pc(s) | 209 |
| 119 911 | 472518 | 01 08 05 01 | 6.95 kg | 1 | pc(s) | 209 |
| 119 912 | 472525 | 01 08 05 01 | 7.42 kg | 1 | pc(s) | 209 |
| 119 913 | 472532 | 01 08 05 01 | 7.90 kg | 1 | pc(s) | 209 |
| 119 914 | 472549 | 01 08 05 01 | 8.37 kg | 1 | pc(s) | 209 |
| 119 915 | 472556 | 01 08 05 01 | 1.61 kg | 1 | pc(s) | 211 |
| 119 916 | 472563 | 01 08 05 01 | 2.05 kg | 1 | pc(s) | 211 |
| 119 917 | 537156 | 01 08 04 01 | 810 g | 1 | pc(s) | 233 |
| 119 918 | 537163 | 01 08 04 01 | 2.70 kg | 1 | pc(s) | 233 |
| 119 922 | 472570 | 01 08 05 01 | 5.37 kg | 1 | pc(s) | 211 |
| 119 924 | 472587 | 01 08 05 01 | 6.32 kg | 1 | pc(s) | 211 |
| 119 925 | 472594 | 01 08 05 01 | 7.10 kg | 1 | pc(s) | 211 |
| 119 926 | 472600 | 01 08 05 01 | 7.57 kg | 1 | pc(s) | 211 |
| 119 927 | 472617 | 01 08 05 01 | 8.09 kg | 1 | pc(s) | 211 |
| 119 928 | 472624 | 01 08 05 01 | 8.52 kg | 1 | pc(s) | 211 |
| 119 929 | 472631 | 01 08 05 01 | 9.01 kg | 1 | pc(s) | 211 |
| 119 930 | 472648 | 01 08 05 01 | 2.23 kg | 1 | pc(s) | 210 |
| 119 931 | 472655 | 01 08 05 01 | 2.67 kg | 1 | pc(s) | 210 |
| 119 937 | 472662 | 01 08 05 01 | 6.03 kg | 1 | pc(s) | 210 |
| 119 938 | 472679 | 01 08 05 01 | 6.50 kg | 1 | pc(s) | 210 |
| 119 939 | 472686 | 01 08 05 01 | 6.98 kg | 1 | pc(s) | 210 |
| 119 940 | 472693 | 01 08 05 01 | 7.76 kg | 1 | pc(s) | 210 |
| 119 941 | 472709 | 01 08 05 01 | 8.23 kg | 1 | pc(s) | 210 |
| 119 942 | 472716 | 01 08 05 01 | 8.71 kg | 1 | pc(s) | 210 |
| 119 943 | 472723 | 01 08 05 01 | 9.19 kg | 1 | pc(s) | 210 |
| 119 944 | 472730 | 01 08 05 01 | 9.66 kg | 1 | pc(s)210 | |
| 119 998 | 488229 | 01 08 05 01 | 780 g | 1 | pc(s) | 208 |
| 123 021 | 092822 | 01 01 01 03 | 2.20 kg | 1 | pc(s) | 88 |
| 123 032 | 242067 | 01 01 01 03 | 17.70 kg | 1 | pc(s) | 89 |
| 123 040 | 353817 | 01 03 01 01 | 167 g | 12 | pc(s) | 88/124 |
| 123 041 | 353787 | 01 03 01 01 | 180 g | 12 | pc(s) | 88/124 |
| 123 042 | 353794 | 01 03 01 01 | 122 g | 12 | pc(s) | 88/124 |
| 123 043 | 353824 | 01 03 01 01 | 75 g | 12 | pc(s) | 88/124 |
| 123 050 | 402454 | 01 06 01 01 | 5.66 kg | 1 | pc(s) | 87/124 |
| 123 051 | 402461 | 01 06 01 01 | 8.17 kg | 1 | pc(s) | 87/124 |
| 123 052 | 402478 | 01 06 01 01 | 10.68 kg | 1 | pc(s) | 87/124 |
| 123 109 | 107366 | 01 01 01 03 | 340 g | 1 | pc(s) | 92 |
| 123 110 | 147911 | 01 01 01 03 | 321 g | 1 | pc(s) | 92 |
| 123 116 | 147966 | 01 01 01 03 | 1.11 kg | 1 | pc(s) | 92 |
| 123 425 | 129009 | 01 01 01 03 | 2.82 kg | 1 | pc(s) | 88 |
| 123 430 | 129016 | 01 01 01 03 | 3.22 kg | 1 | pc(s) | 88 |
| 123 435 | 129023 | 01 01 01 03 | 3.42 kg | 1 | pc(s) | 88 |
| 128 010 | 298231 | 02 08 02 01 | 670 g/m | 50 | m | 13 |
| 128 011 | 300316 | 02 08 02 01 | 890 g/m | 40 | m | 13 |
| 128 012 | 300309 | 02 08 02 01 | 1.34 kg/m | 40 | m | 13 |
| 128 013 | 300293 | 02 08 02 01 | 1.66 kg/m | 30 | m | 13 |
| 128 016 | 300262 | 02 08 02 01 | 1.34 kg/m | 20 | m | 13 |
| 128 018 | 492202 | 02 08 02 01 | 530 g/m | 40 | m | 13 |
| 128 019 | 492219 | 02 08 02 01 | 670 g/m | 40 | m | 13 |
| 128 021 | 492721 | 02 08 02 01 | 1.34 kg/m | 30 | m | 13 |
| 128 022 | 492738 | 02 08 02 01 | 1.07 kg/m | 20 | m | 13 |
| 128 023 | 492745 | 02 08 02 01 | 1.78 kg/m | 20 | m | 13 |
| 128 024 | 492752 | 02 08 02 01 | 2.14 kg/m | 20 | m | 13 |
| 128 030 | 298248 | 02 08 02 02 | 770 g/m | 50 | m | 14 |
| 128 031 | 298323 | 02 08 02 02 | 770 g/m | 50 | m | 14 |
| 128 032 | 298347 | 02 08 02 02 | 770 g/m | 50 | m | 14 |
| 128 034 | 298378 | 02 08 02 02 | 770 g/m | 50 | m | 14 |
| 128 035 | 298385 | 02 08 02 02 | 770 g/m | 50 | m | 14 |
| 128 036 | 298392 | 02 08 02 02 | 770 g/m | 50 | m | 14 |
| 128 080 | 493056 | 02 08 02 02 | 1.53 kg/m | 40 | m | 14 |
| 128 081 | 493063 | 02 08 02 02 | 1.53 kg/m | 40 | m | 14 |
| 128 085 | 493070 | 02 08 02 02 | 1.53 kg/m | 40 | m | 14 |
| 128 090 | 493087 | 02 08 02 02 | 910 g/m | 30 | m | 14 |
| 128 094 | 493100 | 02 08 02 02 | 910 g/m | 30 | m | 14 |
| 128 095 | 493094 | 02 08 02 02 | 910 g/m | 30 | m | 14 |
| 128 105 | 493117 | 02 08 02 02 | 1.50 kg/m | 20 | m | 14 |
| 128 115 | 493124 | 02 08 02 02 | 2.95 kg/m | 20 | m | 14 |
| 128 230 | 300101 | 02 08 02 01 | 1.78 kg/m | 20 | m | 13 |
| 128 235 | 300095 | 02 08 02 01 | 2.67 kg/m | 20 | m | 13 |
| 128 250 | 300088 | 02 08 02 03 | 670 g/m | 50 | m | 14 |
| 128 251 | 492776 | 02 08 02 03 | 890 g/m | 40 | m | 14 |

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|---|---|---|---|---|---|---|
| 128 252 | 492783 | 02 08 02 03 | 1.34 kg/m | 40 | m | 14 |
| 128 253 | 492790 | 02 08 02 03 | 2.14 kg/m | 20 | m | 14 |
| 128 254 | 492806 | 02 08 02 03 | 1.34 kg/m | 20 | m | 14 |
| 128 255 | 492813 | 02 08 02 03 | 1.78 kg/m | 20 | m | 14 |
| 128 256 | 492820 | 02 08 02 03 | 2.67 kg/m | 20 | m | 14 |
| 138 031 | 300767 | 03 08 01 02 | 1.89 kg | 5 | pc(s) | 194 |
| 138 032 | 300750 | 03 08 01 04 | 1.90 kg | 10 | pc(s) | 194 |
| 138 033 | 431164 | 03 08 01 02 | 2.15 kg | 5 | pc(s) | 194 |
| 138 034 | 300743 | 03 08 01 04 | 2.95 kg | 5 | pc(s) | 194 |
| 138 035 | 493414 | 03 08 01 02 | 2.36 kg | 5 | pc(s) | 194 |
| 138 036 | 298170 | 03 08 01 01 | 110 g | 1 | pc(s) | 195 |
| 138 037 | 298163 | 03 08 01 01 | 120 g | 1 | pc(s) | 195 |
| 138 038 | 493421 | 03 08 01 02 | 4.72 kg | 5 | pc(s) | 194 |
| 138 040 | 300736 | 03 08 01 04 | 20 g | 100 | pc(s) | 194 |
| 138 041 | 300729 | 03 08 01 02 | 22 g | 100 | 194 | |
| 138 050 | 493438 | 03 08 01 02 | 2.68 kg | 5 | pc(s) | 194 |
| 138 051 | 475540 | 03 08 01 02 | 5.37 kg | 5 | pc(s) | 194 |
| 138 055 | 525214 | 03 08 01 04 | 2.34 kg | 10 | pc(s) | 194 |
| 138 056 | 525726 | 03 08 01 04 | 4.68 kg | 5 | pc(s) | 194 |
| 138 057 | 525733 | 03 08 01 04 | 3.65 kg | 5 | pc(s) | 194 |
| 138 058 | 525740 | 03 08 01 04 | 7.30 kg | 5 | pc(s) | 194 |
| 138 060 | 300712 | 03 08 01 02 | 3.35 kg | 5 | pc(s) | 194 |
| 138 061 | 468641 | 03 08 01 02 | 3.39 kg | 5 | pc(s) | 194 |
| 138 062 | 493445 | 03 08 01 02 | 4.19 kg | 5 | pc(s) | 194 |
| 138 063 | 493452 | 03 08 01 02 | 8.39 kg | 5 | pc(s) | 194 |
| 138 064 | 522800 | 03 08 01 02 | 1.87 kg | 5 | pc(s) | 194 |
| 138 065 | 522817 | 03 08 01 02 | 2.15 kg | 5 | pc(s) | 194 |
| 138 068 | 300705 | 03 08 06 01 | 40 g | 50 | pc(s) | 195 |
| 138 069 | 300699 | 03 08 06 01 | 60 g | 50 | pc(s) | 195 |
| 138 072 | 300675 | 03 08 06 01 | 30 g | 50 | pc(s) | 195 |
| 138 073 | 300668 | 03 08 06 01 | 40 g | 50 | pc(s) | 195 |
| 138 091 | 309272 | 03 08 05 01 | 28 kg | 1 | pc(s) | 56 |
| 138 094 | 311763 | 03 08 05 01 | 350 g | 1 | pc(s) | 56 |
| 138 097 | 501553 | 03 08 05 01 | 2.35 kg | 1 | pc(s) | 56 |
| 138 110 | 297999 | 03 08 03 02 | 4.35 kg | 1 | pc(s) | 167 |
| 138 111 | 298002 | 03 08 03 02 | 6.57 kg | 1 | pc(s) | 167 |
| 138 115 | 300620 | 03 08 03 02 | 4.80 kg | 1 | pc(s) | 167 |
| 138 116 | 300613 | 03 08 03 02 | 10.80 kg | 1 | pc(s) | 167 |
| 138 118 | 300606 | 03 08 03 02 | 9.60 kg | 1 | pc(s) | 167 |
| 138 119 | 300590 | 03 08 03 02 | 21.60 kg | 1 | pc(s) | 167 |
| 138 125 | 300583 | 03 08 02 01 | 25 kg | 1 | pc(s) | 185 |
| 138 126 | 300576 | 03 08 02 01 | 25 kg | 1 | pc(s) | 185 |
| 138 134 | 519237 | 03 08 01 05 | 180 g | 10 | pc(s) | 196 |
| 138 135 | 519244 | 03 08 01 05 | 190 g | 9 | pc(s) | 196 |
| 138 136 | 475854 | 03 08 01 05 | 70 g | 20 | pc(s) | 196 |
| 138 137 | 475861 | 03 08 01 05 | 100 g | 20 | pc(s) | 196 |
| 138 148 | 300507 | 03 08 01 05 | 230 g | 8 | pc(s) | 184/197 |
| 138 150 | 298156 | 03 08 01 05 | 90 g | 20 | pc(s) | 197 |
| 138 151 | 528253 | 03 08 01 05 | 100 g | 20 | pc(s) | 197 |
| 138 152 | 534995 | 03 08 01 05 | 210 g | 8 | pc(s) | 197 |
| 138 164 | 519077 | 03 08 01 05 | 220 g | 8 | pc(s) | 184/196 |
| 138 165 | 519084 | 03 08 01 05 | 240 g | 8 | pc(s) | 184/196 |
| 138 166 | 519091 | 03 08 01 05 | 280 g | 6 | pc(s) | 184/196 |
| 138 170 | 519107 | 03 08 01 05 | 210 g | 8 | pc(s) | 184/196 |
| 138 171 | 519114 | 03 08 01 05 | 230 g | 8 | pc(s) | 184/196 |
| 138 172 | 519121 | 03 08 01 05 | 270 g | 6 | pc(s) | 184/196 |
| 138 173 | 535008 | 03 08 01 05 | 470 g | 2 | pc(s) | 185 |
| 138 174 | 519152 | 03 08 01 05 | 230 g | 6 | pc(s) | 185 |
| 138 176 | 519169 | 03 08 01 05 | 300 g | 6 | pc(s) | 185 |
| 138 177 | 519138 | 03 08 01 05 | 370 g | 4 | pc(s) | 184/196 |
| 138 178 | 519176 | 03 08 01 05 | 440 g | 4 | pc(s) | 185 |
| 138 179 | 519183 | 03 08 01 05 | 730 g | 2 | pc(s) | 185 |
| 138 185 | 517646 | 03 08 01 05 | 260 g | 4 | pc(s) | 185 |
| 138 186 | 528246 | 03 08 01 05 | 260 g | 4 | pc(s) | 185 |
| 138 187 | 517653 | 03 08 01 05 | 268 g | 4 | pc(s) | 185 |
| 138 200 | 300491 | 03 08 04 01 | 60 g | 25 | pc(s) | 212 |
| 138 201 | 540774 | 03 08 04 02 | 106 g | 25 | pc(s) | 212 |
| 138 202 | 540781 | 03 08 04 02 | 125 g | 20 | pc(s) | 212 |
| 138 203 | 540798 | 03 08 04 02 | 235 g | 20 | pc(s) | 212 |
| 138 220 | 540736 | 03 08 04 02 | 60 g | 25 | pc(s) | 212 |
| 138 222 | 540743 | 03 08 04 02 | 106 g | 25 | pc(s) | 212 |
| 138 224 | 540750 | 03 08 04 02 | 125 g | 20 | pc(s) | 212 |
| 138 226 | 540767 | 03 08 04 02 | 235 g | 20 | pc(s) | 212 |
| 138 251 | 298149 | 03 08 01 05 | 220 g | 10 | pc(s) | 95 |
| 138 252 | 536210 | 03 08 01 05 | 230 g | 10 | pc(s) | 95 |
| 138 253 | 536326 | 03 08 01 05 | 90 g | 10 | pc(s) | 95 |
| 138 260 | 519022 | 03 08 01 05 | 326 g | 4 | pc(s) | 184 |
| 138 261 | 519015 | 03 08 01 05 | 190 g | 8 | pc(s) | 184/197 |
| 138 263 | 519039 | 03 08 01 05 | 345 g | 4 | pc(s) | 184 |
| 138 265 | 519046 | 03 08 01 05 | 210 g | 8 | pc(s) | 184/197 |
| 138 283 | 519190 | 03 08 01 05 | 308 g | 10 | pc(s) | 196 |
| 138 284 | 519206 | 03 08 01 05 | 432 g | 4 | pc(s) | 197 |
| 138 315 | 300415 | 03 08 05 01 | 2.70 kg | 1 | pc(s) | 55 |
| 138 316 | 300408 | 03 08 05 01 | 2.70 kg | 1 | pc(s) | 55 |
| 138 320 | 300392 | 03 08 05 01 | 2.70 kg | 1 | pc(s) | 55 |
| 138 321 | 300385 | 03 08 05 01 | 2.70 kg | 1 | pc(s) | 55 |
| 138 322 | 300378 | 03 08 05 01 | 2.70 kg | 1 | pc(s) | 55 |
| 146 309 | 072398 | 01 01 01 04 | 864 g | 1 | pc(s) | 32 |
| 148 010 | 357891 | 03 08 07 02 | 1.20 kg | 1 | pc(s) | 244 |
| 148 011 | 357907 | 03 08 07 02 | 1.12 kg | 1 | pc(s) | 244 |
| 148 012 | 357914 | 03 08 07 02 | 1.22 kg | 1 | pc(s) | 244 |
| 148 013 | 357921 | 03 08 07 02 | 1.48 kg | 1 | pc(s) | 244 |
| 148 014 | 357938 | 03 08 07 02 | 1.88 kg | 1 | pc(s) | 244 |
| 148 015 | 357945 | 03 08 07 02 | 2.40 kg | 1 | pc(s) | 244 |
| 148 016 | 357952 | 03 08 07 02 | 3.02 kg | 1 | pc(s) | 244 |
| 148 100 | 357969 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 101 | 357976 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 110 | 357983 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 111 | 357990 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 112 | 358003 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 113 | 358010 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 114 | 358034 | 03 08 07 01 | 2.68 kg | 1 | pc(s) | 243 |
| 148 120 | 358041 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 121 | 358058 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 122 | 358065 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 123 | 358072 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 124 | 358089 | 03 08 07 01 | 2.68 kg | 1 | pc(s) | 242 |
| 148 130 | 358096 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 131 | 358102 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 132 | 358119 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 140 | 358126 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 141 | 358133 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 142 | 358140 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 143 | 358157 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 144 | 358164 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 145 | 358171 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 146 | 358188 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 147 | 358195 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 148 | 358201 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 150 | 358218 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 151 | 358225 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 152 | 358232 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 153 | 358249 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 154 | 358256 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 160 | 358263 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 161 | 358270 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 170 | 358836 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 171 | 358843 | 03 08 07 01 | 2.68 kg | 1 | pc(s) | 243 |
| 148 180 | 358850 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 181 | 358867 | 03 08 07 01 | 2.68 kg | 1 | pc(s) | 243 |
| 148 190 | 358874 | 03 08 07 01 | 2.68 kg | 1 | pc(s) | 243 |
| 148 191 | 358881 | 03 08 07 01 | 2.68 kg | 1 | pc(s) | 243 |
| 148 200 | 358898 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 243 |
| 148 201 | 358904 | 03 08 07 01 | 2.68 kg | 1 | pc(s) | 243 |
| 148 202 | 358942 | 03 08 07 01 | 2.68 kg | 1 | pc(s) | 243 |
| 148 210 | 358911 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 211 | 358928 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 212 | 022614 | 03 08 07 01 | 1.42 kg | 1 | pc(s) | 242 |
| 148 998 | 357860 | 03 08 07 02 | 1.10 kg | 1 | pc(s) | 244 |

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|---|---|---|---|---|---|---|
| 148 999 | 357877 | 03 08 07 02 | 1.25 kg | 1 | pc(s) | 244 |
| 200 027 | 031258 | 01 04 01 04 | 46 g | 10 | pc(s) | 40 |
| 200 029 | 031265 | 01 04 01 04 | 45 g | 10 | pc(s) | 40 |
| 200 039 | 129283 | 01 04 01 04 | 40 g | 10 | pc(s) | 40 |
| 200 039 | 129283 | 01 04 01 04 | 40 g | 10 | pc(s) | 340 |
| 200 057 | 041530 | 01 04 01 04 | 30 g | 25 | pc(s) | 40 |
| 200 059 | 041547 | 01 04 01 04 | 26 g | 25 | pc(s) | 40 |
| 200 067 | 041554 | 01 04 01 04 | 34 g | 25 | pc(s) | 40 |
| 200 069 | 041561 | 01 04 01 04 | 28 g | 25 | pc(s) | 40 |
| 200 077 | 082335 | 01 04 01 04 | 32 g | 50 | pc(s) | 40 |
| 200 079 | 069138 | 01 04 01 04 | 49 g | 50 | pc(s) | 40 |
| 200 087 | 082342 | 01 04 01 04 | 36 g | 50 | pc(s) | 40 |
| 200 089 | 074729 | 01 04 01 04 | 54 g | 50 | pc(s) | 40 |
| 200 600 | 098220 | 01 06 01 01 | 4 g | 50 | pc(s) | 46 |
| 200 601 | 098237 | 01 06 01 01 | 7 g | 50 | pc(s) | 46 |
| 202 000 | 019881 | 01 03 01 02 | 9 g | 50 | pc(s) | 39 |
| 202 001 | 020474 | 01 03 01 02 | 3 g | 50 | pc(s) | 39 |
| 202 005 | 022041 | 01 03 01 01 | 70 g | 50 | pc(s) | 35 |
| 202 010 | 019874 | 01 03 01 01 | 159 g | 50 | pc(s) | 30 |
| 202 015 | 022089 | 01 03 01 01 | 59 g | 50 | pc(s) | 35 |
| 202 017 | 019904 | 01 03 01 01 | 189 g | 1 | pc(s) | 30 |
| 202 020 | 020764 | 01 03 01 01 | 250 g | 25 | pc(s) | 27 |
| 202 021 | 020788 | 01 03 01 01 | 264 g | 1 | pc(s) | 27 |
| 202 027 | 020771 | 01 03 01 01 | 290 g | 1 | pc(s) | 27 |
| 202 030 | 022362 | 01 03 01 01 | 114 g | 50 | pc(s) | 21 |
| 202 037 | 019942 | 01 03 01 01 | 187 g | 50 | pc(s) | 30 |
| 202 040 | 019935 | 01 03 01 01 | 170 g | 50 | pc(s) | 30 |
| 202 050 | 020214 | 01 03 01 01 | 137 g | 25 | pc(s) | 31 |
| 202 060 | 022263 | 01 03 01 01 | 226 g | 1 | pc(s) | 21 |
| 202 080 | 020276 | 01 03 01 01 | 250 g | 50 | pc(s) | 31 |
| 202 169 | 105737 | 01 03 01 02 | 6 g | 100 | pc(s) | 39 |
| 202 227 | 020795 | 01 03 01 01 | 290 g | 25 | pc(s) | 27 |
| 202 829 | 159822 | 01 07 01 01 | 119 g | 1 | pc(s) | 120/137 |
| 202 850 | 354135 | 01 07 01 01 | 201 g | 25 | pc(s) | 120/137 |
| 202 851 | 354142 | 01 07 01 01 | 208 g | 25 | pc(s) | 120/137 |
| 202 852 | 354159 | 01 07 01 01 | 153 g | 25 | pc(s) | 120/137 |
| 202 853 | 354166 | 01 07 01 01 | 109 g | 25 | pc(s) | 120/138 |
| 202 857 | 153189 | 01 07 01 03 | 127 g | 1 | pc(s) | 155 |
| 202 860 | 354180 | 01 07 01 03 | 207 g | 25 | pc(s) | 155 |
| 202 861 | 354197 | 01 07 01 03 | 217 g | 25 | pc(s) | 155 |
| 202 862 | 354203 | 01 07 01 03 | 160 g | 25 | pc(s) | 155 |
| 202 863 | 354210 | 01 07 01 03 | 115 g | 25 | pc(s) | 155 |
| 202 900 | 020801 | 01 03 01 01 | 127 g | 1 | pc(s) | 27 |
| 202 901 | 019928 | 01 03 01 01 | 83 g | 50 | pc(s) | 30 |
| 202 902 | 020467 | 01 03 01 01 | 81 g | 50 | pc(s) | 30 |
| 202 906 | 022102 | 01 03 01 01 | 32 g | 50 | pc(s) | 35 |
| 204 001 | 018990 | 01 03 01 02 | 8 g | 100 | pc(s) | 37 |
| 204 002 | 019195 | 01 03 01 02 | 8 g | 50 | pc(s) | 37 |
| 204 003 | 019034 | 01 03 01 02 | 15 g | 100 | pc(s) | 37 |
| 204 004 | 019003 | 01 03 01 02 | 15 g | 50 | pc(s) | 37 |
| 204 006 | 028371 | 01 03 01 02 | 19 g | 50 | pc(s) | 37 |
| 204 007 | 019188 | 01 03 01 02 | 9 g | 50 | pc(s) | 37 |
| 204 017 | 019058 | 01 03 01 02 | 9 g | 100 | pc(s) | 37 |
| 204 027 | 018969 | 01 03 01 02 | 12 g | 100 | pc(s) | 37 |
| 204 029 | 032286 | 01 03 01 01 | 35 g | 50 | pc(s) | 28 |
| 204 037 | 019331 | 01 03 01 02 | 16 g | 50 | pc(s) | 37 |
| 204 039 | 032293 | 01 03 01 01 | 35 g | 50 | pc(s) | 28 |
| 204 049 | 032309 | 01 03 01 01 | 40 g | 50 | pc(s) | 31 |
| 204 059 | 032316 | 01 03 01 01 | 41 g | 50 | pc(s) | 31 |
| 204 069 | 032675 | 01 03 01 01 | 31 g | 50 | pc(s) | 31 |
| 204 079 | 032668 | 01 03 01 01 | 31 g | 50 | pc(s) | 31 |
| 204 089 | 109568 | 01 03 01 01 | 67 g | 1 | pc(s) | 29 |
| 204 107 | 028104 | 01 03 01 01 | 105 g | 25 | pc(s) | 27 |
| 204 109 | 028098 | 01 03 01 01 | 98 g | 25 | pc(s) | 27 |
| 204 120 | 085749 | 01 03 01 02 | 20 g | 50 | pc(s) | 37 |
| 204 127 | 028142 | 01 03 01 01 | 110 g | 25 | pc(s) | 27 |
| 204 129 | 021433 | 01 03 01 01 | 102 g | 25 | pc(s) | 27 |
| 204 147 | 042513 | 01 03 01 01 | 51 g | 50 | pc(s) | 28 |
| 204 149 | 042285 | 01 03 01 01 | 52 g | 50 | pc(s) | 28 |
| 204 157 | 042520 | 01 03 01 01 | 83 g | 50 | pc(s) | 28 |
| 204 159 | 042537 | 01 03 01 01 | 78 g | 50 | pc(s) | 28 |
| 204 169 | 042551 | 01 03 01 01 | 100 g | 1 | pc(s) | 28 |
| 204 170 | 072435 | 01 03 01 01 | 40 g | 50 | pc(s) | 29 |
| 204 171 | 073708 | 01 03 01 01 | 38 g | 50 | pc(s) | 29 |
| 204 177 | 042568 | 01 03 01 01 | 70 g | 50 | pc(s) | 29 |
| 204 179 | 042575 | 01 03 01 01 | 60 g | 50 | pc(s) | 29 |
| 204 187 | 042582 | 01 03 01 01 | 91 g | 50 | pc(s) | 29 |
| 204 189 | 042599 | 01 03 01 01 | 83 g | 50 | pc(s) | 29 |
| 204 197 | 042605 | 01 03 01 01 | 112 g | 1 | pc(s) | 29 |
| 204 199 | 042278 | 01 03 01 01 | 111 g | 50 | pc(s) | 29 |
| 204 229 | 035300 | 01 03 01 01 | 31 g | 50 | pc(s) | 32 |
| 204 239 | 035317 | 01 03 01 01 | 31 g | 50 | pc(s) | 32 |
| 204 247 | 041806 | 01 03 01 01 | 72 g | 25 | pc(s) | 26 |
| 204 249 | 041790 | 01 03 01 01 | 68 g | 25 | pc(s) | 26 |
| 204 267 | 035805 | 01 03 01 01 | 70 g | 25 | pc(s) | 26 |
| 204 269 | 035812 | 01 03 01 01 | 64 g | 25 | pc(s) | 26 |
| 204 359 | 082779 | 01 03 01 01 | 61 g | 1 | pc(s) | 31 |
| 204 449 | 124837 | 01 03 01 01 | 66 g | 25 | pc(s) | 26 |
| 204 469 | 124851 | 01 03 01 01 | 63 g | 25 | pc(s) | 26 |
| 204 906 | 028456 | 01 03 01 01 | 19 g | 50 | pc(s) | 35 |
| 204 911 | 030640 | 01 03 01 01 | 98 g | 25 | pc(s) | 27 |
| 204 913 | 030664 | 01 03 01 01 | 108 g | 25 | pc(s) | 27 |
| 204 916 | 030565 | 01 03 01 01 | 19 g | 50 | pc(s) | 35 |
| 204 921 | 030589 | 01 03 01 01 | 50 g | 1 | pc(s) | 28 |
| 204 924 | 030619 | 01 03 01 01 | 64 g | 50 | pc(s) | 29 |
| 204 925 | 030626 | 01 03 01 01 | 90 g | 50 | pc(s) | 29 |
| 204 935 | 029958 | 01 03 01 01 | 40 g | 1 | pc(s) | 28 |
| 204 936 | 029927 | 01 03 01 01 | 40 g | 50 | pc(s) | 28 |
| 204 937 | 029941 | 01 03 01 01 | 46 g | 50 | pc(s) | 28 |
| 204 938 | 029989 | 01 03 01 01 | 47 g | 50 | pc(s) | 28 |
| 204 949 | 129290 | 01 03 01 01 | 54 g | 50 | pc(s) | 28 |
| 204 957 | 129269 | 01 03 01 01 | 55 g | 50 | pc(s) | 28 |
| 206 049 | 242982 | 01 03 01 01 | 25 g | 50 | pc(s) | 31 |
| 206 105 | 083189 | 01 03 01 01 | 74 g | 50 | pc(s) | 35 |
| 206 109 | 042810 | 01 03 01 01 | 110 g | 25 | pc(s) | 27 |
| 206 170 | 082816 | 01 03 01 01 | 51 g | 50 | pc(s) | 30 |
| 206 171 | 089488 | 01 03 01 01 | 51 g | 50 | pc(s) | 30 |
| 206 207 | 054257 | 01 03 01 01 | 65 g | 50 | pc(s) | 29 |
| 206 209 | 042759 | 01 03 01 01 | 59 g | 50 | pc(s) | 29 |
| 206 217 | 052208 | 01 03 01 01 | 93 g | 50 | pc(s) | 29 |
| 206 219 | 042766 | 01 03 01 01 | 83 g | 50 | pc(s) | 29 |
| 206 227 | 054264 | 01 03 01 01 | 117 g | 50 | pc(s) | 29 |
| 206 229 | 042773 | 01 03 01 01 | 114 g | 50 | pc(s) | 29 |
| 206 237 | 077300 | 01 03 01 01 | 81 g | 25 | pc(s) | 26 |
| 206 239 | 042650 | 01 03 01 01 | 74 g | 25 | pc(s) | 26 |
| 206 247 | 078574 | 01 03 01 01 | 92 g | 25 | pc(s) | 26 |
| 206 249 | 042803 | 01 03 01 01 | 80 g | 25 | pc(s) | 26 |
| 206 289 | 149427 | 01 03 01 01 | 76 g | 50 | pc(s) | 30 |
| 206 309 | 042780 | 01 03 01 01 | 60 g | 50 | pc(s) | 30 |
| 206 319 | 042667 | 01 03 01 01 | 87 g | 50 | pc(s) | 30 |
| 206 329 | 042797 | 01 03 01 01 | 110 g | 50 | pc(s) | 30 |
| 206 339 | 047730 | 01 03 01 01 | 27 g | 50 | pc(s) | 35 |
| 206 349 | 047716 | 01 03 01 01 | 48 g | 50 | pc(s) | 32 |
| 206 359 | 047723 | 01 03 01 01 | 65 g | 50 | pc(s) | 31 |
| 206 369 | 086494 | 01 03 01 01 | 50 g | 50 | pc(s) | 32 |
| 206 379 | 430983 | 01 03 01 01 | 56 g | 50 | pc(s) | 31 |
| 206 389 | 109544 | 01 03 01 01 | 62 g | 50 | pc(s) | 31 |
| 206 399 | 109551 | 01 03 01 01 | 63 g | 50 | pc(s) | 31 |
| 206 439 | 124875 | 01 03 01 01 | 72 g | 25 | pc(s) | 26 |
| 206 449 | 124899 | 01 03 01 01 | 78 g | 25 | pc(s) | 26 |
| 206 807 | 046306 | 01 03 01 01 | 107 g | 25 | pc(s) | 27 |
| 206 809 | 077485 | 01 03 01 01 | 114 g | 25 | pc(s) | 27 |
| 206 817 | 078581 | 01 03 01 01 | 122 g | 25 | pc(s) | 27 |
| 206 819 | 077362 | 01 03 01 01 | 115 g | 25 | pc(s) | 27 |
| 207 007 | 054899 | 01 03 01 02 | 16 g | 50 | pc(s) | 36 |
| 207 009 | 054882 | 01 03 01 02 | 16 g | 50 | pc(s) | 36 |
| 207 017 | 054905 | 01 03 01 02 | 16 g | 50 | pc(s) | 36 |

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| 207 019 | 054912 | 01 03 01 02 | 20 g | 50 | pc(s) | 36 |
| 207 027 | 042728 | 01 03 01 02 | 26 g | 50 | pc(s) | 36 |
| 207 029 | 042711 | 01 03 01 02 | 24 g | 50 | pc(s) | 36 |
| 207 037 | 042742 | 01 03 01 02 | 26 g | 50 | pc(s) | 36 |
| 207 039 | 042735 | 01 03 01 02 | 24 g | 50 | pc(s) | 36 |
| 207 107 | 235649 | 01 03 01 02 | 30 g | 50 | pc(s) | 36 |
| 207 109 | 085800 | 01 03 01 02 | 27 g | 50 | pc(s) | 36 |
| 216 000 | 020054 | 01 03 01 01 | 74 g | 25 | pc(s) | 28 |
| 223 005 | 099937 | 01 03 01 03 | 481 g | 1 | pc(s) | 92 |
| 223 010 | 092778 | 01 03 01 01 | 184 g | 50 | pc(s) | 33 |
| 223 011 | 092785 | 01 03 01 01 | 167 g | 50 | pc(s) | 33 |
| 223 020 | 092792 | 01 03 01 01 | 121 g | 50 | pc(s) | 34 |
| 223 021 | 092808 | 01 03 01 01 | 103 g | 50 | pc(s) | 34 |
| 223 031 | 092815 | 01 03 01 01 | 117 g | 50 | pc(s) | 34 |
| 223 040 | 096752 | 01 03 01 01 | 100 g | 50 | pc(s) | 33 |
| 223 041 | 096769 | 01 03 01 01 | 96 g | 50 | pc(s) | 33 |
| 223 070 | 108738 | 01 03 01 01 | 103 g | 50 | pc(s) | 33 |
| 223 071 | 108745 | 01 03 01 01 | 94 g | 50 | pc(s) | 33 |
| 239 000 | 022621 | 01 01 01 04 | 4.70 kg | 1 | pc(s) | 32 |
| 239 001 | 022638 | 01 01 01 04 | 5.17 kg | 1 | pc(s) | 32 |
| 239 009 | 072350 | 01 01 01 04 | 4.04 kg | 1 | pc(s) | 32 |
| 239 019 | 093560 | 01 01 01 04 | 5.20 kg | 1 | pc(s) | 32 |
| 240 000 | 022614 | 01 01 01 04 | 1.50 kg | 1 | pc(s) | 32 |
| 241 009 | 072985 | 01 01 01 04 | 376 g | 20 | pc(s) | 32 |
| 250 000 | 023871 | 01 03 01 02 | 30 g | 50 | pc(s) | 36 |
| 250 001 | 023888 | 01 03 01 02 | 29 g | 50 | pc(s) | 36 |
| 250 007 | 023895 | 01 03 01 02 | 29 g | 50 | pc(s) | 36 |
| 252 000 | 023963 | 01 03 01 03 | 45 g | 50 | pc(s) | 50 |
| 253 015 | 022201 | 01 03 01 01 | 1.04 kg | 10 | pc(s) | 20/118 |
| 253 015 | 022201 | 01 03 01 01 | 1.04 kg | 10 | pc(s) | 135 |
| 253 021 | 022256 | 01 03 01 01 | 6 g | 50 | pc(s) | 21 |
| 253 023 | 022249 | 01 03 01 01 | 8 g | 50 | pc(s) | 21 |
| 253 025 | 053984 | 01 03 01 01 | 6 g | 50 | pc(s) | 21 |
| 253 026 | 100169 | 01 07 01 01 | 8 g | 50 | pc(s) | 118/135 |
| 253 027 | 110427 | 01 07 01 01 | 8 g | 50 | pc(s) | 122/135 |
| 253 029 | 089617 | 01 03 01 01 | 1 g | 100 | pc(s) | 21 |
| 253 030 | 054271 | 01 03 01 01 | 58 g | 100 | pc(s) | 20 |
| 253 050 | 079687 | 01 03 01 01 | 1.04 kg | 10 | pc(s) | 20 |
| 253 051 | 079823 | 01 03 01 01 | 38 g | 100 | pc(s) | 20 |
| 253 060 | 081628 | 01 03 01 01 | 1.04 kg | 10 | pc(s) | 20 |
| 253 115 | 129870 | 01 03 01 01 | 4.82 kg | 24 | pc(s) | 103 |
| 253 125 | 129887 | 01 03 01 01 | 4.84 kg | 24 | pc(s) | 103 |
| 253 229 | 159846 | 01 07 01 01 | 4.89 kg | 1 | pc(s) | 118/135 |
| 253 239 | 159853 | 01 07 01 01 | 8.70 kg | 1 | pc(s) | 118/135 |
| 253 279 | 159877 | 01 07 01 01 | 178 g | 1 | pc(s) | 119/136 |
| 253 289 | 159860 | 01 07 01 01 | 89 g | 1 | pc(s) | 119/136 |
| 253 300 | 129771 | 01 03 01 01 | 165 g | 24 | pc(s) | 103/119 |
| 253 300 | 129771 | 01 03 01 01 | 165 g | 24 | pc(s) | 136/152 |
| 253 301 | 129788 | 01 03 01 01 | 4.60 kg | 24 | pc(s) | 103/119 |
| 253 301 | 129788 | 01 03 01 01 | 4.60 kg | 24 | pc(s) | 136/152 |
| 253 302 | 129764 | 01 03 01 01 | 13 g | 24 | pc(s) | 103 |
| 253 310 | 129795 | 01 03 01 01 | 470 g | 10 | pc(s) | 103 |
| 253 315 | 129801 | 01 03 01 01 | 55 g | 24 | pc(s) | 92/103 |
| 253 325 | 129863 | 01 03 01 01 | 77 g | 24 | pc(s) | 92/103 |
| 253 330 | 153585 | 01 07 01 03 | 96 g | 1 | pc(s) | 152 |
| 253 331 | 155206 | 01 07 01 03 | 180 g | 25 | pc(s) | 152 |
| 253 333 | 153578 | 01 07 01 03 | 4.74 kg | 24 | pc(s) | 152 |
| 253 334 | 154933 | 01 07 01 03 | 8.59 kg | 1 | pc(s) | 152 |
| 253 335 | 499416 | 01 03 01 01 | 4.98 kg | 24 | pc(s) | 20 |
| 273 019 | 031487 | 01 03 01 02 | 22 g | 50 | pc(s) | 39 |
| 274 030 | 130340 | 01 03 01 02 | 34 g | 50 | pc(s) | 43 |
| 274 030 | 130340 | 01 03 01 02 | 34 g | 50 | pc(s) | 51 |
| 274 110 | 123434 | 01 03 01 02 | 30 g | 50 | pc(s) | 37/49 |
| 274 113 | 123403 | 01 03 01 02 | 36 g | 50 | pc(s) | 38/49 |
| 274 116 | 123410 | 01 03 01 03 | 37 g | 50 | pc(s) | 50/78 |
| 274 117 | 128194 | 01 03 01 02 | 30 g | 50 | pc(s) | 37/49 |
| 274 150 | 128187 | 01 03 01 02 | 33 g | 50 | pc(s) | 37/49 |
| 274 160 | 123380 | 01 03 01 02 | 40 g | 50 | pc(s) | 37/49 |
| 274 160 | 123380 | 01 03 01 02 | 40 g | 50 | pc(s) | 167 |
| 274 167 | 128200 | 01 03 01 02 | 41 g | 50 | pc(s) | 37/49 |
| 274 230 | 130456 | 01 03 01 02 | 45 g | 50 | pc(s) | 43/51 |
| 274 260 | 123489 | 01 03 01 03 | 48 g | 50 | pc(s) | 50/78 |
| 275 019 | 031494 | 01 03 01 03 | 31 g | 50 | pc(s) | 50 |
| 275 030 | 095847 | 01 03 01 02 | 87 g | 50 | pc(s) | 43/51 |
| 275 110 | 095793 | 01 03 01 02 | 65 g | 50 | pc(s) | 38/49 |
| 275 113 | 095816 | 01 03 01 02 | 82 g | 50 | pc(s) | 38/49 |
| 275 116 | 095823 | 01 03 01 03 | 96 g | 50 | pc(s) | 50 |
| 275 129 | 106758 | 01 07 01 01 | 21 g | 10 | pc(s) | 164 |
| 275 160 | 095809 | 01 03 01 02 | 76 g | 50 | pc(s) | 38/49 |
| 275 220 | 103450 | 01 07 01 01 | 18 g | 25 | pc(s) | 121/139 |
| 275 220 | 103450 | 01 07 01 01 | 18 g | 25 | pc(s) | 164 |
| 275 225 | 103467 | 01 07 01 01 | 18 g | 1 | pc(s) | 139 |
| 275 229 | 102040 | 01 07 01 01 | 59 g | 50 | pc(s) | 121/139 |
| 275 229 | 102040 | 01 07 01 01 | 59 g | 50 | pc(s) | 164 |
| 275 230 | 095854 | 01 03 01 02 | 94 g | 50 | pc(s) | 43/51 |
| 275 239 | 115811 | 01 07 01 01 | 73 g | 1 | pc(s) | 139 |
| 275 240 | 152335 | 01 07 01 03 | 53 g | 25 | pc(s) | 154 |
| 275 241 | 152342 | 01 07 01 03 | 53 g | 25 | pc(s) | 154 |
| 275 242 | 152359 | 01 07 01 03 | 52 g | 25 | pc(s) | 154 |
| 275 249 | 152366 | 01 07 01 03 | 56 g | 25 | pc(s) | 154 |
| 275 250 | 155602 | 01 07 01 01 | 46 g | 25 | pc(s) | 121/138 |
| 275 251 | 155619 | 01 07 01 01 | 46 g | 25 | pc(s) | 121/138 |
| 275 252 | 155626 | 01 07 01 01 | 46 g | 25 | pc(s) | 121/138 |
| 275 259 | 155633 | 01 07 01 01 | 49 g | 25 | pc(s) | 121/138 |
| 275 260 | 095830 | 01 03 01 03 | 100 g | 50 | pc(s) | 50 |
| 275 269 | 519213 | 01 07 01 05 | 34 g | 25 | pc(s) | 154 |
| 275 319 | 229952 | 01 07 01 01 | 124 g | 10 | pc(s) | 121 |
| 275 319 | 229952 | 01 07 01 01 | 124 g | 10 | pc(s) | 138 |
| 275 320 | 099876 | 01 07 01 01 | 250 g | 1 | pc(s) | 121/138 |
| 275 330 | 105065 | 01 07 01 01 | 218 g | 1 | pc(s) | 122/138 |
| 275 333 | 105072 | 01 07 01 01 | 220 g | 1 | pc(s) | 138 |
| 275 339 | 223332 | 01 07 01 01 | 247 g | 1 | pc(s) | 154 |
| 275 359 | 223271 | 01 07 01 01 | 131 g | 1 | pc(s) | 154 |
| 275 440 | 146914 | 01 07 01 01 | 152 g | 10 | pc(s) | 140 |
| 275 441 | 146921 | 01 07 01 01 | 240 g | 10 | pc(s) | 140 |
| 275 442 | 146938 | 01 07 01 01 | 250 g | 10 | pc(s) | 140 |
| 275 444 | 244252 | 01 07 01 01 | 158 g | 10 | pc(s) | 140 |
| 275 450 | 244436 | 01 07 01 01 | 168 g | 10 | pc(s) | 156 |
| 275 451 | 244498 | 01 07 01 01 | 273 g | 10 | pc(s) | 156 |
| 275 454 | 244504 | 01 07 01 01 | 173 g | 10 | pc(s) | 156 |
| 275 455 | 244535 | 01 07 01 01 | 277 g | 10 | pc(s) | 156 |
| 275 460 | 485921 | 01 07 01 04 | 138 g | 10 | pc(s) | 117 |
| 275 461 | 485938 | 01 07 01 04 | 211 g | 10 | pc(s) | 117 |
| 275 462 | 485952 | 01 07 01 04 | 214 g | 10 | pc(s) | 117 |
| 275 464 | 485945 | 01 07 01 04 | 145 g | 10 | pc(s) | 117 |
| 275 498 | 146945 | 01 07 01 01 | 320 g | 10 | pc(s) | 117/140 |
| 275 498 | 146945 | 01 07 01 01 | 320 g | 10 | pc(s) | 156 |
| 275 711 | 124233 | 01 03 01 02 | 37 g | 50 | pc(s) | 42 |
| 275 716 | 124226 | 01 03 01 03 | 40 g | 50 | pc(s) | 42 |
| 275 730 | 124219 | 01 03 01 02 | 42 g | 50 | pc(s) | 42 |
| 276 006 | 023291 | 01 03 01 02 | 2 g | 100 | pc(s) | 39 |
| 276 007 | 028166 | 01 03 01 02 | 2 g | 100 | pc(s) | 39 |
| 276 009 | 083318 | 01 03 01 02 | 8 g | 100 | pc(s) | 39 |
| 276 016 | 123373 | 01 03 01 02 | 3 g | 100 | pc(s) | 39 |
| 276 017 | 126596 | 01 03 01 02 | 3 g | 100 | pc(s) | 39 |
| 276 056 | 104983 | 01 06 01 01 | 2 g | 100 | pc(s) | 12 |
| 276 057 | 104990 | 01 06 01 01 | 2 g | 1 | pc(s) | 12 |
| 277 130 | 022669 | 01 03 01 02 | 28 g | 50 | pc(s) | 207 |
| 277 230 | 110984 | 01 05 01 04 | 120 g | 25 | pc(s) | 45/52 |



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| 277 237 | 110991 | 01 05 01 04 | 123 g | 25 pc(s) | 45/52 |
| 277 237 | 110991 | 01 05 01 04 | 123 g | 25 pc(s) | 208 |
| 277 239 | 111004 | 01 05 01 04 | 113 g | 25 pc(s) | 45/52 |
| 277 239 | 111004 | 01 05 01 04 | 113 g | 25 pc(s) | 208 |
| 277 240 | 022577 | 01 05 01 04 | 167 g | 25 pc(s) | 45/52 |
| 277 240 | 022577 | 01 05 01 04 | 167 g | 25 pc(s) | 208 |
| 277 249 | 506251 | 01 05 01 04 | 137 g | 25 pc(s) | 45/52 |
| 277 249 | 506251 | 01 05 01 04 | 137 g | 25 pc(s) | 208 |
| 284 030 | 022485 | 01 03 01 02 | 54 g | 100 pc(s) | 43/51 |
| 284 040 | 022492 | 01 03 01 02 | 65 g | 100 pc(s) | 43/51 |
| 286 030 | 022508 | 01 03 01 02 | 60 g | 50 pc(s) | 43/51 |
| 286 139 | 035393 | 01 03 01 02 | 45 g | 50 pc(s) | 43/51 |
| 286 819 | 085824 | 01 03 01 02 | 70 g | 50 pc(s) | 38/48 |
| 290 001 | 027909 | 03 01 01 01 | 326 g | 25 pc(s) | 183 |
| 290 002 | 027893 | 03 01 01 01 | 89 g | 50 pc(s) | 183 |
| 297 015 | 023383 | 01 03 01 01 | 131 g | 25 pc(s) | 21 |
| 297 025 | 023390 | 01 03 01 01 | 5 g | 100 pc(s) | 21 |
| 297 110 | 100886 | 01 03 01 01 | 32 g | 50 pc(s) | 34 |
| 297 120 | 100916 | 01 03 01 01 | 40 g | 50 pc(s) | 34 |
| 297 130 | 492523 | 01 03 01 01 | 20 g | 50 pc(s) | 34 |
| 297 140 | 492530 | 01 03 01 01 | 28 g | 50 pc(s) | 34 |
| 300 002 | 024052 | 01 04 01 02 | 115 g | 25 pc(s) | 42/61 |
| 300 017 | 024069 | 01 04 01 02 | 154 g | 1 pc(s) | 42/61 |
| 301 000 | 067035 | 01 04 01 02 | 61 g | 100 pc(s) | 41/60 |
| 301 007 | 021358 | 01 04 01 02 | 75 g | 100 pc(s) | 41/60 |
| 301 009 | 081284 | 01 04 01 02 | 61 g | 100 pc(s) | 41/60 |
| 301 010 | 067028 | 01 04 01 02 | 61 g | 100 pc(s) | 41/60 |
| 301 010 | 067028 | 01 04 01 02 | 61 g | 100 pc(s) | 157/215 |
| 301 017 | 053502 | 01 04 01 02 | 79 g | 100 pc(s) | 41/60 |
| 301 017 | 053502 | 01 04 01 02 | 79 g | 100 pc(s) | 157/215 |
| 301 019 | 081277 | 01 04 01 02 | 63 g | 100 pc(s) | 41/60 |
| 301 020 | 481541 | 01 04 01 02 | 118 g | 50 pc(s) | 42/61 |
| 301 089 | 304161 | 01 04 01 02 | 61 g | 100 pc(s) | 41/60 |
| 301 099 | 304178 | 01 04 01 02 | 63 g | 100 pc(s) | 41/60 |
| 301 209 | 158252 | 01 04 01 02 | 59 g | 1 pc(s) | 74/157 |
| 301 209 | 158252 | 01 04 01 02 | 59 g | 1 pc(s) | 215 |
| 301 229 | 101562 | 01 07 01 01 | 167 g | 1 pc(s) | 42/61 |
| 301 229 | 101562 | 01 07 01 01 | 167 g | 1 pc(s) | 157/215 |
| 302 010 | 134904 | 01 04 01 01 | 137 g | 50 pc(s) | 42/61 |
| 305 000 | 041936 | 01 04 01 01 | 146 g | 50 pc(s) | 62 |
| 305 007 | 052307 | 01 04 01 01 | 151 g | 50 pc(s) | 62 |
| 306 020 | 096264 | 01 04 01 01 | 145 g | 50 pc(s) | 62 |
| 306 029 | 129467 | 01 04 01 01 | 120 g | 50 pc(s) | 62 |
| 306 100 | 024113 | 01 04 01 01 | 238 g | 25 pc(s) | 62 |
| 306 101 | 024120 | 01 04 01 01 | 412 g | 25 pc(s) | 62 |
| 306 105 | 269125 | 01 05 01 05 | 242 g | 1 pc(s) | 214 |
| 306 106 | 269149 | 01 05 01 05 | 420 g | 1 pc(s) | 214 |
| 306 121 | 284920 | 03 01 01 01 | 161 g | 50 pc(s) | 62/180 |
| 306 122 | 284937 | 03 01 01 01 | 165 g | 50 pc(s) | 62/180 |
| 306 200 | 327368 | 01 05 01 05 | 74 g | 50 pc(s) | 219 |
| 306 201 | 327375 | 01 05 01 05 | 74 g | 50 pc(s) | 219 |
| 306 202 | 327351 | 01 05 01 05 | 71 g | 50 pc(s) | 219 |
| 306 203 | 327382 | 01 05 01 05 | 74 g | 50 pc(s) | 219 |
| 306 204 | 336766 | 01 05 01 05 | 75 g | 50 pc(s) | 219 |
| 306 205 | 336773 | 01 05 01 05 | 73 g | 50 pc(s) | 219 |
| 306 206 | 336780 | 01 05 01 05 | 71 g | 50 pc(s) | 219 |
| 306 210 | 327399 | 01 05 01 05 | 356 g | 15 pc(s) | 219 |
| 306 211 | 327405 | 01 05 01 05 | 340 g | 15 pc(s) | 219 |
| 306 212 | 327412 | 01 05 01 05 | 314 g | 15 pc(s) | 219 |
| 306 213 | 327429 | 01 05 01 05 | 392 g | 15 pc(s) | 219 |
| 306 220 | 327436 | 01 05 01 05 | 394 g | 50 pc(s) | 220 |
| 306 230 | 327443 | 01 05 01 05 | 11 g | 10 pc(s) | 220 |
| 306 231 | 327450 | 01 05 01 05 | 11 g | 10 pc(s) | 220 |
| 306 240 | 327467 | 01 05 01 05 | 2 g | 20 pc(s) | 220 |
| 307 000 | 024151 | 01 04 01 01 | 105 g | 50 pc(s) | 62 |
| 307 007 | 024168 | 01 04 01 01 | 104 g | 50 pc(s) | 62 |
| 308 025 | 035881 | 03 01 01 01 | 100 g | 50 pc(s) | 179 |
| 308 026 | 035874 | 03 01 01 01 | 107 g | 25 pc(s) | 179 |
| 308 030 | 030749 | 03 01 01 01 | 125 g | 50 pc(s) | 179 |
| 308 031 | 136571 | 03 01 01 01 | 230 g | 25 pc(s) | 180 |
| 308 032 | 152823 | 03 01 01 01 | 169 g | 25 pc(s) | 180 |
| 308 033 | 519978 | 03 01 01 01 | 231 g | 25 pc(s) | 180 |
| 308 035 | 123472 | 03 01 01 01 | 165 g | 25 pc(s) | 174/179 |
| 308 036 | 136588 | 03 01 01 01 | 266 g | 25 pc(s) | 180 |
| 308 037 | 154704 | 03 01 01 01 | 208 g | 25 pc(s) | 180 |
| 308 040 | 055902 | 03 01 01 01 | 450 g | 20 pc(s) | 60/179 |
| 308 041 | 056411 | 03 01 01 01 | 471 g | 20 pc(s) | 60/179 |
| 308 044 | 522992 | 03 01 01 01 | 470 g | 20 pc(s) | 60 |
| 308 045 | 124455 | 03 01 01 01 | 262 g | 25 pc(s) | 179 |
| 308 046 | 124462 | 03 01 01 01 | 288 g | 25 pc(s) | 174/179 |
| 308 060 | 066281 | 03 01 01 01 | 138 g | 50 pc(s) | 65 |
| 308 062 | 344051 | 03 01 01 01 | 156 g | 50 pc(s) | 65/182 |
| 308 069 | 246720 | 03 01 01 01 | 138 g | 50 pc(s) | 65 |
| 308 120 | 099258 | 03 01 01 01 | 134 g | 25 pc(s) | 180 |
| 308 129 | 099265 | 03 01 01 01 | 131 g | 25 pc(s) | 180 |
| 308 130 | 288942 | 03 01 01 01 | 18 g | 50 pc(s) | 178 |
| 308 131 | 288881 | 03 01 01 01 | 18 g | 50 pc(s) | 178 |
| 308 132 | 288423 | 03 01 01 01 | 20 g | 50 pc(s) | 178 |
| 308 133 | 288911 | 03 01 01 01 | 20 g | 50 pc(s) | 178 |
| 308 134 | 308091 | 03 01 01 01 | 18 g | 50 pc(s) | 178 |
| 308 135 | 308107 | 03 01 01 01 | 18 g | 50 pc(s) | 178 |
| 308 136 | 308114 | 03 01 01 01 | 18 g | 50 pc(s) | 178 |
| 308 137 | 308121 | 03 01 01 01 | 18 g | 50 pc(s) | 178 |
| 308 140 | 288935 | 03 01 01 01 | 21 g | 50 pc(s) | 178 |
| 308 141 | 288904 | 03 01 01 01 | 19 g | 50 pc(s) | 178 |
| 308 142 | 288522 | 03 01 01 01 | 18 g | 50 pc(s) | 178 |
| 308 143 | 289123 | 03 01 01 01 | 18 g | 50 pc(s) | 178 |
| 308 150 | 106970 | 03 01 01 01 | 682 g | 1 pc(s) | 183 |
| 308 220 | 084216 | 03 01 01 01 | 250 g | 25 pc(s) | 65/182 |
| 308 229 | 083745 | 03 01 01 01 | 190 g | 25 pc(s) | 65/182 |
| 308 230 | 090859 | 03 01 01 01 | 241 g | 25 pc(s) | 65/182 |
| 308 239 | 090866 | 03 01 01 01 | 197 g | 25 pc(s) | 65/182 |
| 308 249 | 129313 | 03 01 01 01 | 200 g | 25 pc(s) | 65/182 |
| 308 320 | 028531 | 03 01 01 01 | 266 g | 25 pc(s) | 65/182 |
| 308 329 | 081338 | 03 01 01 01 | 220 g | 25 pc(s) | 65/167 |
| 308 329 | 081338 | 03 01 01 01 | 220 g | 25 pc(s) | 182 |
| 308 330 | 096660 | 03 01 01 01 | 266 g | 25 pc(s) | 65/182 |
| 308 403 | 070509 | 04 02 10 01 | 26 g | 10 pc(s) | 349 |
| 308 404 | 070516 | 04 02 10 01 | 32 g | 10 pc(s) | 349 |
| 308 405 | 070523 | 04 02 10 01 | 37 g | 10 pc(s) | 349 |
| 308 406 | 070530 | 04 02 10 01 | 49 g | 10 pc(s) | 349 |
| 308 407 | 070547 | 04 02 10 01 | 60 g | 10 pc(s) | 349 |
| 308 408 | 070554 | 04 02 10 01 | 73 g | 10 pc(s) | 349 |
| 308 411 | 070578 | 04 02 10 01 | 56 g | 5 pc(s) | 349 |
| 308 421 | 070561 | 04 02 10 50 | 974 g | 10 pc(s) | 349 |
| 308 425 | 058798 | 04 02 10 01 | 19 g | 10 pc(s) | 349 |
| 309 008 | 024229 | 01 04 01 01 | 140 g | 50 pc(s) | 61 |
| 309 087 | 024243 | 01 04 01 01 | 99 g | 50 pc(s) | 61 |
| 310 008 | 024328 | 01 04 01 01 | 124 g | 50 pc(s) | 61 |
| 314 300 | 096400 | 01 04 01 01 | 120 g | 50 pc(s) | 63 |
| 314 307 | 096417 | 01 04 01 01 | 132 g | 50 pc(s) | 63 |
| 314 310 | 042841 | 01 04 01 01 | 174 g | 50 pc(s) | 63 |
| 315 119 | 134072 | 01 04 01 01 | 90 g | 50 pc(s) | 61 |
| 318 033 | 021471 | 03 01 01 01 | 236 g | 25 pc(s) | 64 |
| 318 201 | 021464 | 03 01 01 01 | 234 g | 25 pc(s) | 64 |



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| 318 205 | 159921 | 03 01 01 01 | 242 g | 25 pc(s) | 64 |
| 318 207 | 021488 | 03 01 01 01 | 253 g | 1 pc(s) | 64 |
| 318 209 | 035973 | 03 01 01 01 | 245 g | 25 pc(s) | 64 |
| 318 219 | 129320 | 03 01 01 01 | 235 g | 25 pc(s) | 64 |
| 318 229 | 159938 | 03 01 01 01 | 323 g | 25 pc(s) | 64 |
| 318 233 | 096646 | 03 01 01 01 | 225 g | 25 pc(s) | 64 |
| 318 239 | 159945 | 03 01 01 01 | 240 g | 25 pc(s) | 64 |
| 318 251 | 046559 | 03 01 01 01 | 241 g | 25 pc(s) | 64 |
| 319 201 | 024519 | 03 01 01 01 | 320 g | 25 pc(s) | 63 |
| 319 202 | 024526 | 03 01 01 01 | 333 g | 25 pc(s) | 64 |
| 319 207 | 020047 | 03 01 01 01 | 349 g | 25 pc(s) | 63 |
| 319 209 | 035980 | 03 01 01 01 | 313 g | 25 pc(s) | 63 |
| 319 219 | 069916 | 03 01 01 01 | 319 g | 25 pc(s) | 64 |
| 319 229 | 108752 | 03 01 01 01 | 409 g | 25 pc(s) | 63 |
| 320 044 | 021501 | 03 01 01 01 | 301 g | 25 pc(s) | 64 |
| 321 045 | 021518 | 03 01 01 01 | 413 g | 25 pc(s) | 63 |
| 321 047 | 021525 | 03 01 01 01 | 453 g | 25 pc(s) | 63 |
| 338 000 | 024847 | 01 04 01 02 | 171 g | 25 pc(s) | 69 |
| 338 001 | 054172 | 01 04 01 02 | 68 g | 25 pc(s) | 69 |
| 338 007 | 024854 | 01 04 01 02 | 190 g | 25 pc(s) | 69 |
| 338 009 | 057982 | 01 04 01 02 | 136 g | 25 pc(s) | 69 |
| 339 010 | 024823 | 01 04 01 02 | 195 g | 25 pc(s) | 69 |
| 339 050 | 096257 | 01 04 01 02 | 138 g | 25 pc(s) | 68 |
| 339 051 | 127388 | 01 04 01 02 | 95 g | 25 pc(s) | 68 |
| 339 057 | 096332 | 01 04 01 02 | 150 g | 25 pc(s) | 68 |
| 339 059 | 096301 | 01 04 01 02 | 132 g | 25 pc(s) | 68 |
| 339 060 | 046870 | 01 04 01 02 | 133 g | 25 pc(s) | 68 |
| 339 061 | 127395 | 01 04 01 02 | 83 g | 25 pc(s) | 68 |
| 339 067 | 046887 | 01 04 01 02 | 136 g | 25 pc(s) | 68 |
| 339 069 | 079960 | 01 04 01 02 | 122 g | 25 pc(s) | 68 |
| 339 100 | 092068 | 01 04 01 02 | 180 g | 25 pc(s) | 68 |
| 339 101 | 092082 | 01 04 01 02 | 84 g | 1 pc(s) | 68 |
| 339 110 | 092105 | 01 04 01 02 | 176 g | 25 pc(s) | 68 |
| 339 111 | 092129 | 01 04 01 02 | 92 g | 25 pc(s) | 68 |
| 339 157 | 096325 | 01 04 01 02 | 142 g | 25 pc(s) | 69 |
| 339 167 | 034426 | 01 04 01 02 | 140 g | 1 pc(s) | 69 |
| 343 000 | 024861 | 01 04 01 02 | 167 g | 25 pc(s) | 69 |
| 343 007 | 024878 | 01 04 01 02 | 180 g | 1 pc(s) | 69 |
| 345 008 | 025073 | 01 04 01 02 | 27 g | 100 pc(s) | 70 |
| 345 010 | 025080 | 01 04 01 02 | 25 g | 100 pc(s) | 70 |
| 347 205 | 136601 | 01 04 01 02 | 25 g | 100 pc(s) | 70 |
| 363 000 | 045750 | 01 04 01 02 | 66 g | 50 pc(s) | 175 |
| 363 010 | 045743 | 01 04 01 02 | 124 g | 50 pc(s) | 175 |
| 365 010 | 096318 | 01 04 01 02 | 107 g | 50 pc(s) | 67 |
| 365 011 | 528826 | 01 04 01 02 | 52 g | 50 pc(s) | 67 |
| 365 017 | 096349 | 01 04 01 02 | 105 g | 50 pc(s) | 67 |
| 365 019 | 096295 | 01 04 01 02 | 83 g | 50 pc(s) | 67 |
| 365 020 | 035126 | 01 04 01 02 | 120 g | 50 pc(s) | 67 |
| 365 027 | 035133 | 01 04 01 02 | 146 g | 50 pc(s) | 67 |
| 365 030 | 046894 | 01 04 01 02 | 100 g | 50 pc(s) | 67 |
| 365 031 | 055438 | 01 04 01 02 | 49 g | 50 pc(s) | 67 |
| 365 037 | 046900 | 01 04 01 02 | 103 g | 50 pc(s) | 67 |
| 365 039 | 057777 | 01 04 01 02 | 89 g | 50 pc(s) | 67 |
| 365 050 | 091825 | 01 04 01 02 | 155 g | 50 pc(s) | 68 |
| 365 051 | 091832 | 01 04 01 02 | 75 g | 50 pc(s) | 68 |
| 365 057 | 091849 | 01 04 01 02 | 165 g | 50 pc(s) | 68 |
| 365 059 | 091856 | 01 04 01 02 | 134 g | 50 pc(s) | 33/68 |
| 365 117 | 035331 | 01 04 01 02 | 115 g | 50 pc(s) | 67 |
| 365 127 | 080317 | 01 04 01 02 | 104 g | 1 pc(s) | 67 |
| 365 220 | 096103 | 01 04 01 02 | 171 g | 50 pc(s) | 68 |
| 365 221 | 092396 | 01 04 01 02 | 91 g | 50 pc(s) | 68 |
| 365 227 | 096127 | 01 04 01 02 | 197 g | 50 pc(s) | 68 |
| 365 229 | 096110 | 01 04 01 02 | 161 g | 50 pc(s) | 68 |
| 365 250 | 148307 | 01 04 01 02 | 83 g | 50 pc(s) | 205 |
| 365 419 | 128927 | 01 04 01 03 | 458 g | 5 pc(s) | 25 |
| 365 509 | 141773 | 01 04 01 03 | 335 g | 1 pc(s) | 25 |
| 365 519 | 130869 | 01 04 01 03 | 333 g | 1 pc(s) | 25 |
| 371 007 | 024663 | 01 04 01 02 | 231 g | 1 pc(s) | 66 |
| 371 009 | 024656 | 01 04 01 02 | 208 g | 20 pc(s) | 66 |
| 372 018 | 104624 | 01 04 01 02 | 158 g | 25 pc(s) | 67 |
| 372 019 | 104631 | 01 04 01 02 | 154 g | 25 pc(s) | 67 |
| 372 035 | 104648 | 01 04 01 02 | 177 g | 25 pc(s) | 67 |
| 372 110 | 119055 | 01 04 01 02 | 283 g | 25 pc(s) | 66 |
| 372 119 | 119178 | 01 04 01 02 | 277 g | 25 pc(s) | 66 |
| 372 120 | 119062 | 01 04 01 02 | 288 g | 25 pc(s) | 66 |
| 372 129 | 119185 | 01 04 01 02 | 280 g | 25 pc(s) | 66 |
| 372 140 | 119086 | 01 04 01 02 | 336 g | 25 pc(s) | 66 |
| 372 149 | 119208 | 01 04 01 02 | 326 g | 25 pc(s) | 66 |
| 372 150 | 119093 | 01 04 01 02 | 339 g | 25 pc(s) | 66 |
| 372 159 | 119215 | 01 04 01 02 | 333 g | 25 pc(s) | 66 |
| 372 169 | 463660 | 01 04 01 02 | 280 g | 10 pc(s) | 216 |
| 372 179 | 463684 | 01 04 01 02 | 333 g | 10 pc(s) | 216 |
| 372 210 | 119116 | 01 04 01 02 | 284 g | 25 pc(s) | 66 |
| 372 219 | 119239 | 01 04 01 02 | 278 g | 25 pc(s) | 66 |
| 372 220 | 119123 | 01 04 01 02 | 288 g | 25 pc(s) | 66 |
| 372 229 | 119246 | 01 04 01 02 | 283 g | 25 pc(s) | 66 |
| 372 240 | 119147 | 01 04 01 02 | 335 g | 25 pc(s) | 66 |
| 372 249 | 119260 | 01 04 01 02 | 326 g | 1 pc(s) | 66 |
| 372 250 | 119154 | 01 04 01 02 | 338 g | 25 pc(s) | 66 |
| 372 259 | 119277 | 01 04 01 02 | 331 g | 25 pc(s) | 66 |
| 372 269 | 463677 | 01 04 01 02 | 281 g | 10 pc(s) | 216 |
| 372 279 | 463691 | 01 04 01 02 | 332 g | 10 pc(s) | 216 |
| 374 011 | 030701 | 01 04 01 03 | 80 g | 25 pc(s) | 22 |
| 374 020 | 030725 | 01 04 01 03 | 37 g | 50 pc(s) | 22 |
| 377 005 | 024908 | 01 04 01 02 | 22 g | 50 pc(s) | 69 |
| 377 006 | 024922 | 01 04 01 03 | 37 g | 50 pc(s) | 23 |
| 377 007 | 092686 | 01 04 01 03 | 107 g | 10 pc(s) | 23 |
| 377 009 | 119284 | 01 04 01 02 | 52 g | 50 pc(s) | 69 |
| 377 015 | 092693 | 01 04 01 03 | 36 g | 10 pc(s) | 23 |
| 377 016 | 083417 | 01 04 01 03 | 36 g | 50 pc(s) | 23 |
| 377 017 | 024915 | 01 04 01 02 | 49 g | 50 pc(s) | 69 |
| 377 026 | 068582 | 01 04 01 03 | 45 g | 50 pc(s) | 23 |
| 377 027 | 034204 | 01 04 01 03 | 112 g | 50 pc(s) | 23 |
| 377 045 | 099296 | 01 04 01 03 | 36 g | 100 pc(s) | 23 |
| 377 100 | 078604 | 01 04 01 02 | 74 g | 50 pc(s) | 69 |
| 377 107 | 092709 | 01 04 01 03 | 172 g | 10 pc(s) | 23 |
| 377 115 | 092716 | 01 04 01 03 | 59 g | 10 pc(s) | 23 |
| 377 200 | 136465 | 01 04 01 02 | 70 g | 50 pc(s) | 69 |
| 377 201 | 525122 | 01 04 01 02 | 118 g | 50 pc(s) | 69 |
| 377 209 | 525139 | 01 04 01 02 | 112 g | 50 pc(s) | 69 |
| 377 210 | 083028 | 01 04 01 03 | 53 g | 10 pc(s) | 24 |
| 377 216 | 494565 | 01 04 01 03 | 412 g | 1 pc(s) | 24 |
| 377 217 | 494572 | 01 04 01 03 | 412 g | 1 pc(s) | 24 |
| 377 225 | 494589 | 01 04 01 03 | 559 g | 1 pc(s) | 24 |
| 377 226 | 494596 | 01 04 01 03 | 559 g | 1 pc(s) | 24 |
| 377 235 | 494602 | 01 04 01 03 | 937 g | 1 pc(s) | 24 |
| 377 236 | 494619 | 01 04 01 03 | 937 g | 1 pc(s) | 24 |
| 377 250 | 494725 | 01 04 01 03 | 1.02 kg | 1 pc(s) | 24 |
| 377 251 | 494732 | 01 04 01 03 | 1.02 kg | 1 pc(s) | 24 |
| 377 270 | 494749 | 01 04 01 03 | 1.40 kg | 1 pc(s) | 24 |
| 377 271 | 494756 | 01 04 01 03 | 1.40 kg | 1 pc(s) | 24 |
| 377 310 | 033382 | 01 04 01 03 | 72 g | 100 pc(s) | 24 |
| 377 316 | 522459 | 01 04 01 03 | 412 g | 1 pc(s) | 24 |
| 377 325 | 522466 | 01 04 01 03 | 559 g | 1 pc(s) | 24 |
| 377 335 | 522473 | 01 04 01 03 | 937.30 kg | 1 pc(s) | 24 |
| 377 350 | 522480 | 01 04 01 03 | 1.02 kg | 1 pc(s) | 24 |
| 377 370 | 522497 | 01 04 01 03 | 1.40 kg | 1 pc(s) | 24 |

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| 377 410 | 083035 | 01 04 01 03 | 90 g | 10 | pc(s) | 24 |
| 377 510 | 033399 | 01 04 01 03 | 110 g | 10 | pc(s) | 24 |
| 380 020 | 066373 | 01 04 01 01 | 86 g | 50 | pc(s) | 70 |
| 380 029 | 066359 | 01 04 01 01 | 70 g | 50 | pc(s) | 70 |
| 380 110 | 133273 | 01 04 01 01 | 100 g | 50 | pc(s) | 70 |
| 380 116 | 133280 | 01 04 01 01 | 100 g | 50 | pc(s) | 70 |
| 380 129 | 150416 | 01 04 01 02 | 100 g | 50 | pc(s) | 70 |
| 380 209 | 158269 | 01 04 01 02 | 102 g | 1 | pc(s) | 74/157 |
| 380 209 | 158269 | 01 04 01 02 | 102 g | 1 | pc(s) | 215 |
| 385 202 | 068131 | 01 04 01 01 | 69 g | 50 | pc(s) | 62 |
| 385 203 | 035669 | 01 04 01 01 | 64 g | 50 | pc(s) | 62 |
| 385 207 | 049093 | 01 04 01 01 | 64 g | 50 | pc(s) | 63 |
| 385 213 | 090873 | 01 04 01 01 | 38 g | 50 | pc(s) | 63 |
| 385 216 | 100565 | 01 04 01 01 | 133 g | 10 | pc(s) | 70 |
| 390 050 | 095991 | 01 04 01 01 | 99 g | 50 | pc(s) | 57/179 |
| 390 051 | 096219 | 01 04 01 01 | 55 g | 50 | pc(s) | 57 |
| 390 057 | 096073 | 01 04 01 01 | 118 g | 50 | pc(s) | 57 |
| 390 059 | 096004 | 01 04 01 01 | 92 g | 50 | pc(s) | 57 |
| 390 060 | 096011 | 01 04 01 01 | 108 g | 50 | pc(s) | 58 |
| 390 061 | 096196 | 01 04 01 01 | 67 g | 50 | pc(s) | 58 |
| 390 063 | 159396 | 01 04 01 01 | 103 g | 50 | pc(s) | 58 |
| 390 067 | 096080 | 01 04 01 01 | 122 g | 50 | pc(s) | 58 |
| 390 079 | 128996 | 01 04 01 01 | 96 g | 50 | pc(s) | 57/166 |
| 390 110 | 104921 | 01 04 01 02 | 18 g | 100 | pc(s) | 39 |
| 390 119 | 104945 | 01 04 01 02 | 18 g | 100 | pc(s) | 39 |
| 390 120 | 346901 | 01 03 01 02 | 12 g | 50 | pc(s) | 39 |
| 390 121 | 346918 | 01 03 01 02 | 20 g | 50 | pc(s) | 39 |
| 390 122 | 346925 | 01 03 01 02 | 18 g | 50 | pc(s) | 39 |
| 390 150 | 032187 | 01 04 01 02 | 53 g | 100 | pc(s) | 41/60 |
| 390 157 | 032194 | 01 04 01 02 | 53 g | 1 | pc(s) | 41/60 |
| 390 159 | 032200 | 01 04 01 02 | 61 g | 100 | pc(s) | 41/60 |
| 390 209 | 158245 | 01 04 01 01 | 104 g | 1 | pc(s) | 74/157 |
| 390 209 | 158245 | 01 04 01 01 | 104 g | 1 | pc(s) | 215 |
| 390 250 | 031791 | 01 04 01 01 | 74 g | 50 | pc(s) | 59 |
| 390 257 | 031807 | 01 04 01 01 | 78 g | 50 | pc(s) | 59 |
| 390 259 | 031814 | 01 04 01 01 | 71 g | 50 | pc(s) | 59 |
| 390 267 | 034402 | 01 04 01 01 | 79 g | 50 | pc(s) | 59 |
| 390 479 | 035324 | 01 04 01 02 | 74 g | 50 | pc(s) | 175 |
| 390 499 | 127517 | 01 04 01 02 | 57 g | 50 | pc(s) | 175 |
| 390 550 | 096042 | 01 04 01 01 | 90 g | 50 | pc(s) | 57/180 |
| 390 551 | 096202 | 01 04 01 01 | 58 g | 50 | pc(s) | 57 |
| 390 553 | 522787 | 01 04 01 01 | 96 g | 50 | pc(s) | 57 |
| 390 557 | 096097 | 01 04 01 01 | 118 g | 50 | pc(s) | 57 |
| 390 559 | 096035 | 01 04 01 01 | 98 g | 50 | pc(s) | 57 |
| 390 565 | 385313 | 01 04 01 01 | 50 g | 50 | pc(s) | 59 |
| 390 657 | 096165 | 01 04 01 01 | 100 g | 50 | pc(s) | 58 |
| 391 050 | 087064 | 01 04 01 01 | 101 g | 50 | pc(s) | 57/179 |
| 391 058 | 293236 | 01 04 01 01 | 98 g | 50 | pc(s) | 57 |
| 391 059 | 087071 | 01 04 01 01 | 98 g | 50 | pc(s) | 57 |
| 391 060 | 088009 | 01 04 01 01 | 113 g | 50 | pc(s) | 58 |
| 391 066 | 288577 | 01 04 01 01 | 111 g | 50 | pc(s) | 58 |
| 391 068 | 385320 | 01 04 01 01 | 114 g | 50 | pc(s) | 58 |
| 391 069 | 087095 | 01 04 01 01 | 106 g | 50 | pc(s) | 58 |
| 391 070 | 487123 | 01 04 01 01 | 103 g | 50 | pc(s) | 59/181 |
| 391 079 | 487130 | 01 04 01 01 | 93 g | 50 | pc(s) | 59/181 |
| 391 550 | 088016 | 01 04 01 01 | 105 g | 50 | pc(s) | 57 |
| 391 559 | 087088 | 01 04 01 01 | 100 g | 50 | pc(s) | 57 |
| 392 050 | 096066 | 01 04 01 01 | 121 g | 50 | pc(s) | 58/70 |
| 392 059 | 096059 | 01 04 01 01 | 119 g | 50 | pc(s) | 58/70 |
| 392 060 | 096141 | 01 04 01 01 | 130 g | 50 | pc(s) | 58/71 |
| 392 069 | 096158 | 01 04 01 01 | 126 g | 50 | pc(s) | 58/71 |
| 392 209 | 158238 | 01 04 01 01 | 140 g | 1 | pc(s) | 74/157 |
| 392 209 | 158238 | 01 04 01 01 | 140 g | 1 | pc(s) | 215 |
| 393 069 | 094079 | 01 04 01 01 | 150 g | 50 | pc(s) | 102 |

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| 405 020 | 098459 | 01 07 01 01 | 81 g | 1 | Stk. | 136 |
| 407 012 | 026100 | 01 05 01 02 | 432 g | 10 | pc(s) | 204 |
| 407 034 | 026117 | 01 05 01 02 | 443 g | 10 | pc(s) | 204 |
| 407 100 | 026124 | 01 05 01 02 | 457 g | 10 | pc(s) | 204 |
| 407 112 | 026148 | 01 05 01 02 | 502 g | 10 | pc(s) | 204 |
| 407 114 | 026131 | 01 05 01 02 | 480 g | 10 | pc(s) | 204 |
| 407 200 | 026162 | 01 05 01 02 | 556 g | 1 | pc(s) | 204 |
| 410 003 | 028722 | 03 07 01 01 | 105 g | 1 | pc(s) | 226 |
| 410 005 | 028715 | 03 07 01 01 | 120 g | 1 | pc(s) | 226 |
| 410 006 | 028708 | 03 07 01 01 | 140 g | 1 | pc(s) | 226 |
| 410 010 | 028692 | 03 07 01 01 | 190 g | 1 | pc(s) | 226 |
| 410 012 | 026186 | 01 05 01 02 | 234 g | 25 | pc(s) | 204 |
| 410 015 | 028685 | 03 07 01 01 | 248 g | 1 | pc(s) | 226 |
| 410 020 | 028678 | 03 07 01 01 | 300 g | 1 | pc(s) | 226 |
| 410 025 | 028661 | 03 07 01 01 | 370 g | 1 | pc(s) | 226 |
| 410 030 | 028654 | 03 07 01 01 | 438 g | 1 | pc(s) | 226 |
| 410 034 | 026247 | 01 05 01 02 | 231 g | 25 | pc(s) | 204 |
| 410 035 | 028647 | 03 07 01 01 | 490 g | 1 | pc(s) | 226 |
| 410 038 | 026223 | 01 05 01 02 | 211 g | 25 | pc(s) | 204 |
| 410 040 | 028630 | 03 07 01 01 | 550 g | 1 | pc(s) | 226 |
| 410 050 | 028623 | 03 07 01 01 | 680 g | 1 | pc(s) | 226 |
| 410 060 | 028616 | 03 07 01 01 | 800 g | 1 | pc(s) | 226 |
| 410 070 | 028609 | 03 07 01 01 | 920 g | 1 | pc(s) | 226 |
| 410 099 | 028593 | 03 07 01 01 | 1.27 kg | 1 | pc(s) | 226 |
| 410 100 | 026254 | 01 05 01 02 | 246 g | 25 | pc(s) | 204 |
| 410 112 | 026278 | 01 05 01 02 | 296 g | 25 | pc(s) | 204 |
| 410 114 | 026261 | 01 05 01 02 | 276 g | 25 | pc(s) | 204 |
| 410 134 | 026285 | 01 05 01 02 | 312 g | 1 | pc(s) | 204 |
| 410 140 | 028586 | 03 07 01 01 | 1.78 kg | 1 | pc(s) | 226 |
| 410 150 | 028579 | 03 07 01 01 | 1.87 kg | 1 | pc(s) | 226 |
| 410 199 | 028562 | 03 07 01 01 | 2.48 kg | 1 | pc(s) | 226 |
| 410 200 | 026292 | 01 05 01 02 | 324 g | 25 | pc(s) | 204 |
| 410 212 | 026308 | 01 05 01 02 | 402 g | 1 | pc(s) | 204/206 |
| 410 222 | 482289 | 01 07 01 04 | 42 g | 1 | pc(s) | 115 |
| 410 229 | 107731 | 01 07 01 01 | 72 g | 1 | pc(s) | 130 |
| 410 239 | 152465 | 01 07 01 01 | 80 g | 1 | pc(s) | 147 |
| 410 299 | 028555 | 03 07 01 01 | 3.66 kg | 1 | pc(s) | 226 |
| 410 300 | 026315 | 01 05 01 02 | 416 g | 1 | pc(s) | 204/206 |
| 410 309 | 081451 | 01 05 01 02 | 180 g | 1 | pc(s) | 205 |
| 410 319 | 081505 | 01 05 01 02 | 188 g | 25 | pc(s) | 205 |
| 410 329 | 081512 | 01 05 01 02 | 192 g | 25 | pc(s) | 205 |
| 410 339 | 081550 | 01 05 01 02 | 206 g | 25 | pc(s) | 205 |
| 410 349 | 081604 | 01 05 01 02 | 232 g | 1 | pc(s) | 205 |
| 410 359 | 081468 | 01 05 01 02 | 248 g | 1 | pc(s) | 205 |
| 410 369 | 081529 | 01 05 01 02 | 260 g | 25 | pc(s) | 205 |
| 410 379 | 081475 | 01 05 01 02 | 272 g | 1 | pc(s) | 205 |
| 410 389 | 081482 | 01 05 01 02 | 315 g | 1 | pc(s) | 205 |
| 410 399 | 081499 | 01 05 01 02 | 360 g | 1 | pc(s) | 205 |
| 410 401 | 029200 | 03 07 01 01 | 90 g | 1 | pc(s) | 228 |
| 410 403 | 029194 | 03 07 01 01 | 109 g | 1 | pc(s) | 228 |
| 410 404 | 029187 | 03 07 01 01 | 122 g | 1 | pc(s) | 228 |
| 410 405 | 029262 | 03 07 01 01 | 140 g | 1 | pc(s) | 228 |
| 410 406 | 029163 | 03 07 01 01 | 147 g | 1 | pc(s) | 228 |
| 410 407 | 029255 | 03 07 01 01 | 145 g | 1 | pc(s) | 228 |
| 410 410 | 029248 | 03 07 01 01 | 200 g | 1 | pc(s) | 228 |
| 410 411 | 029156 | 03 07 01 01 | 197 g | 1 | pc(s) | 228 |
| 410 413 | 029279 | 03 07 01 01 | 110 g | 1 | pc(s) | 228 |
| 410 415 | 029149 | 03 07 01 01 | 261 g | 1 | pc(s) | 228 |
| 410 416 | 029231 | 03 07 01 01 | 250 g | 1 | pc(s) | 228 |
| 410 420 | 029132 | 03 07 01 01 | 320 g | 1 | pc(s) | 228 |
| 410 421 | 029224 | 03 07 01 01 | 320 g | 1 | pc(s) | 228 |
| 410 425 | 029125 | 03 07 01 01 | 385 g | 1 | pc(s) | 228 |
| 410 426 | 029217 | 03 07 01 01 | 370 g | 1 | pc(s) | 228 |
| 410 430 | 029118 | 03 07 01 01 | 445 g | 1 | pc(s) | 228 |
| 410 431 | 029590 | 03 07 01 01 | 430 g | 1 | pc(s) | 228 |
| 410 450 | 029170 | 03 07 01 01 | 135 g | 1 | pc(s) | 228 |
| 410 503 | 029408 | 03 07 01 01 | 100 g | 1 | pc(s) | 228 |
| 410 506 | 029415 | 03 07 01 01 | 116 g | 1 | pc(s) | 228 |
| 410 510 | 029422 | 03 07 01 01 | 185 g | 1 | pc(s) | 228 |

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| 410 515 | 029439 | 03 07 01 01 | 250 g | 1 | pc(s) | 228 |
| 410 520 | 029446 | 03 07 01 01 | 300 g | 1 | pc(s) | 228 |
| 410 525 | 029453 | 03 07 01 01 | 365 g | 1 | pc(s) | 228 |
| 410 530 | 029460 | 03 07 01 01 | 425 g | 1 | pc(s) | 228 |
| 410 603 | 029330 | 03 07 01 01 | 100 g | 1 | pc(s) | 226 |
| 410 605 | 029347 | 03 07 01 01 | 120 g | 1 | pc(s) | 226 |
| 410 606 | 029491 | 03 07 01 01 | 114 g | 1 | pc(s) | 231 |
| 410 610 | 029354 | 03 07 01 01 | 185 g | 1 | pc(s) | 226 |
| 410 615 | 029361 | 03 07 01 01 | 240 g | 1 | pc(s) | 226 |
| 410 620 | 029378 | 03 07 01 01 | 305 g | 1 | pc(s) | 226 |
| 410 625 | 029385 | 03 07 01 01 | 365 g | 1 | pc(s) | 226 |
| 410 630 | 029392 | 03 07 01 01 | 430 g | 1 | pc(s) | 226 |
| 410 720 | 032415 | 03 07 01 01 | 292 g | 1 | pc(s) | 231 |
| 410 903 | 029033 | 03 07 01 01 | 110 g | 1 | pc(s) | 230 |
| 410 905 | 029040 | 03 07 01 01 | 140 g | 1 | pc(s) | 230 |
| 410 906 | 029057 | 03 07 01 01 | 140 g | 1 | pc(s) | 230 |
| 410 910 | 029064 | 03 07 01 01 | 200 g | 1 | pc(s) | 230 |
| 410 915 | 029071 | 03 07 01 01 | 260 g | 1 | pc(s) | 230 |
| 410 920 | 029088 | 03 07 01 01 | 320 g | 1 | pc(s) | 230 |
| 410 925 | 029095 | 03 07 01 01 | 380 g | 1 | pc(s) | 230 |
| 410 930 | 029101 | 03 07 01 01 | 440 g | 1 | pc(s) | 230 |
| 416 003 | 028937 | 03 07 01 01 | 126 g | 1 | pc(s) | 227 |
| 416 005 | 028920 | 03 07 01 01 | 165 g | 1 | pc(s) | 227 |
| 416 006 | 028913 | 03 07 01 01 | 184 g | 1 | pc(s) | 227 |
| 416 010 | 028906 | 03 07 01 01 | 262 g | 1 | pc(s) | 227 |
| 416 015 | 028890 | 03 07 01 01 | 360 g | 1 | pc(s) | 227 |
| 416 016 | 029484 | 03 07 01 01 | 340 g | 1 | pc(s) | 231 |
| 416 020 | 028883 | 03 07 01 01 | 460 g | 1 | pc(s) | 227 |
| 416 025 | 028876 | 03 07 01 01 | 545 g | 1 | pc(s) | 227 |
| 416 030 | 028869 | 03 07 01 01 | 650 g | 1 | pc(s) | 227 |
| 416 035 | 028852 | 03 07 01 01 | 748 g | 1 | pc(s) | 227 |
| 416 040 | 028845 | 03 07 01 01 | 830 g | 1 | pc(s) | 227 |
| 416 050 | 028838 | 03 07 01 01 | 1.04 kg | 1 | pc(s) | 227 |
| 416 060 | 028821 | 03 07 01 01 | 1.24 kg | 1 | pc(s) | 227 |
| 416 070 | 028814 | 03 07 01 01 | 1.44 kg | 1 | pc(s) | 227 |
| 416 080 | 028807 | 03 07 01 01 | 1.60 kg | 1 | pc(s) | 227 |
| 416 100 | 042933 | 03 07 01 01 | 2.01 kg | 1 | pc(s) | 227 |
| 416 120 | 028791 | 03 07 01 01 | 2.43 kg | 1 | pc(s) | 227 |
| 416 140 | 028784 | 03 07 01 01 | 2.73 kg | 1 | pc(s) | 227 |
| 416 150 | 028777 | 03 07 01 01 | 3.01 kg | 1 | pc(s) | 227 |
| 416 200 | 028760 | 03 07 01 01 | 3.95 kg | 1 | pc(s) | 227 |
| 416 220 | 028753 | 03 07 01 01 | 4.38 kg | 1 | pc(s) | 227 |
| 416 280 | 028746 | 03 07 01 01 | 5.64 kg | 1 | pc(s) | 227 |
| 416 300 | 028739 | 03 07 01 01 | 5.94 kg | 1 | pc(s) | 227 |
| 416 403 | 029286 | 03 07 01 01 | 130 g | 1 | pc(s) | 229 |
| 416 410 | 032422 | 03 07 01 01 | 265 g | 1 | pc(s) | 229 |
| 416 411 | 032545 | 03 07 01 01 | 266 g | 1 | pc(s) | 229/347 |
| 416 415 | 032439 | 03 07 01 01 | 364 g | 1 | pc(s) | 229 |
| 416 416 | 032453 | 03 07 01 01 | 364 g | 1 | pc(s) | 229 |
| 416 420 | 032446 | 03 07 01 01 | 464 g | 1 | pc(s) | 229 |
| 416 421 | 036116 | 03 07 01 01 | 461 g | 1 | pc(s) | 229 |
| 416 425 | 032460 | 03 07 01 01 | 558 g | 1 | pc(s) | 229 |
| 416 426 | 032477 | 03 07 01 01 | 558 g | 1 | pc(s) | 229 |
| 416 430 | 032484 | 03 07 01 01 | 654 g | 1 | pc(s) | 229 |
| 416 431 | 032491 | 03 07 01 01 | 655 g | 1 | pc(s) | 229 |
| 416 440 | 032507 | 03 07 01 01 | 849 g | 1 | pc(s) | 229 |
| 416 441 | 032514 | 03 07 01 01 | 849 g | 1 | pc(s) | 229 |
| 416 450 | 032521 | 03 07 01 01 | 1.04 kg | 1 | pc(s) | 229 |
| 416 451 | 032538 | 03 07 01 01 | 1.04 kg | 1 | pc(s) | 229 |
| 416 505 | 029477 | 03 07 01 01 | 158 g | 1 | pc(s) | 229 |
| 416 516 | 032408 | 03 07 01 01 | 341 g | 1 | pc(s) | 227 |
| 416 903 | 028944 | 03 07 01 01 | 132 g | 1 | pc(s) | 230 |
| 416 905 | 028951 | 03 07 01 01 | 180 g | 1 | pc(s) | 230 |
| 416 906 | 028968 | 03 07 01 01 | 190 g | 1 | pc(s) | 230 |
| 416 910 | 028975 | 03 07 01 01 | 265 g | 1 | pc(s) | 230 |
| 416 915 | 028982 | 03 07 01 01 | 365 g | 1 | pc(s) | 230 |
| 416 920 | 028999 | 03 07 01 01 | 455 g | 1 | pc(s) | 230 |
| 416 925 | 029002 | 03 07 01 01 | 550 g | 1 | pc(s) | 230 |
| 416 930 | 029019 | 03 07 01 01 | 660 g | 1 | pc(s) | 230 |
| 416 940 | 360280 | 03 01 01 01 | 513 g | 25 | pc(s) | 173/174 |
| 416 941 | 360273 | 03 01 01 01 | 497 g | 25 | pc(s) | 174 |
| 416 950 | 508620 | 03 01 01 01 | 650 g | 25 | pc(s) | 173/174 |
| 416 970 | 029026 | 03 07 01 01 | 1.46 kg | 1 | pc(s) | 230 |
| 417 005 | 031982 | 03 07 01 01 | 168 g | 1 | pc(s) | 227 |
| 417 010 | 031975 | 03 07 01 01 | 259 g | 1 | pc(s) | 227 |
| 417 015 | 031968 | 03 07 01 01 | 353 g | 1 | pc(s) | 227 |
| 417 020 | 031951 | 03 07 01 01 | 447 g | 1 | pc(s) | 227 |
| 417 030 | 031944 | 03 07 01 01 | 635 g | 1 | pc(s) | 227 |
| 417 050 | 031937 | 03 07 01 01 | 1.01 kg | 1 | pc(s) | 227 |
| 417 100 | 031920 | 03 07 01 01 | 1.95 kg | 1 | pc(s) | 227 |
| 417 115 | 031913 | 03 07 01 01 | 2.89 kg | 1 | pc(s) | 227 |
| 417 120 | 031906 | 03 07 01 01 | 3.83 kg | 1 | pc(s) | 227 |
| 417 125 | 031890 | 03 07 01 01 | 4.77 kg | 1 | pc(s) | 227 |
| 417 130 | 031883 | 03 07 01 01 | 5.71 kg | 1 | pc(s) | 227 |
| 417 150 | 031876 | 03 07 01 01 | 9.47 kg | 1 | pc(s) | 227 |
| 419 000 | 439412 | 03 09 01 01 | 840 g | 1 | pc(s) | 234 |
| 419 001 | 439429 | 03 09 01 01 | 950 g | 1 | pc(s) | 234 |
| 419 002 | 439436 | 03 09 01 01 | 1.05 kg | 1 | pc(s) | 234 |
| 419 010 | 439443 | 03 09 01 01 | 760 g | 1 | pc(s) | 234 |
| 419 011 | 439450 | 03 09 01 01 | 740 g | 1 | pc(s) | 235 |
| 419 012 | 439467 | 03 09 01 01 | 1.46 kg | 1 | pc(s) | 235 |
| 419 020 | 439405 | 03 09 01 01 | 950 g | 1 | pc(s) | 235 |
| 419 030 | 439474 | 03 09 01 01 | 750 g | 1 | pc(s) | 235 |
| 419 040 | 439481 | 03 09 01 01 | 630 g | 1 | pc(s) | 236 |
| 419 041 | 439498 | 03 09 01 01 | 560 g | 1 | pc(s) | 236 |
| 419 050 | 439504 | 03 09 01 01 | 710 g | 1 | pc(s) | 236 |
| 419 051 | 439511 | 03 09 01 01 | 640 g | 1 | pc(s) | 236 |
| 419 060 | 439528 | 03 09 01 01 | 590 g | 1 | pc(s) | 236 |
| 419 061 | 439535 | 03 09 01 01 | 530 g | 1 | pc(s) | 236 |
| 419 070 | 439542 | 03 09 01 01 | 700 g | 1 | pc(s) | 236 |
| 419 071 | 439559 | 03 09 01 01 | 620 g | 1 | pc(s) | 236 |
| 419 080 | 439566 | 03 09 01 01 | 1 kg | 1 | pc(s) | 236 |
| 419 090 | 439573 | 03 09 01 01 | 2.80 kg | 1 | pc(s) | 237 |
| 419 091 | 439580 | 03 09 01 01 | 570 g | 1 | pc(s) | 237 |
| 419 100 | 439597 | 03 09 01 01 | 700 g | 1 | pc(s) | 237 |
| 419 101 | 439603 | 03 09 01 01 | 640 g | 1 | pc(s) | 237 |
| 419 110 | 439665 | 03 09 01 01 | 530 g | 1 | pc(s) | 237 |
| 419 160 | 510203 | 03 09 01 01 | 698 g | 8 | pc(s) | 234 |
| 419 260 | 439610 | 03 09 01 02 | 630 g | 1 | pc(s) | 237 |
| 419 290 | 439627 | 03 09 01 01 | 390 g | 1 | pc(s) | 238 |
| 419 291 | 439634 | 03 09 01 01 | 410 g | 1 | pc(s) | 238 |
| 419 400 | 439672 | 03 09 01 02 | 700 g | 1 | pc(s) | 238 |
| 419 500 | 458383 | 03 09 01 01 | 205 g | 1 | pc(s) | 234 |
| 419 501 | 458390 | 03 09 01 01 | 980 g | 1 | pc(s) | 236 |
| 419 502 | 458406 | 03 09 01 01 | 1.40 kg | 1 | pc(s) | 236 |
| 419 503 | 458413 | 03 09 01 01 | 2.10 kg | 1 | pc(s) | 236 |
| 419 504 | 458420 | 03 09 01 01 | 2.80 kg | 1 | pc(s) | 236 |
| 419 505 | 458437 | 03 09 01 01 | 1.12 kg | 1 | pc(s) | 237 |
| 419 506 | 458444 | 03 09 01 01 | 1.10 kg | 1 | pc(s) | 237 |
| 419 507 | 458451 | 03 09 01 02 | 280 g | 1 | pc(s) | 238 |
| 419 508 | 458468 | 03 09 01 02 | 640 g | 1 | pc(s) | 238 |
| 419 511 | 480513 | 03 09 01 01 | 390 g | 1 | pc(s) | 238 |
| 419 512 | 480520 | 03 09 01 01 | 410 g | 1 | pc(s) | 238 |
| 419 513 | 480506 | 03 09 01 01 | 390 g | 1 | pc(s) | 238 |
| 419 514 | 480537 | 03 09 01 01 | 390 g | 1 | pc(s) | 238 |
| 419 750 | 486898 | 03 09 01 04 | 162 g | 50 | pc(s) | 239 |
| 419 751 | 459892 | 03 01 01 01 | 169 g | 50 | pc(s) | 239 |
| 419 752 | 463172 | 02 01 01 01 | 1.80 kg | 10 | pc(s) | 239 |
| 419 753 | 506053 | 02 01 01 01 | 9.76 kg | 1 | pc(s) | 239 |
| 419 758 | 505940 | 03 09 01 03 | 15.75 kg | 1 | pc(s) | 240 |
| 419 759 | 505995 | 03 09 01 03 | 31.50 kg | 1 | pc(s) | 240 |
| 419 760 | 505964 | 03 09 01 02 | 121 g | 3 | pc(s) | 240 |
| 419 761 | 506367 | 03 09 01 02 | 219 g | 3 | pc(s) | 240 |
| 419 762 | 506374 | 03 09 01 02 | 129 g | 3 | pc(s) | 240 |
| 419 763 | 506381 | 03 09 01 02 | 224 g | 3 | pc(s) | 240 |
| 419 765 | 506404 | 03 09 01 03 | 84 g | 3 | pc(s) | 240 |
| 419 766 | 506411 | 03 09 01 03 | 84 g | 3 | pc(s) | 240 |
| 419 900 | 439641 | 03 09 01 03 | 2 g | 1 | pc(s) | 239 |
| 419 901 | 439658 | 03 09 01 03 | 3 g | 1 | pc(s) | 239 |

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| 419 903 | 439696 | 03 09 01 03 | 34 g | 1 | pc(s) | 239 |
| 419 904 | 439702 | 03 09 01 03 | 9 g | 1 | pc(s) | 239 |
| 420 100 | 022805 | 01 04 01 04 | 137 g | 50 | pc(s) | 40/206 |
| 420 107 | 045828 | 01 04 01 04 | 158 g | 1 | pc(s) | 40/206 |
| 420 120 | 022829 | 01 04 01 04 | 160 g | 1 | pc(s) | 40/206 |
| 420 127 | 045804 | 01 04 01 04 | 186 g | 1 | pc(s) | 40/206 |
| 420 207 | 045873 | 01 04 01 04 | 215 g | 1 | pc(s) | 40/207 |
| 423 010 | 054325 | 01 04 01 04 | 113 g | 50 | pc(s) | 41/207 |
| 423 011 | 054332 | 01 04 01 04 | 48 g | 50 | pc(s) | 41/207 |
| 423 017 | 054349 | 01 04 01 04 | 119 g | 1 | pc(s) | 41/207 |
| 423 019 | 054356 | 01 04 01 04 | 109 g | 50 | pc(s) | 41/207 |
| 423 020 | 054288 | 01 04 01 04 | 138 g | 50 | pc(s) | 41/207 |
| 423 021 | 054295 | 01 04 01 04 | 61 g | 50 | pc(s) | 41/207 |
| 423 027 | 054301 | 01 04 01 04 | 156 g | 50 | pc(s) | 41/207 |
| 423 029 | 054318 | 01 04 01 04 | 151 g | 50 | pc(s) | 41/207 |
| 425 076 | 022683 | 01 04 01 04 | 208 g | 50 | pc(s) | 206 |
| 425 089 | 022706 | 01 04 01 04 | 231 g | 1 | pc(s) | 206 |
| 435 803 | 029781 | 03 07 01 01 | 468 g | 1 | pc(s) | 232 |
| 435 805 | 029798 | 03 07 01 01 | 317 g | 1 | pc(s) | 232 |
| 444 006 | 029323 | 03 07 01 01 | 29 g | 100 | pc(s) | 231 |
| 444 008 | 029293 | 03 07 01 01 | 36 g | 1 | pc(s) | 231 |
| 444 009 | 029309 | 03 07 01 01 | 36 g | 1 | pc(s) | 231 |
| 444 010 | 029316 | 03 07 01 01 | 34 g | 100 | pc(s) | 231 |
| 444 050 | 291218 | 03 07 01 01 | 24 g/PAK | 1 | PAK | 130/147 |
| 450 000 | 025158 | 01 04 01 03 | 122 g | 50 | pc(s) | 73 |
| 450 001 | 090903 | 01 04 01 03 | 62 g | 50 | pc(s) | 73 |
| 450 007 | 025165 | 01 04 01 03 | 133 g | 1 | pc(s) | 73 |
| 450 011 | 025172 | 01 04 01 03 | 134 g | 50 | pc(s) | 73 |
| 450 101 | 094093 | 01 04 01 03 | 44 g | 50 | pc(s) | 73 |
| 453 100 | 025523 | 01 04 01 03 | 333 g | 10 | pc(s) | 52 |
| 454 000 | 025387 | 01 04 01 03 | 261 g | 25 | pc(s) | 73 |
| 454 100 | 035904 | 01 04 01 03 | 177 g | 25 | pc(s) | 73 |
| 454 107 | 035911 | 01 04 01 03 | 198 g | 25 | pc(s) | 73 |
| 455 000 | 025394 | 01 04 01 03 | 250 g | 1 | pc(s) | 73 |
| 459 000 | 025189 | 01 04 01 03 | 127 g | 50 | pc(s) | 72 |
| 459 003 | 025202 | 01 04 01 03 | 126 g | 50 | pc(s) | 72 |
| 459 010 | 099838 | 01 04 01 03 | 110 g | 1 | pc(s) | 72 |
| 459 019 | 031272 | 01 04 01 03 | 87 g | 50 | pc(s) | 72 |
| 459 020 | 099845 | 01 04 01 03 | 103 g | 50 | pc(s) | 72 |
| 459 029 | 047587 | 01 04 01 03 | 87 g | 50 | pc(s) | 72 |
| 459 030 | 099852 | 01 04 01 03 | 101 g | 50 | pc(s) | 72 |
| 459 039 | 047594 | 01 04 01 03 | 88 g | 50 | pc(s) | 72 |
| 459 119 | 051379 | 01 04 01 03 | 124 g | 50 | pc(s) | 72 |
| 459 127 | 119291 | 01 04 01 03 | 152 g | 1 | pc(s) | 71 |
| 459 129 | 051386 | 01 04 01 03 | 120 g | 50 | pc(s) | 71/167 |
| 459 139 | 078628 | 01 04 01 03 | 122 g | 50 | pc(s) | 71 |
| 459 159 | 152830 | 01 04 01 03 | 122 g | 50 | pc(s) | 72 |
| 459 200 | 155527 | 01 04 01 03 | 132 g | 1 | pc(s) | 74/157 |
| 459 200 | 155527 | 01 04 01 03 | 132 g | 1 | pc(s) | 215 |
| 459 219 | 158221 | 01 04 01 03 | 126 g | 1 | pc(s) | 74/157 |
| 459 219 | 158221 | 01 04 01 03 | 126 g | 1 | pc(s) | 215 |
| 460 147 | 025349 | 01 04 01 03 | 340 g | 1 | pc(s) | 73 |
| 460 213 | 034358 | 01 04 01 03 | 166 g | 50 | pc(s) | 72 |
| 460 507 | 034266 | 01 04 01 03 | 126 g | 1 | pc(s) | 72 |
| 460 517 | 034259 | 01 04 01 03 | 105 g | 50 | pc(s) | 71 |
| 460 557 | 034242 | 01 04 01 03 | 80 g | 50 | pc(s) | 71 |
| 463 010 | 025493 | 01 04 01 03 | 138 g | 50 | pc(s) | 61 |
| 465 801 | 030091 | 03 07 01 01 | 321 g | 1 | pc(s) | 232 |
| 466 192 | 030084 | 03 07 01 01 | 550 g | 1 | pc(s) | 232 |
| 466 203 | 033009 | 03 07 01 01 | 813 g | 1 | pc(s) | 233 |
| 472 021 | 027879 | 01 05 01 03 | 866 g | 1 | pc(s) | 202 |
| 472 022 | 030305 | 01 05 01 03 | 588 g | 1 | pc(s) | 202 |
| 472 023 | 030312 | 01 05 01 03 | 517 g | 1 | pc(s) | 202 |
| 472 024 | 034495 | 01 05 01 03 | 677 g | 1 | pc(s) | 202 |
| 472 109 | 074477 | 01 05 01 03 | 604 g | 1 | pc(s) | 202 |
| 472 119 | 074484 | 01 05 01 03 | 740 g | 1 | pc(s) | 202 |
| 472 129 | 074491 | 01 05 01 03 | 841 g | 1 | pc(s) | 202 |
| 472 139 | 074507 | 01 05 01 03 | 1.10 kg | 1 | pc(s) | 202 |
| 472 201 | 089631 | 01 06 01 01 | 66 g | 1 | pc(s) | 201/218 |
| 472 202 | 147331 | 01 06 01 01 | 70 g | 1 | pc(s) | 201 |
| 472 207 | 090927 | 01 05 01 03 | 964 g | 1 | pc(s) | 200/218 |
| 472 209 | 090934 | 01 05 01 03 | 1.01 kg | 1 | pc(s) | 200/218 |
| 472 209 | 090934 | 01 05 01 03 | 1.01 kg | 1 | pc(s) | 347 |
| 472 210 | 096790 | 01 50 50 01 | 92 g | 1 | pc(s) | 201/218 |
| 472 217 | 090941 | 01 05 01 03 | 1.35 kg | 1 | pc(s) | 200/218 |
| 472 219 | 090958 | 01 05 01 03 | 1.41 kg | 1 | pc(s) | 200/218 |
| 472 227 | 096424 | 01 05 01 03 | 1.14 kg | 1 | pc(s) | 200/218 |
| 472 229 | 096431 | 01 05 01 03 | 1.18 kg | 1 | pc(s) | 200/218 |
| 472 237 | 096448 | 01 05 01 03 | 1.53 kg | 1 | pc(s) | 200/218 |
| 472 239 | 096455 | 01 05 01 03 | 1.59 kg | 1 | pc(s) | 200/218 |
| 472 269 | 096462 | 01 05 01 03 | 322 g | 1 | pc(s) | 201/218 |
| 472 279 | 090972 | 01 05 01 03 | 285 g | 1 | pc(s) | 201/218 |
| 472 289 | 090989 | 01 05 01 03 | 366 g | 1 | pc(s) | 201/218 |
| 472 299 | 096479 | 01 05 01 03 | 403 g | 1 | pc(s) | 201/218 |
| 472 309 | 157170 | 01 05 01 03 | 226 g | 1 | pc(s) | 201 |
| 472 319 | 157187 | 01 05 01 03 | 267 g | 1 | pc(s) | 201 |
| 472 329 | 157194 | 01 05 01 03 | 307 g | 1 | pc(s) | 201 |
| 472 339 | 157200 | 01 05 01 03 | 348 g | 1 | pc(s) | 201 |
| 472 349 | 157217 | 01 05 01 03 | 387 g | 1 | pc(s) | 201 |
| 472 410 | 470521 | 01 05 01 05 | 1.75 kg | 1 | pc(s) | 217 |
| 472 411 | 470460 | 01 05 01 05 | 1.44 kg | 1 | pc(s) | 217 |
| 472 412 | 470491 | 01 05 01 05 | 364 g | 1 | pc(s) | 217 |
| 472 415 | 470590 | 01 05 01 05 | 2.59 kg | 1 | pc(s) | 216 |
| 472 420 | 476059 | 01 05 01 05 | 2.28 kg | 1 | pc(s) | 217 |
| 472 421 | 470477 | 01 05 01 05 | 1.95 kg | 1 | pc(s) | 217 |
| 472 422 | 470507 | 01 05 01 05 | 446 g | 1 | pc(s) | 217 |
| 472 425 | 470606 | 01 05 01 05 | 3.18 kg | 1 | pc(s) | 216 |
| 472 432 | 470538 | 01 05 01 05 | 13 g | 3 | pc(s) | 218 |
| 472 433 | 470545 | 01 05 01 05 | 17 g | 3 | pc(s) | 218 |
| 472 434 | 470552 | 01 05 01 05 | 32 g | 3 | pc(s) | 218 |
| 472 435 | 470569 | 01 05 01 05 | 49 g | 3 | pc(s) | 218 |
| 472 436 | 470576 | 01 05 01 05 | 65 g | 3 | pc(s) | 218 |
| 472 437 | 470583 | 01 05 01 05 | 93 g | 3 | pc(s) | 218 |
| 472 497 | 470484 | 01 05 01 05 | 174 g | 1 | pc(s) | 217 |
| 472 498 | 476042 | 01 05 01 05 | 756 g | 1 | pc(s) | 217 |
| 472 499 | 470514 | 01 05 01 05 | 386 g | 1 | pc(s) | 217 |
| 476 001 | 028548 | 01 04 01 03 | 468 g | 10 | pc(s) | 54 |
| 476 010 | 025578 | 01 04 01 03 | 797 g | 1 | pc(s) | 53 |
| 476 016 | 125216 | 01 04 01 03 | 559 g | 1 | pc(s) | 53 |
| 476 020 | 126916 | 01 04 01 03 | 800 g | 1 | pc(s) | 54 |
| 476 050 | 219717 | 01 04 01 03 | 869 g | 1 | pc(s) | 53 |
| 476 053 | 219724 | 01 04 01 03 | 185 g | 1 | pc(s) | 53 |
| 476 055 | 219755 | 01 04 01 03 | 1.02 kg | 1 | pc(s) | 53 |
| 476 100 | 086470 | 01 04 01 03 | 460 g | 10 | pc(s) | 54 |
| 478 011 | 033054 | 01 05 01 01 | 301 g | 25 | pc(s) | 172 |
| 478 012 | 069183 | 01 05 01 01 | 182 g | 20 | pc(s) | 172 |
| 478 019 | 072107 | 01 05 01 01 | 299 g | 25 | pc(s) | 172 |
| 478 027 | 125995 | 01 05 01 01 | 603 g | 10 | pc(s) | 173 |
| 478 041 | 105157 | 01 05 01 01 | 304 g | 25 | pc(s) | 172 |
| 478 049 | 105164 | 01 05 01 01 | 303 g | 25 | pc(s) | 172 |
| 478 051 | 124448 | 01 05 01 01 | 370 g | 10 | pc(s) | 172 |
| 478 098 | 337411 | 01 05 01 01 | 8 g | 10 | pc(s) | 173 |
| 478 099 | 120334 | 01 06 01 01 | 52 g | 20 | pc(s) | 12/48 |
| 478 112 | 118140 | 01 05 01 01 | 276 g | 25 | pc(s) | 173 |
| 478 129 | 118508 | 01 05 01 01 | 140 g | 10 | pc(s) | 175 |
| 478 141 | 101425 | 01 05 01 01 | 338 g | 10 | pc(s) | 175 |

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| Part No. | GTIN* | PG | Weight | PU | SU | Page |
|---|---|---|---|---|---|---|
| 478 149 | 154964 | 01 05 01 01 | 390 g | 10 | pc(s) | 175 |
| 478 150 | 359512 | 01 05 01 01 | 464 g | 10 | pc(s) | 175 |
| 478 200 | 035652 | 01 05 01 01 | 263 g | 25 | pc(s) | 173 |
| 478 410 | 136335 | 01 05 01 01 | 580 g | 5 | pc(s) | 176 |
| 478 430 | 136342 | 01 05 01 01 | 680 g | 5 | pc(s) | 176 |
| 478 450 | 136359 | 01 05 01 01 | 780 g | 1 | pc(s) | 176 |
| 478 530 | 120341 | 01 05 01 01 | 697 g | 10 | pc(s) | 176 |
| 478 540 | 120358 | 01 05 01 01 | 750 g | 4 | pc(s) | 176 |
| 478 550 | 120365 | 01 05 01 01 | 838 g | 4 | pc(s) | 176 |
| 478 597 | 523029 | 01 06 01 01 | 160 g | 12 | pc(s) | 176 |
| 478 699 | 158054 | 01 05 01 01 | 122 g | 10 | pc(s) | 176 |
| 480 003 | 035348 | 01 06 01 01 | 24 g | 50 | pc(s) | 56 |
| 480 004 | 035355 | 01 06 01 01 | 26 g | 50 | pc(s) | 56 |
| 480 018 | 076372 | 01 02 01 01 | 1.90 kg | 10 | pc(s) | 47 |
| 480 019 | 068339 | 01 02 01 01 | 1.82 kg | 10 | pc(s) | 47 |
| 480 020 | 051638 | 01 02 01 01 | 2.24 kg | 10 | pc(s) | 47 |
| 480 021 | 051621 | 01 02 01 01 | 3.06 kg | 1 | pc(s) | 47 |
| 480 113 | 112681 | 01 06 01 01 | 61 g | 50 | pc(s) | 54 |
| 480 150 | 019591 | 01 02 01 01 | 2.58 kg | 1 | pc(s) | 47 |
| 480 157 | 019577 | 01 02 01 01 | 2.87 kg | 1 | pc(s) | 47 |
| 480 291 | 149441 | 01 06 01 01 | 9 g | 100 | pc(s) | 54/55 |
| 480 598 | 105607 | 01 07 01 01 | 84 g | 1 | pc(s) | 122/139 |
| 480 599 | 105614 | 01 07 01 01 | 5 g | 10 | pc(s) | 122/139 |
| 480 698 | 144590 | 01 07 01 01 | 128 g | 1 | pc(s) | 165 |
| 480 699 | 107229 | 01 07 01 01 | 137 g | 1 | pc(s) | 165 |
| 483 100 | 019430 | 01 01 01 01 | 1.60 kg | 10 | pc(s) | 77 |
| 483 125 | 019416 | 01 01 01 01 | 2 kg | 10 | pc(s) | 77 |
| 483 150 | 019492 | 01 02 01 01 | 2.40 kg | 10 | pc(s) | 47/77 |
| 483 200 | 019713 | 01 02 01 01 | 3 kg | 1 | pc(s) | 47/77 |
| 483 200 | 019713 | 01 02 01 01 | 3 kg | 1 | pc(s) | 239 |
| 484 000 | 327306 | 01 06 01 01 | 24 g | 50 | pc(s) | 56 |
| 484 001 | 327313 | 01 06 01 01 | 26 g | 50 | pc(s) | 56 |
| 484 010 | 482272 | 01 06 01 01 | 16 g | 1 | pc(s) | 56 |
| 490 000 | 306417 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 001 | 306431 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 002 | 306493 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 003 | 306509 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 004 | 306516 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 005 | 306523 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 006 | 306530 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 007 | 306547 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 008 | 306554 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 009 | 306561 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 020 | 306578 | 01 06 01 01 | 4 g | 100 | pc(s) | 55 |
| 490 021 | 306585 | 01 06 01 01 | 34 g | 50 | pc(s) | 55 |
| 490 022 | 306592 | 01 06 01 01 | 10 g | 100 | pc(s) | 55 |
| 490 099 | 306455 | 01 06 01 01 | 7.93 kg | 1 | pc(s) | 55 |
| 490 100 | 306486 | 01 06 01 01 | 6 g | 100 | pc(s) | 54 |
| 490 110 | 306462 | 01 06 01 01 | 23 g | 50 | pc(s) | 54 |
| 490 116 | 306479 | 01 06 01 01 | 24 g | 50 | pc(s) | 54 |
| 490 900 | 306424 | 01 06 01 01 | 44 g | 100 | pc(s) | 55 |
| 490 999 | 306448 | 01 06 01 01 | 7.93 kg | 1 | pc(s) | 54 |
| 505 901 | 019355 | 01 50 50 01 | 2 g | 20 | pc(s) | 220 |
| 524 906 | 004009 | 01 50 50 01 | 1 g | 20 | pc(s) | 220 |
| 528 610 | 150553 | 01 06 01 01 | 3 g | 500 | pc(s) | 25 |
| 528 619 | 108882 | 01 06 01 01 | 7 g | 1 | pc(s) | 24 |
| 528 850 | 020955 | 01 06 01 01 | 15 g | 1 | pc(s) | 46 |
| 528 870 | 020962 | 01 06 01 01 | 22 g | 1 | pc(s) | 46 |
| 540 100 | 094109 | 01 05 01 02 | 133 g | 10 | pc(s) | 203/232 |
| 540 103 | 101302 | 01 05 01 02 | 120 g | 10 | pc(s) | 203/232 |
| 540 104 | 239685 | 01 05 01 05 | 127 g | 10 | pc(s) | 214 |
| 540 105 | 115880 | 01 05 01 02 | 359 g | 1 | pc(s) | 93 |
| 540 110 | 094116 | 01 05 01 02 | 98 g | 50 | pc(s) | 203/232 |
| 540 120 | 379947 | 01 04 01 02 | 144 g | 25 | pc(s) | 203 |
| 540 121 | 380660 | 01 04 01 02 | 144 g | 25 | pc(s) | 187/203 |
| 540 122 | 379930 | 01 04 01 02 | 63 g | 25 | pc(s) | 41/60 |
| 540 122 | 379930 | 01 04 01 02 | 63 g | 25 | pc(s) | 203 |
| 540 199 | 304741 | 01 05 01 05 | 107 g | 25 | pc(s) | 214 |
| 540 200 | 113039 | 01 05 01 02 | 136 g | 10 | pc(s) | 204/340 |
| 540 210 | 221284 | 01 05 01 02 | 98 g | 50 | pc(s) | 204 |
| 540 249 | 512320 | 01 04 01 02 | 57 g | 50 | pc(s) | 205 |
| 540 250 | 138650 | 01 04 01 02 | 60 g | 50 | pc(s) | 205 |
| 540 251 | 138674 | 01 04 01 02 | 37 g | 100 | pc(s) | 206 |
| 540 260 | 138667 | 01 04 01 02 | 60 g | 50 | pc(s) | 205 |
| 540 261 | 138681 | 01 04 01 02 | 24 g | 100 | pc(s) | 206 |
| 540 262 | 449237 | 01 04 01 02 | 78 g | 50 | pc(s) | 205 |
| 540 263 | 449244 | 01 04 01 02 | 77 g | 10 | pc(s) | 205 |
| 540 270 | 320536 | 01 04 01 02 | 100 g | 50 | pc(s) | 166 |
| 540 271 | 385306 | 01 04 01 01 | 50 g | 50 | pc(s) | 59/166 |
| 540 801 | 115460 | 01 05 01 05 | 503 g | 1 | pc(s) | 213 |
| 540 803 | 115477 | 01 05 01 05 | 566 g | 1 | pc(s) | 213 |
| 540 805 | 128873 | 01 05 01 05 | 766 g | 1 | pc(s) | 213 |
| 540 810 | 115484 | 01 05 01 05 | 550 g | 1 | pc(s) | 213 |
| 540 821 | 123724 | 01 05 01 05 | 249 g | 1 | pc(s) | 213 |
| 540 900 | 076532 | 01 05 01 02 | 55 g | 50 | pc(s) | 202 |
| 540 901 | 076525 | 01 05 01 02 | 6.28 kg | 1 | pc(s) | 101/121 |
| 540 901 | 076525 | 01 05 01 02 | 6.28 kg | 1 | pc(s) | 138/140 |
| 540 901 | 076525 | 01 05 01 02 | 6.28 kg | 1 | pc(s) | 154/156 |
| 540 901 | 076525 | 01 05 01 02 | 6.28 kg | 1 | pc(s) | 204/214 |
| 540 901 | 076525 | 01 05 01 02 | 6.28 kg | 1 | pc(s) | 232 |
| 540 902 | 478688 | 01 06 01 01 | 49 g | 1 | pc(s) | 214 |
| 540 905 | 273269 | 01 05 01 02 | 3.45 kg | 1 | pc(s) | 42 |
| 540 910 | 025684 | 01 05 01 02 | 71 g | 10 | pc(s) | 202 |
| 540 911 | 025691 | 01 05 01 02 | 76 g | 10 | pc(s) | 202 |
| 540 912 | 035362 | 01 05 01 02 | 94 g | 10 | pc(s) | 202 |
| 540 920 | 144194 | 01 05 01 02 | 29 g | 10 | pc(s) | 202 |
| 540 930 | 101319 | 01 05 01 02 | 24 g | 25 | pc(s) | 42 |
| 540 931 | 101296 | 01 05 01 02 | 1.69 kg | 1 | pc(s) | 42 |
| 545 000 | 027367 | 03 05 01 03 | 10,50 g/m | 100 | m | 224 |
| 545 001 | 141131 | 03 05 01 03 | 10,50 g/m | 100 | m | 224 |
| 546 000 | 019959 | 03 06 01 01 | 451 g | 1 | pc(s) | 207 |
| 546 001 | 019973 | 03 06 01 01 | 446 g | 1 | pc(s) | 207 |
| 546 002 | 004016 | 03 06 01 01 | 177 g | 1 | pc(s) | 207 |
| 546 025 | 004023 | 03 06 01 01 | 178 g | 1 | pc(s) | 207 |
| 546 211 | 294493 | 03 06 01 01 | 552 g | 1 | pc(s) | 207 |
| 549 000 | 025547 | 01 04 01 03 | 6.20 kg | 1 | pc(s) | 52 |
| 549 001 | 025554 | 01 04 01 03 | 6.10 kg | 1 | pc(s) | 52 |
| 549 050 | 128217 | 01 04 01 03 | 1.90 kg | 1 | pc(s) | 52 |
| 549 051 | 128224 | 01 04 01 03 | 1.38 kg | 1 | pc(s) | 52 |
| 549 090 | 128231 | 01 04 01 03 | 3.58 kg | 1 | pc(s) | 53 |
| 549 091 | 128248 | 01 04 01 03 | 3 kg | 1 | pc(s) | 53 |
| 552 010 | 021150 | 01 01 01 03 | 33 g | 25 | pc(s) | 22 |
| 552 030 | 021563 | 01 01 01 03 | 196 g | 25 | pc(s) | 22 |
| 554 011 | 030756 | 01 06 01 01 | 46 g/m | 1 | m | 47 |
| 556 125 | 028517 | 01 06 01 01 | 762 g | 24 | pc(s) | 167/181 |
| 556 130 | 028524 | 01 06 01 01 | 1.43 kg | 12 | pc(s) | 167/181 |
| 557 125 | 509856 | 01 06 01 01 | 850 g | 24 | pc(s) | 167/181 |
| 557 130 | 509863 | 01 06 01 01 | 1.44 kg | 12 | pc(s) | 167/181 |
| 561 923 | 056923 | 01 50 50 01 | 29 g | 1 | pc(s) | 173 |
| 562 001 | 019782 | 01 06 01 01 | 4 g | 100 | pc(s) | 71 |
| 562 035 | 019744 | 01 06 01 01 | 3 g | 100 | pc(s) | 71 |
| 562 050 | 019751 | 01 06 01 01 | 4 g | 100 | pc(s) | 71 |
| 562 101 | 019799 | 01 06 01 01 | 3 g | 100 | pc(s) | 71 |
| 562 135 | 019768 | 01 06 01 01 | 2 g | 100 | pc(s) | 71 |
| 562 150 | 019775 | 01 06 01 01 | 4 g | 100 | pc(s) | 71 |
| 562 250 | 019737 | 01 06 01 01 | 2 g | 100 | pc(s) | 71 |

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|---|---|---|---|---|---|---|
| 562 440 | 019805 | 01 06 01 01 | 38 g | 1 | pc(s) | 71 |
| 562 460 | 019812 | 01 06 01 01 | 57 g | 1 | pc(s) | 71 |
| 563 010 | 027800 | 01 05 01 03 | 469 g | 1 | pc(s) | 198 |
| 563 011 | 027732 | 01 05 01 03 | 13 g | 200 | pc(s) | 199 |
| 563 012 | 027749 | 01 05 01 03 | 63 g | 1 | pc(s) | 199 |
| 563 013 | 027756 | 01 05 01 03 | 32 g | 100 | pc(s) | 199 |
| 563 014 | 027787 | 01 05 01 03 | 11 g | 50 | pc(s) | 199 |
| 563 015 | 027794 | 01 05 01 03 | 59 g | 10 | pc(s) | 199 |
| 563 016 | 027763 | 01 05 01 03 | 166 g | 10 | pc(s) | 199 |
| 563 017 | 027770 | 01 05 01 03 | 370 g | 10 | pc(s) | 199 |
| 563 018 | 083585 | 01 05 01 03 | 672 g | 1 | pc(s) | 199 |
| 563 019 | 096998 | 01 05 01 03 | 65 g | 1 | pc(s) | 199 |
| 563 020 | 027817 | 01 05 01 03 | 476 g | 1 | pc(s) | 199 |
| 563 030 | 027824 | 01 05 01 03 | 444 g | 1 | pc(s) | 199 |
| 563 040 | 082861 | 01 05 01 03 | 460 g | 1 | pc(s) | 199 |
| 563 050 | 054707 | 01 05 01 03 | 226 g | 1 | pc(s) | 198 |
| 563 105 | 027831 | 01 05 01 03 | 210 g | 10 | pc(s) | 200 |
| 563 169 | 104839 | 01 05 01 04 | 76 g | 50 | pc(s) | 208 |
| 563 200 | 056558 | 01 05 01 03 | 410 g | 1 | pc(s) | 198 |
| 563 201 | 101234 | 01 05 01 03 | 397 g | 1 | pc(s) | 198 |
| 572 000 | 021723 | 01 06 01 02 | 190 g | 1 | pc(s) | 225 |
| 573 000 | 021617 | 01 06 01 01 | 25 kg/Stk | 25 | kg | 189 |
| 578 370 | 110953 | 03 05 01 01 | 240 g | 1 | pc(s) | 222 |
| 578 386 | 353329 | 03 05 01 01 | 2.23 kg | 1 | pc(s) | 222 |
| 582 600 | 034730 | 03 05 01 02 | 5.88 kg | 1 | pc(s) | 223 |
| 582 620 | 110960 | 03 05 01 02 | 3.77 kg | 1 | pc(s) | 223 |
| 585 010 | 029620 | 03 05 01 03 | 211 g | 1 | pc(s) | 224 |
| 585 025 | 029637 | 03 05 01 03 | 468 g | 1 | pc(s) | 224 |
| 585 051 | 141155 | 03 05 01 03 | 740 g | 1 | pc(s) | 224 |
| 585 200 | 029712 | 03 05 01 03 | 211 g | 1 | pc(s) | 224 |
| 585 210 | 029729 | 03 05 01 03 | 1.33 kg | 1 | pc(s) | 224 |
| 585 211 | 141162 | 03 05 01 03 | 1.33 kg | 1 | pc(s) | 224 |
| 585 310 | 034679 | 03 05 01 03 | 468 g | 1 | pc(s) | 224 |
| 585 320 | 148024 | 03 05 01 03 | 740 g | 1 | pc(s) | 224 |
| 587 460 | 035263 | 03 05 01 03 | 368 g | 1 | pc(s) | 223 |
| 588 000 | 027404 | 03 05 01 03 | 100 g | 1 | pc(s) | 224 |
| 589 000 | 027411 | 03 05 01 03 | 292 g | 1 | pc(s) | 224 |
| 590 000 | 507678 | 01 06 01 01 | 400 g | 1 | pc(s) | 87/224 |
| 595 000 | 046535 | 01 06 01 02 | 329 g | 1 | pc(s) | 225 |
| 596 000 | 046528 | 01 06 01 02 | 362 g | 1 | pc(s) | 225 |
| 597 004 | 027701 | 01 06 01 02 | 5.95 kg | 1 | pc(s) | 225 |
| 597 005 | 027718 | 01 06 01 02 | 15.70 kg | 1 | pc(s) | 225 |
| 597 006 | 029606 | 01 06 01 02 | 42.80 kg | 1 | pc(s) | 225 |
| 597 020 | 154957 | 01 06 01 02 | 155 g | 1 | pc(s) | 165 |
| 597 032 | 155008 | 01 06 01 02 | 1.49 kg | 1 | pc(s) | 117/141 |
| 597 032 | 155008 | 01 06 01 02 | 1.49 kg | 1 | pc(s) | 158 |
| 597 101 | 143838 | 01 06 01 02 | 10 g/PAK | 1 | PAK | 118/141 |
| 597 102 | 153127 | 01 06 01 02 | 3.30 g/PAK | 1 | PAK | 158 |
| 597 103 | 463103 | 01 06 01 02 | 13 g | 1 | pc(s) | 158 |
| 597 104 | 519336 | 01 06 01 02 | 2 g | 1 | pc(s) | 118 |
| 597 120 | 142497 | 01 06 01 02 | 100 g | 1 | pc(s) | 141 |
| 597 125 | 513945 | 01 06 01 02 | 277 g | 1 | pc(s) | 118 |
| 597 126 | 519954 | 01 06 01 02 | 213 g | 1 | pc(s) | 141 |
| 597 127 | 153110 | 01 06 01 02 | 412 g | 1 | pc(s) | 158 |
| 597 130 | 155022 | 01 06 01 02 | 1 g | 1 | pc(s) | 141 |
| 597 139 | 157941 | 01 06 01 02 | 172 g | 1 | pc(s) | 141/158 |
| 597 150 | 519855 | 03 04 01 03 | 367 g | 1 | pc(s) | 183 |
| 597 151 | 519862 | 03 04 01 03 | 573 g | 1 | pc(s) | 183 |
| 597 152 | 519879 | 03 04 01 03 | 666 g | 1 | pc(s) | 183 |
| 597 153 | 519909 | 03 04 01 03 | 449 g | 1 | pc(s) | 183 |
| 597 154 | 519886 | 03 04 01 03 | 541 g | 1 | pc(s) | 183 |
| 597 155 | 519893 | 03 04 01 03 | 525 g | 1 | pc(s) | 183 |
| 597 220 | 144972 | 01 06 01 02 | 330 g | 1 | pc(s) | 117/141 |
| 597 227 | 153103 | 01 06 01 02 | 699 g | 1 | pc(s) | 158 |
| 597 230 | 155015 | 01 06 01 02 | 202 g | 1 | pc(s) | 117/141 |
| 597 231 | 525207 | 01 06 01 02 | 182 g | 1 | pc(s) | 117/141 |
| 597 320 | 154940 | 01 06 01 02 | 442 g | 1 | pc(s) | 165 |
| 597 817 | 512597 | 01 06 01 02 | 400 g | 1 | pc(s) | 118 |
| 599 101 | 694229950632 | 01 06 01 03 | 449 g | 1 | pc(s) | 222 |
| 600 003 | 026957 | 03 04 01 03 | 46 kg | 1 | pc(s) | 193 |
| 600 035 | 460003 | 03 04 01 03 | 5.78 kg | 1 | pc(s) | 193 |
| 600 050 | 462854 | 03 04 01 03 | 5.39 kg | 1 | pc(s) | 193 |
| 600 055 | 443433 | 03 04 01 03 | 5.36 kg | 1 | pc(s) | 193 |
| 600 060 | 443440 | 03 04 01 03 | 5.54 kg | 1 | pc(s) | 193 |
| 610 010 | 022010 | 03 04 01 01 | 786 g | 1 | pc(s) | 187 |
| 610 020 | 054110 | 03 04 01 01 | 436 g | 25 | pc(s) | 187 |
| 610 233 | 508897 | 03 08 06 01 | 68 g | 50 | pc(s) | 195 |
| 610 234 | 260115 | 03 08 06 01 | 122 g | 50 | pc(s) | 195 |
| 610 257 | 508880 | 03 08 06 01 | 54 g | 50 | pc(s) | 195 |
| 610 258 | 260122 | 03 08 06 01 | 80 g | 50 | pc(s) | 195 |
| 614 120 | 241435 | 03 08 01 01 | 1.53 kg | 5 | pc(s) | 195 |
| 614 150 | 241527 | 03 08 01 01 | 1.85 kg | 5 | pc(s) | 195 |
| 614 180 | 431478 | 03 08 01 01 | 2.26 kg | 5 | pc(s) | 195 |
| 614 240 | 241596 | 03 08 01 01 | 3 kg | 5 | pc(s) | 195 |
| 614 300 | 241657 | 03 08 01 01 | 3.80 kg | 5 | pc(s) | 195 |
| 617 120 | 303058 | 03 08 01 01 | 2.18 kg | 5 | pc(s) | 195 |
| 617 150 | 241701 | 03 08 01 01 | 2.73 kg | 5 | pc(s) | 195 |
| 617 180 | 470934 | 03 08 01 01 | 3.33 kg | 5 | pc(s) | 195 |
| 617 240 | 241718 | 03 08 01 01 | 4.35 kg | 5 | pc(s) | 195 |
| 617 300 | 241428 | 03 08 01 01 | 5.44 kg | 5 | pc(s) | 195 |
| 618 214 | 322950 | 03 03 01 01 | 2 kg | 1 | pc(s) | 166 |
| 620 001 | 021938 | 03 04 01 02 | 36 g | 100 | pc(s) | 189 |
| 620 002 | 066052 | 03 04 01 03 | 857 g | 1 | pc(s) | 192 |
| 620 005 | 027039 | 03 04 01 03 | 1.07 kg | 1 | pc(s) | 190 |
| 620 007 | 027084 | 03 04 01 03 | 1.08 kg | 1 | pc(s) | 190 |
| 620 008 | 066151 | 03 04 01 03 | 1.44 kg | 1 | pc(s) | 191 |
| 620 009 | 118119 | 03 04 01 03 | 2.80 kg | 1 | pc(s) | 190 |
| 620 010 | 244764 | 03 04 01 03 | 2.31 kg | 1 | pc(s) | 191 |
| 620 011 | 026636 | 03 04 01 01 | 315 g | 20 | pc(s) | 187 |
| 620 015 | 026582 | 03 04 01 01 | 370 g | 20 | pc(s) | 187 |
| 620 019 | 027008 | 03 04 01 03 | 1.98 kg | 1 | pc(s) | 191 |
| 620 029 | 066113 | 03 04 01 03 | 1.43 kg | 1 | pc(s) | 191 |
| 620 030 | 244818 | 03 04 01 03 | 800 g | 1 | pc(s) | 191 |
| 620 031 | 244849 | 03 04 01 03 | 1.13 kg | 1 | pc(s) | 191 |
| 620 101 | 021860 | 03 03 01 01 | 2.50 kg | 6 | pc(s) | 186 |
| 620 151 | 021846 | 03 03 01 01 | 3.70 kg | 6 | pc(s) | 186 |
| 620 902 | 021914 | 03 03 01 02 | 3.67 kg | 6 | pc(s) | 186 |
| 620 903 | 342859 | 03 03 01 02 | 2.43 kg | 6 | pc(s) | 186 |
| 620 915 | 026629 | 03 04 01 01 | 298 g | 20 | pc(s) | 187 |
| 621 050 | 498976 | 03 03 01 04 | 1.21 kg | 1 | pc(s) | 188 |
| 621 090 | 501133 | 03 03 01 04 | 3.99 kg | 1 | pc(s) | 188 |
| 621 091 | 498945 | 03 03 01 04 | 316 g | 1 | pc(s) | 188 |
| 621 092 | 501140 | 03 03 01 04 | 778 g | 1 | pc(s) | 188 |
| 621 093 | 502383 | 03 03 01 04 | 529 g | 1 | pc(s) | 189 |
| 621 094 | 500082 | 03 03 01 04 | 177 g | 1 | pc(s) | 188 |
| 621 095 | 499959 | 03 03 01 04 | 2.15 kg | 1 | pc(s) | 188 |
| 621 096 | 502734 | 03 50 50 01 | 20 g | 1 | pc(s) | 189 |
| 621 097 | 502741 | 03 50 50 01 | 236 g | 1 | pc(s) | 188 |
| 621 150 | 499065 | 03 03 01 04 | 3.66 kg | 6 | pc(s) | 188 |
| 621 300 | 499089 | 03 03 01 04 | 7.66 kg | 3 | pc(s) | 188 |

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|---|---|---|---|---|---|---|
| 625 001 | 021945 | 03 04 01 02 | 69 g | 50 | pc(s) | 189 |
| 625 002 | 095380 | 03 04 01 03 | 810 g | 1 | pc(s) | 192 |
| 625 005 | 027046 | 03 04 01 03 | 1.05 kg | 1 | pc(s) | 190 |
| 625 007 | 027091 | 03 04 01 03 | 1.03 kg | 1 | pc(s) | 190 |
| 625 008 | 066144 | 03 04 01 03 | 1.41 kg | 1 | pc(s) | 191 |
| 625 009 | 118126 | 03 04 01 03 | 2.80 kg | 1 | pc(s) | 190 |
| 625 010 | 157613 | 03 04 01 03 | 2.25 kg | 1 | pc(s) | 191 |
| 625 011 | 026643 | 03 04 01 01 | 340 g | 20 | pc(s) | 187 |
| 625 015 | 026599 | 03 04 01 01 | 383 g | 20 | pc(s) | 187 |
| 625 019 | 027015 | 03 04 01 03 | 2.08 kg | 1 | pc(s) | 191 |
| 625 029 | 066120 | 03 04 01 03 | 1.41 kg | 1 | pc(s) | 191 |
| 625 030 | 244825 | 03 04 01 03 | 760 g | 1 | pc(s) | 191 |
| 625 031 | 244856 | 03 04 01 03 | 1.44 kg | 1 | pc(s) | 191 |
| 625 101 | 021877 | 03 03 01 01 | 3.72 kg | 6 | pc(s) | 186 |
| 625 151 | 021853 | 03 03 01 01 | 5.72 kg | 6 | pc(s) | 186 |
| 630 120 | 107427 | 03 04 01 01 | 152 g | 25 | pc(s) | 187 |
| 630 129 | 107434 | 03 04 01 01 | 150 g | 25 | pc(s) | 187 |
| 634 145 | 125735 | 03 07 01 01 | 1.20 kg | 1 | pc(s) | 233 |
| 634 160 | 125728 | 03 07 01 01 | 1.60 kg | 1 | pc(s) | 233 |
| 635 100 | 056640 | 03 02 01 01 | 2.53 kg | 5 | pc(s) | 189 |
| 635 150 | 056657 | 03 02 01 01 | 3.75 kg | 5 | pc(s) | 189 |
| 635 200 | 056664 | 03 02 01 01 | 5.28 kg | 5 | pc(s) | 189 |
| 635 250 | 067011 | 03 02 01 01 | 6.20 kg | 3 | pc(s) | 189 |
| 640 015 | 106864 | 03 04 01 01 | 389 g | 1 | pc(s) | 187 |
| 644 000 | 030268 | 03 07 01 01 | 4.45 kg | 1 | pc(s) | 233 |
| 646 000 | 078161 | 03 07 01 01 | 2.24 kg | 1 | pc(s) | 189 |
| 648 005 | 129160 | 03 04 01 03 | 1.46 kg | 1 | pc(s) | 192 |
| 648 009 | 315501 | 03 04 01 03 | 973 g | 1 | pc(s) | 192 |
| 648 029 | 236059 | 03 04 01 03 | 1.60 kg | 1 | pc(s) | 192 |
| 648 031 | 293182 | 03 04 01 03 | 1.51 kg | 1 | pc(s) | 192 |
| 649 015 | 119376 | 03 04 01 01 | 300 g | 20 | pc(s) | 187 |
| 649 150 | 126350 | 03 03 01 03 | 1.71 kg | 6 | pc(s) | 189 |
| 690 001 | 500013 | 03 50 01 01 | 57.16 kg | 1 | pc(s) | 186 |
| 723 199 | 151703 | 05 03 01 01 | 750 g | 1 | pc(s) | 359 |
| 800 008 | 018716 | 02 01 01 01 | 394 g/m | 127 | m | 12 |
| 800 010 | 018723 | 02 01 01 01 | 617 g/m | 81 | m | 12 |
| 800 028 | 508446 | 02 01 01 01 | 394 g/m | 50 | m | 12 |
| 800 108 | 018754 | 02 01 01 01 | 440 g/m | 75 | m | 11 |
| 800 110 | 018761 | 02 01 01 01 | 680 g/m | 50 | m | 11 |
| 800 310 | 131064 | 02 01 01 01 | 617 g/m | 30 | m | 12 |
| 800 906 | 486829 | 02 01 01 01 | 641 g | 10 | pc(s) | 12 |
| 800 908 | 486836 | 02 01 01 01 | 1.28 kg | 10 | pc(s) | 12 |
| 800 910 | 253315 | 02 01 01 01 | 1.85 kg | 10 | pc(s) | 12 |
| 800 911 | 273689 | 02 01 01 01 | 4.10 kg/Stk | 1 | pc(s) | 12 |
| 801 050 | 018921 | 02 03 01 01 | 330 g/m | 100 | m | 15 |
| 801 058 | 523166 | 02 03 01 01 | 660 g/m | 20 | m | 15 |
| 801 059 | 523173 | 02 03 01 01 | 660 g/m | 1 | m | 15 |
| 810 225 | 018815 | 02 02 01 01 | 400 g/m | 100 | m | 13 |
| 810 304 | 019232 | 02 02 01 01 | 960 g/m | 52 | m | 13 |
| 810 335 | 032880 | 02 02 01 01 | 840 g/m | 50 | m | 13 |
| 810 404 | 048256 | 02 02 01 01 | 1.28 kg/m | 40 | m | 13 |
| 810 405 | 032897 | 02 02 01 01 | 1.60 kg/m | 30 | m | 13 |
| 810 503 | 534421 | 02 02 01 01 | 1.60 kg/m | 30 | m | 12/240 |
| 810 504 | 456303 | 02 02 01 01 | 1.60 kg/m | 30 | m | 13 |
| 814 335 | 442979 | 02 02 01 01 | 840 g/m | 50 | m | 13 |
| 819 110 | 436008 | 01 07 01 01 | 630 g/m | 400 | m | 129 |
| 819 131 | 223189 | 01 07 01 01 | 2.88 kg | 1 | pc(s) | 129 |
| 819 132 | 223172 | 01 07 01 01 | 3.78 kg | 1 | pc(s) | 129 |
| 819 135 | 141759 | 01 07 01 01 | 488 g/m | 100 | m | 129 |
| 819 136 | 147140 | 01 07 01 01 | 630 g/m | 100 | m | 129 |
| 819 137 | 152625 | 01 07 01 03 | 854 g/m | 100 | m | 146 |
| 819 138 | 434523 | 01 07 01 01 | 488 g/m | 500 | m | 129 |
| 819 142 | 152458 | 01 07 01 03 | 403 g | 1 | pc(s) | 147 |
| 819 145 | 152533 | 01 07 01 01 | 344 g | 1 | pc(s) | 129 |
| 819 146 | 152540 | 01 07 01 01 | 368 g | 1 | pc(s) | 129 |
| 819 149 | 272057 | 01 07 01 03 | 757 g | 1 | pc(s) | 147 |
| 819 160 | 152298 | 01 07 01 03 | 4.80 kg | 1 | pc(s) | 146 |
| 819 161 | 281646 | 01 07 01 03 | 25.97 kg | 1 | pc(s) | 146 |
| 819 163 | 280199 | 01 07 01 03 | 4.36 kg | 1 | pc(s) | 146 |
| 819 165 | 272224 | 01 07 01 03 | 4.48 kg | 1 | pc(s) | 146 |
| 819 185 | 249288 | 01 07 01 01 | 1.15 kg | 1 | pc(s) | 132/149 |
| 819 186 | 249295 | 01 07 01 01 | 3.25 kg | 1 | pc(s) | 132/149 |
| 819 197 | 222236 | 01 07 01 01 | 196 g | 1 | pc(s) | 129 |
| 819 199 | 222274 | 01 07 01 01 | 184 g | 1 | pc(s) | 130 |
| 819 220 | 244238 | 01 07 01 01 | 2.80 kg | 1 | pc(s) | 128 |
| 819 223 | 157675 | 01 07 01 01 | 4 kg | 1 | pc(s) | 128 |
| 819 226 | 260528 | 01 07 01 01 | 13.86 kg | 1 | pc(s) | 129 |
| 819 227 | 157712 | 01 07 01 01 | 3.90 kg | 1 | pc(s) | 129 |
| 819 235 | 477216 | 01 07 01 01 | 77 g | 1 | pc(s) | 130 |
| 819 247 | 260900 | 01 07 01 01 | 6.80 kg | 1 | pc(s) | 128 |
| 819 283 | 499621 | 01 07 01 04 | 422 g | 1 | pc(s) | 116 |
| 819 288 | 236479 | 01 07 01 02 | 172 g | 1 | pc(s) | 130 |
| 819 294 | 152571 | 01 07 01 01 | 701 g | 1 | pc(s) | 130 |
| 819 296 | 492684 | 01 07 01 04 | 34 g | 1 | pc(s) | 116 |
| 819 297 | 492691 | 01 07 01 04 | 29 g | 1 | pc(s) | 116 |
| 819 298 | 492653 | 01 07 01 04 | 117 g | 1 | pc(s) | 116 |
| 819 326 | 260511 | 01 07 01 01 | 8.40 kg | 1 | pc(s) | 127 |
| 819 328 | 260504 | 01 07 01 01 | 8.80 kg | 1 | pc(s) | 127 |
| 819 336 | 241237 | 01 07 01 01 | 9.60 kg | 1 | pc(s) | 127 |
| 819 338 | 241244 | 01 07 01 01 | 10 kg | 1 | pc(s) | 127 |
| 819 371 | 260498 | 01 07 01 01 | 17 kg | 1 | pc(s) | 127 |
| 819 373 | 260481 | 01 07 01 01 | 17.90 kg | 1 | pc(s) | 127 |
| 819 381 | 241954 | 01 07 01 01 | 18.50 kg | 1 | pc(s) | 127 |
| 819 383 | 241961 | 01 07 01 01 | 19.10 kg | 1 | pc(s) | 127 |
| 819 426 | 260474 | 01 07 01 01 | 11.30 kg | 1 | pc(s) | 127 |
| 819 430 | 152236 | 01 07 01 03 | 15.40 kg | 1 | pc(s) | 145 |
| 819 431 | 155442 | 01 07 01 03 | 17 kg | 1 | pc(s) | 145 |
| 819 433 | 155459 | 01 07 01 03 | 21 kg | 1 | pc(s) | 145 |
| 819 438 | 241251 | 01 07 01 01 | 12.50 kg | 1 | pc(s) | 127 |
| 819 473 | 260450 | 01 07 01 01 | 37 kg | 1 | pc(s) | 128 |
| 819 483 | 241978 | 01 07 01 01 | 38.20 kg | 1 | pc(s) | 128 |
| 819 600 | 499645 | 01 07 01 04 | 470 g/m | 100 | m | 114 |
| 819 605 | 499652 | 01 07 01 04 | 470 g/m | 500 | m | 114 |
| 819 609 | 481794 | 01 07 01 04 | 4.25 kg | 1 | pc(s) | 115 |
| 819 636 | 485815 | 01 07 01 04 | 4.56 kg | 1 | pc(s) | 114 |
| 819 638 | 499935 | 01 07 01 04 | 4.57 kg | 1 | pc(s) | 114 |
| 819 640 | 481763 | 01 07 01 04 | 153 g | 10 | pc(s) | 115 |
| 819 642 | 499638 | 01 07 01 04 | 368 g | 1 | pc(s) | 115 |
| 819 645 | 481770 | 01 07 01 04 | 314 g | 1 | pc(s) | 115 |
| 819 646 | 511460 | 01 07 01 04 | 178 g | 5 | pc(s) | 115 |
| 819 647 | 511477 | 01 07 01 04 | 181 g | 5 | pc(s) | 115 |
| 819 648 | 511484 | 01 07 01 04 | 172 g | 5 | pc(s) | 115 |
| 819 649 | 512498 | 01 07 01 04 | 38 g | 5 | pc(s) | 115/130 |
| 819 672 | 494527 | 01 07 01 04 | 7.07 kg | 1 | pc(s) | 113 |
| 819 673 | 494534 | 01 07 01 04 | 7.34 kg | 1 | pc(s) | 113 |
| 819 674 | 494541 | 01 07 01 04 | 8.07 kg | 1 | pc(s) | 113 |
| 819 675 | 494558 | 01 07 01 04 | 8.34 kg | 1 | pc(s) | 113 |
| 819 680 | 494442 | 01 07 01 04 | 12.94 kg | 1 | pc(s) | 113 |
| 819 682 | 494428 | 01 07 01 04 | 12.74 kg | 1 | pc(s) | 113 |
| 819 685 | 494459 | 01 07 01 04 | 6.12 kg | 1 | pc(s) | 113 |
| 819 687 | 494435 | 01 07 01 04 | 12.90 kg | 1 | pc(s) | 113 |
| 819 688 | 499782 | 01 07 01 04 | 9.30 kg | 1 | pc(s) | 114 |
| 819 690 | 494466 | 01 07 01 04 | 6.40 kg | 1 | pc(s) | 113 |
| 819 730 | 243477 | 01 07 01 01 | 53 kg | 1 | pc(s) | 128 |
| 819 735 | 499539 | 01 07 01 04 | 51.72 kg | 1 | pc(s) | 114 |
| 819 760 | 240391 | 01 07 01 03 | 56.64 kg | 1 | pc(s) | 145 |
| 819 799 | 499256 | 01 07 01 04 | 501 g | 1 | pc(s) | 86 |

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| 819 895 | 515574 | 01 07 01 05 | 19 g | 10 | pc(s) | 139/155 |
| 819 895 | 515574 | 01 07 01 05 | 19 g | 10 | Stk. | 122 |
| 819 896 | 515581 | 01 07 01 05 | 54 g | 10 | pc(s) | 139/155 |
| 819 896 | 515581 | 01 07 01 05 | 54 g | 10 | Stk. | 122 |
| 819 897 | 515567 | 01 07 01 05 | 94 g | 10 | pc(s) | 139/155 |
| 819 897 | 515567 | 01 07 01 05 | 94 g | 10 | Stk. | 122 |
| 819 898 | 515550 | 01 07 01 05 | 32 g | 10 | pc(s) | 139/155 |
| 819 898 | 515550 | 01 07 01 05 | 32 g | 10 | Stk. | 122 |
| 819 997 | 504394 | 01 50 50 01 | 66 g | 10 | pc(s) | 116/122 |
| 819 997 | 504394 | 01 50 50 01 | 66 g | 10 | pc(s) | 130 |
| 819 998 | 494251 | 01 07 01 04 | 6 g | 100 | pc(s) | 122/130 |
| 819 999 | 222779 | 01 07 01 01 | 15 g | 50 | pc(s) | 122/130 |
| 819 999 | 222779 | 01 07 01 01 | 15 g | 50 | pc(s) | 147 |
| 830 008 | 018785 | 02 01 01 02 | 448 g/m | 100 | m | 11 |
| 830 038 | 035690 | 02 01 01 02 | 448 g/m | 100 | m | 11 |
| 830 108 | 080430 | 02 01 01 02 | 448 g/m | 20 | m | 11 |
| 830 208 | 106116 | 01 07 01 01 | 2.60 kg | 1 | pc(s) | 164 |
| 830 218 | 106123 | 01 07 01 01 | 3.60 kg | 1 | pc(s) | 164 |
| 831 225 | 018891 | 02 02 01 02 | 450 g/m | 100 | m | 13 |
| 832 095 | 048324 | 02 03 01 02 | 845 g/m | 50 | m | 15 |
| 832 120 | 129610 | 02 03 01 02 | 1.03 kg/m | 25 | m | 15 |
| 832 192 | 018914 | 02 03 01 02 | 597 g/m | 50 | m | 15 |
| 832 202 | 081048 | 02 03 01 02 | 597 g/m | 50 | m | 15 |
| 832 202 | 081048 | 02 03 01 02 | 597 g/m | 50 | m | 220 |
| 832 295 | 093447 | 02 03 01 02 | 845 g/m | 50 | m | 15 |
| 832 320 | 129641 | 02 03 01 02 | 1.03 kg/m | 25 | m | 15 |
| 832 739 | 018907 | 02 03 01 02 | 438 g/m | 50 | m | 15 |
| 832 740 | 093454 | 02 03 01 02 | 438 g/m | 100 | m | 15 |
| 832 838 | 335776 | 02 03 01 02 | 334 g/m | 100 | m | 15 |
| 832 838 | 335776 | 02 03 01 02 | 334 g/m | 100 | m | 220 |
| 832 839 | 093164 | 02 03 01 02 | 438 g/m | 100 | m | 15 |
| 832 839 | 093164 | 02 03 01 02 | 438 g/m | 100 | m | 220 |
| 833 008 | 151987 | 02 01 01 02 | 182 g/m | 110 | m | 10 |
| 840 008 | 018730 | 02 01 01 04 | 135 g/m | 148 | m | 10 |
| 840 010 | 018747 | 02 01 01 04 | 210 g/m | 100 | m | 10 |
| 840 018 | 035706 | 02 01 01 04 | 135 g/m | 148 | m | 10 |
| 840 028 | 131163 | 02 01 01 04 | 135 g/m | 21 | m | 10 |
| 840 050 | 070141 | 02 03 01 04 | 133 g/m | 100 | m | 15 |
| 840 108 | 080423 | 02 01 01 04 | 135 g/m | 21 | m | 10 |
| 840 118 | 071483 | 02 01 01 04 | 200 g/m | 100 | m | 10 |
| 840 128 | 160002 | 02 01 01 04 | 200 g/m | 100 | m | 10 |
| 850 008 | 129627 | 02 03 01 03 | 235 g/m | 100 | m | 15 |
| 850 010 | 129634 | 02 03 01 03 | 395 g/m | 100 | m | 15 |
| 852 335 | 031067 | 02 02 01 01 | 840 g/m | 25 | m | 13 |
| 854 335 | 439955 | 02 02 01 01 | 840 g/m | 25 | m | 13 |
| 860 008 | 018808 | 02 01 01 03 | 395 g/m | 125 | m | 11 |
| 860 010 | 019997 | 02 01 01 03 | 617 g/m | 80 | m | 11/166 |
| 860 020 | 092662 | 02 01 01 03 | 617 g/m | 20 | m | 11/166 |
| 860 050 | 139923 | 02 01 01 03 | 617 g/m | 50 | m | 11/166 |
| 860 110 | 150256 | 02 01 01 03 | 624 g | 5 | pc(s) | 48/166 |
| 860 115 | 101104 | 02 01 01 03 | 930 g | 5 | pc(s) | 48/166 |
| 860 129 | 486782 | 02 01 01 03 | 1.24 kg | 5 | pc(s) | 48 |
| 860 130 | 101111 | 02 01 01 03 | 1.80 kg | 5 | pc(s) | 48/166 |
| 860 210 | 159365 | 02 02 01 03 | 830 g | 5 | pc(s) | 48 |
| 860 215 | 101081 | 02 02 01 03 | 1.25 kg | 5 | pc(s) | 48 |
| 860 230 | 101098 | 02 02 01 03 | 2.48 kg | 5 | pc(s) | 48 |
| 860 240 | 159372 | 02 02 01 03 | 3.32 kg | 5 | pc(s) | 48 |
| 860 315 | 150058 | 02 02 01 03 | 1.25 kg | 5 | pc(s) | 48 |
| 860 325 | 093157 | 02 02 01 03 | 825 g/m | 25 | m | 14 |
| 860 330 | 150065 | 02 02 01 03 | 2.50 kg | 5 | pc(s) | 48 |
| 860 335 | 143388 | 02 02 01 03 | 827 g/m | 60 | m | 14 |
| 860 404 | 276482 | 02 02 01 03 | 1.26 kg/m | 40 | m | 14 |
| 860 405 | 276499 | 02 02 01 03 | 1.57 kg/m | 30 | m | 14 |
| 860 430 | 227781 | 02 02 01 03 | 2 kg | 5 | pc(s) | 48 |
| 860 900 | 143395 | 02 02 01 03 | 824 g/m | 60 | m | 14 |
| 860 908 | 019362 | 02 01 01 03 | 395 g/m | 125 | m | 11 |
| 860 910 | 019300 | 02 01 01 03 | 617 g/m | 80 | m | 11 |
| 860 920 | 092679 | 02 01 01 03 | 617 g/m | 20 | m | 11 |
| 860 925 | 093140 | 02 02 01 03 | 825 g/m | 25 | m | 14 |
| 860 950 | 155596 | 02 01 01 03 | 617 g/m | 50 | m | 11 |
| 870 008 | 509724[1)] | 02 08 01 02 | 400 g/m | 1 | m | 11 |
| 870 010 | 503586[1)] | 02 08 01 02 | 620 g/m | 1 | m | 11 |
| 870 013 | 503609[1)] | 02 99 00 00 | 1.06 kg/m | 100 | m | 11 |
| 870 014 | 503616[1)] | 02 99 00 00 | 1.22 kg/m | 100 | m | 11 |
| 870 016 | 503623[1)] | 02 99 00 00 | 1.58 kg/m | 100 | m | 11 |
| 900 050 | 107496 | 04 01 01 14 | 507 g | 1 | pc(s) | 271 |
| 900 070 | 504521[1)] | 04 01 01 05 | 509 g | 1 | pc(s) | 265 |
| 900 071 | 504545[1)] | 04 01 01 05 | 562 g | 1 | pc(s) | 265 |
| 900 075 | 504538[1)] | 04 01 01 05 | 511 g | 1 | pc(s) | 265 |
| 900 076 | 504552[1)] | 04 01 01 05 | 564 g | 1 | pc(s) | 265 |
| 900 095 | 510838 | 04 01 01 05 | 511 g | 1 | pc(s) | 265 |
| 900 220 | 106734 | 04 01 01 11 | 699 g | 1 | pc(s) | 268 |
| 900 230 | 153783 | 04 01 01 07 | 1.49 kg | 1 | pc(s) | 266 |
| 900 255 | 125773 | 04 01 01 09 | 194 g | 1 | pc(s) | 266 |
| 900 261 | 094352 | 04 01 02 16 | 158 g | 1 | pc(s) | 292 |
| 900 262 | 072572 | 04 01 02 16 | 158 g | 1 | pc(s) | 292 |
| 900 263 | 094369 | 04 01 02 16 | 194 g | 1 | pc(s) | 292 |
| 900 264 | 073661 | 04 01 02 16 | 157 g | 1 | pc(s) | 292 |
| 900 270 | 106703 | 04 01 02 16 | 223 g | 1 | pc(s) | 292 |
| 900 271 | 106710 | 04 01 02 16 | 224 g | 1 | pc(s) | 292 |
| 900 411 | 107205 | 04 01 01 50 | 54 g | 1 | pc(s) | 262/268 |
| 900 411 | 107205 | 04 01 01 50 | 54 g | 1 | pc(s) | 292/306 |
| 900 417 | 120419 | 04 01 01 50 | 66 g | 1 | pc(s) | 262/268 |
| 900 417 | 120419 | 04 01 01 50 | 66 g | 1 | pc(s) | 292/306 |
| 900 418 | 159884 | 04 01 02 50 | 49 g | 1 | pc(s) | 281/306 |
| 900 419 | 156821 | 04 01 02 50 | 39 g | 1 | pc(s) | 262/292 |
| 900 419 | 156821 | 04 01 02 50 | 39 g | 1 | pc(s) | 306 |
| 900 429 | 159891 | 04 01 02 50 | 59 g | 1 | pc(s) | 281/306 |
| 900 430 | 157286 | 04 01 02 05 | 59 g | 1 | pc(s) | 286 |
| 900 431 | 310827 | 04 01 02 05 | 46 g | 1 | pc(s) | 286 |
| 900 432 | 157309 | 04 01 02 05 | 61 g | 1 | pc(s) | 286 |
| 900 433 | 157316 | 04 01 02 05 | 48 g | 1 | pc(s) | 286 |
| 900 435 | 292963 | 04 01 02 05 | 54 g | 1 | pc(s) | 287 |
| 900 439 | 436053 | 04 01 02 05 | 105 g | 1 | pc(s) | 286 |
| 900 443 | 394322 | 04 01 02 05 | 785 g | 20 | pc(s) | 287 |
| 900 445 | 280380 | 04 01 02 05 | 58 g | 1 | pc(s) | 286 |
| 900 446 | 292970 | 04 01 02 05 | 49 g | 1 | pc(s) | 286 |
| 900 447 | 282216 | 04 01 02 05 | 130 g | 1 | pc(s) | 287 |
| 900 448 | 293007 | 04 01 02 05 | 113 g | 1 | pc(s) | 287 |
| 900 449 | 320031 | 04 01 02 05 | 128 g | 1 | pc(s) | 287 |
| 900 450 | 157989 | 04 01 02 19 | 77 g | 1 | pc(s) | 278 |
| 900 455 | 157996 | 04 01 02 19 | 143 g | 1 | pc(s) | 278 |
| 900 458 | 320574 | 04 01 02 19 | 76 g | 1 | pc(s) | 278 |
| 900 459 | 320581 | 04 01 02 19 | 143 g | 1 | pc(s) | 278 |
| 900 460 | 244146 | 04 01 02 50 | 37 g | 1 | pc(s) | 281/288 |
| 900 460 | 244146 | 04 01 02 50 | 37 g | 1 | pc(s) | 306 |
| 900 461 | 260559 | 04 01 01 50 | 64 g | 1 | pc(s) | 267/306 |
| 900 462 | 260566 | 04 01 01 50 | 81 g | 1 | pc(s) | 267/306 |
| 900 471 | 067547 | 04 01 03 04 | 22 g | 1 | pc(s) | 299 |
| 900 588 | 323933 | 04 01 04 03 | 31 g | 4 | pc(s) | 303 |
| 900 589 | 109339 | 04 01 04 03 | 20 g | 1 | pc(s) | 303 |
| 900 595 | 078208 | 04 01 04 03 | 58 g | 1 | pc(s) | 301/305 |
| 900 610 | 048553 | 04 01 04 03 | 19 g | 1 | pc(s) | 305 |
| 900 611 | 048560 | 04 01 04 03 | 38 g | 1 | pc(s) | 305 |
| 900 615 | 086562 | 04 01 04 03 | 14 g | 1 | pc(s) | 305 |
| 900 617 | 086593 | 04 01 04 03 | 9 g | 1 | pc(s) | 305 |
| 900 760 | 156135 | 04 01 02 20 | 274 g | 1 | Stk. | 285 |
| 900 761 | 156142 | 04 01 02 20 | 294 g | 1 | Stk. | 285 |
| 900 762 | 156159 | 04 01 02 20 | 294 g | 1 | Stk. | 285 |
| 900 765 | 156166 | 04 01 02 20 | 512 g | 1 | Stk. | 285 |
| 900 766 | 156173 | 04 01 02 20 | 545 g | 1 | Stk. | 285 |

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| 900 767 | 156180 | 04 01 02 20 | 551 g | 1 | Stk. | 285 |
| 900 768 | 156197 | 04 01 02 20 | 556 g | 1 | Stk. | 285 |
| 900 780 | 156203 | 04 01 02 20 | 368 g | 1 | Stk. | 285 |
| 900 781 | 156210 | 04 01 02 20 | 390 g | 1 | Stk. | 285 |
| 900 782 | 156227 | 04 01 02 20 | 389 g | 1 | Stk. | 285 |
| 900 785 | 156234 | 04 01 02 20 | 693 g | 1 | pc(s) | 285 |
| 900 786 | 156241 | 04 01 02 20 | 726 g | 1 | pc(s) | 285 |
| 900 787 | 156258 | 04 01 02 20 | 732 g | 1 | pc(s) | 285 |
| 900 788 | 156265 | 04 01 02 20 | 736 g | 1 | pc(s) | 285 |
| 900 815 | 087996 | 04 01 04 03 | 29 g | 1 | pc(s) | 305 |
| 900 839 | 153059 | 04 01 04 03 | 14 g | 1 | pc(s) | 305 |
| 900 848 | 107816 | 04 01 04 03 | 34 g | 1 | pc(s) | 305 |
| 900 849 | 473348 | 04 01 01 50 | 118 g | 1 | pc(s) | 262 |
| 900 849 | 473348 | 04 01 01 50 | 118 g | 1 | pc(s) | 268/305 |
| 900 850 | 460379 | 04 01 04 03 | 61 g | 5 | pc(s) | 301/305 |
| 900 910 | 155046 | 04 01 02 10 | 426 g | 1 | pc(s) | 295 |
| 900 913 | 492455 | 04 01 02 10 | 1.32 kg | 1 | pc(s) | 295 |
| 900 920 | 155053 | 04 01 02 10 | 617 g | 1 | pc(s) | 295 |
| 900 921 | 492462 | 04 01 02 10 | 1.88 kg | 1 | pc(s) | 295 |
| 900 923 | 492400 | 04 01 02 10 | 1.74 kg | 1 | pc(s) | 295 |
| 900 945 | 425118 | 04 01 02 10 | 230 g | 1 | pc(s) | 295 |
| 902 314 | 151031 | 04 01 04 02 | 786 g | 1 | pc(s) | 304 |
| 902 315 | 125759 | 04 01 04 02 | 1.83 kg | 1 | pc(s) | 304 |
| 902 316 | 151048 | 04 01 04 02 | 1.92 kg | 1 | pc(s) | 304 |
| 902 317 | 151055 | 04 01 04 02 | 5 g | 1 | pc(s) | 304 |
| 902 471 | 108943 | 04 01 04 02 | 1.79 kg | 1 | pc(s) | 304 |
| 902 472 | 108950 | 04 01 04 02 | 2.39 kg | 1 | pc(s) | 304 |
| 902 485 | 045767 | 04 01 04 02 | 612 g | 1 | pc(s) | 304 |
| 906 055 | 071513 | 04 02 10 02 | 1 kg | 1 | pc(s) | 350 |
| 906 058 | 091658 | 04 02 10 02 | 899 g | 1 | pc(s) | 350 |
| 906 100 | 106598 | 04 02 04 03 | 3.40 kg | 1 | pc(s) | 334 |
| 906 101 | 106604 | 04 02 04 03 | 4.97 kg | 1 | pc(s) | 334 |
| 906 102 | 106611 | 04 02 04 03 | 5.70 kg | 1 | pc(s) | 334 |
| 906 103 | 106628 | 04 02 04 03 | 7.65 kg | 1 | pc(s) | 334 |
| 907 208 | 107373 | 04 02 04 50 | 2 g | 1 | pc(s) | 333 |
| 907 214 | 100879 | 04 02 04 02 | 66 g | 1 | pc(s) | 333 |
| 907 216 | 106680 | 04 02 04 02 | 66 g | 1 | pc(s) | 333 |
| 907 217 | 107342 | 04 02 04 50 | 2 g | 1 | pc(s) | 333 |
| 907 218 | 107588 | 04 02 04 50 | 2 g | 1 | pc(s) | 333 |
| 907 219 | 107595 | 04 02 04 50 | 2 g | 1 | pc(s) | 332 |
| 907 400 | 107557 | 04 02 04 01 | 65 g | 1 | pc(s) | 331 |
| 907 401 | 107564 | 04 02 04 01 | 69 g | 1 | pc(s) | 331 |
| 907 421 | 107618 | 04 02 04 01 | 4 g | 10 | pc(s) | 331 |
| 907 422 | 107625 | 04 02 04 01 | 4 g | 10 | pc(s) | 331 |
| 907 423 | 107632 | 04 02 04 01 | 4 g | 10 | pc(s) | 331 |
| 907 424 | 107649 | 04 02 04 01 | 4 g | 10 | pc(s) | 331 |
| 907 425 | 107656 | 04 02 04 01 | 3 g | 10 | pc(s) | 331 |
| 907 430 | 107670 | 04 02 04 01 | 4 g | 10 | pc(s) | 332 |
| 907 441 | 107694 | 04 02 04 01 | 4 g | 10 | pc(s) | 332 |
| 907 442 | 107700 | 04 02 04 01 | 3 g | 10 | pc(s) | 332 |
| 907 443 | 107717 | 04 02 04 01 | 4 g | 10 | pc(s) | 332 |
| 907 444 | 107724 | 04 02 04 01 | 3 g | 10 | pc(s) | 332 |
| 907 445 | 118461 | 04 02 04 01 | 3 g | 10 | pc(s) | 332 |
| 907 470 | 107663 | 04 02 04 01 | 4 g | 10 | pc(s) | 332 |
| 907 496 | 150683 | 04 02 04 50 | 13 g | 10 | pc(s) | 333 |
| 907 497 | 112995 | 04 02 04 50 | 16 g | 1 | pc(s) | 333 |
| 907 498 | 107540 | 04 02 04 50 | 10 g | 1 | pc(s) | 333 |
| 907 499 | 107533 | 04 02 04 50 | 45 g | 1 | pc(s) | 332 |
| 907 991 | 112988 | 04 02 04 50 | 181 g | 1 | pc(s) | 335 |
| 907 993 | 048584 | 04 02 04 50 | 60 g | 1 | pc(s) | 335 |
| 907 994 | 033511 | 04 02 04 50 | 105 g | 1 | pc(s) | 335 |
| 907 995 | 033528 | 04 02 04 50 | 228 g | 1 | pc(s) | 335 |
| 907 996 | 033535 | 04 02 04 50 | 60 g | 1 | pc(s) | 335 |
| 907 997 | 033542 | 04 02 04 50 | 48 g | 1 | pc(s) | 335 |
| 908 010 | 148512 | 04 01 02 17 | 42 g | 1 | pc(s) | 285 |
| 908 011 | 148482 | 04 01 02 17 | 37 g | 1 | pc(s) | 285 |
| 908 012 | 148505 | 04 01 02 17 | 40 g | 1 | pc(s) | 285 |
| 908 013 | 148536 | 04 01 02 17 | 57 g | 1 | pc(s) | 285 |
| 908 014 | 148529 | 04 01 02 17 | 49 g | 1 | pc(s) | 285 |
| 908 015 | 148543 | 04 01 02 17 | 60 g | 1 | pc(s) | 285 |
| 908 070 | 148499 | 04 01 02 17 | 113 g | 1 | pc(s) | 284 |
| 908 074 | 148567 | 04 01 02 17 | 123 g | 1 | pc(s) | 284 |
| 908 076 | 148581 | 04 01 02 17 | 130 g | 1 | pc(s) | 284 |
| 908 090 | 148550 | 04 01 02 17 | 117 g | 1 | pc(s) | 285 |
| 908 094 | 148574 | 04 01 02 17 | 126 g | 1 | pc(s) | 285 |
| 908 096 | 148598 | 04 01 02 17 | 134 g | 1 | pc(s) | 285 |
| 908 190 | 148604 | 04 01 02 17 | 219 g | 1 | pc(s) | 283 |
| 908 192 | 148628 | 04 01 02 17 | 238 g | 1 | pc(s) | 283 |
| 908 195 | 148611 | 04 01 02 17 | 225 g | 1 | pc(s) | 284 |
| 908 197 | 148635 | 04 01 02 17 | 243 g | 1 | pc(s) | 284 |
| 908 203 | 148642 | 04 01 02 17 | 225 g | 1 | pc(s) | 284 |
| 908 204 | 148666 | 04 01 02 17 | 259 g | 1 | pc(s) | 284 |
| 908 208 | 148659 | 04 01 02 17 | 230 g | 1 | pc(s) | 284 |
| 908 209 | 148673 | 04 01 02 17 | 266 g | 1 | pc(s) | 284 |
| 908 214 | 267961 | 04 01 02 17 | 304 g | 1 | pc(s) | 284 |
| 908 219 | 267978 | 04 01 02 17 | 311 g | 1 | pc(s) | 284 |
| 908 300 | 148680 | 04 01 02 17 | 303 g | 1 | pc(s) | 281 |
| 908 301 | 148727 | 04 01 02 17 | 363 g | 1 | pc(s) | 281 |
| 908 305 | 148697 | 04 01 02 17 | 310 g | 1 | pc(s) | 282 |
| 908 306 | 148734 | 04 01 02 17 | 370 g | 1 | pc(s) | 282 |
| 908 314 | 148703 | 04 01 02 17 | 339 g | 1 | pc(s) | 281 |
| 908 319 | 148710 | 04 01 02 17 | 347 g | 1 | pc(s) | 282 |
| 908 340 | 148840 | 04 01 02 17 | 386 g | 1 | pc(s) | 282 |
| 908 341 | 148864 | 04 01 02 17 | 423 g | 1 | pc(s) | 282 |
| 908 342 | 148765 | 04 01 02 17 | 448 g | 1 | pc(s) | 282 |
| 908 343 | 148789 | 04 01 02 17 | 399 g | 1 | pc(s) | 283 |
| 908 344 | 148802 | 04 01 02 17 | 430 g | 1 | pc(s) | 283 |
| 908 345 | 148857 | 04 01 02 17 | 394 g | 1 | pc(s) | 283 |
| 908 346 | 148871 | 04 01 02 17 | 432 g | 1 | pc(s) | 283 |
| 908 347 | 148772 | 04 01 02 17 | 456 g | 1 | pc(s) | 283 |
| 908 348 | 148796 | 04 01 02 17 | 406 g | 1 | pc(s) | 283 |
| 908 349 | 148819 | 04 01 02 17 | 438 g | 1 | pc(s) | 283 |
| 908 350 | 148741 | 04 01 02 17 | 373 g | 1 | pc(s) | 282 |
| 908 351 | 148826 | 04 01 02 17 | 319 g | 1 | pc(s) | 282 |
| 908 355 | 148758 | 04 01 02 17 | 380 g | 1 | pc(s) | 282 |
| 908 356 | 148833 | 04 01 02 17 | 325 g | 1 | pc(s) | 282 |
| 908 505 | 228139 | 04 01 01 15 | 861 g | 1 | pc(s) | 266 |
| 908 506 | 228146 | 04 01 01 15 | 882 g | 1 | pc(s) | 266 |
| 909 230 | 117686 | 04 01 03 03 | 199 g | 1 | pc(s) | 299 |
| 909 250 | 132566 | 04 01 03 03 | 970 g | 1 | pc(s) | 300 |
| 909 251 | 132573 | 04 01 03 03 | 877 g | 1 | pc(s) | 300 |
| 909 300 | 117723 | 04 02 07 01 | 224 g | 1 | pc(s) | 342 |
| 909 310 | 117747 | 04 02 07 01 | 212 g | 1 | pc(s) | 342 |
| 909 321 | 126152 | 04 02 07 01 | 216 g | 1 | pc(s) | 342 |
| 909 703 | 085664 | 04 02 08 02 | 233 g | 1 | pc(s) | 345 |
| 909 704 | 105690 | 04 02 08 02 | 86 g | 1 | pc(s) | 345 |
| 909 705 | 105706 | 04 02 08 02 | 283 g | 1 | pc(s) | 345 |
| 909 706 | 362437 | 04 02 08 02 | 222 g | 1 | pc(s) | 345 |
| 909 710 | 118942 | 04 02 08 01 | 114 g | 1 | pc(s) | 345 |
| 909 711 | 118980 | 04 02 08 01 | 116 g | 1 | pc(s) | 345 |
| 910 099 | 037298 | 04 02 10 02 | 38 g | 1 | pc(s) | 350 |
| 910 200 | 144019 | 04 01 04 01 | 140 g | 1 | pc(s) | 303 |
| 910 486 | 124479 | 04 03 01 50 | 80 g | 1 | pc(s) | 323/352 |
| 910 499 | 157149 | 04 03 01 50 | 180 g | 1 | pc(s) | 301/315 |
| 910 499 | 157149 | 04 03 01 50 | 180 g | 1 | pc(s) | 352/327 |
| 910 499 | 157149 | 04 03 01 50 | 180 g | 1 | pc(s) | 323 |
| 910 508 | 111363 | 04 03 01 03 | 800 g | 1 | pc(s) | 354 |
| 910 511 | 111424 | 04 03 01 01 | 1.32 kg | 1 | pc(s) | 302/354 |
| 910 513 | 506310 [1)] | 04 01 04 01 | 162 g | 1 | pc(s) | 302 |
| 910 631 | 108196 | 04 01 01 11 | 114 g | 1 | pc(s) | 269 |
| 910 641 | 093416 | 04 01 01 11 | 1 g | 20 | pc(s) | 269 |
| 910 642 | 107878 | 04 01 01 11 | 80 g | 1 | pc(s) | 269 |
| 910 652 | 114531 | 04 03 01 50 | 64 g | 1 | pc(s) | 323/353 |
| 910 653 | 113008 | 04 03 01 02 | 1.06 kg | 1 | pc(s) | 323/353 |
| 910 655 | 149250 | 04 03 01 02 | 835 g | 1 | pc(s) | 323/353 |
| 910 694 | 350212 | 04 03 01 03 | 67 g | 1 | pc(s) | 353 |

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| 910 695 | 118959 | 04 03 01 03 | 180 g | 1 | pc(s) | 323/352 |
| 910 696 | 149359 | 04 03 01 03 | 54 g | 1 | pc(s) | 323/352 |
| 910 697 | 123717 | 04 03 01 50 | 31 g/PAK | 1 | PAK | 322/353 |
| 910 698 | 337053 | 04 03 01 03 | 67 g | 1 | pc(s) | 353 |
| 910 710 | 424678 | 04 03 01 03 | 52 g | 1 | pc(s) | 314/327 |
| 910 710 | 424678 | 04 03 01 03 | 52 g | 1 | pc(s) | 352 |
| 910 797 | 428829 | 04 02 01 50 | 28 g | 1 | PAK | 314/327 |
| 910 920 | 460263 | 04 03 01 03 | 380 g | 1 | pc(s) | 300 |
| 910 921 | 460270 | 04 03 01 03 | 380 g | 1 | pc(s) | 300 |
| 910 935 | 460676 | 04 03 01 50 | 101 g | 1 | pc(s) | 300 |
| 910 936 | 460683 | 04 03 01 50 | 111 g | 1 | pc(s) | 301 |
| 910 937 | 460690 | 04 03 01 50 | 193 g | 1 | pc(s) | 301 |
| 910 938 | 467668 | 04 03 01 50 | 131 g | 1 | pc(s) | 301 |
| 912 253 | 068360 | 04 01 03 01 | 563 g | 1 | pc(s) | 298 |
| 912 254 | 073685 | 04 01 03 01 | 300 g | 1 | pc(s) | 298 |
| 915 000 | 421271 | 04 01 07 01 | 1.02 kg | 1 | pc(s) | 301 |
| 915 001 | 421301 | 04 01 07 01 | 1.01 kg | 1 | pc(s) | 301 |
| 915 051 | 422247 | 04 01 07 01 | 820 g | 1 | pc(s) | 302 |
| 915 105 | 498822 | 04 01 07 01 | 5.80 kg | 1 | pc(s) | 302 |
| 915 109 | 422162 | 04 01 07 01 | 4.37 kg | 1 | pc(s) | 302 |
| 915 111 | 422179 | 04 01 07 01 | 5.35 kg | 1 | pc(s) | 302 |
| 915 113 | 422209 | 04 01 07 01 | 6.15 kg | 1 | pc(s) | 302 |
| 915 115 | 422223 | 04 01 07 01 | 6.85 kg | 1 | pc(s) | 302 |
| 915 117 | 422230 | 04 01 07 01 | 7.85 kg | 1 | pc(s) | 302 |
| 915 120 | 498839 | 04 01 07 01 | 9.30 kg | 1 | pc(s) | 302 |
| 918 401 | 074224 | 04 02 03 01 | 182 g | 1 | pc(s) | 328 |
| 918 409 | 146709 | 04 02 03 01 | 110 g | 1 | pc(s) | 329 |
| 918 411 | 093133 | 04 02 03 01 | 99 g | 1 | pc(s) | 329 |
| 918 420 | 094895 | 04 02 03 01 | 212 g | 1 | pc(s) | 329 |
| 918 421 | 094901 | 04 02 03 01 | 118 g | 1 | pc(s) | 329 |
| 918 422 | 149267 | 04 02 03 01 | 97 g | 1 | pc(s) | 329 |
| 919 010 | 071612 | 04 02 10 01 | 13 g | 10 | pc(s) | 349 |
| 919 011 | 071605 | 04 02 10 01 | 28 g | 10 | pc(s) | 349 |
| 919 012 | 071599 | 04 02 10 01 | 40 g | 1 | pc(s) | 349 |
| 919 014 | 071575 | 04 02 10 01 | 5 g | 10 | pc(s) | 349 |
| 919 015 | 071568 | 04 02 10 01 | 15 g | 1 | pc(s) | 349 |
| 919 016 | 071551 | 04 02 10 01 | 481 g | 1 | pc(s) | 349 |
| 919 030 | 103504 | 04 02 10 01 | 167 g | 1 | pc(s) | 334/350 |
| 919 031 | 103511 | 04 02 10 01 | 2 g | 20 | pc(s) | 334/350 |
| 919 032 | 103528 | 04 02 10 01 | 2 g | 20 | pc(s) | 334/350 |
| 919 033 | 103535 | 04 02 10 01 | 5 g | 20 | pc(s) | 334/350 |
| 919 034 | 103542 | 04 02 10 01 | 7 g | 10 | pc(s) | 334/350 |
| 919 035 | 103559 | 04 02 10 01 | 12 g | 10 | pc(s) | 334/350 |
| 919 036 | 103566 | 04 02 10 01 | 23 g | 25 | pc(s) | 350 |
| 919 037 | 103573 | 04 02 10 01 | 50 g | 20 | pc(s) | 350 |
| 919 038 | 103580 | 04 02 10 01 | 82 g | 10 | pc(s) | 350 |
| 920 000 | 057494 | 04 01 05 01 | 127 g | 1 | pc(s) | 206 |
| 920 211 | 120570 | 04 02 01 02 | 23 g | 1 | pc(s) | 319 |
| 920 220 | 118331 | 04 02 01 02 | 36 g | 1 | pc(s) | 318 |
| 920 222 | 118355 | 04 02 01 02 | 21 g | 1 | pc(s) | 318 |
| 920 224 | 117785 | 04 02 01 02 | 37 g | 1 | pc(s) | 318 |
| 920 225 | 118379 | 04 02 01 02 | 21 g | 1 | pc(s) | 318 |
| 920 226 | 142121 | 04 02 01 02 | 23 g | 1 | pc(s) | 318 |
| 920 240 | 118348 | 04 02 01 02 | 20 g | 1 | pc(s) | 318 |
| 920 242 | 118362 | 04 02 01 02 | 21 g | 1 | pc(s) | 318 |
| 920 243 | 126732 | 04 02 01 02 | 21 g | 1 | pc(s) | 319 |
| 920 244 | 117792 | 04 02 01 02 | 21 g | 1 | pc(s) | 318 |
| 920 245 | 118386 | 04 02 01 02 | 36 g | 1 | pc(s) | 318 |
| 920 247 | 116078 | 04 02 01 02 | 43 g | 1 | pc(s) | 318 |
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| 920 270 | 117549 | 04 02 01 02 | 22 g | 1 | pc(s) | 318 |
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| 920 280 | 142138 | 04 02 01 05 | 22 g | 1 | pc(s) | 321 |
| 920 288 | 137363 | 04 02 01 02 | 25 g | 1 | pc(s) | 319 |
| 920 289 | 135840 | 04 02 01 02 | 22 g | 1 | pc(s) | 319 |
| 920 296 | 340015 | 04 02 01 02 | 21 g | 1 | pc(s) | 319 |
| 920 300 | 109179 | 04 02 01 01 | 34 g | 1 | pc(s) | 315 |
| 920 301 | 109186 | 04 02 01 01 | 53 g | 1 | pc(s) | 320 |
| 920 308 | 109209 | 04 02 01 02 | 22 g | 1 | pc(s) | 322 |
| 920 309 | 109193 | 04 02 01 02 | 14 g | 1 | pc(s) | 322 |
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| 920 320 | 109032 | 04 02 01 02 | 24 g | 1 | pc(s) | 316 |
| 920 322 | 109049 | 04 02 01 02 | 24 g | 1 | pc(s) | 316 |
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| 920 344 | 108981 | 04 02 01 02 | 37 g | 1 | pc(s) | 316 |
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| 920 354 | 109148 | 04 02 01 02 | 24 g | 1 | pc(s) | 317 |
| 920 362 | 120587 | 04 02 01 02 | 24 g | 1 | pc(s) | 317 |
| 920 364 | 109155 | 04 02 01 02 | 25 g | 1 | pc(s) | 317 |
| 920 370 | 109117 | 04 02 01 02 | 24 g | 1 | pc(s) | 317 |
| 920 371 | 109094 | 04 02 01 02 | 24 g | 1 | pc(s) | 317 |
| 920 375 | 109100 | 04 02 01 02 | 24 g | 1 | pc(s) | 317 |
| 920 381 | 109025 | 04 02 01 05 | 23 g | 1 | pc(s) | 321 |
| 920 384 | 109162 | 04 02 01 05 | 22 g | 1 | pc(s) | 321 |
| 920 388 | 137370 | 04 02 01 02 | 28 g | 1 | pc(s) | 317 |
| 920 389 | 118447 | 04 02 01 02 | 30 g | 1 | pc(s) | 317 |
| 920 395 | 118157 | 04 02 01 50 | 12 g/PAK | 1 | PAK | 322 |
| 920 398 | 126572 | 04 02 01 50 | 5.60 g/PAK | 1 | PAK | 322/352 |
| 920 538 | 125285 | 04 02 01 05 | 20 g | 1 | pc(s) | 321 |
| 922 020 | 463561 | 04 02 07 50 | 42 g | 1 | pc(s) | 343 |
| 922 220 | 433953 | 04 02 07 03 | 64 g | 1 | pc(s) | 343 |
| 922 400 | 137349 | 04 02 07 03 | 220 g | 1 | pc(s) | 343 |
| 923 019 | 033177 | 04 01 05 02 | 1.70 kg | 1 | pc(s) | 220/356 |
| 923 021 | 036161 | 04 01 05 01 | 185 g | 1 | pc(s) | 206/356 |
| 923 023 | 074262 | 04 01 05 01 | 185 g | 1 | pc(s) | 206/356 |
| 923 025 | 110397 | 04 01 05 03 | 137 g | 1 | pc(s) | 221/357 |
| 923 035 | 110403 | 04 01 05 03 | 163 g | 1 | pc(s) | 221/357 |
| 923 045 | 110410 | 04 01 05 03 | 190 g | 1 | pc(s) | 221/357 |
| 923 060 | 038899 | 04 01 05 02 | 725 g | 1 | pc(s) | 220/356 |
| 923 061 | 038905 | 04 01 05 02 | 750 g | 1 | pc(s) | 220/356 |
| 923 062 | 038912 | 04 01 05 02 | 781 g | 1 | pc(s) | 220/356 |
| 923 100 | 108325 | 04 01 05 02 | 289 g | 1 | pc(s) | 221/357 |
| 923 101 | 108332 | 04 01 05 02 | 1.98 kg | 1 | pc(s) | 221/357 |
| 923 110 | 092426 | 05 03 01 01 | 46 g | 10 | pc(s) | 359 |
| 923 116 | 085978 | 05 03 01 01 | 42 g | 10 | pc(s) | 359 |
| 923 117 | 093478 | 05 03 01 01 | 42 g | 10 | pc(s) | 359 |
| 923 118 | 104969 | 05 03 01 01 | 38 g | 10 | pc(s) | 359 |
| 923 119 | 104976 | 05 03 01 01 | 38 g | 10 | pc(s) | 359 |
| 923 211 | 150904 | 04 01 05 03 | 109 g | 1 | pc(s) | 221/357 |
| 923 214 | 150911 | 04 01 05 03 | 107 g | 1 | pc(s) | 22/357 |
| 923 218 | 150928 | 04 01 05 03 | 99 g | 1 | pc(s) | 221/357 |
| 923 222 | 150935 | 04 01 05 03 | 95 g | 1 | pc(s) | 221/357 |
| 923 226 | 150942 | 04 01 05 03 | 92 g | 1 | pc(s) | 221/357 |
| 923 230 | 150959 | 04 01 05 03 | 180 g | 1 | pc(s) | 221/357 |
| 923 233 | 150966 | 04 01 05 03 | 174 g | 1 | pc(s) | 221/357 |
| 923 236 | 150973 | 04 01 05 03 | 167 g | 1 | pc(s) | 221/357 |
| 923 239 | 150980 | 04 01 05 03 | 162 g | 1 | pc(s) | 221/357 |
| 923 242 | 150997 | 04 01 05 03 | 158 g | 1 | pc(s) | 221/357 |
| 923 311 | 150775 | 04 01 05 03 | 105 g | 1 | pc(s) | 221/357 |
| 923 314 | 150782 | 04 01 05 03 | 103 g | 1 | pc(s) | 221/357 |
| 923 318 | 150799 | 04 01 05 03 | 101 g | 1 | pc(s) | 221/357 |
| 923 322 | 150805 | 04 01 05 03 | 96 g | 1 | pc(s) | 221/357 |
| 923 326 | 150812 | 04 01 05 03 | 91 g | 1 | pc(s) | 221/357 |

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| 923 330 | 150829 | 04 01 05 03 | 178 g | 1 | pc(s) | 221/357 |
| 923 333 | 150836 | 04 01 05 03 | 172 g | 1 | pc(s) | 221/357 |
| 923 336 | 150843 | 04 01 05 03 | 168 g | 1 | pc(s) | 221/357 |
| 923 339 | 150850 | 04 01 05 03 | 159 g | 1 | pc(s) | 221/357 |
| 923 342 | 150867 | 04 01 05 03 | 158 g | 1 | pc(s) | 221/357 |
| 923 348 | 150874 | 04 01 05 03 | 144 g | 1 | pc(s) | 221/357 |
| 923 356 | 150881 | 04 01 05 03 | 262 g | 1 | pc(s) | 221/357 |
| 923 362 | 150898 | 04 01 05 03 | 244 g | 1 | pc(s) | 221/357 |
| 923 401 | 237766 | 04 01 06 04 | 12.15 kg | 1 | pc(s) | 358 |
| 923 402 | 442269 | 04 01 06 04 | 3.59 kg | 1 | pc(s) | 358 |
| 923 403 | 442962 | 04 01 06 04 | 207 g | 1 | pc(s) | 358 |
| 924 017 | 045934 | 04 02 09 01 | 30 g | 1 | pc(s) | 343 |
| 924 328 | 100008 | 04 01 03 50 | 15 g | 1 | pc(s) | 298 |
| 924 329 | 099234 | 04 01 03 50 | 12 g | 1 | pc(s) | 298 |
| 924 335 | 071773 | 04 01 03 02 | 122 g | 1 | pc(s) | 298 |
| 924 336 | 071681 | 04 01 03 50 | 13 g | 1 | pc(s) | 298 |
| 924 350 | 076709 | 04 01 03 04 | 34 g | 1 | pc(s) | 299 |
| 924 370 | 081321 | 04 01 03 02 | 71 g | 1 | pc(s) | 298 |
| 924 389 | 073692 | 04 01 03 02 | 36 g | 1 | pc(s) | 299 |
| 924 395 | 076334 | 04 01 03 02 | 67 g | 1 | pc(s) | 299 |
| 924 396 | 091016 | 04 01 03 02 | 32 g | 1 | pc(s) | 299 |
| 925 001 | 047365 | 04 02 07 02 | 10 g | 1 | pc(s) | 342 |
| 926 304 | 157125 | 04 02 01 01 | 45 g | 1 | pc(s) | 315 |
| 927 010 | 410114 | 04 02 01 06 | 14 g | 1 | pc(s) | 312 |
| 927 014 | 473010 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 022 | 410121 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 024 | 410138 | 04 02 01 06 | 15 g | 1 | pc(s) | 313 |
| 927 025 | 410145 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 027 | 468689 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 042 | 410152 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 044 | 410169 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 045 | 410176 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 047 | 468672 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 070 | 410183 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 071 | 410190 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 074 | 468573 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 075 | 468580 | 04 02 01 06 | 14 g | 1 | pc(s) | 313 |
| 927 084 | 410206 | 04 02 01 06 | 14 g | 1 | pc(s) | 314 |
| 927 090 | 466531 | 04 02 01 06 | 14 g | 1 | pc(s) | 314 |
| 927 210 | 405585 | 04 02 01 06 | 33 g | 1 | pc(s) | 311 |
| 927 214 | 473003 | 04 02 01 06 | 33 g | 1 | pc(s) | 312 |
| 927 222 | 405592 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 224 | 405608 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 225 | 405615 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 227 | 468658 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 242 | 405622 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 244 | 405639 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 245 | 405646 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 247 | 468665 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 270 | 405653 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 271 | 405660 | 04 02 01 06 | 34 g | 1 | pc(s) | 312 |
| 927 274 | 468559 | 04 02 01 06 | 34 g | 1 | pc(s) | 311 |
| 927 275 | 468566 | 04 02 01 06 | 34 g | 1 | pc(s) | 312 |
| 927 284 | 405677 | 04 02 01 06 | 35 g | 1 | pc(s) | 312 |
| 927 290 | 466524 | 04 02 01 06 | 36 g | 1 | pc(s) | 312 |
| 927 305 | 454699 | 04 02 01 50 | 12 g | 10 | pc(s) | 315 |
| 927 318 | 470644 | 04 02 01 50 | 32 g | 1 | pc(s) | 314/327 |
| 927 408 | 463653 | 04 02 03 06 | 52 g | 1 | pc(s) | 326 |
| 927 910 | 411739 | 04 02 02 06 | 33 g | 1 | pc(s) | 325 |
| 927 922 | 411951 | 04 02 02 06 | 33 g | 1 | pc(s) | 325 |
| 927 924 | 411968 | 04 02 02 06 | 33 g | 1 | pc(s) | 325 |
| 927 925 | 411975 | 04 02 02 06 | 33 g | 1 | pc(s) | 325 |
| 927 942 | 411777 | 04 02 02 06 | 33 g | 1 | pc(s) | 325 |
| 927 944 | 411784 | 04 02 02 06 | 33 g | 1 | pc(s) | 325 |
| 927 945 | 411807 | 04 02 02 06 | 33 g | 1 | pc(s) | 325 |
| 927 954 | 485730 | 04 02 03 06 | 58 g | 1 | pc(s) | 326 |
| 927 970 | 411982 | 04 02 02 06 | 33 g | 1 | pc(s) | 325 |
| 927 971 | 411999 | 04 02 02 06 | 33 g | 1 | pc(s) | 326 |
| 927 984 | 412002 | 04 02 02 06 | 33 g | 1 | pc(s) | 326 |
| 927 987 | 485754 | 04 02 02 06 | 32 g | 1 | pc(s) | 326 |
| 927 988 | 485747 | 04 02 02 06 | 32 g | 1 | pc(s) | 326 |
| 927 989 | 485761 | 04 02 02 06 | 32 g | 1 | pc(s) | 326 |
| 928 430 | 261389 | 04 02 03 02 | 110 g | 1 | pc(s) | 328 |
| 928 440 | 280809 | 04 02 03 02 | 134 g | 1 | pc(s) | 328 |
| 929 010 | 039940 | 04 02 08 01 | 68 g | 1 | pc(s) | 345 |
| 929 039 | 135185 | 04 02 08 03 | 24 g | 1 | pc(s) | 346 |
| 929 042 | 091030 | 04 02 08 03 | 39 g | 1 | pc(s) | 346 |
| 929 043 | 091047 | 04 02 08 03 | 90 g | 1 | pc(s) | 346 |
| 929 044 | 091054 | 04 02 08 03 | 86 g | 1 | pc(s) | 346 |
| 929 045 | 091061 | 04 02 08 03 | 266 g | 1 | pc(s) | 346 |
| 929 047 | 091085 | 04 02 08 03 | 467 g | 1 | pc(s) | 346 |
| 929 095 | 113398 | 04 02 08 50 | 90 g | 1 | pc(s) | 347 |
| 929 096 | 107212 | 04 02 08 50 | 203 g | 1 | pc(s) | 347 |
| 929 100 | 102170 | 04 02 06 01 | 244 g | 1 | pc(s) | 339 |
| 929 121 | 118935 | 04 02 06 01 | 109 g | 1 | pc(s) | 339 |
| 929 126 | 242258 | 04 02 06 01 | 96 g | 1 | pc(s) | 340 |
| 929 146 | 157156 | 04 02 08 03 | 471 g | 1 | pc(s) | 346 |
| 929 148 | 157163 | 04 02 08 03 | 448 g | 1 | pc(s) | 346 |
| 929 161 | 472921 | 04 02 06 01 | 180 g | 1 | pc(s) | 339 |
| 929 166 | 472914 | 04 02 06 01 | 167 g | 1 | pc(s) | 340 |
| 929 199 | 103313 | 04 02 06 50 | 350 g | 1 | pc(s) | 340 |
| 929 200 | 344082 | 04 02 06 50 | 6 g | 1 | pc(s) | 340/347 |
| 929 221 | 342866 | 04 02 06 01 | 606 g | 1 | pc(s) | 339 |
| 929 309 | 472938 | 04 02 06 01 | 13 g | 1 | pc(s) | 340 |
| 929 335 | 228672 | 04 02 06 50 | 1.38 kg | 1 | pc(s) | 340 |
| 929 497 | 104143 | 04 02 08 50 | 2 g | 1 | pc(s) | 347 |
| 929 498 | 104136 | 04 02 08 50 | 2 g | 1 | pc(s) | 347 |
| 929 499 | 104129 | 04 02 08 50 | 2 g | 1 | pc(s) | 347 |
| 929 921 | 098169 | 04 02 05 01 | 218 g | 1 | pc(s) | 337 |
| 929 941 | 098152 | 04 02 05 01 | 173 g | 1 | pc(s) | 337 |
| 929 950 | 137387 | 04 02 05 03 | 222 g | 1 | pc(s) | 338 |
| 929 951 | 137394 | 04 02 05 03 | 222 g | 1 | pc(s) | 338 |
| 929 960 | 098145 | 04 02 05 01 | 172 g | 1 | pc(s) | 337 |
| 929 961 | 101784 | 04 02 05 02 | 169 g | 1 | pc(s) | 337 |
| 929 962 | 101791 | 04 02 05 02 | 169 g | 1 | pc(s) | 337 |
| 929 963 | 101807 | 04 02 05 02 | 172 g | 1 | pc(s) | 337 |
| 929 964 | 101814 | 04 02 05 02 | 169 g | 1 | pc(s) | 337 |
| 929 965 | 360778 | 04 02 05 01 | 171 g | 1 | pc(s) | 337 |
| 929 969 | 127418 | 04 02 05 03 | 255 g | 1 | pc(s) | 338 |
| 929 970 | 127425 | 04 02 05 03 | 248 g | 1 | pc(s) | 338 |
| 929 971 | 120761 | 04 02 05 01 | 272 g | 1 | pc(s) | 337 |
| 929 982 | 098695 | 04 02 05 50 | 36 g | 1 | pc(s) | 338 |
| 929 984 | 098688 | 04 02 05 50 | 30 g | 1 | pc(s) | 338 |
| 929 996 | 098244 | 04 02 05 50 | 13 g | 1 | pc(s) | 338 |
| 941 110 | 137899 | 04 01 01 04 | 275 g | 1 | pc(s) | 265 |
| 941 115 | 289208 | 04 01 01 04 | 285 g | 1 | pc(s) | 265 |
| 941 116 | 373235 | 04 01 01 04 | 285 g | 1 | pc(s) | 265 |
| 941 200 | 138209 | 04 01 01 04 | 250 g | 1 | pc(s) | 264 |
| 941 205 | 289185 | 04 01 01 04 | 260 g | 1 | pc(s) | 264 |
| 941 206 | 373839 | 04 01 01 04 | 260 g | 1 | pc(s) | 264 |
| 941 300 | 133556 | 04 01 01 04 | 386 g | 1 | pc(s) | 263 |
| 941 305 | 275317 | 04 01 01 04 | 361 g | 1 | pc(s) | 263 |
| 941 306 | 328068 | 04 01 01 04 | 362 g | 1 | pc(s) | 263 |
| 941 310 | 131798 | 04 01 01 04 | 480 g | 1 | pc(s) | 264 |
| 941 315 | 275324 | 04 01 01 04 | 448 g | 1 | pc(s) | 264 |
| 941 316 | 328075 | 04 01 01 04 | 450 g | 1 | pc(s) | 264 |
| 941 400 | 133563 | 04 01 01 04 | 525 g | 1 | pc(s) | 263 |
| 941 405 | 275331 | 04 01 01 04 | 428 g | 1 | pc(s) | 263 |
| 941 406 | 328082 | 04 01 01 04 | 429 g | 1 | pc(s) | 263 |
| 942 310 | 484108 | 04 01 02 01 | 344 g | 1 | pc(s) | 274 |
| 942 341 | 477186 | 04 01 02 24 | 378 g | 1 | pc(s) | 272 |
| 942 400 | 484115 | 04 01 02 01 | 408 g | 1 | pc(s) | 274 |
| 942 405 | 477124 | 04 01 02 01 | 351 g | 1 | pc(s) | 274 |
| 942 440 | 477148 | 04 01 02 24 | 377 g | 1 | pc(s) | 272 |

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| 950 112 | 105638 | 04 01 02 13 | 196 g | 1 | pc(s) | 292 |
| 950 530 | 152960 | 04 01 02 09 | 300 g | 1 | pc(s) | 294 |
| 950 531 | 152953 | 04 01 02 09 | 275 g | 1 | pc(s) | 294 |
| 950 535 | 154988 | 04 01 02 09 | 310 g | 1 | pc(s) | 294 |
| 950 536 | 154995 | 04 01 02 09 | 285 g | 1 | pc(s) | 294 |
| 952 010 | 108356 | 04 01 02 01 | 43 g | 1 | pc(s) | 278/280 |
| 952 010 | 108356 | 04 01 02 01 | 43 g | 1 | pc(s) | 290 |
| 952 011 | 109773 | 04 01 02 01 | 32 g | 1 | pc(s) | 280/290 |
| 952 012 | 109780 | 04 01 02 01 | 35 g | 1 | pc(s) | 278/280 |
| 952 012 | 109780 | 04 01 02 01 | 35 g | 1 | pc(s) | 290 |
| 952 013 | 109797 | 04 01 02 01 | 46 g | 1 | pc(s) | 278/280 |
| 952 013 | 109797 | 04 01 02 01 | 46 g | 1 | pc(s) | 290 |
| 952 014 | 108363 | 04 01 02 01 | 50 g | 1 | pc(s) | 278/280 |
| 952 014 | 108363 | 04 01 02 01 | 50 g | 1 | pc(s) | 290 |
| 952 015 | 109803 | 04 01 02 01 | 53 g | 1 | pc(s) | 278/280 |
| 952 015 | 109803 | 04 01 02 01 | 53 g | 1 | pc(s) | 290 |
| 952 016 | 109810 | 04 01 02 01 | 64 g | 1 | pc(s) | 280/290 |
| 952 017 | 113329 | 04 01 02 01 | 63 g | 1 | pc(s) | 278/280 |
| 952 017 | 113329 | 04 01 02 01 | 63 g | 1 | pc(s) | 291 |
| 952 018 | 119482 | 04 01 02 01 | 36 g | 1 | pc(s) | 280/290 |
| 952 022 | 376533 | 04 01 02 24 | 43 g | 1 | pc(s) | 273/290 |
| 952 024 | 377356 | 04 01 02 24 | 52 g | 1 | pc(s) | 273/290 |
| 952 025 | 127357 | 04 01 02 04 | 34 g | 1 | pc(s) | 280/291 |
| 952 027 | 127364 | 04 01 02 04 | 40 g | 1 | pc(s) | 280/291 |
| 952 028 | 387843 | 04 01 02 24 | 52 g | 1 | pc(s) | 273 |
| 952 029 | 127371 | 04 01 02 04 | 44 g | 1 | pc(s) | 280/291 |
| 952 030 | 108530 | 04 01 02 06 | 111 g | 1 | pc(s) | 287 |
| 952 035 | 108547 | 04 01 02 06 | 114 g | 1 | pc(s) | 287 |
| 952 041 | 141841 | 04 01 02 07 | 53 g | 1 | pc(s) | 291/294 |
| 952 044 | 141858 | 04 01 02 07 | 62 g | 1 | pc(s) | 291/294 |
| 952 048 | 327733 | 04 01 02 22 | 51 g | 1 | pc(s) | 291/293 |
| 952 049 | 327740 | 04 01 02 22 | 60 g | 1 | pc(s) | 291/293 |
| 952 050 | 108370 | 04 01 02 01 | 38 g | 1 | pc(s) | 277/291 |
| 952 051 | 126442 | 04 01 02 07 | 49 g | 1 | pc(s) | 291/294 |
| 952 054 | 127975 | 04 01 02 07 | 52 g | 1 | pc(s) | 291/294 |
| 952 056 | 149106 | 04 01 02 08 | 71 g | 1 | pc(s) | 294 |
| 952 060 | 108387 | 04 01 02 06 | 37 g | 1 | pc(s) | 287/291 |
| 952 070 | 108493 | 04 01 02 02 | 130 g | 1 | pc(s) | 279 |
| 952 071 | 109834 | 04 01 02 02 | 107 g | 1 | pc(s) | 279 |
| 952 072 | 109858 | 04 01 02 02 | 109 g | 1 | pc(s) | 279 |
| 952 073 | 109872 | 04 01 02 02 | 119 g | 1 | pc(s) | 279 |
| 952 074 | 108516 | 04 01 02 02 | 123 g | 1 | pc(s) | 279 |
| 952 075 | 109896 | 04 01 02 02 | 142 g | 1 | pc(s) | 279 |
| 952 076 | 109919 | 04 01 02 02 | 136 g | 1 | pc(s) | 279 |
| 952 077 | 119680 | 04 01 02 02 | 137 g | 1 | pc(s) | 280 |
| 952 078 | 119468 | 04 01 02 02 | 109 g | 1 | pc(s) | 279 |
| 952 080 | 127296 | 04 01 02 04 | 107 g | 1 | pc(s) | 280 |
| 952 081 | 318182 | 04 01 02 01 | 38 g | 1 | pc(s) | 278/291 |
| 952 082 | 127319 | 04 01 02 04 | 113 g | 1 | pc(s) | 280 |
| 952 083 | 376540 | 04 01 02 24 | 51 g | 1 | pc(s) | 273/291 |
| 952 084 | 127333 | 04 01 02 04 | 117 g | 1 | pc(s) | 280 |
| 952 085 | 127302 | 04 01 02 04 | 111 g | 1 | pc(s) | 280 |
| 952 087 | 127326 | 04 01 02 04 | 116 g | 1 | pc(s) | 280 |
| 952 089 | 127340 | 04 01 02 04 | 121 g | 1 | pc(s) | 280 |
| 952 090 | 108509 | 04 01 02 02 | 119 g | 1 | pc(s) | 279 |
| 952 091 | 109841 | 04 01 02 02 | 110 g | 1 | pc(s) | 279 |
| 952 092 | 109865 | 04 01 02 02 | 113 g | 1 | pc(s) | 279 |
| 952 093 | 109889 | 04 01 02 02 | 137 g | 1 | pc(s) | 279 |
| 952 094 | 108523 | 04 01 02 02 | 140 g | 1 | pc(s) | 279 |
| 952 095 | 109902 | 04 01 02 02 | 140 g | 1 | pc(s) | 279 |
| 952 096 | 109926 | 04 01 02 02 | 160 g | 1 | pc(s) | 279 |
| 952 097 | 119697 | 04 01 02 02 | 140 g | 1 | pc(s) | 280 |
| 952 098 | 119475 | 04 01 02 02 | 123 g | 1 | pc(s) | 279 |
| 952 100 | 376526 | 04 01 02 24 | 128 g | 1 | pc(s) | 273 |
| 952 110 | 108417 | 04 01 02 01 | 242 g | 1 | pc(s) | 277 |
| 952 111 | 119420 | 04 01 02 01 | 232 g | 1 | pc(s) | 277 |
| 952 113 | 387874 | 04 01 02 24 | 130 g | 1 | pc(s) | 273 |
| 952 115 | 108424 | 04 01 02 01 | 228 g | 1 | pc(s) | 277 |
| 952 116 | 119413 | 04 01 02 01 | 236 g | 1 | pc(s) | 277 |
| 952 121 | 376663 | 04 01 02 24 | 250 g | 1 | pc(s) | 273 |
| 952 122 | 387867 | 04 01 02 24 | 252 g | 1 | pc(s) | 273 |
| 952 130 | 128521 | 04 01 02 01 | 247 g | 1 | pc(s) | 277 |
| 952 135 | 128538 | 04 01 02 01 | 253 g | 1 | pc(s) | 277 |
| 952 181 | 318175 | 04 01 02 01 | 228 g | 1 | pc(s) | 277 |
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| 952 200 | 108394 | 04 01 02 01 | 229 g | 1 | pc(s) | 276 |
| 952 201 | 123915 | 04 01 02 01 | 211 g | 1 | pc(s) | 276 |
| 952 205 | 108400 | 04 01 02 01 | 232 g | 1 | pc(s) | 277 |
| 952 206 | 123922 | 04 01 02 01 | 217 g | 1 | pc(s) | 277 |
| 952 220 | 376656 | 04 01 02 24 | 241 g | 1 | pc(s) | 273 |
| 952 300 | 108431 | 04 01 02 01 | 334 g | 1 | pc(s) | 275 |
| 952 302 | 113305 | 04 01 02 01 | 386 g | 1 | pc(s) | 278 |
| 952 303 | 120709 | 04 01 02 01 | 355 g | 1 | pc(s) | 275 |
| 952 305 | 108448 | 04 01 02 01 | 328 g | 1 | pc(s) | 275 |
| 952 307 | 113312 | 04 01 02 01 | 388 g | 1 | pc(s) | 278 |
| 952 308 | 120716 | 04 01 02 01 | 362 g | 1 | pc(s) | 275 |
| 952 310 | 108479 | 04 01 02 01 | 405 g | 1 | pc(s) | 276 |
| 952 311 | 119390 | 04 01 02 01 | 432 g | 1 | pc(s) | 276 |
| 952 313 | 123939 | 04 01 02 01 | 299 g | 1 | pc(s) | 275 |
| 952 314 | 124028 | 04 01 02 01 | 342 g | 1 | pc(s) | 275 |
| 952 315 | 108486 | 04 01 02 01 | 415 g | 1 | pc(s) | 276 |
| 952 316 | 119406 | 04 01 02 01 | 436 g | 1 | pc(s) | 276 |
| 952 318 | 124011 | 04 01 02 01 | 306 g | 1 | pc(s) | 275 |
| 952 319 | 124035 | 04 01 02 01 | 350 g | 1 | pc(s) | 275 |
| 952 320 | 126794 | 04 01 02 01 | 416 g | 1 | pc(s) | 276 |
| 952 323 | 133235 | 04 01 02 01 | 381 g | 1 | pc(s) | 276 |
| 952 325 | 126800 | 04 01 02 01 | 425 g | 1 | pc(s) | 276 |
| 952 328 | 133242 | 04 01 02 01 | 390 g | 1 | pc(s) | 276 |
| 952 330 | 376649 | 04 01 02 24 | 354 g | 1 | pc(s) | 272 |
| 952 332 | 469945 | 04 01 02 01 | 433 g | 1 | pc(s) | 276 |
| 952 341 | 376632 | 04 01 02 24 | 452 g | 1 | pc(s) | 273 |
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# Notes

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**Abbreviations:**

| | |
|---|---|
| **PG** | Product Group |
| **PU** | Packing Unit |
| **SU** | Sales Unit (Piece, Meter, Millimeter, Kilogram, Gram, Liter, Set or Pair) |
| **Pc(s)** | Piece(s) |
| **m** | Meter |
| **mm** | Millimeter |
| **kg** | Kilogram |
| **g** | Gram |
| **Ltr** | Liter |
| **Pa** | Pair |
| **Pak** | Set |
| **Weight** | Weight per sales unit |

# Conversion Table

**Conversion Table**

| Description | Part No. | Length | Weight | Weight | Length |
|---|---|---|---|---|---|
| Round wire **St/tZn**, 8 mm | **800 008** | 1 m | 393 g | 1 kg | 2.54 m |
| Round wire **St/tZn**, 10 mm | **800 010 / 800 310** | 1 m | 617 g | 1 kg | 1.62 m |
| Round wire **St/tZn**, with PVC sheath,, 8 mm | **800 108** | 1 m | 440 g | 1 kg | 2.30 m |
| Round wire **St/tZn**, with PVC sheath,, 10 mm | **800 110** | 1 m | 680 g | 1 kg | 1.48 m |
| Round wire **Al**, semi-rigid/soft, 8 mm | **840 008 / 840 018 840 108 / 840 028** | 1 m | 135 g | 1 kg | 7.40 m |
| Round wire **StSt (V2A) / (V4A)**, 8 mm | **860 008 / 860 908** | 1 m | 395 g | 1 kg | 2.54 m |
| Round wire **StSt (V2A) / (V4A)**, 10 mm | **860 010 / 860 020 860 910 / 860 920** | 1 m | 617 g | 1 kg | 1.62 m |
| Round wire **Cu**, semi-rigid/soft, 8 mm | **830 008 / 830 108 830 038** | 1 m | 448 g | 1 kg | 2.22 m |
| Strip **St/tZn**, 20 x 2.5 mm, Z500 | **810 225** | 1 m | 400 g | 1 kg | 2.50 m |
| Strip **St/tZn**, 30 x 3.5 mm, Z500 | **810 335 / 852 335** | 1 m | 840 g | 1 kg | 1.19 m |
| Strip **St/tZn**, 30 x 4 mm, Z500 | **810 304** | 1 m | 960 g | 1 kg | 1.04 m |
| Strip **St/tZn**, 40 x 4 mm, Z500 | **810 404** | 1 m | 1.280 kg | 1 kg | 0.78 m |
| Strip **St/tZn**, 40 x 5 mm, Z500 | **810 405** | 1 m | 1.560 kg | 1 kg | 0.64 m |
| Strip **StSt (V2A) / (V4A)**, 30 x 3.5 mm | **860 335 / 860 325 860 900 / 860 925 861 325 / 861 335** | 1 m | 825 g | 1 kg | 1.21 m |
| Strip **StSt (V4A)** 40 x 4 mm | **860 404** | 1 m | 1.248 kg | 1 kg | 0.80 m |
| Strip **StSt (V4A)** 40 x 5 mm | **860 405** | 1 m | 1.560 kg | 1 kg | 0.64 m |
| Strip **Cu**, 20 x 2.5 mm | **831 225** | 1 m | 450 g | 1 kg | 2.22 m |

# Abbreviations / Symbols / Recommended values

## Materials:

| Abbreviation | Description |
|---|---|
| Al | Aluminium |
| AlMgSi | Aluminium magnesium silicon wrought alloy |
| Cu | Copper, electrical copper |
| Cu/bronze | Copper / Bronze |
| Cu/gal Sn | Copper, tin-coated |
| EVA Ethylen | Ethylene vinyl acetate copolymer |
| GRP | Glass-fibre reinforced plastic |
| GCI | Grey cast iron |
| K | Plastic material / Polyethylene / Polyamide / Polystyrene |
| Ms | Brass |
| Ms/gal Cu | Brass, copper-coated |
| Ms/gal Sn | Brass, tin-coated |
| StSt | Stainless steel<br>Material No.: 1.4301 (Material No.: ASTM/AISI 304)<br>Material No.: 1.4303 (Material No.: ASTM/AISI 305)<br>Material No.: 1.4307 (Material No.: ASTM/AISI 304L) |
| StSt (V4A) | Stainless steel<br>Material No.: 1.4401 (Material No.: ASTM/AISI 316)<br>Material No.: 1.4404 (Material No.: ASTM/AISI 316L)<br>Material No.: 1.4571 (Material No.: ASTM/AISI 316Ti) |
| StSt/gal Cu | Stainless steel, copper-coated |
| PA | Polyamide |
| PC | Polycarbonate |
| PE | Polyethylene |
| PP | Polypropylene |
| PS | Polystyrene |
| PVC | Polyvinyl chloride |
| ABS | Acrylonitrile butadiene styrene |
| RG | Red brass |
| Sn | Tin |
| St/bare | Steel (black) |
| St/gal Zn | Steel, galvanised |
| St/tZn | Steel, hot dip galvanised |
| St/Cu | Steel, copper-coated |
| MCI | Malleable cast iron |
| MCI/tZn | Malleable cast iron, hot dip galvanised |
| UP | Polyester (unsaturated) |
| XLPE | Cross-linked polyethylene |
| ZDC | Zinc die casting |

## Material combinations to prevent contact corrosion

| air-termination systems / down conductors: | Construction parts: | | | | | |
|---|---|---|---|---|---|---|
| | Steel | Aluminium | Copper | StSt | Titanium | Tin |
| Steel (St/tZn) | yes | yes | no | yes | yes | yes |
| Aluminium | yes | yes | no | yes | yes | yes |
| Copper | no | no | yes | yes | no | yes |
| StSt | yes | yes | yes | yes | yes | yes |
| Titanium | yes | yes | no | yes | yes | yes |
| Tin | yes | yes | yes | yes | yes | yes |

## Conductor types:

| Abbreviation | Conductor types |
|---|---|
| Fl | Flat conductor (strip) |
| Rd | Round conductor (round wire) |

## Key to symbols:

| Screws | |
|---|---|
|  | Half-round wood screw |
|  | Countersunk head wood screw |
|  | Wood screw with threaded head |
|  | Cheese head screw |
|  | Truss head screw |
|  | Knurled screw |
|  | Flat head screw |
|  | Rounded head screw |

| Screw heads | |
|---|---|
|  | Slot |
|  | Hexagon |
|  | Hexagon with slot |
|  | Cross recessed |
|  | Star drive |
|  | Combined slot |

| Symbols | |
|---|---|
|  | Test according to EN 62561-1<br>Please find more information on our website. |
|  | Wind load calculation according to Eurocode<br>(Catalogue information for Germany) |
|  | HVI check |
|  | New products |

## Recommended values:

| Screw | Tightening torque |
|---|---|
| M5 / M6 | ≥ 4 Nm |
| M8 | ≥ 10 Nm |
| M10 | ≥ 20 Nm |
| M12 | ≥ 25 Nm |
| M16 | ≥ 25 Nm |

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**Surge Protection**
**Lightning Protection / Earthing**
**Safety Equipment**

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DS591/EN/0425
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