

# TBS

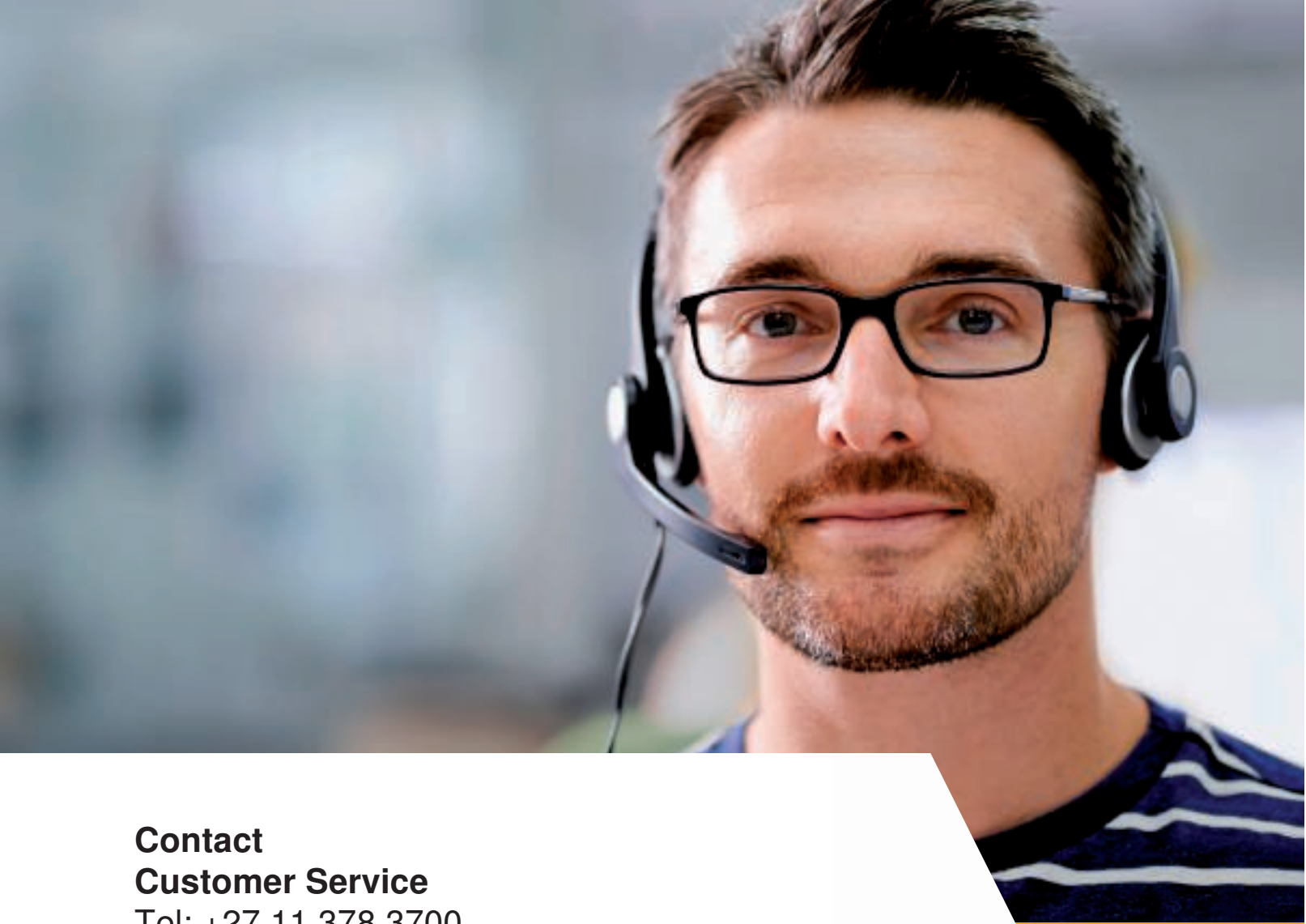


**Transient and lightning  
protection systems  
South Africa**

**2020/2021**

**OBO**  
BETTERMANN

***O-line***



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## Planning and mounting aids

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## OBO Construct planning aids

### Digital selection aids for earthing systems and surge protection

The OBO Construct electronic planning aids are programs developed to support electrical installation engineers and planners in the design of electrical installation systems. In particular, in complex areas such as surge protection and earthing, there are countless technical and standard general conditions to be observed. The two OBO Construct programs for earthing and surge protection systems should provide active help here. Systematic questions simplify the search for suitable products and guaranteed surge protection systems and earthing systems which fulfil the standards.

### OBO Construct for earthing systems

The digital selection aid can be used for the easy planning and configuration of earthing systems. The simple and intuitive user guidance leads you through the individual components of the earthing system step by step. The software then automatically calculates the amounts required and the matching accessories. The application can be opened on any end device irrespective of its operating system – be it smartphone, tablet or desktop PC.

### OBO Construct for surge protection

This online tool aids you in the project-orientated selection and connection of suitable surge protection systems and provides you with information on the OBO surge protection systems. You can create your personal materials list, connection diagram and invitation to tender texts quickly, efficiently and in a targeted manner for complete surge protection in the fields of energy technology, photovoltaics, telecommunication, MSR, TV, HF and data technology. The result can be exported easily into Excel format for further processing.

## Benefits

- Time and place-independent work assistance
- Transmit planning requirements to complete product systems
- Find suitable products quickly and simply
- Calculate material and parts lists automatically
- Download configuration results as Excel or Word files





## Lightning protection guide. Safely routed.

### Reference work and planning aid for electrical installation engineers and technical planners

At OBO Bettermann, we can look back on more than 90 years of experience in the field of lightning and surge protection. This experience and, of course, the latest standards and technical innovations have flowed into the company's new lightning protection guide. The brochure allows you to plan installations in the field of lightning and surge protection faster and more easily.

It contains a balanced mixture of both basic and expert knowledge, as well as planning and selection aids for the protection of buildings and systems.

The new lightning protection guide can be requested by calling +49 2373 89 - 1700 and is also available for download on the OBO website.



### Topics

- Basic principles
- The external lightning protection system
- Air-termination and down-conductor systems
- Examples and selection aids for wind load calculation conform with Eurocode 1+3
- Earthing systems with foundation earther to current DIN 18014
- The internal lightning protection system
- Equipotential bonding systems
- Overvoltage protection systems
- Current standards
- New selection and planning aids
- Examples





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### **OBO TBS seminars: First-hand knowledge**

With a comprehensive programme of training courses and seminars on the subject of surge voltage and lightning protection systems, OBO is able to support its customers with specialist knowledge from a single source. Alongside the basic theoretical principles, the programme also deals with practical implementation in everyday applications. Special calculation and application examples round off the comprehensive programme of knowledge transfer.

### **Invitations to tender on the Internet at [www.ausschreiben.de](http://www.ausschreiben.de)**

More than 10,000 entries from the cable support systems, fire protection systems, connection and fastening systems, transient and lightning protection systems, cable routing systems, device systems and underfloor systems can be recalled for free. Regular updates and extensions mean that you always have a comprehensive overview of the OBO products. All the current file formats (PDF, DOC, GAEB, HTML, TEXT, XML, ÖNORM) are available. [www.ausschreiben.de](http://www.ausschreiben.de)

### **Invitations to tender, product information and data sheets**

We can make life easier for you, with our comprehensive selection of materials designed for practical applications, which provide you with effective support with the planning and calculation of a project. These include:

- Invitations to tender
- Product information
- Data sheets
- Data sheets

### **Invitations to tender for lightning protection/earthing at the highest level:**

OBO manufacturers products to RAL GZ642-5 and is dedicated to compliance with the RAL directives. Lightning protection and earthing products can be used for invitations to tender according to RAL.

These documents are continually updated and can be downloaded for free at any time from the Internet download area at [www.obo-bettermann.com](http://www.obo-bettermann.com).





**Customer service and credibility**

Friendliness, reliability and competence create acceptance, credibility and lasting working relationships. These shared values arise from OBO's consistent orientation around the wishes and needs of its customers. Close partnerships with customers is OBO's foremost priority.

**Help and advice**

Answers to questions about products and installation, planning advice for complex projects – OBO's staff will help you through every phase of your project, no matter what field it is in. We are constantly improving the support we provide in every phase of collaboration, laying the foundations for genuine partnerships.

**Speed and reliability**

Optimised procedures and highly developed logistics ensure that OBO products are in the right place at the right time, anywhere in the world. OBO offers comprehensive support for large-scale projects, from planning all the way to installation.



**Lightning protection guide**

Free order and download from [www.obo.de](http://www.obo.de)



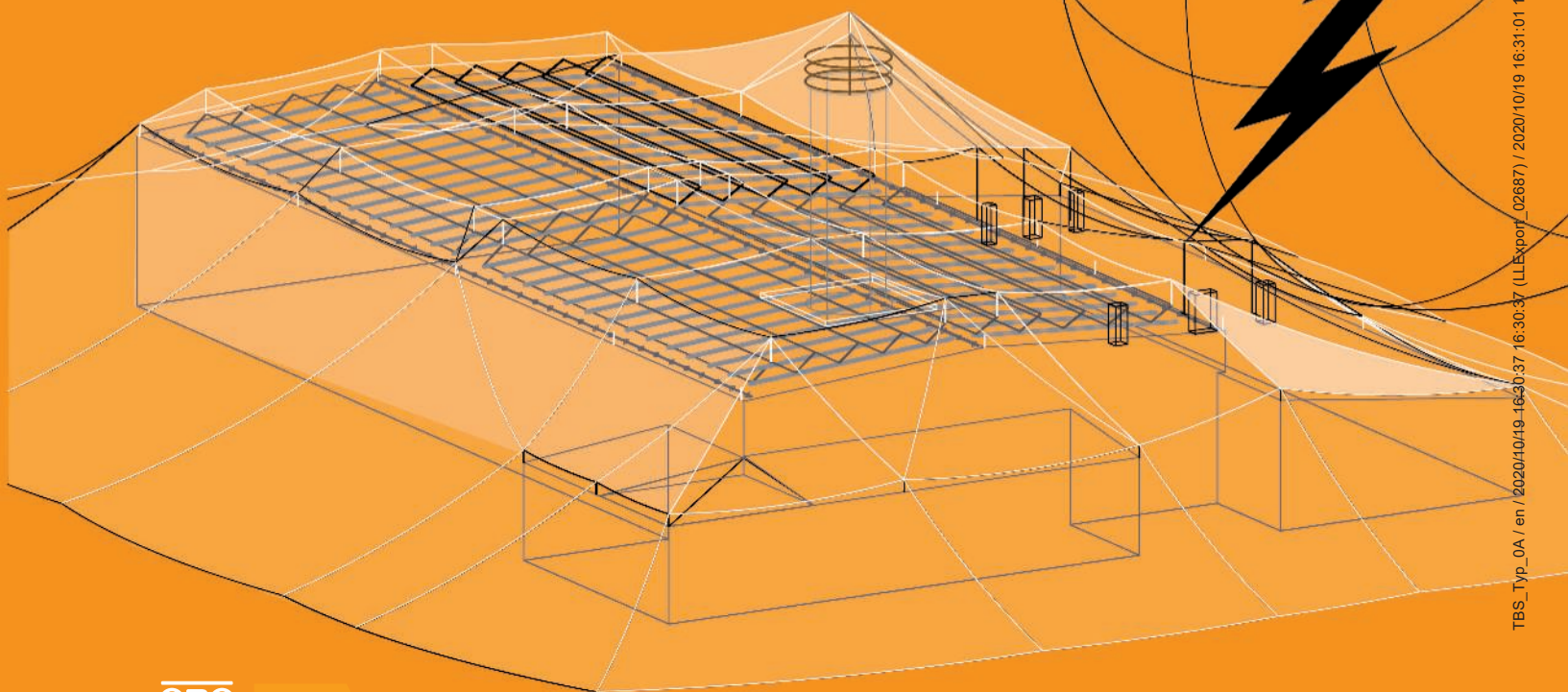
- Production location
- Subsidiary
- Representative



## OBO Engineering Services

OBO engineering situated in Selby Johannesburg is a newly established division designed to provide technical assistance to the African Market within the field of lightning and surge protection. The Division which has an experienced design and solutions team will now complement its already world renowned products through providing the following services:

- Earth resistivity testing with detailed report on findings
- Risk assessments with detailed report and mitigation measures
- Site assessments
- Detailed engineering designs with Bill of materials
- 2D & 3D drawings of lightning protection systems in (CAD) format
- Detailed installation instructions
- Calculation of separation distances according to IEC/SANS 62305
- Selection of Surge Protection devices
- Detailed Tender Specifications in accordance with IEC/SANS codes



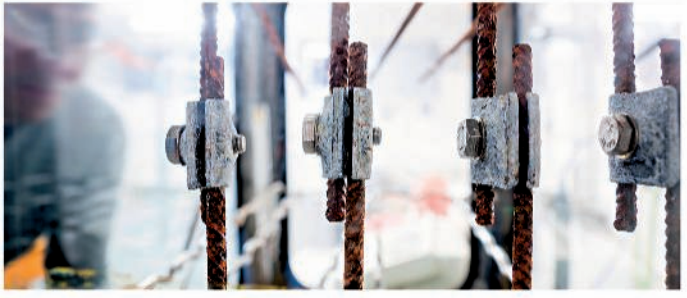
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# BET Test Centre generator for lightning current tests

OBO's advanced Technical Facilities consisting of its in house BET Test Centre make provision for tests to be carried out up to 200 kA. The generator was planned and constructed in cooperation with Soest Technical College. Due to the intensive planning and scientific support in the construction of the test system, it has worked for 20 years without errors and meets current standardised test requirements

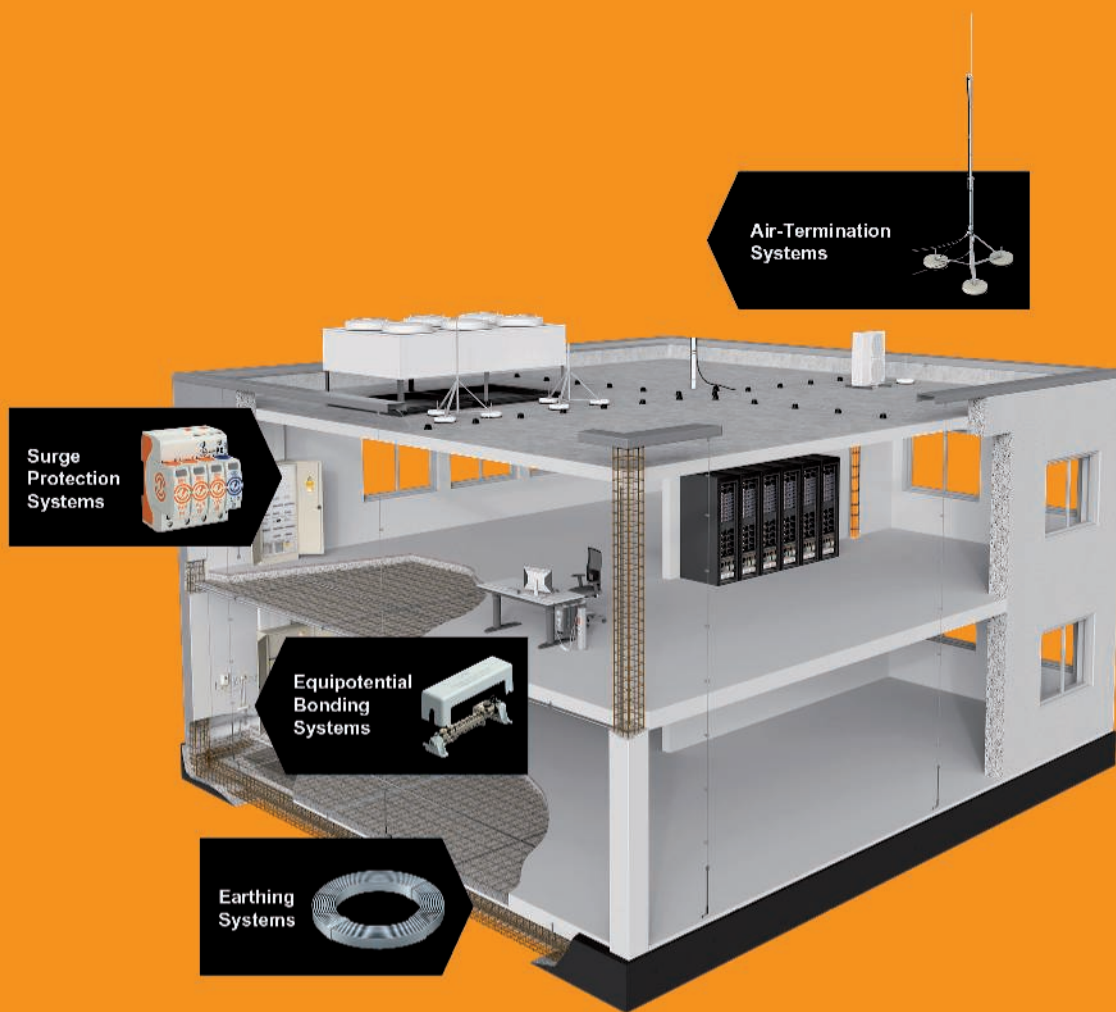
The centre allows for a magnitude of test to be carried out including that of new developments, modifications to existing OBO products and also comparison tests with competitive products. These include lightning protection components, surge protection devices and lightning arrestors.



Tests for lightning protection components are carried out according to IEC 62561, for spark gaps according to IEC 62561 and for lightning and surge protection devices according to IEC 61643-11. This is only a small amount of the testing standards used for tests in the BET Test Centre.

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This makes OBO Engineering Services your partner in the planning of complex systems and projects. The visualisation of the lightning protection measures indicates clearly each stage of the planning process, how the lightning protection solutions can be integrated into the project.

OBO Engineering Services include the construct and design of detailed Lightning Protection systems for various industries including but not limited to:

- Renewable energy- Rooftop PV, CSP plants, Biogas, PV plants etc.
- Commercial
- Industrial
- Domestic
- Security
- Food & Process Industry
- Oil and Gas Industry
- Telecommunication
- Transportation
- HV, MV & LV networks



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## Minor cause, major effect: Damage caused by surge voltages



Our dependency on electrical and electronic equipment continues to increase, in both our professional and private lives. Data networks in companies or emergency facilities such as hospitals and fire stations are lifelines for an essential real time information exchange. Sensitive databases, e.g. in banks or media publishers, need reliable transmission paths.

It is not only lightning strikes that pose a latent threat to these systems. More and more frequently, today's electronic aids are damaged by surge voltages caused by remote lightning discharges or switching operations in large electrical systems. During thunderstorms too, high volumes of energy are instantaneously released. These voltage peaks can penetrate a building through all manner of conductive connections and cause enormous damage.



## Financial implications of lightning and surge voltage damage



Financial losses can only be considered in isolation in cases where no legal or insurance requirements relating to personal safety apply.

**Substantial losses result from the destruction of electrical devices, notably:**

- Computers and servers
- Telephone systems
- Fire alarm systems
- Monitoring systems
- Lift, garage door and roller shutter drives
- Consumer electronics
- Kitchen appliances

**Further costs can also be incurred due to outages and consequential damage in relation to:**

- Loss of data
- Production outage
- Loss of contactability (Internet, telephone, fax)
- Defective heating systems
- Costs due to faults and false alarms in fire and burglar alarm systems

**Financial losses are on the rise**

Current statistics and estimates of insurance companies show: Damage levels caused by surges – excluding consequential or outage costs – long since reached drastic levels due to the growing dependency on electronic "aids". It's no surprise then that property insurers are checking more and more claims and stipulating the use of devices to protect against surges. Information on protection measures can be found in, for example, the German Directive VdS 2010.

Year	Number of lightning and surge voltage damage cases	Paid damages for lightning and surge voltage damage
1999	490,000	€310 million
2006	550,000	€340 million
2007	520,000	€330 million
2008	480,000	€350 million
2009	490,000	€340 million
2010	330,000	€220 million
2011	440,000	€330 million
2012	410,000	€330 million
2013	340,000	€240 million
2014	410,000	€340 million
2015	350,000	€240 million
2016	300,000	€250 million

*Number of instances of damage from lightning and surge voltages and amounts paid out by home and contents insurance companies (the example is of Germany); source: GDV extrapolation based on industry and risk statistics; numbers rounded to the nearest €10,000 or €10 million.*



## Lightning and surge protection standards

When planning and executing a lightning protection system, it is necessary to observe all relevant national annexes and take account of any special circumstances or applications and the safety stipulations in the relevant country-specific supplements.

A lightning and surge protection system consists of several systems, each tailored to each of the others. At its most basic, a lightning and surge protection system consists of one internal and one external lightning protection system.

These, in turn, can be categorised as follows:

- Air-termination devices
- Down-conductors
- Earthing systems
- Area shielding
- Separation distance
- Lightning protection equipotential bonding system

These systems must be carefully selected for the application at hand, and used in a coordinated way. Installation of the systems takes place according to various application and product standards. The supplements to the international IEC guidelines and harmonised European versions of the various country-specific translations often contain additional informative information specific to the country in question.

### Product standards

To ensure that the components can withstand the loads to which they are likely to be exposed in application, they must be checked against the respective product standard for external and internal lightning protection.



External and internal lightning protection systems



Standard	German supplement	Contents
VDE 0185-305-1 (IEC 62305-1)		Protection against lightning – Part 1: General principles
VDE 0185-305-2 (IEC 62305-2)		Protection against lightning – Part 2: Risk management
	1	Lightning risk in Germany
	2	Calculation aids for estimating the risk of damage for buildings
	3	Additional information on use of EN 62305-2
VDE 0185-305-3 (IEC 62305-3)		Protection against lightning – Part 3: Physical damage to structures and life hazard
	1	Additional information on use of EN 62305-3
	2	Additional information for building structures
	3	Additional information for the testing and servicing of lightning protection systems
	4	Use of metal roofs in lightning protection systems
	5	Lightning and surge protection in PV power supply systems
VDE 0185-305-4 (IEC 62305-4)		Protection against lightning – Part 4: Electrical and electronic systems within structures
	1	Distribution of the lightning current
VDE 0675-6-11 (IEC 0675-6-11)		Low-voltage surge protective devices – Part 11: Surge protective devices connected to low-voltage power systems
VDE 0100-534 (IEC 60364-5-53)		Low-voltage electrical installations – Part 5-53: Selection and erection of electrical equipment – Isolation, switching and control – Clause 534: Devices for protection against surge voltages
VDE 0100-443 (IEC 60364-4-44)		Low-voltage electrical installations – Part 4-44: Protection for safety – Protection against voltage disturbances and electromagnetic disturbances – Clause 443: Protection against surge voltages of atmospheric origin or due to switching
VDE 0100-712 (IEC 60364-7-712)		Requirements for operational premises, special rooms and systems – photovoltaic (PV) power supply systems

#### Key lightning protection standards and specifications

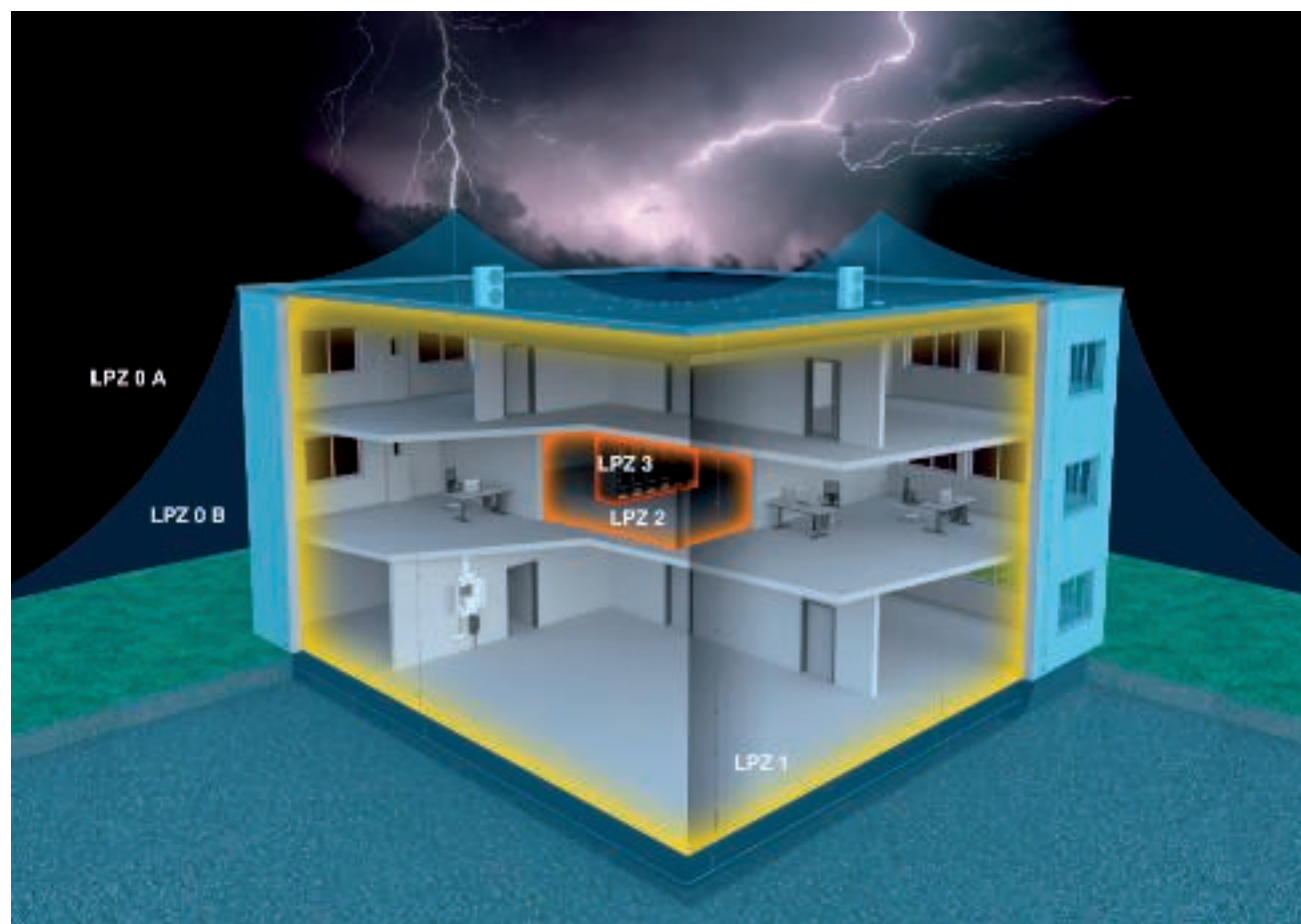
Product standards	Contents
VDE 0185-561-1 (IEC 62561-1)	Lightning protection system components – Requirements for connection components
VDE 0185-561-2 (IEC 62561-2)	Lightning protection system components – Requirements for conductors and earthers
VDE 0185-561-3 (IEC 62561-3)	Lightning protection system components – Requirements for isolating spark gaps
VDE 0185-561-4 (IEC 62561-4)	Lightning protection system components – Requirements for conductor fasteners
VDE 0185-561-5 (IEC 62561-5)	Lightning protection system components – Requirements for earth electrode inspection housings and earth electrode seals
VDE 0185-561-6 (IEC 62561-6)	Lightning protection system components – Requirements for lightning strike counters
VDE 0185-561-7 (IEC 62561-7)	Lightning protection system components – Requirements for earthing enhancing compounds
IEC TS 62561-8	Lightning protection system components – Requirements for components for insulated lightning protection systems
VDE 0675-6-11 (IEC 61643-11)	Surge protective devices for use in low-voltage power systems – Requirements and test methods
VDE 0845-3-1 (IEC 61643-21)	Surge protection for use in telecommunications and signalling networks

#### Lightning protection and surge protection components





## Gradual surge reduction with lightning protection zones



### Lightning protection zone concept

The lightning protection zone concept described in international standard IEC 62305-4 (DIN VDE 0185 Part 4) has proved to be practical and efficient. This concept is based on the principle

of gradually reducing surges to a safe level before they reach the terminal device and cause damage. In order to achieve this situation, a building's entire energy network is split into lightning protection zones (LPZ = lightning protection zone). Installed at each

transition from one zone to another is a surge arrester for equipotential bonding. These arresters correspond to the requirement class in question.

### Lightning protection zone




<b>LPZ 0 A</b>	Unprotected zone outside the building. Direct lightning strike, no shielding against electromagnetic interference pulses LEMP (Lightning Electromagnetic Pulse).
<b>LPZ 0 B</b>	Through the area protected by the external lightning protection system. No shielding against LEMP.
<b>LPZ 1</b>	Zone inside the building. Low partial lightning energies possible.
<b>LPZ 2</b>	Zone inside the building. Low surges possible.
<b>LPZ 3</b>	Zone inside the building (can also be the metal housing of a consumer). No interference pulses through LEMP or surges present.

## Choosing the right surge protective devices



The classification of surge protective devices into types means they can be matched to different requirements with regard to location, protection level and current-carrying capacity. The table provides an overview of the zone

transitions. It also shows which OBO surge protective devices can be installed in the energy supply network and their respective function.

Zone transition	Protection device and device type	Product example	Product figure
LPZ 0 B to LPZ 1	Protection device for lightning protection equipotential bonding in accordance with VDE 0185-305 (IEC 62305) for direct or close lightning strikes. Devices: Type 1+2 (Class I+II), e.g. CCF Compact Max. protection level according to standard: 1.5 kV OBO protection level: < 1.5 kV Installation, e.g. in the main distributor/at building entry	MCF Compact Item no.: 5096987	
LPZ 1 to LPZ 2	Protection device for lightning protection equipotential bonding in accordance with VDE 0185-305 (IEC 62305) for direct or close lightning strikes. Devices: Type 2 (Class II), e.g. V20 Max. protection level according to standard: 1.5 kV OBO protection level: < 1.3 kV Installation, e.g. in the main distributor/at building entry	V20 Item no.: 5095253	
LPZ 2 to LPZ 3	Protection device, designed for surge protection of portable consumers at sockets and power supplies. Devices: Type 3 (Class III), e.g. ÜSM-A Max. protection level according to standard: 1.5 kV OBO protection level: < 1.3 kV Installation, e.g. on the end consumer	ÜSM-A Item no.: 5092451	



## BET – testing centre for lightning protection, electrical engineering and support systems



Lightning current generator

### BET with countless tasks

Whereas previously only lightning current, environmental and electrical testing had been possible at BET, the BET Test Centre is now also a competent partner for the testing of cable support systems. This combination has made it necessary to revise the meaning of the name. If BET previously stood for "Blitzschutz- und EMV-Technologiezentrum" (Lightning protection and EMC technology centre), since 2009 these letters have meant BET Test Centre for lightning protection, electrical engineering and support systems.

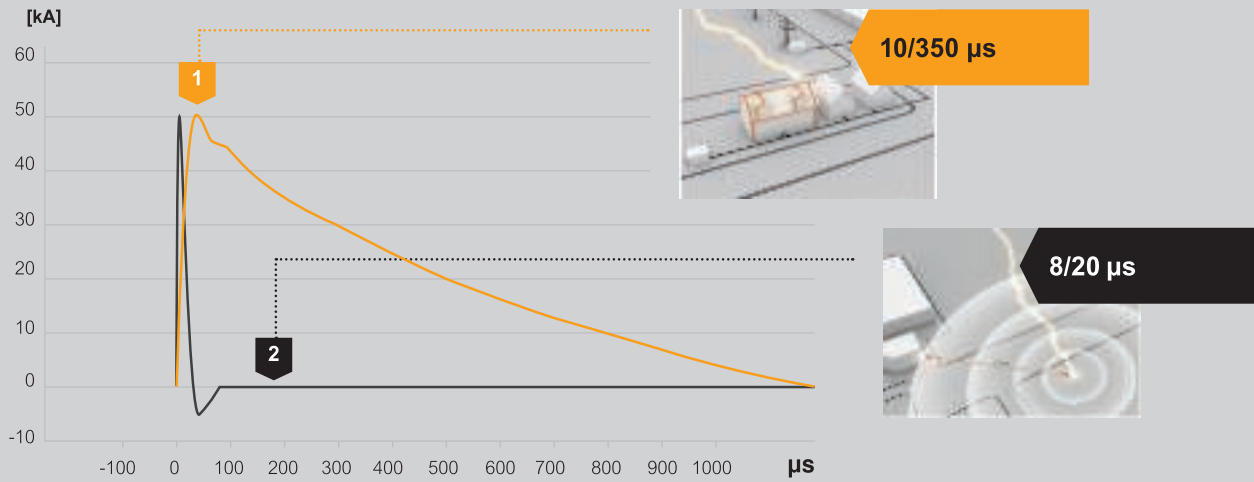
### Test generator for lightning current tests

The test generator planned in 1994 and completed in 1996 makes it possible to carry out lightning current tests at up to 200 kA. The generator was planned and constructed in cooperation with Soest Technical College. Due to the intensive planning and scientific support in the construction of the test system, it has worked for 20 years without errors and meets current standardised test requirements.

### Testing tasks

The main load of the testing generator is generated through the testing of products from the TBS product division. For this, developmental tests of new developments, modifications to existing OBO products and also comparison tests with competitive products are carried out. These include lightning protection components, surge protective devices and lightning arresters. Tests for lightning protection components are carried out according to DIN EN 62561-1, for spark gaps according to DIN EN 62561-3 and for lightning and surge protective devices according to DIN EN 61643-11. This is only a small amount of the testing standards used for tests in the BET Test Centre.





<b>1</b>	Pulse shape 1: Direct lightning strike, 10/350 $\mu$ s simulated lightning pulse
<b>2</b>	Pulse shape 2: Remote lightning strike or switching operation, 8/20 $\mu$ s simulated current pulse (surge voltage)

*Types of pulse and their characteristics*

**Testing types for lightning and surge protection**

Both lightning current tests and surge voltage tests can be carried out at up to 20 kV. A hybrid generator is used for these tests, which was also developed as part of a cooperation with the Soest Technical College. EMC testing of cable support systems can also be carried out using this test generator. All kinds of cable routing and cable support systems of up to 8 m length can be tested without any difficulties. Tests for electrical conductivity according to IEC 61537 are also carried out.

**Simulation of real environmental conditions**

To carry out standardised tests on components intended for external use, they must be pretreated under real environmental conditions. This takes place in a salt spray trough and a sulphur dioxide testing chamber. Depending on the test, the test length and the concentration of the salt spray or sulphur dioxide in the testing chambers may vary. This means that it is possible to conduct tests according to IEC 60068-2-52, ISO 7253, ISO 9227 and EN ISO 6988.

**Testing cable support systems**

The well-known KTS testing system, newly installed in the BET Test Centre, allows the investigation of the load capacities of any cable support system manufactured by OBO. The basis for this is IEC 61537 and VDE 0639.

In the BET Test Centre, OBO Bettermann has a testing department in which products can be tested according to standards, even during the development phase.



# Planning aids, surge protection energy technology

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## Selection aid, energy technology

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# Selection aid, energy technology

## AC combination arrester and surge protection; type 1, type 1+2, type 2 and type 3

Planning aids, surge protection energy technology









		Installation location 1 Installation in the main distributor box / combined distributor Basic protection / type 1, type 2				
Initial situation	Building type	Description	Type	Item no.	Test mark	Product figure
<ul style="list-style-type: none"> <li>No external lightning protection system</li> <li>Earthing cable connection</li> </ul> 	Private building, multiple dwelling	TN-/TT Type 2 4 SU Secondary meter zone	V20 3+NPE	<b>5093 38 0</b> Page: 185	VDE ÖVE UL	
			V10-C 3+NPE	<b>5093 39 1</b> Page: 187	VDE ÖVE UL	
	Industry, commerce	TN-/TT Type 2 4 SU Secondary meter zone	V20 3+NPE	<b>5095 25 3</b> Page: 167	VDE ÖVE UL	
			V20 3+NPE+FS with remote signalling	<b>5095 33 3</b> Page: 168	VDE ÖVE UL	
<ul style="list-style-type: none"> <li>External lightning protection system (according to IEC 62305)</li> </ul> 	Buildings of lightning protection classes III and IV (e.g. housing, offices and commercial buildings)	TN-/TT Type 1 + 2 4 SU Secondary meter zone	V50 3+NPE	<b>5093 52 6</b> Page: 132	VDE ÖVE UL	
			V50 3+NPE+FS with remote signalling	<b>5093 53 3</b> Page: 133	VDE ÖVE UL	
<ul style="list-style-type: none"> <li>Outdoor connection</li> </ul> 	Buildings of lightning protection classes I to IV (e.g. industry)	TN-C Type 1+2 6 SU Pre-metered or secondary meter zone	MCF75-3+FS	<b>5096981</b> Page: 101		
		TN-S Type 1+2 6 SU Pre-metered or secondary meter zone	MCD 50-B 3+1	<b>5096 87 9</b> Page: 108		














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**Installation location 2**  
**Installation in the subdistributor**  
**Medium protection / Type 2**  
**Only required if distance  $\geq 10m$**

Description	Type	Item no.	Test mark	Product figure
TN/TT Type 2 + 3 2.5 SU	V10 Compact	<b>5093380</b> Page: 185		
	V10 Compact FS, with remote signalling	<b>5093382</b> Page: 188		
TN/TT Type 2 4 SU	V20 3+NPE	<b>5095253</b> Page: 167	VDE ÖVE UL	
	V20 3+NPE+FS with remote signalling	<b>5095333</b> Page: 168	VDE ÖVE UL	
TN/TT Type 2 4 SU	V20 3+NPE	<b>5095253</b> Page: 167	VDE ÖVE UL	
	V20 3+NPE+FS with remote signalling	<b>5095333</b> Page: 168	VDE ÖVE UL	
TN/TT Type 2 4 SU	V20 3+NPE	<b>5095253</b> Page: 167	VDE ÖVE UL	
	V20 3+NPE+FS with remote signalling	<b>5095333</b> Page: 168	VDE ÖVE UL	

**Installation location 2**  
**Installation before the terminal**  
**Fine protection / type 3**

Description	Type	Item no.	Product figure
Plug-in	FC-D	<b>5092 80 0</b>	
	FC-TV-D	<b>5092 80 8</b>	
	FS-SAT-D	<b>5092 81 6</b>	
	FC-TAE-D	<b>5092 82 4</b>	
	FC-ISDN-D	<b>5092 81 2</b>	
	FC-RJ-D	<b>5092 82 8</b>	
	CNS-3-D-D	<b>5092 70 1</b>	
Fixed installation	ÜSM-A	<b>5092 45 1</b> Page: 206	
	ÜSM-A ST-230 1P+PE	<b>5092 44 1</b>	
	ÜSS 45-o-RW	<b>6117 47 3</b> Page: 209	
Series installation in distributor	V10 Compact L1/L2/L3/N	<b>5093 38 0</b> Page: 185	
	VF230-AC/DC	<b>5097 65 0</b> Page: 302	
	VF230-AC-FS with remote signalling	<b>5097 85 8</b> Page: 306	





## Planning aids, contents lightning and surge protection, photovoltaics

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# Coordinated protection: The ProtectPlus system kit

A well-thought-out system for the whole electrical infrastructure of a photovoltaic system – that's ProtectPlus. Different components provide comprehensive protection, which allows both the erection engineer and the system operator to sleep in peace.



## External lightning protection systems

Lightning currents are intercepted and run safely to the earth with the following systems:

- Air-termination rods and masts
- Insulated lightning protection
- Insulated isCon® conductor
- Flat and round conductors
- Cable brackets
- Connection clamps and connection terminals

## Earthing systems

Our products for perfect earthing:

- Flat and round conductors
- Connectors
- Connection terminals
- Earth entries
- Deep, ring and foundation earthers
- Corrosion protection



## Equipotential bonding systems

Equipotential bonding systems are the link between external lightning protection, surge protection and earthing. They are available in the following variants:

- For indoor use
- For outdoor use
- For industrial use

## Overvoltage protection systems

A product range for any application:

- Lightning arrestor/combination arrestor
- Surge protection for energy and data technology
- Complete system solutions, terminated and premounted in the housing
- Combination and surge arrestor for photovoltaics, DC side

## Cable support systems

Quick-mounting, safe cable routing with:

- Cable trays
- Mesh cable trays
- Cable ladders
- Vertical ladders
- Suspended supports
- Wall and support brackets



## Cable routing systems

Tidy cable routing within the building can be achieved using

- Wall and ceiling ducts
- Cable and pipe fastening systems made of plastic and metal
- Screw-in and knock-in systems
- Rail systems

## Fire protection systems

Our fire protection system consists of the following components:

- Insulation
- Weatherproof fire protection bandages
- Systems for emergency and escape routes

# Four steps to comprehensive protection

## Step 1:

### Check the separation distance

If the required separation distance cannot be complied with, then the metallic parts must be interconnected to be able to carry lightning current.

## Step 2:

### Check the protection measures

Measures for lightning protection equipotential bonding are used on the DC and the AC side, e.g. lightning current arrester (type 1).

## Step 3:

### Include data cables

Data cables must be included in the protection concept.









## Step 4:

### Carrying out the equipotential bonding

Local equipotential bonding must be provided on the inverter.



Planning aids, lightning and surge protection, photovoltaics

Overview of protection measures					
Initial situation	Measure	Separation distance according to DIN EN 62305 maintained	equipotential bonding	Surge protection	Sample product picture
<ul style="list-style-type: none"> <li>External lightning protection system (according to DIN EN 62305)</li> </ul> 	Adapt the lightning protection system according to IEC 62305	Yes	min. 6 mm <sup>2</sup>	DC: Type 2	
				AC: Type 1	
		No	min. 16 mm <sup>2</sup>	DC: Type 1	
				AC: Type 1	
<ul style="list-style-type: none"> <li>No external lightning protection system</li> <li>Earthing cable connection</li> </ul> 	Requirements' testing: LBO, Vds 2010, risk analysis, ...	-	min. 6 mm <sup>2</sup>	DC: Type 2	
				AC: Type 2	

# Selection aid

## Photovoltaic system solutions










Planning aids, lightning and surge protection, photovoltaics







Energy technology, type 2, protection of the DC side								
Initial situation	Max. DC voltage	Max. number of MPP per inverter	Max. number of strings per MPP terminal	Connection (DC side)	Version	Type	Item no.	Product figure
<ul style="list-style-type: none"> <li>No external lightning protection system</li> <li>Earthing cable connection</li> </ul> <p>The following are required:</p> <ul style="list-style-type: none"> <li>Surge voltage protection, type 2</li> <li>Lightning protection equipotential bonding 6.5 mm<sup>2</sup></li> </ul>	1000 V	1	1In/1Out	MC 4 connector		VG-C DCPH-Y1000	<b>5088 67 2</b>	
		1	2	Terminals	Circuit breaker	VG-C DC-TS1000	<b>5088 66 0</b>	
		1	4	Terminals	4 fuse holders, unequipped	VG-C PV1000KS4	<b>5088 65 4</b>	
		1	1 0	Terminals		VG-C DCPH-MS1000	<b>5088 69 1</b> Page: 230	
		2	4	Terminals		VG-CPV1000K 22	<b>5088 56 8</b>	
		2	6	Terminals		VG-CPV 1000K 330	<b>5088 58 2</b>	
		3	6	Terminals		VG-CPV 1000K 333	<b>5088 58 5</b> Page: 227	

You can find the selection aid for AC combination arrestors and surge protection in the chapter Surge Protection in Energy Technology.



Energy technology, type 1+2, protection of the DC side								
Initial situation	Max. DC voltage	Max. number of MPP per inverter	Max. number of strings per MPP terminal	Connection (DC side)	Version	Type	Item no.	Product figure
<ul style="list-style-type: none"> <li>External lightning protection system according to DIN EN 0185-305</li> </ul> <p>The following are required:</p> <ul style="list-style-type: none"> <li>Lightning and surge protection Type 1+2</li> <li>Lightning protection equipotential bonding 16 mm<sup>2</sup></li> <li>Separating distance could not be maintained</li> </ul> 	600 V	1	1 0	Terminal		VG-BC DCPH-MS600	<b>5088 69 3</b> Page: 232	
	900 V	1	1In/1Out	MC 4 connector		VG-BC DCPH-Y900	<b>5088 67 8</b>	
	1	2	Terminals	Circuit breaker		VG-BC DC-TS900	<b>5088 63 5</b>	
	1	1 0	Terminals			VG-BC DCPH-MS900	<b>5088 69 2</b> Page: 231	
	2	4	Terminals			VG-BCPV900K 22	<b>5088 56 6</b> Page: 226	
	2	6	Terminals			VG-BCPV 900K 330	<b>5088 57 6</b>	
	3	2In/1Out	MC 4 connector			VG-BC DCPH900-31	<b>5088 62 9</b> Page: 229	
	3	6	Terminals			VG-BCPV 900K 333	<b>5088 57 9</b>	

Data technology						
Initial situation		RJ 45	Terminal	Type	Item no.	Product figure
	<ul style="list-style-type: none"> <li>No external lightning protection system</li> <li>Earthing cable connection</li> </ul>	•		ND-CAT6A/EA	<b>5081800</b> Page: 265	
	<ul style="list-style-type: none"> <li>External lightning protection system (according to DIN EN 62305)</li> </ul>		•	FRD 24 HF	<b>5098575</b> Page: 309	



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Net-Defender



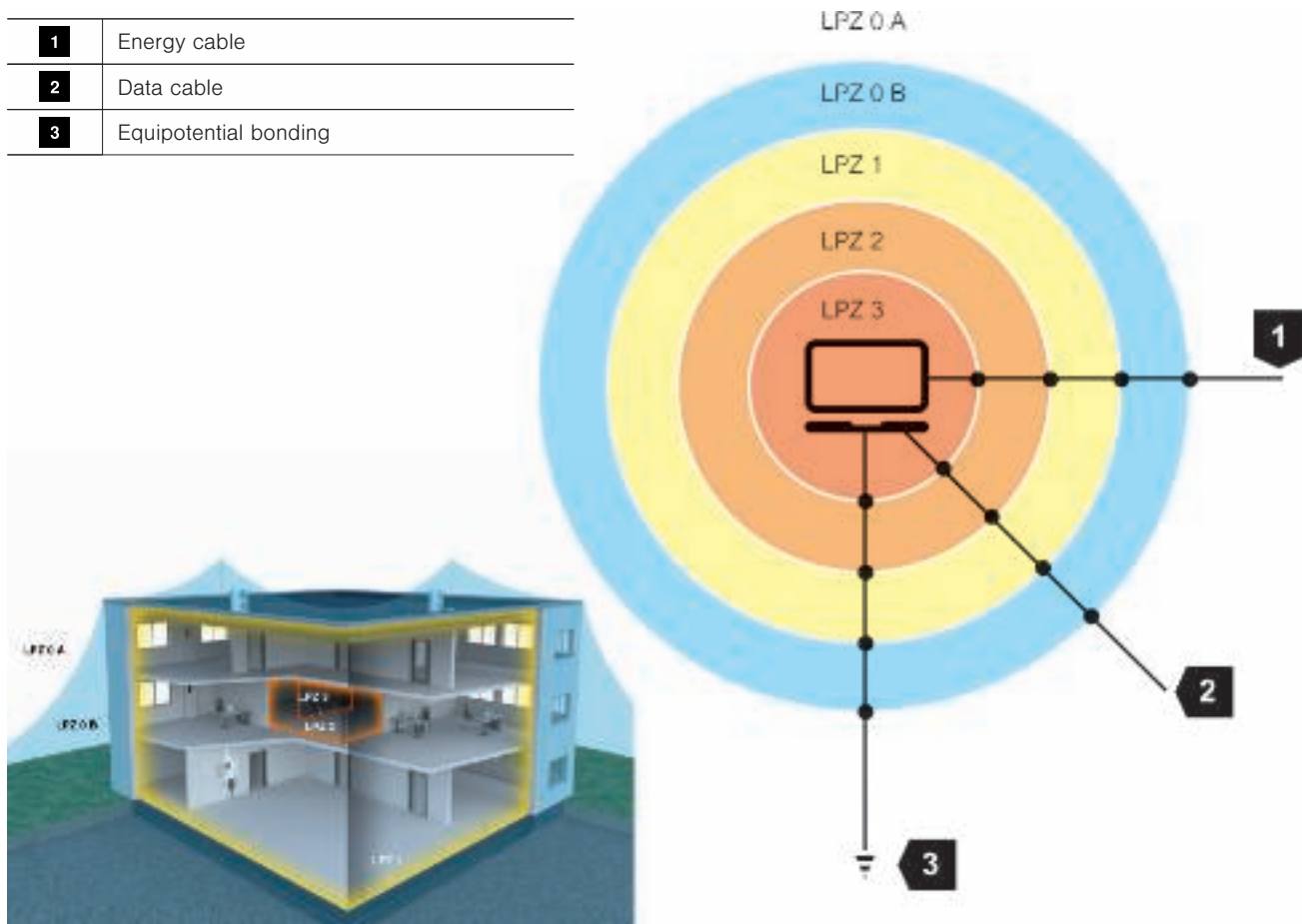
## Planning aids, surge protection device for data and information technology

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# Surge protection systems for data and information technology

<b>1</b>	Energy cable
<b>2</b>	Data cable
<b>3</b>	Equipotential bonding

Planning aids, surge protection device for data and information technology



Protection principle based on lightning protection zone concept

Data and information technology systems are used in many different applications. Almost every electronic system used to process information is considered extremely important. Ever increasing volumes of data are being stored and must be accessible at all times at very short notice. It has become even more important to protect these systems too against dangerous surges. In order to prevent failure or even destruction of these systems, they must be integrated into the lightning and surge protection concept.

## Planning methods – Basic

### principles

These days, communication and IT systems are the lifelines of almost every company. In the worst-case scenario, surge voltages, caused by galvanic, capacitive or inductive couplings in data cables, can destroy IT equipment and communication technology. To avoid such failures, suitable protection measures have to be taken.

In practice, the wide range of standard information, telecommunication and measurement systems often makes the selection of the right surge protection device complex.

The following factors must be taken into account:

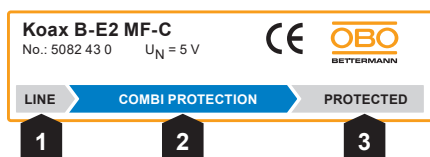
- The connection system of the protection device must fit the device to be protected.
- Parameters such as the highest signal level, highest frequency, maximum protection level and the installation environment must be taken into account.
- The protection device may only exert the minimum of impacts, such as attenuation and reflection, on the transmission path.

# Data cable protection devices and labelling



1	Unprotected side
2	Protection class, basic protection
3	Protected side/device

LPZ 0B - 2, final code B = Basic protection, red colour coding



1	Unprotected side
2	Protection class, combination protection
3	Protected side/device

LPZ 0B - 3, final code C = Combi Protection, blue colour coding



1	Unprotected side
2	Protection class, fine protection
3	Protected side/device

LPZ 1 - 3, final code: F = fine protection, green colour coding

## Basic protection

Basic protection devices are lightning arrestors of class 1 that can directly arrest lightning currents and surge voltages. The single-stage protection circuit contains gas arresters. These devices are installed where the lines enter the buildings. They serve to arrest lightning current with waveform 10/350  $\mu$ s coupled from outside the building via the data cables.

## Combined protection

The combined protection devices limit the transients with gas-discharge protectors or transzorb diodes, which are decoupled through resistors. These correspond to classes 1, 2 and 3 or categories D1 and C2 as defined in the standard DIN EN 61643-21. The devices can be installed as basic protection where the lines enter the building, or as fine protection directly before the terminal device. In the latter case it should be noted that the distance to the device needing protection should not exceed 10 metres. If it does, then a further fine protection device should be installed before the device.

## Fine protection

The fine protection devices use transzorb diodes to limit surge impulses. The devices are earthed with powerful gas discharge protectors. The decoupling required for basic and fine protection is achieved when the line section between basic and fine protection device is at least five metres. Fine protection devices should always be installed on the device to be protected itself.

# Selection aid, HF, video and satellite TV

Planning aids, surge protection device for data and information technology

Technology	Connection	Protected wires	Frequency range	Type	Gender	Item no.	Protection type
CATV	F	1	0-3.4 GHz	DS-F	plug/connector	5093275	Combination protection
	F	1	0-3.4 GHz	DS-F	connector/connector	5093272	Combination protection
DCF 77	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
DCS 1800	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
DOCSIS	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
	F	1	0-3.4 GHz	DS-F	plug/connector	5093275	Combination protection
DVB-T / terrestrial	F	1	0-3.4 GHz	DS-F	connector/connector	5093272	Combination protection
	F	1	0.5-2.8 GHz	TV4+1	connector	5083400	Fine protection
DVB-T-2	N	1	0-6 GHz	DS-N-6	plug/connector	5093998	Combination protection
Radio installations	UHF	1	0-1.3 GHz	S-UHF	plug/connector	5093023	Combination protection
	UHF	1	0-1.3 GHz	S-UHF	connector/connector	5093015	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
	F	1	0-3.4 GHz	DS-F	plug/connector	5093275	Combination protection
	F	1	0-3.4 GHz	DS-F	connector/connector	5093272	Combination protection
	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection
GPS	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection

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## Selection aid, HF, video and satellite TV

Technology	Connection	Protected wires	Frequency range	Type	Gender	Item no.	Protection type
GSM 900 / 1800	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	509327 7	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection
LTE	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection
PCS 1900	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
PCS 1901	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection
	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
PCS 1902	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
PCS 1903	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection
	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
PCS 1904	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
PCS 1905	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
PCS 1906	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection
	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
Satellite TV	F	1	0-3.4 GHz	DS-F	plug/connector	5093275	Combination protection
	F	1	0-3.4 GHz	DS-F	connector/connector	5093272	Combination protection
	F	1	0.5-2.8 GHz	TV4+1	connector	5083400	Fine protection
	F	3	0-2.5 GHz	FC-SAT-D	plug/connector	5092816	Fine protection
C strip	N	1	0-6 GHz	DS-N6	plug/connector	5093998	Combination protection
	N	1	0-6 GHz	DS-N6	connector/connector	5093998	Combination protection
Sky DSL	F	1	0-3.4 GHz	DS-F	plug/connector	5093275	Combination protection
	F	1	0-3.4 GHz	DS-F	connector/connector	5093272	Combination protection
TETRA/BOS	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection



Technology	Connection	Protected wires	Frequency range	Type	Gender	Item no.	Protection type
TV	F	1	0-3.4 GHz	DS-F	plug/connector	5093275	Combination protection
	F	1	0-3.4 GHz	DS-F	connector/connector	5093272	Combination protection
	F	3	0-2.5 GHz	FC-TV-D	plug/connector	5092808	Fine protection
UMTS	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/connector	5093252	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	connector/connector	5093236	Combination protection
	BNC	1	0-2.2 GHz	DS-BNC	plug/plug	5093260	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection
Video/CCTV	Jul 16	1	0-3 GHz	DS-7 16	plug/connector	5093171	Combination protection
	BNC	1	0-65 MHz	Coax B-E2 MF-F	plug/connector	5082432	Fine protection
	BNC	1	0-65 MHz	Coax B-E2 MF-C	plug/connector	5082430	Combination protection
Wi-Fi (2.4 GHz)	BNC	1	0-160 MHz	Coax B-E2 FF-F	plug/plug	5082434	Fine protection
	SMA	1	0-3.7 GHz	DS-SMA	connector/connector	5093277	Combination protection
	N	1	0-3 GHz	DS-N	plug/connector	5093996	Combination protection
	N	1	0-3 GHz	DS-N	connector/connector	5093988	Combination protection
Wi-Fi (> 5 GHz) Standard: a/h, n, ac	TNC	1	0-4 GHz	DS-TNC	plug/connector	5093270	Combination protection
	N	1	0-6 GHz	DS-N-6	plug/connector	5093998	Combination protection
WiMAX	N	1	0-6 GHz	DS-N-6	plug/connector	5093998	Combination protection

# Selection aid, data technology

Technology	Connection	Protected wires	Type	Item no.	Protection type	
Arcnet	BNC	1	KoaxB-E2 FF-F	5082 43 4	Fine protection	
	BNC	1	KoaxB-E2 MF-F	5082 43 2	Fine protection	
	BNC	1	KoaxB-E2 MF-C	5082 43 0	Combination protection	
ATM	RJ45	8	ND-CAT6A/EA	5081 80 0	Fine protection	
	RJ45	8	RJ45 S-ATM 8-F	5081 99 0	Fine protection	
Ethernet	Up to class 6A/EA	RJ45 (PoE)	8	ND-CAT6A/EA	5081 80 0	Fine protection
	Up to class 6 / E	RJ45 (PoE)	8	ND-CAT6/E-F	5081 80 2	Fine protection
		RJ45 (PoE)	8	ND-CAT6/E-B	5081 80 4	Combination protection
	Up to class 5 / D	RJ45	8	RJ45 S-ATM 8-F	5081 99 0	Fine protection
	10 Base 2 / 10 Base 5	BNC	1	KoaxB-E2 FF-F	5082 43 4	Fine protection
		BNC	1	KoaxB-E2 MF-F	5082 43 2	Fine protection
		BNC	1	KoaxB-E2 MF-C	5082 43 0	Combination protection
FDDI, CDDI	RJ45	8	ND-CAT6A/EA	5081 80 0	Fine protection	
	RJ45	8	RJ45 S-ATM 8-F	5081 99 0	Fine protection	
Industrial Ethernet	RJ45	8	ND-CAT6A/EA	5081 80 0	Fine protection	
	RJ45	8	RJ45 S-ATM 8-F	5081 99 0	Fine protection	
	Wire-to-terminal connection	20	LSA-B-MAG	5084 02 0	Combination protection	
	Wire-to-terminal connection	2	LSA-BF-180	5084 02 4	Combination protection	
	Wire-to-terminal connection	2	LSA-BF-24	5084 02 8	Combination protection	
Power over Ethernet	RJ45 (PoE)	8	ND-CAT6A/EA	5081 80 0	Fine protection	
	RJ45 (PoE)	8	ND-CAT6/E-F	5081 80 2	Fine protection	
	RJ45 (PoE)	8	ND-CAT6/E-B	5081 80 4	Combination protection	
Token Ring	RJ45	8	ND-CAT6A/EA	5081 80 0	Fine protection	
	RJ45	8	RJ45 S-ATM 8-F	5081 99 0	Fine protection	
	BNC	1	KoaxB-E2 FF-F	5082 43 4	Fine protection	
	BNC	1	KoaxB-E2 MF-F	5082 43 2	Fine protection	
	BNC	1	KoaxB-E2 MF-C	5082 43 0	Combination protection	
RS232, V24	Wire-to-terminal connection	2	MDP-2 D-24-T	5098 42 2	Combination protection	
	Wire-to-terminal connection	4	MDP-4 D-24-EX	5098 43 2	Combination protection	
	Wire-to-terminal connection	2	FDB-2 24-M	5098 38 0	Combination protection	
	Wire-to-terminal connection	2	FDB-2 24-N	5098 39 0	Combination protection	
	Wire-to-terminal connection	2	FRD 24 HF	5098 57 5	Fine protection	
	Wire-to-terminal connection	4	MDP-4 D-24-T	5098 43 1	Combination protection	
	Wire-to-terminal connection	4	MDP-4 D-24-EX	5098 43 2	Combination protection	
	Wire-to-terminal connection	4	ASP-V24T 4	5083 06 0	Fine protection	
	Connector	9	SD09-V24 9	5080 05 3	Fine protection	
	Connector	15	SD15-V24 15	5080 15 0	Fine protection	
VG Any LAN	RJ45	8	ND-CAT6A/EA	5081 80 0	Fine protection	
Voice over IP	RJ45	8	ND-CAT6A/EA	5081 80 0	Fine protection	
4-wire information technology systems	RJ45	4	RJ45 S-E100 4-B	5081 00 1	Combination protection	
	RJ45	4	RJ45 S-E100 4-C	5081 00 3	Combination protection	
	RJ45	4	RJ45 S-E100 4-F	5081 00 5	Fine protection	

Planning aids, surge protection device for data and information technology



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# Selection aid, telecommunications

Planning aids, surge protection device for data and information technology

Technology	Connection	Protected wires	Mounting/note	Type	Item no.	Protection type
a/b - analogue	RJ11	4	Various	RJ11-TELE 4-C	5081975	Combination protection
	RJ11	4	Various	RJ11-TELE 4-F	5081977	Fine protection
	RJ45	4	Various	RJ45-TELE 4-C	5081982	Combination protection
	RJ45	4	Various	RJ45-TELE 4-F	5081984	Fine protection
	Wire-to-terminal connection	2	DIN rail	TD-2/D-HS	5081694	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I	5081690	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I-TAE-F	5081692	Combination protection
	Wire-to-terminal connection	2	Wall mounting	TD-2D-V	5081698	Combination protection
	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection
		TAE/RJ11 / Connector	2	Socket	FC-TAE-D	5092824
ADSL	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	DIN rail	TD-2/D-HS	5081694	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I	5081690	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I-TAE-F	5081692	Combination protection
	Wire-to-terminal connection	2	Wall mounting	TD-2D-V	5081698	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection
ADSL2+	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	Wall mounting	TD-2D-V	5081698	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection
SDSL/SHDSL	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	Wall mounting	TD-2D-V	5081698	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection
VDSL	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	Wall mounting	TD-2D-V	5081698	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection

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# Selection aid, telecommunications

Technology	Connection	Protected wires	Mounting/note	Type	Item no.	Protection type
VDSL2	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	Wall mounting	TD-2D-V	5081698	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection
ISDN basic connection ( $U_{k0}$ )	Wire-to-terminal connection	2	DIN rail	TD-2/D-HS	5081694	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I	5081690	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I-TAE-F	5081692	Combination protection
	Wire-to-terminal connection	20	LSA / can only be used WITH LSA-A-LEI or LSA-T-LEI	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA / can only be used WITH LSA-A-LEI or LSA-T-LEI	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection
	RJ11	4	Various	RJ11-TELE 4-C	5081975	Combination protection
	RJ11	4	Various	RJ11-TELE 4-F	5081977	Fine protection
	RJ45	4	Various	RJ45-TELE 4-C	5081982	Combination protection
	RJ45	4	Various	RJ45-TELE 4-F	5081984	Fine protection
ISDN basic connection ( $S_0$ )	RJ45	8	Various	ND-CAT6A/EA	5081800	Fine protection
	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	LSA	LSA-BF-24	5084028	Combination protection
	RJ11/connector	4	Socket	FC-ISDN-D	5092812	Fine protection
ISDN Primary Rate Interface ( $S_{2m}/U_{2m}$ )	RJ11	4	Various	RJ11-TELE 4-C	5081975	Combination protection
	RJ11	4	Various	RJ11-TELE 4-F	5081977	Fine protection
	RJ45	4	Various	RJ45-TELE 4-C	5081982	Combination protection
	RJ45	4	Various	RJ45-TELE 4-F	5081984	Fine protection
	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
Datex-P	Spring terminal	4	DIN rail	MDP-4 D-24-T-10	5098433	Combination protection
G.703/G.704	RJ45	8	Various	RJ45 S-ATM 8-F	5081990	Fine protection
	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	LSA	LSA-BF-24	5084028	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection
	Wire-to-terminal connection	2	DIN rail	TD-2/D-HS	5081694	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I	5081690	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I-TAE-F	5081692	Combination protection

Planning aids, surge protection device for data and information technology



Technology	Connection	Protected wires	Mounting/note	Type	Item no.	Protection type
E1	RJ45	8	Various	RJ45 S-ATM 8-F	5081990	Fine protection
	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	LSA	LSA-BF-24	5084028	Combination protection
Various telecom systems	Wire-to-terminal connection	20	LSA	LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA	LSA-BF-180	5084024	Combination protection
	Wire-to-terminal connection	2	LSA	LSA-BF-24	5084028	Combination protection
	Wire-to-terminal connection	2	DIN rail	TKS-B	5097976	Basic protection
	Wire-to-terminal connection	2	DIN rail	TD-2/D-HS	5081694	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I	5081690	Combination protection
	Wire-to-terminal connection	4	Wall mounting	TD-4/I-TAE-F	5081692	Combination protection
	RJ11	4	Various	RJ11-TELE 4-C	5081975	Combination protection
	RJ11	4	Various	RJ11-TELE 4-F	5081977	Fine protection
	RJ45	4	Various	RJ45-TELE 4-C	5081982	Combination protection
	RJ45	4	Various	RJ45-TELE 4-F	5081984	Fine protection
	RJ45	8	Various	RJ45 S-ATM 8-F	5081990	Fine protection
	RJ45	8	Various	ND-CAT6A/EA	5081800	Fine protection
	RJ11/connector	4	Socket	FC-RJ-D	5092828	Fine protection

## Selection aid, measurement and control systems

Interface	Connection	Protected wires	Mounting	#EX icon	FS**	Type	Item no.	Protection rating
RS232, V24	Spring terminal	2	DIN rail			MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	4	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
	Spring terminal	4	DIN rail			MDP-4 D-24-T	5098431	Combination protection
	Spring terminal	4	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
	Wire-to-terminal connection	2	Thread - metric	✓		FDB-2 24-M	5098380	Fine protection
	Wire-to-terminal connection	2	Thread - NPT	✓		FDB-2 24-N	5098390	Fine protection
	Screw terminal	2	DIN rail			FRD 24	5098514	Fine protection
	Screwless terminal	4	Miscellaneous			ASP-V24T 4	5083060	Fine protection
	SUB-D-9	9	Connector			SD09-V24 9	5080053	Fine protection
	SUB-D-15	15	Connector			SD15-V24 15	5080150	Fine protection
RS422, V11	Wire-to-terminal connection	2	Thread - metric	✓		FDB-2 24-M	5098380	Fine protection
	Wire-to-terminal connection	2	Thread - NPT	✓		FDB-2 24-N	5098390	Fine protection
	Screw terminal	2	DIN rail			FRD 24	5098514	Combination protection
	Spring terminal	2	DIN rail			MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	2	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
	Spring terminal	4	DIN rail			MDP-4 D-24-T	5098431	Combination protection
	Spring terminal	4	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
RS485	Spring terminal	2	DIN rail			MDP-2 D-5-T	5098404	Combination protection
	Spring terminal	2	DIN rail	✓		MDP-4 D-5-EX	5098432	Combination protection
	Spring terminal	4	DIN rail			MDP-4 D-5-T	5098411	Combination protection
	Spring terminal	4	DIN rail	✓		MDP-4 D-5-EX	5098432	Combination protection
	Screw terminal	2	DIN rail			FRD 5 HF	5098571	Combination protection
SUB-D-9	9	Connector			SD-09-V11 9	5080061	Fine protection	
Binary signals, ground potential-free	Spring terminal	2	DIN rail			MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	2	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
	Wire-to-terminal connection	2	Thread - metric			FDB-2 24-M	5098380	Combination protection
	Wire-to-terminal connection	2	Thread - NPT			FDB-2 24-N	5098390	Combination protection
	Screw terminal	2	DIN rail			FRD 5 HF	5098571	Combination protection
	Screw terminal	2	DIN rail			FRD 5	5098492	Combination protection
Binary signals, common reference potential	Screw terminal	2	DIN rail			FRD 2-24	5098727	Combination protection
	Screw terminal	2	DIN rail			FLD 2-24	5098816	Combination protection

\*\* Remote signalling



# Selection aid, measurement and control systems

Planning aids, surge protection device for data and information technology

Interface	Connection	Protected wires	Mounting	#EX icon	FS**	Type	Item no.	Protection type
(0)4-20 mA	Spring terminal	2	DIN rail			MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	2	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
	Spring terminal	4	DIN rail			MDP-4 D-24-T	5098431	Combination protection
	Spring terminal	4	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
	Wire-to-terminal connection	2	Thread - metric	✓		FDB-2 24-M	5098380	Fine protection
	Wire-to-terminal connection	2	Thread - NPT	✓		FDB-2 24-N	5098390	Fine protection
	Wire-to-terminal connection	2	LSA			LSA-B-MAG	5084020	Basic protection
	Wire-to-terminal connection	2	LSA			LSA-BF-24	5084028	Combination protection
	Spring terminal	2	DIN rail			FLD 24	5098611	Fine protection
0-10 V	Spring terminal	2	DIN rail			MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	2	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
	Wire-to-terminal connection	2	Thread - metric	✓		FDB-2 24-M	5098380	Fine protection
	Wire-to-terminal connection	2	Thread - NPT	✓		FDB-2 24-N	5098390	Fine protection
	Screw terminal	2	DIN rail			FLD 24	5098611	Combination protection
Various DC circuits	Ground potential-free	Spring terminal	2	DIN rail		FLD 5	5098600	Combination protection
		Spring terminal	2	DIN rail		FLD 12	5098603	Combination protection
		Spring terminal	2	DIN rail		FLD 24	5098611	Combination protection
		Spring terminal	2	DIN rail		FLD 48	5098630	Combination protection
		Spring terminal	2	DIN rail		FLD 60	5098638	Combination protection
		Spring terminal	2	DIN rail		FLD 110	5098646	Combination protection
	Common reference potential	Spring terminal	2	DIN rail		FLD 2-5	5098867	Combination protection
	Common reference potential	Spring terminal	2	DIN rail		FLD 2-12	5098808	Combination protection
		Spring terminal	2	DIN rail		FLD 2-24	5098816	Combination protection
		Spring terminal	2	DIN rail		FLD 2-48	5098824	Combination protection
		Spring terminal	2	DIN rail		FLD 2-110	5098859	Combination protection
Various frequency-dependent circuits	Ground potential-free	Spring terminal	2	DIN rail		FRD 5 HF	5098571	Combination protection
		Spring terminal	2	DIN rail		FRD 24 HF	5098575	Combination protection
		Spring terminal	2	DIN rail		FRD 5	5098492	Combination protection
		Spring terminal	2	DIN rail		FRD 12	5098506	Combination protection
		Spring terminal	2	DIN rail		FRD 24	5098514	Combination protection
		Spring terminal	2	DIN rail		FRD 48	5098522	Combination protection
		Spring terminal	2	DIN rail		FRD 110	5098557	Combination protection
** Remote signalling								

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## Selection aid, measurement and control systems

Interface	Connection	Protected wires	Mounting	#EX icon	FS*	Type	Item no.	Protection type
2-pin power supplies 5 V	Spring terminal	4	DIN rail			MDP-4 D-5-T-10	5098413	Combination protection
2-pin power supplies 12 V	Screw terminal	2	DIN rail			VF12-AC-DC	5097453	Fine protection
	Screw terminal	2	DIN rail		✓	VF12-AC/DC-FS	5097454	Fine protection
2-pin power supplies 24 V	Screw terminal	2	DIN rail			VF24-AC/DC	5097607	Fine protection
	Screw terminal	2	DIN rail		✓	VF24-AC/DC-FS	5097820	Fine protection
2-pin power supplies 48 V	Screw terminal	2	DIN rail			VF48-AC/DC	5097615	Fine protection
	Screw terminal	2	DIN rail		✓	VF48-AC/DC-FS	5097822	Fine protection
2-pin power supplies 60 V	Screw terminal	2	DIN rail			VF60-AC/DC	5097623	Fine protection
	Screw terminal	2	DIN rail		✓	VF60-AC/DC-FS	5097824	Fine protection
2-pin power supplies 110 V	Screw terminal	2	DIN rail			VF110-AC/DC	5097631	Fine protection
2-pin power supplies 230 V	Screw terminal	2	DIN rail			VF230-AC/DC	5097650	Fine protection
	Screw terminal	2	DIN rail		✓	VF230-AC-FS	5097858	Fine protection
	Screw terminal	2	DIN rail		✓ **	VF2-230-AC/DC-FS	5097939	Fine protection
PT 100	Spring terminal	2	DIN rail			FLD 24	5098611	Combination protection
	Spring terminal	2	DIN rail			FLD 2-24	5098816	Combination protection
	Spring terminal	4	DIN rail			MDP-4 D-24-T-10	5098433	Combination protection
PT 1000	Spring terminal	2	DIN rail			FLD 24	5098611	Combination protection
	Spring terminal	2	DIN rail			FLD 2-24	5098816	Combination protection
	Spring terminal	4	DIN rail			MDP-4 D-24-T-10	5098433	Combination protection
TTL	Spring terminal	2	DIN rail			FRD 12	5098603	Combination protection
	Spring terminal	2	DIN rail			MDP-2 D-24-T	5098422	Combination protection
	SUB-D-9	9	Connector			SD09-V24 9	5080053	Fine protection
	SUB-D-15	15	Connector			SD15-V24 15	5080150	Fine protection
* Remote signalling, ** Leakage current-free								



# Selection aid, bus systems

Planning aids, surge protection device for data and information technology

Interface	Connection	Protected wires	Mounting	#EX icon	Testable	FS*	Type	Item no.	Protection type
ADVANT	Spring terminal	4	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
ARCNET	RJ45	8	DIN rail				ND-CAT6A/EA	5081800	Fine protection
AS-I	Data cable	Spring terminal	2	DIN rail		✓	MDP-2 D-24-T-10	5098425	Combination protection
	Power supply	Spring terminal	2	DIN rail		✓	VF24-AC/DC	5097607	Fine protection
		Spring terminal	2	DIN rail		✓	✓	VF24-AC/DC-FS	5097820
BITBUS	Spring terminal	4	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
BLN	Spring terminal	2	DIN rail		✓		MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	2	DIN rail				FRD 24 HF	5098575	Fine protection
CANBus	Data cable	Spring terminal	3	DIN rail		✓	MDP-3 D-5-T	5098407	Combination protection
	Power supply	Spring terminal	2	DIN rail		✓	VF24-AC/DC	5097607	Fine protection
		Spring terminal	2	DIN rail		✓	✓	VF24-AC/DC-FS	5097820
CAN open	Data cable	Spring terminal	4	DIN rail		✓	MDP-4 D-24-T	5098431	Combination protection
	Power supply	Spring terminal	2	DIN rail		✓	VF24-AC/DC	5097607	Fine protection
		Spring terminal	2	DIN rail		✓	✓	VF24-AC/DC-FS	5097820
C-BUS	Spring terminal	2	DIN rail				MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	2	DIN rail				FRD 24 HF	5098575	Combination protection
CC-Link	Data cable	Spring terminal	4	DIN rail		✓	MDP-4-D-24-T	5098431	Combination protection
	Power supply	Spring terminal	2	DIN rail		✓	VF24-AC/DC	5097607	Fine protection
		Spring terminal	2	DIN rail		✓	✓	VF24-AC/DC-FS	5097820
Data Highway Plus	Spring terminal	4	DIN rail		✓	MDP-4 D-24-T	5098431	Combination protection	
Device Net	Data cable	Spring terminal	4	DIN rail		✓	MDP-4 D-24-T	5098431	Combination protection
	Power supply	Spring terminal	2	DIN rail		✓	VF24-AC/DC	5097607	Fine protection
		Spring terminal	2	DIN rail		✓	✓	VF24-AC/DC-FS	5097820
Dupline	Spring terminal	2	DIN rail		✓		MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	2	DIN rail				FRD 24 HF	5098575	Combination protection
eBUS	Spring terminal	2	DIN rail		✓		MDP-2 D-48-T	5098442	Combination protection
	Spring terminal	2	DIN rail				FRD 48	5098522	Fine protection
EIB	Spring terminal	2	DIN rail		✓		MDP-2 D-24-T-10	5098425	Combination protection
	Spring terminal	4	DIN rail		✓		MDP-4 D-24-T-10	5098433	Combination protection
	Spring terminal	2	DIN rail				TKS-B	5097976	Basic protection
ET 200	Spring terminal	2	DIN rail				FRD 5	5098492	Fine protection
	Spring terminal	2	DIN rail		✓		MDP-2 D-5-T	5098404	Combination protection
	Spring terminal	4	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
FIPIO/FIPWAY	Spring terminal	4	DIN rail		✓		MDP-4 D-5-T	5098411	Combination protection
Foundation Fieldbus	Spring terminal	2	DIN rail		✓		MDP-2 D-48-T	5098450	Combination protection
	Spring terminal	2	DIN rail	✓	✓		MDP-4 D-48-EX	5098452	Combination protection
	Spring terminal	2	Thread - metric	✓			FDB-2 24-M	5098380	Combination protection
	Spring terminal	2	Thread - NPT	✓			FDB-2 24-N	5098390	Combination protection
FSK	Spring terminal	2	DIN rail				FRD 5	5098492	Fine protection
	Spring terminal	2	DIN rail		+		MDP-2 D-5-T	5098404	Combination protection
Genius	Spring terminal	4	DIN rail		+		MDP-4 D-24-T	5098431	Combination protection
* Remote signalling									

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## Selection aid, bus systems

Interface	Connection	Protected wires	Mounting	#EX icon	Testable	Type	Item no.	Protection type
HARD	Spring terminal	2	DIN rail			FRD 24	5098514	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-24-T	5098422	Combination protection
	Spring terminal	4	DIN rail		✓	MDP-4 D-24-T	5098431	Combination protection
	Spring terminal	4	DIN rail	✓		MDP-4 D-24-EX	5098432	Combination protection
	Wire-to-terminal connection	4	Thread – metric	✓		FDB-2 24-M	5098380	Fine protection
	Wire-to-terminal connection	4	Thread – NPT	✓		FDB-2 24-N	5098390	Fine protection
IEC bus	Spring terminal	4	DIN rail		✓	MDP-4 D-5-T	5098411	Combination protection
Interbus Inline (I/O)s	Spring terminal	4	DIN rail		✓	MDP-4 D-24-T	5098422	Combination protection
Interbus Loop	Spring terminal	2	DIN rail		✓	MDP-4 D-24-T-10	5098433	Combination protection
KNX	Spring terminal	2	DIN rail			TKS-B	5097976	Basic protection
LON	Spring terminal	2	DIN rail			FRD 48	5098522	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-48-T	5098442	Combination protection
LRE	Spring terminal	2	DIN rail			FRD 5	5098492	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-5-T	5098404	Combination protection
LUXMATE	Spring terminal	4	DIN rail			MDP-4 D-5-T	5098411	Combination protection
M-BUS	Spring terminal	2	DIN rail			FRD 24	5098514	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-24-T	5098422	Combination protection
Melsec Net 2	BNC	1	Miscellaneous			DS-BNC m/f	5093252	Basic protection
Melsec Net 3	BNC	1	Miscellaneous			DS-BNC f/f	5093236	Basic protection
Melsec Net 4	BNC	1	Miscellaneous			DS-BNC f/m	5093260	Basic protection
MODBUS	Spring terminal	4	DIN rail		✓	MDP-4 D-24-T	5098431	Combination protection
MPI bus	Spring terminal	2	DIN rail			FRD 5	5098492	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-5-T	5098404	Combination protection
	Spring terminal	4	DIN rail		✓	MDP-4 D-5-T	5098411	Combination protection
N1 LAN	Spring terminal	2	DIN rail			FRD 5	5098492	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-5-T	5098404	Combination protection
	Spring terminal	20	DIN rail			LSA-B-MAG	5084020	Basic protection
	Spring terminal	2	DIN rail			LSA-BF-24	5084028	Combination protection
N2 bus	Spring terminal	2	DIN rail			FRD 2-5	5098794	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-5-T	5098404	Combination protection
novaNet	Spring terminal	2	DIN rail			FRD 12	5098603	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-24-T	5098422	Combination protection



# Selection aid, bus systems

Interface		Connection	Protected wires	Mounting	#EX icon	Testable	FS*	Type	Item no.	Protection type
P-BUS, Process Bus, Panel Bus	Data cable	Spring terminal	2	DIN rail				FRD 24 HF	5098575	Combination protection
		Spring terminal	2	DIN rail		✓		MDP-2 D-24-T	5098422	Combination protection
	Power supply	Spring terminal	2	DIN rail		✓		VF24-AC/DC	5097607	Fine protection
		Spring terminal	2	DIN rail		✓	✓	VF24-AC/DC-FS	5097820	Fine protection
P-NET		Spring terminal	4	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
Procontic CS31		Spring terminal	2	DIN rail				FRD 12	5098603	Combination protection
		Spring terminal	2	DIN rail		✓		MDP-2 D-24-T	5098422	Combination protection
Procontic T200		Spring terminal	4	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
Profibus DP		Spring terminal	2	DIN rail		✓		MDP-2 D-5-T	5098404	Combination protection
		Screw terminal	2	DIN rail				FRD 5 HF	5098571	Combination protection
		SUB-D-9	9	Connector				SD09-V24 9	5080053	Fine protection
Profibus PA		Spring terminal	2	DIN rail		✓		MDP-2 D-48-T	5098442	Combination protection
		Spring terminal	4	DIN rail	✓			MDP-4 D-48-EX	5098452	Combination protection
		Wire-to-terminal connection	2	Metric thread	✓			FDB-2 24-M	5098380	Fine protection
		Wire-to-terminal connection	2	Thread – NPT	✓			FDB-2 24-N	5098390	Fine protection
Profinet		Spring terminal	8	DIN rail				ND-CAT6A/EA	5081800	Fine protection
SafetyBUS p		Spring terminal	4	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
SDLC		Spring terminal	4	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
SIGMALOOP (SIGMASYS)		Spring terminal	2	DIN rail				FRD 24	5098514	Combination protection
		Spring terminal	2	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
SIGMANET (SIGMASYS)		Spring terminal	2	DIN rail				FRD 24	5098514	Combination protection
		Spring terminal	2	DIN rail		✓		MDP-4 D-24-T	5098431	Combination protection
SINEC L1	SINEC L2	Spring terminal	4	DIN rail		✓		MDP-4 D-5-T	5098411	Combination protection
* Remote signalling										

Planning aids, surge protection device for data and information technology

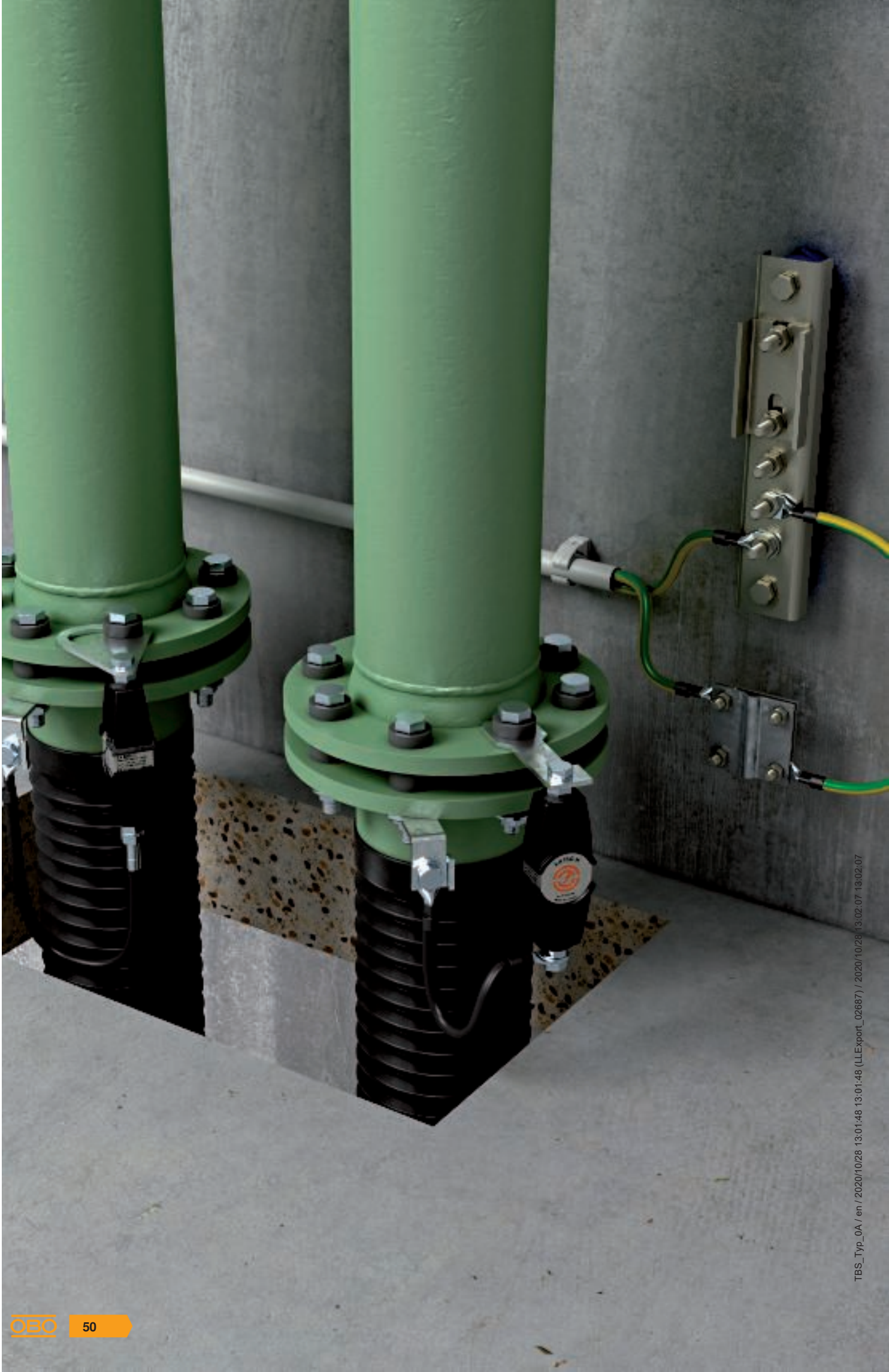




## Selection aid, bus systems

Interface	Connection	Protected wires	Mounting	#EX icon	Testable	Type	Item no.	Protection type
SINEC L2	Spring terminal	2	DIN rail			FRD 5 HF	5098571	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-4 D-5-T	5098411	Combination protection
	SUB-D-9	9	Connector			SD09-V24 9	5080053	Fine protection
SS97 SINIX	Spring terminal	4	DIN rail		✓	MDP-4 D-24-T	5098431	Combination protection
SUCONET	Spring terminal	4	DIN rail		✓	MDP-4 D-24-T	5098431	Combination protection
	Crimp clamp	20	LSA			LSA-B-MAG	5084020	Basic protection
	Crimp clamp	2	LSA			LSA-BF-24	5084028	Fine protection
TTL	Spring terminal	2	DIN rail			FRD 24	5098514	Combination protection
	Spring terminal	2	DIN rail		✓	MDP-2 D-24-T	5098422	Combination protection
	SUB-D-9	9	Connector			SD09-V24 9	5080053	Fine protection
	SUB-D-15	15	Connector			SD15-V24 15	5080150	Fine protection
U-BUS	Spring terminal	4	DIN rail			2x TKS-B	5097976	Basic protection





## Planning aids, protection and spark gaps

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<b>Protection and spark gaps/ATEX approval</b>	52
<b>Installation principle for protection and spark gaps</b>	53

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# Protection and spark gaps/ATEX approval



## Task

OBO isolating and protective spark gaps are designed to isolate electrical system components, which under normal operating conditions are not connected together. If lightning strikes cause a potential increase in one of the electrical system components, the isolating spark gap guarantees a conductive connection and therefore equipotential bonding.

## Function

As their name suggests, isolating and protective spark gaps comprise a spark gap. This gap transfers from the insulating to the current-permeable condition when an electric arc is ignited by a surge voltage. An isolating spark gap differs from a protective spark gap in its purpose for use. Isolating spark gaps isolate varying earth potentials, while the protective spark gaps are used only in roof standard open-wire lines.

## Applications

- For producing an indirect connection between insulating flanges (cathodic corrosion protection).
- For bridging insulating flanges, also in potentially explosive areas (tested in accordance with ATEX Directive 2014/34/EU).
- Avoidance of drag in residual voltages, especially TT systems.
- For lightning equipotential bonding in accordance with DIN VDE 0185-305 (IEC 62305).
- For connecting different earthing systems, the aim being to make optimum use of all earthers for lightning protection equipotential bonding.
- As a measure that saves isolating connections for measuring and test purposes.

# Installation principle for protection and spark gaps

Overview				
Application	Description	Type	Item no.	Product figure
Isolating spark gaps for insulating flange 	<ul style="list-style-type: none"> <li>e.g. in a gas pressure control station</li> <li>Particularly for Ex areas</li> <li>For bridging of insulating flanges or insulating threaded joints which can carry lightning currents</li> </ul>	EX ISG H EX ISG H350	<b>5240030</b> <b>5240031</b>	
Spark gaps for potential isolation 	<ul style="list-style-type: none"> <li>Several earthing systems in one building, e.g. foundation earther and deep earther</li> <li>Connection via spark gap</li> <li>No electrochemical corrosion</li> <li>Entire earth rod surface is effective in the event of a direct lightning strike</li> </ul>	Type 481	<b>5240085</b> Page: 443	
Open-wire connection 	<ul style="list-style-type: none"> <li>Roof stand spark gap for insulation</li> <li>Largest possible distance between the roof stand of a low voltage free cable and a lightning protection system</li> <li>Distance &lt; 0.5 m: encapsulated spark gap in agreement with the power supply company</li> </ul>	Type 482	<b>5240050</b> Page: 443	
Coupling of earthing systems 	<ul style="list-style-type: none"> <li>Several earthing systems on one building</li> <li>If the operation of special electronic equipment requires a separate earthing system, then this functional earth must be connected to the operating earth</li> <li>Prevention of dangerously high voltage differences</li> <li>An additional throttle is fitted to keep high-frequency voltages away from the functional earthing</li> </ul>	Type FS-V20	<b>5099803</b> Page: 443	

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OBO isCon®-System.  
Änderungen sind nur von einer  
Blitzschutzfachkraft  
durchzuführen!





# Measuring and testing systems



Life Control testing unit



ISOLAB testing device

### Testing surge protection devices within data cables

Often, it is necessary to check the functionality of the surge protection devices within the data cable. Of particular importance is that the actual testing of the protection devices has no negative impact on the data signal.

### Testing of the arrester upper parts V50, V25, V20 and V10

The ISOLAB testing unit allows the checking of the arrester upper parts V50, V25, V20 and V10. A rotary controller allows the selection of the appropriate OBO Bettermann arrester. Then, the upper part of the appropriate combination and/or surge arrester is placed in the appropriate opening in the device. The function of the varistor is then checked by pressing the test button. Besides arrester testing, the ISOLAB also allows insulation testing according to VDE 0100-610.

The Life Control testing unit, developed by OBO Bettermann, allows testing of the protection devices when installed, without influencing the data signal. A thin testing pin creates the contact with the integrated lightning barrier. The integrated microprocessor displays the test result on the OLED display and also emphasises it with acoustic signals. A connectable LED within the testing pin is an additional feature, allowing orientation, even in the darkest switchgear cabinet. A high-quality testing case for safe transport and the documentation of the testing results are a component part of this innovation from OBO Bettermann.







The LSC I+II lightning current meter records lightning and pulse currents (10/30) (/20) and permanently saves this event together with the date and time, tested to VDE 0185-561-6 Ed.2. (IEC 62561-6 ED. 2)

### Testing of lightning protection systems with the PCS system

The peak current sensor (PCS) records and stores pulsed currents in the form of a magnetic card. This is a method of monitoring whether lightning has hit the lightning protection and which maximum lightning current has occurred.

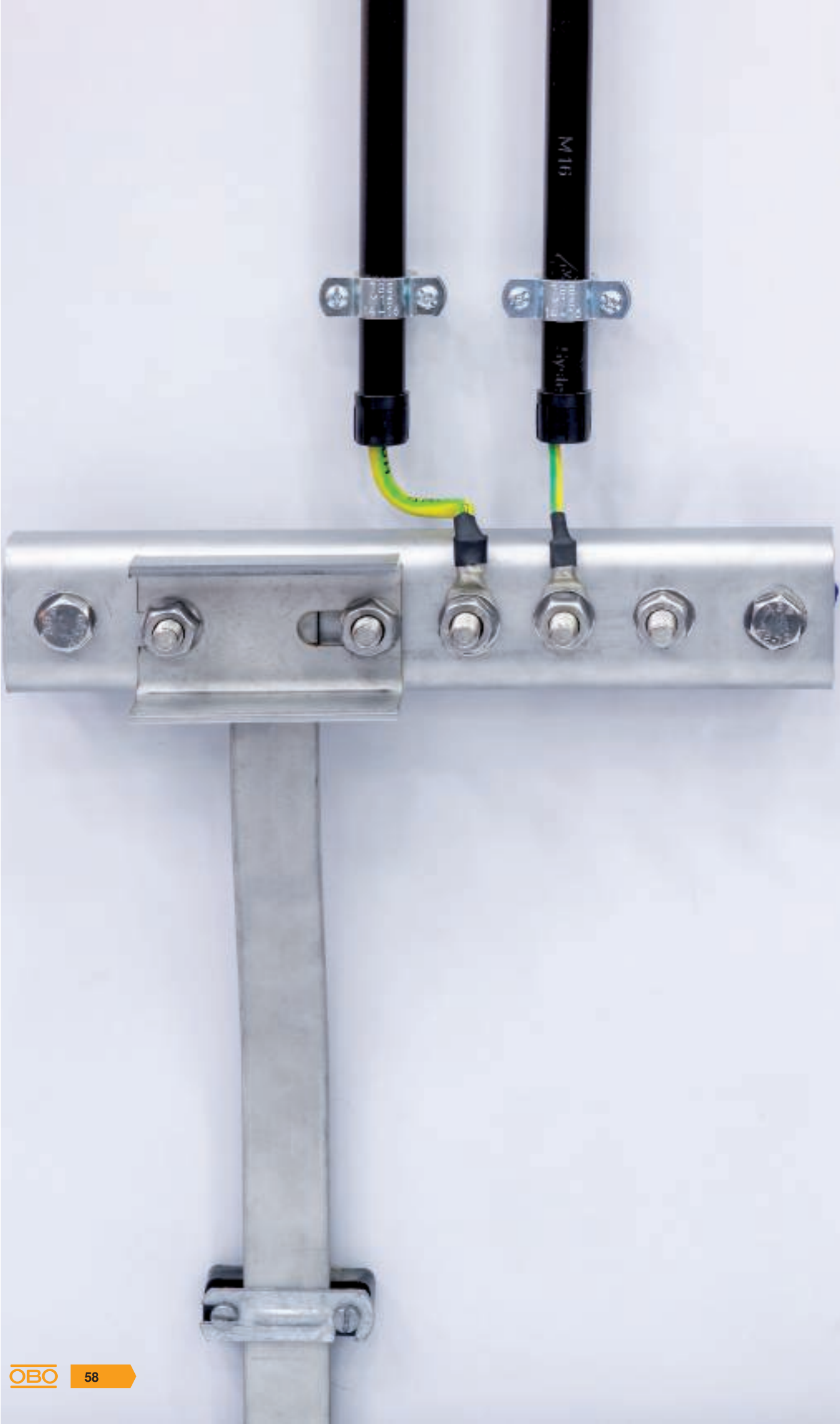
If the PCS system is mounted between the interface from equipotential bonding to earthing system, the coupled lightning current in a building can also be measured. The results can provide information on potential damage in



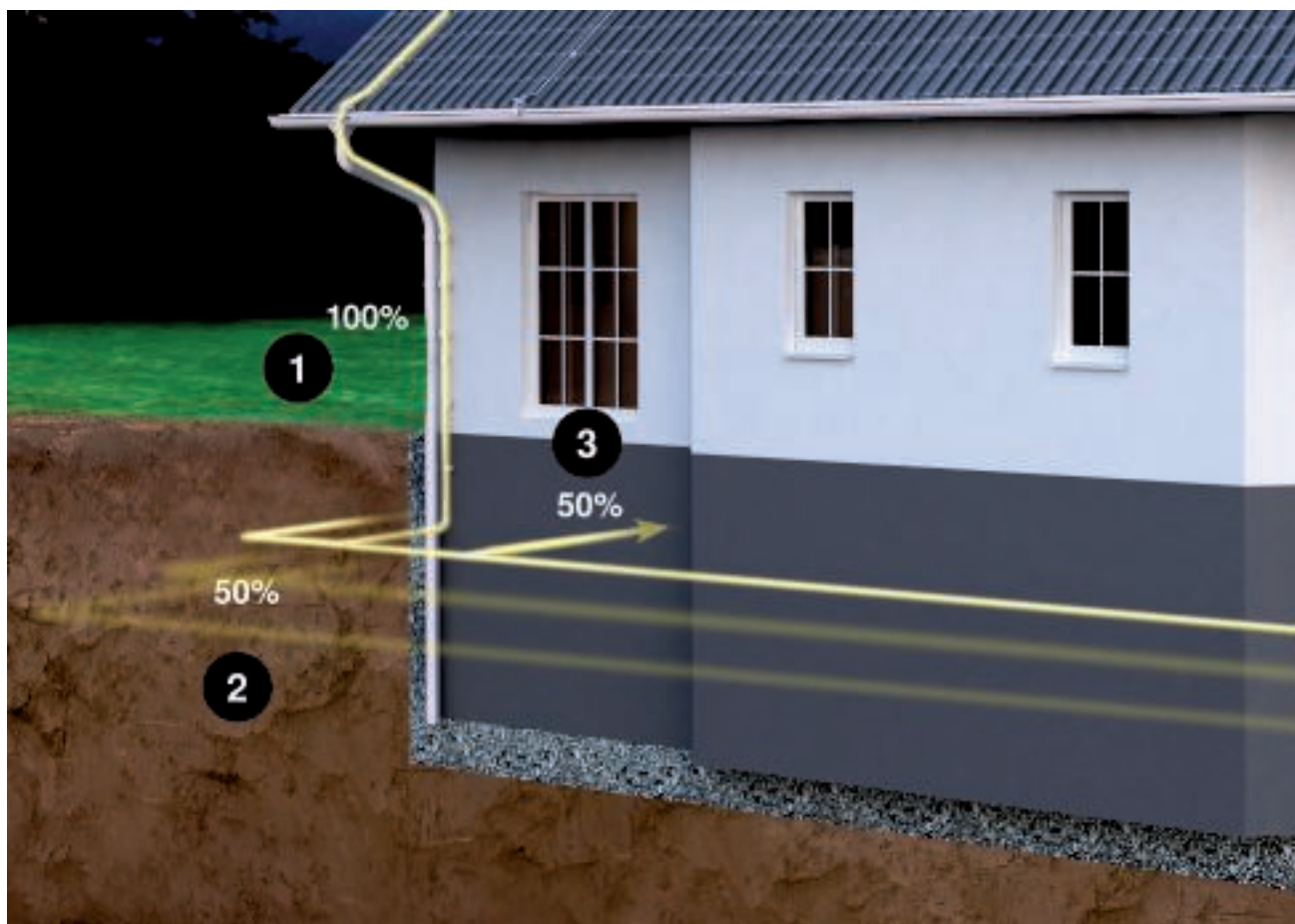
the electrical installation. The PCS card is mounted by snapping a card holder onto the round conductor at a defined distance. The measuring range of the card is between 3 and 120 kA. The magnetic card reader offers the option of evaluating peak current sensors. The appropriate peak current value is shown on the display.

Alternatively, OBO Bettermann can read it off for you. In this case please contact your OBO Bettermann agency or subsidiary.









Path of the lightning current: 1 = 100%, 2 = 50%, 3 = max. 50%

### Tasks and function of internal lightning protection

The task of an internal lightning protection system is to prevent dangerous sparking within the building to be protected. Sparking can occur especially when high potential differences with metallic or electrically operated system components occur due to a conductor (arrester) passing from the lightning current. Electrical energy and information technology systems in particular require special protection, as a direct connection between the external lightning protection system and the building installation exists via the earthing system and the equipotential bonding. In order to avoid damage inside the building, a lightning protection equipotential

bonding in accordance with DIN EN 62305 (IEC 62305) is necessary.

### System components to be connected

In addition, the following system components must be connected to the equipotential bonding:

- Metal carcass of the structure
- Metal installations
- External conductive components
- Electrical energy and information technology systems

### Installing the equipotential bonding

The equipotential bonding should be installed at the basement or at ground level. The electrical energy

and information technology lines must be connected to the equipotential bonding via type 1 lightning current arrestors. The arrestors must be connected to the equipotential bonding as close as possible to where the lines enter the building. The surge arrester connection must comply with DIN VDE 0100-534. The following cross-sections apply as minimum dimensions for connections in the lightning protection equipotential bonding (unless larger cross-sections are specified in other standards):

- Copper: 16 mm<sup>2</sup>
- Aluminium: 25 mm<sup>2</sup>
- Steel: 50 mm<sup>2</sup>

### Minimum dimensions of cables, protection class I to IV

Material	Cross-section of cables, which interconnect different equipotential bonding busbars or which connect to the earthing system	Cross-section of cables, which connect the internal metallic installations with the equipotential bonding busbar
Copper	16 mm <sup>2</sup>	6 mm <sup>2</sup>
Aluminium	25 mm <sup>2</sup>	10 mm <sup>2</sup>
Steel	50 mm <sup>2</sup>	16 mm <sup>2</sup>

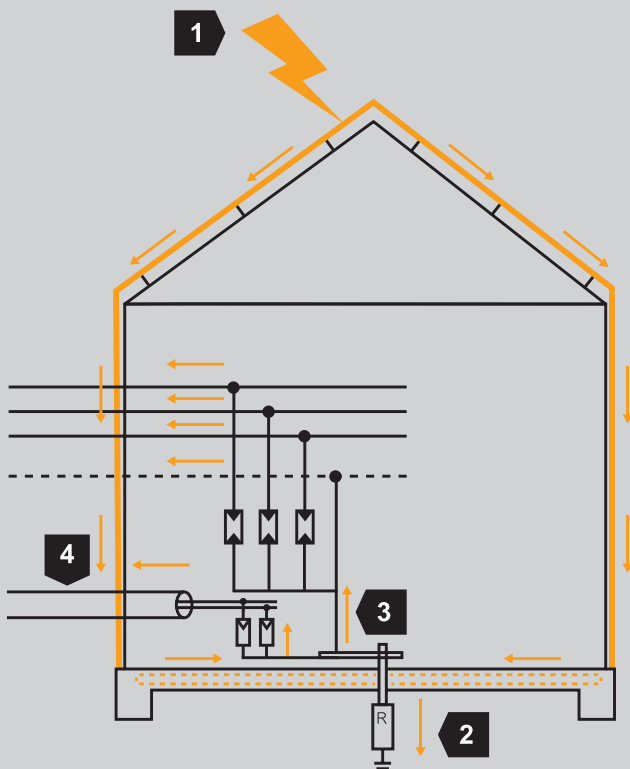
# Equipotential bonding systems

Very large surge voltages are caused mainly by lightning strikes on or close to energy systems. Even from several hundred metres away, lightning currents can also cause impermissible surge voltages in conductor loops, through either capacitive, inductive or galvanic coupling. Large surge voltages are coupled over a radius of up to 2 km. Switching operations involving inductive loads create dangerous surge voltages in the medium and low-voltage power networks.

## Lightning discharges (LEMP: Lightning Magnetic Impulse)

The international lightning protection standard IEC 62305 describes how direct lightning strikes of up to 200 kA are safely arrested. The current is coupled into the earthing system and, due to the voltage drop at the earthing resistor, half of the lightning current is coupled into the internal installation. The partial lightning current then divides itself among the power lines entering the building (number of cores of power line entering building), while around 5% enters data cables.

The voltage drop at the earthing resistor is calculated from the product of the partial lightning current ( $i$ ) and the earthing resistance ( $R$ ). This is then the potential difference between the local earth (equipotential bonding) and the live cables, which are earthed some distance away.



*The highest surges are caused by lightning strikes. According to VDE 0185-305 (IEC 62305), lightning strikes are simulated with lightning surge currents of up to 200 kA (10/350  $\mu$ s).*

<b>1</b>	Lightning strike	100 %	$i_{imp} = \max 200 \text{ kA}$ (IEC 62305)
<b>2</b>	Earthing system	$\sim 50\%$	$I = 100 \text{ kA}$ (50%)
<b>3</b>	Electrical installation	$\sim 50\%$	$I = 100 \text{ kA}$ (50%)
<b>4</b>	lightning current	$\sim 5\%$	$I = 5 \text{ kA}$ (5%)

Typical distribution of lightning current





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## Planning aids, earthing systems

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<b>Selection aid, foundation earth electrodes</b>	67
<b>Selection aid, ring earth electrodes</b>	69

## Earthing systems



Installing a foundation earther

The standards specify that each system must include an earthing system.

### What do we mean by an "earthing system"?

We can find the required definitions in IEC 60050-826 – Low-voltage electrical installations: Terms.

- "Totality of the electrical connections and equipment used to earth a network, a system or a resource." Also:
- "Conductive element, embedded in the earth or in another specific conductive medium in electrical contact with the earth."

### The tasks of an earthing system are:

- Arresting of the lightning current into the earth
- Equipotential bonding between the down-conductors
- Equipotential bonding near conductive walls of the building structure

### Consequences of an improperly created earthing system:

- Dangerous surge voltages at the equipotential bonding
- No even potential course on the earthing system
- Destruction of the foundation through insufficient arresting area of the energy-rich lightning current
- Destruction of the foundation through improperly made connections (no terminal connection)
- Electrical decoupling of high amounts of lightning energy



## Earther arrangement to VDE 0185-305-3 (IEC 62305-3)

### Type A

- Horizontal earth electrodes
- Vertical earth electrodes (earth rods)

### Type B

- Ring earth electrodes (surface earthers)
- Foundation earth electrodes

External and internal lightning protection systems

### Planning methods

VDE 0185-305-3 (IEC 62305-3) demands continuous lightning protection equipotential bonding. This means individual earthing systems must be connected together to create a global earthing system.

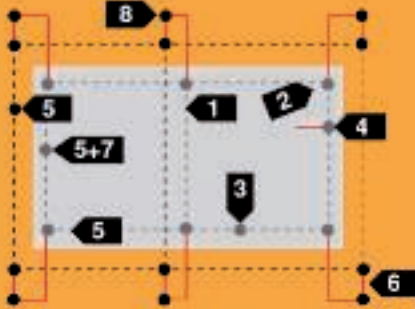
The standard differentiates between type A and type B earthing systems. Type A earth electrodes are vertical or horizontal earthers (earth rods). Type B earth electrodes are any surface earther (ring earthers, foundation earthers). OBO Construct for earthing systems offers digital support in the planning of earthing systems.

Foundation earther – without lightning protection



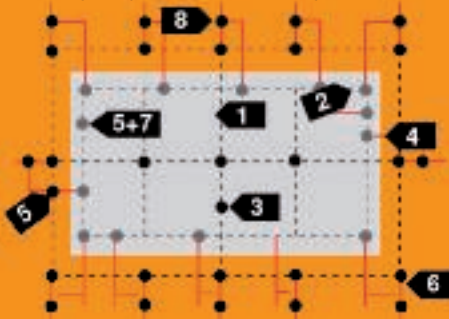
Functional equipotential bonding conductor and ring earther

- Without lightning protection Insulating foundation



Functional equipotential bonding conductor and ring earther

- With lightning protection Insulating foundation



### Earthing material, for use in concrete:

- Surrounded by min. 5 cm of concrete on all sides; ≤ 2 m connect to reinforcement
- Grid width max. 20 x 20 m; with EMC protection to VDE 0185-305-4: 5 x 5 m
- Unreinforced foundation: Material no. 1.4571/1.4404, V4A

	Type	Item no.	Description
1	5052	5019 34 7	Strip steel 30x3.5 mm FT
2	250 A-FT	5313 01 5	Connector, strip steel with reinforcement FT
3	1814 FT	5014 46 8	Terminal on reinforcement to Ø 14 mm
3	1814 FT D37	5014 46 9	For reinforcements Ø 16–37 mm
4	205 DG L180 V4A	5420 02 2	Earthing fixed point with axis
8	ProtectionBall	5018 01 4	Protective cap for connection straps

### Earthing and connection material, for use in the earth or cleanliness layer

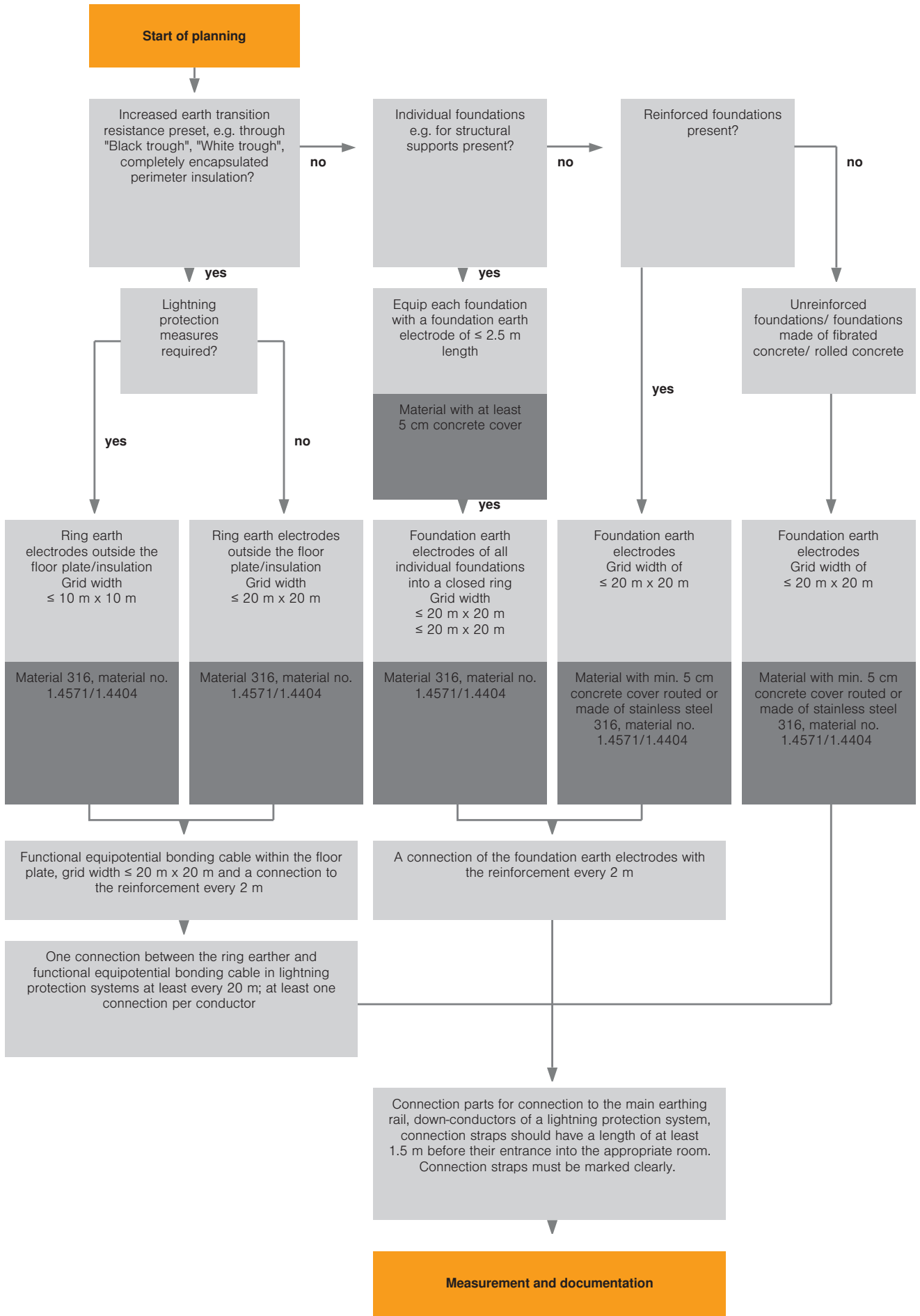
- Material no. 1.4571/ 1.4404, V4A; clamps in earth with corrosion protection strip
- Min. 0.8 m deep, routing outside drainage shaft, frost apron (moist area)
- Grid: Without lightning protection: 20 x 20 m, connection between earth and concrete: Every 20 m, with lightning protection: 10 x 10 m, connection between earth and concrete: Every down-conductor

	Type	Item no.	Description
5	RD 10 V4A	5021 64 2	Round conductor Ø10 mm V4A
6	250 V4A	5312 92 5	Terminal for round conductor and strip steel












### Material for equipotential bonding

	Type	Item no.	Description
7	1801 VDE	5015 65 0	Equipotential busbar, industrial









# Decision-making aid to determine the grid width of ring or foundation earthers










## Selection aid, foundation earthers

Foundation earther				
Application	Designation	Type	Item no.	Product figure
Foundation earthers for lightning protection measures according to VDE 0185-305-3 (IEC 62305) and for protection measures against electric shocks according to DIN 18014	Flat conductor, galvanised steel, 30 m	5052 DIN 30X3.5	<b>5019 34 5</b> Page: 380	
	Round conductor, galvanised steel, 80 m	RD 10	<b>5021 10 3</b> Page: 380	
	Spacer, 250 mm long, galvanised steel	1 81 1	<b>5014 01 8</b> Page: 400	
	Spacer, 400 mm long, galvanised steel	1811 I	<b>5014 02 6</b> Page: 400	
	Cross-connector for flat conductors and round conductors, galvanised steel	25 0	<b>5312 90 6</b> Page: 395	
	Cross-connector for flat conductor, galvanised steel	256 A-DIN 30 FT	<b>5314 65 8</b> Page: 391	
	Parallel clamp, galvanised steel	259 A FT	<b>5315 51 4</b> Page: 397	
	Connection terminal for reinforcing steels, galvanised steel	1814 FT	<b>5014 46 8</b> Page: 398	
	Round conductor, galvanised steel with PVC jacketing, 75 m	RD 10-PVC	<b>5021 16 2</b> Page: 381	
	Wall penetration, sealed against pressurised water	DW RD10	<b>2360 04 1</b> Page: 398	
Wall penetration, sealed against pressurised water	DW FL30x3.5	<b>2360 04 3</b> Page: 398		

## Selection aid, ring earthers for lightning protection measures

Ring earther				
Application	Designation	Type	Item no.	Product figure
Ring earther for lightning protection measures according to VDE 0185-305-3 (IEC 62305) Not suitable for loamy or wet soil!	Flat conductor, galvanised steel, 30 m	5052 DIN 30X3.5	<b>5019 34 5</b> Page: 380	
	Flat conductor, galvanised steel, 60 m	5052 DIN 30X3.5	<b>5019 34 7</b> Page: 380	
	Round conductor, galvanised steel, 80 m	RD 10	<b>5021 10 3</b> Page: 380	
	Cross-connector for flat conductors and round conductors, galvanised steel	252 8-10 FT	<b>5312 31 0</b> Page: 393	
	Cross-connector for flat conductor, galvanised steel	256 A-DIN 30 FT	<b>5314 65 8</b> Page: 391	
Ring earther for lightning protection measures according to VDE 0185-305-3 (IEC 62305) Usable universally in many environments.	Flat conductor, stainless steel V4A, 25 m	5052 V4A 30X3.5	<b>5018 73 0</b> Page: 380	
	Flat conductor, stainless steel V4A, 50 m	5052 V4A 30X3.5	<b>5018 70 6</b> Page: 380	
	V4A stainless steel round conductor, 50 m	RD 10-V4A	<b>5021 64 2</b> Page: 382	
	V4A stainless steel round conductor, 80 m	RD 10-V4A	<b>5021 64 7</b> Page: 382	
	Cross-connector for flat conductors and round conductors, V4A	252 8-10 V4A	<b>5312 31 8</b> Page: 393	
	Cross-connector for flat conductor, V4A	256 A-DIN 30 V4A	<b>5314 65 9</b> Page: 392	
	Plastic corrosion protection strip, 10 m	356 50	<b>2360 05 5</b> Page: 404	

# Selection aid, ring earthers for protection measures against electric shocks

Ring earther				
Application	Designation	Type	Item no.	Product figure
Ring earthers for protection measures against electric shocks according to DIN 18014	Flat conductor, stainless steel V4A, 25 m	5052 V4A 30X3.5	<b>5018 73 0</b> Page: 380	
	Flat conductor, stainless steel V4A, 50 m	5052 V4A 30X3.5	<b>5018 70 6</b> Page: 380	
	V4A stainless steel round conductor, 50 m	RD 10-V4A	<b>5021 64 2</b> Page: 382	
	V4A stainless steel round conductor, 80 m	RD 10-V4A	<b>5021 64 7</b> Page: 382	
	Cross-connector for flat conductors and round conductors, V4A	252 8-10 V4A	<b>5312 31 8</b> Page: 393	
	Cross-connector for flat conductor, V4A	256 A-DIN 30 V4A	<b>5314 65 9</b> Page: 392	
	Plastic corrosion protection strip, 10 m	356 50	<b>2360 05 5</b> Page: 404	





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## Planning aids, air-termination and down-conductor systems

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# Lightning protection classes

## Lightning protection classes and allocation

Before a lightning protection system is planned, the object to be protected must be assigned to one of four lightning protection classes. Efficiency in lightning protection class I is the highest at 98% and in lightning protection class IV the lowest at 81% (see table of hazard parameters). The cost of erecting a lightning protection system (e.g. necessary protection angles, distances from loops, protection profiles, distances from down-conductors) is more involved for lightning protection class I systems than for lightning protection class IV systems.

## VdS Directive

The required lightning protection class is determined by assessing the damage risk in accordance with DIN EN 62305-2 (IEC 62305-2), unless specified in regulations or national guidelines, such as special building codes or model or state building codes. Lightning protection is preventive fire protection. Directive VdS 2010 (risk-oriented lightning and surge protection), published by Gesamtverband der Deutschen Versicherungswirtschaft e. V. (GDV) offers an alternative method of determining the lightning protection class.



You can obtain further information from [www.vds.de](http://www.vds.de), via OBO Customer Service +49 (0)2371 7899-2000 or at [www.obo.de](http://www.obo.de).

## Hazard parameters in dependence of lightning protection classes

Lightning protection class	Peak lightning current value min.	Peak lightning current value max.	Capture probability
I	3 kA	200 kA	98%
II	5 kA	150 kA	95%
II	10 kA	100 kA	88%
IV	16 kA	100 kA	81%

## Lightning protection classes based on Directive VdS 2010

Application	Lightning protection class
Computer centres, military applications, nuclear power stations	I
Ex zones in industry and the chemicals sector	II
Photovoltaic systems > 10 kW	III
Museums, schools, hotels with more than 60 beds	III
Hospitals, churches, storage facilities, meeting places accommodating more than 100 to 200 people	III
Administrative buildings, sales points, offices and bank buildings of over 2,000 m <sup>2</sup>	III
Residential buildings with more than 20 apartments, multi-storey buildings over 22 m high	III
Photovoltaics (< 10 KW)	III



# Materials for external lightning protection



### Substances and material

The following materials are preferred for use in external lightning protection systems: hot galvanised steel, rust-proof steel (VA), copper and aluminium.

### Corrosion

A risk of corrosion occurs especially when joining different material types. Therefore, no copper parts may be installed above galvanised surfaces or above aluminium parts as copper particles worn away by rain or other environmental influences can penetrate the galvanised surface. In addition, a galvanic element occurs, which accelerates corrosion of the contact surface.

### Examples

As you can see from the examples, the copper connection on the steel water pipe is corroded and could become detached. If two different materials that are not recommended need to be joined, bi-metal connectors can be used. The example shows the use of bi-metal connectors on a copper gutter to which an aluminium round conductor is attached. Points at increased risk of corrosion, such as insertion points into the concrete or soil, must be

corrosion-protected. A suitable coating must be applied as corrosion protection to connection points in the ground. Aluminium must not be placed directly (without a distance) on, in or under plaster, mortar or concrete or in the earth – the potential consequences of doing so are shown in our example. In the "Material combinations" table, possible metal combinations are evaluated with regard to contact corrosion in air.

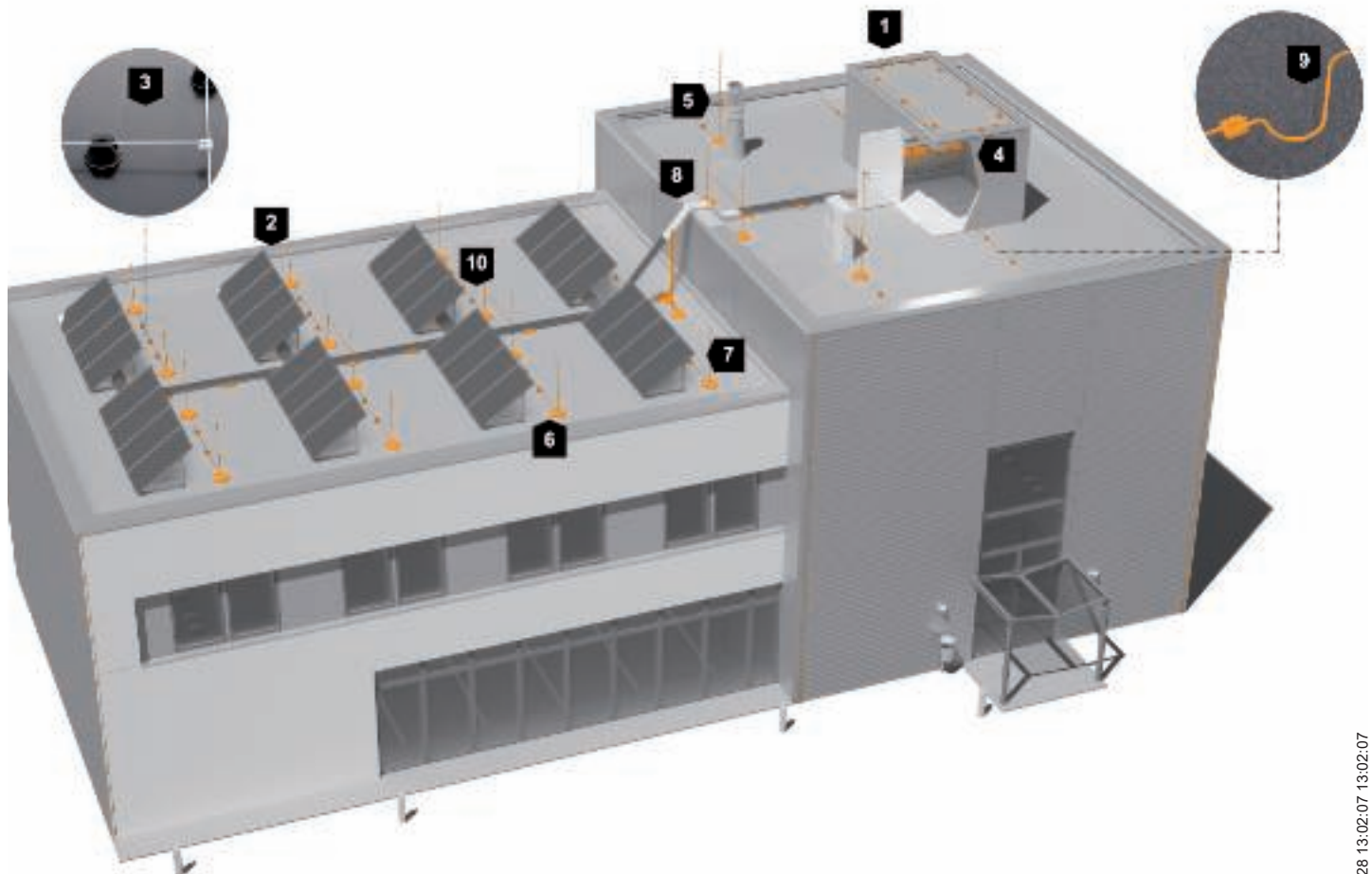
### Material combinations without increased risk of corrosion

	Steel, galvanised	Aluminium	Copper	Stainless steel	Titanium	Tin
Steel, galvanised	Yes	Yes	No	Yes	Yes	Yes
Aluminium	Yes	Yes	No	Yes	Yes	Yes
Copper	No	No	Yes	Yes	No	Yes
Stainless steel	Yes	Yes	Yes	Yes	Yes	Yes
Titanium	Yes	Yes	No	Yes	Yes	Yes
Tin	Yes	Yes	Yes	Yes	Yes	Yes



## Installation principle, building with flat roof

In buildings with flat roofs, the grid method is generally used. Roof structures such as PV systems, air-conditioning units, roof dome lights and ventilators are protected with additional air-termination rods.



1	Terminal block
2	Bridging component
3	Roof conductor holder
4	Cable bracket
5	Insulated spacer
6	Air-termination system stand
7	Air-termination rod
8	Fire protection bandage over insulated parapet cover
9	Expansion piece
10	Vario quick connector

## Installation principle, building with a pitched/gabled roof

The exposed points, e.g. the ridge, chimneys and any roof structures, must be protected with air-termination systems.



<b>1</b>	Roof conductor holder for ridge tiles
<b>2</b>	Vario quick connector
<b>3</b>	Roof conductor holder
<b>4</b>	Round conductor
<b>5</b>	Air-termination rod
<b>6</b>	Cable bracket
<b>7</b>	Gutter clamp



*The wind load describes the effect on buildings and installed systems. It must be taken into account during planning.*

## Determining the wind load

For decades, wind load has been an important consideration for OBO Bettermann in relation to external lightning protection. Today's calculation models and air-termination rod systems are the result of numerous studies and years of R&D experience.

The previous German standards in this area – DIN 1055:2005 Part 4: Wind loads and Part 5: Snow and ice loads, and DIN 4131: Steel antenna mounts – dealt with all load assumptions for mounts in Germany.

The Eurocodes (EC) are the result of European standardisation in the construction field. EC 0 to EC 9 cover the documents in the series DIN EN 1990 to 1999. These are supplemented by the various national annexes (NA). The NAs contain provisions that go beyond the Eurocode rules, i.e. the provisions that were previously part of the national standards.

Following the publication of the national annexes to the ECs, the old standards became invalid, following appropriate coexistence phases.

Old standard	New standard
Eurocode 1: DIN EN 1991-1-4:2010-12: Parts 1-4: General effects; wind loads + DIN EN 1991-1-4/NA: 2010-12	Eurocode 1: DIN EN 1991-1-4:2010-12: Parts 1-4: General effects; wind loads + DIN EN 1991-1-4/NA: 2010-12
DIN EN 1991-1-3: 2010-12 -; Parts 1-3: General effects; snow loads + DIN EN 1991-1-3/NA: 2010-12	DIN EN 1991-1-3: 2010-12 -; Parts 1–3: General effects; snow loads + DIN EN 1991-1-3/NA: 2010-12
Eurocode 3: DIN EN 1993-3-1: 2010-12: Parts 3-1: Towers, masts and chimneys – Towers and masts + DIN EN 1993-3-1/NA: 2010-12	Eurocode 3: DIN EN 1993-3-1: 2010-12: Parts 3-1: Towers, masts and chimneys – Towers and masts + DIN EN 1993-3-1/NA: 2010-12

Example of German national standards for the calculation of wind load

### 1st step: Determining the wind zone

The second factor that needs to be known when determining the wind load is the wind load zone in which the object is located.

The standards contain no statements regarding the following aspects:

- Framework masts and towers with non-parallel main legs,
- Guyed masts and chimneys,
- Cable-stayed and suspension bridges,
- Torsional vibrations.

Zone	Wind speed in m/s	Speed pressure in kN/m <sup>2</sup>
1	22.5	0.32
2	25.0	0.39
3	27.5	0.47
4	30.0	0.56



Basic speeds and speed pressures

Wind zones in Germany according to DIN EN 1991-1-4 NA

### 2nd step: Determining the terrain category (TC)

Terrain-specific loads and dynamic pressures are an important element in calculating wind loads.

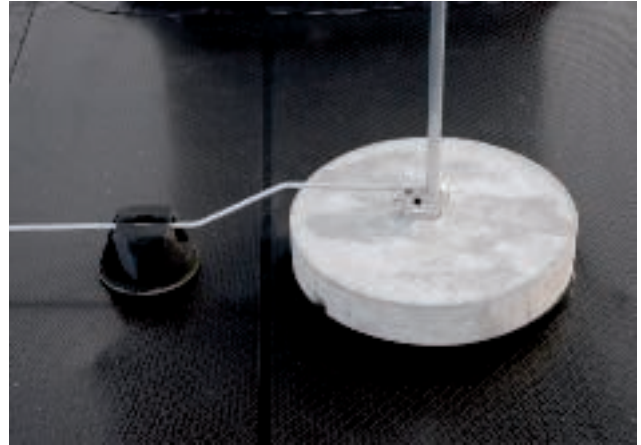
Terrain category (TC)	Definition
Terrain category I	Open sea; lakes with at least 5 km of open water in the wind direction; even, flat land without obstacles
Terrain category II	Terrain with hedges, individual farmsteads, buildings or trees, e.g. agricultural area
Terrain category III	Suburbs, industrial or commercial areas; forests
Terrain category IV	Urban areas in which at least 15% of the area is built up with buildings whose average height is higher than 15 m

Table 2.10: Terrain categories according to DIN EN 1991-1-4



### 3rd step: Determining the maximum gust speed

The tilt and slip resistance of air-termination rods must always be determined on a project-by-project basis. The reference height is the building height and two thirds of the length of the air-termination rod. The maximum gust speed at the project location must be determined.



Air-termination rod with stand

Gust speed in wind zone I				
Reference height in metres	TC I in kph	TC II in kph	TC III in kph	TC IV in kph
0	112	105	100	93
5	122	108	100	93
10	136	124	103	93
16	136	124	111	93
20	139	128	115	98
30	145	134	122	106
40	149	139	128	112
70	157	148	139	126
100	162	155	147	135

Gust speeds, wind zone I

Gust speed in wind zone II				
Reference height in metres	TC I in kph	TC II in kph	TC III in kph	TC IV in kph
0	124	117	111	104
5	136	120	111	104
10	145	131	114	104
16	152	138	123	104
20	155	142	127	109
30	161	149	136	118
40	165	154	142	125
70	174	165	155	139
100	180	172	163	150

Gust speeds, wind zone II

Gust speed in wind zone III				
Reference height in metres	TC I in kph	TC II in kph	TC III in kph	TC IV in kph
0	137	129	122	114
5	149	132	122	114
10	159	144	126	114
16	167	152	135	114
20	170	156	140	119
30	177	164	149	129
40	182	170	156	137
70	192	181	170	153
100	198	189	180	165

Gust speeds, wind zone III

Gust speed in wind zone IV				
Reference height in metres	TC I in kph	TC II in kph	TC III in kph	TC IV in kph
0	149	140	133	124
5	163	144	133	124
10	174	157	137	124
16	182	166	148	125
20	186	170	153	130
30	193	179	163	141
40	198	185	170	150
70	209	198	185	167
100	216	206	196	180

Gust speeds, wind zone IV

#### 4th step: Determining what concrete blocks are required

Based on the maximum gust speed, the number and size (10 or 16 kg) of concrete blocks required can be determined for the air-termination rod used. The value in the tables must lie above the maximum gust speed for the location.

#### An example

The maximum gust speed at the location is 142 km/h.

A tapered pipe air-termination rod of type 101 VL2500 and height 2.5 m is used.

Because the value in Table 2.15 must be higher than the maximum gust speed at the location (i.e. in this case more than 142 km/h), the next possible value is 164. Three concrete blocks, each of weight 16 kg, must therefore be used.

#### Number of concrete blocks for tapered pipe air-termination rods

Air-termination rod height in m	1.5	2	2.5	3	3.5	4	Concrete blocks required
Type	101 VL1500	101 VL2000	101 VL2500	101 VL3000	101 VL3500	101 VL4000	
Item no.	5401980	5401983	5401986	5401989	5401993	5401995	
Wind speed kph	117	-	-	-	-	-	<b>1 x 10 kg</b>
	164	120	95	-	-	-	<b>2 x 10 kg</b>
	165	122	96	-	-	-	<b>1 x 16 kg</b>
	-	170	135	111	95	-	<b>2 x 16 kg</b>
	-	208	164	136	116	102	<b>3 x 16 kg</b>

#### Number of concrete blocks for air-termination rod, one end rounded

Air-termination rod height in m	1	1.5	2	2.5	3	Concrete blocks required
Type	101 ALU-1000	101 ALU-1500	101 ALU-2000	101 ALU-2500	101 ALU-3000	
Item no.	5401771	5401801	5401836	5401852	5401879	
Wind speed kph	97	-	-	-	-	<b>1 x 10 kg</b>
	196	133	103	-	-	<b>1 x 16 kg</b>
	-	186	143	117	100	<b>2 x 16 kg</b>
	-	-	173	142	121	<b>3 x 16 kg</b>

#### Number of concrete blocks for air-termination rod, one end rounded with connection strap

Air-termination rod height in m	1	1.5	Concrete blocks required
Type	101 A-L 100	101 A-L 150	
Item no.	5401808	5401859	
Wind speed kph	100	-	<b>1 x 10 kg</b>
	192	129	<b>1 x 16 kg</b>
	-	177	<b>2 x 16 kg</b>
	-	214	<b>3 x 16 kg</b>



### Number of concrete blocks for insulated VA and AI air-termination rods

Air-termination rod height in m	4	6	4	6	Concrete blocks required
Material	VA	VA	AI	AI	
Item no.	5408942	5408946	5408943	5408947	
Item no. of appropriate air-termination rod stand	5408968	5408969	5408966	5408967	
Wind speed kph	120	94	120	92	<b>3 x 16 kg</b>
	161	122	163	122	<b>6 x 16 kg</b>
	194	145	197	147	<b>9 x 16 kg</b>
	222	165	227	168	<b>12 x 16 kg</b>
	246	182	252	187	<b>15 x 16 kg</b>

### Number of concrete blocks for insulated air-termination rods with exit

Air-termination rod height in m	4	6	8	10	Concrete blocks required
Item no.	5408938	5408940	5408888	5408890	
Item no. of appropriate air-termination rod stand	5408930	5408932	5408902	5408902	
Wind speed kph	110	85	93	82	<b>3 x 16 kg</b>
	148	111	116	102	<b>6 x 16 kg</b>
	178	132	134	119	<b>9 x 16 kg</b>
	204	151	151	133	<b>12 x 16 kg</b>
	227	167	166	146	<b>15 x 16 kg</b>





**Number of concrete blocks for isFang air-termination rod with VA tripod stand**

Air-termination rod height in m	4	4.5	5.0	5.5	6.0	6.5	7.0	7.5	8.0	Required concrete blocks
Air-termination rod item no.	5402 864	5402 866	5402 868	5402 870	5402 872	5402 874	5402 876	5402 878	5402 880	
Item no. of appropriate air-termination rod stand	5408 968	5408 968	5408 968	5408 968	5408 969	5408 969	5408 969	5408 969	5408 969	
Wind speed kph	143	124	110	99	104	96	89	83	78	<b>3 x 16 kg</b>
	193	168	148	133	138	127	117	109	102	<b>6 x 16 kg</b>
	232	202	178	159	165	151	139	129	121	<b>9 x 16 kg</b>
	266	231	203	182	188	172	159	147	138	<b>12 x 16 kg</b>
	296	257	226	202	208	191	176	163	152	<b>15 x 16 kg</b>





## Planning aids, insulated lightning protection

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# isFang air-termination rod system

## Quickly and simply installed

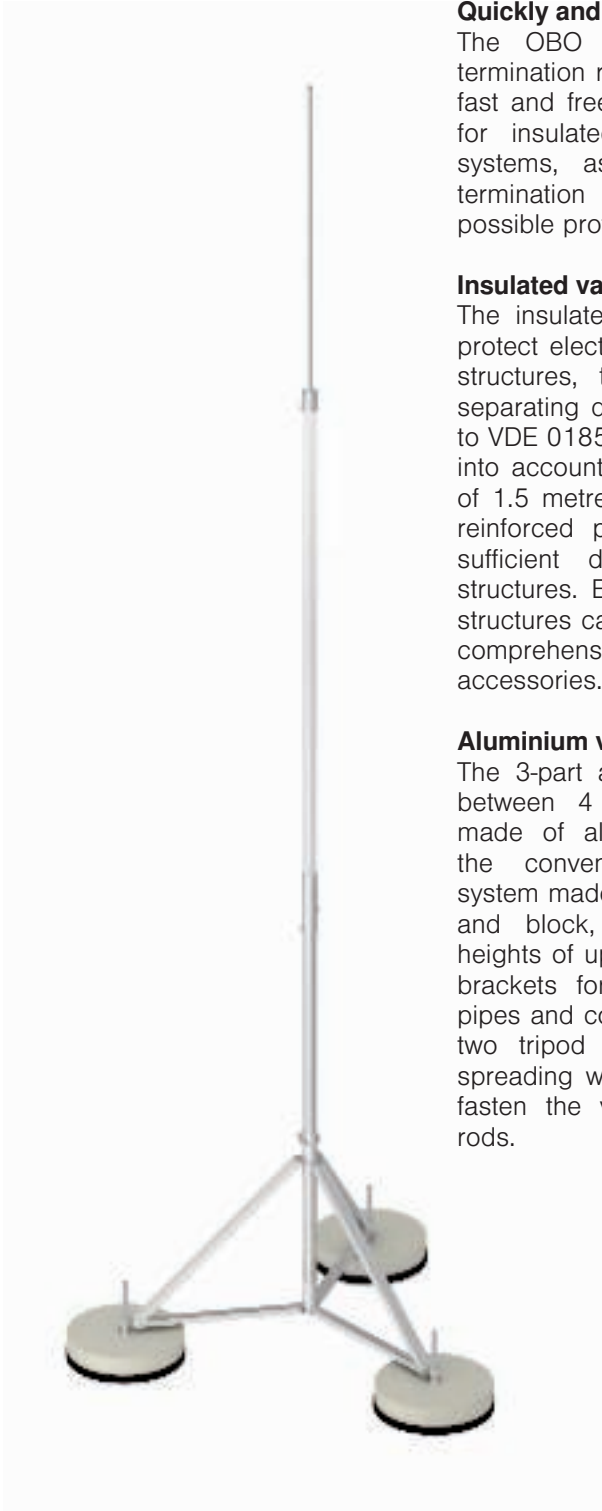
The OBO isFang modular air-termination rod system can offer a fast and freely terminable solution for insulated air-termination rod systems, as well as high air-termination rods for the largest possible protection angle.

## Insulated variant

The insulated air-termination rods protect electrical and metallic roof structures, taking the calculated separating distance (s), according to VDE 0185-305-3 (IEC 62305-3), into account. An insulated section of 1.5 metres made of fibre-glass reinforced plastic (GFK) ensures sufficient distance to all roof structures. Even complex building structures can be protected by the comprehensive system accessories.

## Aluminium variant

The 3-part air-termination rods of between 4 and 8 metres and made of aluminium complement the conventional air-termination system made of air-termination rod and block, which is used for heights of up to 4 metres. Various brackets for mounting on walls, pipes and corner pipes, as well as two tripod stands with different spreading widths, are available to fasten the various air-termination rods.



# isCon®



The high voltage-resistant, insulated isCon® down conductor is the modern solution for planners and erectors of lightning protection systems, in order to maintain the necessary separation distances safely according to VDE 0185-305-3 (IEC/EN 62305-3).

As an innovative international provider of complete lightning and surge protection systems, OBO has adjusted its product range according to the different demands of our customers in the area of insulated lightning protection.

The result: We can now offer the appropriate isCon® conductor system with external certification according to the most recent testing norms (VDE V 0185-561-8/IEC TS 62561-8) for any lightning protection project.











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# isCon®



## Technical data

<b>BASIC</b>		$s_e \leq 45 \text{ cm}$	150 kA	Ø 20 mm		Flat roof/ 2 storeys
<b>PROFESSIONAL</b>		$s_e \leq 75 \text{ cm}$	150 kA	Ø 20 mm		Industrial buildings
<b>PROFESSIONAL+</b>		$s_e \leq 75 \text{ cm}$	150 kA	Ø 23 mm		Chemicals industry
<b>PREMIUM</b>		$s_e \leq 90 \text{ cm}$	200 kA	Ø 23 mm		Tower blocks

## Product safety and quality

The isCon® down-conductors comply with the requirements of VDE 0185-561-2 (IEC/EN 62561-2) thanks to their normative cable diameter. Numerous lightning current tests according to VDE 0185-561-1 (IEC/EN 62561-1) as well as to IEC TS 62561-8 with up to 200 kA (10/350) ensure the safe use in all lightning protection classes.

The surface-discharge-free isCon® Professional+ down-conductor is certified for the use externally in EX areas. Moreover, the isCon® Professional+ down-conductor with the additional grey outer sheath ensures protection against dangerous touch voltages to VDE 0185-305-3 (IEC/EN 62305-3).



## OBO isCon® system



1	Weakly conductive EVA (ethylene vinyl acetate copolymer), UV-resistant
2	Conductive PEX (cross-linked polyethylene)
3	Insulating PEX (cross-linked polyethylene)
4	35 mm <sup>2</sup> copper cable

Structure of the high-voltage-resistant OBO isCon® Professional + insulated down conductor

In complex installations, the required separation distance can often no longer be implemented with conventional down conductors, as the structural conditions do not permit the required distances between the air-termination systems and the electrical installations. Insulated lightning protection systems with the OBO isCon® conductors can be implemented to maintain the required separation distance.

**Tested to IEC TS 62561-8: Up to 90 cm separation distance in the air and 180 cm in solid materials, and up to 200 kA lightning current.**

This means that installation is possible directly on metallic and electrical structures. There is no direct arcing between the down conductor and the building to be protected.

**Total flexibility on the construction site**

The OBO isCon® conductors can be used flexibly. The isCon® conductor is supplied on disposable cable rolls. The user can cut it to the exact size they require and terminate it as necessary. This means: No ordering of pre-terminated cables, but rather flexible working according to actual conditions on the construction site. Special knowledge is required to be able to carry out the planning and routing of the isCon® conductors correctly. This knowledge is imparted by the current installation instructions, but can also be deepened in special OBO workshops.



# OBO isCon® system: Air-termination system and down conductor



## The air-termination system

The routing of the air-termination system is planned taking DIN EN 62305-3 (VDE 0185-305-3) Section 5.2 into account. The area to be protected must be designed specially according to the height and arrangement of the air-termination system.

## The down-conductor

Only the connection element may be connected to the air-termination or forwarding down-conductor of the external lightning protection. The cable must be located in the protection area of the air-termination system and be fastened at a maximum distance of one metre using the installation material indicated. If cables are routed in the building, then specified protection measures, such as fire insulation, must be taken into account.

## Separation distance

Calculation of the separation distance according to DIN EN 62305-3 (VDE 0185-305-3) Section 6.3 at the point the isCon® cable is connected. The length (l) should be measured from the connection point of the isCon® conductor to the next level of the lightning protection equipotential bonding (e.g. earthing system). Check whether the calculated separating distance (s) is less than the specified equivalent separating distance of the isCon® conductor.

## Maximum lengths of the isCon® down-conductors

			Basic	Professional Professional Plus	Premium
LPS lightning protection class	Max. lightning current peak value	Number of down-conductors	Length at s ≤ 0.45 m in air	Length at s ≤ 0.75 m in air	Length at s ≤ 0.90 m in air
I	200 kA	1	-	-	11,25
		2	8,52	14,20	17,05
		3 and more	12,78	21,31	25,57
II	150 kA	1	7,50	12,50	15,00
		2	11,36	18,94	22,73
		3 and more	17,05	28,41	34,09
III	100 kA	1	11,25	18,75	22,50
		2	17,05	28,41	34,09
		3 and more	25,57	42,61	51,14

An exact calculation of the separation distance verifies the possible use of the isCon® conductor.

NOTE: The values in the table apply to all type B earth rods and to those type A earth rods in which the earth resistance of the neighbouring earth electrodes does not differ by more than a factor of 2. If the earth resistance of individual electrodes deviates by more than a factor of 2, then  $k_c = 1$  should be assumed.

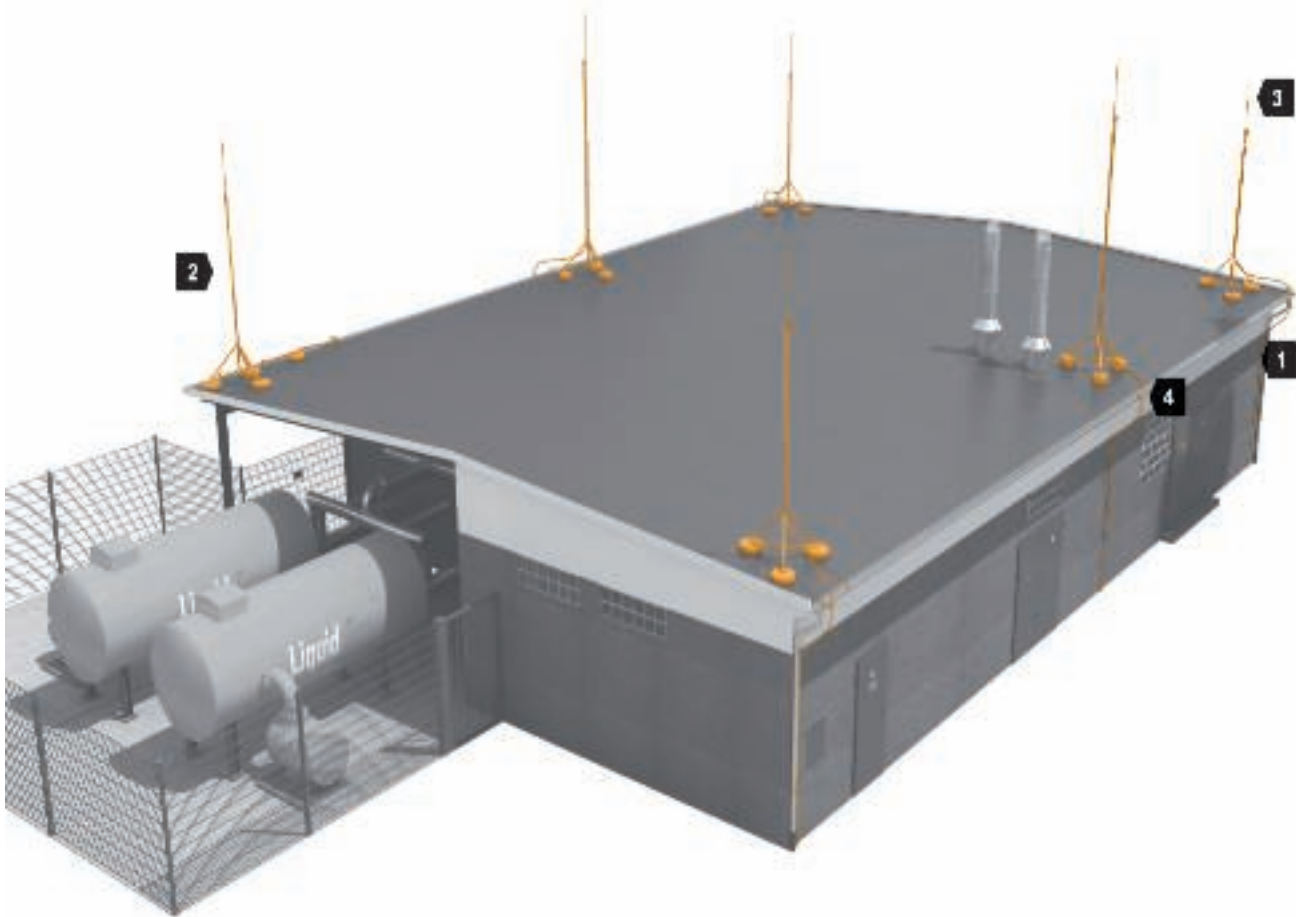
Source: Table 12 DIN EN 62305-3:2011





## Installation principle for isCon® in potentially explosive areas

In the Ex zones 1 and 21, after the first potential connection, the OBO isCon® Professional + should be connected at regular distances (0.5 metres) using a metallic conductor bracket (e.g. isCon H VA or PAE) to the equipotential bonding. If there is a lightning strike, lightning current may not flow through the equipotential bonding and it must be in the protection angle of the lightning protection system.



<b>1</b>	isCon® Professional + conductor
<b>2</b>	isFang air-termination rod 4 m with external isCon® conductor
<b>3</b>	isFang air-termination rod 6 m with external isCon® conductor
<b>4</b>	Potential connection

Planning aids, insulated lightning protection



# OBO isCon® system: Ex areas



## Installation in potentially explosive areas

When planning and running a lightning protection system through Ex zones, the following rules must particularly be taken into account:

- DIN EN 62305-3 – Appendix D – "Additional information for lightning protection systems for structure in areas with the risk of explosion"
- VDE 0185-305-3 – Supplementary sheet 2 – "Additional information for special structures"

For Ex systems with Ex zone 2 and 22, supplementary sheet 2 (VDE 0185-305-3, Point 4.3) states that an Ex atmosphere will only occur in rare, unforeseen circumstances. Therefore, it is possible to position interception units in Ex zone 2 and 22, taking Appendix D in DIN EN 62305-3 (VDE 0185-305-3) into account.

In the Ex zones 1 and 21, after the first potential connection, the OBO isCon® Professional + conductor should be connected at regular distances (0.5 metres) using a metallic cable bracket (e.g. isCon® H VA or PAE) to the equipotential bonding. If there is a lightning strike, lightning current may not flow through the equipotential bonding and it must be in the protection angle of the lightning protection system.

Secure screw connectors against loosening.



## OBO isCon® system: application examples



### Application example: soft-covered roofs

Soft-covered roofs, for example with straw, thatch or reeds, require increased protection against lightning strikes and the resulting risk of fire.

A separate lightning protection system incorporating the isCon® Professional or Basic conductor is recommended in order to comply with the aesthetic expectations of builders and architects. The air-termination system is implemented using air-termination rods, which allow the conductor to be routed in their interior (type isFang IN). The grey variant of the isCon® conductor guarantees a high degree of protection and should be used for soft roofs. In this way, the conductor can be routed under the soft roof.

Observe the OBO isCon® system manual for detailed mounting instructions.



### Application example: mobile telecommunications system

Installations such as mobile telecommunications systems must be included in the lightning protection concept, particularly in the case of refitting work.

Spatial restrictions, as well as the influence of transmission signals, can be overcome by constructing the lightning protection system using an isCon® conductor. Simple inclusion in the existing lightning protection system as well as separate lightning protection can be implemented simply and in accordance with the standards.




















### Aesthetic aspects

In easily visible areas, as well as wherever aesthetics are important, we recommend routing the isCon® conductor in air-termination rods. Equipotential bonding after the first 1.5 metres takes place in the rod. The entire retaining pipe is earthed, guaranteeing comprehensive equipotential bonding. A simple and visually perfect installation solution.








## Test marks

	Lightning current-tested
	Lightning current-tested, Class H (100 kA)
	ELEKTROTECHNICKÝ ZKUŠEBNÍ ÚSTAV, Czech Republic
	ATEX certificate for explosive areas
	Russia, GOST The State Committee for Standards
	KEMA-KEUR, Netherlands
	Indication of metric products
	MAGYAR ELEKTROTECHNIKAI ELLENŐRZŐ INTÉZET Budapest, Hungary
	Österreichischer Verband für Elektrotechnik, Austria
	Underwriters Laboratories Inc., USA
	Eidgenössisches Starkstrominspektorat, Switzerland
	Underwriters Laboratories Inc., USA
	Verband der Elektrotechnik, Elektronik, Informationstechnik e.V., Germany
	German Association of Electricians, tested safety
	5-year warranty
	Halogen-free; without chlorine, fluorine and bromine
	INMETRO, Brazil









# Pictogram explanation



















## Lightning protection classes

	Protection device to DIN EN 61643-11 or IEC 61643-11
	Combination protection device made of type 1 and type 2
	Protection device to DIN EN 61643-11 or IEC 61643-11
	Protection device to DIN EN 61643-11 or IEC 61643-11
	Protection device to DIN EN 61643-11 or IEC 61643-11











## Lightning protection zone

	Transition from LPZ 0 to LPZ 1
	Transition from LPZ 0 to LPZ 2
	Transition from LPZ 0 to LPZ 3
	Transition from LPZ 1 to LPZ 2
	Transition from LPZ 1 to LPZ 3
	Transition from LPZ 2 to LPZ 3








## Applications

	Remote signalling
	Acoustic signalling
	Integrated Service Digital Network, ISDN applications
	Digital Subscriber Line, DSL applications
	Analogue telecommunication
	Category 5 TwisterPair
	Channel Performance to American EIA/TIA standard
	Measuring, controlling and regulating systems
	TV applications
	SAT-TV applications
	MultiBase base
	LifeControl
	Intrinsically safe protection device for areas with a risk of explosions
	Channel Performance to ISO / IEC 11801
	Power over Ethernet
	230/400 V system
	Protection rating IP 54
	Protection rating IP 65








## Metals

	Aluminium
	Stainless steel, rustproof 1.4301
	Stainless steel, rustproof 1.4401
	Stainless steel, rustproof 1.4404
	Stainless steel, rustproof 1.4571
	Copper
	Brass
	Steel
	Malleable iron
	Die-cast zinc

## Plastics

	Fibre-glass-reinforced plastic
	Petrolatum
	Polyamide
	Polycarbonate
	Polyethylene
	Polypropylene
	Polystyrene

## Surfaces

	Strip galvanised
	Hot-dip galvanised
	Electrogalvanised
	Hot-dip galvanised
	Copper-plated
	Nickel-plated
	Galvanised, Deltatone 500

## Metallic materials

**Alu** — Aluminium

**VA (1.4301)** — Stainless steel, rustproof 1.4301

**VA (1.4401)** — Stainless steel, rustproof 1.4401

**VA (1.4404)** — Stainless steel, rustproof 1.4404

**VA (1.4571)** — Stainless steel, rustproof 1.4571

**Cu** — Copper

**CuZn** — Brass

**St** — Steel

**TG** — Malleable iron  
Electrogalvanised

**Zn** — Die-cast zinc



# Plastic materials

## GFK — Fibre-glass-reinforced plastic

Temperature resistance:  
minus 50 to 130 °C.

### Resistant to

High chemical resistance  
Corrosion resistance  
UV light resistance

## PETR — Petrolatum

## PA — Polyamide

Temperature resistance:  
permanently up to approx. 90 °C, briefly up to about 130 °C  
and to about minus 40 °C\*.

Chem. resistance generally as for polyethylene.

### Resistant to

Petrol, benzene, diesel oil, acetone, solvents for paints and lacquers,  
oils and greases.

### Unstable with

Bleach, most acids, chlorine.

### Risk of stress cracks

Low in air-humid conditions; only with some aqueous salt solutions.  
Highly desiccated parts (high temperature and extremely low air  
humidity) are highly sensitive to fuels and various solvents.

## PA/PE — Polyamide/polyethylene

## PC — Polycarbonate

Temperature resistance:  
permanently up to approx. 110 °C (in water 60 °C), briefly up to  
125 °C, and to below minus 35 °C.

### Resistant to

Petrol, turpentine, most weak acids.

### Unstable with

Acetone, benzene, chlorine, methylene chloride, most concentrated  
acids.

### Risk of stress cracks

Relatively low.

Media which can cause tension cracking include benzene, aromatic  
hydrocarbons, methanol, butanol, acetone, turpentine.

## PE — Polyethylene

Temperature resistance:  
hard types permanently up to about 90 °C, briefly up to about 105 °C,  
soft types permanently up to about 80 °C, briefly up to about 100 °C  
and to about minus 40 °C\*.

### Resistant to

Alkalis and inorganic acids.

### Conditionally resistant to

Acetone, organic acids, petrol, benzene, diesel oil, most oils.

### Unstable with

Chlorine, hydrocarbons, oxidising acids.

### Risk of stress cracks

Relatively high.

Stress cracks can be caused by, among other things, acetone, various  
alcohols, formic acid, ethanol, petrol, benzene, butyric acid, acetic acid,  
formaldehyde, various oils, petroleum, propanol, nitric acid,  
hydrochloric acid, sulphuric acid, soap solutions, turpentine,  
trichloroethylene, citric acid.

## PP — Polypropylene

Temperature resistance:  
permanently up to approx. 90 °C, briefly up to about 110 °C  
and to about minus 30 °C\*.

Chem. resistance generally as for polyethylene.

### Resistant to

Alkalis and inorganic acids.

### Conditionally resistant to

Acetone, organic acids, petrol, benzene, diesel oil, most oils.

### Unstable with

Chlorine, hydrocarbons, oxidising acids.

### Risk of stress cracks

Low, only with some acids such as chromic acid, hydrofluoric acid and  
hydrochloric acid, as well as nitrogen oxide.

## PS — Polystyrene

Temperature resistance:

Because of its relatively high sensitivity to the effects of chemicals, its  
use is not recommended at temperatures above normal room  
temperature, about 25 °C.

Resistance to cold: to about minus 40 °C\*.

### Resistant to

Alkalis, most acids, alcohol.

### Conditionally resistant to

Oils and greases.

### Unstable with

Butyric acid, concentrated nitric acid, concentrated acetic acid,  
acetone, ether, petrol and benzene, solvents for paints and lacquers,  
chlorine, diesel fuel.

### Risk of stress cracks

Relatively high.

Stress cracks can be caused by, amongst other things, acetone, ether,  
petrol, cyclohexane, heptane, methanol, propanol and the softeners  
used in some PVC cable mixes.

\*The minus values apply only for parts in the quiescent condition with  
no severe impact stress.

There is no plastic that is resistant to every chemical. The agents listed  
are only a small selection. Plastic parts are especially at risk in the  
presence of chemicals and high temperatures. Stress cracks may  
occur. If in doubt, please consult us and/or ask for a detailed chemical  
resistance table.

Stress crack formation: Stress cracks may occur if plastic parts under  
tension are exposed to chemicals at the same time. Parts made of  
polystyrene and polyethylene are particularly susceptible. Stress cracks  
may even be caused by agents to which the plastic in question is  
resistant in the absence of stress. Typical examples of parts under  
constant stress when used as intended: Grip clips, intermediate  
connectors of cable glands, ribbon clips.



# Tested lightning protection components

## Tightening torques

M5 = 4 Nm

M6 = 6 Nm

M8 = 12 Nm

M10 = 20 Nm

Detailed data can be provided on request.





# Brief glossary of overvoltage protection

## 100% response lightning impulse voltage

The 100% response lightning impulse voltage is the value of the lightning impulse voltage 1.2/50  $\mu$ s, causing the arrester to switch. With this testing voltage, the surge protection device must respond ten times to ten loads.

## Arrestor

Arrestors are resources, which primarily consist of voltage-dependent resistors and/or spark gaps. Both elements can be switched in series or in parallel or used individually.

Arrestors are used to protect other electrical resources and electrical systems against surge voltages.

## Arrestor measured voltage $V_c$

For arrestors without a spark gap, the measured voltage is the maximum permitted effective value of the mains voltage on the arrester terminals. The measured voltage may constantly be applied to the arrester without changing its operational characteristics.

## Back-up fuse before the arrestors

There must be a back-up fuse before the arrestors. If the upstream fuse is greater than the maximum approved back-up fuse of the arrester elements (see technical data of the device), the arrester must be protected selectively with the required value.

## Cut-off unit

The cut-off unit cuts the arrester off from the mains or the earthing system if it is overloaded, thus preventing a fire risk and also signalling the switch-off of the protection device.

## Equipotential bonding

Electrical connection, which brings the bodies of electrical resources and other conductive parts to the same or almost the same potential.

## Equipotential busbar (PAS)

A terminal or rail, intended to connect the protective conductor, the equipotential bonding conductor and, if necessary, the conductor for function earthing with the earthing cable and the earthers.

## Error current protection unit (RCD)

Resource for protection against electric shocks and fire protection (e.g. FI protection switches).

## Lightning protection equipotential bonding system

The lightning protection equipotential bonding is a key measure in reducing the risk of fire and explosion on the room or building to be protected. The lightning protection equipotential bonding is achieved using equipotential bonding cables or arrestors, which connect the external lightning protection system, metallic parts of the building or room, the installation, the other conductive parts and the electrical energy and telecommunications systems.

## Lightning protection system (LPS)

A lightning protection system (LPS) is considered as the entire system used to protect a room or building against the impact of a lightning strike. This includes both internal and external lightning protection.

## Lightning protection zone (LPZ)

Lightning protection zones are those areas in which the electromagnetic environment of the lightning is to be defined and mastered. At the zone transitions, all cables and metallic parts must be integrated into the equipotential bonding system.

## Lightning surge current (Iimp)

A lightning surge current (lightning current carrying capacity per path) is a standardised surge current curve of the shape 10/350  $\mu$ s. With its parameters

- Peak value
- Charge
- Specific energy

it represents the load from natural lightning currents. Type 1 lightning current arrestors (previously requirement class B) must be able to arrest such lightning currents without being destroyed.

## Line follow current quenching (If)

The follow current – also called network follow current – is the current which flows through the surge protection device after an arresting operation and is supplied by the network. The follow current is considerably different from the continuous operating current. The level of the network follow current is dependent on the feed line from the transformer to the arrester.

## Nominal current (In)

The nominal current is the maximum permitted operating current which may be run continually through the appropriately labelled connection terminals.

## Nominal discharge surge current (In)

Peak value of the current flowing through the arrester with the wave shape 8/20. It is used to classify the testing of surge arrestors of type 2 (formerly requirements Class C).

## Nominal frequency (fn)

The nominal frequency is that frequency for which a resource is measured, by which it is called and upon which other nominal parameters refer.

## Nominal voltage (Vn)

The rated voltage is the voltage value for which a resource is designed. In so doing it might be a direct voltage value or the effective value of a sine-form alternating voltage.

## Surge protection device (SPD)

A device intended for the limitation of transient surge voltages and arresting of surge voltages. It contains at least one non-linear construction element. In general speech, surge protection devices are also termed arrestors.

## Protection level (Up)

The protection level is the highest current voltage value on the terminals of the surge protection device before response.

## Residual voltage (Vres)

The peak voltage value, occurring via the terminals of the surge protection device during or immediately after the arresting surge current has flowed.

## Short-circuit resistance

The surge protection device must be able to conduct the short-circuit current, until it is either interrupted by the device itself or by an internal or external cut-off unit or by mains-side over-current protection (e.g. back-up fuse).

## Response time (ta)

The response time primarily characterises the response behaviour of the individual protection elements used in arrestors. Depending on the slope  $du/dt$  of the surge voltage or  $di/dt$  of the surge current, the response times may vary within specific limits.

## SPD

Surge protection device.

## Surge arrester, type 1

Arrestors, which, due to their special structure, are able to arrest lightning currents or partial lightning currents during direct strikes.

## Surge arrester, type 2

Arrestors, which are able to arrest surged voltages caused by remote or nearby strikes or switching actions.

## Surge arrester, type 3

Arrestors, used for surge protection of individual consumers or consumer groups and are employed directly on sockets.

## Surge voltage

A surge voltage is a voltage occurring briefly between conductors or between a conductor and the earth, which exceeds the highest permissible operating voltage value by a long way, but does not have the operating frequency. It can be created by storms or by earthing or shortcircuits.

## Temperature range

The operating temperature specifies within which temperature limits the perfect function of the surge protection device is guaranteed.

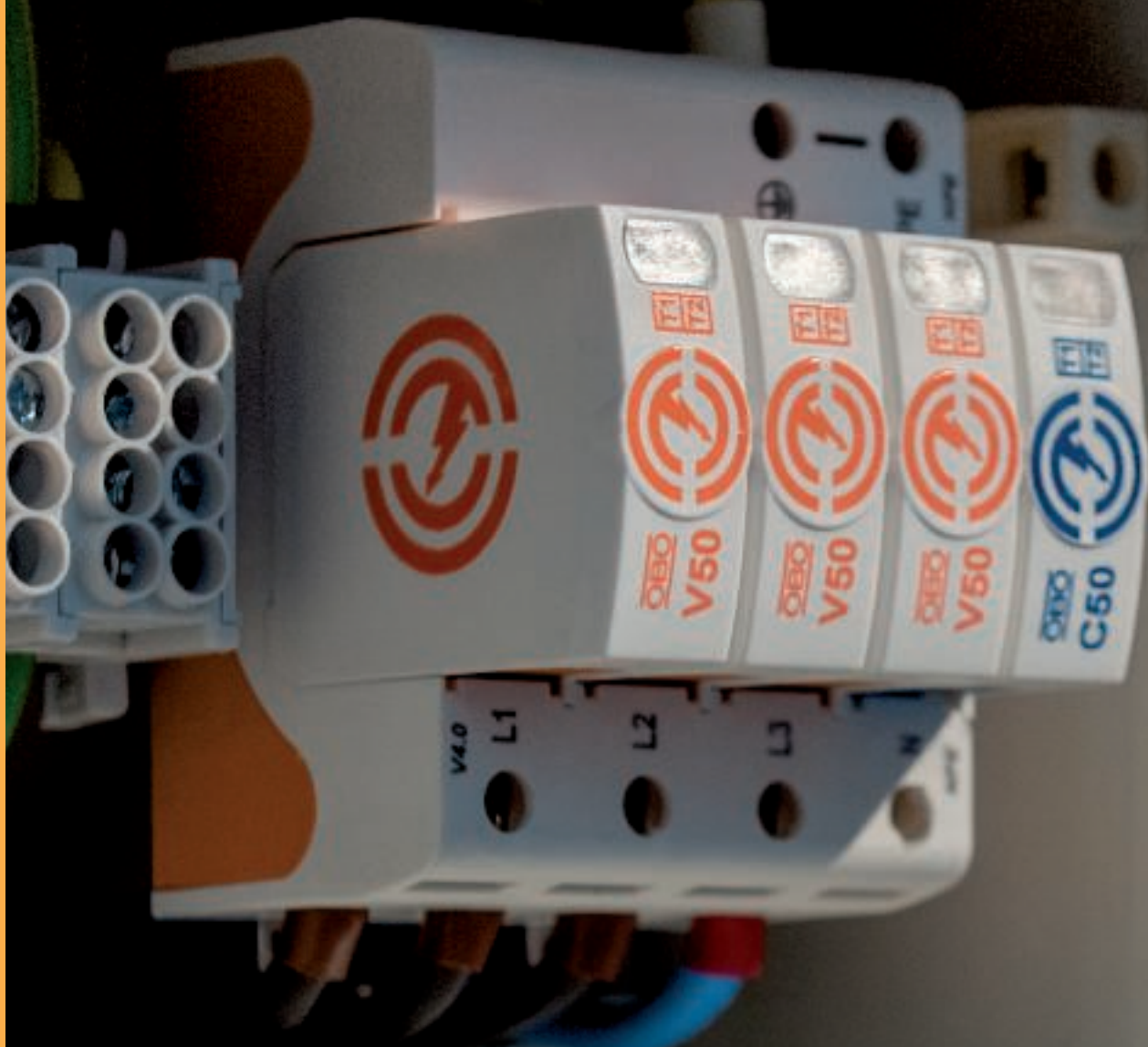
## Transmission frequency (fg)

The transmission frequency specifies up to which frequency the insertion damping of the employed resource is less than 3 dB.

## Volume resistance per path, series resistance

The volume resistance per path specifies the ohmic resistance increase of the conductor path per wire caused by the use of the surge protection device.





Diese Anlage ist mit  
Überspannungsschutzgeräten  
ausgerüstet.

Bei Isolationsmessungen bitte die OBO  
Schutzmodule herausziehen bzw.  
abklemmen.

System contains overvoltage protection  
devices. Please remove or disconnect the  
OBO protectors during isolation tests.

**OBO**  
BETTERMANN

Mod. 44 41002 00003

## Surge protection energy technology, arrester, type 1+2

	<b>Combination arrester MCF Compact</b>	100
	<b>MCD combination arrester</b>	108
	<b>V50 combination arrester</b>	115
	<b>Accessories, upper parts and bases</b>	134



## Lightning Controller Compact - MCF100



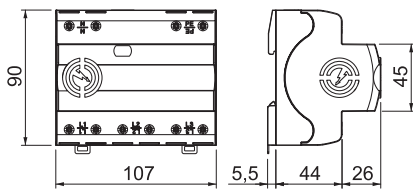
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF100-3+NPE+FS</b>	255	3+N/PE	IP20	1	93.500	<b>5096987</b>

Combination arrester, lightning current and surge arrester, type 1+2

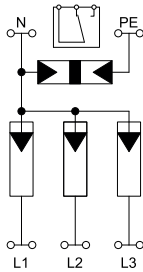
- Protection level  $\leq 1.5$  kV
- For lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity up to 100 kA (10/350), 3+NPE
- Line following current quenching 50 kA I<sub>peak</sub>, arrester backup fuse to 315 A gL/gG
- Fulfills the requirements of VDE-AR-N 4100 for use in pre-meter area
- Encapsulated, non-extinguishing spark gap arrester for use in distributor housings

Application: Industrial systems and buildings with external lightning protection of the highest class I to IV.

## Dimensions



## Connection options



## MCF100-3+NPE+FS

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	U <sub>n</sub> 230 V
Maximum continuous voltage AC	U <sub>c</sub> 255 V
Nominal discharge current (8/20 $\mu$ s)	I <sub>n</sub> / I <sub>N</sub> 35 kA
Maximum discharge current (8/20 $\mu$ s)	I <sub>max</sub> 50 kA
Lightning surge current (10/350 $\mu$ s)	I <sub>imp</sub> 25 kA
Lightning surge current (10/350)	I <sub>total</sub> 100 kA
Arrester surge current (8/20 $\mu$ s) [total]	I <sub>total</sub> 100 kA
Protection level [L-N]	U <sub>n</sub> 1.5 kV
Max. mains-side overcurrent protection	315 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	T <sub>n</sub> -40 - +80 °C
Protection rating	IP20
Approvals	VDE, UL
Conductor cross-section, flexible (fine-wire)	1.5 - 25 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 3 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Lightning Controller Compact - MCF75



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF75-3+FS</b>	255	3	IP20	1	75.000	<b>5096981</b>

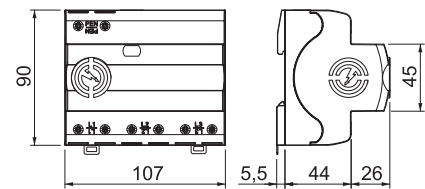
Combination arrester, lightning current and surge arrester, type 1+2

- Protection level  $\leq 1.5$  kV
- For lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity to 75 kA (10/350), 3-pole
- Line following current quenching 50 kA  $I_{peak}$ , arrester backup fuse to 315 A gL/gG
- Fulfills the requirements of VDE-AR-N 4100 for use in pre-meter area
- Encapsulated, non-extinguishing spark gap arrester for use in distributor housings

Application: Industrial systems and buildings with external lightning protection of the highest class I to IV.



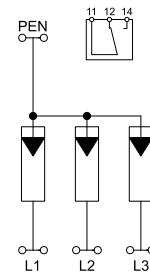
## Dimensions



## MCF75-3+FS

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_C$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{-N}$ 35 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 25 kA
Lightning surge current (10/350)	$I_{total}$ 75 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 75 kA
Combined voltage protection level [L-PEN]	$U_{n / L-PEN}$ 1.5 kV
Max. mains-side overcurrent protection	315 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_v$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE, UL
Conductor cross-section, flexible (fine-wire)	1.5 - 25 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 3 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Connection options



## LightningController - MCF25-NAR-TNC



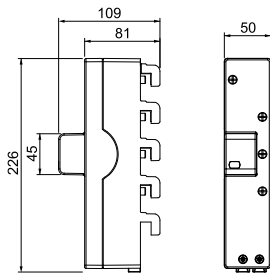
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF25-NAR-TNC</b>	255	3	IP20	1	100.800	<b>5096950</b>
<b>MCF25-NAR-TNC+FS</b>	255	3	IP20	1	102.000	<b>5096953</b>

Combination arrester, type 1+2, for mounting on 40 mm bus bars, for TN-C systems

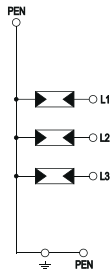
- Protection level  $\leq 1.5$  kV to protect the terminals
- Lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity up to 25 kA (10/350) 3-pole
- Fulfils the requirements of VDE 0100-534 (IEC 60364-5-53)
- Line follow current quenching up to 50 kA and max. backup fuse up to 160 A gL/gG
- Spark gaps for use in the pre-meter area according to VDE-AR-N 4100

Application: Building with outside cable infeed.

### Dimensions



### Connection options



#### MCF25-NAR-TNC

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 8.5 kA
Lightning surge current (10/350)	$I_{total}$ 25 kA
Arrestor surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Combined voltage protection level [L-PEN]	$U_n / L-PEN$ 1.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / L-N, 120 \text{ min}$ 442 V
Max. mains-side overcurrent protection	160 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE
Conductor cross-section, flexible (fine-wire)	10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	10 - 35 mm <sup>2</sup>

#### MCF25-NAR-TNC+FS

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 8.5 kA
Lightning surge current (10/350)	$I_{total}$ 25 kA
Arrestor surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Combined voltage protection level [L-PEN]	$U_n / L-PFN$ 1.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / L-N, 120 \text{ min}$ 442 V
Max. mains-side overcurrent protection	160 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE
Conductor cross-section, flexible (fine-wire)	10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	10 - 35 mm <sup>2</sup>
FM contacts	Changeover
Switching power AC	250V/ 2A
Switching power DC	250V/ 0,1A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>



## LightningController - MCF30-NAR-TT



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF30-NAR-TT</b>	255	3+N/PE	IP20	1	107.504	<b>5096961</b>
<b>MCF30-NAR-TT+FS</b>	255	3+N/PE	IP20	1	107.600	<b>5096963</b>

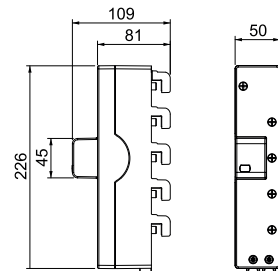
Combination arrester, type 1+2, for mounting on 40 mm bus bars, for TN-S and TT systems

- Protection level  $\leq 1.5$  kV to protect the terminals
- Lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity up to 30 kA (10/350) 3+NPE
- Fulfills the requirements of VDE 0100-534 (IEC 60364-5-53)
- Line follow current quenching up to 50 kA and max. backup fuse up to 160 A gL/gG
- Spark gaps for use in the pre-meter area according to VDE-AR-N 4100

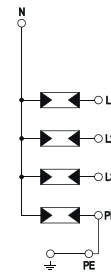
Application: Building with outside cable infeed.



### Dimensions



### Connection options



### MCF30-NAR-TT

SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$	230 V
Maximum continuous voltage AC	$U_c$	255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$	7.5 kA
Lightning surge current (10/350)	$I_{total}$	30 kA
Arrestor surge current (8/20 $\mu$ s) [total]	$I_{total}$	80 kA
Protection level [L-N]	$U_o$	1.5 kV
Protection level [N-PE]	$U_o / N-PE$	1.5 kV
Combined voltage protection level [L-PE]	$U_o / L-PE$	2.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / L-N, 120 \text{ min}$	442 V
TOV voltage [N-PE] – withstand mode – 200 ms	$U_T / N-PE, 200 \text{ ms}$	1200 V
Max. mains-side overcurrent protection		160 A
Short-circuit withstand for max. mains-side overcurrent protection		50 kA eff
Operating temperature range	$T_u$	-40 - +80 °C
Protection rating		IP20
Approvals		VDE
Conductor cross-section, flexible (fine-wire)		10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)		10 - 35 mm <sup>2</sup>

### MCF30-NAR-TT+FS

SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$	230 V
Maximum continuous voltage AC	$U_c$	255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$	7.5 kA
Lightning surge current (10/350)	$I_{total}$	30 kA
Arrestor surge current (8/20 $\mu$ s) [total]	$I_{total}$	80 kA
Protection level [L-N]	$U_o$	1.5 kV
Protection level [N-PE]	$U_o / N-PE$	1.5 kV
Combined voltage protection level [L-PE]	$U_o / L-PE$	2.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / L-N, 120 \text{ min}$	442 V
TOV voltage [N-PE] – withstand mode – 200 ms	$U_T / N-PE, 200 \text{ ms}$	1200 V
Max. mains-side overcurrent protection		160 A
Short-circuit withstand for max. mains-side overcurrent protection		50 kA eff
Operating temperature range	$T_u$	-40 - +80 °C
Protection rating		IP20
Approvals		VDE
Conductor cross-section, flexible (fine-wire)		10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)		10 - 35 mm <sup>2</sup>
FM contacts		Changeover
Switching power AC		250V/ 2A
Switching power DC		250V/ 0,1A
Connection cross-section, FM terminals		0,5 - 1,5 mm <sup>2</sup>



## LightningController - MCF38-NAR-TNC



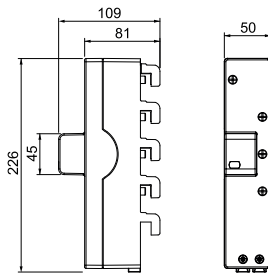
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF38-NAR-TNC</b>	255	3	IP20	1	100.800	<b>5096971</b>
<b>MCF38-NAR-TNC+FS</b>	255	3	IP20	1	102.000	<b>5096973</b>

Combination arrester, type 1+2, for mounting on 40 mm bus bars, for TN-C systems

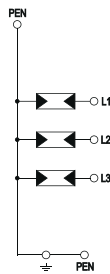
- Protection level  $\leq 1.5$  kV to protect the terminals
- Lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity up to 38 kA (10/350) 3-pole
- Fulfils the requirements of VDE 0100-534 (IEC 60364-5-53)
- Line follow current quenching up to 50 kA and max. backup fuse up to 160 A gL/gG
- Spark gaps for use in the pre-meter area according to VDE-AR-N 4100

Application: Building with lightning protection or outside cable infeed.

### Dimensions



### Connection options



#### MCF38-NAR-TNC

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 38 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Combined voltage protection level [L-PEN]	$U_n / L-PEN$ 1.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / L-N, 120 \text{ min}$ 442 V
Max. mains-side overcurrent protection	160 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE
Conductor cross-section, flexible (fine-wire)	10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	10 - 35 mm <sup>2</sup>

#### MCF38-NAR-TNC+FS

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 38 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Combined voltage protection level [L-PEN]	$U_n / L-PFN$ 1.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / L-N, 120 \text{ min}$ 442 V
Max. mains-side overcurrent protection	160 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE
Conductor cross-section, flexible (fine-wire)	10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	10 - 35 mm <sup>2</sup>
FM contacts	Changeover
Switching power AC	250V/ 2A
Switching power DC	250V/ 0,1A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>



LightningController - MCF50-NAR-TT



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF50-NAR-TT</b>	255	3+N/PE	IP20	1	106.700	<b>5096975</b>
<b>MCF50-NAR-TT+FS</b>	255	3+N/PE	IP20	1	107.500	<b>5096977</b>

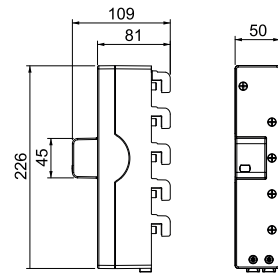
Combination arrester, type 1+2, for mounting on 40 mm bus bars, for TN-S and TT systems

- Protection level  $\leq 1.5$  kV to protect the terminals
- Lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity up to 50 kA (10/350) 3+NPE
- Fulfils the requirements of VDE 0100-534 (IEC 60364-5-53)
- Line follow current quenching up to 50 kA and max. backup fuse up to 160 A gL/gG
- Spark gaps for use in the pre-meter area according to VDE-AR-N 4100

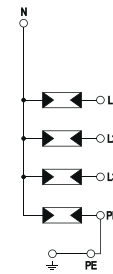
Application: Building with lightning protection or outside cable infeed.



Dimensions



Connection options



**MCF50-NAR-TT**

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_C$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 50 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 1.5 kV
Protection level [N-PE]	$U_o / N-PE$ 1.5 kV
Combined voltage protection level [L-PE]	$U_o / L-PE$ 2.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / I-N, 120 \text{ min}$ 442 V
TOV voltage [N-PE] – withstand mode – 200 ms	$U_L / N-PE, 200 \text{ ms}$ 1200 V
Max. mains-side overcurrent protection	160 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_u$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE
Conductor cross-section, flexible (fine-wire)	10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	10 - 35 mm <sup>2</sup>

**MCF50-NAR-TT+FS**

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_C$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 50 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 1.5 kV
Protection level [N-PE]	$U_o / N-PE$ 1.5 kV
Combined voltage protection level [L-PE]	$U_o / L-PE$ 2.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / I-N, 120 \text{ min}$ 442 V
TOV voltage [N-PE] – withstand mode – 200 ms	$U_L / N-PE, 200 \text{ ms}$ 1200 V
Max. mains-side overcurrent protection	160 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE
Conductor cross-section, flexible (fine-wire)	10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	10 - 35 mm <sup>2</sup>
FM contacts	Changeover
Switching power AC	250V/ 2A
Switching power DC	250V/ 0,1A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>



## LightningController – MCF75-NAR-TNC



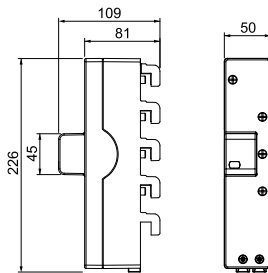
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF75-NAR-TNC</b>	255	3	IP20	1	100.800	<b>5096982</b>
<b>MCF75-NAR-TNC+FS</b>	255	3	IP20	1	102.000	<b>5096983</b>

Combination arrester, type 1+2, for mounting on 40 mm bus bars, for TN-C systems

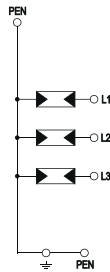
- Protection level  $\leq 1.5$  kV to protect the terminals
- Lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity up to 75 kA (10/350) 3-pole
- Fulfils the requirements of VDE 0100-534 (IEC 60364-5-53)
- Line follow current quenching up to 50 kA and max. backup fuse up to 315 A gL/gG
- Spark gaps for use in the pre-meter area according to VDE-AR-N 4100

Application: Building with lightning protection or outside cable infeed.

### Dimensions



### Connection options



#### MCF75-NAR-TNC

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$ 25 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 25 kA
Lightning surge current (10/350)	$I_{total}$ 75 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 75 kA
Combined voltage protection level [L-PEN]	$U_n / L-PEN$ 1.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / L-N, 120 \text{ min}$ 442 V
Max. mains-side overcurrent protection	315 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE
Conductor cross-section, flexible (fine-wire)	10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	10 - 35 mm <sup>2</sup>

#### MCF75-NAR-TNC+FS

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 255 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$ 25 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 25 kA
Lightning surge current (10/350)	$I_{total}$ 75 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 75 kA
Combined voltage protection level [L-PEN]	$U_n / L-PFN$ 1.5 kV
TOV voltage [L-N] – fail safe mode – 120 min.	$U_T / L-N, 120 \text{ min}$ 442 V
Max. mains-side overcurrent protection	315 A
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	VDE
Conductor cross-section, flexible (fine-wire)	10 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	10 - 35 mm <sup>2</sup>
FM contacts	Changeover
Switching power AC	250V/ 2A
Switching power DC	250V/ 0,1A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>

Voltage tap for MCF-NAR series



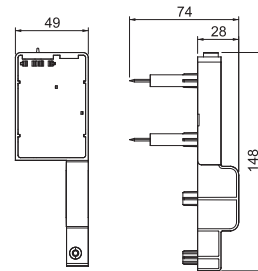
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF-NAR-SMG</b>	—	—	IP20	1	5.850	<b>5096900</b>

Adapter for voltage tap in power-side connection compartment

- Simple and space-saving voltage taps for the termination point meter position (APZ) and the space for additional applications (RfZ)
- With spring contacts for easy connection of wires
- Includes 2 plug sockets
- Safety screw to prevent unwanted loosening
- Replaceable 5 A fine-wire fuse with a breaking capacity of 50 kA
- Fuse holder 6.3 x 32 mm



Dimensions



Connection options

**MCF-NAR-SMG**

Nominal voltage AC (50/60 Hz)	$U_n$	230 V
Nominal frequency	f	50 Hz
Operating temperature range	$T_u$	-40 - +80 °C
Protection rating		IP20
Conductor cross-section, flexible (fine-wire)		0.75 - 2.5 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)		0.75 - 2.5 mm <sup>2</sup>



Combination arrester, 3-pole + NPE



Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
MCD 50-B 3+1	255	3 + NPE	1	168.000	5096879

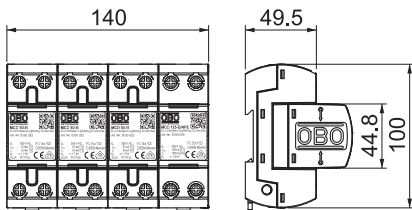
Combination arrester, type 1+2, 4-pole, for use in TT and TN-S networks.

Completely pre-terminated and ready for connection, consisting of:  
 3x MCD 50-B: Coordinated lightning current arrester, type 1+2 to EN 61643-11 and  
 1x MCD 125-B/NPE: Coordinated N-PE spark gap, type 1+2 to EN 61643-11. For interface 0 to 2 (LPZ) in accordance with lightning protection zone concept to IEC 61312-1 and/or VDE 0185-305.

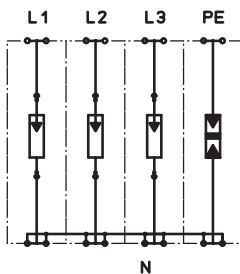
- Lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity to 50 kA (10/350) per pole and up to 125 kA (10/350) in total
- Protection level < 1.7 kV allows device protection
- Short-circuit resistance 10 kA, arrester backup fuse to 500 A gL/gG
- Suitable for use in pre-meter area according to VDE-AR-N 4100
- Encapsulated, non-extinguishing spark gaps

Application: Industrial systems and buildings with external lightning protection of the classes I to IV.

Dimensions



Connection options



MCD 50-B 3+1

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class II
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	$I_{imp}$	50 kA
Lightning surge current (10/350)	$I_{total}$	125 kA
Nominal discharge current (8/20)	$I_n$	50 kA
Arrester surge current (8/20) [total]	$I_{total 8/20}$	125 kA
Protection level	$U_D$	< 1,7 kV
Protection level (N-PE)		< 1,5 kV
Response time	$t_A$	<100 ns
Follow current quenching capacity leff	$I_{fi eff}$	10 kA
Follow current quenching capacity (eff) [N-PE]	$I_{fi}$	0.1 kA
Maximum back-up fuse		500 A
Temperature range	$\vartheta$	-40 - +85 °C
Division unit TE (17.5 mm)		8
Protection rating		IP20
Approvals		VDE
Connection cross-section, rigid		10 - 50 mm <sup>2</sup>
Connection cross-section, multi-wire		10 - 35 mm <sup>2</sup>
Connection cross-section, flexible		10 - 25 mm <sup>2</sup>

Combination arrester, 3-pole + NPE with function display



Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCD 50-B 3+1-OS</b>	255	3 + NPE	1	172.000	<b>5096836</b>

Combination arrester, type 1+2, 4-pole, with visual function display, for use in TN-S and TT networks.

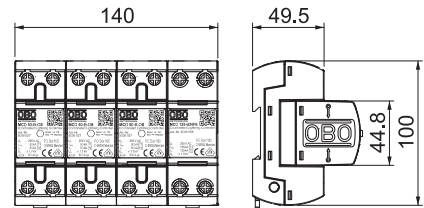
Completely pre-terminated and ready for connection, consisting of:  
 3x MCD 50-B\_OS: Type 1+2 (Class B) coordinated lightning current arrester EN 61643-11.  
 1x MCD 125-B/NPE: Coordinated N-PE spark gap, type 1+2 EN 61643-11 for use in TN-S and TT systems.  
 Interface 0 to 1 according to lightning protection zone concept according to IEC 61312-1 and VDE 0185-305.

- Lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity to 50 kA (10/350) per pole and up to 125 kA (10/350) in total
- Protection level < 1.7 kV allows device protection
- Short-circuit resistance 10 kA, arrester backup fuse to 500 A gL/gG
- Power consumption < 26 mW/pole
- Encapsulated, non-extinguishing spark gap

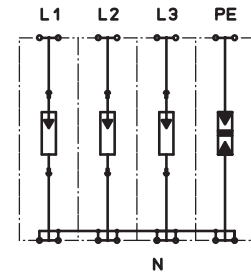
Application: Industrial systems and buildings with external lightning protection of Classes I to IV.



Dimensions



Connection options



**MCD 50-B 3+1-OS**

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	$I_{imp}$	50 kA
Lightning surge current (10/350)	$I_{total}$	125 kA
Nominal discharge current (8/20)	$I_n$	50 kA
Arrester surge current (8/20) [total]	$I_{Total 8/20}$	125 kA
Protection level	$U_p$	< 1,7 kV
Protection level (N-PE)		< 1,5 kV
Response time	$t_A$	<100 ns
Follow current quenching capacity leff	$I_{n eff}$	10 kA
Follow current quenching capacity (eff) [N-PE]	$I_n$	0.1 kA
Maximum back-up fuse		500 A
Temperature range	$\vartheta$	-40 - +85 °C
Division unit TE (17.5 mm)		8
Protection rating		IP20
Approvals		VDE
Connection cross-section, rigid		10 - 50 mm <sup>2</sup>
Connection cross-section, multi-wire		10 - 35 mm <sup>2</sup>
Connection cross-section, flexible		10 - 25 mm <sup>2</sup>



Combination arrester, 1-pole

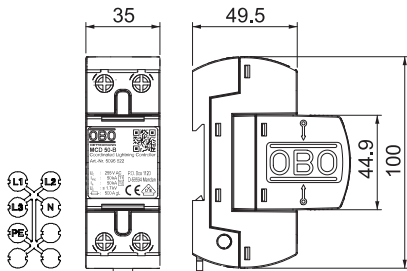


Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
MCD 50-B	255	1-pole	1	34.400	5096849

Combination arrester, type 1+2, for use in TN and TT networks

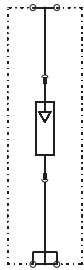
- Lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity to 50 kA (10/350) per pole and up to 150 kA (10/350) in total
- Protection level < 1.7 kV allows device protection
- Short-circuit resistance 10 kA, arrester backup fuse to 500 A gL/gG
- Suitable for use in pre-meter area
- Encapsulated, non-extinguishing spark gaps

Dimensions



Application: Industrial systems and buildings with external lightning protection of the highest class I to IV.

Connection options



MCD 50-B

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_c$	255 V
SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Lightning protection zone LPZ		0-2
Impulse discharge current (10/350)	$I_{imp}$	50 kA
Lightning surge current (10/350)	$I_{total}$	50 kA
Nominal discharge current (8/20)	$I_n$	50 kA
Arrester surge current (8/20) [total]	$I_{Total 8/20}$	50 kA
Protection level	$U_p$	< 1,7 kV
Response time	$t_A$	<100 ns
Follow current quenching capacity left	$I_{fl\ off}$	10 kA
Maximum back-up fuse		500 A
Temperature range	$\vartheta$	-40 - +85 °C
Division unit TE (17.5 mm)		2
Protection rating		IP20
Approvals		VDE
Connection cross-section, rigid		10 - 50 mm <sup>2</sup>
Connection cross-section, multi-wire		10 - 35 mm <sup>2</sup>
Connection cross-section, flexible		10 - 25 mm <sup>2</sup>

Combination arrester, 1-pole with function display



Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCD 50-B-OS</b>	255	1-pole	1	34.800	<b>5096852</b>

Combination arrester, type 1+2, 1-pole, for use in TN and TT networks:

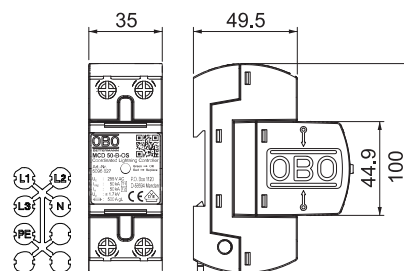
MCD 50-B-OS: Coordinated lightning current arrester, type 1+2 to EN 61643-11 with visual function display. For interface 0 to 2 (LPZ) in accordance with lightning protection zone concept to IEC 61312-1 and/or DIN VDE 0185-305.

- Arresting capacity 50 kA (10/350 μs) per pole
- Power consumption < 26 mW/pole
- Protection level < 1.7 kV, allows device protection
- Line follow current quenching 25 kA Ipeak
- Incl. plug caps for labelling the connections
- Encapsulated, non-extinguishing spark gap
- Can be used in standard distributor housings.

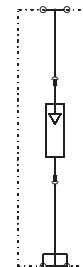
Application: Compact surge protection concepts and installations in a distributor.



Dimensions



Connection options



MCD 50-B-OS

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_c$	255 V
SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	$I_{imp}$	50 kA
Lightning surge current (10/350)	$I_{total}$	50 kA
Nominal discharge current (8/20)	$I_n$	50 kA
Arrester surge current (8/20) [total]	$I_{Total 8/20}$	50 kA
Protection level	$U_p$	< 1,7 kV
Response time	$t_A$	<100 ns
Follow current quenching capacity Ieff	$I_{fi\ eff}$	10 kA
Maximum back-up fuse		500 A
Temperature range	$\vartheta$	-40 - +85 °C
Division unit TE (17.5 mm)		2
Protection rating		IP20
Approvals		VDE
Connection cross-section, rigid		10 - 50 mm <sup>2</sup>
Connection cross-section, multi-wire		10 - 35 mm <sup>2</sup>
Connection cross-section, flexible		10 - 25 mm <sup>2</sup>



## Combination arrester, 1-pole NPE



Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCD 125-B NPE</b>	255	NPE	1	46.500	<b>5096865</b>

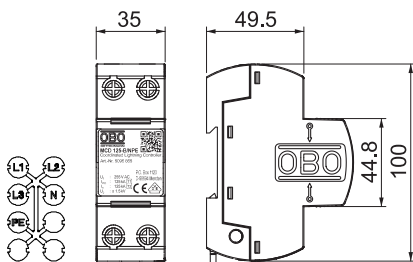
Combination arrester, type 1+2, N+PE for use in TN-S and TT networks.

MCD 125-B/NPE: Coordinated N-PE spark gap, type 1+2 to EN 61643-11. For interface 0 to 2 (LPZ) in accordance with lightning protection zone concept to IEC 61312-1 and/or VDE 0185-305.

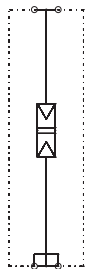
- Arresting capacity 125 kA (10/350  $\mu$ s)
- Conforms to VDE-AR-N 4100
- Incl. plug caps for labelling the connections
- Protection level < 1.5 kV, allows device protection
- Encapsulated, non-extinguishing spark gap

Application: Industrial systems and buildings with external lightning protection of Classes I to IV.

### Dimensions



### Connection options



### MCD 125-B NPE

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	$I_{imp}$	125 kA
Lightning surge current (10/350)	$I_{total}$	125 kA
Nominal discharge current (8/20)	$I_n$	125 kA
Arrestor surge current (8/20) [total]	$I_{total\ 8/20}$	125 kA
Protection level (N-PE)		< 1,5 kV
Response time	$t_A$	<100 ns
Follow current quenching capacity (eff) [N-PE]	$I_{fi}$	0.1 kA
Temperature range	$\vartheta$	-40 - +85 °C
Division unit TE (17.5 mm)		2
Protection rating		IP20
Approvals		VDE
Connection cross-section, rigid		10 - 50 mm <sup>2</sup>
Connection cross-section, multi-wire		10 - 35 mm <sup>2</sup>
Connection cross-section, flexible		10 - 25 mm <sup>2</sup>



Protection set PS 2-B+C TNC



Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
PS 2-B+C TNC	255	2-pole	1	105.800	5089736
PS 2-B+C TNC+FS	255	2-pole	1	106.300	5089738

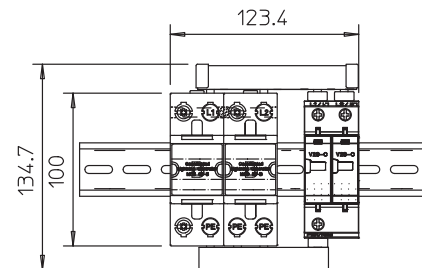


Protection set, lightning and surge arrester combination, type 1+2

- For lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity to 50 kA (10/350) per pole
- Arrester, connectable, including connecting bridges, labelled connection terminals
- Encapsulated, non-extinguishing arrester for use in distributor housings

Application: Mobile telecommunications systems and industrial systems with special requirements.

Dimensions



Connection options

PS 2-B+C TNC

Nominal voltage	$U_N$	230 V
SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	$I_{imp}$	50 kA
Lightning surge current (10/350)	$I_{total}$	100 kA
Nominal discharge current (8/20)	$I_n$	50 kA
Arrester surge current (8/20) [total]	$I_{Total 8/20}$	100 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	100 kA
Protection level	$U_p$	1,3 kV
Response time	$t_A$	<25 ns
Maximum back-up fuse		500 A
Temperature range	$\vartheta$	-40 - +85 °C
Division unit TE (17.5 mm)		7
Protection rating		IP20
Connection cross-section, rigid		10 - 50 mm <sup>2</sup>
Connection cross-section, multi-wire		10 - 35 mm <sup>2</sup>
Connection cross-section, flexible		10 - 25 mm <sup>2</sup>

PS 2-B+C TNC+FS

Nominal voltage	$U_N$	230 V
SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	$I_{imp}$	50 kA
Lightning surge current (10/350)	$I_{total}$	100 kA
Nominal discharge current (8/20)	$I_n$	50 kA
Arrester surge current (8/20) [total]	$I_{Total 8/20}$	100 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	100 kA
Protection level	$U_p$	1,3 kV
Response time	$t_A$	<25 ns
Maximum back-up fuse		500 A
Temperature range	$\vartheta$	-40 - +85 °C
Division unit TE (17.5 mm)		7
Protection rating		IP20
Connection cross-section, rigid		10 - 50 mm <sup>2</sup>
Connection cross-section, multi-wire		10 - 35 mm <sup>2</sup>
Connection cross-section, flexible		10 - 25 mm <sup>2</sup>





## MCD accessories, upper parts and bases

## Coordinated Lightning Controller, plug-in arrester



Type	Highest continuous voltage		Pack Piece	Weight kg/100 pc.	Item no.
	V	Version			
<b>MCD 50-B 0</b>	255	1-pole	1	19.200	<b>5096822</b>

Combination arrester, lightning current arrester, type 1+2, upper part.

- Protection level < 1.7 kV, allows device protection
- Line current quenching capacity 10 kA
- Encapsulated, non-extinguishing spark gap

Application: Industrial systems and buildings with external lightning protection of Classes I to IV.

## Coordinated Lightning Controller, plug-in arrester with function display



Type	Highest continuous voltage		Pack Piece	Weight kg/100 pc.	Item no.
	V	Version			
<b>MCD 50-B 0-OS</b>	255	1-pole	1	19.500	<b>5096827</b>

Combination arrester, type 1+2, plug-in arrester with visual display.

- Lightning current arresting capacity 50 kA (10/350)
- Power consumption < 26 mW/pole
- Protection level < 1.7 kV
- Line current quenching capacity 10 kA
- Encapsulated, non-extinguishing spark gap

Application: Installations of surge protection devices, type 1+2, in a distribution.

Combination arrester V50, 1-pole 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>V50-1-150</b>	150	1	IP20	1	15.400	<b>5093440</b>

PA Polyamide

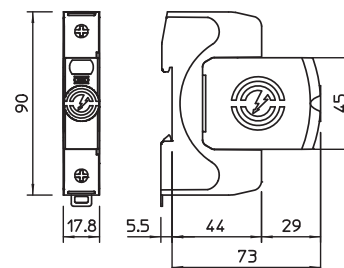
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.



Dimensions



Connection options



V50-1-150

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Protection level [L-N]	$U_p$ 0.8 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.4 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.5 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50 in 150 V, type 1+2

## Combination arrester V50, with RS, 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-1+FS-150</b>	150	1	IP20	1	15.600	<b>5093446</b>

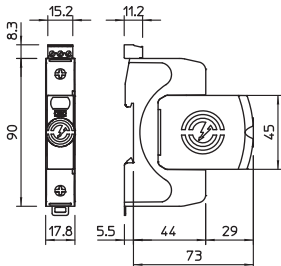
PA Polyamide

Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.

### Dimensions



### Connection options



### V50-1+FS-150

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Protection level [L-N]	$U_p$ 0.8 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.4 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.5 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50, 3-pole 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-3-150</b>	150	3	IP20	1	43.500	<b>5093442</b>

PA Polyamide

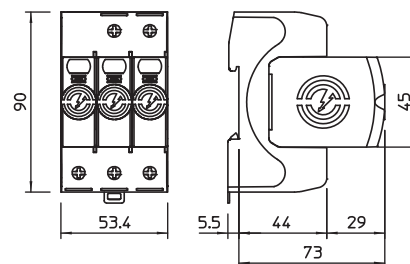
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

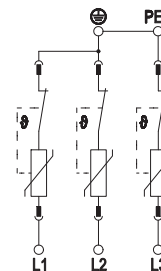
Application: Lightning current equipotential bonding for buildings of class III and IV.



### Dimensions



### Connection options



### V50-3-150

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 37.5 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_n$ 0.8 kV
Residual voltage [L-N] @ 1 kA	$U_{RES}$ 0.4 kV
Residual voltage [L-N] @ 5 kA	$U_{RES}$ 0.5 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{st}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50 in 150 V, type 1+2

## Combination arrester V50, 3-pole with FS 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-3+FS-150</b>	150	3	IP20	1	43.900	<b>5093448</b>

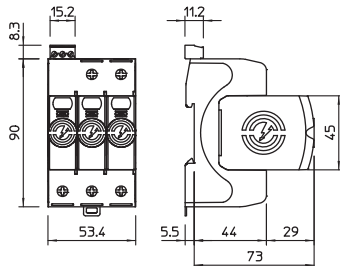
PA Polyamide

Lightning current combination arrester, type 1+2

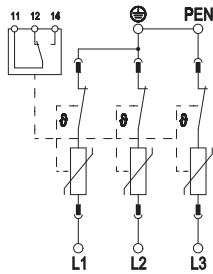
- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.

### Dimensions



### Connection options



### V50-3+FS-150

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 37.5 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_n$ 0.8 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.4 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.5 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0.5 A
Switching power DC	230 V; 0.1 A / 75 V; 0.5 A
Connection cross-section, FM terminals	0.5 - 1.5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Combination arrester V50, 1-pole + NPE 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-1+NPE-150</b>	150	1+N/PE	IP20	1	29.300	<b>5093452</b>

PA Polyamide

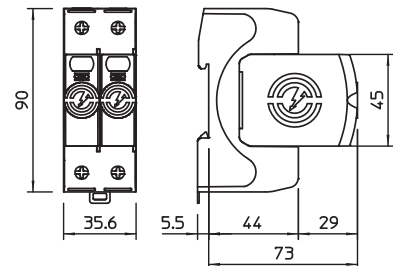
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.



Dimensions



Connection options



V50-1+NPE-150

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 25 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 0.8 kV
Combined voltage protection level [L-PE]	$U_n / I_{-PE}$ 2.1 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,4 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,5 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{II}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50 in 150 V with NPE, type 1+2

## Combination arrester V50, 1-pole + NPE with FS 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-1+NPE+FS-150</b>	150	1+N/PE	IP20	1	29.600	<b>5093460</b>

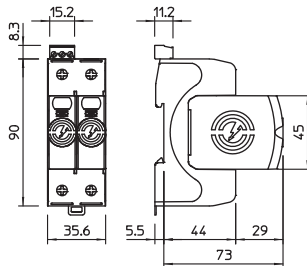
PA Polyamide

Lightning current combination arrester, type 1+2

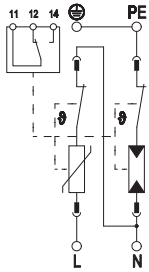
- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.

### Dimensions



### Connection options



### V50-1+NPE+FS-150

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Protection level [L-N]	$U_p$ 0.8 kV
Combined voltage protection level [L-PE]	$U_{p / L-PE}$ 2.1 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.4 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.5 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



Combination arrester V50, 3-pole + NPE 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-3+NPE-150</b>	150	3+N/PE	IP20	1	55.800	<b>5093454</b>

PA Polyamide

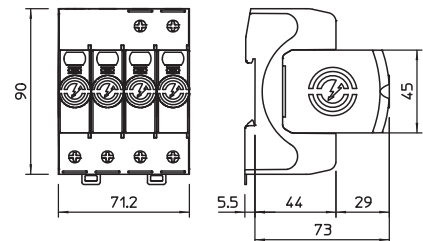
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

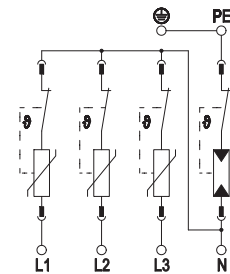
Application: Lightning current equipotential bonding for buildings of class III and IV.



Dimensions



Connection options



V50-3+NPE-150

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 50 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 0.8 kV
Combined voltage protection level [L-PE]	$U_n / I_{-PE}$ 2.1 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,4 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,5 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{II}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



Combination arrester V50, 3-pole + NPE with FS 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-3+NPE+FS-150</b>	150	3+N/PE	IP20	1	56.300	<b>5093462</b>

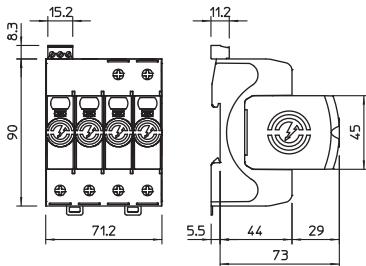
PA Polyamide

Lightning current combination arrester, type 1+2

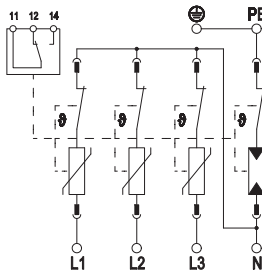
- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.

Dimensions



Connection options



V50-3+NPE+FS-150

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 50 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 0.8 kV
Combined voltage protection level [L-PE]	$U_n / I_{n-PF}$ 2.1 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.4 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.5 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Combination arrester V50, 1-pole 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>V50-1-280</b>	280	1	IP20	1	16.400	<b>5093500</b>

PA Polyamide

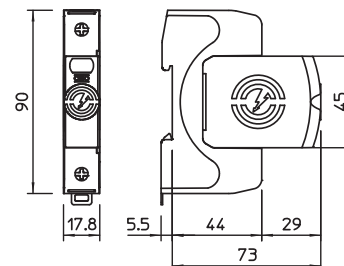
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.



Dimensions



Connection options



V50-1-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Protection level [L-N]	$U_p$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50 in 280 V, type 1+2

## Combination arrester V50, 1-pole with FS 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-1+FS-280</b>	280	1	IP20	1	16.600	<b>5093502</b>

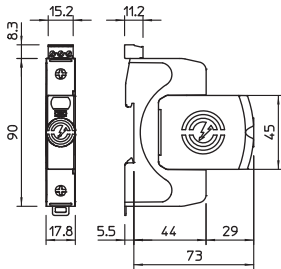
PA Polyamide

Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.

### Dimensions



### Connection options



### V50-1+FS-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Protection level [L-N]	$U_p$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50, 3-pole 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V50-3-280	280	3	IP20	1	46.500	5093511

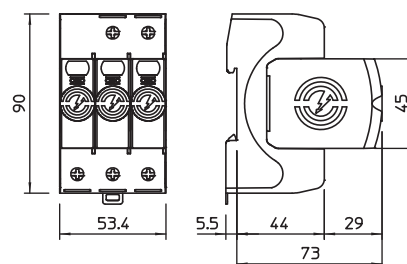
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

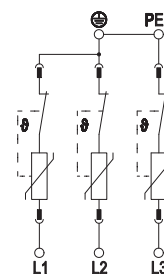
Application: Lightning current equipotential bonding for buildings of class III and IV.



### Dimensions



### Connection options



### V50-3-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 37.5 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_n$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{u}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50 in 280 V, type 1+2

## Combination arrester V50, 3-pole with FS 280 V

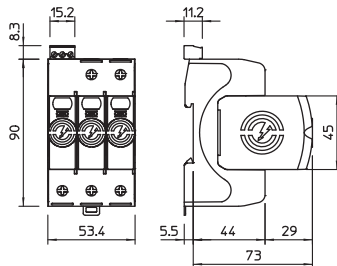


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V50-3+FS-280	280	3	IP20	1	46.900	5093516

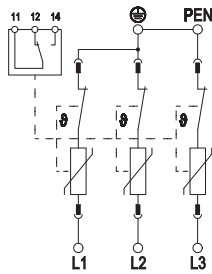
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

### Dimensions



### Connection options



### V50-3+FS-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 37.5 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_n$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Combination arrester V50, 4-pole 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V50-4-280	280	4	IP20	1	61.000	5093513

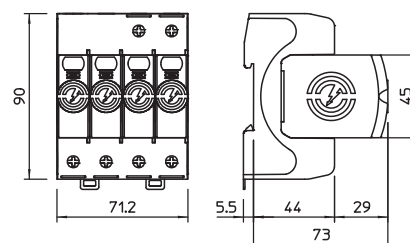
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

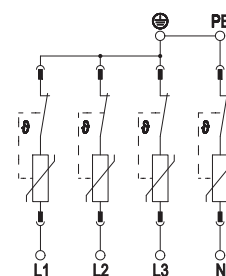
Application: Lightning current equipotential bonding for buildings of class III and IV.



### Dimensions



### Connection options



### V50-4-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 50 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 160 kA
Protection level [L-N]	$U_n$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{u}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50, 4-pole with FS 280 V

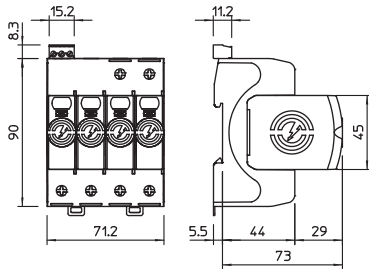


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V50-4+FS-280	280	4	IP20	1	61.500	5093518

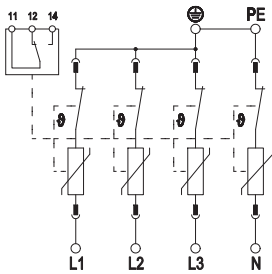
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

### Dimensions



### Connection options



### V50-4+FS-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 50 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 160 kA
Protection level [L-N]	$U_n$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Application: Lightning current equipotential bonding for buildings of class III and IV.



## Combination arrester V50, 1-pole + NPE 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-1+NPE-280</b>	280	1+N/PE	IP20	1	30.300	<b>5093522</b>

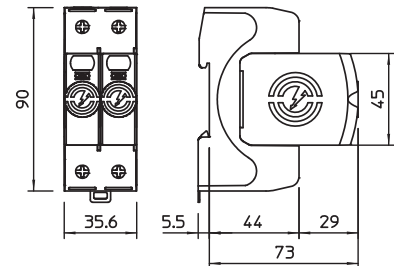
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

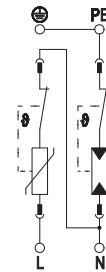
Application: Lightning current equipotential bonding for buildings of class III and IV.



### Dimensions



### Connection options



### V50-1+NPE-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 25 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{L-PE}$ 2.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{II}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50, 1-pole + NPE with FS 280 V



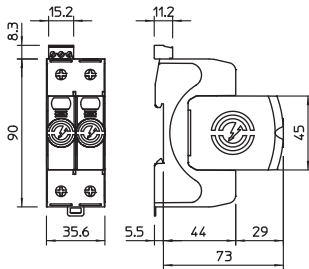
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-1+NPE+FS-280</b>	280	1+N/PE	IP20	1	30.600	<b>5093531</b>

Lightning current combination arrester, type 1+2

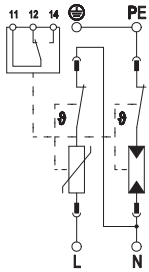
- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

Application: Lightning current equipotential bonding for buildings of class III and IV.

### Dimensions



### Connection options



### V50-1+NPE+FS-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 25 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{1-PF}$ 2.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Combination arrester V50, 2-pole + NPE 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V50-2+NPE-280	280	2+N/PE	IP20	1	44.300	5093524

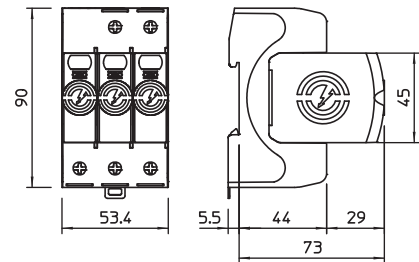
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

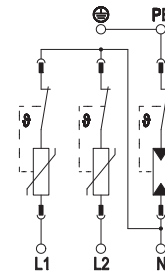
Application: Lightning current equipotential bonding for buildings of class III and IV.



Dimensions



Connection options



V50-2+NPE-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 37.5 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{-PE}$ 2.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{II}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50 in 280 V with NPE, type 1+2

## Combination arrester V50, 3-pole + NPE 280 V

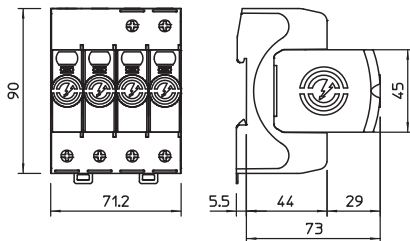


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-3+NPE-280</b>	280	3+N/PE	IP20	1	58.800	<b>5093526</b>

Lightning current combination arrester, type 1+2

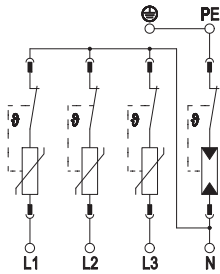
- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

### Dimensions



Application: Lightning current equipotential bonding for buildings of class III and IV.

### Connection options



### V50-3+NPE-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 50 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{1-PF}$ 2.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Combination arrester V50, 3-pole + NPE with FS 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V50-3+NPE+FS-280	280	3+N/PE	IP20	1	59.300	5093533

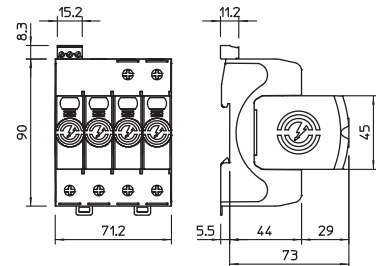
Lightning current combination arrester, type 1+2

- For lightning current equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current arresting capacity of 12.5 kA (10/350) per pole and up to 50 kA (10/350) in total
- Modular, plug-in arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling (FS) variants have a potential-free changeover contact for remote signalling

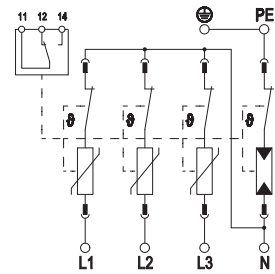
Application: Lightning current equipotential bonding for buildings of class III and IV.



Dimensions



Connection options



V50-3+NPE+FS-280

SPD to EN 61643-11	Type 1+2
SPD to IEC 61643-11	Class I+II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 30 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 50 kA
Lightning surge current (10/350 $\mu$ s)	$I_{imp}$ 12.5 kA
Lightning surge current (10/350)	$I_{total}$ 50 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{-PE}$ 2.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, KEMA, ÖVE, VDE
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Combination arrester V50 upper part, type 1+2

### Plug-in arrester V50 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
	<b>V50-0-150</b>	150	1	IP20	1	7.660

Combination arrester, type 1+2

- For lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current discharge capacity of 12.5 kA (10/350) per pole
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)

### Plug-in arrester V50 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
	<b>V50-0-280</b>	280	1	IP20	1	8.500

Combination arrester, type 1+2

- For lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current discharge capacity of 12.5 kA (10/350) per pole
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)

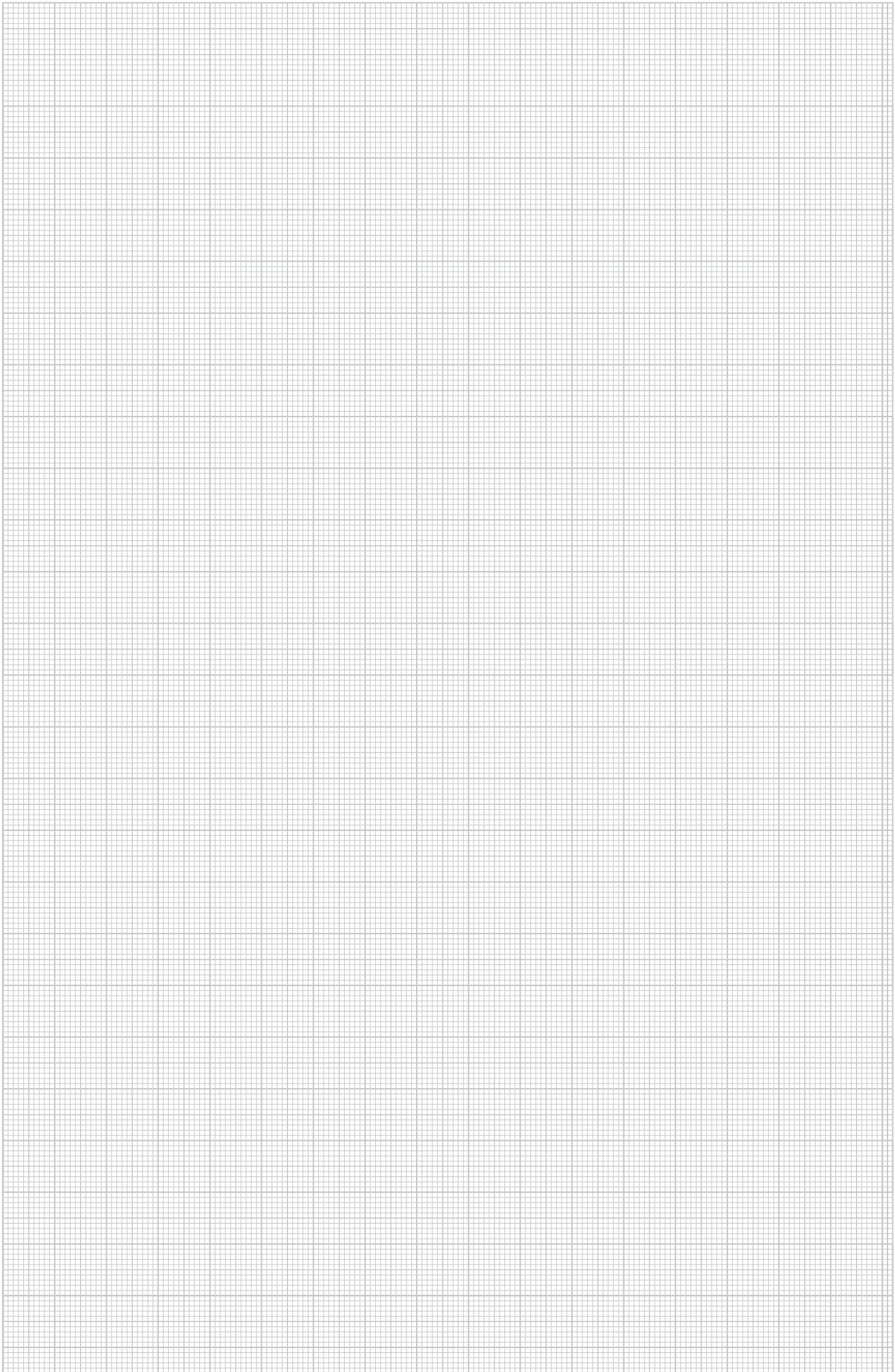
### Plug-in arrester NPE-C50



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
	<b>C50-0-255</b>	255	N/PE	IP20	1	7.215

Cover NPE, lightning current combination arrester, type 1+2

- For lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)
- Lightning current discharge capacity up to 50 kA (10/350) in total
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic according to UL 94 V-0





**MCF 35-1+FS-440**  
Lightning protection for 400/500V power supply systems  
UL 440 V  
In 35 kA  
I<sub>nom</sub> 35 kA  
U<sub>c</sub> 4.25 kV  
SPO L1PEN III  
400 A gL/gD  
CE 0589  
0589-PI-0446  
Schnellabschirmung fast-lock device  
NEM 033g  
OBO Bettermann  
Merx, Germany

**MCF 35-1+FS-440**  
Lightning protection for 400/500V power supply systems  
UL 440 V  
In 35 kA  
I<sub>nom</sub> 35 kA  
U<sub>c</sub> 4.25 kV  
SPO L1PEN III  
400 A gL/gD  
CE 0589  
0589-PI-0446  
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**MCF 35-1+FS-440**  
Lightning protection for 400/500V power supply systems  
UL 440 V  
In 35 kA  
I<sub>nom</sub> 35 kA  
U<sub>c</sub> 4.25 kV  
SPO L1PEN III  
400 A gL/gD  
CE 0589  
0589-PI-0446  
Schnellabschirmung fast-lock device  
NEM 033g  
OBO Bettermann  
Merx, Germany



# Surge protection device for energy technology, arrester, type 1 (industry)



**Lightning arrester MCF 35**

138



**Accessories MCF**

140



## Lightning arrester MCF 35, 400/690 V for power networks

## Lightning arrester MCF 35, 400/690 V, 1-pole with IR



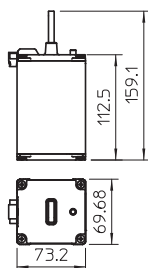
Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF 35-1+FS-440</b>	440	1-pole	1	98.000	<b>5096974</b>

**AIG** Die-cast aluminium  
Lightning arrester type 1

- For lightning protection equipotential bonding to DIN EN 62305 (IEC 62305)
- Lightning current arresting capacity 35 kA (10/350) per pole
- Follow current extinguishing 50 kA<sub>eff</sub>, arrester back-up fuse up to 400 A gL/gG
- Encapsulated, non-extinguishing spark gap arrester for use in distributor housings
- Cut-off unit with visual indicator
- Remote signalling with potential-free changeover contact

Application: Without exception for 400/690 V network systems

## Dimensions



## Connection options



## MCF 35-1+FS-440

Nominal voltage	$U_N$	400 V
Max. continuous operating voltage	$U_c$	440 V
SPD to EN 61643-11		Type 1
SPD to IEC 61643-11		Class I
Impulse discharge current (10/350)	$I_{imp}$	35 kA
Nominal discharge current (8/20)	$I_n$	35 kA
Protection level	$U_o$	2,5 kV
Follow current quenching capacity leff	$I_{fi\ eff}$	50 kA
Maximum back-up fuse		400 A
Protection rating		IP20
Response time	$t_A$	< 100 ns
Temperature range	$\vartheta$	-40 - +85 °C

## Lightning arrester MCF 35, 400/690 V, 3-pole with IR



Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF 35-P3+FS-440</b>	440	3-pole	1	400.000	<b>5096976</b>

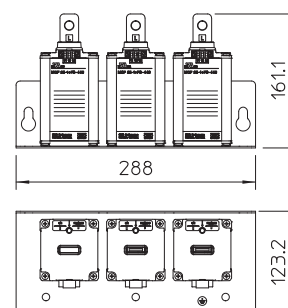
**AIG** Die-cast aluminium  
Lightning arrester type 1

- Fully assembled 3-pole connection unit
- For lightning protection equipotential bonding according to DIN EN 62305 (IEC 62305)
- Lightning current arresting capacity 35 kA (10/350) per pole
- Line following current quenching 50 kA<sub>eff</sub>, arrester back-up fuse up to 400 A gL/gG
- Encapsulated, non-extinguishing spark gap arrester for use in distributor housings
- Cut-off unit with visual indicator
- Remote signalling with potential-free changeover contact
- For finished mounting on busbars and walls

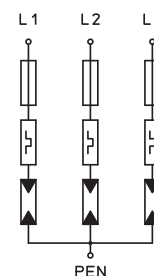
Application: Without exception for 400/690 V power systems



### Dimensions



### Connection options



### MCF 35-P3+FS-440

Nominal voltage	$U_n$	400 V
Max. continuous operating voltage	$U_c$	440 V
SPD to EN 61643-11		Type 1
SPD to IEC 61643-11		Class I
Impulse discharge current (10/350)	$I_{imp}$	35 kA
Nominal discharge current (8/20)	$I_n$	35 kA
Protection level	$U_p$	2,5 kV
Follow current quenching capacity $I_{eff}$	$I_{fi\ eff}$	50 kA
Maximum back-up fuse		400 A
Protection rating		IP20
Response time	$t_A$	< 100 ns
Temperature range	$\vartheta$	-40 - +85 °C

### Accessories MCF

### Mounting plate, 1-pole

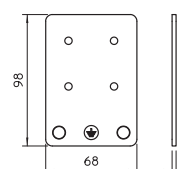


Type	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF-MS-P1</b>	1-pole	1	19.600	<b>5096992</b>

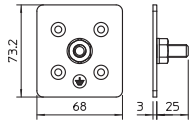
**A2** Stainless steel, rustproof 1.4301

Mounting plate 1-pole

- Mounting plate for installation of the arrester MCF 35-1+FS-440
- Prefabricated hole pattern for mounting the arrester on busbars
- Required screws for installation the arrester enclosed



## Mounting plate, 1-pole, M10



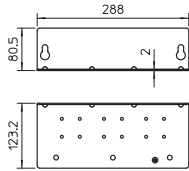
Type	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF-MS-M10</b>	1-pole	1	14.200	<b>5096990</b>

A2 Stainless steel, rustproof 1.4301

Mounting plate with threaded connector M10

- Mounting plate with threaded M10 connector to install the arrester MCF 35-1+FS-440
- M10 bolts for direct installation of the arrester on busbars
- Required screws for installation enclosed

## Mounting plate, 3-pole

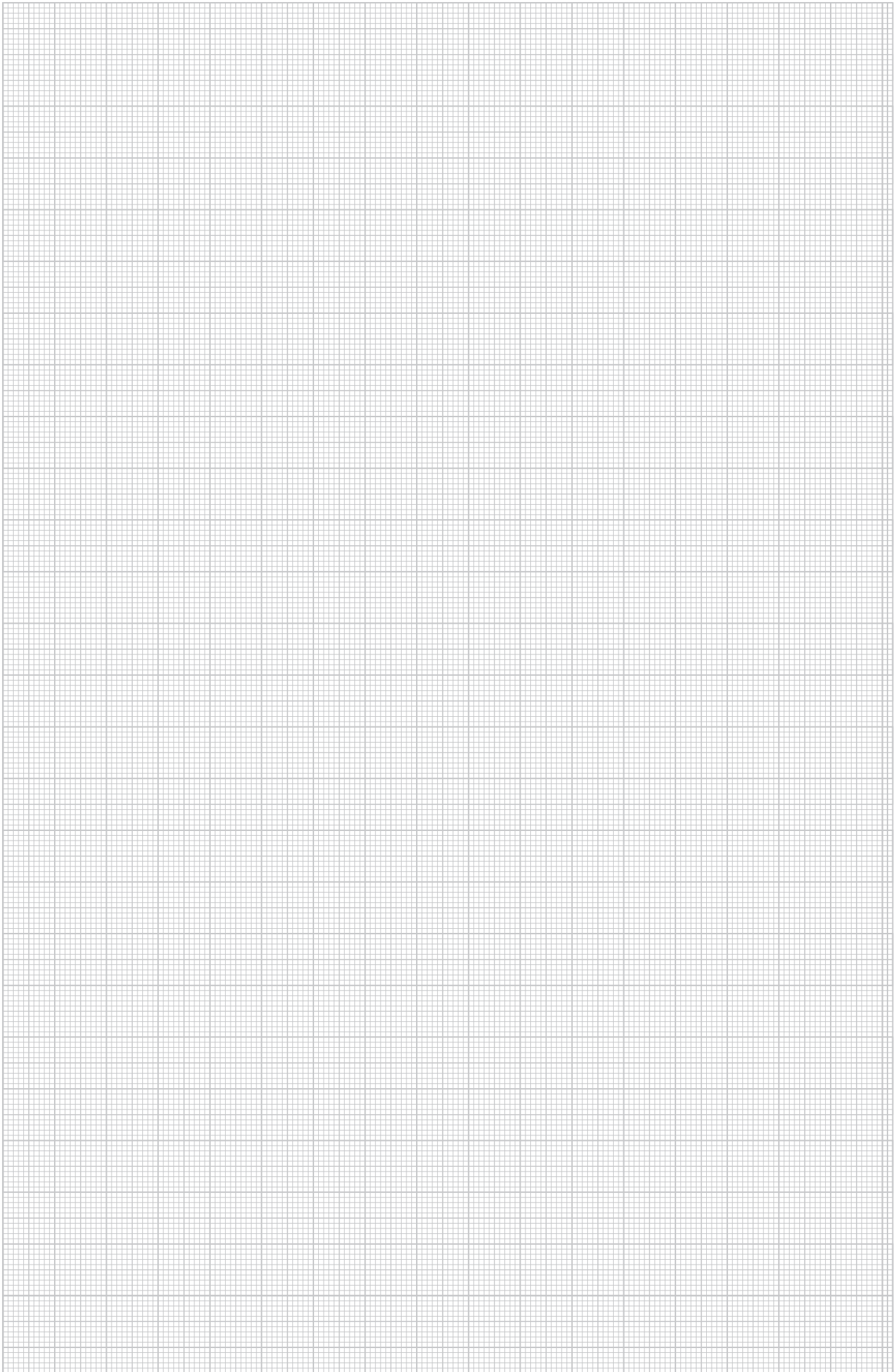


Type	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>MCF-MS-P3</b>	3-pole	1	99.800	<b>5096994</b>

A2 Stainless steel, rustproof 1.4301

Mounting plate 3-pole

- Mounting plate 3-pole for installation of the arrester MCF 35-1+FS-440
- Prefabricated hole pattern for mounting the arrester on busbars
- Suitable for wall mounting
- Required screws for installation enclosed





Diese Anlage ist mit  
Überspannungsschutzgeräten  
ausgerüstet.



Bei Isolationsmessungen bitte die OBO  
Schutzmodule herausziehen bzw.  
abklemmen.

System contains overvoltage protection  
devices. Please remove or disconnect the  
OBO protectors during isolation tests.

Mat.-Nr. 4100 8383



V20 Überspannungsableiter Typ 2

V20 surge arrester type 2



## Surge arrester V20

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## Surge arrester V20, 1-pole 75 V



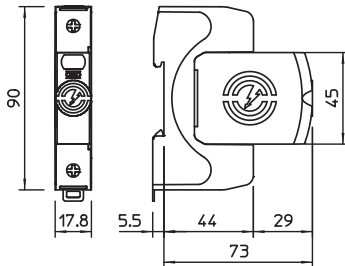
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1-75	75	1	IP20	1	11.500	5095141

Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

### Dimensions



### Connection options



### V20-1-75

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 60 V
Maximum continuous voltage AC	$U_c$ 75 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 40 kA
Protection level [L-N]	$U_p$ 0.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.3 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.4 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	25 kA
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG





## Surge arrester V20, 1-pole + NPE, 75 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1+NPE-75	75	1+N/PE	IP20	1	22.900	5095221

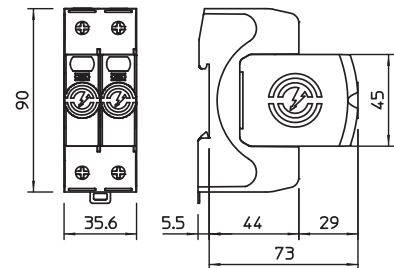
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

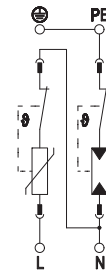
Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-1+NPE-75

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 60 V
Maximum continuous voltage AC	$U_c$ 75 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_n$ 0.5 kV
Combined voltage protection level [L-PE]	$U_n / I_{1-PE}$ 1.2 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.3 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.4 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{11}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 2-pole, 75 V



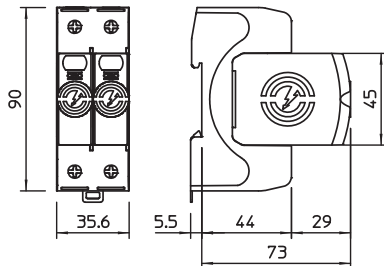
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-2-75	75	2	IP20	1	22.800	5095142

Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

### Dimensions



### Connection options



### V20-2-75

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 60 V
Maximum continuous voltage AC	$U_c$ 75 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_p$ 0.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,3 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,4 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Surge arrester V20, 1-pole, 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1-150	150	1	IP20	1	11.900	5095151

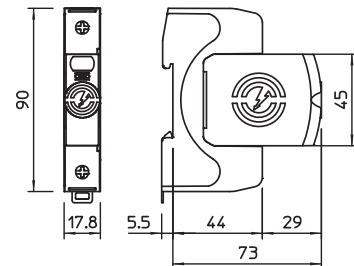
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-1-150

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 40 kA
Protection level [L-N]	$U_D$ 0.8 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,6 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 2-pole, 150 V



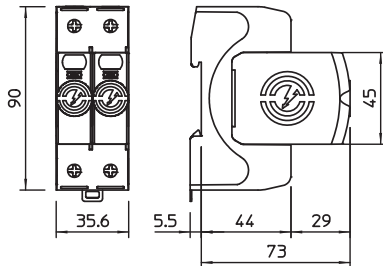
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-2-150	150	2	IP20	1	23.600	5095152

Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

Dimensions



Connection options



V20-2-150

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_p$ 0.8 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.6 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 2-pole + NPE, 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V20-2+NPE-150</b>	150	2+N/PE	IP20	1	32.800	<b>5095232</b>

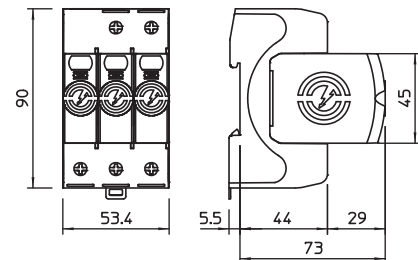
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

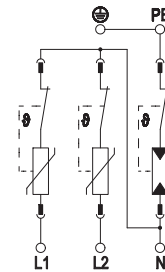
Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-2+NPE-150

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_n$ 0.8 kV
Combined voltage protection level [L-PE]	$U_n / I_{1-PE}$ 1.2 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0.6 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{11}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 2-pole + NPE and FS, 150 V

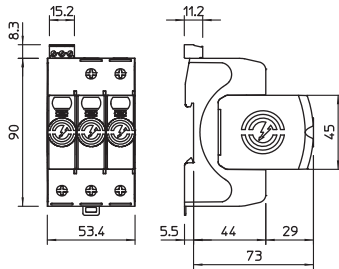


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-2+NPE+FS-150	150	2+N/PE	IP20	1	33.200	5095322

Surge arrester, type 2

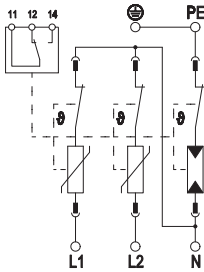
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Dimensions



Application: Equipotential bonding in main and sub-distributions.

Connection options



V20-2+NPE+FS-150

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_p$ 0.8 kV
Combined voltage protection level [L-PE]	$U_{p / L-PE}$ 1.2 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,6 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 3-pole, 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-3-150	150	3	IP20	1	33.000	5095153

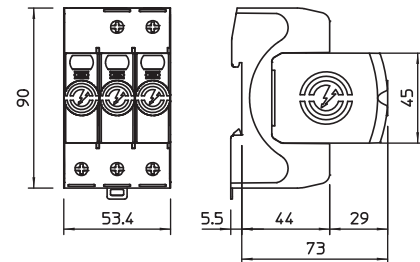
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

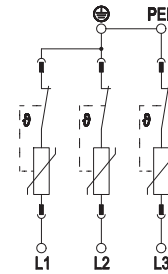
Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-3-150

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_n$ 0.8 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,6 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 1-pole+ NPE, 150 V

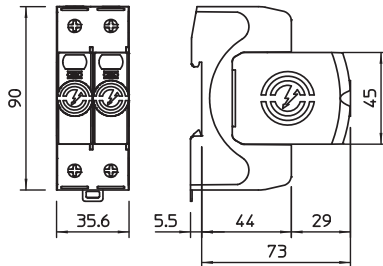


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1+NPE-150	150	1+N/PE	IP20	1	23.300	5095231

Surge arrester, type 2

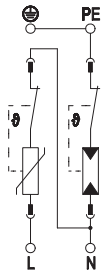
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Dimensions



Application: Equipotential bonding in main and sub-distributions.

Connection options



V20-1+NPE-150

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_n$ 0.8 kV
Combined voltage protection level [L-PE]	$U_n / I_{1-PF}$ 1.2 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,6 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{11}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Surge arrester V20, 3-pole + NPE, 150 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V20-3+NPE-150</b>	150	3+N/PE	IP20	1	42.700	<b>5095233</b>

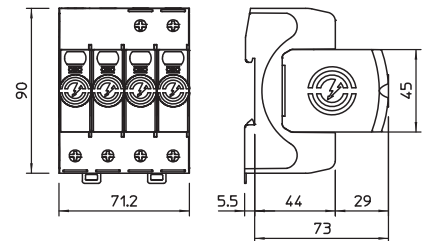
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.



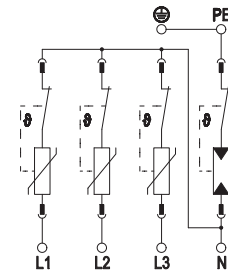
## Dimensions



## V20-3+NPE-150

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_n$ 0.8 kV
Combined voltage protection level [L-PE]	$U_n / I_{L-PE}$ 1.2 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,6 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Connection options



## Surge arrester V20, 3-pole+ NPE and FS, 150 V



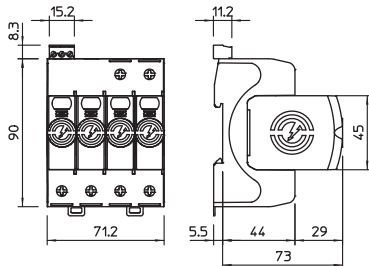
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V20-3+NPE+FS-150</b>	150	3+N/PE	IP20	1	43.300	<b>5095321</b>

Surge arrester, type 2

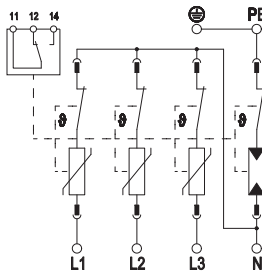
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

### Dimensions



### Connection options



### V20-3+NPE+FS-150

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 120 V
Maximum continuous voltage AC	$U_c$ 150 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_p$ 0.8 kV
Combined voltage protection level [L-PE]	$U_{p / L-PE}$ 1.2 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 0,6 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ii}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 1-pole, 280 V



Type	Highest continuous voltage AC	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
	V					
<b>V20-1-280</b>	280	1	IP20	1	12.900	<b>5095161</b>

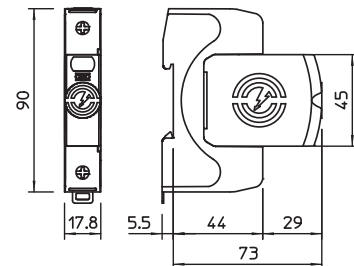
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-1-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 40 kA
Protection level [L-N]	$U_D$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 1-pole with remote signalling, 280 V



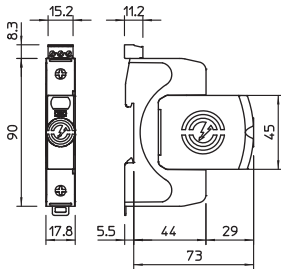
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1+FS-280	280	1	IP20	1	13.100	5095281

Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

### Dimensions



### Connection options



### V20-1+FS-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 40 kA
Protection level [L-N]	$U_p$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 2-pole, 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-2-280	280	2	IP20	1	25.600	5095162

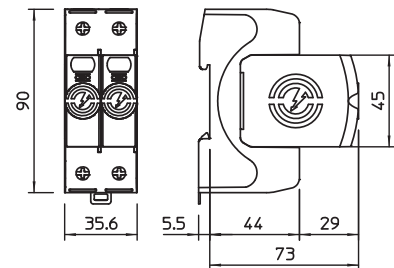
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-2-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_p$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 2-pole with remote signalling, 280 V

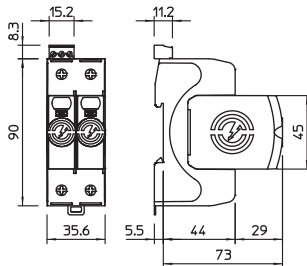


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-2+FS-280	280	2	IP20	1	25.900	5095282

Surge arrester, type 2

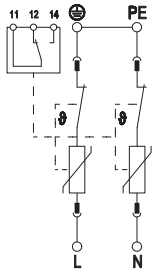
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Dimensions



Application: Equipotential bonding in main and sub-distributions.

Connection options



V20-2+FS-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_p$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 2-pole + NPE, 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-2+NPE-280	280	2+N/PE	IP20	1	34.600	5095252

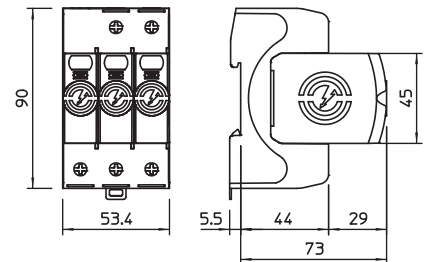
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

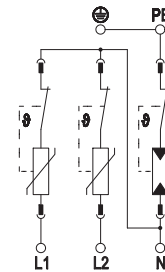
Application: Equipotential bonding in main and sub-distributions.



Dimensions



Connection options



V20-2+NPE-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{1-PE}$ 1.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{ui}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20 in 280 V, type 2, for TN-S networks

### Surge arrester V20, 2-pole + NPE and remote signalling, 280 V

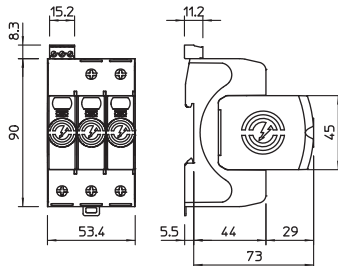


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V20-2+NPE+FS-280</b>	280	2+N/PE	IP20	1	34.800	<b>5095332</b>

Surge arrester, type 2

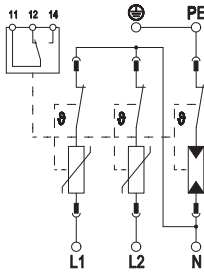
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

#### Dimensions



Application: Equipotential bonding in main and sub-distributions.

#### Connection options



#### V20-2+NPE+FS-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_p$ 1.3 kV
Combined voltage protection level [L-PE]	$U_{p / 1-PF}$ 1.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1.0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{11}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Surge arrester V20, 3-pole, 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-3-280	280	3	IP20	1	36.000	5095163

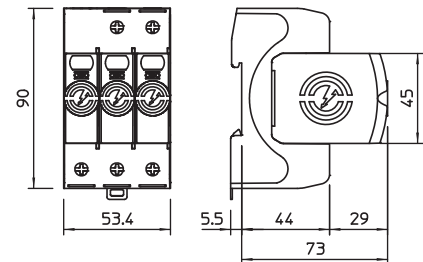
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

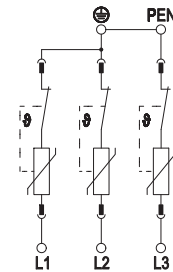
Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-3-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_D$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 3-pole with remote signalling, 280 V

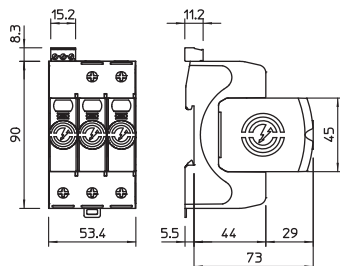


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-3+FS-280	280	3	IP20	1	36.400	5095283

Surge arrester, type 2

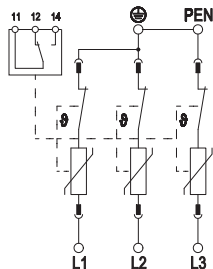
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

### Dimensions



Application: Equipotential bonding in main and sub-distributions.

### Connection options



### V20-3+FS-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_p$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 4-pole, 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-4-280	280	4	IP20	1	47.000	5095164

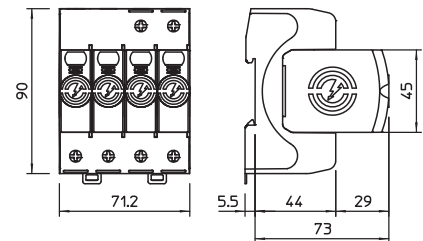
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

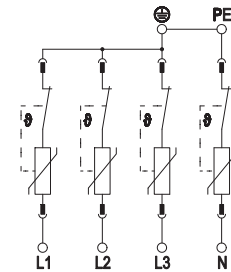
Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-4-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 160 kA
Protection level [L-N]	$U_D$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 4-pole with remote signalling, 280 V



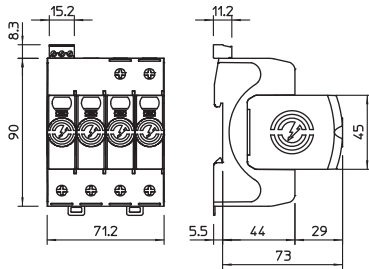
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-4+FS-280	280	4	IP20	1	47.500	5095284

Surge arrester, type 2

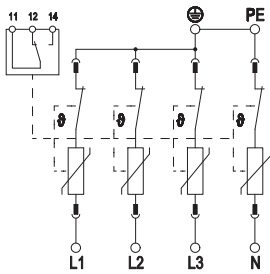
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

Dimensions



Connection options



V20-4+FS-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 160 kA
Protection level [L-N]	$U_p$ 1.3 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 1-pole + NPE, 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1+NPE-280	280	1+N/PE	IP20	1	24.300	5095251

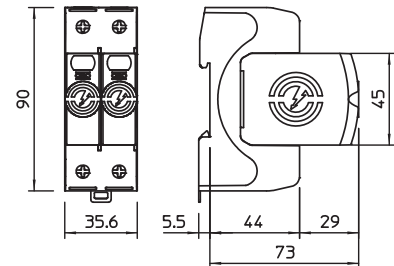
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

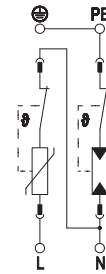
Application: Equipotential bonding in main and sub-distributions.



Dimensions



Connection options



V20-1+NPE-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{1-PE}$ 1.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{11}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 1-pole + NPE and remote signalling, 280 V



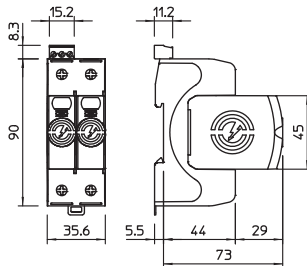
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1+NPE+FS-280	280	1+N/PE	IP20	1	24.600	5095331

Surge arrester, type 2

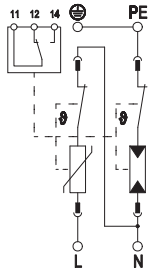
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

Dimensions



Connection options



V20-1+NPE+FS-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_p$ 1.3 kV
Combined voltage protection level [L-PE]	$U_{p / L-PE}$ 1.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{11}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, flexible (fine-wire)	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 3-pole + NPE, 280 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
<b>V20-3+NPE-280</b>	280	3+N/PE	IP20	1	45.800	<b>5095253</b>

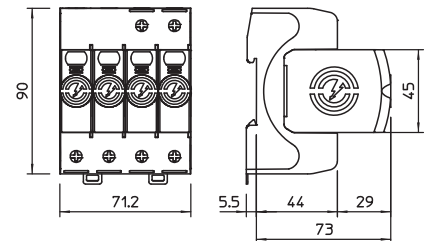
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

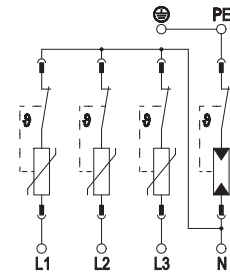
Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-3+NPE-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{L-PE}$ 1.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0,8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 3-pole + NPE and remote signalling, 280 V



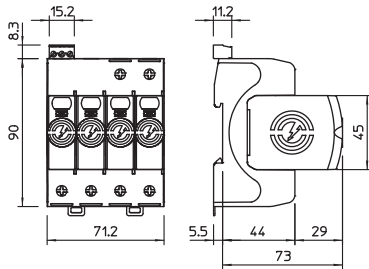
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-3+NPE+FS-280	280	3+N/PE	IP20	1	46.300	5095333

Surge arrester, type 2

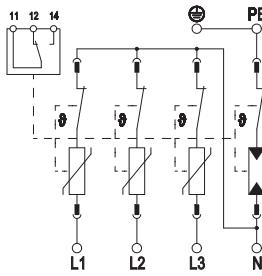
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

Dimensions



Connection options



V20-3+NPE+FS-280

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 230 V
Maximum continuous voltage AC	$U_c$ 280 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{1-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 60 kA
Protection level [L-N]	$U_n$ 1.3 kV
Combined voltage protection level [L-PE]	$U_n / I_{1-PF}$ 1.5 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 0.8 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1.0 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{11}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL, ÖVE, VDE, KEMA
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Surge arrester V20, 1-pole, 440 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1-440	440	1	IP20	1	13.600	5095201

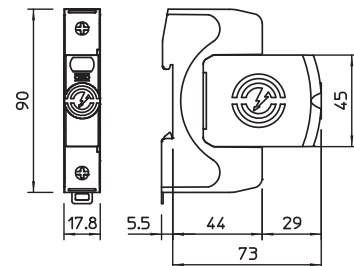
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-1-440

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 400 V
Maximum continuous voltage AC	$U_c$ 440 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 40 kA
Protection level [L-N]	$U_p$ 2 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 1,5 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 1,8 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 1-pole, 550 V



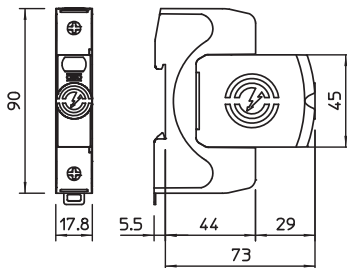
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-1-550	550	1	IP20	1	14.300	5095211

Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.

### Dimensions



### Connection options



### V20-1-550

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 400 V
Maximum continuous voltage AC	$U_c$ 550 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 15 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 40 kA
Protection level [L-N]	$U_p$ 2.4 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 1,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 2,1 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG



## Surge arrester V20, 2-pole, 550 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-2-550	550	2	IP20	1	27.000	5095212

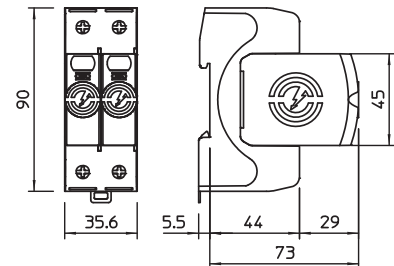
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.



## Dimensions



## Connection options



## V20-2-550

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 400 V
Maximum continuous voltage AC	$U_c$ 550 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 15 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_D$ 2.4 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 1,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 2,1 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 2-pole with remote signalling, 550 V

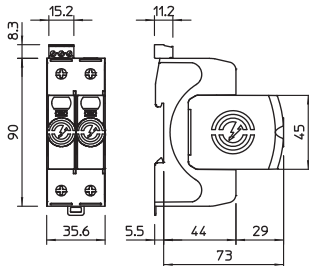


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-2+FS-550	550	2	IP20	1	27.300	5095312

Surge arrester, type 2

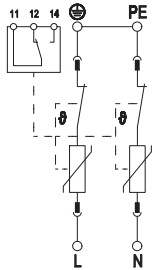
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Dimensions



Application: Equipotential bonding in main and sub-distributions.

Connection options



V20-2+FS-550

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 480 V
Maximum continuous voltage AC	$U_c$ 550 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 15 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 80 kA
Protection level [L-N]	$U_p$ 2.4 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 1,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 2,1 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Surge arrester V20, 3-pole, 550 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-3-550	550	3	IP20	1	38.100	5095213

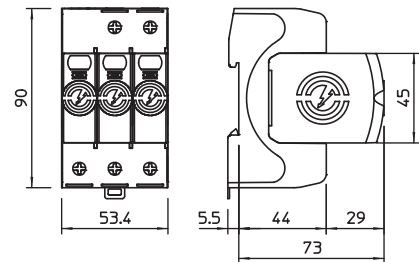
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

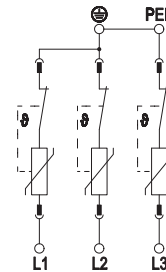
Application: Equipotential bonding in main and sub-distributions.



Dimensions



Connection options



V20-3-550

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 400 V
Maximum continuous voltage AC	$U_c$ 550 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 15 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_p$ 2.4 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 1,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 2,1 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 3-pole with remote signalling, 550 V

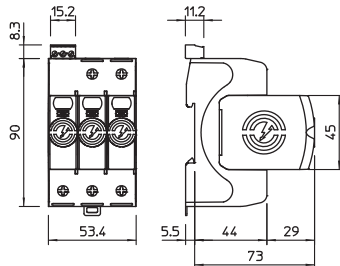


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-3+FS-550	550	3	IP20	1	38.500	5095313

Surge arrester, type 2

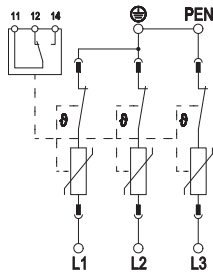
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

### Dimensions



Application: Equipotential bonding in main and sub-distributions.

### Connection options



### V20-3+FS-550

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 480 V
Maximum continuous voltage AC	$U_c$ 550 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 15 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 120 kA
Protection level [L-N]	$U_p$ 2,4 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 1,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 2,1 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Surge arrester V20, 4-pole, 550 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-4-550	550	4	IP20	1	49.800	5095214

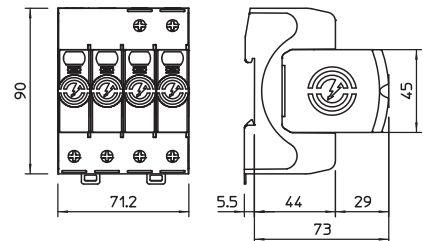
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

Application: Equipotential bonding in main and sub-distributions.



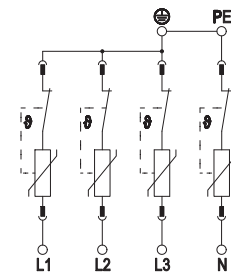
## Dimensions



## V20-4-550

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 400 V
Maximum continuous voltage AC	$U_c$ 550 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 15 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 160 kA
Protection level [L-N]	$U_p$ 2.4 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 1,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 2,1 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{U}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL
Conductor cross-section, flexible (fine-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1.5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

## Connection options



## Surge arrester V20, 4-pole with remote signalling, 550 V

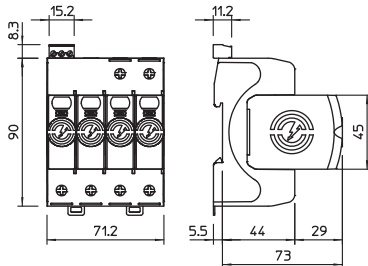


Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-4+FS-550	550	4	IP20	1	50.300	5095314

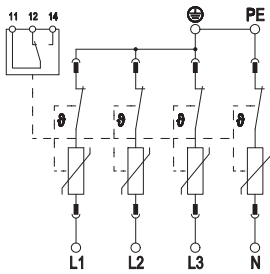
Surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic to UL 94 V-0
- The remote signalling variants (FS) have a potential-free changeover contact for remote signalling

### Dimensions



### Connection options



### V20-4+FS-550

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 480 V
Maximum continuous voltage AC	$U_c$ 550 V
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{n-N}$ 15 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Arrester surge current (8/20 $\mu$ s) [total]	$I_{total}$ 160 kA
Protection level [L-N]	$U_p$ 2.4 kV
Residual voltage [L-N] @ 1 kA	$U_{res}$ 1,7 kV
Residual voltage [L-N] @ 5 kA	$U_{res}$ 2,1 kV
Max. mains-side overcurrent protection	160 A gL/gG
Short-circuit withstand for max. mains-side overcurrent protection	50 kA eff
Operating temperature range	$T_{li}$ -40 - +80 °C
Protection rating	IP20
Approvals	UL
FM contacts	Changeover
Switching power AC	230 V; 0,5 A
Switching power DC	230 V; 0,1 A / 75 V; 0,5 A
Connection cross-section, FM terminals	0,5 - 1,5 mm <sup>2</sup>
Connection cross-section, FM terminals	21 - 16 AWG
Conductor cross-section, flexible (fine-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, rigid (single wire/multi-wire)	1,5 - 35 mm <sup>2</sup>
Conductor cross-section, flexible (fine-wire)	16 - 2 AWG
Conductor cross-section, rigid (single wire/multi-wire)	16 - 2 AWG

Application: Equipotential bonding in main and sub-distributions.



## Plug-in arrester V20 75 V



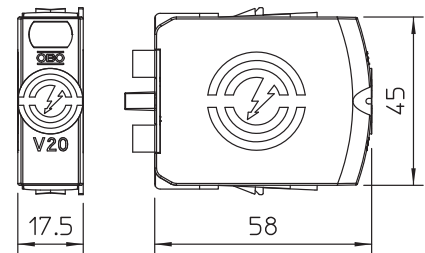
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-0-75	75	1	IP20	1	3.600	5095360

Surge arrester, type 2

- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)



## Dimensions



## Plug-in arrester V20 150 V



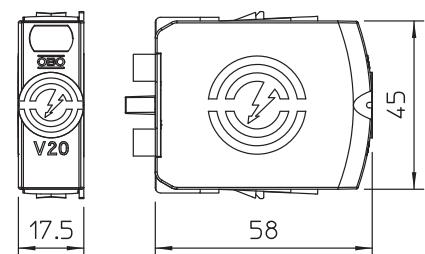
Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-0-150	150	1	IP20	1	4.160	5095362

Surge arrester, type 2

- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)



## Dimensions



## Surge arrester V20 upper parts, type 2

## Plug-in arrester V20 280 V

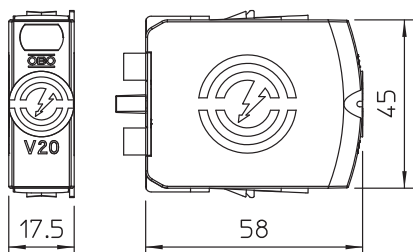


Type	AC	Pole	Protection	Pack	Weight	Item no.
	V	version	rating	Piece	kg/100 pc.	
<b>V20-0-280</b>	280	1	IP20	1	5.000	<b>5095364</b>

Surge arrester, type 2

- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)

## Dimensions



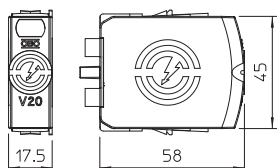
## V20 cover 440 V



Type	AC	Pole	Protection	Pack	Weight	Item no.
	V	version	rating	Piece	kg/100 pc.	
<b>V20-0-440</b>	440	1	IP20	1	5.660	<b>5095370</b>

Surge arrester, type 2

- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)



## V20-0-440

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 400 V
Maximum continuous voltage AC	$U_c$ 440 V
Protection level	$U_p$ 2 kV
Nominal discharge current (8/20 $\mu$ s)	$I_n / I_{L-N}$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Operating temperature range	$T_u$ -40 - +80 °C
Protection rating	IP20
Approvals	UL

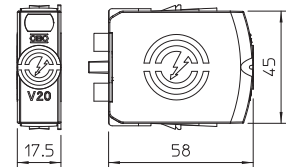
## Plug-in arrester V20 550 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-0-550	550	1	IP20	1	6.360	5095372

Surge arrester, type 2

- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)



## V20-0-550

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 400 V
Maximum continuous voltage AC	$U_C$ 550 V
Protection level	$U_n$ 2.4 kV
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Operating temperature range	$T_u$ -40 - +80 °C
Protection rating	IP20
Approvals	UL

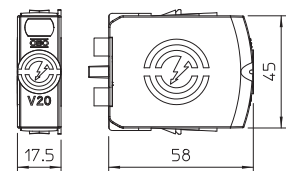
## Plug-in arrester V20 1000 V



Type	Highest continuous voltage AC V	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
V20-0-1000	1000	1	IP20	1	6.960	5095378

Surge arrester, type 2

- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular, plug-in arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)



## V20-0-1000

SPD to EN 61643-11	Type 2
SPD to IEC 61643-11	Class II
SPD to UL 1449	Type 4
Nominal voltage AC (50/60 Hz)	$U_n$ 750 V
Maximum continuous voltage AC	$U_C$ 1000 V
Protection level	$U_n$ 4.2 kV
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$ 20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$ 40 kA
Operating temperature range	$T_u$ -40 - +80 °C
Protection rating	IP20
Approvals	—

## NPE discharge gap C20 in 280 V, type 2

## Plug-in arrester C20 280 V

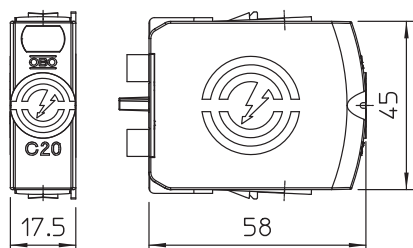


Type	Highest continuous voltage AC	Pole version	Protection rating	Pack Piece	Weight kg/100 pc.	Item no.
	V					
<b>C20-0-255</b>	255	N/PE	IP20	1	3.680	<b>5095600</b>

N-PE surge arrester, type 2

- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Discharge capacity to 40 kA (8/20) per pole through high-performance varistors
- Modular connectable arrester with dynamic cut-off unit and visual status display
- Locking mechanism with vibration protection and voltage keying
- Plastic (UL 94 V-0)

## Dimensions



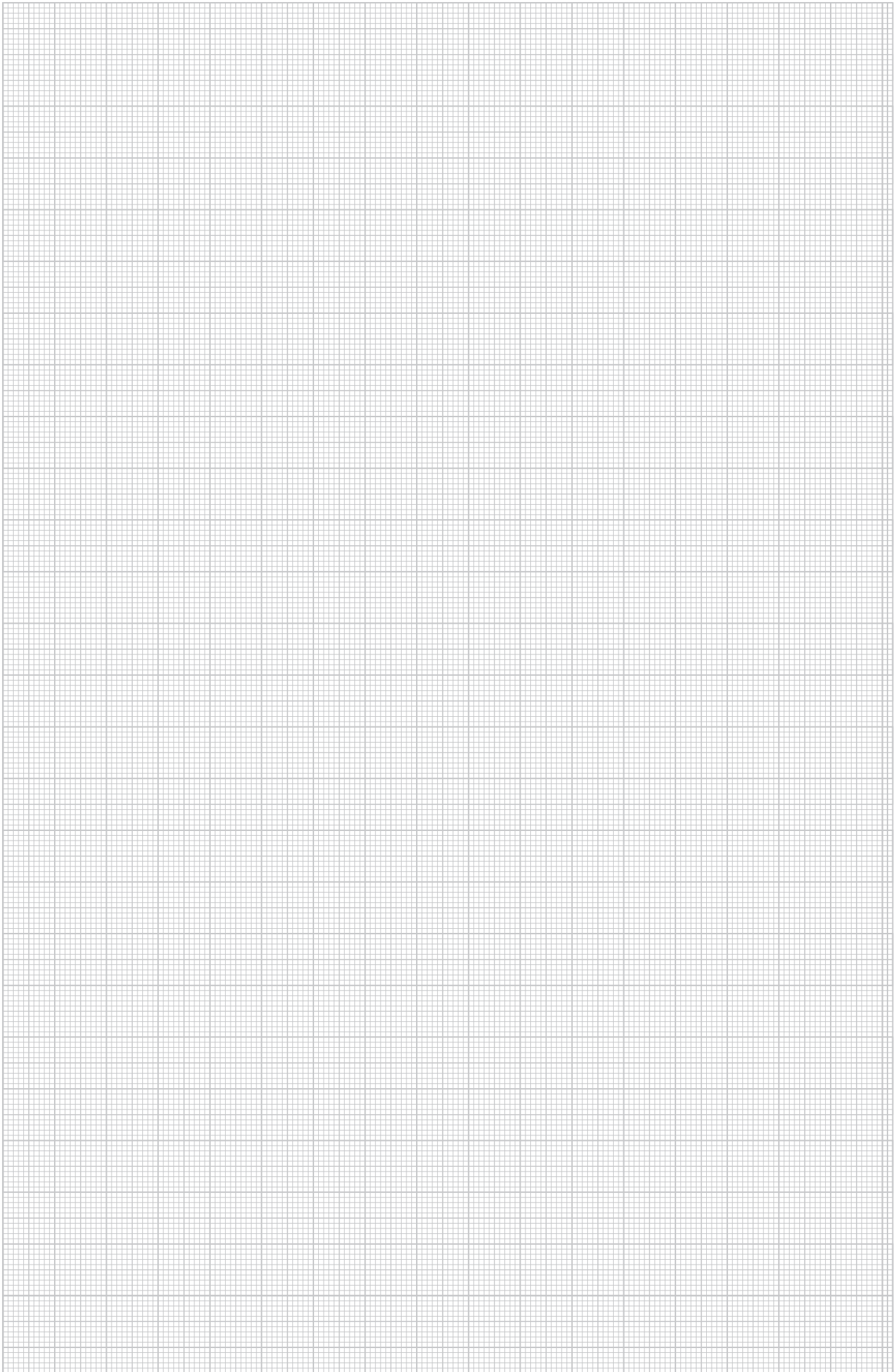
Application: Equipotential bonding in main and sub-distributors.

## Connection options



## C20-0-255

SPD to EN 61643-11		Type 2
SPD to IEC 61643-11		Class II
SPD to UL 1449		Type 4
Nominal voltage AC (50/60 Hz)	$U_n$	230 V
Maximum continuous voltage AC	$U_c$	255 V
Protection level [N-PE]	$U_{p / N-PE}$	1.3 kV
Nominal discharge current (8/20 $\mu$ s)	$I_n / L-N$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	40 kA
Operating temperature range	$T_{vi}$	-40 - +80 °C
Protection rating		IP20
Approvals		UL, ÖVE, VDE, KEMA





# Surge protection energy technology, arrester, type 2+3

	<b>Surge arrester V10 Compact</b>	184
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	<b>Compact surge protection</b>	194



Surge arrester V10 Compact 150 V

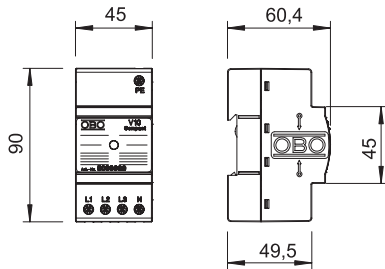


Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V10 COMPACT 150	150	3 + NPE	1	15.800	5093378

Surge protection device, compact module, type 2+3

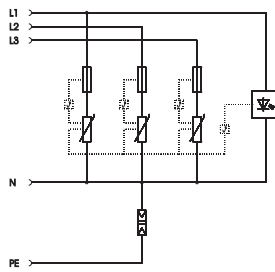
- Surge protection in sub-distributors to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity up to 60 kA (8/20) in total
- Integrated 3+1 solution for TN and TT network systems on 45 mm module width
- High-performance varistor technology
- Incl. thermal and dynamic cut-off unit and visual function display

Dimensions



Application: Sub/storey distribution as well as device protection in rotational current systems.

Connection options



V10 COMPACT 150

Nominal voltage	$U_N$	130 V
Max. continuous operating voltage	$U_C$	150 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	60 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 0,7 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		63 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		1.5
Protection rating		IP20
Connection cross-section, rigid		2.5 - 10 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 10 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 10 mm <sup>2</sup>



## Surge arrester V10 Compact 255 V



Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>V10 COMPACT 255</b>	255	3 + NPE	1	15.800	<b>5093380</b>

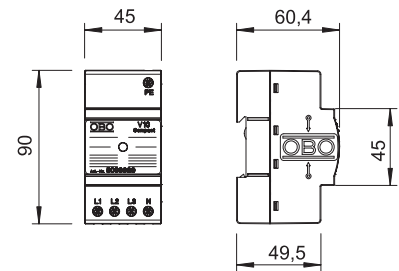
Surge protection device, compact module, type 2+3

- Surge protection in sub-distributors to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity up to 60 kA (8/20) in total
- Integrated 3+1 solution for TN and TT network systems on 45 mm module width
- High-performance varistor technology
- Incl. thermal and dynamic cut-off unit and visual function display

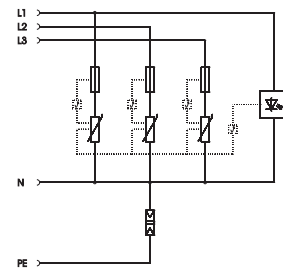
Application: Sub/storey distribution as well as device protection in rotational current systems.



## Dimensions



## Connection options



## V10 COMPACT 255

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	60 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 1,1 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		63 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		1.5
Protection rating		IP20
Connection cross-section, rigid		2.5 - 10 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 10 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 10 mm <sup>2</sup>



Surge arrester V10 Compact 385 V



Highest continuous voltage V

Version

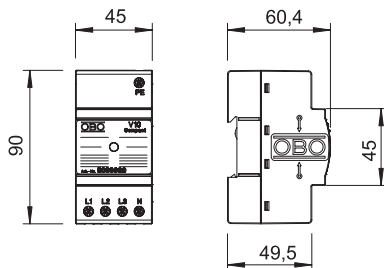
Pack Weight Piece kg/100 pc. Item no.

Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V10 COMPACT 385	385	3 + NPE	1	16.800	5093384

Surge protection device, compact module, type 2+3

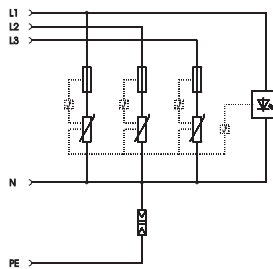
- Surge protection in sub-distributors to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity up to 60 kA (8/20) in total
- Integrated 3+1 solution for TN and TT network systems on 45 mm module width
- High-performance varistor technology
- Incl. thermal and dynamic cut-off unit and visual function display

Dimensions



Application: Sub/storey distribution as well as device protection in rotational current systems.

Connection options



V10 COMPACT 385

Nominal voltage	$U_N$	385 V
Max. continuous operating voltage	$U_C$	385 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	60 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 1,5 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		63 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		1.5
Protection rating		IP20
Connection cross-section, rigid		2.5 - 10 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 10 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 10 mm <sup>2</sup>

## Surge arrester V10 Compact with audible signalling 255 V



Type	Highest continuous voltage V	Version	Designation	Pack Piece	Weight kg/100 pc.	Item no.
<b>V10 COMPACT-AS</b>	255	3 + NPE	with acoustic signalling	1	15.800	<b>5093391</b>

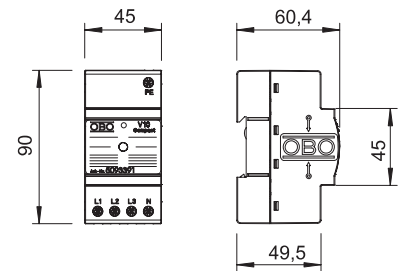
Surge protection device, compact module, type 2+3

- Surge protection in sub-distributors to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity up to 60 kA (8/20) in total
- Integrated 3+1 solution for TN and TT network systems on 45 mm module width
- High-performance varistor technology
- Including thermic and dynamic cut-off unit and visual function display
- ...-AS version with additional acoustic defect signalling (switchable)

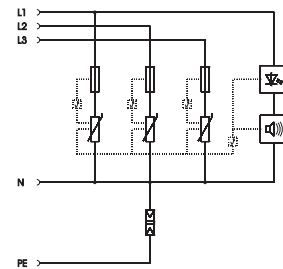
Application: Sub/storey distribution as well as device protection in rotational current systems.



## Dimensions



## Connection options



## V10 COMPACT-AS

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	60 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 1,1 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		63 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		1.5
Protection rating		IP20
Connection cross-section, rigid		2.5 - 10 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 10 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 10 mm <sup>2</sup>



## Surge arrester V10 Compact

## Surge arrester V10 Compact with remote signalling 255 V

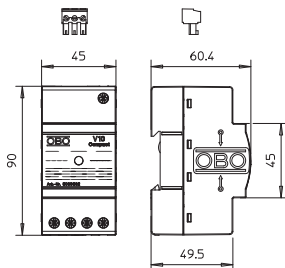


Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>V10 COMPACT-FS</b>	255	3 + NPE	1	17.300	<b>5093382</b>

Surge protection device, compact module, type 2+3

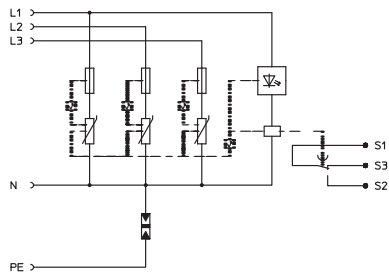
- Surge protection in subdistributors to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity up to 60 kA (8/20) in total
- Integrated 3+1 solution for TN and TT network systems on 45 mm module width
- High-performance varistor technology
- Including thermic and dynamic cut-off unit and visual function display
- ...-FS version with potential-free changeover contact for remote signalling

### Dimensions



Application: Sub/storey distribution as well as device protection in rotational current systems.

### Connection options



### V10 COMPACT-FS

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	60 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 1,1 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		63 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		1.5
Protection rating		IP20
Connection cross-section, rigid		2.5 - 10 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 10 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 10 mm <sup>2</sup>

## Upper part, surge arrester V10 280 V



Highest  
continu-  
ous  
voltage

V Version

Pack Weight  
Piece kg/100 pc. Item no.

Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V10-C 1-280	280	1-pole	1	10.000	5093415

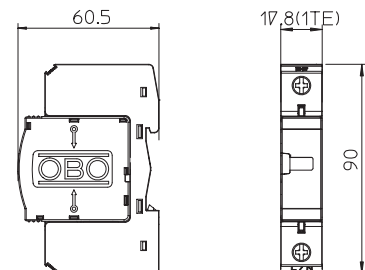
Surge arrester, type 2+3

- Surge protection in sub-distributors to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 20 kA (8/20) per pole
- Arrester, connectable with dynamic cut-off unit and visual function display
- High-performance varistor technology
- Base with multiple connection terminals

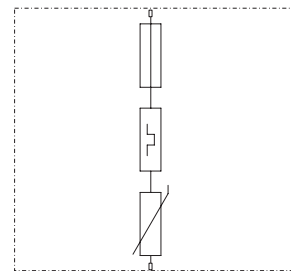
Application: Equipotential bonding in sub-distributors and device protection



## Dimensions



## Connection options



## V10-C 1-280

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	280 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1-3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrester surge current (8/20) [total]	$I_{Total\ 8/20}$	10 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 1,1 kV
Response time	$t_A$	<25 ns
Maximum back-up fuse		125 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>



## Surge arrester V10, 280 V

## Surge arrester V10 3-pole + NPE 280 V

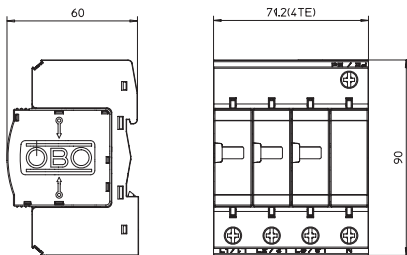


Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V10-C 3+NPE	280	3 + NPE	1	37.800	5094920

Surge arrester, type 2+3

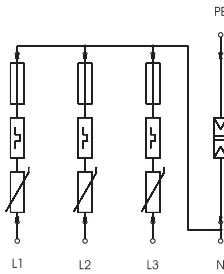
- Complete unit consisting of cover and base, pre-mounted and ready for connection
- Suitable for TN-S and TT network systems
- Incl. thermal and dynamic cut-off unit
- With visual display of defects
- High current conductivity and long service life
- Labelled connections

### Dimensions



Application example: Residential buildings, single-family homes

### Connection options



### V10-C 3+NPE

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	280 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	40 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 1,1 kV
Response time	$t_A$	<25 ns
Maximum back-up fuse		125 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		4
Protection rating		IP20
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>

## Surge arrester V10 3-pole + NPE with remote signalling 280 V



Type	Highest continuous voltage V	Version	Pack Weight		Item no.
			Piece	kg/100 pc.	
V10-C 3+NPE+FS	280	3 + NPE	1	37.900	5094931

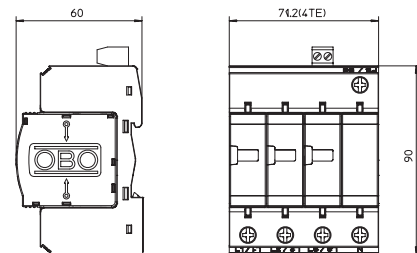
Surge arrester, type 2+3

- Complete unit consisting of cover and base, pre-mounted and ready for connection
- Suitable for TN-S and TT network systems
- Incl. thermal and dynamic cut-off unit
- With visual display of defects
- Version ...-FS with remote signalling and potential-free NO contact for function monitoring
- High current conductivity and long service life
- Labelled connections

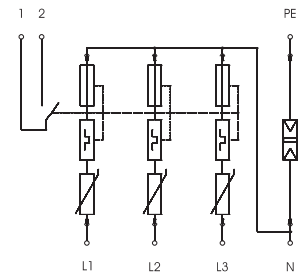
Application example: Residential buildings, single-family homes



## Dimensions



## Connection options



## V10-C 3+NPE+FS

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	280 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	40 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 1,1 kV
Response time	$t_A$	<25 ns
Maximum back-up fuse		125 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		4
Protection rating		IP20
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>



Surge arrester V10 1-pole + NPE 280 V



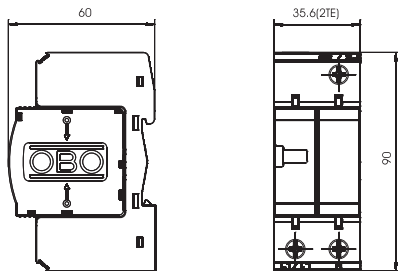
Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V10-C 1+NPE-280	280	1 + NPE	1	22.200	5093418

Surge arrester, type 2+3

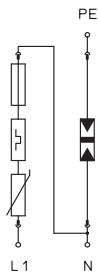
- Complete unit consisting of cover and base, pre-mounted and ready for connection
- Suitable for TN-S and TT network systems
- Incl. thermal and dynamic cut-off unit
- With visual display of defects
- High current conductivity and long service life
- Labelled connections

Application example: Residential buildings, single-family homes

Dimensions



Connection options



V10-C 1+NPE-280

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	280 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 1,1 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		125 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		2
Protection rating		IP20
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 35 mm <sup>2</sup>



## Plug-in arrester V10 150 V



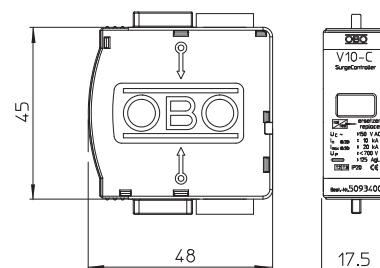
Type	Highest continuous voltage		Pack Piece	Weight kg/100 pc.	Item no.
	V	Version			
V10-C 0-150	150	1-pole	1	2.900	5093400

Surge arrester, type 2+3 to EN 61643-11

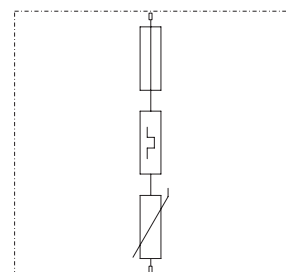
- Plug-in cover; cover can be separated from base without tools
- Incl. thermal and dynamic cut-off unit and visual display of defects
- High current conductivity and long service life



## Dimensions



## Connection options



## V10-C 0-150

Nominal voltage	$U_N$	150 V
Max. continuous operating voltage	$U_C$	150 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	10 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	< 0,7 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		125 A
Temperature range	$\vartheta$	-40 - +80 °C
Division unit TE (17.5 mm)		1
Protection rating		IP20



## Surge protection for LED systems 230V



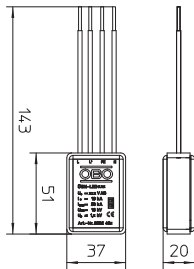
Highest continuous voltage V Version

Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-LED 230	255	1+NPE	1	3.500	5092480

Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids. Appropriate for the protection of LED lighting.

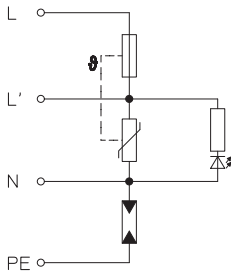
- With visual function display
- Small size for the installation in the pole or in the LED lamp head
- 1+NPE protective circuit with a maximum discharge capacity of 20 kA
- Surge limitation under 1,300 V or 1,000 V @ 5 kA
- Available with or without cut-off function of the lamp in case of malfunction

### Dimensions



Application: Universally deployable in all lighting systems

### Connection options



### ÜSM-LED 230

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	1,3 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_u$	-40 - +80 °C
Protection rating		IP20
Connecting cable length		0.09 m

Surge protection for LED systems 230 V IP65



Type	Highest continuous voltage		Pack Piece	Weight kg/100 pc.	Item no.
	V	Version			
<b>ÜSM-LED 230-65</b>	255	1+NPE	25	7.500	<b>5092478</b>

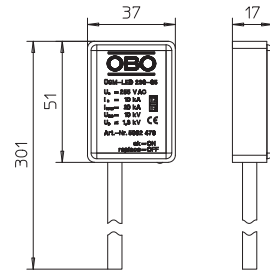
Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids. Appropriate for the protection of LED lighting and the LED driver.

- With visual function display
- Small size for the installation in the mast connection box
- IP65 and with 25 cm connection cable
- 1+NPE protective circuit with a maximum discharge capacity of 20 kA
- Surge limitation under 1,300 V or 1,000 V @ 5 kA
- Available with or without cut-off function of the lamp in case of malfunction

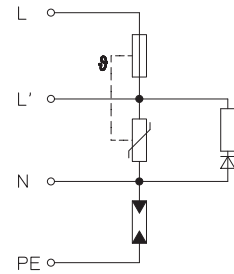
Application: Universally deployable in all lighting systems



Dimensions



Connection options



ÜSM-LED 230-65

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total 8/20}$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	1,3 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_u$	-40 - +80 °C
Protection rating		IP65
Connecting cable length		0.25 m



## Surge protection for LED systems 440 V



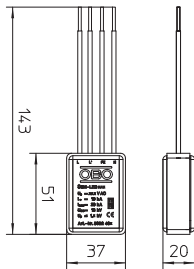
Highest continuous voltage V Version

Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-LED 440	440	1+NPE	1	4.500	5092482

Surge protection module type 2+3 to DIN EN 61643-11 for 440 V power grids. Appropriate for the protection of LED lighting.

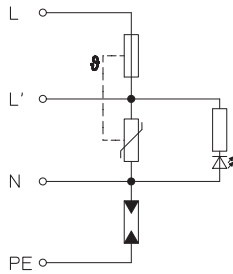
- With visual function display
- Small size for the installation in the pole or in the LED lamp head
- 1+NPE protective circuit with a maximum discharge capacity of 20 kA
- Surge limitation under 1,800 V
- Available with or without cut-off function of the lamp in case of malfunction

### Dimensions



Application: Universally deployable in all lighting systems

### Connection options



### ÜSM-LED 440

Nominal voltage	$U_N$	440 V
Max. continuous operating voltage	$U_C$	440 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→3
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	1,8 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_u$	-40 - +80 °C
Protection rating		IP20
Connecting cable length		0.09 m

## Surge protection for LED systems ÜSM-20-230I1P+PE

LPZ  
1→3Type  
2+3Highest  
continu-  
ous  
voltage

V

Version

Pack Weight  
Piece kg/100 pc.

Item no.

Type	Max. continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-20-230I1P+PE	255	1-pole + NPE for PC I	1	4.100	5092431

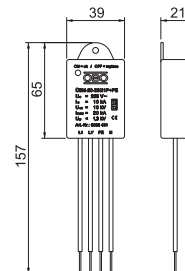
Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids.  
Appropriate for the protection of LED lighting.

- With function display and switch-off of the load circuit when a SPD fails
- Small size for the installation in the pole connection box or upstream of the LED driver
- 1+NPE protective circuit with a maximum discharge capacity of 20 kA
- Reduction of overvoltage to under 1,300 V or 1,000 V @ 5 kA
- With or without luminaire switch-off in case of defect

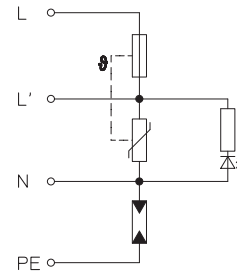
Application: In the cable transition box, junction boxes, cable duct to underfloor systems



## Dimensions



## Connection options



## ÜSM-20-230I1P+PE

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	1,3 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_{U}$	-40 - +80 °C
Protection rating		IP20
Connecting cable length		0.09 m



## Surge protection for LED systems ÜSM-20-230I1PE65



Highest continuous voltage V

Version

Pack Weight Piece kg/100 pc. Item no.

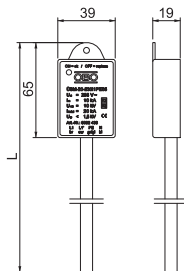
Type	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-20-230I1PE65	255   1-pole + NPE for PC I	1	8.300	5092433

Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids. Appropriate for the protection of LED lighting.

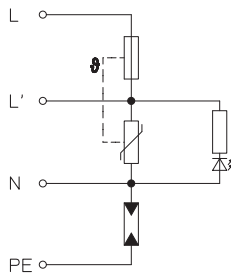
- With function display and switch-off of the load circuit when a SPD fails
- Small size for the installation in the pole connection box or upstream of the LED driver
- 1+NPE protective circuit with a maximum discharge capacity of 20 kA
- Reduction of overvoltage to under 1500 V or 1000 V @ 5 kA
- With or without luminaire switch-off in case of defect

Application: In the cable transition box, junction boxes, cable duct to underfloor systems

### Dimensions



### Connection options



### ÜSM-20-230I1PE65

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	$I_n$	10 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	20 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	20 kA
Protection level	$U_n$	1,5 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_u$	-40 - +80 °C
Protection rating		IP65
Connecting cable length		0.25 m

## Surge protection module ÜSM-10-230I2P+PE



Type	Highest continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-10-230I2P+PE	255	2-pole + NPE for PC I	1	4.400	5092426

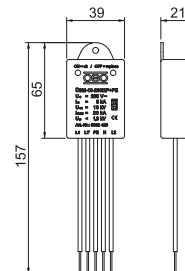
Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids. Appropriate for the protection of electronic devices and LED drivers.

- For luminaires with 2 phases (power reduction)
- With function display and switch-off of the load circuit when a SPD fails
- Small size for the installation in the pole connection box or upstream of the LED driver
- Protective circuit with a maximum arresting capacity of 10 kA
- Reduction of overvoltage to under 1,300 V (protection level)
- For LED luminaires with PE connection

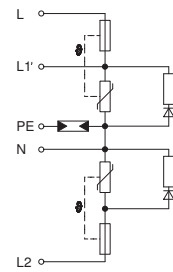
Application: In the cable transition box, junction boxes, cable duct to underfloor systems



Dimensions



Connection options

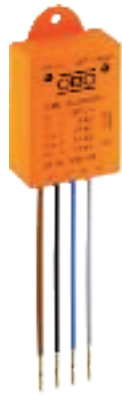


## ÜSM-10-230I2P+PE

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	$I_n$	5 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	10 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	10 kA
Protection level	$U_n$	1,3 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_U$	-40 - +80 °C
Protection rating		IP20
Connecting cable length		0.09 m



## Surge protection module ÜSM-10-230I2P-0



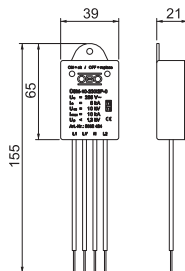
Highest continuous voltage

Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-10-230I2P-0	255	2-pole without NPE for SK II	1	4.100	5092424

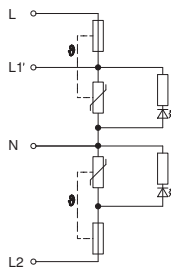
Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids. Appropriate for the protection of electronic devices and LED drivers.

- For luminaires with 2 phases (power reduction)
- With function display and switch-off of the load circuit when a SPD fails
- Small size for the installation in the pole connection box or upstream of the LED driver
- Protective circuit with a maximum arresting capacity of 10 kA
- Reduction of overvoltage to under 1,300 V (protection level)
- For protection insulated luminaires (PC II) without PE connection

### Dimensions



### Connection options



### ÜSM-10-230I2P-0

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	$I_n$	5 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	— kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	10 kA
Protection level	$U_n$	1,3 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_{li}$	-40 - +80 °C
Protection rating		IP20
Connecting cable length		0.09 m



## Surge protection module ÜSM-10-230I1P+PE

LPZ  
1→3Type  
2+3Highest  
continu-  
ous  
voltage

V

Version

Pack Weight  
Piece kg/100 pc.

Item no.

Type	Max. continuous voltage V	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-10-230I1P+PE	255	1-pole + NPE for PC I	1	3.500	5092422

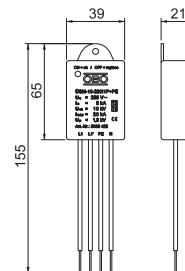
Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids.  
Appropriate for the protection of electronic devices and LED drivers.

- With function display and switch-off of the load circuit when a SPD fails
- Small size for the installation in the pole connection box or upstream of the LED driver
- Use in the LED luminaire head upstream of the electronic LED driver
- Protective circuit with a maximum arresting capacity of 10 kA
- Reduction of overvoltage to under 1,300 V (protection level)
- For LED luminaires with PE connection

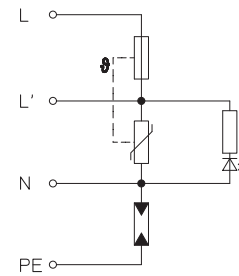
Application: In the cable transition box, junction boxes, cable duct to underfloor systems



## Dimensions



## Connection options



## ÜSM-10-230I1P+PE

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	$I_n$	5 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	10 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	10 kA
Protection level	$U_n$	1,3 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_{U}$	-40 - +80 °C
Protection rating		IP20
Connecting cable length		0.09 m



## Surge protection module ÜSM-10-2301P-0



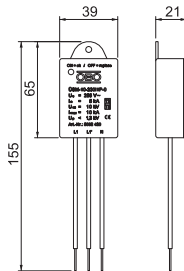
Highest continuous voltage

Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-10-2301P-0	255	1-pole without NPE for PC II	1	3.200	5092420

Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids. Appropriate for the protection of electronic devices and LED drivers.

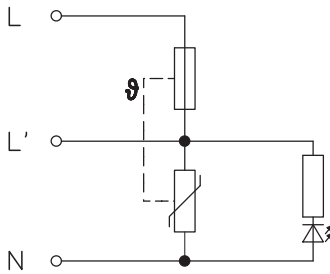
- With function display and switch-off of the load circuit when a SPD fails
- Small size for the installation in the pole connection box or upstream of the LED driver
- Protective circuit with a maximum arresting capacity of 10 kA
- Reduction of overvoltage to under 1,300 V (protection level)
- For protection insulated luminaires (PC II) without PE connection

### Dimensions



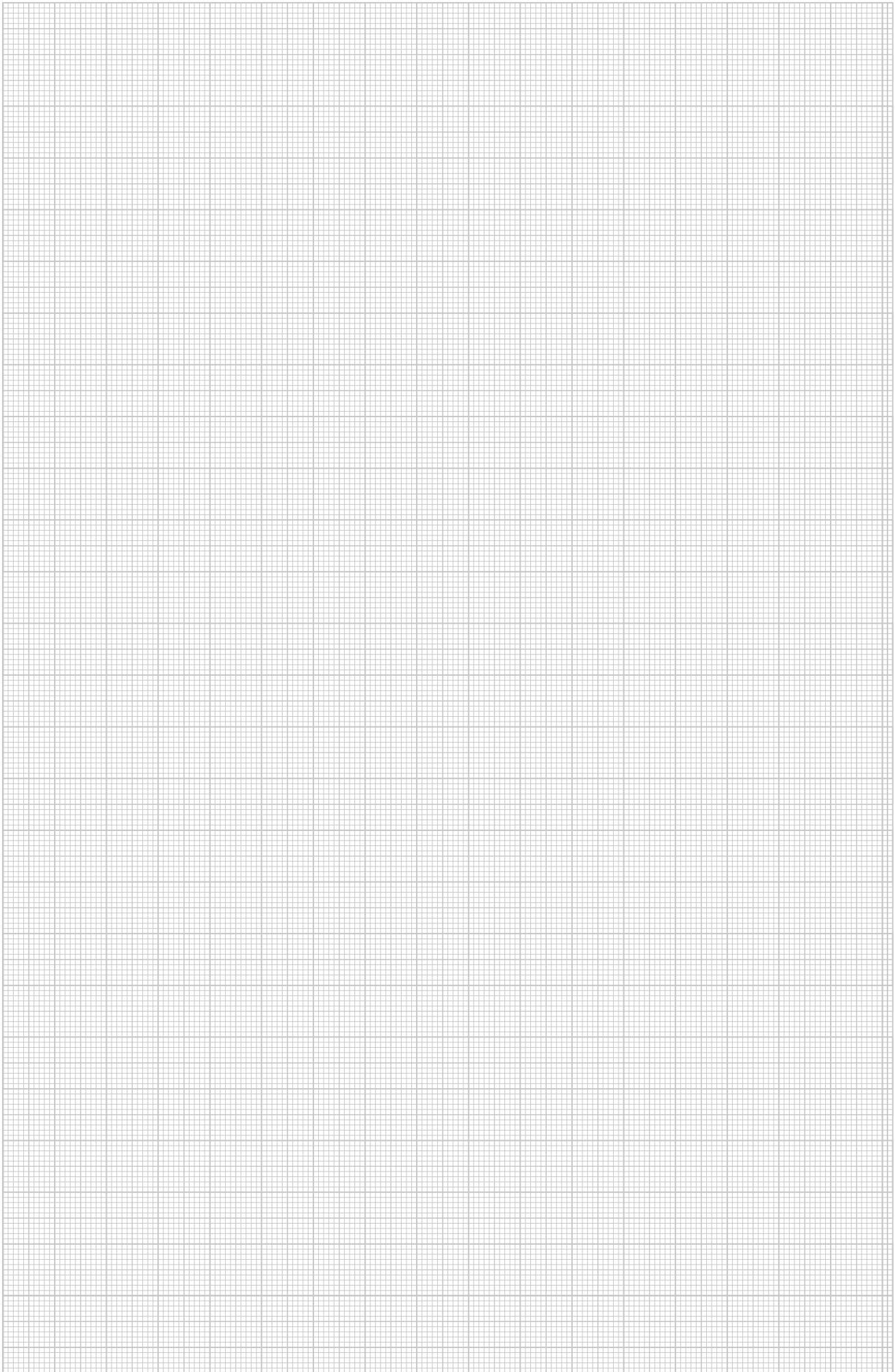
Application: In the cable transition box, junction boxes, cable duct to underfloor systems

### Connection options



### ÜSM-10-2301P-0

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	$I_n$	5 kA
Arrestor surge current (8/20) [total]	$I_{Total\ 8/20}$	— kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	10 kA
Protection level	$U_n$	1,3 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_U$	-40 - +80 °C
Protection rating		IP20
Connecting cable length		0.09 m



OBO

Blitzbarriere  
**VF**  
**24**  
AC/DC



OK



Replace

$U_N$  : 24 V  
 $I_L$  : 20 A  
 $I_n (8/20)$  : 700 A  
 $I_{max} (8/20)$  : 2 kA  
 $U_p$  :  $\leq 130$  V  
IP20 CE

Art.-Nr. 5097 60 7

theben

13 03 15

OFF

13:41 18

MENU



# Surge protection Energy technology, type 3 arrester



**Fine power protection, fixed installation**

206



Fine power protection, fixed installation

## Surge protection module 230 V



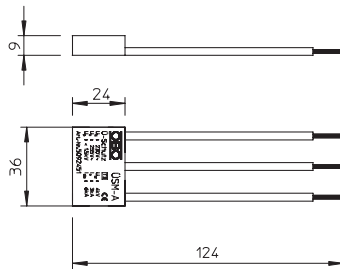
Type	Signalling on device	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSM-A	Acoustic	Acoustic operating display	1	1.500	5092451

Surge protection module type 3 to DIN EN 61643-11.

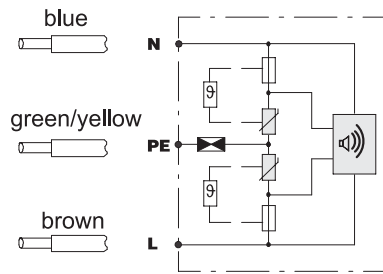
- With audible defect signal
- With low construction height
- Halogen-free plastic (UL 94 V-0)
- Y circuit

Application: Universally applicable for all installation systems.

### Dimensions



### Connection options



### ÜSM-A

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	$I_n$	3 kA
Protection level (L-N)		< 1,3 kV
Protection level (N-PE)		< 1,5 kV
Maximum back-up fuse		16 A
Response time	$t_A$	< 25 ns
Temperature range	$\vartheta$	-15 - +60 °C
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	6 kA
Rated current	$I_t$	16 A

## Surge protection module 150 V



Type	Signalling on device	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>ÜSM-A-150</b>	Acoustic	Acoustic operating display	1	1.500	<b>5092466</b>

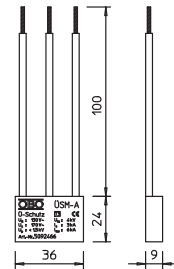
Surge protection module type 3 to DIN EN 61643-11.

- With audible defect signal
- With low construction height
- Halogen-free plastic (UL 94 V-0)
- Y circuit

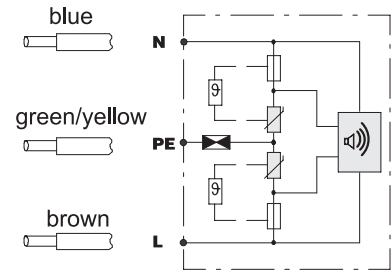
Application: Universally applicable for all installation systems.



### Dimensions



### Connection options



### ÜSM-A-150

Nominal voltage	$U_N$	150 V
Max. continuous operating voltage	$U_C$	170 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	$I_n$	3 kA
Protection level (L-N)		< 1,3 kV
Protection level (N-PE)		< 1,5 kV
Maximum back-up fuse		16 A
Response time	$t_A$	< 25 ns
Temperature range	$\vartheta$	-15 - +60 °C
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	6 kA
Rated current	$I_r$	16 A

## Surge protection device 230 V for through wiring



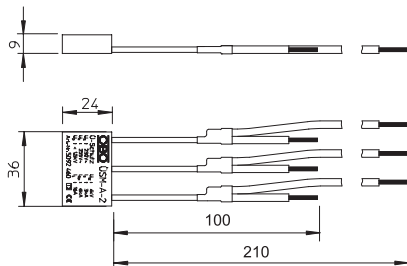
Type	Signalling on device	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>ÜSM-A-2</b>	Acoustic	V connection	1	2.200	<b>5092460</b>

Surge protection device type 3 to DIN EN 61643-11 for 230 V networks.

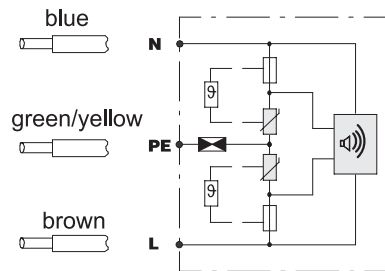
- With acoustic defect signal
- With 2 strands for continuous wiring
- With low construction height
- Halogen-free plastic (UL 94 V-0)
- Y circuit

Application: Universally applicable for all installation systems.

### Dimensions



### Connection options



### ÜSM-A-2

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	$I_n$	3 kA
Protection level (L-N)		< 1,3 kV
Protection level (N-PE)		< 1,5 kV
Maximum back-up fuse		16 A
Response time	$t_A$	< 25 ns
Temperature range	$\vartheta$	-15 - +60 °C
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	6 kA
Rated current	$I_t$	16 A



## Fine power protection for Modul 45 with acoustic function display



Type	Signalling on device	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>ÜSS 45-O-RW</b>	Visual	Visual function display	1	2.411	<b>6117473</b>

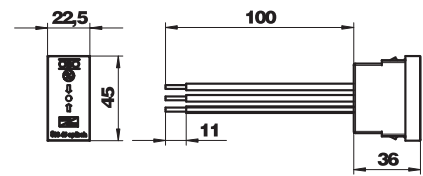
Surge protection / network fine protection, type 3, according to EN 61643-11 for installation in Rapid 45 trunking, device installation trunking and underfloor systems.

- Version-O with acoustic function display
- Quick and easy mounting
- Low construction width of 22.5 mm

Application: The surge protection device secures downstream and nearby sockets.



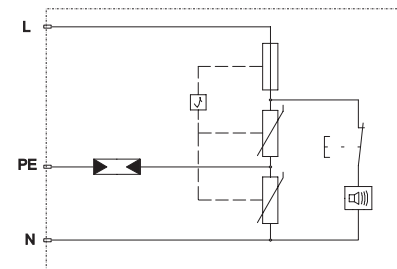
Dimensions



### ÜSS 45-O-RW

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_c$	255 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	$I_n$	2.5 kA
Protection level (L-N)		< 1,5 kV
Protection level (N-PE)		< 1,5 kV
Maximum back-up fuse		16 A
Response time	$t_A$	25 ns
Temperature range	$\vartheta$	-25 - +45 °C

Connection options



## Surge protection module for Modul 45 with audible signalling



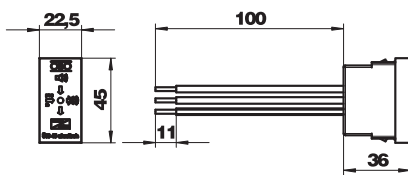
Type	Signalling on device	Version	Pack Piece	Weight kg/100 pc.	Item no.
ÜSS 45-A-RW	Acoustic	Acoustic function display	1	2.800	6117465

Surge protection / network fine protection, type 3, according to EN 61643-11 for installation in Rapid 45 trunking, device installation trunking and underfloor systems.

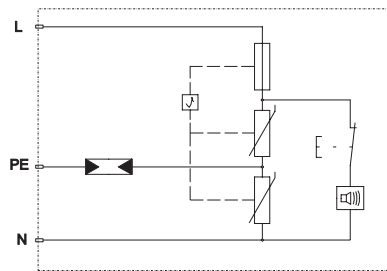
- Version-A with acoustic function display (switchable signal tone)
- Quick and easy mounting
- Low construction width of 22.5 mm

Application: The surge protection device secures downstream and nearby sockets.

### Dimensions



### Connection options



### ÜSS 45-A-RW

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	$I_n$	2.5 kA
Protection level (L-N)		< 1,5 kV
Protection level (N-PE)		< 1,5 kV
Maximum back-up fuse		16 A
Response time	$t_A$	25 ns
Temperature range	$\vartheta$	-25 - +45 °C

## Surge protection module ÜSM 10



Highest continuous voltage

Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>ÜSM-10-230I1PE25</b>	255	1-pole + NPE for PC I	1	5.500	<b>5092440</b>

Surge protection module type 2+3 to DIN EN 61643-11 for 230/400 V power grids. Appropriate for the protection of LED lighting.

- With function display and switch-off of the load circuit when a SPD fails
- Small size for the installation in the pole connection box or upstream of the LED driver
- 1+NPE protective circuit with a maximum discharge capacity of 10 kA
- Reduction of overvoltage to under 1300 V or 1000 V @ 5 kA
- With or without luminaire switch-off in case of defect

Application: In the cable transition box, junction boxes, cable duct to underfloor systems

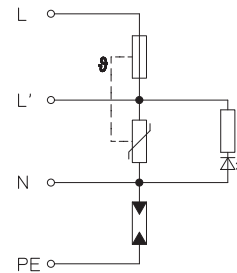
### ÜSM-10-230I1PE25

Nominal voltage	$U_N$	230 V
Max. continuous operating voltage	$U_C$	255 V
SPD to EN 61643-11		Type 2+3
SPD to IEC 61643-11		Class II+III
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	$I_n$	5 kA
Arrestor surge current (8/20) [total]	$I_{Ttotal 8/20}$	10 kA
Maximum discharge current (8/20 $\mu$ s)	$I_{max}$	10 kA
Protection level	$U_p$	1,5 kV
Response time	$t_A$	< 25 ns
Maximum back-up fuse		16 A
Operating temperature range	$T_u$	-40 - +80 °C
Protection rating		IP20
Connecting cable length		0.09 m













Dimensions

Connection options





## Photovoltaic systems

	<b>Lightning current and surge arrester, type 1+2, photovoltaic systems 1,500 V DC</b>	214
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	<b>Photovoltaic system solution with fuses</b>	228
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## PV complete block 1500 V DC



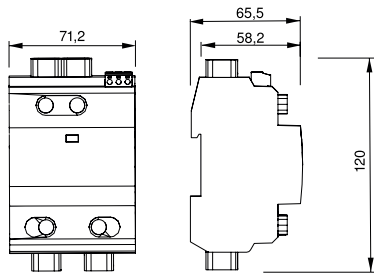
Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V-PV-T1+2-1500	1500	Y configuration	1	49.200	5094240

Type 1+2 combination arrester for lightning and surge protection of PV systems.

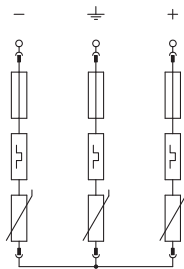
- Lightning protection equipotential bonding according to IEC 62305 (VDE 0185-305)
- Surge protection according to IEC 60364-7-712 (VDE 0100-712)
- Arresting capacity to 12.5 kA (10/350) and 40 kA (8/20)
- Error-resistant Y circuit with status display
- The FS variant possesses a potential-free changeover contact for remote signalling

Application: Lightning current and surge protection devices for PV systems.

### Dimensions



### Connection options



### V-PV-T1+2-1500

U max DC	U <sub>c</sub> DC	1500 V
SPD to EN 61643-11	Type	1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>imp</sub>	6.25 kA
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>o</sub>	< 4,5 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - 80 °C
Protection rating		IP20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 35 mm <sup>2</sup>

**PV complete block 1500 V DC with remote signalling**



Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>V-PV-T1+2-1500FS</b>	1500	Y configuration + RS	1	49.600	<b>5094242</b>

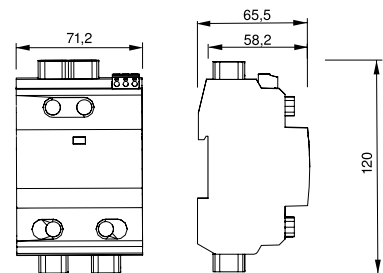
Type 1+2 combination arrester for lightning and surge protection of PV systems.

- Lightning protection equipotential bonding according to IEC 62305 (VDE 0185-305)
- Surge protection according to IEC 60364-7-712 (VDE 0100-712)
- Arresting capacity to 12.5 kA (10/350) and 40 kA (8/20)
- Error-resistant Y circuit with status display
- The FS variant possesses a potential-free changeover contact for remote signalling

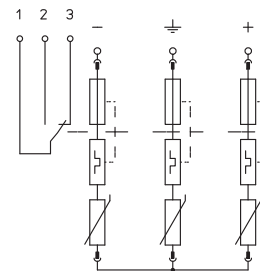
Application: Lightning current and surge protection devices for PV systems.



**Dimensions**



**Connection options**



**V-PV-T1+2-1500FS**

U max DC	U <sub>c</sub> DC	1500 V
SPD to EN 61643-11	Type	1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>impD</sub>	6.25 kA
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>d</sub>	< 4,5 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - 80 °C
Protection rating		IP20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 35 mm <sup>2</sup>



## PV complete block 1000 V DC



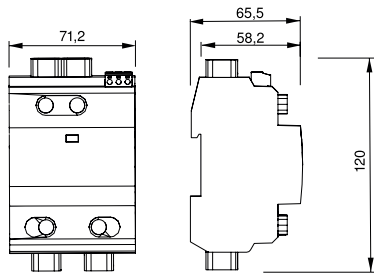
Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V-PV-T1+2-1000	1000	Y configuration	1	40.700	5094230

Type 1+2 combination arrester according to EN 50539-11 for lightning and surge protection of PV systems.

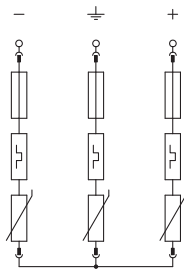
- Lightning protection equipotential bonding according to IEC 62305 (VDE 0185-305)
- Surge protection according to IEC 60364-7-712 (VDE 0100-712)
- Arresting capacity to 12.5 kA (10/350) and 40 kA (8/20)
- Error-resistant Y circuit with status display
- The FS variant possesses a potential-free changeover contact for remote signalling

Application: Lightning current and surge protection devices for PV systems.

### Dimensions



### Connection options



### V-PV-T1+2-1000

U max DC	U <sub>c</sub> DC	1000 V
SPD to EN 61643-11	Type	1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>imp</sub>	6.25 kA
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>p</sub>	< 3,3 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - 80 °C
Protection rating		IP20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 35 mm <sup>2</sup>



**PV complete block 1000 V DC with remote signalling**



Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>V-PV-T1+2-1000FS</b>	1000	Y configuration + RS	1	41.200	<b>5094232</b>

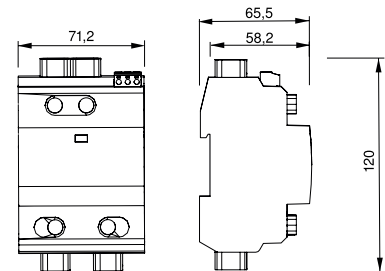
Type 1+2 combination arrester according to EN 50539-11 for lightning and surge protection of PV systems.

- Lightning protection equipotential bonding according to IEC 62305 (VDE 0185-305)
- Surge protection according to IEC 60364-7-712 (VDE 0100-712)
- Arresting capacity to 12.5 kA (10/350) and 40 kA (8/20)
- Error-resistant Y circuit with status display
- The FS variant possesses a potential-free changeover contact for remote signalling

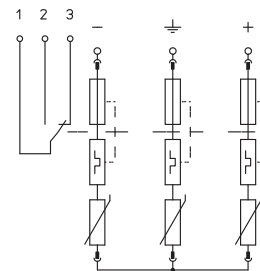
Application: Lightning current and surge protection devices for PV systems.



**Dimensions**



**Connection options**



**V-PV-T1+2-1000FS**

U max DC	U <sub>c</sub> DC	1000 V
SPD to EN 61643-11		Type 1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>impD</sub>	6.25 kA
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>o</sub>	< 3,3 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - 80 °C
Protection rating		IP20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 35 mm <sup>2</sup>



**PV combination arrester V50, 600 V DC**

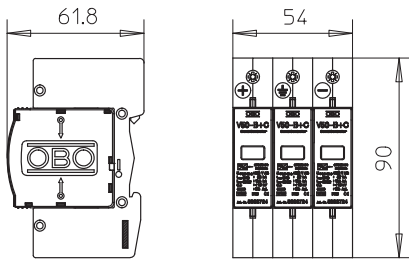


Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V50-B+C 3-PH600	600	3-pole for PV systems	1	41.000	5093623

V50 combination arrester, type 1+2, for photovoltaic systems

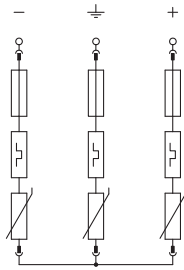
- Complete unit, consisting of plug-in varistor arrester with cut-off unit
- Error-resistant Y circuit to VDE 0100-712 (EN 50539-12)
- Surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity up to 12.5 kA (10/350) and 50 kA (8/20) per pole
- Low DC protection level: < 2.6 kV and Voc max = 600 V DC
- With visual function display for use in distributor housings

**Dimensions**



Application: PV systems with lightning protection system

**Connection options**



**V50-B+C 3-PH600**

U max DC	U <sub>c</sub> DC	600 V
SPD to EN 61643-11	Type	1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>impD</sub>	12.5 kA
Nominal discharge current (8/20)	I <sub>n</sub>	30 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	50 kA
Protection level	U <sub>o</sub>	< 2,6 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		3
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>

**PV combination arrester V50, 600 V DC with remote signalling**



Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>V50-B+C 3PHFS600</b>	600	3-pole for PV systems with FS	1	49.600	<b>5093625</b>

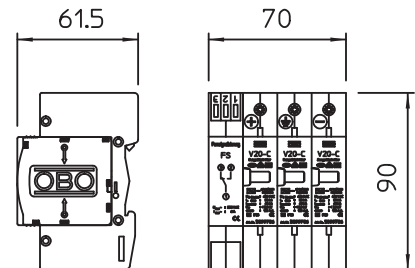
V50 combination arrester, type 1+2, for photovoltaic systems

- Complete unit, consisting of plug-in varistor arrester with cut-off unit
- Error-resistant Y circuit to VDE 0100-712 (EN 50539-12)
- Surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity up to 12.5 kA (10/350) and 50 kA (8/20) per pole
- Low DC protection level: < 2.6 kV and Voc max = 600 V DC
- With visual function display for use in distributor housings

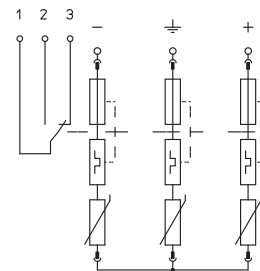
Application: PV systems with lightning protection system



**Dimensions**



**Connection options**



**V50-B+C 3PHFS600**

U max DC	U <sub>c</sub> DC	600 V
SPD to EN 61643-11	Type	1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>impD</sub>	12.5 kA
Nominal discharge current (8/20)	I <sub>n</sub>	30 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	50 kA
Protection level	U <sub>d</sub>	< 2,6 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>



**PV complete block 1500 V DC**



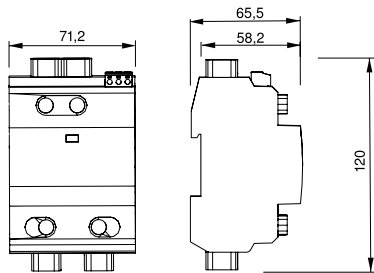
Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V-PV-T2-1500	1500	Y configuration	1	33.800	5094210

Type 2 surge protection for PV plants.

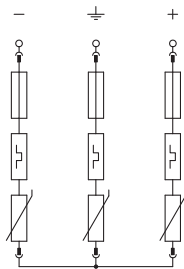
- Surge protection according to IEC 60364-7-712 (VDE 0100-712)
- Arresting capacity of 20 kA per pole and up to 40 kA (8/20)
- Error-resistant Y circuit with status display
- The FS variant possesses a potential-free changeover contact for remote signalling

Application: Surge protection devices for PV systems.

**Dimensions**



**Connection options**



**V-PV-T2-1500**

U max DC	U <sub>c</sub> DC	1500 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>n</sub>	< 4,5 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	ϑ	-40 - 80 °C
Protection rating		IP20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 35 mm <sup>2</sup>

## PV complete block 1500 V DC with remote signalling



Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V-PV-T2-1500+FS	1500	Y configuration + RS	1	34.400	5094212

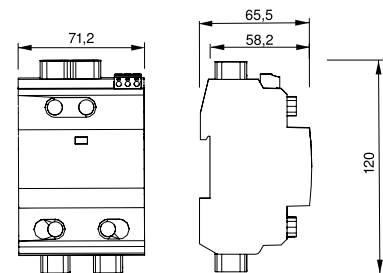
Type 2 surge protection for PV plants.

- Surge protection according to IEC 60364-7-712 (VDE 0100-712)
- Arresting capacity of 20 kA per pole and up to 40 kA (8/20)
- Error-resistant Y circuit with status display
- The FS variant possesses a potential-free changeover contact for remote signalling

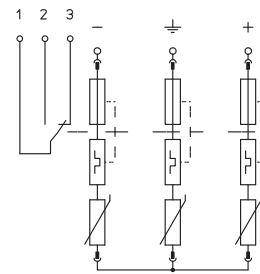
Application: Surge protection devices for PV systems.



## Dimensions



## Connection options



## V-PV-T2-1500+FS

U max DC	U <sub>c</sub> DC	1500 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>n</sub>	< 4,5 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - 80 °C
Protection rating		IP20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 35 mm <sup>2</sup>



PV surge protection V20, 1000 V DC

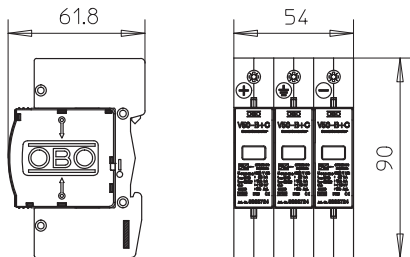


Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V20-C 3-PH-1000	1000	3-pole for PV systems	1	36.500	5094608

V20 surge arrester, type 2, for photovoltaic systems

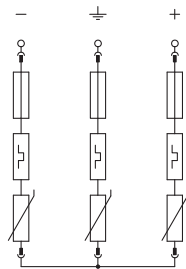
- Complete unit, consisting of plug-in varistor arrester with cut-off unit
- Error-resistant Y circuit to VDE 0100-712 (EN 50539-12)
- Surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- V20-C 3-PH-1000 tested to EN 50539-11 (VDE / KEMA)
- Arresting capacity to 40 kA (8/20) per pole
- Low DC protection level: < 4.0 kV and Voc max = 1,000 V DC
- With visual status display for use in distributor housings

Dimensions



Application: PV systems with or without separate lightning protection system

Connection options



V20-C 3-PH-1000

U max DC	U <sub>c</sub> DC	1000 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>n</sub>	< 4,0 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	ϑ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		3
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>

## PV surge protection V20, 1000 V DC with remote signalling

Type  
2LPZ  
1→2

Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V20-C 3PHFS-1000	1000	3-pole for PV systems with FS	1	44.500	5094574

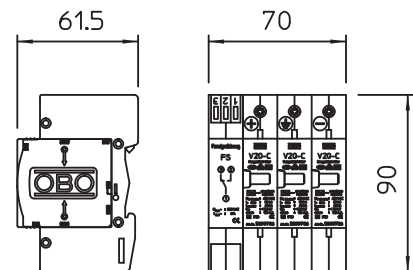
V20 surge arrester, type 2, for photovoltaic systems

- Complete unit, consisting of plug-in varistor arrester with cut-off unit
- Error-resistant Y circuit to VDE 0100-712 (EN 50539-12)
- Surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- V20-C 3-PH-1000 tested to EN 50539-11 (VDE / KEMA)
- Arresting capacity to 40 kA (8/20) per pole
- Low DC protection level: < 4.0 kV and Voc max = 1,000 V DC
- With visual status display for use in distributor housings

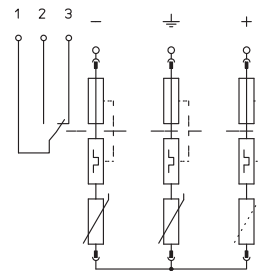
Application: PV systems with or without separate lightning protection system



## Dimensions



## Connection options



## V20-C 3PHFS-1000

U max DC	U <sub>c</sub> DC	1000 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>n</sub>	< 4,0 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>



PV surge protection V20, 600 V DC

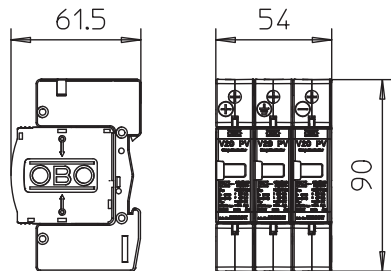


Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V20-C 3PH-600	600	3-pole for PV systems	1	33.500	5094605

V20 surge arrester, type 2, for PV systems

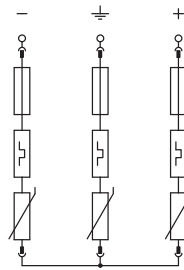
- Complete unit, consisting of plug-in varistor arrester with cut-off unit
- Error-resistant Y circuit for use according to VDE 0100-712 (EN 50539-12)
- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pole
- Low DC protection level: < 2.6 kV (Voc max = 600 V DC)
- Arrester, connectable with thermodynamic cut-off unit and visual function display
- Encapsulated, zinc oxide varistor arrester for use in distributor housings

Dimensions



Application: PV systems with or without separate lightning protection system

Connection options



V20-C 3PH-600

U max DC	U <sub>c</sub> DC	600 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>n</sub>	< 2,6 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	ϑ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		3
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>



## PV surge protection V20, 600 V DC with remote signalling



Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V20-C 3PHFS-600	600	3-pole for PV systems; Y circuit with FS	1	41.500	5094576

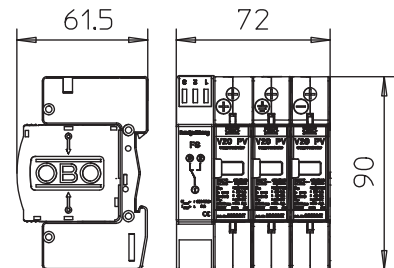
V20 surge arrester, type 2, for PV systems

- Complete unit, consisting of plug-in varistor arrester with cut-off unit
- Error-resistant Y circuit for use according to VDE 0100-712 (EN 50539-12)
- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pole
- Low DC protection level: < 2.6 kV (Voc max = 600 V DC)
- Arrester, connectable with thermodynamic cut-off unit and visual function display
- Encapsulated, zinc oxide varistor arrester for use in distributor housings

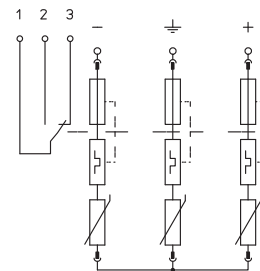
Application: PV systems with or without separate lightning protection system



## Dimensions



## Connection options

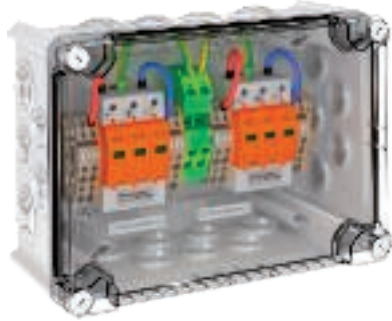


## V20-C 3PHFS-600

U max DC	U <sub>c</sub> DC	600 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>n</sub>	< 2,6 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		4
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>



## PV system solution, type 1+2, for inverter with 2 MPP trackers, 900 V DC

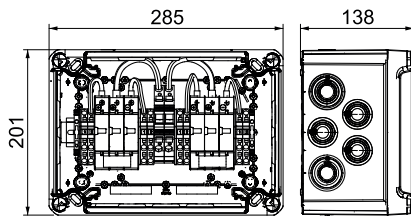


Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
VG-BCPV900K 22	900	For two MPP and with terminal connection	1	220.000	5088566

System solution for photovoltaic inverter with 2 separate MPP trackers

- Varistor arrestor, connectable with disconnecting device in error-resistant Y circuit to VDE 0100-712 (50539-12)
- Low DC protection level: < 4.0 kV (Uoc max = 1,000 V DC with V20-C/0-500PV)
- Low DC protection level: < 3.0 kV (Uoc max = 900 V DC with V25-B+C/0-450PV)
- Per protection device, there are 4 terminals up to 6 mm<sup>2</sup> pre-mounted in the housing, up to 30 A DC per terminal
- Pre-mounted in polycarbonate housing (IP66), UV-resistant for the use outside, including cable gland kit

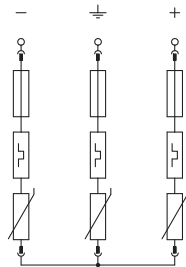
### Dimensions



For DC protection of the inverter in photovoltaic systems.

If there is a danger of condensation forming through wind, ice, temperature or sunlight, further measures may be necessary!

### Connection options



### VG-BCPV900K 22

U max DC	U <sub>c</sub> DC	900 V
SPD to EN 61643-11		Type 1+2
Lightning protection zone LPZ		0-2
Nominal discharge current (8/20)	I <sub>n</sub>	30 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	60 kA
Protection level	U <sub>p</sub>	< 3,0 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-30 - 90 °C
Protection rating		IP66

**PV system solution, type 2, for inverter with 3 MPP trackers, 1000 V DC**



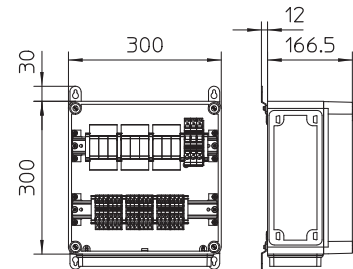
Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>VG-CPV 1000K 333</b>	1000	For three MPP and with terminal connection	1	528.000	<b>5088585</b>

System solution for photovoltaic inverter with 3 separate MPP trackers

- Varistor arrestor, connectable with cut-off unit in error-resistant Y circuit to VDE 0100-712 (50539-12)
- Low DC protection level: < 3.0 kV (Voc max = 900 V DC with V25-B+C/0-450PV)
- Per protection device there are 6 terminals up to 6 mm<sup>2</sup> pre-mounted in the housing, up to 30 A DC per terminal
- Pre-mounted in polycarbonate housing (IP65), UV-resistant for use outside, including cable gland kit



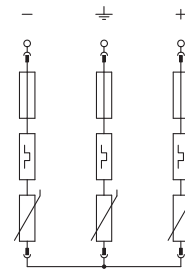
**Dimensions**



For DC protection of the inverter in photovoltaic systems.

If there is a danger of condensation forming through wind, ice, temperature or sunlight, further measures may be necessary!

**Connection options**



**VG-CPV 1000K 333**

U max DC	U <sub>c</sub> DC	1000 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>n</sub>	< 4,0 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP65



## Photovoltaic housing with 4 fuses 10 A

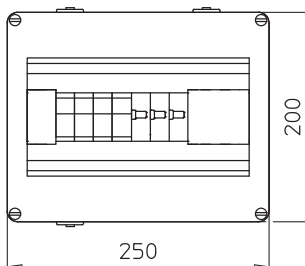


Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
VG-C DCPH1000-4S	1000	Type 2 in housing with 4 PV fuses (10 A)	1	200.000	5088651

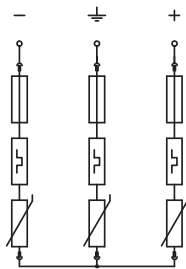
System solution for photovoltaic fuses for photovoltaic inverters with 1 MPP tracker

- Error-resistant Y circuit to VDE 0100-712 (50539-12)
- Low DC protection level: < 4.0 kV (Voc max = 1,000 V DC with V20-C/0-500PV)
- Item no.: 5088651: (+) poles protected via 4 photovoltaic fuses 10 x 38 mm 10 A, 1,000 V DC protected
- Item no.: 5088654: (+) poles protected via 4 photovoltaic fuses 10 x 38 mm (unequipped), 1,000 V DC protected
- 4 (-) poles via terminal up to 6 mm<sup>2</sup> switched in parallel in the housing, up to 30 A DC per terminal
- Pre-mounted in polycarbonate housing (IP65), weather-resistant for use outside, including cable gland kit

### Dimensions



### Connection options



For DC protection of the inverter in photovoltaic systems.

If there is a danger of condensation forming through wind, ice, temperature or sunlight, further measures may be necessary!

### VG-C DCPH1000-4S

U max DC	U <sub>c DC</sub>	1000 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>n</sub>	< 4,0 kV
Response time	t <sub>A</sub>	< 25 ns
Connection cross-section, rigid		0.5 - 6 mm <sup>2</sup>
Connection cross-section, flexible		0.5 - 6 mm <sup>2</sup>
Temperature range	ϑ	-40 - +80 °C
Protection rating		IP 65

## PV housing for inverter with 3 MPP trackers, type 1+2, 900 V DC



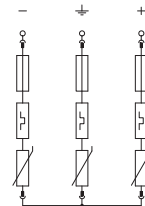
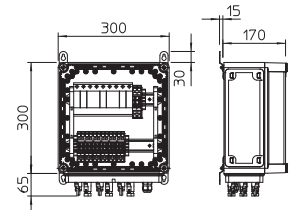
Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>VG-BC DCPH900-31</b>	900	For three MPP and with MC4 connection	1	542.000	<b>5088629</b>

System solution with MC4 connector for photovoltaic inverter with 3 separate MPP trackers

- Varistor arrestor, connectable with cut-off unit in error-resistant Y circuit to VDE 0100-712 (50539-12)
- Low DC protection level: < 4.0 kV (Voc max = 1,000 V DC with V20-C/0-500PV)
- Low DC protection level: < 3.0 kV (Voc max = 900 V DC with V25-B+C/0-450PV)
- Two PV string inputs (MC4 plug connector) at one MPP inverter input, up to 30 A DC per terminal
- Pre-mounted in polycarbonate housing (IP65), UV-resistant for use outside, including cable gland kit

For DC protection of the inverter in photovoltaic systems.

If there is a danger of condensation forming through wind, ice, temperature or sunlight, further measures may be necessary!



### VG-BC DCPH900-31

U max DC	U <sub>c</sub> DC	900 V
SPD to EN 61643-11	Type	1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>impD</sub>	7 kA
Nominal discharge current (8/20)	I <sub>n</sub>	30 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	60 kA
Protection level	U <sub>d</sub>	< 3,0 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP65



PV housing for inverter with 1 MPP tracker, type 2

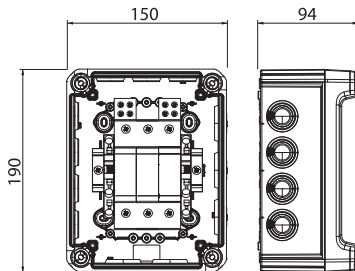


Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
VG-C DCPH-MS1000	1000	Type 2 in housing with terminals	1	154.000	5088691

System solution for photovoltaic inverter with 1 separate MPP tracker

- Varistor arrester, connectable with disconnecting device in error-resistant Y circuit to VDE 0100-712 (50539-12)
- Low DC protection level: < 4.0 kV (Uoc max = 1000 V DC with V20-C/0-500PV)
- Low DC protection level: < 3.0 kV (Uoc max = 900 V DC with V25-B+C/0-450PV)
- Per protection device, there are 3 terminals up to 16 mm<sup>2</sup> pre-mounted in the housing, up to 30 A DC per terminal
- Pre-mounted in polycarbonate housing (IP66), UV-resistant for the use outside, including cable gland kit

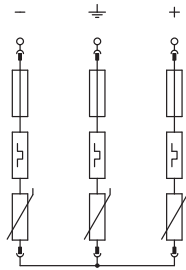
Dimensions



For DC protection of the inverter in photovoltaic systems.

If there is a danger of condensation forming through wind, ice, temperature or sunlight, further measures may be necessary!

Connection options



VG-C DCPH-MS1000

U max DC	U <sub>c</sub> DC	1000 V
SPD to EN 61643-11		Type 2
Lightning protection zone LPZ		1→2
Impulse discharge current (10/350)	I <sub>impD</sub>	— kA
Nominal discharge current (8/20)	I <sub>n</sub>	20 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	40 kA
Protection level	U <sub>o</sub>	< 4,0 kV
Response time	t <sub>A</sub>	< 25 ns
Connection cross-section, rigid		0.5 - 6 mm <sup>2</sup>
Connection cross-section, flexible		0.5 - 6 mm <sup>2</sup>
Temperature range	θ	-40 - +80 °C
Protection rating		IP 65

PV housing for inverter with 1 MPP tracker, type 1+2



Type	U max DC V		Version	Pack Piece	Weight kg/100 pc.	Item no.
	900	1000				
<b>VG-BC DCPH-MS900</b>	900	1000	Type 1+2 in housing with terminals	1	160.000	<b>5088692</b>

System solution for photovoltaic inverter with 1 MPP tracker

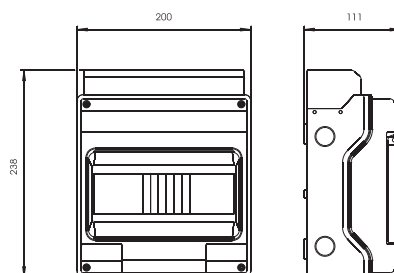
- Varistor arrester, connectable with cut-off unit in error-resistant Y circuit to VDE 0100-712 (50539-12)
- Low DC protection level: < 2.6 kV (Voc max = 600 V DC with V50-B+C/0-300PV / V20-C/0-300PV)
- Low DC protection level: < 3.0 kV (Voc max = 900 V DC with V25-B+C/0-450PV)
- Low DC protection level: < 4.0 kV (Voc max = 1000 V DC with V20-C/0-500PV)
- For each protection device, there are 3 terminals up to 16 mm<sup>2</sup> pre-mounted in the housing, up to 30 A DC per terminal
- Pre-mounted in polycarbonate housing (IP66), UV-resistant for use outside, including cable gland kit

For DC protection of the inverter in photovoltaic systems.

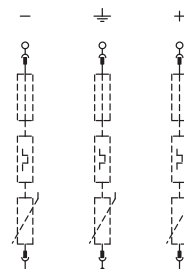
If there is a danger of condensation forming through wind, ice, temperature or sunlight, further measures may be necessary!



Dimensions



Connection options



**VG-BC DCPH-MS900**

U max DC	U <sub>c</sub> DC	900 V
SPD to EN 61643-11		Type 1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>impD</sub>	7 kA
Nominal discharge current (8/20)	I <sub>n</sub>	30 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	50 kA
Protection level	U <sub>o</sub>	< 3,0 kV
Response time	t <sub>A</sub>	< 25 ns
Connection cross-section, rigid		0.5 - 6 mm <sup>2</sup>
Connection cross-section, flexible		0.5 - 6 mm <sup>2</sup>
Temperature range	θ	-40 - +80 °C
Protection rating		IP 65



PV housing for inverter with 1 MPP tracker, type 1+2

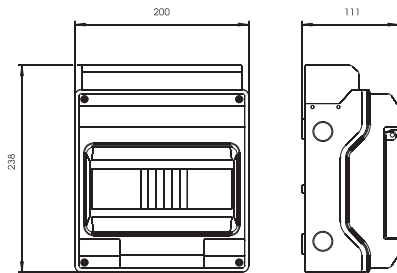


Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
VG-BC DCPH-MS600	600	Type 1+2 in housing with terminals	1	159.000	5088693

System solution for photovoltaic inverter with 1 MPP tracker

- Varistor arrester, connectable with cut-off unit in error-resistant Y circuit to VDE 0100-712 (50539-12)
- Low DC protection level: < 2.6 kV (Voc max = 600 V DC with V50-B+C/0-300PV / V20-C/0-300PV)
- Low DC protection level: < 3.0 kV (Voc max = 900 V DC with V25-B+C/0-450PV)
- Low DC protection level: < 4.0 kV (Voc max = 1000 V DC with V20-C/0-500PV)
- For each protection device, there are 3 terminals up to 16 mm<sup>2</sup> pre-mounted in the housing, up to 30 A DC per terminal
- Pre-mounted in polycarbonate housing (IP66), UV-resistant for use outside, including cable gland kit

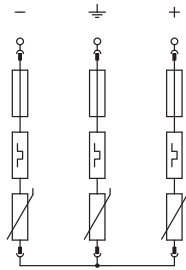
Dimensions



For DC protection of the inverter in photovoltaic systems.

If there is a danger of condensation forming through wind, ice, temperature or sunlight, further measures may be necessary!

Connection options



VG-BC DCPH-MS600

U max DC	U <sub>c</sub> DC	600 V
SPD to EN 61643-11		Type 1+2
Lightning protection zone LPZ		0→2
Impulse discharge current (10/350)	I <sub>impD</sub>	12.5 kA
Nominal discharge current (8/20)	I <sub>n</sub>	30 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	50 kA
Protection level	U <sub>o</sub>	< 2,6 kV
Response time	t <sub>A</sub>	< 25 ns
Connection cross-section, rigid		0.5 - 6 mm <sup>2</sup>
Connection cross-section, flexible		0.5 - 6 mm <sup>2</sup>
Temperature range	θ	-40 - +80 °C
Protection rating		IP 65



## PV system solution, type 1+2, with MC4 connector for inverter with 1 MPP tracker, 900 V DC



Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>VG-BC900S1</b>	900	For one MPP and with MC4 connection	1	105.000	<b>5088564</b>

System solution, type 1+2, with MC4 connector for photovoltaic inverter with 1 MPP tracker

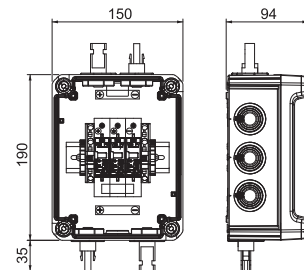
- Varistor arrester, connectable with cut-off unit in error-resistant Y circuit to VDE 0100-712 (50539-12)
- Type 1+2 combination arrester for lightning protection equipotential bonding to EN 62305 (VDE 0185-305)
- Low DC voltage protection level: < 3.0 kV (Voc max = 900 V DC with V25-B+C/0-450PV)
- One PV string input (MC4 plug connector) at one MPP inverter input, up to 30 A DC per terminal
- Pre-mounted in polycarbonate housing (IP66), UV-resistant for use outside

For DC protection of the inverter of photovoltaic systems.

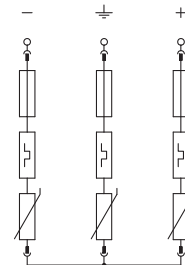
If there is a danger of condensation forming through wind, ice, temperature or sunlight, further measures may be necessary!



### Dimensions



### Connection options



### VG-BC900S1

U max DC	U <sub>c</sub> DC	900 V
SPD to EN 61643-11		Type 1+2
Lightning protection zone LPZ		0-2
Impulse discharge current (10/350)	I <sub>imp</sub>	7 kA
Nominal discharge current (8/20)	I <sub>n</sub>	30 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	50 kA
Protection level	U <sub>p</sub>	< 3,0 kV
Response time	t <sub>A</sub>	< 25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP66



## PV CombiController V50, plug-in arrester, type 1+2

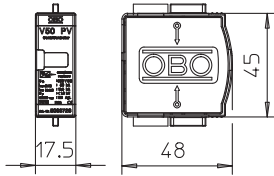


Type	U max DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
V50-B+C 0-300PV	300	1-pole, PV upper part with Y base to 600 V DC	1	8.200	5093726

CombiController cover – type 1+2, combination arrester for photovoltaic systems

- For surge protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 12.5 kA (10/350) and 50 kA (8/20) per pole
- Low DC voltage protection level: < 1.3 kV per pole (Y circuit: 2.6 kV and Voc max = 600 V DC)
- Plug-in arrester with thermodynamic cut-off unit and visual function display
- Encapsulated, zinc oxide varistor arrester for use in distributor housings
- High current carrying capacity with long lifespan

Application: PV systems with lightning protection system



### V50-B+C 0-300PV

U max DC	U <sub>c</sub> DC	300 V
SPD to EN 61643-11		Type 1+2
SPD to IEC 61643-11		Class I+II
Lightning protection zone LPZ		0→2
Nominal discharge current (8/20)	I <sub>n</sub>	30 kA
Impulse discharge current (10/350)	I <sub>imp</sub>	12.5 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	50 kA
Protection level	U <sub>p</sub>	< 1,3 kV
Response time	t <sub>A</sub>	<25 ns
Maximum back-up fuse		125 A
Temperature range	ϑ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1

## PV lightning and surge protection bases

### PV base, 3-pole in Y circuit

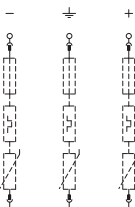
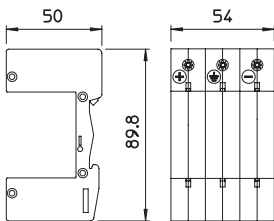


Type	Version	Pack Piece	Weight kg/100 pc.	Item no.
V20-C U-3PH-Y	3-pole Y circuit for PV	1	17.000	5096647

Base for photovoltaic systems up to Voc = 1000 V (Y-circuit)

- Suitable for V 25-B+C covers, type 1+2, combination arresters
- Suitable for V 20-C covers, type 2, surge arresters
- Protection circuit against transverse and longitudinal voltages
- Y-protection circuit
- Low DC voltage protection level: < 4.0 kV (Voc max = 1000 V DC with V20-C/0-440)
- Low DC voltage protection level: < 3.0 kV (Voc max = 900 V DC with V25-B+C/0-385)
- Low DC voltage protection level: < 2.6 kV (Voc max = 600 V DC with V50-C/0-280)
- Labelled connections

Application: In photovoltaic systems between PH modules and inverters.



### V20-C U-3PH-Y

Temperature range	ϑ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		3
Connection cross-section, rigid		2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire		2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible		2.5 - 25 mm <sup>2</sup>

PV base, 3-pole in Y circuit with remote signalling

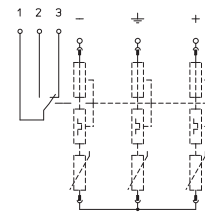
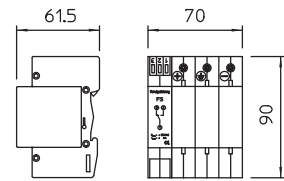


Type	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>V20-C U-3PH-Y-FS</b>	3-pole Y circuit for photovoltaic systems with FS	1	25.000	<b>5096646</b>

Base for photovoltaic systems up to  $V_{oc} = 1000$  V (Y circuit)

- Suitable for V 50-B+C and V25-B+C covers, type 1+2, combination arrester
- Suitable for V 20-C covers, type 2, surge arresters
- Protection circuit against transverse and longitudinal voltages
- Y circuit
- Low DC voltage protection level:  $< 4.0$  kV ( $V_{oc}$  max = 1000 V DC with V20-C/0-440)
- Low DC voltage protection level:  $< 3.0$  kV ( $V_{oc}$  max = 900 V DC with V25-B+C/0-385)
- Low DC voltage protection level:  $< 2.6$  kV ( $V_{oc}$  max = 600 V DC with V50-B+C/0-280)
- FS with remote signalling and potential-free changeover contact for function monitoring
- Labelled connections

Application: In photovoltaic systems between PH modules and inverters.



**V20-C U-3PH-Y-FS**

Temperature range	$\vartheta$ -40 - +80 °C
Protection rating	IP 20
Division unit TE (17.5 mm)	4
Connection cross-section, rigid	2.5 - 35 mm <sup>2</sup>
Connection cross-section, multi-wire	2.5 - 35 mm <sup>2</sup>
Connection cross-section, flexible	2.5 - 25 mm <sup>2</sup>












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Net-Defender

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	<b>Surge protection for telecommunication systems</b>	238
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	<b>MCR protection MDP, in series terminal format</b>	325



## Combination protection device TD-2d-V for VDSL systems



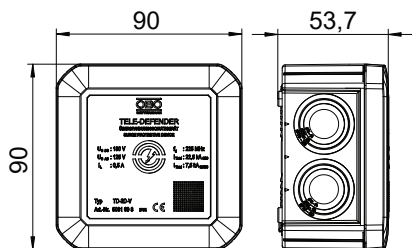
Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>TD-2D-V</b>	125	180	2	Terminal	1	9.500	<b>5081698</b>

Plastic

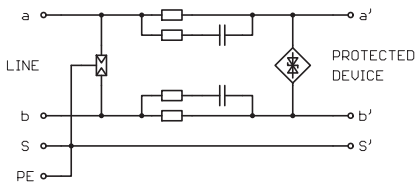
Data cable protection device for telecommunications equipment

- Low protection level at a high current load
- "Push-in" clamps for quick installation
- Bandwidth-optimised for secure transmission up to 225 MHz
- Surface mounting

### Dimensions



### Connection options



Application: Ideal for all DSL systems, IP connections, ISDN or analogue telecommunications

### TD-2D-V

Maximum continuous voltage AC	$U_c$	125 V
Maximum continuous voltage DC	$U_c$	180 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		2
Rated current	$I_n$	0.5 A
Capacity (wire-wire)		<10 pF
Capacity (wire-earth)		<20 pF
Series resistance per wire		2,2 $\Omega$ $\pm$ 5 %
Impulse durability wire-wire		C2: 15 kV / 7,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 15 kV / 7,5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		22,5 kA
Total discharge current (10/350)		D1: 7,5 kA
Protection level wire-wire		<350 V
Protection level wire-earth		<600 V
Frequency range		0 - 225 MHz
Insertion loss	$S_{21}$	$\leq$ 3 dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Surface-mounted
Connection system		Terminal
Protection rating		IP54
Shielding connection available		Yes
Connection cross-section, flexible		0.14 - 1 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1 mm <sup>2</sup>
Connection cross-section, rigid		0.08 - 1.5 mm <sup>2</sup>
Testing standard		IEC 61643-21

## Combination protection device TD-4/I for ISDN and DSL systems



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>TD-4/I</b>	120	170	4	Terminal	1	11.000	<b>5081690</b>

Plastic

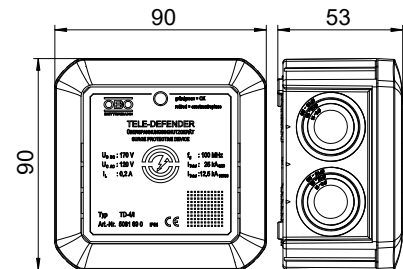
Data cable protection device for telecommunications equipment

- Low protection level at a high current load
- "Push-in" terminals for quick installation
- Bandwidth-optimised for secure transmission
- Surface mounting
- Visual function display

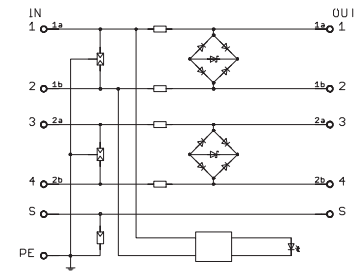
Application: DSL systems, IP connections, ISDN or analogue telecommunications



## Dimensions



## Connection options



## TD-4/I

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	170 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		4
Rated current	$I_n$	0.2 A
Capacity (wire-wire)		<50 pF
Capacity (wire-earth)		<10 pF
Series resistance per wire		9 $\Omega$ $\pm$ 10 %
Impulse durability wire-wire		C2: 18 kV / 9 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 18 kV / 9 kA (8/20 $\mu$ s)
Impulse discharge current (10/350) $I_{imp}$		2.5 kA
Total discharge current (8/20)		25 kA
Total discharge current (10/350)		D1: 12,5 kA
Protection level wire-wire		<300 V
Protection level wire-earth		<650 V
Protection level, shield-earth (S-PE)		850 V
Frequency range		0 - 100 MHz
Insertion loss	$S_{21}$	$\leq$ 3 dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Surface-mounted
Connection system		Terminal
Protection rating		IP54
Shielding connection available		Yes
Connection cross-section, flexible		0.14 - 0.75 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 0.75 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 0.75 mm <sup>2</sup>
Testing standard		IEC 61643-21

## Combination protection device TD-2/D-HS for ISDN and DSL systems



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>TD-2/D-HS</b>	120	170	2	Terminal	1	4.800	<b>5081694</b>

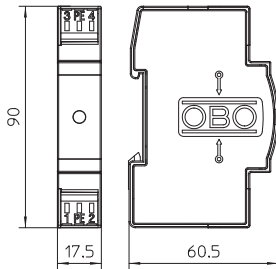
Plastic

Data cable protection devices for telecommunication systems

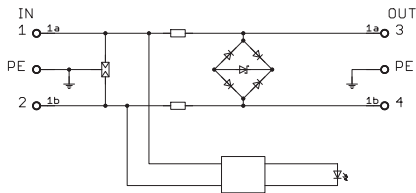
- Low protection level at high current load
- Screwless terminals or connectable
- Bandwidth-optimised for secure transmission
- Quick mounting onto DIN rail for a telephone line
- Visual function display

Application: DSL systems, ISDN or analogue telecommunication

### Dimensions



### Connection options



### TD-2/D-HS

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	170 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.2 A
Capacity (wire-wire)		<50 pF
Capacity (wire-earth)		<50 pF
Series resistance per wire		$9 \Omega \pm 10 \%$
Impulse durability wire-wire		C2: 18 kV / 9 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 18 kV / 9 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 5 kA kA
Protection level wire-wire		<300 V
Protection level wire-earth		<650 V
Frequency range		0 - 75 MHz
Insertion loss	$S_{21}$	$\leq 3$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		No
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Testing standard		IEC 61643-21



## Combination protection device TELE 4-C for ISDN RJ11



Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>RJ11-TELE 4-C</b>	Combi protection, 4 wires	RJ11	1	14.000	<b>5081975</b>

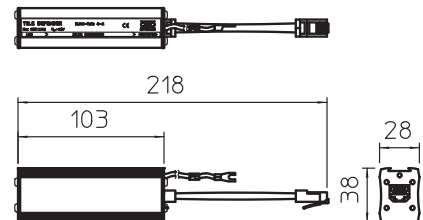
Data line protection device for analogue telecommunications systems

- In aluminium housing
- With 2-stage protection circuit
- Simple mounting
- Incl. 150 mm connection cable with RJ11 and/or RJ45 connectors
- Optimised bandwidth for TC systems
- DIN rail mounting with DLS-BS accessories (5082 38 2)

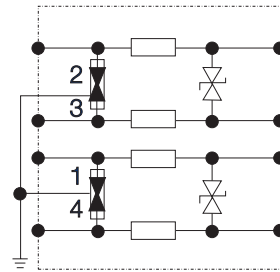
Application: For analogue telecommunication systems



## Dimensions



## Connection options



## RJ11-TELE 4-C

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	170 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		4
Series resistance per wire		$8,2 \Omega \pm 10 \%$
Total discharge current (8/20)		4 kA
Total discharge current (10/350)		1,5 kA
Protection level wire-wire		<300 V
Protection level wire-earth		<600 V
Protection level, wire-earth at 1 kV/ $\mu$ s (C3)	$U_p$	<245 V
Frequency range		0 - 12 MHz
Insertion loss	$S_{p,1}$	$\leq 3$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		RJ11
Protection rating		IP40
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Fine protection device TELE 4-F for ISDN RJ11



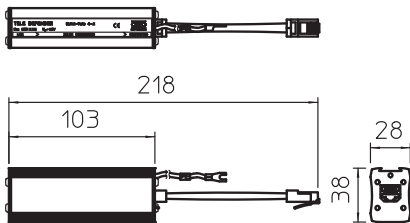
Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>RJ11-TELE 4-F</b>	Fine protection, 4 wires	RJ11	1	14.000	<b>5081977</b>

Data line protection device for analogue telecommunications systems

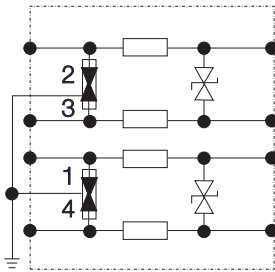
- In aluminium housing
- With 2-stage protection circuit
- Simple mounting
- Incl. 150 mm connection cable with RJ11 and/or RJ45 connectors
- Optimised bandwidth for TC systems
- DIN rail mounting with DLS-BS accessories (5082 38 2)

Application: For analogue telecommunication systems

### Dimensions



### Connection options



### RJ11-TELE 4-F

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	170 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1→3
Number of poles		4
Series resistance per wire		2,2 $\Omega \pm 10\%$
Total discharge current (8/20)		4 kA
Protection level wire-wire		<300 V
Protection level wire-earth		<600 V
Protection level, wire-earth at 1 kV/ $\mu$ s (C3)	$U_n$	<245 V
Frequency range		0 - 18 MHz
Insertion loss	$S_{21}$	$\leq 3$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		RJ11
Protection rating		IP40
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Combination protection device TELE 4-C for ISDN RJ45



Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>RJ45-TELE 4-C</b>	Combi protection, 4 wires	RJ45	1	14.000	<b>5081982</b>

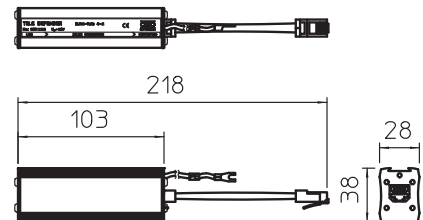
Data line protection device for analogue telecommunications systems

- In aluminium housing
- With 2-stage protection circuit
- Simple mounting
- Incl. 150 mm connection cable with RJ11 and/or RJ45 connectors
- Optimised bandwidth for TC systems
- DIN rail mounting with DLS-BS accessories (5082 38 2)

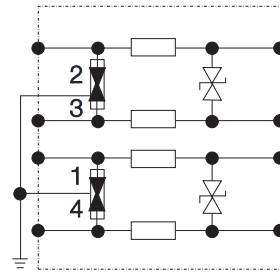
Application: For analogue telecommunication systems



## Dimensions



## Connection options



## RJ45-TELE 4-C

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	170 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		4
Series resistance per wire		$8,2 \Omega \pm 10 \%$
Total discharge current (8/20)		4 kA
Total discharge current (10/350)		1,5 kA
Protection level wire-wire		<300 V
Protection level wire-earth		<600 V
Protection level, wire-earth at 1 kV/ $\mu$ s (C3)	$U_p$	<245 V
Frequency range		0 - 12 MHz
Insertion loss	$S_{p,1}$	$\leq 3$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		RJ45
Protection rating		IP40
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Fine protection device TELE 4-F for ISDN RJ45



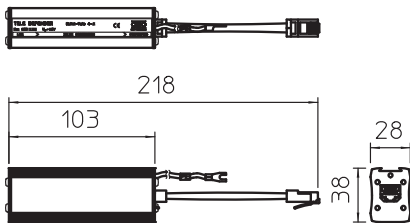
Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>RJ45-TELE 4-F</b>	Fine protection, 4 wires	RJ45	1	14.000	<b>5081984</b>

Data line protection device for analogue telecommunications systems

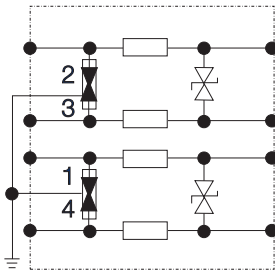
- In aluminium housing
- With 2-stage protection circuit
- Simple mounting
- Incl. 150 mm connection cable with RJ11 and/or RJ45 connectors
- Optimised bandwidth for TC systems
- DIN rail mounting with DLS-BS accessories (5082 38 2)

Application: For analogue telecommunication systems

### Dimensions



### Connection options



### RJ45-TELE 4-F

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	170 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1→3
Number of poles		4
Series resistance per wire		2,2 $\Omega$ $\pm$ 10 %
Total discharge current (8/20)		4 kA
Protection level wire-wire		<300 V
Protection level wire-earth		<600 V
Protection level, wire-earth at 1 kV/ $\mu$ s (C3)	$U_n$	<245 V
Frequency range		0 - 18 MHz
Insertion loss	$S_{21}$	$\leq$ 3 dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		RJ45
Protection rating		IP40
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## LSA basic protection magazine



Type	Installation type	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>LSA-B-MAG</b>	LSA-Plus, connectable	20	1	8.600	<b>5084020</b>

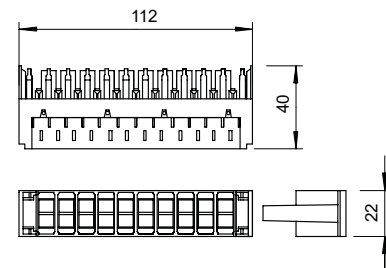
LSA basic protection magazine for use in multi-core data cable systems, MCR systems and telephone switchboards.

- Basic protection
- Equipped with 20 gas arresters
- Max. voltage: 180 V

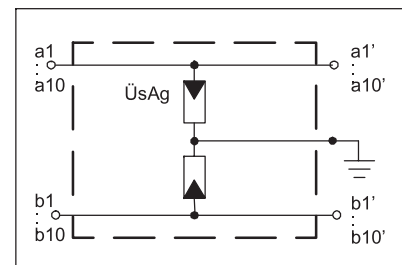
Application: Directly on LSA-Plus separating strips or connection rails (e.g. OBO LSA-A-LEI (5084 00 8) or OBO LSA-T-LEI (5084 01 2)).



## Dimensions



## Connection options



## LSA-B-MAG

Maximum continuous voltage AC $U_c$	120 V
Maximum continuous voltage DC $U_c$	180 V
Category	Type 1+2 / D1+C2
Lightning protection zone LPZ	0→2
Number of poles	20
Rated current $I_n$	1 A
Impulse durability wire-wire	C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)	10 kA
Total discharge current (10/350)	1 kA
Protection level @ C1	<750 V
Temperature range $\vartheta$	-40 - +80 °C
Installation type	LSA-Plus, connectable
Connection system	Other
Protection rating	IP20
Testing standard	IEC 61643-21

## Combination protection device LSA BF 180



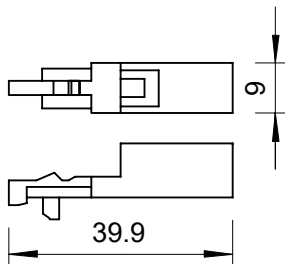
Type	Installation type	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>LSA-BF-180</b>	LSA-Plus, connectable	2	1	0.500	<b>5084024</b>

LSA basic and fine protection, for application in MCR systems

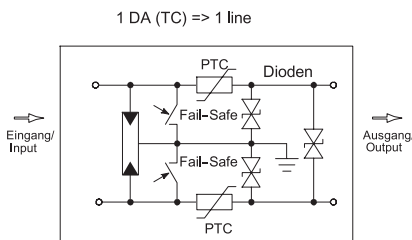
- Basic and fine protection
- Coarse protection using fail-safe technology.
- With PTC protection components against overcurrent.
- Max. voltage: 180 V

Application: Directly on LSA-Plus separating strip or connection rails with earthing rail (e.g. OBO LSA-A-LEI (5084 00 8) or OBO LSA-T-LEI (5084 01 2), and OBO LSA-E (5084 03 2))

### Dimensions



### Connection options



### LSA-BF-180

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	180 V
Category	Type 1+2+3 / D1+C2+C1	
Lightning protection zone LPZ	0→3	
Number of poles	2	
Rated current	$I_n$	0.12 A
Impulse durability wire-wire	C2: 5 kV / 2,5 kA (8/20 $\mu$ s)	
Impulse durability wire-earth	C2: 5 kV / 2,5 kA (8/20 $\mu$ s)	
Total discharge current (8/20)	5 kA	
Total discharge current (10/350)	0,5 kA	
Protection level wire-wire	<300 V	
Protection level wire-earth	<300 V	
Temperature range	$\vartheta$	-40 - +80 °C
Installation type	LSA-Plus, connectable	
Connection system	Other	
Protection rating	IP20	
Testing standard	IEC 61643-21	

## Combination protection device LSA BF 24



Type	Installation type	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>LSA-BF-24</b>	LSA-Plus, connectable	2	1	0.500	<b>5084028</b>

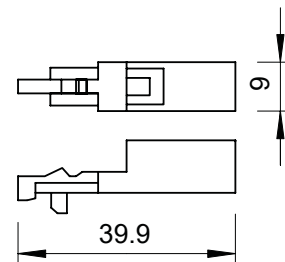
LSA basic and fine protection, for application in MCR systems

- Basic and fine protection
- Coarse protection using fail-safe technology.
- With PTC protection components against overcurrent.
- Max. voltage: 24 V

Application: Directly on LSA-Plus separating strip or connection rails with earthing rail (e.g. OBO LSA-A-LEI (5084 00 8) or OBO LSA-T-LEI (5084 01 2), and OBO LSA-E (5084 03 2))

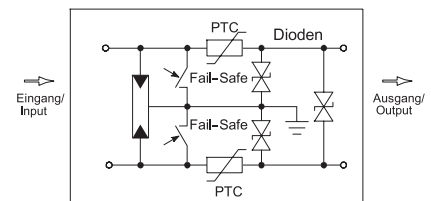


## Dimensions



## Connection options

1 DA (TC) => 1 line



## LSA-BF-24

Maximum continuous voltage AC $U_c$	15 V
Maximum continuous voltage DC $U_c$	24 V
Category	Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ	0-3
Number of poles	2
Rated current $I_n$	0.12 A
Impulse durability wire-wire	C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)	5 kA
Total discharge current (10/350)	0,5 kA
Protection level wire-wire	<70 V
Protection level wire-earth	<70 V
Temperature range $\vartheta$	-40 - +80 °C
Installation type	LSA-Plus, connectable
Connection system	Other
Protection rating	IP20
Testing standard	IEC 61643-21

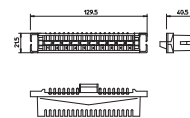
## LSA connection strip



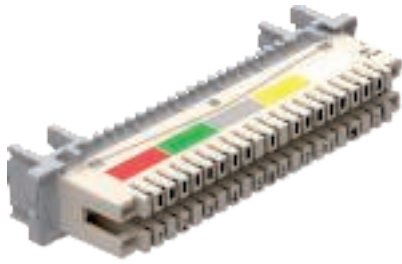
Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
<b>LSA-A-LEI</b>	Grey	1	5.100	<b>5084008</b>

LSA connection strip 2/10 for attaching 10 double-cores.

- For use with protection element LSA-B-MAG
- Fastening to mounting trough LSA-M
- Colour: Grey
- Clampable cross-section 0.14–0.5 (AWG 26-20)



## LSA separating strip

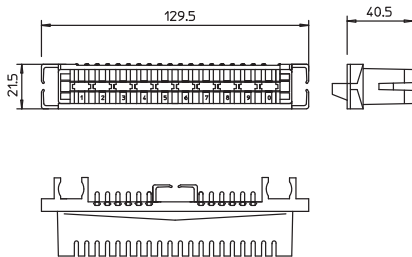


Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
<b>LSA-T-LEI</b>	White	1	5.400	<b>5084012</b>

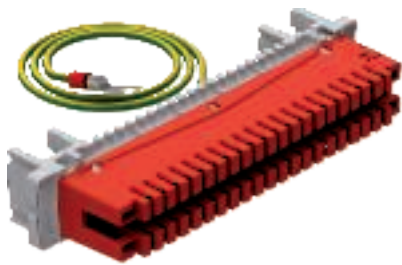
LSA separating strip 2/10 for attaching up to 10 double-cores.

- For use with protection element LSA-BF-180; LSA-BF-24; LSA-B-MAG
- Fastening to mounting trough LSA-M
- Colour: White
- Clampable cross-sections 0.14–0.5 mm<sup>2</sup> (AWG 26-20)

### Dimensions



## LSA earthing strip

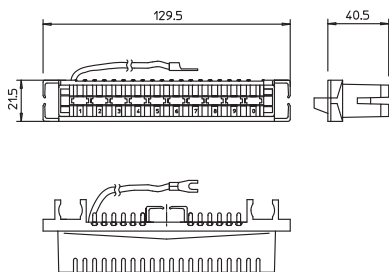


Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
<b>LSA-E-LEI</b>	Red	1	6.500	<b>5084016</b>

LSA earthing strip, 40-pole for connecting earthing cables or screens to the earth connection.

- Complete with connection line, green-yellow, 1.5 mm<sup>2</sup>
- Colour: Red

### Dimensions





## LSA earthing rail

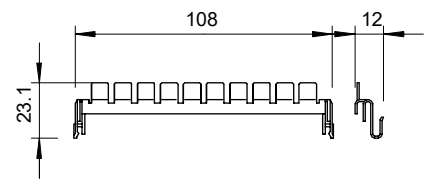


Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
<b>LSA-E</b>	1	1.275	5084032

Earth rail as earth connection between surge protectors LFS-BF... (1 DA) and distributor connector LSA-...-LEI.



### Dimensions



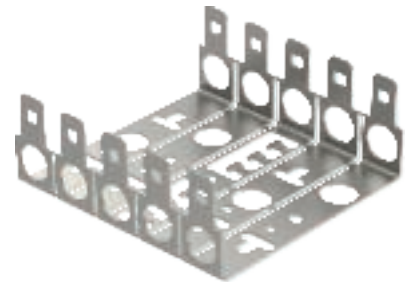
## LSA installation trough



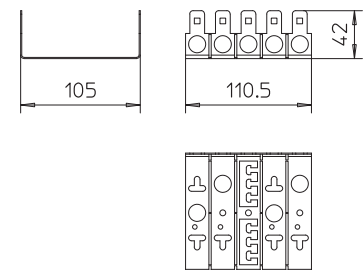
Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
<b>LSA-M</b>	1	7.800	5084036

St. Steel

Installation trough for 5 connection rails or separating strips Grid 22.5 mm.  
Depth: 22 mm; 30 mm; 50 mm



### Dimensions



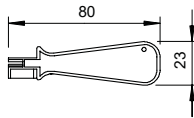
## LSA simple tool



Type	Pack	Weight	Item no.
LSA-TOOL	Piece	kg/100 pc.	
	1	0.600	5084040

Simple tool for the soldering, bolting and stripping-free connection of cores, without cutter.

### Dimensions



## LSA protective housing



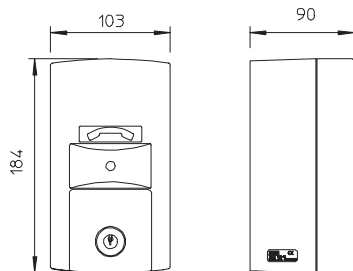
Type	Colour	Pack	Weight	Item no.
LSA-G	Light grey	Piece	kg/100 pc.	
		1	57.500	5084048

PA Polyamide

Protective housing for a LSA 10 DA bar

- Protective housing for 10 wire pairs
- Housing can be locked
- Incl. key
- 4x cable fixing
- Light grey

### Dimensions



Coaxial protection devices for S-UHF connection: female/female



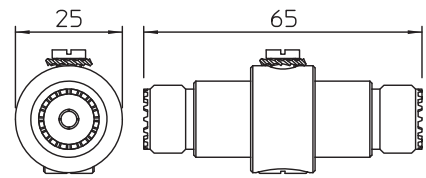
Type	Conne- tion system	Frequency range	Pack Weight		Item no.
			Piece	kg/100 pc.	
S-UHF W/W	UHF	0 - 1,3 GHz	1	7.000	5093015

Coaxial data cable protection devices

- Basic protection
- High pulsed current carrying capacity 2 x 2.5 kA (10/350  $\mu$ s)
- Simple installation (adapter plug), m = male/f = female connector
- Various plug combinations
- With UHF connector
- Optimised transmission behaviour
- Including OBO M25 Quick clip for simple installation



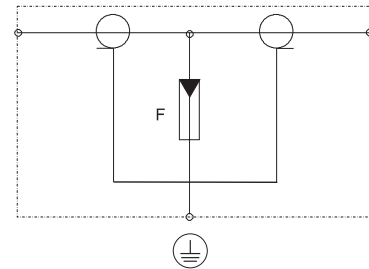
Dimensions



S-UHF W/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category	Type	1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 $\Omega$
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 1,3 GHz
Insertion loss	$S_{21}$	$\leq 0,2$ dB
Return loss	$S_{11}$	$\geq 14$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		UHF
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Connection options



Coaxial protection devices for S-UHF connection: male/female

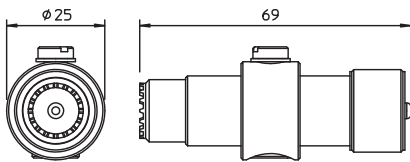


Type	Connection system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
S-UHF M/W	UHF	0 - 1,3 GHz	1	7.000	5093023

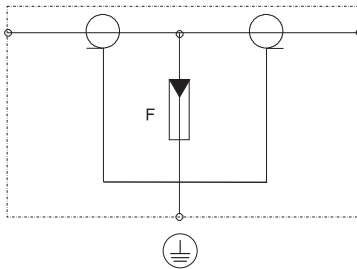
Coaxial data cable protection devices

- Basic protection
- High pulsed current carrying capacity 2 x 2.5 kA (10/350 μs)
- Simple installation (adapter plug), m = male/f = female connector
- Various plug combinations
- With UHF connector
- Optimised transmission behaviour
- Including OBO M25 Quick clip for simple installation

Dimensions



Connection options



S-UHF M/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 Ω
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20μs)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20μs)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 1,3 GHz
Insertion loss	$S_{21}$	≤0,2 dB
Return loss	$S_{11}$	≥14 dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		UHF
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Coaxial protection device for BNC connection: male/female



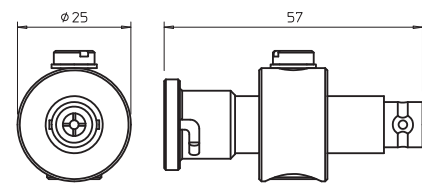
Type	Conne- tion system	Frequency range	Pack Weight		Item no.
			Piece	kg/100 pc.	
<b>DS-BNC M/W</b>	BNC	0 - 2,2 GHz	1	6.500	<b>5093252</b>

Coaxial data cable protection devices

- Basic protection
- High pulsed current carrying capacity 2 x 2.5 kA (10/350  $\mu$ s)
- Simple installation (adapter plug), m = plug/f = female connector
- Various plug combinations
- With BNC connector
- Optimised transmission behaviour
- Including OBO M25 Quick clip for simple installation



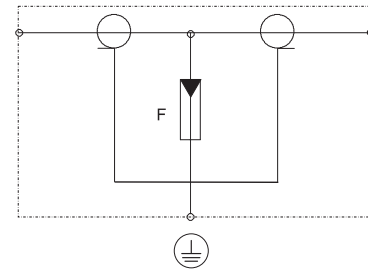
Dimensions



**DS-BNC M/W**

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category	Type	1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 $\Omega$
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 2,2 GHz
Insertion loss	$S_{21}$	$\leq 0,95$ dB
Return loss	$S_{11}$	$\geq 14$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		BNC
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Connection options



Coaxial protection device for BNC connection: female/female

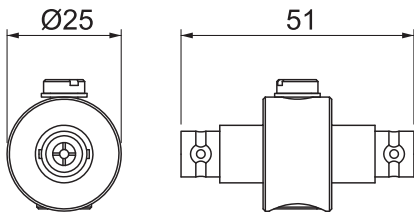


Type	Conne- tion system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
<b>DS-BNC W/W</b>	BNC	0 - 2,2 GHz	1	6.000	<b>5093236</b>

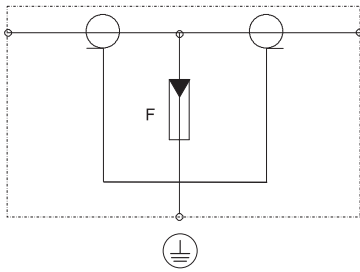
Coaxial data cable protection devices

- Basic protection
- High pulsed current carrying capacity 2 x 2.5 kA (10/350 μs)
- Simple installation (adapter plug), m = plug/f = female connector
- Various plug combinations
- With BNC connector
- Optimised transmission behaviour
- Including OBO M25 Quick clip for simple installation

Dimensions



Connection options



DS-BNC W/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 Ω
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20μs)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20μs)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 2,2 GHz
Insertion loss	$S_{2,1}$	≤0,95 dB
Return loss	$S_{1,1}$	≥14 dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		BNC
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Coaxial protection device for BNC connection: male/male



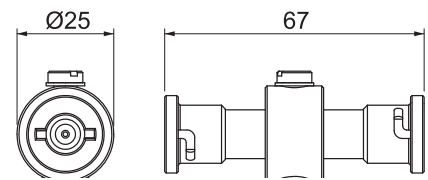
Type	Connection system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
<b>DS-BNC M/M</b>	BNC	0 - 2,2 GHz	1	7.000	<b>5093260</b>

Coaxial data cable protection devices

- Basic protection
- High pulsed current carrying capacity 2 x 2.5 kA (10/350  $\mu$ s)
- Simple installation (adapter plug), m = plug/f = female connector
- Various plug combinations
- With BNC connector
- Optimised transmission behaviour
- Including OBO M25 Quick clip for simple installation



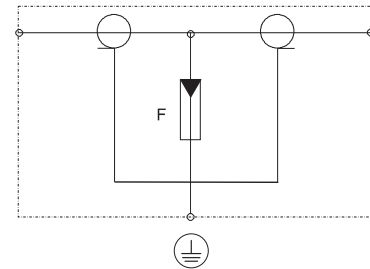
Dimensions



**DS-BNC M/M**

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category	Type	1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 $\Omega$
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 2,2 GHz
Insertion loss	$S_{2,1}$	$\leq 0,95$ dB
Return loss	$S_{1,1}$	$\geq 14$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		BNC
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Connection options



Coaxial protection device for N connection: male/female

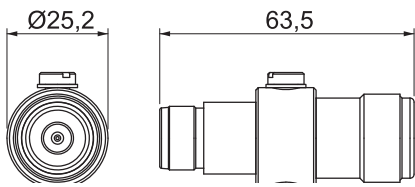


Type	Connection system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
DS-N M/W	N	0 - 3 GHz	1	12.200	5093996

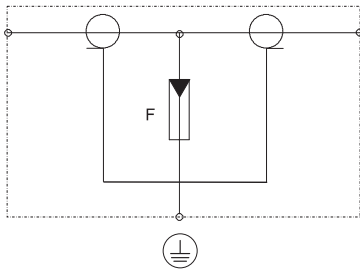
Coaxial data cable protection devices

- High pulsed current carrying capacity 2 x 2.5 kA (10/350)
- Simple mounting (adapter plug), m = plug/f = female connector
- Optimised transmission behaviour
- 5-year guarantee
- With N connector
- Including OBO M25 Quick clip for simple installation

Dimensions



Connection options



DS-N M/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 $\Omega$
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 3 GHz
Insertion loss	$S_{2,1}$	$\leq 0,62$ dB
Return loss	$S_{1,1}$	$\geq 14$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		N
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21



Coaxial protection device for N connection: female/female



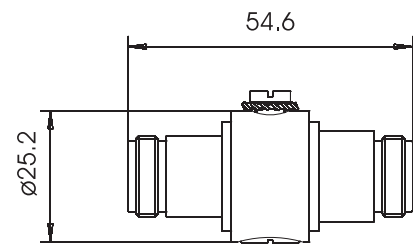
Type	Connection system	Frequency range	Pack Weight		Item no.
			Piece	kg/100 pc.	
DS-N W/W	N	0 - 3 GHz	1	11.500	5093988

Coaxial data cable protection devices

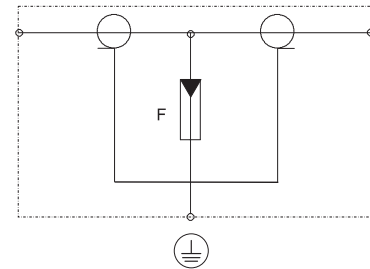
- High pulsed current carrying capacity 2 x 2.5 kA (10/350)
- Simple mounting (adapter plug), m = plug/f = female connector
- Optimised transmission behaviour
- 5-year guarantee
- With N connector
- Including OBO M25 Quick clip for simple installation



Dimensions



Connection options



DS-N W/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category	Type	1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 $\Omega$
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 3 GHz
Insertion loss	$S_{2,1}$	$\leq 0,62$ dB
Return loss	$S_{1,1}$	$\geq 14$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		N
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Coaxial protection device for N connection up to 6 GHz: Male/female

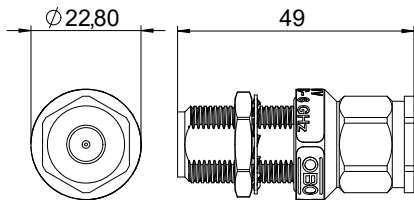


Type	Connection system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
DS-N-6 M/W	N	0 - 6 GHz	1	7.830	5093998

Coaxial data cable protection devices for transmission and reception technology

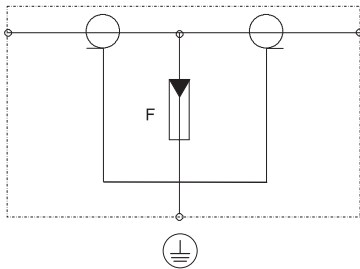
- With N-Connector, male/female
- High impulse current load capacity: 2.5 kA (10/350)
- Simple mounting (adapter), m = connector, w = socket
- Low protection level at high current loads
- Optimum transmission behaviour:
  - Low reflection behaviour
  - Bandwidth-optimised for secure transmission up to 6 GHz
- Available in 50 Ω technology

Dimensions



Application: For example: SAT-TV C band, WiMAX, WLAN applications, DVB-T2

Connection options



DS-N-6 M/W

Maximum continuous voltage AC	$U_c$	50 V
Maximum continuous voltage DC	$U_c$	70 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 Ω
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20μs)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20μs)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Protection level		<750 V
Frequency range		0 - 6 GHz
Insertion loss	$S_{21}$	≤0,1 dB
Return loss	$S_{11}$	≥22 dB
Temperature range	$\theta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		N
Protection rating		IP65/67
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21



Coaxial protection device for TNC connection: male/female



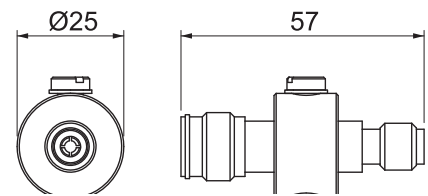
Type	Connection system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
DS-TNC M/W	TNC	0 - 4 GHz	1	7.953	5093270

Coaxial data cable protection devices

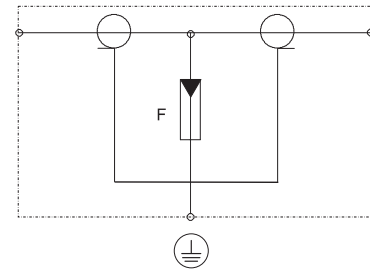
- Basic protection
- High pulsed current carrying capacity 2 x 2.5 kA (10/350 μs)
- Simple installation (adapter plug), m = plug/f = female connector
- Various plug combinations
- With TNC connector
- Optimised transmission behaviour
- Including OBO M25 Quick clip for simple installation



Dimensions



Connection options



DS-TNC M/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category	Type	1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 Ω
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20μs)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20μs)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 4 GHz
Insertion loss	$S_{21}$	≤0,5 dB
Return loss	$S_{11}$	≥14 dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		TNC
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Coaxial protection device for 7/16 connection: male/female



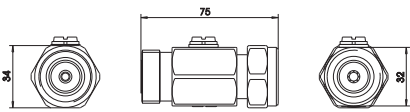
Type	Connection system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
DS-7 16 M/W	7/16	0 - 3 GHz	1	35.500	5093171

Coaxial data protection device

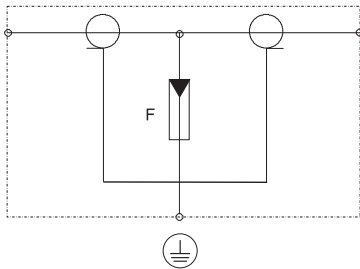
- Basic protection
- Simple mounting (adapter)
- Optimum transmission
- High pulse load capacity
- With 7/16 connector

Application: to protect mobile telephony applications.

Dimensions



Connection options



DS-7 16 M/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 $\Omega$
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 3 GHz
Insertion loss	$S_{21}$	$\leq 0,95$ dB
Return loss	$S_{11}$	$\geq 14$ dB
Temperature range	$\theta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		7/16
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Coaxial protection device for F connection: male/female



Type	Conne- tion system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
<b>DS-F M/W</b>	F	0 - 3,4 GHz	1	9.000	<b>5093275</b>

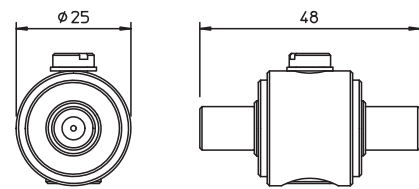
Coaxial data cable protection devices

- Basic protection
- High pulsed current carrying capacity 2 x 2.5 kA (10/350  $\mu$ s)
- Simple installation (adapter plug), m = plug/f = female connector
- Various plug combinations
- With F connector
- Optimised transmission behaviour
- Including OBO M25 Quick clip for simple installation

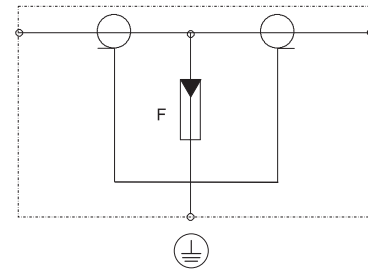
Application: Protection of TV and SAT systems, multi-switches, receivers and DVB-T(2)



Dimensions



Connection options



DS-F M/W		
Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category	Type	1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		1
Rated current	$I_n$	5 A
Wave resistance	$Z_L$	75 $\Omega$
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	1 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		2 kA
Protection level		<800 V
Frequency range		0 - 3,4 GHz
Insertion loss	$S_{21}$	$\leq 0,9$ dB
Return loss	$S_{11}$	$\geq 14$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		F
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Coaxial protection device for F connection: female/female



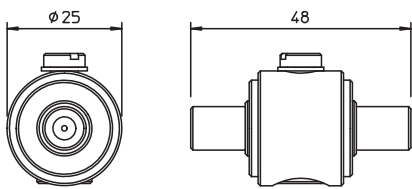
Type	Connection system	Frequency range	Pack Piece	Weight kg/100 pc.	Item no.
DS-F W/W	F	0 - 3,4 GHz	1	9.000	5093272

Coaxial data cable protection devices

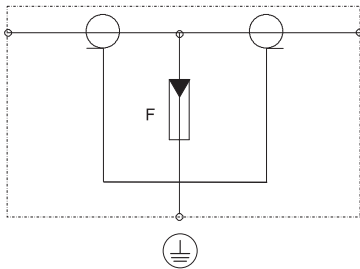
- Basic protection
- High pulsed current carrying capacity 2 x 2.5 kA (10/350 μs)
- Simple installation (adapter plug), m = plug/f = female connector
- Various plug combinations
- With F connector
- Optimised transmission behaviour
- Including OBO M25 Quick clip for simple installation

Dimensions

Application: Protection of TV and SAT systems, multi-switches, receivers and DVB-T(2)



Connection options



DS-F W/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		1
Rated current	$I_n$	5 A
Wave resistance	$Z_L$	75 Ω
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20μs)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20μs)
Impulse discharge current (10/350)	$I_{imp}$	1 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		2 kA
Protection level		<800 V
Frequency range		0 - 3,4 GHz
Insertion loss	$S_{21}$	≤0,9 dB
Return loss	$S_{11}$	≥14 dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		F
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

Coaxial protection device for SMA connection: female/female



Type	Con- nection system	Frequency range	Pack Weight		Item no.
			Piece	kg/100 pc.	
DS-SMA W/W	SMA	0 - 3,7 GHz	1	7,500	5093277

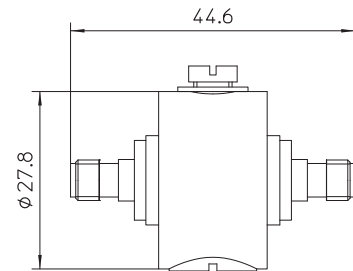
Coaxial data cable protection devices

- High pulse current carrying capacity 2 x 2.5 kA (10/350)
- Simple mounting (adapter connector), m = connector, f = socket
- Optimised transmission behaviour
- 5-year guarantee
- With SMA connector
- Including OBO Multi-Quick clip 25-28 for simple installation
- 50 Ω technology

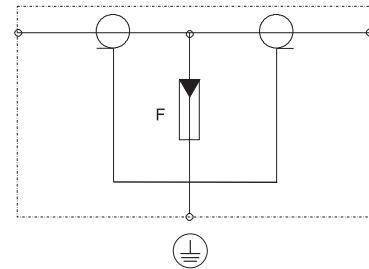
Application: Radio and data technology with SMA connector



Dimensions



Connection options



DS-SMA W/W

Maximum continuous voltage AC	$U_c$	130 V
Maximum continuous voltage DC	$U_c$	185 V
Category	Type	1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		1
Rated current	$I_n$	10 A
Wave resistance	$Z_L$	50 Ω
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20μs)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20μs)
Impulse discharge current (10/350)	$I_{imp}$	2.5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		5 kA
Protection level		<800 V
Frequency range		0 - 3,7 GHz
Insertion loss	$S_{21}$	≤0,2 dB
Return loss	$S_{11}$	≥14 dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		SMA
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

## Coaxial protection device for SAT and cable multi-switch



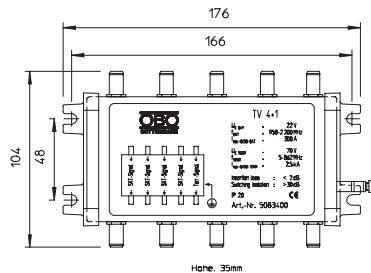
Type	Connection system	Frequency range	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
TV 4+1	F	0,5 - 2,8 GHz	F	1	37.000	5083400

Coaxial data line protection for TV reception systems

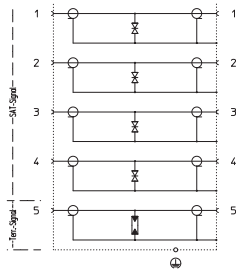
- Protects up to four SAT lines
- Protects one terrestrial line, e.g. DVB-T.
- Simple mounting using screws and holder
- With F-connector
- Optimum transmission behaviour with 75 Ohm technology.

Application: Protection of TV and SAT systems, multi-switches, receivers and DVB-T receivers

### Dimensions



### Connection options



### TV 4+1

Maximum continuous voltage $V_c$   SAT inputs	$U_c$	22 V
Maximum continuous voltage $V_c$   terrestrial input	$U_c$	70 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1-3
Number of poles		5
Rated current	$I_l$	2 A
Wave resistance	$Z_L$	75 $\Omega$
Nominal discharge current   SAT inputs	$I_n$	300 A
Lightning impulse current   terrestrial input	$I_{imp}$	1 kA
Protection level   SAT inputs at $I_n$	$U_p$	<45 V
Protection level   Terrestrial input at $I_n$		<500 V
Frequency range		0,5 - 2,8 GHz
Insertion loss	$S_{p1}$	$\leq 3$ dB
Return loss	$S_{11}$	>30 dB
Temperature range	$\theta$	-40 - +80 °C
Installation type		Surface-mounted
Connection system		F
Protection rating		IP10
Shielding connection available		Yes
Shield connection		Direct
Earthing via:		Connection cable
Testing standard		IEC 61643-21



## Surge protection for high-speed networks up to 10 GBit (Class EA/CAT6A)



Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>ND-CAT6A/EA</b>	Fine protection, 8 wires + shield	RJ45 8(8)	1	16.600	<b>5081800</b>

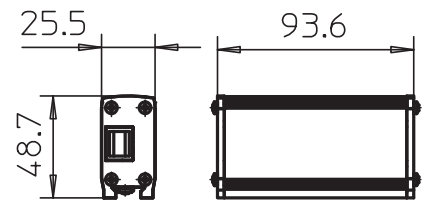
Data cable protection device for high-speed networks

- High-quality RJ45 sockets
- Low protection level at high current load
- Earthing via DIN rail or connection cable
- Support of Power over Ethernet ++ (PoE++/4PPoE) to 1 A in accordance with IEEE 802.3
- Tested transmission quality in networks up to 1 GBit/s (Class E) or CAT6
- Fast installation through plug-in version
- Incl. DIN rail fastening set and earthing cable

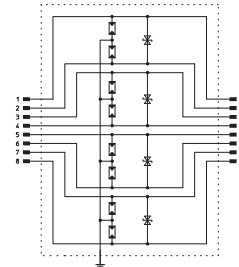
Application example: 1 GBit Ethernet, 10/100 MBit Ethernet, PoE applications, IP camera systems, ISDN S0 interfaces



### Dimensions



### Connection options



### ND-CAT6A/EA

Maximum continuous voltage AC $U_C$	41 V
Maximum continuous voltage DC $U_C$	58 V
Category	Type 2+3 / C2+C1
Lightning protection zone LPZ	1→3
Channel performance ISO/IEC	Class EA
Channel performance Ansi/EA	CAT 6A
Number of poles	8
Rated current $I_n$	1 A
Impulse durability wire-wire	C1: 0,3 kV / 0,15 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 2 kV / 1 kA (8/20 $\mu$ s)
Total discharge current (8/20)	7 kA
Protection level wire-wire	<120 V
Protection level wire-earth	<700 V
Frequency range	>500 MHz
Temperature range $\vartheta$	-40 - +80 °C
Installation type	Connector/cable adapter
Connection system	RJ45 8(8)
Protection rating	IP10
Shielding connection available	Yes
Shield connection	Direct
Earthing via:	Connection cable / DIN rail
Testing standard	IEC 61643-21

## Surge protection for high-speed networks up to 1 GBit (Class ND-CAT6/E-B)



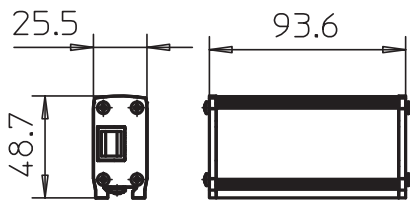
Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>ND-CAT6/E-B</b>	Basic protection, 8 wires + shield	RJ45 8(8)	1	16.220	<b>5081804</b>

Alu Aluminium

Data cable protection device for high-speed networks

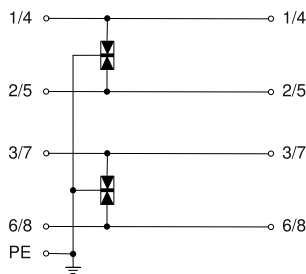
- High-quality RJ45 sockets
- Low protection level at high current load
- Earthing via DIN rail or connection cable
- Support of Power over Ethernet ++ (PoE++/4PPoE) to 1 A in accordance with IEEE 802.3
- Tested transmission quality in networks up to 1 GBit/s (Class E) or CAT6
- Fast installation through plug-in version
- Incl. DIN rail fastening set and earthing cable

### Dimensions



Application example: 1 GBit Ethernet, 10/100 MBit Ethernet, PoE applications, IP camera systems, ISDN S0 interfaces

### Connection options



### ND-CAT6/E-B

Maximum continuous voltage AC $U_c$	46 V
Maximum continuous voltage DC $U_c$	65 V
Category	Type 1 / D1
Lightning protection zone LPZ	0→1
Channel performance ISO/IEC	Class E
Channel performance Ansi/EA	CAT 6
Number of poles	8
Rated current $I_n$	1 A
Impulse durability wire-wire	C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)	10 kA
Protection level wire-wire	<1100 V
Protection level wire-earth	<900 V
Frequency range	>250 MHz
Temperature range $\vartheta$	-40 - +80 °C
Installation type	Connector/cable adapter
Connection system	RJ45 8(8)
Protection rating	IP10
Shielding connection available	Yes
Shield connection	Direct
Earthing via:	Connection cable / DIN rail
Testing standard	IEC 61643-21

## Surge protection for high-speed networks up to 1 GBit (Class ND-CAT6/E-F)



Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
ND-CAT6/E-F	Fine protection, 8 wires + shield	RJ45 8(8)	1	16.380	5081802

Alu Aluminium

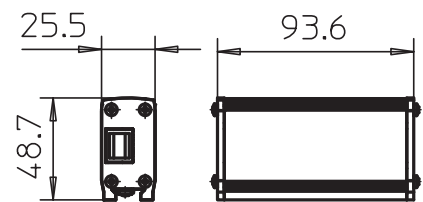
Data cable protection device for high-speed networks

- High-quality RJ45 sockets
- Low protection level at high current load
- Earthing via DIN rail or connection cable
- Support of Power over Ethernet ++ (PoE++/4PPoE) to 1 A in accordance with IEEE 802.3
- Tested transmission quality in networks up to 1 GBit/s (Class E) or CAT6
- Fast installation through plug-in version
- Incl. DIN rail fastening set and earthing cable

Application example: 1 GBit Ethernet, 10/100 MBit Ethernet, PoE applications, IP camera systems, ISDN S0 interfaces



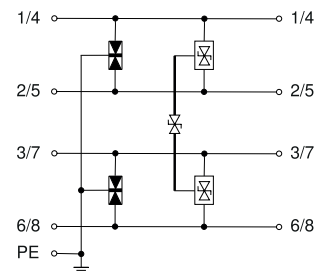
## Dimensions



## ND-CAT6/E-F

Maximum continuous voltage AC $U_C$	41 V
Maximum continuous voltage DC $U_C$	58 V
Category	Type 2+3 / C2+C1
Lightning protection zone LPZ	1-3
Channel performance ISO/IEC	Class E
Channel performance Ansi/EA	CAT 6
Number of poles	8
Rated current $I_n$	1 A
Impulse durability wire-wire	C1: 0,3 kV / 0,15 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)	5 kA
Protection level wire-wire	<40 V
Protection level wire-earth	<900 V
Frequency range	>250 MHz
Temperature range $\vartheta$	-40 - +80 °C
Installation type	Connector/cable adapter
Connection system	RJ45 8(8)
Protection rating	IP10
Shielding connection available	Yes
Shield connection	Direct
Earthing via:	Connection cable / DIN rail
Testing standard	IEC 61643-21

## Connection options



## Fine protection 8-F for Ethernet networks (Class D/CAT 5)

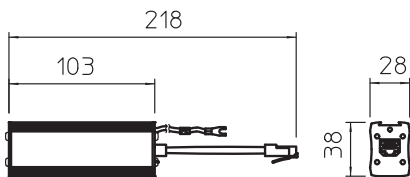


Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>RJ45 S-ATM 8-F</b>	Fine protection, 8 wires + shield	RJ45 8(8)	1	14.000	<b>5081990</b>

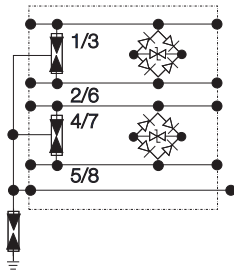
Universal data cable protection device for network technology and telecommunication systems

- In aluminium housing
- Protection for 8 cores
- With two-stage protective circuit
- Simple mounting
- With RJ45 Western connector
- Incl. 150 mm connection cable with RJ45 connectors
- Cat 5e network technology, 10BaseT, 100BaseT, 1000BaseT
- DIN rail mounting with accessories DLS-BS (5082 38 2)

### Dimensions



### Connection options



Application: For analogue, ISDN, DSL systems, Ethernet Twisted Pair.

### RJ45 S-ATM 8-F

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6.2 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1→3
Channel performance ISO/IEC		Class D
Channel performance Ansi/EA		CAT 5e
Number of poles		8
Rated current	$I_t$	1 A
Impulse durability wire-wire		C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		7,5 kA
Protection level wire-wire		<40 V
Protection level wire-earth		<900 V
Frequency range		>155 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		RJ45 8(8)
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Combination arrester for 10Base2-/10Base5 networks



Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>KOAX B-E2 MF-C</b>	Combi protection	BNC	1	10.300	<b>5082430</b>

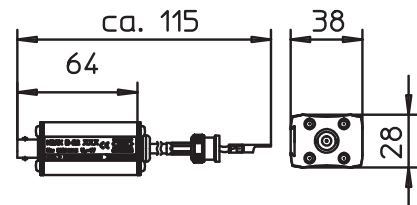
Data line protection device for coaxial Ethernet network systems

- In aluminium housing
- BNC connector m/f
- Simple mounting with adapter plug
- Two-stage protection circuit
- DIN rail mounting with DLS-BS accessories (5082 38 2)

Application: Protecting video signals; cameras and/or CCTV units, Cheapernet, 10BASE2, 10BASE5



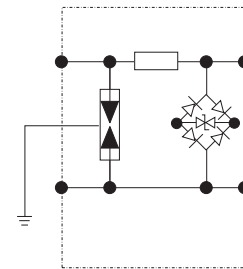
## Dimensions



## KOAX B-E2 MF-C

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6.2 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		1
Rated current	$I_n$	0.3 A
Series resistance per wire		4,7 $\Omega$ $\pm$ 10%
Wave resistance	$Z_1$	75 $\Omega$
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	1 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		2 kA
Protection level wire-wire		<75 V
Protection level wire-earth		<600 V
Frequency range		0 - 68 MHz
Insertion loss	$S_{21}$	$\leq$ 1,7 dB
Return loss	$S_{11}$	$\geq$ 14 dB
Temperature range	$\vartheta$	-20 - +80 °C
Installation type		Connector/cable adapter
Connection system		BNC
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Connection options



## Fine protection for 10Base2-/10Base5 networks



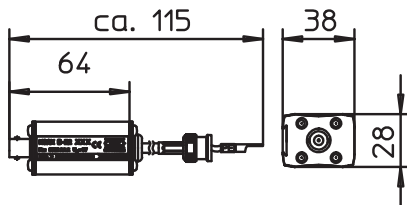
Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
KOAX B-E2 MF-F	Fine protection	BNC	1	9.800	5082432

Data line protection device for coaxial Ethernet network systems

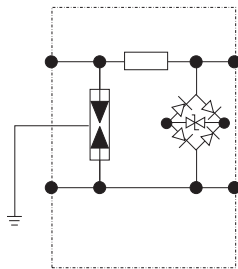
- In aluminium housing
- BNC connector m/f
- Simple mounting with adapter plug
- Two-stage protection circuit
- DIN rail mounting with DLS-BS accessories (5082 38 2)

Application: Protecting video signals; cameras and/or CCTV units, Cheapernet, 10BASE2, 10BASE5

### Dimensions



### Connection options



### KOAX B-E2 MF-F

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6.2 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1-3
Number of poles		1
Rated current	$I_n$	1 A
Wave resistance	$Z_L$	75 $\Omega$
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Protection level wire-wire		<40 V
Protection level wire-earth		<600 V
Frequency range		0 - 70 MHz
Insertion loss	$S_{21}$	$\leq 1$ dB
Return loss	$S_{11}$	$\geq 14$ dB
Temperature range	$\vartheta$	-20 - +80 °C
Installation type		Connector/cable adapter
Connection system		BNC
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Data cable protection device for coaxial TV / camera systems



Type	Version	Con- nection system	Pack Weight		Item no.
			Piece	kg/100 pc.	
<b>KOAX B-E2 FF-F</b>	Fine protection	BNC	1	14.400	<b>5082434</b>

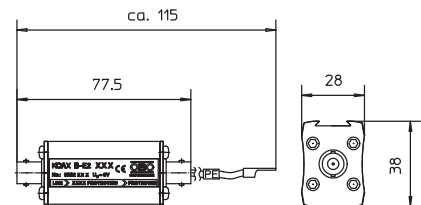
Data cable protection device for coaxial TV / camera systems

- In aluminium housing
- BNC connector socket/socket
- Simple mounting with adapter plug
- Two-stage protection circuit
- DIN rail mounting with DLS-BS accessories (5082 38 2)

Application: Protection of CCTV, video signals; cameras and/or TV systems



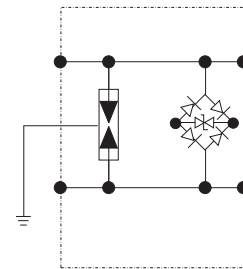
## Dimensions



## KOAX B-E2 FF-F

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6.2 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1→3
Number of poles		1
Rated current	$I_n$	1 A
Wave resistance	$Z_L$	75 $\Omega$
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Protection level wire-wire		<40 V
Protection level wire-earth		<600 V
Frequency range		0 - 160 MHz
Insertion loss	$S_{21}$	$\leq 1,7$ dB
Return loss	$S_{11}$	$\geq 14$ dB
Temperature range	$\vartheta$	-20 - +80 °C
Installation type		Connector/cable adapter
Connection system		BNC
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Connection options



## Fastening set for DIN profile rail

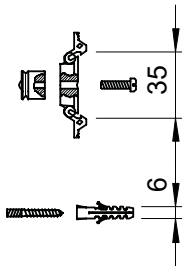


Type	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>DLS-BS</b>	For mounting: <ul style="list-style-type: none"> <li>• Coax B-E2/...</li> <li>• Coax N-E5/...</li> <li>• RJ 11-Tele/4...</li> <li>• RJ 45 S-...</li> </ul>	1	5.000	<b>5082382</b>

DLS-BS: The fastening set is designed for a hat profile rail and wall mounting and can be used for the data cable protection devices listed below:

- Coax N-E5/...
- Coax B-E2/...
- RJ 11-Tele/4...
- RJ 45 S-...

### Dimensions





## Basic protection for 4-wire information technology systems with RJ45



Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>RJ45 S-E100 4-B</b>	Basic protection, 4 wires + shield	RJ45	1	14.000	<b>5081001</b>

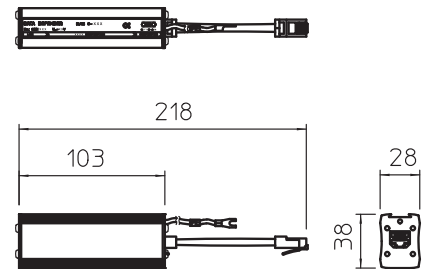
Data line protection device for IT systems

- In aluminium housing
- RJ45 connector
- Incl. 150 mm connection cable with RJ45 connectors
- Simple mounting using adapter
- 2-stage protection circuit
- DIN rail mounting with DLS-BS accessories (5082 38 2)

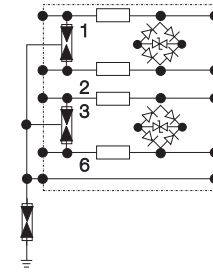
Application: Twisted Pair, control circuits, RJ45 communication cables



## Dimensions



## Connection options

**RJ45 S-E100 4-B**

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	170 V
Category	Type	1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		4
Rated current	$I_n$	1 A
Impulse durability wire-wire		C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	0,5 kA
Total discharge current (8/20)		7,5 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		<700 V
Protection level wire-earth		<850 V
Frequency range		0 - 463 MHz
Insertion loss	$S_{21}$	$\leq 3$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		RJ45
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Indirect
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Combination arrester for 4-wire information technology systems with RJ45



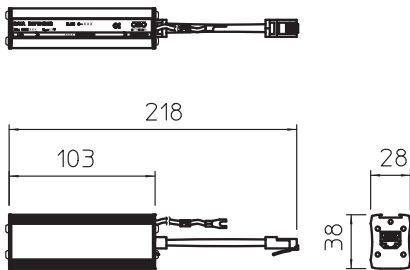
Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>RJ45 S-E100 4-C</b>	Combined protection, 4 wires + shield	RJ45	1	14.000	<b>5081003</b>

Data line protection device for IT systems

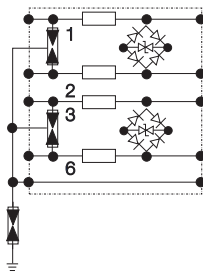
- In aluminium housing
- RJ45 connector
- Incl. 150 mm connection cable with RJ45 connectors
- Simple mounting using adapter
- 2-stage protection circuit
- DIN rail mounting with DLS-BS accessories (5082 38 2)

Application: Twisted Pair, control circuits, RJ45 communication cables

### Dimensions



### Connection options



### RJ45 S-E100 4-C

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6.2 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-2
Number of poles		4
Rated current	$I_L$	0.3 A
Series resistance per wire		4,7 $\Omega \pm 10\%$
Impulse durability wire-wire		C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 3 kV / 1,5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	1.5 kA
Total discharge current (8/20)		7,5 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		<70 V
Protection level wire-earth		<850 V
Frequency range		0 - 109 MHz
Insertion loss	$S_{21}$	$\leq 3$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		RJ45
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Indirect
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Fine protection for 4-wire information technology systems with RJ45



Type	Version	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>RJ45 S-E100 4-F</b>	Fine protection, 4 wires + shield	RJ45	1	14.000	<b>5081005</b>

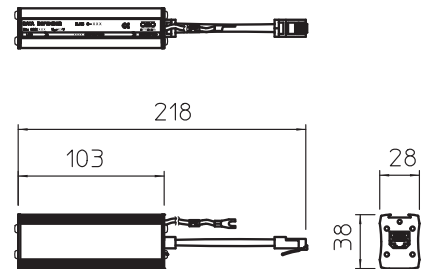
Data line protection device for IT systems

- In aluminium housing
- RJ45 connector
- Incl. 150 mm connection cable with RJ45 connectors
- Simple mounting using adapter
- 2-stage protection circuit
- DIN rail mounting with DLS-BS accessories (5082 38 2)

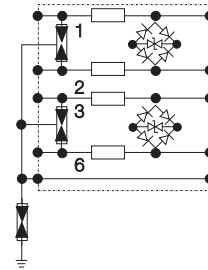
Application: Twisted Pair, control circuits, RJ45 communication cables



## Dimensions



## Connection options

**RJ45 S-E100 4-F**

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6.2 V
Category	Type	2+3 / C2+C1
Lightning protection zone LPZ		2→3
Number of poles		4
Rated current	$I_n$	1 A
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse discharge current (10/350)	$I_{imp}$	— kA
Total discharge current (8/20)		2,5 kA
Total discharge current (10/350)		— kA
Protection level wire-wire		<40 V
Protection level wire-earth		<750 V
Frequency range		0 - 100 MHz
Insertion loss	$S_{21}$	$\leq 3$ dB
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		RJ45
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Indirect
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Combined protection device 2in1 for CCTV camera systems

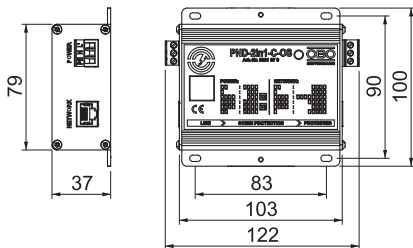


Type	Maximum continuous voltage (L-N) V	Maximum discharge current (8/20 μs) kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>PND-2in1-C-OS</b>	255	10	1	27.000	<b>5081070</b>

Combination protection device for IP-based TV/camera systems

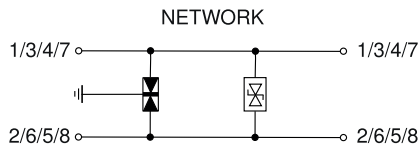
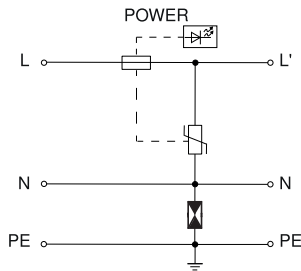
- Protection of power and data interface in a single device
- In aluminium housing
- Simple mounting with adapter plug
- Two-stage protection circuit
- Three-pole power connection for the power interface
- RJ45 connection for the data interface
- With LED operation display (OS)
- Incl. DIN rail fastening set

### Dimensions



Application: Protection of CCTV, video signals, (IP) cameras and/or TV systems

### Connection options



### PND-2in1-C-OS

Temperature range	θ	-20 - +80 °C
Installation type		Installation
Protection rating		IP20
Earthing via:		Connection cable / DIN rail
Lightning protection zone LPZ		1→3
Power		
SPD to IEC 61643-11		Class II+III
SPD to EN 61643-11		Type 2+3
Maximum continuous voltage (L-N)	$U_c$	255 V
Rated current	$I_n$	16 A
Protection level	$U_p$	<1,3 kV
Idle voltage	$U_{OC}$	10 kV
Nominal discharge current (8/20 μs)	$I_n / I_{-N}$	5 kA
Maximum discharge current (8/20 μs)	$I_{max}$	10 kA
Network		
Maximum continuous voltage AC	$U_c$	5,65 V
Maximum continuous voltage DC	$U_c$	8 V
Category		Type 1+2+3 / D1+C2+C1
Impulse durability wire-wire		C1: 0,3 kV / 0,15 kA (8/20μs)
Impulse durability wire-earth		C2: 3 kV / 1,5 kA (8/20μs)
Protection level wire-wire		<40 V
Protection level wire-earth		<450 V
Frequency range		0 - 100 MHz
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

## Combined protection device 3in1 for CCTV camera systems



Type	Maximum continuous voltage (L-N) V	Maximum discharge current (8/20 μs) kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>PND-3in1-C-OS</b>	255	10	1	29.900	<b>5081072</b>

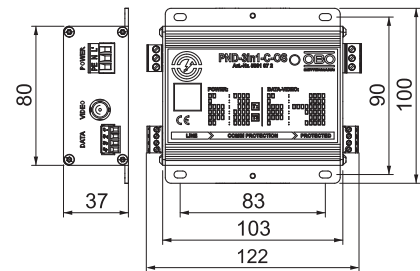
Combination protection device for coaxial TV/camera systems

- Protection of power and data interfaces in a single device
- In aluminium housing
- Simple mounting with adapter
- Two-stage protection circuit
- Three-pole power connection for the power interface
- With LED operation display (OS)
- Incl. DIN rail fastening set

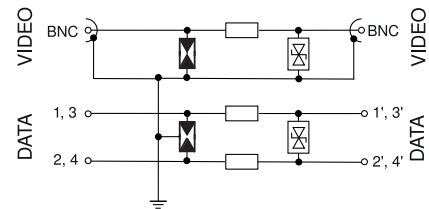
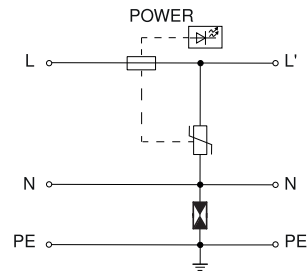


Application: Protection of CCTV, video signals, cameras and/or TV systems

### Dimensions



### Connection options



### PND-3in1-C-OS

Lightning protection zone LPZ		1-3
Earthing via:		Connection cable / DIN rail
Protection rating		IP20
Power		
SPD to IEC 61643-11		Class II+III
SPD to EN 61643-11		Type 2+3
Maximum continuous voltage (L-N)	$U_C$	255 V
Rated current	$I_L$	16 A
Protection level	$U_n$	<1,3 kV
Nominal discharge current (8/20 μs)	$I_n / I_{1-N}$	5 kA
Maximum discharge current (8/20 μs)	$I_{max}$	10 kA
Data		
Maximum continuous voltage AC	$U_C$	5,65 V
Maximum continuous voltage DC	$U_C$	8 V
SPD to IEC 61643-21		Class I+II / D1+C2
Category		Type 1+2 / D1+C2
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20μs)
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20μs)
Impulse current (10/350)	$I_{imp}$	1 kA
Protection level wire-earth		<450 V
Protection level wire-wire		<65 V
Frequency range		0-100 MHz
Video		
Maximum continuous voltage AC	$U_C$	5,65 V
Maximum continuous voltage DC	$U_C$	8 V
SPD to IEC 61643-21		Class I+II / D1+C2
Category		Type 1+2 / D1+C2
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20μs)
Impulse durability wire-wire		C2: 10 kV / 5 kA (8/20μs)
Impulse current (10/350)	$I_{imp}$	1 kA
Protection level wire-wire		<90 V
Protection level wire-earth		<150 V
Frequency range		0-100 MHz
Screen connection		Yes
Screening		Direct
Temperature range	$\vartheta$	-20 - +80 °C

## Fine protection for 9-pole RS232 interface



Highest continuous voltage

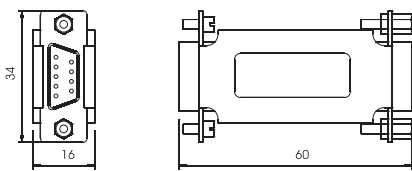
Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>SD09-V24 9</b>	18	SUB-D-9; V24 RS232	1	6.000	<b>5080053</b>

Data cable protection device for serial interfaces

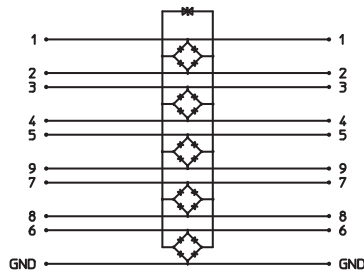
- Various connection technologies available
- Low voltage protection level

Application: PLC, alarm systems, controllers

### Dimensions



### Connection options



### SD09-V24 9

Max. continuous operating voltage	$U_c$	18 V
Category		Type 3 / C1
Lightning protection zone LPZ		2→3
Number of poles		9
Impulse durability wire-wire		0,34 kA (8/20 $\mu$ s)
Impulse durability wire-earth		0,34 kA (8/20 $\mu$ s)
Protection level wire-wire		<50 V
Protection level wire-earth		<50 V
Protection level, wire-earth at 1 kV/ $\mu$ s (C3)	$U_n$	<25 V
Temperature range	$\theta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		D-Sub 9-pin
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21



## Fine protection for 15-pole RS232 interface



Highest  
continu-  
ous  
voltage

Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>SD15-V24 15</b>	18	SUB-D-15; V24 RS232	1	7.000	<b>5080150</b>

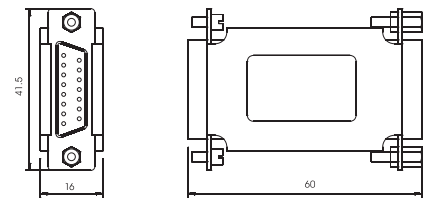
Data cable protection device for serial interfaces

- Various connection technologies available
- Low voltage protection level

Application: PLC, alarm systems, controllers



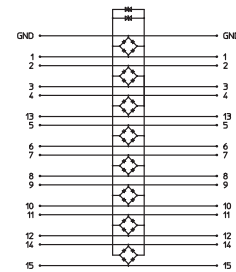
## Dimensions



## SD15-V24 15

Max. continuous operating voltage	$U_c$	18 V
Category		Type 3 / C1
Lightning protection zone LPZ		2-3
Number of poles		15
Impulse durability wire-wire		0,34 kA (8/20 $\mu$ s)
Impulse durability wire-earth		0,34 kA (8/20 $\mu$ s)
Protection level wire-wire		<50 V
Protection level wire-earth		<50 V
Protection level, wire-earth at 1 kV/ $\mu$ s (C3)	$U_n$	<25 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		D-Sub 15-pin
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21

## Connection options



## Fine protection for 9-pole RS485 interface



Highest continuous voltage

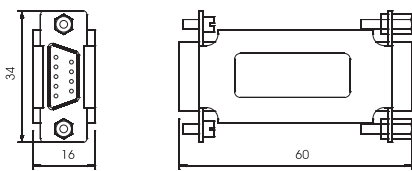
Type	V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>SD09-V11 9</b>	7.5	SUB-D-9; V11 RS485	1	2.951	<b>5080061</b>

Data cable protection device for serial interfaces

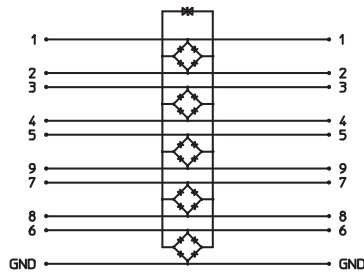
- Various connection technologies available
- Low voltage protection level

Application: PLC, alarm systems, controllers

### Dimensions



### Connection options



### SD09-V11 9

Max. continuous operating voltage	$U_c$	7.5 V
Category		Type 3 / C1
Lightning protection zone LPZ		2→3
Number of poles		9
Impulse durability wire-wire		0,75 kA (8/20µs)
Impulse durability wire-earth		0,75 kA (8/20µs)
Protection level wire-wire		<100 V
Protection level wire-earth		<100 V
Protection level, wire-earth at 1 kV/µs (C3)	$U_n$	<10 V
Temperature range	$\theta$	-40 - +80 °C
Installation type		Connector/cable adapter
Connection system		D-Sub 9-pin
Protection rating		IP40
Shielding connection available		Yes
Shield connection		Direct
Testing standard		IEC 61643-21





## Connectable data cable protection, 2-pole, direct earthing



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>PDP-2-5-D</b>	4.2	6	2	1	6.500	<b>5080301</b>

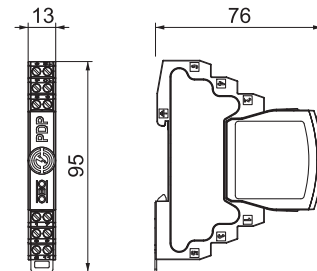
Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Direct shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Installation width from 12.5 mm
- High system availability – no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.



## Dimensions



## Connection options

**PDP-2-5-D**

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		2
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		100 V
Protection level wire-earth		850 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2-pole, direct earthing

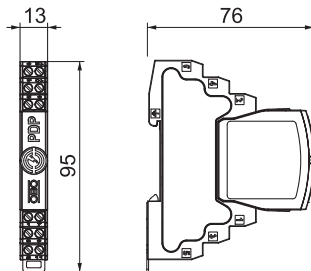


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>PDP-2-12-D</b>	12	16	2	1	6.500	<b>5080303</b>

Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Direct shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Installation width from 12.5 mm
- High system availability – no signal interruption without protection module

### Dimensions



### Connection options

Application: Universal lightning and surge protection for MCR data transmission devices.

### PDP-2-12-D

Maximum continuous voltage AC	$U_c$	12 V
Maximum continuous voltage DC	$U_c$	16 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		2
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		130 V
Protection level wire-earth		850 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2-pole, direct earthing



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>PDP-2-24-D</b>	21	30	2	1	6.500	<b>5080305</b>

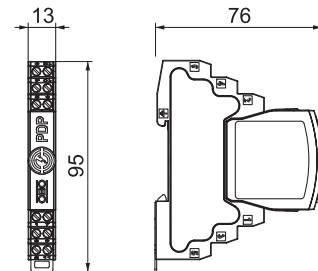
Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Direct shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Installation width from 12.5 mm
- High system availability – no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.



## Dimensions



## Connection options

## PDP-2-24-D

Maximum continuous voltage AC	$U_c$	21 V
Maximum continuous voltage DC	$U_c$	30 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		2
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		150 V
Protection level wire-earth		850 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2-pole, direct earthing

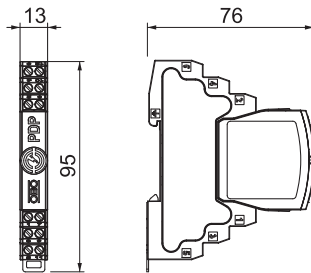


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>PDP-2-48-D</b>	37	52	2	1	6.500	<b>5080307</b>

Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Direct shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Installation width from 12.5 mm
- High system availability – no signal interruption without protection module

### Dimensions



### Connection options

Application: Universal lightning and surge protection for MCR data transmission devices.

### PDP-2-48-D

Maximum continuous voltage AC	$U_c$	37 V
Maximum continuous voltage DC	$U_c$	52 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		2
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		170 V
Protection level wire-earth		850 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2-pole, indirect earthing



Type	Highest continuous voltage AC	Maximum continuous voltage DC	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
	V	V				
<b>PDP-2-5-I</b>	4.2	6	2	1	6.600	<b>5080309</b>

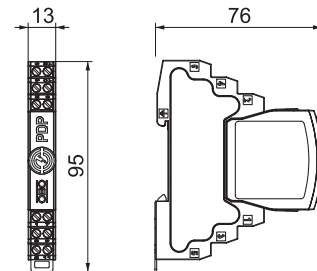
Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Indirect shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Small installation width of 12.5 mm
- High system availability - no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.



## Dimensions



## Connection options

## PDP-2-5-I

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		2
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		100 V
Protection level wire-earth		1600 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Indirect
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2-pole, indirect earthing

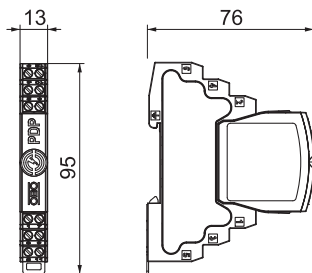


Type	Highest continuous voltage AC	Maximum continuous voltage DC	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
	V	V				
<b>PDP-2-12-I</b>	12	16	2	1	6.600	<b>5080311</b>

Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Indirect shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Small installation width of 12.5 mm
- High system availability - no signal interruption without protection module

### Dimensions



### Connection options

Application: Universal lightning and surge protection for MCR data transmission devices.

### PDP-2-12-I

Maximum continuous voltage AC	$U_c$	12 V
Maximum continuous voltage DC	$U_c$	16 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		2
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		130 V
Protection level wire-earth		1600 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Indirect
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2-pole, indirect earthing



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>PDP-2-24-I</b>	21	30	2	1	6.600	<b>5080313</b>

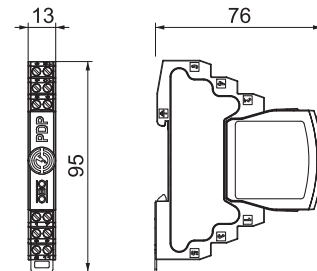
Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Indirect shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Small installation width of 12.5 mm
- High system availability - no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.



## Dimensions



## Connection options

**PDP-2-24-I**

Maximum continuous voltage AC	$U_c$	21 V
Maximum continuous voltage DC	$U_c$	30 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0-2
Number of poles		2
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		150 V
Protection level wire-earth		1600 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Indirect
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2-pole, indirect earthing



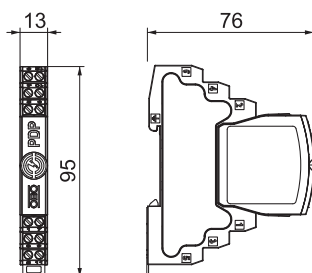
Type	Highest continuous voltage AC	Maximum continuous voltage DC	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
	V	V				
<b>PDP-2-48-I</b>	37	52	2	1	6.600	<b>5080315</b>

Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Indirect shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Small installation width of 12.5 mm
- High system availability - no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.

### Dimensions



### Connection options

#### PDP-2-48-I

Maximum continuous voltage AC	$U_c$	37 V
Maximum continuous voltage DC	$U_c$	52 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		2
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		170 V
Protection level wire-earth		1600 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Indirect
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21



## Connectable data cable protection, 2x2-pole, direct earthing



Type	Highest continuous voltage AC	Maximum continuous voltage DC	Number of poles	Pack	Weight	Item no.
	V	V		Piece	kg/100 pc.	
<b>PDP-2x2-5-D</b>	4.2	6	—	1	7.200	<b>5080317</b>

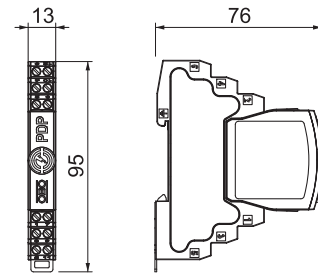
Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Direct shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Installation width from 12.5 mm
- High system availability – no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.



### Dimensions



### Connection options

#### PDP-2x2-5-D

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Version		2x2-pole
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		100 V
Protection level wire-earth		850 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2x2-pole, direct earthing



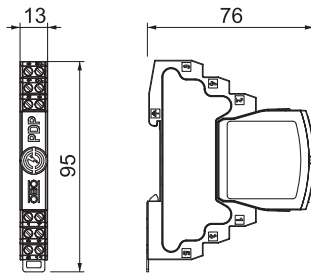
Type	Highest continuous voltage AC	Maximum continuous voltage DC	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
	V	V				
<b>PDP-2x2-12-D</b>	12	16	—	1	7.200	<b>5080319</b>

Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Direct shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Installation width from 12.5 mm
- High system availability – no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.

### Dimensions



### Connection options

#### PDP-2x2-12-D

Maximum continuous voltage AC	$U_c$	12 V
Maximum continuous voltage DC	$U_c$	16 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Version		2x2-pole
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		130 V
Protection level wire-earth		850 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2x2-pole, direct earthing



Type	Highest continuous voltage AC	Maximum continuous voltage DC	Number of poles	Pack	Weight	Item no.
	V	V		Piece	kg/100 pc.	
<b>PDP-2x2-24-D</b>	21	30	—	1	7.200	<b>5080321</b>

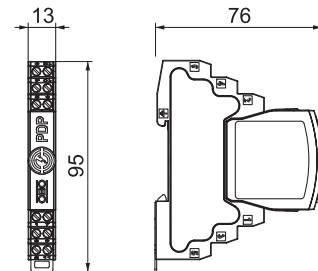
Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Direct shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Installation width from 12.5 mm
- High system availability – no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.



### Dimensions



### Connection options

#### PDP-2x2-24-D

Maximum continuous voltage AC	$U_c$	21 V
Maximum continuous voltage DC	$U_c$	30 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Version		2x2-pole
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		150 V
Protection level wire-earth		850 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2x2-pole, direct earthing



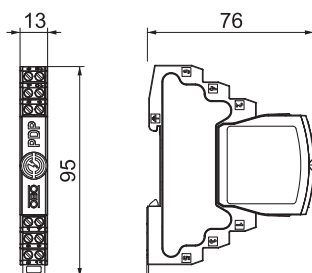
Type	Highest continuous voltage AC	Maximum continuous voltage DC	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
	V	V				
<b>PDP-2x2-48-D</b>	37	52	—	1	7.200	<b>5080323</b>

Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Direct shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Installation width from 12.5 mm
- High system availability – no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.

### Dimensions



### Connection options

#### PDP-2x2-48-D

Maximum continuous voltage AC	$U_c$	37 V
Maximum continuous voltage DC	$U_c$	52 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Version		2x2-pole
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		170 V
Protection level wire-earth		850 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2x2-pole, indirect earthing



Type	Highest continuous voltage AC	Maximum continuous voltage DC	Number of poles	Pack	Weight	Item no.
	V	V		Piece	kg/100 pc.	
<b>PDP-2x2-5-I</b>	4.2	6	—	1	7.300	<b>5080325</b>

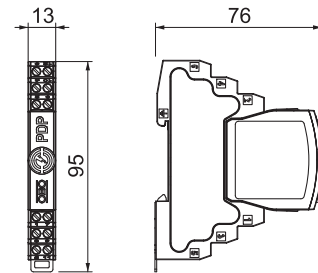
Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Indirect shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Small installation width of 12.5 mm
- High system availability - no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.



### Dimensions



### Connection options

#### PDP-2x2-5-I

Maximum continuous voltage AC	$U_c$	4.2 V
Maximum continuous voltage DC	$U_c$	6 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Version		2x2-pole
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		100 V
Protection level wire-earth		1600 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Indirect
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2x2-pole, indirect earthing

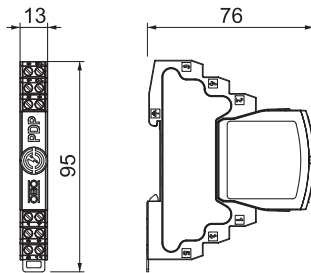


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>PDP-2x2-12-I</b>	12	16	—	1	7.300	<b>5080327</b>

Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Indirect shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Small installation width of 12.5 mm
- High system availability - no signal interruption without protection module

### Dimensions



### Connection options

Application: Universal lightning and surge protection for MCR data transmission devices.

#### PDP-2x2-12-I

Maximum continuous voltage AC	$U_c$	12 V
Maximum continuous voltage DC	$U_c$	16 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Version		2x2-pole
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		130 V
Protection level wire-earth		1600 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Indirect
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2x2-pole, indirect earthing



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>PDP-2x2-24-I</b>	21	30	—	1	7.300	<b>5080329</b>

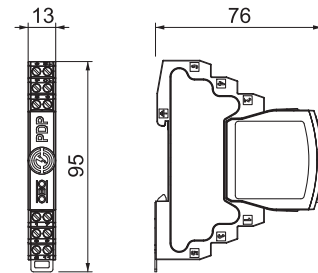
Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Indirect shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Small installation width of 12.5 mm
- High system availability - no signal interruption without protection module

Application: Universal lightning and surge protection for MCR data transmission devices.



### Dimensions



### Connection options

#### PDP-2x2-24-I

Maximum continuous voltage AC	$U_c$	21 V
Maximum continuous voltage DC	$U_c$	30 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Version		2x2-pole
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		150 V
Protection level wire-earth		1600 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Indirect
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21

## Connectable data cable protection, 2x2-pole, indirect earthing

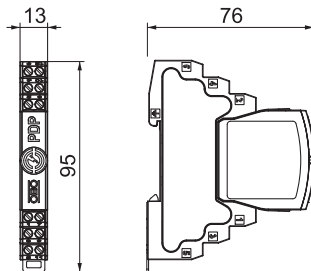


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>PDP-2x2-48-I</b>	37	52	—	1	7.300	<b>5080331</b>

Connectable data cable protection, type 1+2/D1+C2 for use in measurement and control technology

- Protection device for multi-wire systems
- Indirect shield earthing
- Frequency range up to 100 MHz
- Earthing via DIN rail or connection cable
- Small installation width of 12.5 mm
- High system availability - no signal interruption without protection module

### Dimensions



### Connection options

Application: Universal lightning and surge protection for MCR data transmission devices.

#### PDP-2x2-48-I

Maximum continuous voltage AC	$U_c$	37 V
Maximum continuous voltage DC	$U_c$	52 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Version		2x2-pole
Nominal load current AC	$I_n$	0.43 A
Nominal load current DC	$I_n$	0.6 A
Series resistance per wire		1,2 $\Omega$ $\pm$ 5%
Impulse durability wire-wire		10 kV / 5 kA
Impulse durability wire-earth		10 kV / 5 kA
Total discharge current (8/20)		20 kA
Total discharge current (10/350)		2,5 kA
Protection level wire-wire		170 V
Protection level wire-earth		1600 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Indirect
Connection cross-section, flexible		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable / DIN rail
Testing standard		IEC 61643-21



## MCR protection for 2-pole power supply, 12 V



Highest  
continu-  
ous  
voltage  
V

## Type

**VF12-AC DC** | 13.5

Pack Weight  
Piece kg/100 pc.

1 | 9.000 | **5097453**

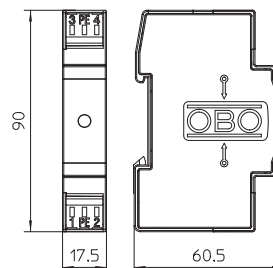
Surge protection device / fine protection type 3 to EN 61643-11

- Suitable for DC and AC voltage systems
- With visual function display
- With installation-friendly, screwless connection terminals
- In a space-saving 17.5 mm grid
- Y circuit

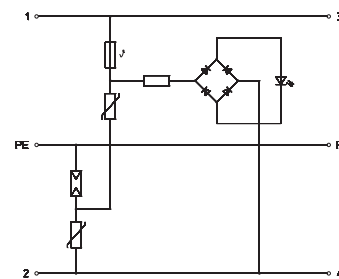
Application: Universal use on 35 mm DIN profile rail in every normal commercially available distributor housing.



## Dimensions



## Connection options



## VF12-AC DC

U max AC	U <sub>c</sub> AC	13.5 V
U max DC	U <sub>c</sub> DC	18 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	0,7 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	2 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<110 V
Protection level wire-earth		<1200 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>



## MCR protection for 2-pole for power supply, 24 V



Highest continuous voltage V

Type

**VF24-AC/DC** | 34

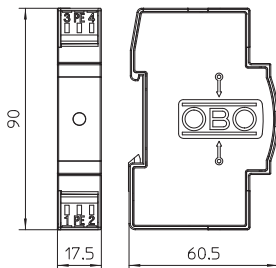
Pack Weight  
Piece kg/100 pc. **Item no.**

1 | 8.000 | **5097607**

Surge protection device / fine protection type 3 to EN 61643-11

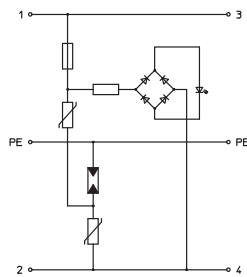
- Suitable for DC and AC voltage systems
- With visual function display
- With installation-friendly, screwless connection terminals
- In a space-saving 17.5 mm grid
- Y circuit

### Dimensions



Application: Universal use on 35 mm DIN profile rail in every normal commercially available distributor housing.

### Connection options



### VF24-AC/DC

U max AC	U <sub>c</sub> AC	34 V
U max DC	U <sub>c</sub> DC	46 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	0,7 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	2 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<130 V
Protection level wire-earth		<1200 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	ϑ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>

## MCR protection for 2-pole for power supply, 48 V



Highest  
continu-  
ous  
voltage  
V

## Type

VF48-AC/DC | 60

Pack Piece	Weight kg/100 pc.	Item no.
1	8.000	5097615

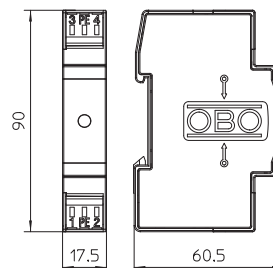
Surge protection device / fine protection type 3 to EN 61643-11

- Suitable for DC and AC voltage systems
- With visual function display
- With installation-friendly, screwless connection terminals
- In a space-saving 17.5 mm grid
- Y circuit

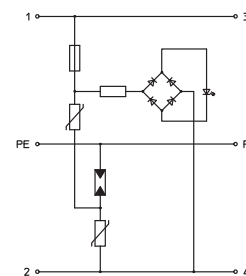
Application: Universal use on 35 mm DIN profile rail in every normal commercially available distributor housing.



## Dimensions



## Connection options



## VF48-AC/DC

U max AC	U <sub>c</sub> AC	60 V
U max DC	U <sub>c</sub> DC	80 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	0,7 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	2 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<220 V
Protection level wire-earth		<1200 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>



MCR protection for 2-pole for power supply, 60 V



Highest continuous voltage V

Type

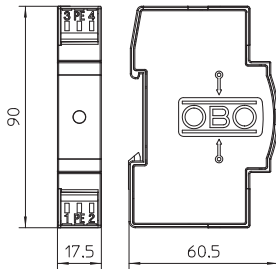
**VF60-AC/DC** | 80

Pack Piece	Weight kg/100 pc.	Item no.
1	8.000	<b>5097623</b>

Surge protection device / fine protection type 3 to EN 61643-11

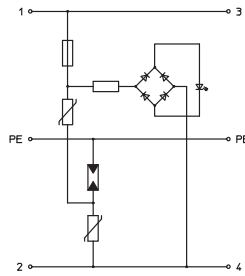
- Suitable for DC and AC voltage systems
- With visual function display
- With installation-friendly, screwless connection terminals
- In a space-saving 17.5 mm grid
- Y circuit

Dimensions



Application: Universal use on 35 mm DIN profile rail in every normal commercially available distributor housing.

Connection options



VF60-AC/DC

U max AC	U <sub>c</sub> AC	80 V
U max DC	U <sub>c</sub> DC	110 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	0,7 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	2 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<280 V
Protection level wire-earth		<1200 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>

## MCR protection for 2-pole for power supply, 110 V



Highest continuous voltage V

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>VF110-AC DC</b>   150	1	8.000	<b>5097631</b>

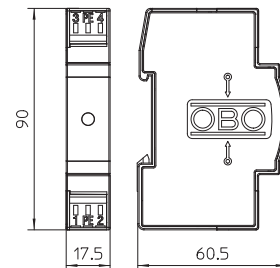
Surge protection device / fine protection type 3 to EN 61643-11

- Suitable for DC and AC voltage systems
- With visual function display
- With installation-friendly, screwless connection terminals
- In a space-saving 17.5 mm grid
- Y circuit

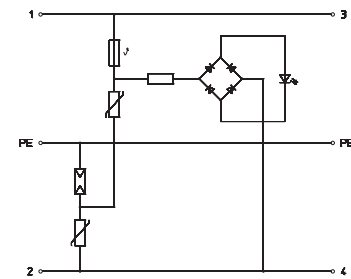
Application: Universal use on 35 mm DIN profile rail in every normal commercially available distributor housing.



## Dimensions



## Connection options



## VF110-AC DC

U max AC	U <sub>c AC</sub>	150 V
U max DC	U <sub>c DC</sub>	200 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	2 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	6.5 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<500 V
Protection level wire-earth		<1400 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>



MCR protection for 2-pole for power supply, 230 V



Highest continuous voltage V

Type

**VF230-AC/DC** | 255

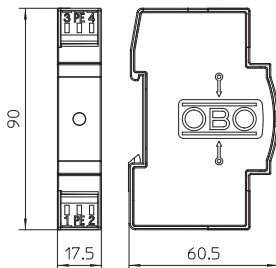
Pack Weight  
Piece kg/100 pc. **Item no.**

1 | 8.000 | **5097650**

Surge protection device / fine protection type 3 to EN 61643-11

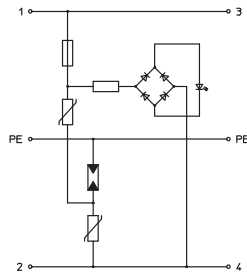
- Suitable for DC and AC voltage systems
- With visual function display
- With installation-friendly, screwless connection terminals
- In a space-saving 17.5 mm grid
- Y circuit

Dimensions



Application: Universal use on 35 mm DIN profile rail in every normal commercially available distributor housing.

Connection options



VF230-AC/DC

U max AC	U <sub>c</sub> AC	255 V
U max DC	U <sub>c</sub> DC	350 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	2.5 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	7 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<1000 V
Protection level wire-earth		<1400 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>

## MCR protection for 2-pole for power supply with remote signalling, 12 V AC/DC



Highest continuous voltage V

Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
<b>VF12-AC/DC-FS</b>   13.5	1	6.400	<b>5097454</b>

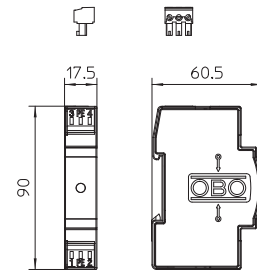
Surge protection / fine power protection, type 3, to EN 61643-11 with remote signalling

- With remote signalling, potential-free changeover contact, for function monitoring
- Suitable for DC and AC systems
- With visual function display
- With easy mounting, screwless connection terminals
- In space-saving 17.5 mm grid
- Y circuit

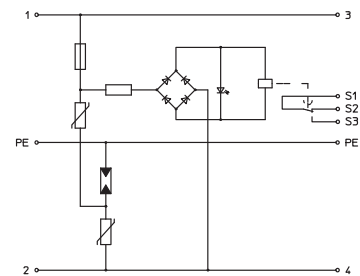
Application: Universal use on 35 mm DIN profile rails in any standard distributor housing.



### Dimensions



### Connection options



### VF12-AC/DC-FS

U max AC	U <sub>c</sub> AC	13.5 V
U max DC	U <sub>c</sub> DC	18 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	0,7 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	2 kA
Rated current	I <sub>n</sub>	20 A
Protection level wire-wire		<110 V
Protection level wire-earth		<1200 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>

## MCR protection for 2-pole power supply with remote signalling, 24 V AC/DC



Highest continuous voltage V

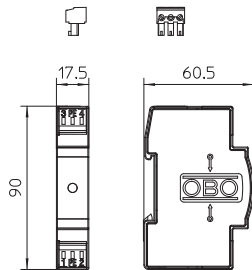
Pack Weight  
Piece kg/100 pc. Item no.

Type	VF24-AC/DC-FS	34	1	6.620	5097820
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Surge protection / fine power protection, type 3, to EN 61643-11 with remote signalling

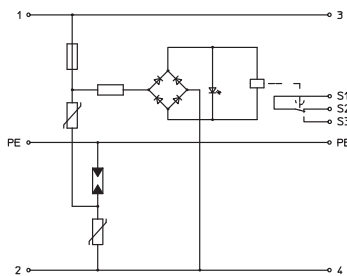
- With remote signalling, potential-free changeover contact, for function monitoring
- Suitable for DC and AC systems
- With visual function display
- With easy mounting, screwless connection terminals
- In space-saving 17.5 mm grid
- Y circuit

### Dimensions



Application: Universal use on 35 mm DIN profile rails in any standard distributor housing.

### Connection options



### VF24-AC/DC-FS

U max AC	U <sub>c</sub> AC	34 V
U max DC	U <sub>c</sub> DC	46 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	0,7 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	2 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<160 V
Protection level wire-earth		<1200 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>



## MCR protection for 2-pole for power supply with remote signalling, 12 V AC/DC



Highest continuous voltage V

Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
<b>VF48-AC/DC-FS</b>   60	1	6.630	<b>5097822</b>

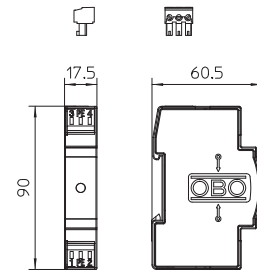
Surge protection / fine power protection, type 3, to EN 61643-11 with remote signalling

- With remote signalling, potential-free changeover contact, for function monitoring
- Suitable for DC and AC systems
- With visual function display
- With easy mounting, screwless connection terminals
- In space-saving 17.5 mm grid
- Y circuit

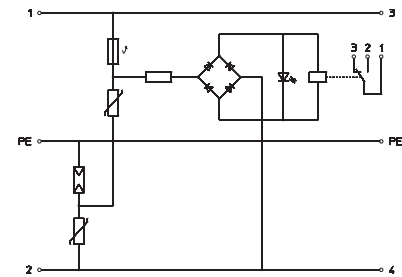
Application: Universal use on 35 mm DIN profile rails in any standard distributor housing.



### Dimensions



### Connection options



### VF48-AC/DC-FS

U max AC	U <sub>c</sub> AC	60 V
U max DC	U <sub>c</sub> DC	80 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	0,7 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	2 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<220 V
Protection level wire-earth		<1200 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>

## MCR protection for 2-pole power supply with remote signalling, 230 V AC



Highest continuous voltage V

Type

**VF230-AC-FS** | 255

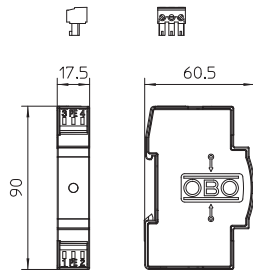
Pack Weight  
Piece kg/100 pc. **Item no.**

1 | 6.910 | **5097858**

Surge protection / fine power protection, type 3, to EN 61643-11 with remote signalling

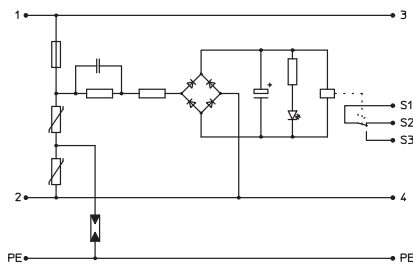
- With remote signalling, potential-free changeover contact, for function monitoring
- Suitable for AC systems
- With visual function display
- With easy mounting, screwless connection terminals
- In space-saving 17.5 mm grid
- Y circuit

### Dimensions



Application: Universal use on 35 mm DIN profile rails in any standard distributor housing.

### Connection options



### VF230-AC-FS

U max AC	U <sub>c</sub> AC	255 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	2,5 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	7 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		<1060 V
Protection level wire-earth		<1400 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>

## MCR protection for 2-pin for power supply with leak current-free remote signalling, 230 V AC/DC



Type	U max		Pack Piece	Weight kg/100 pc.	Item no.
	AC V	DC V			
<b>VF2-230-AC/DC-FS</b>	255	350	1	6.000	<b>5097939</b>

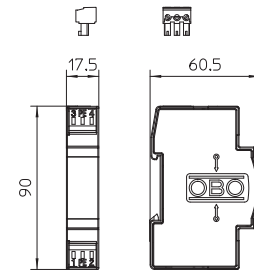
Type 3 surge protection/fine network protection to EN 61643-11 with leak current-free remote signalling

- With remote signalling: potential-free NC contact for function monitoring
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- Y circuit

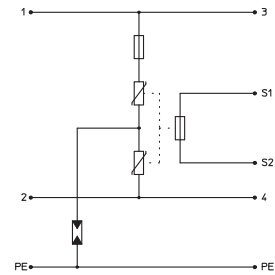
Application: Universal use on 35 mm DIN profile rails in any standard distributor housing.



### Dimensions



### Connection options



### VF2-230-AC/DC-FS

U max AC	U <sub>c</sub> AC	255 V
U max DC	U <sub>c</sub> DC	350 V
SPD to EN 61643-11		Type 3
SPD to IEC 61643-11		Class III
Lightning protection zone LPZ		2→3
Nominal discharge current (8/20)	I <sub>n</sub>	2,5 kA
Maximum discharge current (8/20 μs)	I <sub>max</sub>	7 kA
Rated current	I <sub>t</sub>	20 A
Protection level wire-wire		< 1000 V
Protection level wire-earth		< 1400 V
Response time	t <sub>A</sub>	<25 ns
Temperature range	θ	-40 - +80 °C
Protection rating		IP 20
Division unit TE (17.5 mm)		1
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>

Combination protection for two-core systems with HF applications 5 V

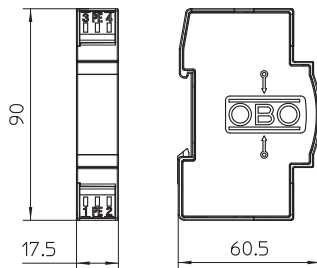


Type	Highest continuous AC voltage V	Maximum continuous DC voltage V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FRD 5 HF</b>	4	6	2	Terminal	1	4.400	<b>5098571</b>

Surge protection for use in measuring, control and regulation systems.

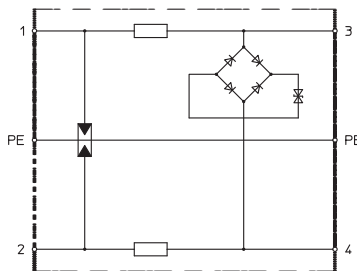
- Basic, medium and fine protection
- Two-stage protection circuit with high lightning current carrying capacity
- High transmission frequency up to 100 MHz
- Suitable for all bus systems (e.g. Profibus)
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid

Dimensions



Application: Multipurpose use on any 35 mm DIN profile rail in every commercially available distribution housing.

Connection options



FRD 5 HF

Maximum continuous voltage AC	$U_c$	4 V
Maximum continuous voltage DC	$U_c$	6 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.45 A
Series resistance per wire		$2,2 \Omega \pm 10 \%$
Impulse durability wire-wire		C2: 18 kV / 9 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 18 kV / 9 kA (8/20 $\mu$ s)
Total discharge current (8/20)		18 kA
Total discharge current (10/350)		D1: 6 kA
Protection level wire-wire		<90 V
Protection level wire-earth		<650 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Combination protection for two-core systems with HF applications 24 V



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FRD 24 HF</b>	19	28	2	Terminal	1	4.400	<b>5098575</b>

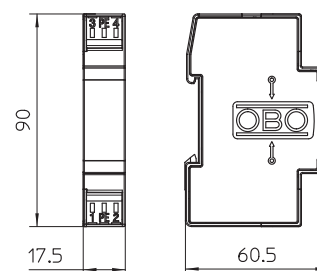
Surge protection for use in measuring, control and regulation systems.

- Basic, medium and fine protection
- Two-stage protection circuit with high lightning current carrying capacity
- High transmission frequency up to 100 MHz
- Suitable for all bus systems (e.g. Profibus)
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid

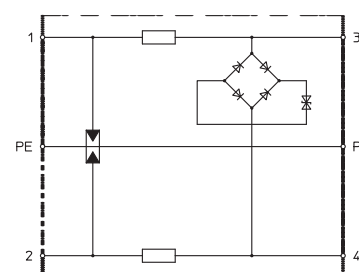
Application: Multipurpose use on any 35 mm DIN profile rail in every commercially available distribution housing.



### Dimensions



### Connection options



### FRD 24 HF

Maximum continuous voltage AC	$U_c$	19 V
Maximum continuous voltage DC	$U_c$	28 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_L$	0.45 A
Series resistance per wire		$2,2 \Omega \pm 10 \%$
Impulse durability wire-wire		C2: 18 kV / 9 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 18 kV / 9 kA (8/20 $\mu$ s)
Total discharge current (8/20)		18 kA
Total discharge current (10/350)		D1: 6 kA
Protection level wire-wire		<120 V
Protection level wire-earth		<650 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

Basic protection for two-core systems with HF applications 120 V

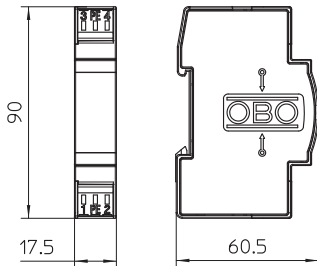


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
TKS-B	120	170	2	Terminal	1	4.400	5097976

Basic protection for measuring, control and regulation technology and telecommunication systems.

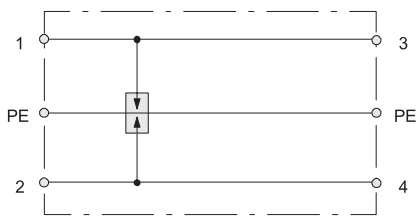
- Basic protection for lightning protection equipotential bonding
- High impulse arresting capacity 6 kA (10/350)
- With easy-to-mount, screwless connection terminals
- In a space-saving 17.5 mm grid

Dimensions



Application: Universal use on 35 mm DIN rails in standard distributor housings.

Connection options



TKS-B

Maximum continuous voltage AC	$U_c$	120 V
Maximum continuous voltage DC	$U_c$	170 V
Category		Type 1+2 / D1+C2
Lightning protection zone LPZ		0→2
Number of poles		2
Rated current	$I_n$	20 A
Impulse durability wire-wire		C2: 18 kV / 9 kA
Impulse durability wire-earth		C2: 18 kV / 9 kA
Total discharge current (8/20)		18 kA
Total discharge current (10/350)		D1: 6 kA
Protection level wire-wire		<950 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Connection cable
Testing standard		IEC 61643-21

## Medium and fine protection FRD for two-core systems 5 V



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FRD 5</b>	5	8	2	Terminal	1	5.100	<b>5098492</b>

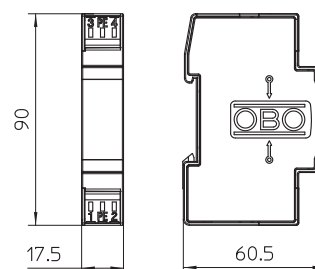
Surge protection for use in measurement and control technology

- Medium and fine protection
- Standard design for double core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With ohmic decoupling in the longitudinal branch

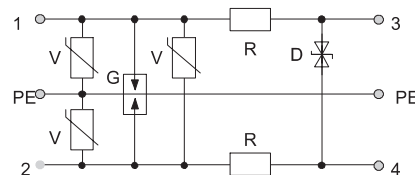
Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.



## Dimensions



## Connection options



## FRD 5

Maximum continuous voltage AC	$U_c$	5 V
Maximum continuous voltage DC	$U_c$	8 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.2 A
Series resistance per wire		15 $\Omega$ $\pm$ 10 %
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<15 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FRD for two-core systems 12 V

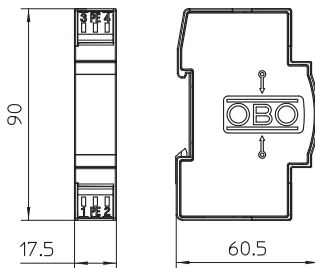


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
FRD 12	9	13	2	Terminal	1	5.100	5098506

Surge protection for use in measurement and control technology

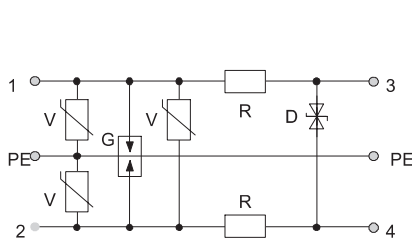
- Medium and fine protection
- Standard design for double core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With ohmic decoupling in the longitudinal branch

### Dimensions



Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.

### Connection options



### FRD 12

Maximum continuous voltage AC	$U_c$	9 V
Maximum continuous voltage DC	$U_c$	13 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.2 A
Series resistance per wire		15 $\Omega$ $\pm$ 10 %
Impulse durability wire-wire		C1: 1 kV / 0.5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<30 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL



## Medium and fine protection FRD for two-core systems 24 V



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FRD 24</b>	19	28	2	Terminal	1	5.100	<b>5098514</b>

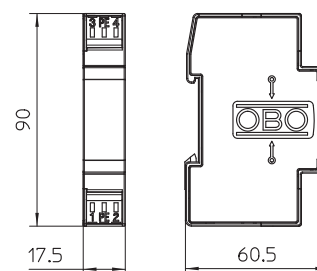
Surge protection for use in measurement and control technology

- Medium and fine protection
- Standard design for double core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With ohmic decoupling in the longitudinal branch

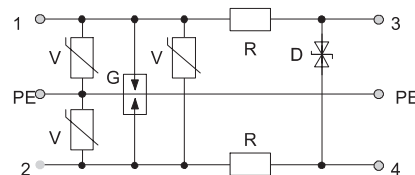
Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.



## Dimensions



## Connection options



## FRD 24

Maximum continuous voltage AC	$U_c$	19 V
Maximum continuous voltage DC	$U_c$	28 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.2 A
Series resistance per wire		15 $\Omega$ $\pm$ 10 %
Impulse durability wire-wire		C2: 5 kV / 2.5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<60 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FRD for two-core systems 48 V

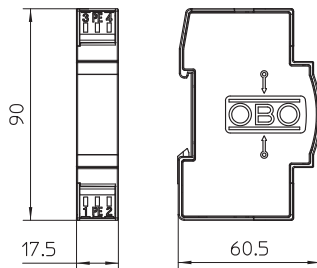


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FRD 48</b>	37	53	2	Terminal	1	5.100	<b>5098522</b>

Surge protection for use in measurement and control technology

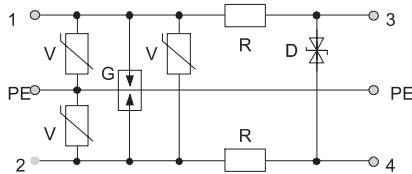
- Medium and fine protection
- Standard design for double core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With ohmic decoupling in the longitudinal branch

### Dimensions



Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.

### Connection options



### FRD 48

Maximum continuous voltage AC	$U_c$	37 V
Maximum continuous voltage DC	$U_c$	53 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.2 A
Series resistance per wire		15 $\Omega$ ± 10 %
Impulse durability wire-wire		C2: 5 kV / 2.5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<140 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FRD for two-core systems 110 V



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FRD 110</b>	86	122	2	Terminal	1	5.100	<b>5098557</b>

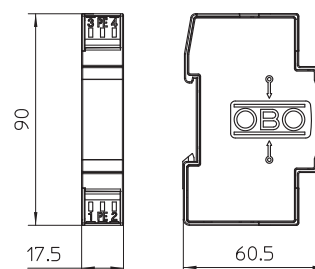
Surge protection for use in measurement and control technology

- Medium and fine protection
- Standard design for double core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With ohmic decoupling in the longitudinal branch

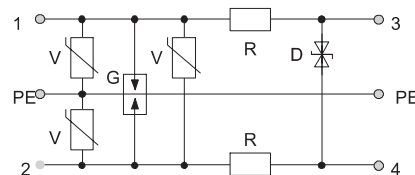
Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.



## Dimensions



## Connection options



## FRD 110

Maximum continuous voltage AC	$U_c$	86 V
Maximum continuous voltage DC	$U_c$	122 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.2 A
Series resistance per wire		15 $\Omega$ $\pm$ 10 %
Impulse durability wire-wire		C2: 5 kV / 2.5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<300 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FRD 2 for two-core systems 24 V

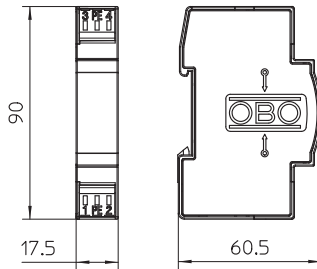


Type	Highest continuous AC voltage V	Maximum continuous DC voltage V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FRD 2-24</b>	19	28	2	Terminal	1	5.100	<b>5098727</b>

Surge protection for use in measurement and control technology

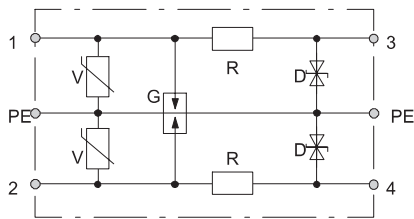
- Medium and fine protection
- Standard design for double core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With ohmic decoupling in the longitudinal branch

### Dimensions



Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.

### Connection options



### FRD 2-24

Maximum continuous voltage AC	$U_c$	19 V
Maximum continuous voltage DC	$U_c$	28 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1→3
Number of poles		2
Rated current	$I_n$	0.2 A
Series resistance per wire		15 $\Omega$ $\pm$ 10 %
Impulse durability wire-wire		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		5 kA
Total discharge current (10/350)		– kA
Protection level wire-wire		<120 V
Protection level wire-earth		<60 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21

## Medium and fine protection FLD for two-core systems 5 V



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FLD 5</b>	5	8	2	Terminal	1	5.200	<b>5098600</b>

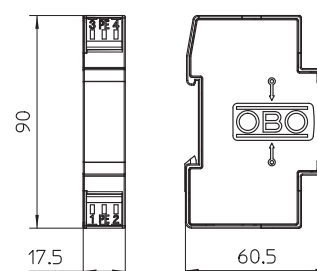
Surge protection for use in measurement and control technology

- Medium and fine protection
- Standard design for single core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With inductive decoupling in the longitudinal branch

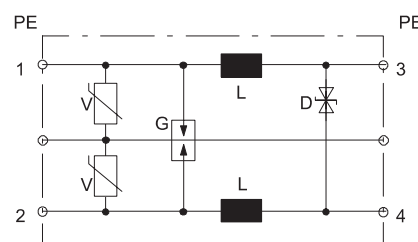
Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.



## Dimensions



## Connection options



## FLD 5

Maximum continuous voltage AC	$U_c$	5 V
Maximum continuous voltage DC	$U_c$	8 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		2
Rated current	$I_n$	1 A
Series inductivity per wire		120 $\mu$ H $\pm$ 20 %
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<15 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FLD for two-core systems 12 V

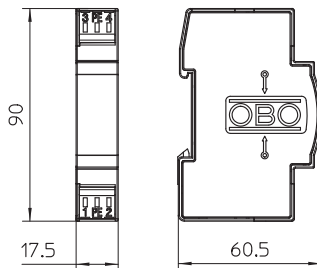


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FLD 12</b>	9	13	2	Terminal	1	5.200	<b>5098603</b>

Surge protection for use in measurement and control technology

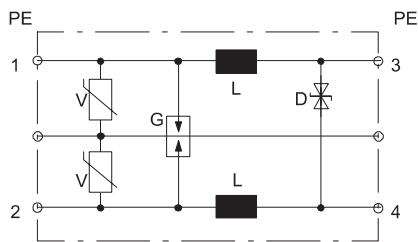
- Medium and fine protection
- Standard design for single core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With inductive decoupling in the longitudinal branch

### Dimensions



Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.

### Connection options



### FLD 12

Maximum continuous voltage AC	$U_c$	9 V
Maximum continuous voltage DC	$U_c$	13 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		2
Rated current	$I_n$	1 A
Series inductivity per wire		120 $\mu$ H $\pm$ 20 %
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<30 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FLD for two-core systems 24 V



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FLD 24</b>	19	28	2	Terminal	1	5.200	<b>5098611</b>

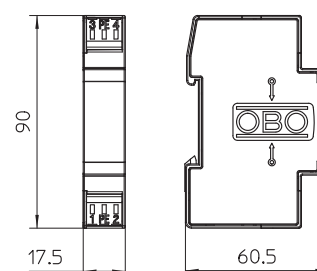
Surge protection for use in measurement and control technology

- Medium and fine protection
- Standard design for single core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With inductive decoupling in the longitudinal branch

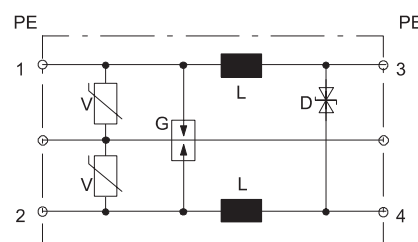
Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.



## Dimensions



## Connection options



## FLD 24

Maximum continuous voltage AC	$U_c$	19 V
Maximum continuous voltage DC	$U_c$	28 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		2
Rated current	$I_n$	1 A
Series inductivity per wire		120 $\mu$ H $\pm$ 20 %
Impulse durability wire-wire		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<60 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FLD for two-core systems 48 V

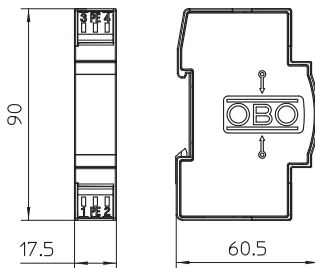


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FLD 48</b>	37	53	2	Terminal	1	5.200	<b>5098630</b>

Surge protection for use in measurement and control technology

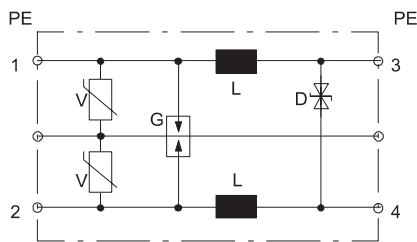
- Medium and fine protection
- Standard design for single core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With inductive decoupling in the longitudinal branch

### Dimensions



Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.

### Connection options



### FLD 48

Maximum continuous voltage AC	$U_c$	37 V
Maximum continuous voltage DC	$U_c$	53 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		2
Rated current	$I_n$	1 A
Series inductivity per wire		120 $\mu$ H $\pm$ 20 %
Impulse durability wire-wire		C2: 5 kV / 2.5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<140 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL



## Medium and fine protection FLD for two-core systems 110 V



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FLD 110</b>	86	122	2	Terminal	1	5.200	<b>5098646</b>

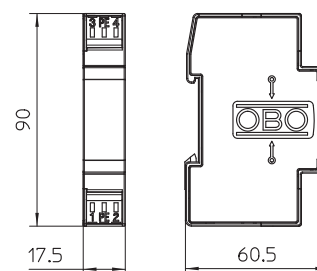
Surge protection for use in measurement and control technology

- Medium and fine protection
- Standard design for single core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With inductive decoupling in the longitudinal branch

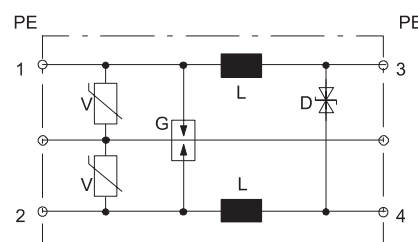
Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.



## Dimensions



## Connection options



## FLD 110

Maximum continuous voltage AC	$U_c$	86 V
Maximum continuous voltage DC	$U_c$	122 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		2
Rated current	$I_n$	1 A
Series inductivity per wire		120 $\mu$ H $\pm$ 20 %
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 10 kV / 5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 3 kA
Protection level wire-wire		<300 V
Protection level wire-earth		<600 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FLD 2 for two-core systems 12 V

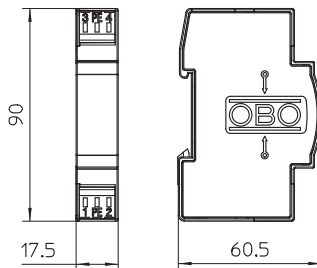


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FLD 2-12</b>	9	13	2	Terminal	1	5.100	<b>5098808</b>

Surge protection for use in measurement and control technology

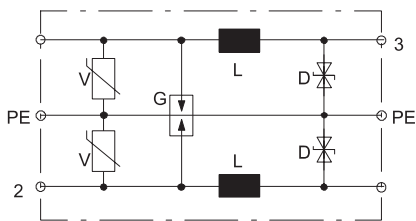
- Medium and fine protection
- Standard design for single core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With inductive decoupling in the longitudinal branch

### Dimensions



Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.

### Connection options



### FLD 2-12

Maximum continuous voltage AC	$U_c$	9 V
Maximum continuous voltage DC	$U_c$	13 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1→3
Number of poles		2
Rated current	$I_n$	1 A
Series inductivity per wire		120 $\mu$ H $\pm$ 10 %
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		1 kA
Total discharge current (10/350)		— kA
Protection level wire-wire		<60 V
Protection level wire-earth		<30 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection for two-core systems 24 V



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FLD 2-24</b>	19	28	2	Terminal	1	5.100	<b>5098816</b>

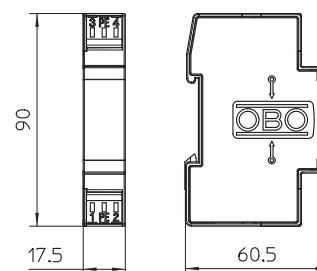
Surge protection for use in measurement and control technology

- Medium and fine protection
- Standard design for single core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With inductive decoupling in the longitudinal branch

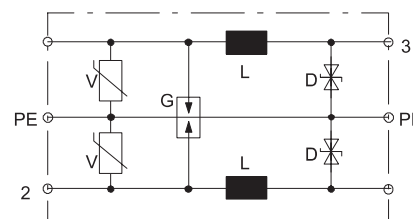
Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.



## Dimensions



## Connection options



## FLD 2-24

Maximum continuous voltage AC	$U_c$	19 V
Maximum continuous voltage DC	$U_c$	28 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1→3
Number of poles		2
Rated current	$I_n$	1 A
Series inductivity per wire		120 $\mu$ H $\pm$ 10 %
Impulse durability wire-wire		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C1: 1 kV / 0,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		1 kA
Total discharge current (10/350)		– kA
Protection level wire-wire		<120 V
Protection level wire-earth		<60 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Medium and fine protection FLD 2 for two-core systems 110 V

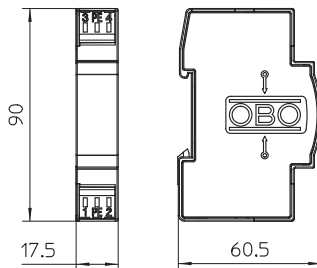


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>FLD 2-110</b>	86	122	2	Terminal	1	5.100	<b>5098859</b>

Surge protection for use in measurement and control technology

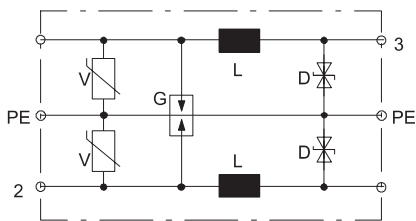
- Medium and fine protection
- Standard design for single core systems
- Two-stage protection circuit
- With installation-friendly, screwless connection terminals
- In space-saving 17.5 mm grid
- With inductive decoupling in the longitudinal branch

### Dimensions



Application: Universal use on any 35 mm DIN profile rail in every commercially available distributor housing.

### Connection options



### FLD 2-110

Maximum continuous voltage AC	$U_c$	86 V
Maximum continuous voltage DC	$U_c$	122 V
Category		Type 2+3 / C2+C1
Lightning protection zone LPZ		1→3
Number of poles		2
Rated current	$I_n$	1 A
Series inductivity per wire		120 $\mu$ H $\pm$ 10 %
Impulse durability wire-wire		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		5 kA
Total discharge current (10/350)		— kA
Protection level wire-wire		<500 V
Protection level wire-earth		<300 V
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Division unit TE (17.5 mm)		1
Protection rating		IP20
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		Terminal
Testing standard		IEC 61643-21
Approvals		UL

## Series protection device, 2-pole, 5 V version



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-2 D-5-T</b>	7	10	2	Terminal	1	6.000	<b>5098404</b>

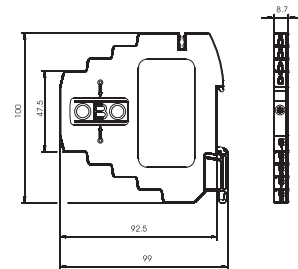
Lightning barrier with test function; 5 V version

- Nominal load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High frequency range of 0–100 MHz
- UL-listed (4DG1)

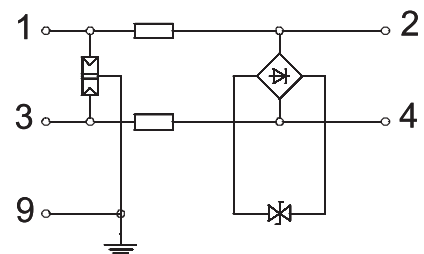
Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.



Dimensions



Connection options



#### MDP-2 D-5-T

Maximum continuous voltage AC	$U_c$	7 V
Maximum continuous voltage DC	$U_c$	10 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega \pm 5\%$
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		5 kA
Total discharge current (10/350)		D1: 1 kA
Protection level wire-wire		<35 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

Series protection device, 3-pole, 5 V version

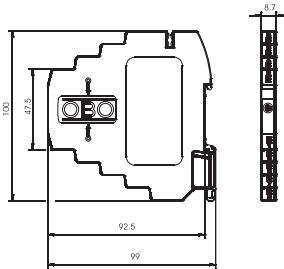


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-3 D-5-T</b>	7	10	3	Terminal	1	6.000	<b>5098407</b>

Lightning barrier with test function; 5 V version

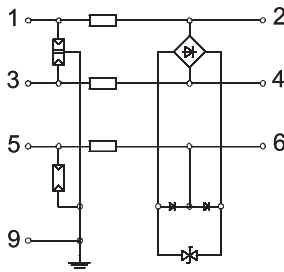
- Nominal load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High frequency range of 0–100 MHz
- UL-listed (4DG1)

Dimensions



Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.

Connection options



MDP-3 D-5-T

Maximum continuous voltage AC	$U_c$	7 V
Maximum continuous voltage DC	$U_c$	10 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		3
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega$ $\pm$ 5 %
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		7,5 kA
Total discharge current (10/350)		D1: 1,5 kA
Protection level wire-wire		<35 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

Series protection device, 4-pole, 5 V version



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-4 D-5-T</b>	7	10	4	Terminal	1	6.000	<b>5098411</b>

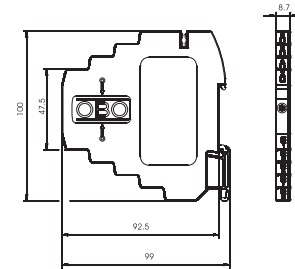
Lightning barrier with test function; 5 V version

- Nominal load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High frequency range of 0–100 MHz
- UL-listed (4DG1)

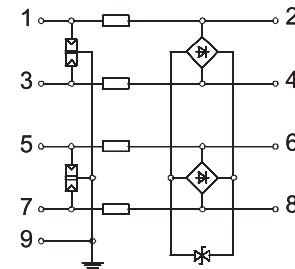
Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.



Dimensions



Connection options



**MDP-4 D-5-T**

Maximum continuous voltage AC	$U_c$	7 V
Maximum continuous voltage DC	$U_c$	10 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		4
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega \pm 5\%$
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 2 kA
Protection level wire-wire		<35 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

## Series protection device, 2-pole, 24 V version

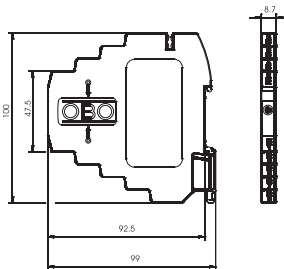


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-2 D-24-T</b>	20	28	2	Terminal	1	6.000	<b>5098422</b>

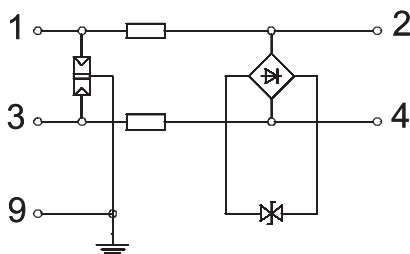
Lightning barrier with test function; 24 V version

- Rated load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

### Dimensions



### Connection options



Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.

### MDP-2 D-24-T

Maximum continuous voltage AC	$U_c$	20 V
Maximum continuous voltage DC	$U_c$	28 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega \pm 5\%$
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		5 kA
Total discharge current (10/350)		D1: 1 kA
Protection level wire-wire		<55 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL



Series protection device, 3-pole, 24 V version



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-3 D-24-T</b>	20	28	3	Terminal	1	6.000	<b>5098427</b>

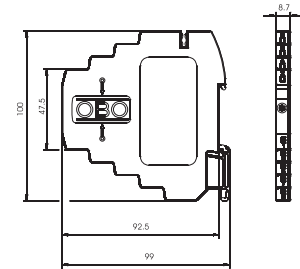
Lightning barrier with test function; 24 V version

- Rated load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

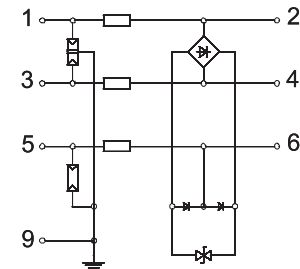
Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.



Dimensions



Connection options



MDP-3 D-24-T

Maximum continuous voltage AC	$U_c$	20 V
Maximum continuous voltage DC	$U_c$	28 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		3
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega \pm 5\%$
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		7,5 kA
Total discharge current (10/350)		D1: 1,5 kA
Protection level wire-wire		<55 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

## Series protection device, 4-pole, 24 V version

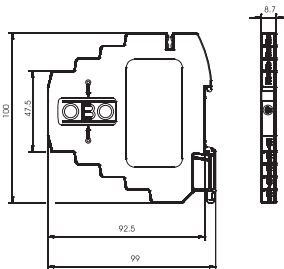


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-4 D-24-T</b>	20	28	4	Terminal	1	5.800	<b>5098431</b>

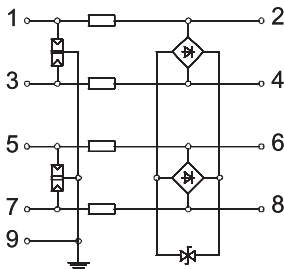
Lightning barrier with test function; 24 V version

- Rated load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

### Dimensions



### Connection options



Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.

### MDP-4 D-24-T

Maximum continuous voltage AC	$U_c$	20 V
Maximum continuous voltage DC	$U_c$	28 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		4
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega$ $\pm$ 5 %
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 2 kA
Protection level wire-wire		<55 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

Series protection device, 2-pole, 48 V version



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-2 D-48-T</b>	41	58	2	Terminal	1	6.000	<b>5098442</b>

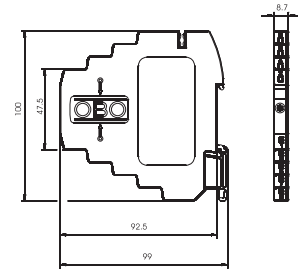
Lightning barrier with test function; 48 V version

- Rated load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

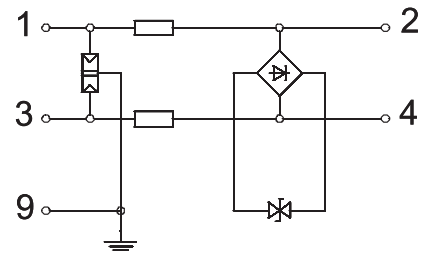
Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.



Dimensions



Connection options



MDP-2 D-48-T

Maximum continuous voltage AC	$U_c$	41 V
Maximum continuous voltage DC	$U_c$	58 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega \pm 5\%$
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		5 kA
Total discharge current (10/350)		D1: 1 kA
Protection level wire-wire		<95 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

## Series protection device, 3-pole, 48 V version

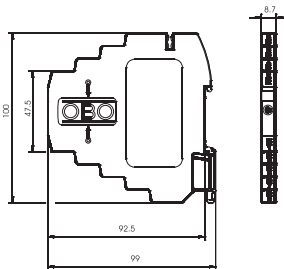


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-3 D-48-T</b>	41	58	3	Terminal	1	6.000	<b>5098446</b>

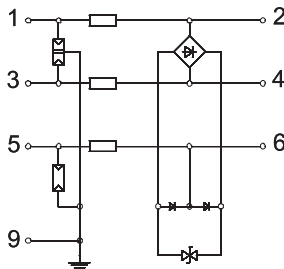
Lightning barrier with test function; 48 V version

- Rated load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

### Dimensions



### Connection options



Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.

### MDP-3 D-48-T

Maximum continuous voltage AC	$U_c$	41 V
Maximum continuous voltage DC	$U_c$	58 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		3
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega$ $\pm$ 5 %
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		7,5 kA
Total discharge current (10/350)		D1: 1,5 kA
Protection level wire-wire		<95 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

Series protection device, 4-pole, 48 V version



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-4 D-48-T</b>	41	58	4	Terminal	1	5.800	<b>5098450</b>

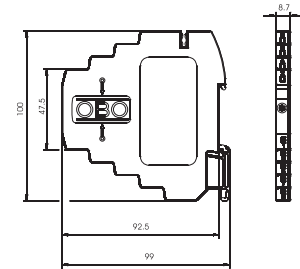
Lightning barrier with test function; 48 V version

- Rated load current 0.58 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

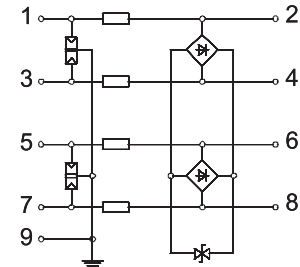
Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.



Dimensions



Connection options



MDP-4 D-48-T

Maximum continuous voltage AC	$U_c$	41 V
Maximum continuous voltage DC	$U_c$	58 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		4
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega \pm 5\%$
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 2 kA
Protection level wire-wire		<95 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail 35 mm
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

Series protection device, 4-pole, 5 V version

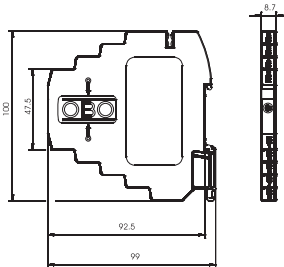


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-4 D-5-T-10</b>	7	10	4	Terminal	1	7.200	<b>5098413</b>

Lightning barrier with test function; 5 V version

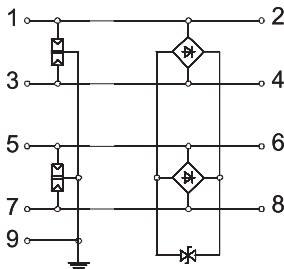
- Rated load current 10 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

Dimensions



Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.

Connection options



MDP-4 D-5-T-10

Maximum continuous voltage AC	$U_c$	7 V
Maximum continuous voltage DC	$U_c$	10 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		4
Rated current	$I_n$	10 A
Series resistance per wire		—
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20μs)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 2 kA
Protection level wire-wire		<45 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

Series protection device, 2-pole, 12 V version



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-2 D-12-T-10</b>	10.5	15	2	Terminal	1	6.000	<b>5098415</b>

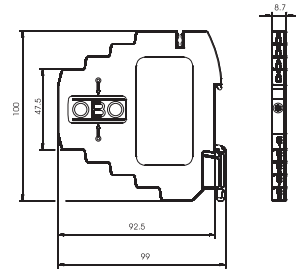
Lightning barrier with test function; 12 V version

- Rated load current 10 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

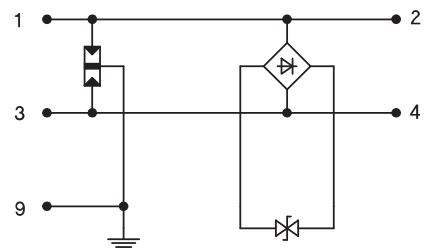
Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.



Dimensions



Connection options



**MDP-2 D-12-T-10**

Maximum continuous voltage AC	$U_c$	10.5 V
Maximum continuous voltage DC	$U_c$	15 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	10 A
Series resistance per wire		—
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20μs)
Total discharge current (8/20)		5 kA
Total discharge current (10/350)		D1: 1 kA
Protection level wire-wire		<55 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

Series protection device, 4-pole, 12 V version

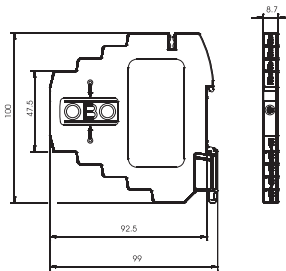


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-4 D-12-T-10</b>	10.5	15	4	Terminal	1	6.000	<b>5098419</b>

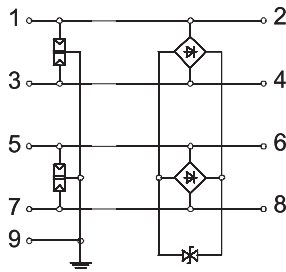
Lightning barrier with test function; 12 V version

- Rated load current 10 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

Dimensions



Connection options



MDP-4 D-12-T-10

Maximum continuous voltage AC	$U_c$	10.5 V
Maximum continuous voltage DC	$U_c$	15 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		4
Rated current	$I_n$	10 A
Series resistance per wire		—
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20μs)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 2 kA
Protection level wire-wire		<55 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL



Series protection device, 2-pole, 24 V version



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Connection system	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-2 D-24-T-10</b>	20	28	2	Terminal	1	6.000	<b>5098425</b>

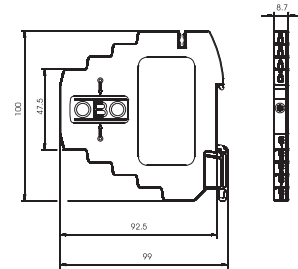
Lightning barrier with test function; 24 V version

- Rated load current 10 A
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- Protection circuit testable with Life Control
- High bandwidth to 100 MHz
- UL-listed (4DG1)

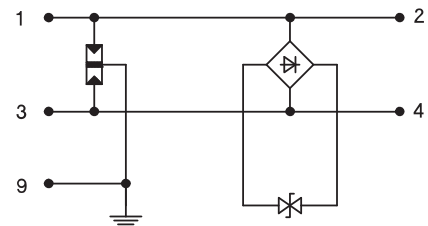
Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.



Dimensions



Connection options



**MDP-2 D-24-T-10**

Maximum continuous voltage AC	$U_c$	20 V
Maximum continuous voltage DC	$U_c$	28 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		2
Rated current	$I_n$	10 A
Series resistance per wire		—
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20µs)
Total discharge current (8/20)		5 kA
Total discharge current (10/350)		D1: 1 kA
Protection level wire-wire		<70 V
Protection level wire-earth		<800 V
Frequency range		0 - 100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
Testing standard		IEC 61643-21
Approvals		UL

## Earthing strip



**Type**

**VB-MDP 10-MD**

Pack Weight  
Piece kg/100 pc. **Item no.**

1	2.300	<b>5098470</b>
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**Cu** Copper

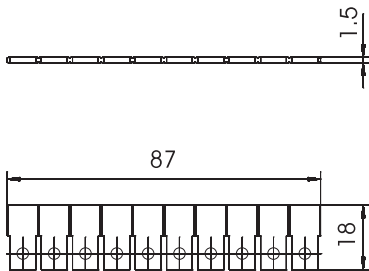
Connecting bridge for 8 mm lightning barriers



- Length of bridge can be adjusted
- Material: Copper
- Allows quick equipotential bonding

Application: Parallel switching of the MDP lightning barriers

### Dimensions



## Replacement connector for VF remote signalling



Version

**Type**

**VF-FS** | 3-pole

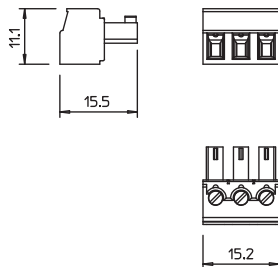
Pack Weight  
Piece kg/100 pc. **Item no.**

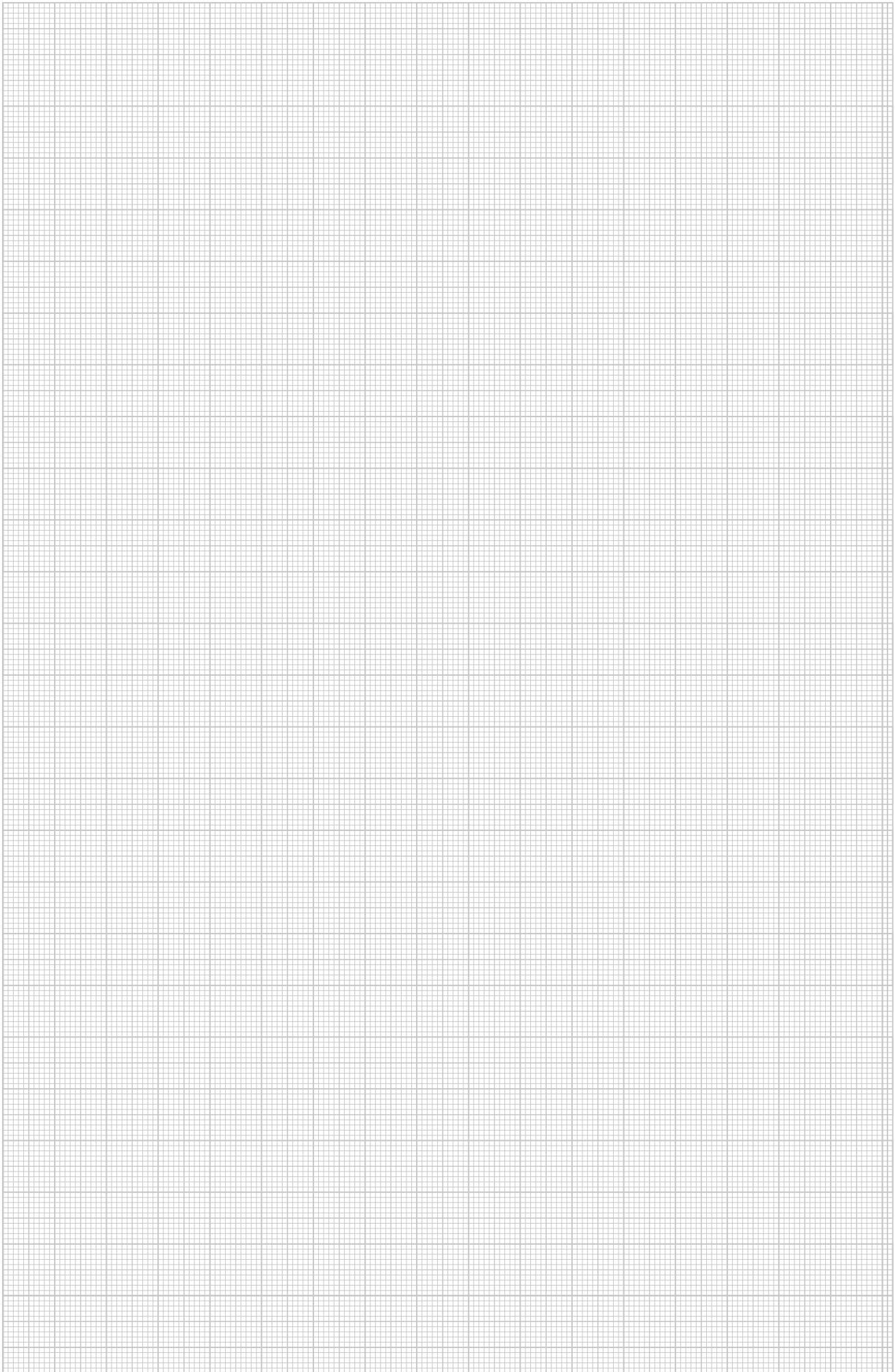
25	0.320	<b>5098475</b>
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Replacement telephony connector, 3-pin version, for VF variant








### Dimensions







## Surge protection, Ex protection

	<b>Series protection device, 4-pole, 5 V</b>	342
	<b>Series protection device, 4-pole, 24 V</b>	343
	<b>Series protection device, 4-pole, 48 V</b>	344
	<b>MCR protection, 2-pole 24 V</b>	345
	<b>MCR protection, 3-pole 24 V</b>	346



Series protection device, 4-pole, 5 V version

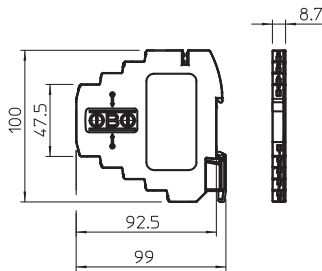


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-4 D-5-EX</b>	7	10	4	1	5.800	<b>5098412</b>

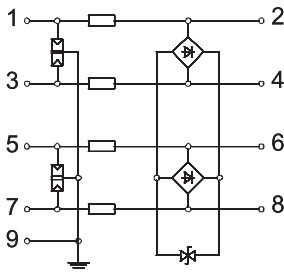
Lightning barrier for intrinsically safe measuring circuits

- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- High frequency range of 0–100 MHz
- ATEX approval: II 2(1) G Ex ia [ia Ga] IIC T4 (BVS 11 ATEX E 131 X)
- UL-listed (4UM2)

Dimensions



Connection options



MDP-4 D-5-EX

Maximum continuous voltage AC	$U_c$	7 V
Maximum continuous voltage DC	$U_c$	10 V
Category		Type 1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		4
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega$ $\pm$ 5 %
Impulse durability wire-wire		C1: 0,5 KV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 KV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 2 kA
Protection level wire-wire		< 35 V
Protection level wire-earth		<800 V
Frequency range		0-100 MHz
Temperature range	$\theta$	-40 - +80 °C
Installation type		DIN rail
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
EX approval		II 2(1)G Ex ia [ia Ga] IIC T4 Gb
Testing standard		IEC 61643-21
Approvals		UL

## Series protection device, 4-pole, 24 V version



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-4 D-24-EX</b>	20	28	4	1	5.800	<b>5098432</b>

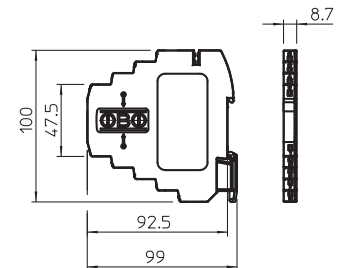
Lightning barrier for intrinsically safe measuring circuits

- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- High frequency range of 0–100 MHz
- ATEX approval: II 2(1) G Ex ia [ia Ga] IIC T4 (BVS 11 ATEX E 131 X)
- UL-listed (4UM2)

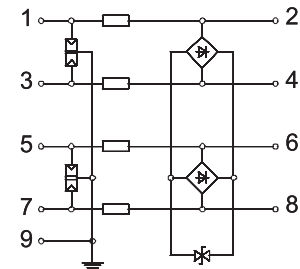
Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.



Dimensions



Connection options



#### MDP-4 D-24-EX

Maximum continuous voltage AC	$U_c$	20 V
Maximum continuous voltage DC	$U_c$	28 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0→3
Number of poles		4
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega \pm 5\%$
Impulse durability wire-wire		C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 2 kA
Protection level wire-wire		< 55 V
Protection level wire-earth		< 800 V
Frequency range		0-100 MHz
Temperature range	$\vartheta$	-40 - +80 °C
Installation type		DIN rail
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
EX approval		II 2(1)G Ex ia [ia Ga] IIC T4 Gb
Testing standard		IEC 61643-21
Approvals		UL



Series protection device, 4-pole, 48 V version

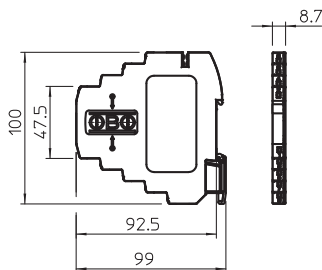


Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Number of poles	Pack Piece	Weight kg/100 pc.	Item no.
<b>MDP-4 D-48-EX</b>	41	58	4	1	5.800	<b>5098452</b>

Lightning barrier for intrinsically safe measuring circuits

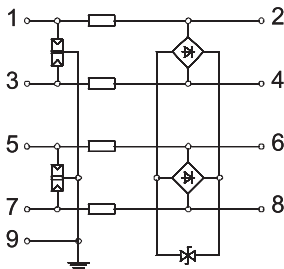
- Protection device for multi-wire systems
- Direct shield earthing and screwless connection terminals
- Space-saving width of just 8.7 mm
- High frequency range of 0–100 MHz
- ATEX approval: II 2(1) G Ex ia [ia Ga] IIC T4 (BVS 11 ATEX E 131 X)
- UL-listed (4UM2)

Dimensions



Application: Universal use on 35 mm DIN profile rail in any standard distribution housing.

Connection options



MDP-4 D-48-EX

Maximum continuous voltage AC	$U_c$	41 V
Maximum continuous voltage DC	$U_c$	58 V
Category	Type	1+2+3 / D1+C2+C1
Lightning protection zone LPZ		0-3
Number of poles		4
Rated current	$I_n$	0.58 A
Series resistance per wire		2,35 $\Omega$ $\pm$ 5 %
Impulse durability wire-wire		C1: 0,5 KV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth		C2: 5 KV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)		10 kA
Total discharge current (10/350)		D1: 2 kA
Protection level wire-wire		< 95 V
Protection level wire-earth		< 800 V
Frequency range		0-100 MHz
Temperature range	$\theta$	-40 - +80 °C
Installation type		DIN rail
Connection system		Terminal
Protection rating		IP20
Shielding connection available		Yes
Shield connection		Direct
Connection cross-section, flexible		0.14 - 2.5 mm <sup>2</sup>
Connection cross-section, multi-wire		0.14 - 1.5 mm <sup>2</sup>
Connection cross-section, rigid		0.14 - 2.5 mm <sup>2</sup>
Earthing via:		DIN rail
EX approval		II 2(1)G Ex ia [ia Ga] IIC T4 Gb
Testing standard		IEC 61643-21
Approvals		UL



## Protection for field devices, 2-pole, 24 V, metric



Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>FDB-2 24-M</b>	22	32	2-pole; metric	1	18.500	<b>5098380</b>

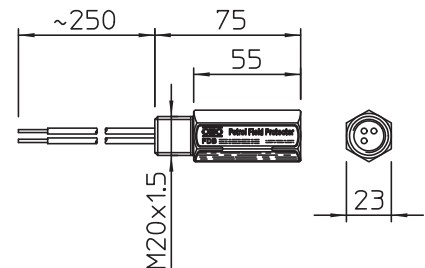
Petrol Field Protector FDB for intrinsically safe measuring circuits and bus systems

- Different connection technologies available (metric/NPT)
- Low protection level at high current load
- Easy mounting on field devices
- Negligible internal capacitance and inductance
- Stainless steel housing with pressure-resistant encapsulation
- ATEX approval: II 2(1) G Ex ia [ia Ga] IIC T4..T6 Gb (BVS 10 ATEX E 048)

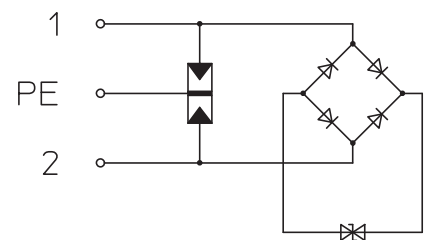
Application: Flow sensors, temperature sensors



## Dimensions



## Connection options



## FDB-2 24-M

Maximum continuous voltage AC $U_c$	22 V
Maximum continuous voltage DC $U_c$	32 V
Category	Type 2+3 / C2+C1
Lightning protection zone LPZ	1-3
Number of poles	2
Impulse durability wire-wire	C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)	10 kA
Protection level wire-wire	<80 V
Protection level wire-earth	<800 V
Temperature range	$\vartheta$ -20 - +70 °C
Installation type	Screw-on
Protection rating	IP65/67
Mounting of input / output	M20 x 1.5 external thread
Mounting of field / device side:	Connection cable 1.5 mm <sup>2</sup> Length ~ 250 mm
Earthing via:	Connection cable
Housing material	V2A
EX approval	II 2(1)G Ex ia [ia Ga] IIC T4..T6 Gb (BVS 10 ATEX E 048)
Testing standard	IEC 61643-21



Protection for field devices, 3-pole, 24 V, metric



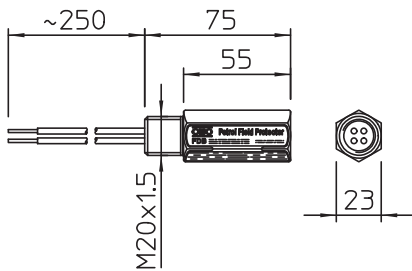
Type	Highest continuous voltage AC V	Maximum continuous voltage DC V	Version	Pack Piece	Weight kg/100 pc.	Item no.
<b>FDB-3 24-M</b>	22	32	3-pole; metric	1	19.000	<b>5098382</b>

Petrol Field Protector FDB for intrinsically safe measuring circuits and bus systems

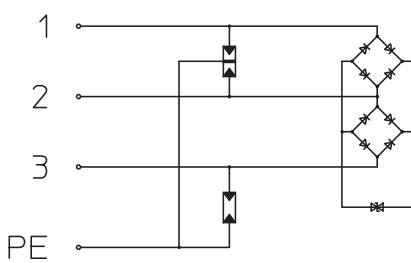
- Different connection technologies available (metric/NPT)
- Low protection level at high current load
- Easy mounting on field devices
- Negligible internal capacitance and inductance
- Stainless steel housing with pressure-resistant encapsulation
- ATEX approval: II 2(1) G Ex ia [ia Ga] IIC T4..T6 Gb (BVS 10 ATEX E 048)

Application: Flow sensors, temperature sensors

Dimensions



Connection options



FDB-3 24-M

Maximum continuous voltage AC $U_c$	22 V
Maximum continuous voltage DC $U_c$	32 V
Category	Type 2+3 / C2+C1
Lightning protection zone LPZ	1→3
Number of poles	3
Impulse durability wire-wire	C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)	10 kA
Protection level wire-wire	<80 V
Protection level wire-earth	<800 V
Temperature range $\vartheta$	-20 - +70 °C
Installation type	Screw-on
Protection rating	IP65/67
Mounting of input / output	M20 x 1.5 external thread
Mounting of field / device side:	Connection cable 1.5 mm <sup>2</sup> Length ~ 250 mm
Earthing via:	Connection cable
Housing material	V2A
EX approval	II 2(1)G Ex ia [ia Ga] IIC T4..T6 Gb (BVS 10 ATEX E 048)
Testing standard	IEC 61643-21

## Protection for field devices, 2-pole, 24 V, NPT



Type	Highest continuous voltage AC	Maximum continuous voltage DC	Version	Pack Piece	Weight kg/100 pc.	Item no.
	V	V		1	19.000	
<b>FDB-2 24-N</b>	22	32	2-pole; NPT	1	19.000	<b>5098390</b>

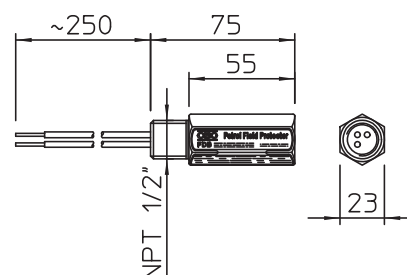
Petrol Field Protector FDB for intrinsically safe measuring circuits and bus systems

- Different connection technologies available (metric/NPT)
- Low protection level at high current load
- Easy mounting on field devices
- Negligible internal capacitance and inductance
- Stainless steel housing with pressure-resistant encapsulation
- ATEX approval: II 2(1) G Ex ia [ia Ga] IIC T4..T6 Gb (BVS 10 ATEX E 048)

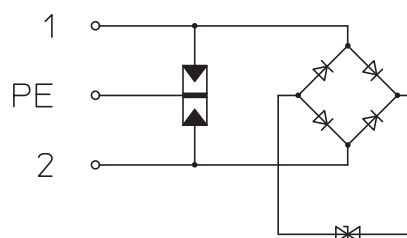
Application: Flow sensors, temperature sensors



## Dimensions



## Connection options



## FDB-2 24-N

Maximum continuous voltage AC $U_c$	22 V
Maximum continuous voltage DC $U_c$	32 V
Category	Type 2+3 / C2+C1
Lightning protection zone LPZ	1→3
Number of poles	2
Impulse durability wire-wire	C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)	10 kA
Protection level wire-wire	<80 V
Protection level wire-earth	<800 V
Temperature range $\vartheta$	-20 - +70 °C
Installation type	Screw-on
Protection rating	IP65/67
Mounting of input / output	1/2" NPT
Mounting of field / device side:	Connection cable 1.5 mm <sup>2</sup> Length ~ 250 mm
Earthing via:	Connection cable
Housing material	V2A
EX approval	II 2(1)G Ex ia [ia Ga] IIC T4..T6 Gb (BVS 10 ATEX E 048)
Testing standard	IEC 61643-21



Protection for field devices, 3-pole, 24 V, NPT



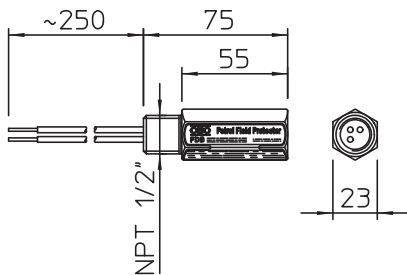
Type	Highest continuous voltage AC	Maximum continuous voltage DC	Version	Pack	Weight	Item no.
	V	V		Piece	kg/100 pc.	
<b>FDB-3 24-N</b>	22	32	3-pole; NPT	1	19.500	<b>5098392</b>

Petrol Field Protector FDB for intrinsically safe measuring circuits and bus systems

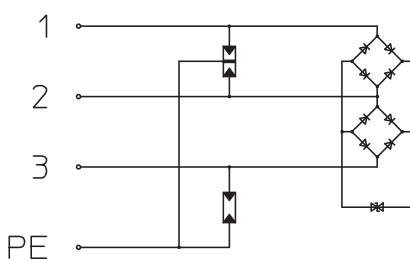
- Different connection technologies available (metric/NPT)
- Low protection level at high current load
- Easy mounting on field devices
- Negligible internal capacitance and inductance
- Stainless steel housing with pressure-resistant encapsulation
- ATEX approval: II 2(1) G Ex ia [ia Ga] IIC T4..T6 Gb (BVS 10 ATEX E 048)

Application: Flow sensors, temperature sensors

Dimensions

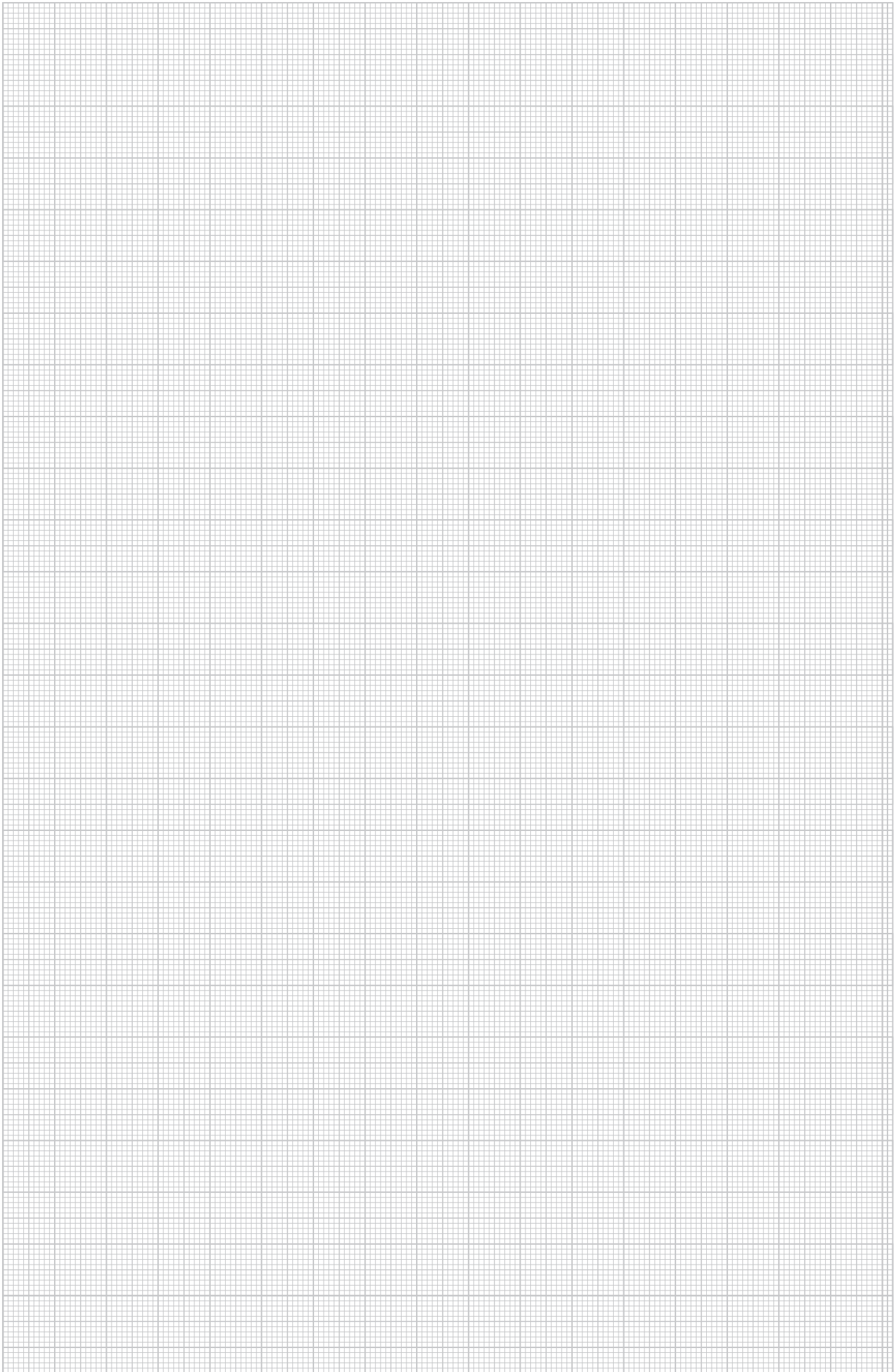


Connection options



FDB-3 24-N

Maximum continuous voltage AC $U_c$	22 V
Maximum continuous voltage DC $U_c$	32 V
Category	Type 2+3 / C2+C1
Lightning protection zone LPZ	1→3
Number of poles	3
Impulse durability wire-wire	C1: 0,5 kV / 0,25 kA (8/20 $\mu$ s)
Impulse durability wire-earth	C2: 5 kV / 2,5 kA (8/20 $\mu$ s)
Total discharge current (8/20)	10 kA
Protection level wire-wire	<80 V
Protection level wire-earth	<800 V
Temperature range $\vartheta$	-20 - +70 °C
Installation type	Screw-on
Protection rating	IP65/67
Mounting of input / output	1/2" NPT
Mounting of field / device side:	Connection cable 1.5 mm <sup>2</sup> Length ~ 250 mm
Earthing via:	Connection cable
Housing material	V2A
EX approval	II 2(1)G Ex ia [ia Ga] IIC T4..T6 Gb (BVS 10 ATEX E 048)
Testing standard	IEC 61643-21







## Isolating spark gap

352



## EX ISG H spark gap



**Type**

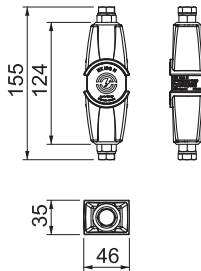
**EX ISG H**

Pack Piece	Weight kg/100 pc.	Item no.
1	41.360	5240030

Hotmelt

- Spark gap to VDE 0185-561-3 (IEC 62561-3)
- Ex certificate to ATEX
- Labelling to EN 60079-0/-1: II 2 G Ex db IIC T6 Gb
- Labelling to EN 60079-0/-31: II 2 D Ex td IIIC T80 °C Db IP67
- Ex certificate to IECEX
- Labelling to IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to IEC 60079-0/-31: Ex td IIIC T80 °C Db IP67
- Ex certificate to INMETRO
- Labelling to ABNT NBR IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to ABNT NBR IEC 60079-31: Ex td IIIC T80 °C Db IP67

**Dimensions**



Application: In potentially explosive areas zone 1/21 and 2/22, indirect bridging of insulating flanges and insulating glands, e.g. in cathodic, corrosion-protected (KKS) systems.

## ES ISG H spark gap, with one cable



**Type**

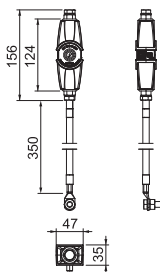
**EX ISG H 350**

Pack Piece	Weight kg/100 pc.	Item no.
1	57.260	5240031

Hotmelt

- Spark gap to VDE 0185-561-3 (IEC 62561-3)
- Ex certificate to ATEX
- Labelling to EN 60079-0/-1: II 2 G Ex db IIC T6 Gb
- Labelling to EN 60079-0/-31: II 2 D Ex td IIIC T80 °C Db IP67
- Ex certificate to IECEX
- Labelling to IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to IEC 60079-0/-31: Ex td IIIC T80 °C Db IP67
- Ex certificate to INMETRO
- Labelling to ABNT NBR IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to ABNT NBR IEC 60079-31: Ex td IIIC T80 °C Db IP67

**Dimensions**



Application: In potentially explosive areas zone 1/21 and 2/22, indirect bridging of insulating flanges and insulating glands, e.g. in cathodic, corrosion-protected (KKS) systems.



## EX ISG H spark gap, with 2 cables



## Type

EX ISG H 350 2L

Pack Piece	Weight kg/100 pc.	Item no.
1	74.155	5240033

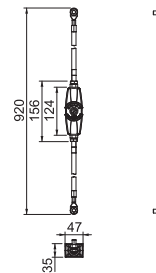
Hotmelt

- Spark gap to VDE 0185-561-3 (IEC 62561-3)
- Ex certificate to ATEX
- Labelling to EN 60079-0/-1: II 2 G Ex db IIC T6 Gb
- Labelling to EN 60079-0/-31: II 2 D Ex td IIIC T80 °C Db IP67
- Ex certificate to IECEx
- Labelling to IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to IEC 60079-0/-31: Ex td IIIC T80 °C Db IP67
- Ex certificate to INMETRO
- Labelling to ABNT NBR IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to ABNT NBR IEC 60079-31: Ex td IIIC T80 °C Db IP67

Application: In potentially explosive areas zone 1/21 and 2/22, indirect bridging of insulating flanges and insulating glands, e.g. in cathodic, corrosion-protected (KKS) systems.



## Dimensions



## EX ISG H spark gap, jacketed



## Type

EX ISG H KU

Pack Piece	Weight kg/100 pc.	Item no.
1	210.300	5240032

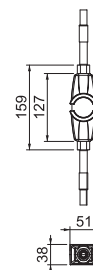
Hotmelt

- Spark gap to VDE 0185-561-3 (IEC 62561-3)
- Ex certificate to ATEX
- Labelling to EN 60079-0/-1: II 2 G Ex db IIC T6 Gb
- Labelling to EN 60079-0/-31: II 2 D Ex td IIIC T80 °C Db IP67
- Ex certificate to IECEx
- Labelling to IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to IEC 60079-0/-31: Ex td IIIC T80 °C Db IP67
- Ex certificate to INMETRO
- Labelling to ABNT NBR IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to ABNT NBR IEC 60079-31: Ex td IIIC T80 °C Db IP67

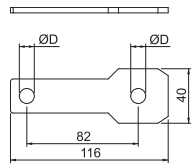
Application: In potentially explosive areas zone 1/21 and 2/22, indirect bridging of insulating flanges and insulating glands, e.g. in cathodic, corrosion-protected (KKS) systems.



## Dimensions



### Connection clamp AB EX ISG straight



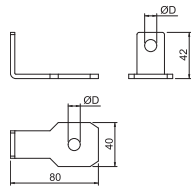
Type	Drill hole		Pack Piece	Weight kg/100 pc.	Item no.
	Ø mm	Version			
<b>AB EX ISG S M10</b>	11	For M10 bolt	2	9.000	<b>5240360</b>
<b>AB EX ISG S M12</b>	14	For M12 bolt	2	8.900	<b>5240362</b>
<b>AB EX ISG S M16</b>	18	For M16 bolt	2	8.600	<b>5240366</b>
<b>AB EX ISG S M20</b>	22	For M20 bolt	2	8.200	<b>5240370</b>
<b>AB EX ISG S M24</b>	26	For M24 bolt	2	7.800	<b>5240374</b>

**St** Steel

**FT** Hot-dip galvanised

Connection clamp for mounting the OBO Ex spark gap, type EX ISG, on insulating flanges and insulating pieces.

### Connection clamp AB EX ISG, angled



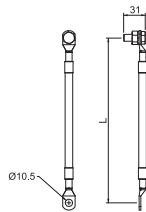
Type	Drill hole		Pack Piece	Weight kg/100 pc.	Item no.
	Ø mm	Version			
<b>AB EX ISG SW M10</b>	11	For M10 bolt	2	10.900	<b>5240380</b>
<b>AB EX ISG SW M12</b>	14	For M12 bolt	2	10.800	<b>5240382</b>
<b>AB EX ISG SW M16</b>	18	For M16 bolt	2	10.500	<b>5240386</b>
<b>AB EX ISG SW M20</b>	22	For M20 bolt	2	10.100	<b>5240390</b>
<b>AB EX ISG SW M24</b>	26	For M24 bolt	2	9.700	<b>5240394</b>

**St** Steel

**FT** Hot-dip galvanised

Connection clamp for mounting the OBO Ex spark gap, type EX ISG, on insulating flanges and insulating pieces.

### Connection cable – AL EX ISG

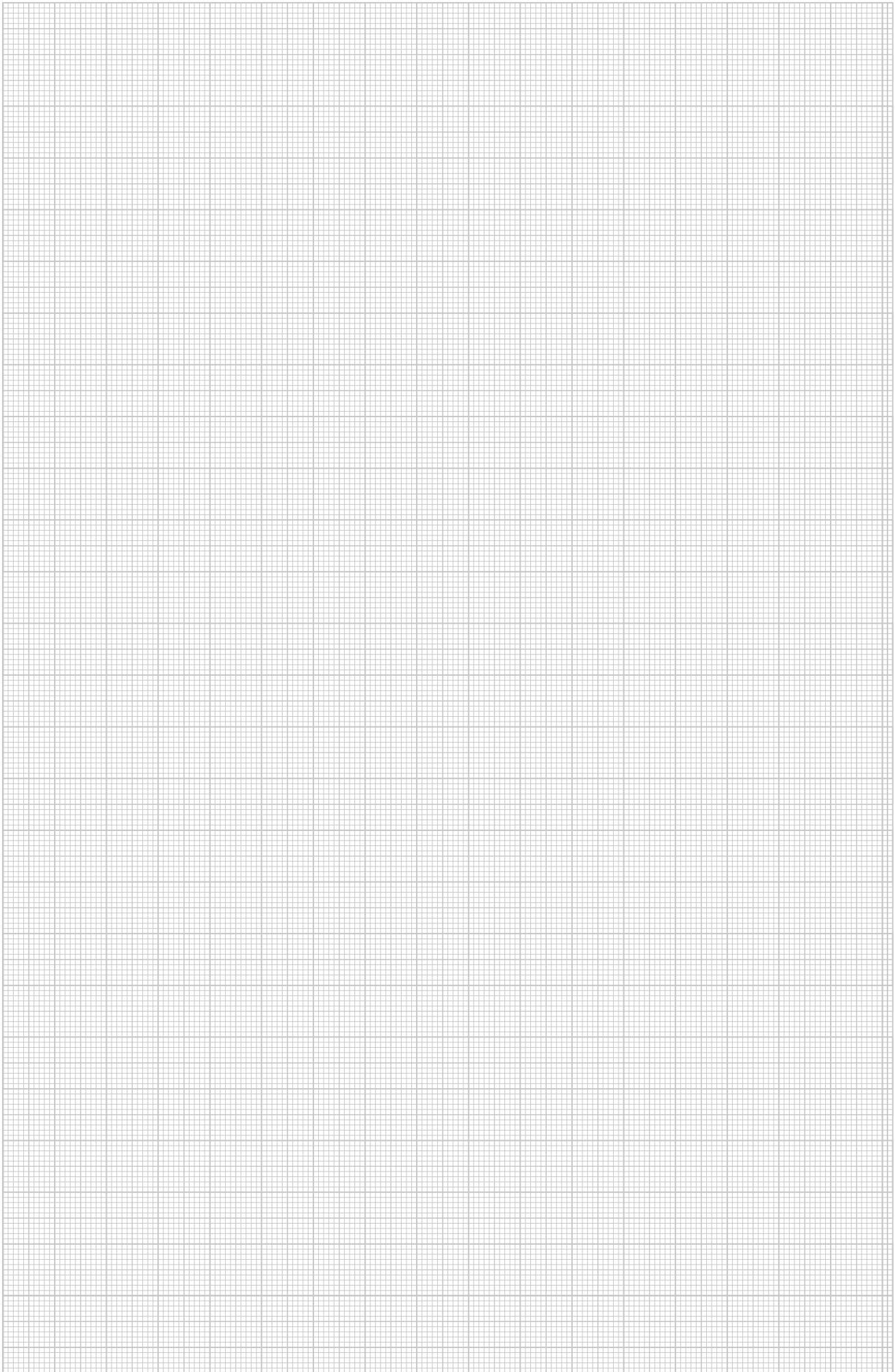


Type	Dimension mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>AL EX ISG 200</b>	200	1	12.300	<b>5240104</b>
<b>AL EX ISG 300</b>	300	1	15.200	<b>5240106</b>

**Cu** Copper

UV-resistant connection cable (copper 25 mm<sup>2</sup>) for mounting the OBO Ex spark gap, type EX ISG, on insulating flanges and insulating pieces. With cable shoe for M10 bolts on both sides, on one side with M10 screw, nuts and spring ring.










**HINWEIS!**  
Isolierter Blitzschutz mit dem  
OBO isCon<sup>®</sup>-System.  
Änderungen sind nur von einer  
Blitzschutzfachkraft  
durchzuführen!

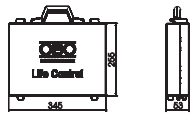


## Measuring and testing systems

	<b>Testing unit for lightning barriers</b>	358
	<b>Magnetic card PCS</b>	358
	<b>Magnetic card holder PCS-H</b>	358
	<b>Card reader PCS-CS..</b>	359
	<b>Lightning current meter LSC</b>	359



## Testing unit for lightning barriers



Type  
**LFC**

Pack	Weight	Item no.
Piece	kg/100 pc.	
1	164.500	5096786

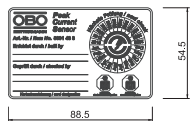
OBO Life Control allows function control of the MDP lightning barriers.

The lightning barriers can be checked while installed. Life Control will not have any influences on the measuring signal.

Life Control possesses an integrated OLED with visual and acoustic defect signalling. A separate LED inside the testing pin is also integrated.

Life Control is delivered in a case, complete with a CD and instructions.

## Magnetic card PCS



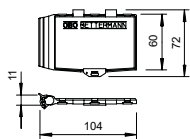
Type  
**PCS**

Pack	Weight	Item no.
PU	kg/100 PUs	
1	5.000	5091438

Peak Current Sensor (PCS) card for recording pulsed/lightning currents. A continuous check of whether lightning has struck the lightning protection system and how high the most recent lightning current was in kA can thus be carried out in the simplest manner by the system operator, specialist lightning protection company or by a surveyor. Here, the printed maintenance circuit and the labelling panels support the maintenance work of the entire lightning protection system which must be performed at defined intervals according to VDE 0185-305-3 (IEC/EN 62305-3).

- Contents = 10 units
- Digital evaluation via the PCS card reading device
- Can be used in addition to the OBO lightning current meter LSC I+II
- With separate labelling panels: "Erected by", "Tested by", "Card code"
- Integrated maintenance circuit (year/month)

## Magnetic card holder PCS-H



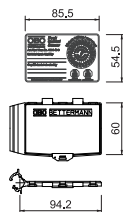
Type  
**PCS-H**

Pack	Weight	Item no.
PU	kg/100 PUs	
1	31.000	5091527

Magnetic card holder for mounting PCS cards.

- Sealable holder
- For installing on round conductor Rd 8-10
- Simple holder installation by means of clamp
- 1 PU = 10 pieces

## Magnetic card and holder MK-B



Type  
**MK-B**

Pack	Weight	Item no.
PU	kg/100 PUs	
1	31.000	5091322

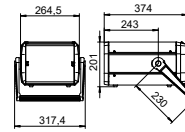
PCS magnetic card to record pulse/lightning currents including holder

- Holder can be leaded
- For mounting on round conductor Rd 8-10
- Simple holder mounting through clamping
- 1 PU = 10 units

## Card reader PCS-CS..



Type	Country version	Nom. voltage V	Measuring range	Measuring tolerances	Pack Piece	Weight kg/100 pc.	Item no.
PCS-CS-D	EN	230	3 -- 120 kA	< 2 kA (< 2%)	1	750.000	5091683
PCS-CS-GB	GB	230	3 -- 120 kA	< 2 kA (< 2%)	1	750.000	5091691



Magnetic card reader for reading and analysing PCS cards.

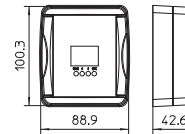
- Inc. rechargeable battery for 4 h continuous, no-mains operation
- Large, clear display

## Lightning strike counter



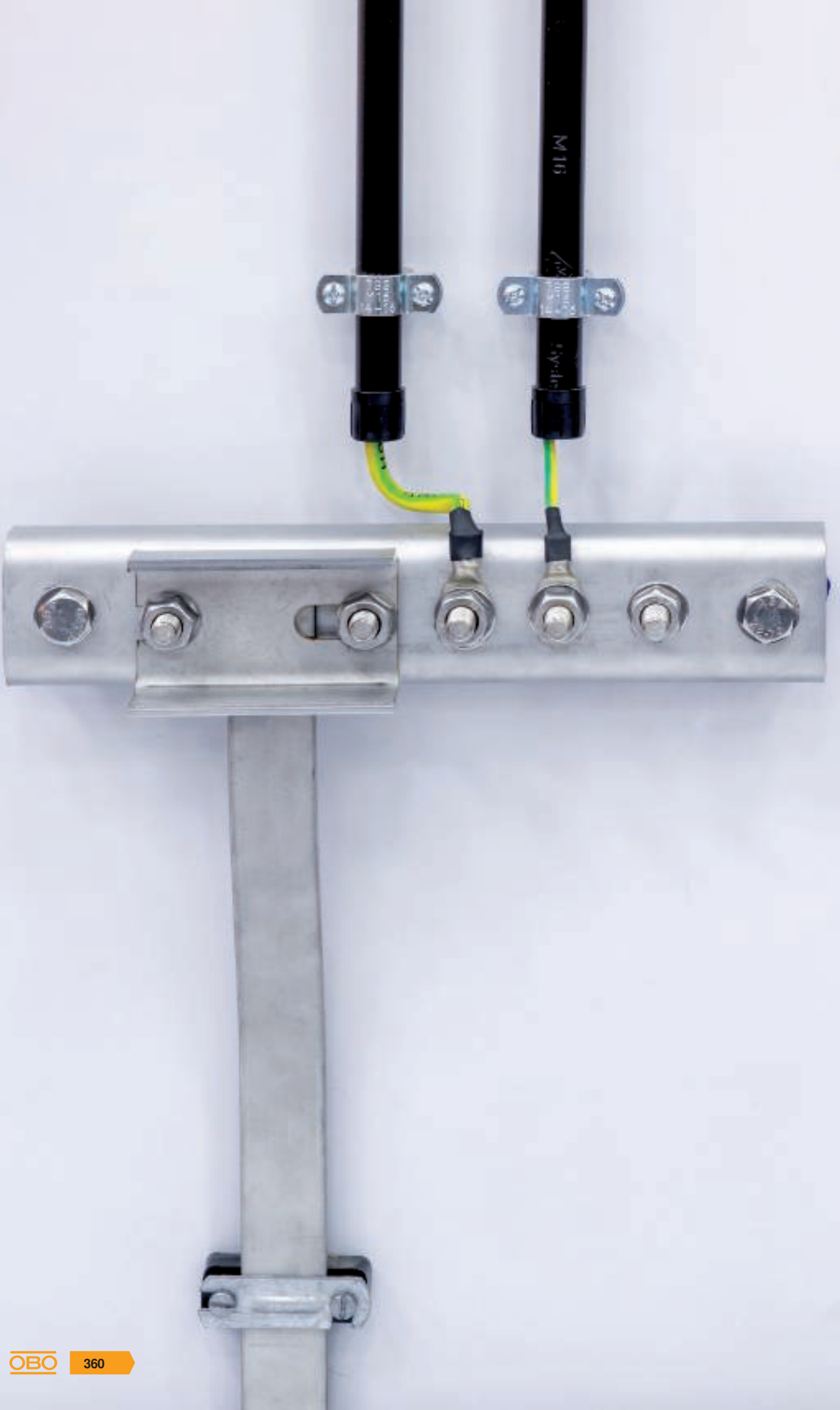
Type	Measuring range	Pack Piece	Weight kg/100 pc.	Item no.
LSC I+II	1 kA - 100 kA	1	32.500	5091722

Plastic









The LSC I+II lightning current meter measures and permanently saves pulse currents, together with the date and time. This ensures constant monitoring in order to notice if any lightning has struck the lightning protection system. Should this be the case, then the lightning protection system must be maintained according to VDE 0185-305 (IEC 62305).

- Saving and display of time and date
- Usable both inside and outside due to its protection class of IP65
- Cable clip for round conductor or flat conductor
- Direct mounting on the conductor or the PE conductor of the surge protection device
- Long lifespan of the internal lithium batteries
- LCD display
- Internal battery
- Tested according to VDE 0185-561-6 (IEC 62561-6)





# Equipotential bonding systems

	<b>Equipotential busbars for indoor use</b>	362
	<b>Equipotential busbars for outdoor areas</b>	364
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	<b>Earthing clamps</b>	372



## Equipotential busbar rail for indoors, VDE-tested



Colour

Type

1801 VDE | Grey

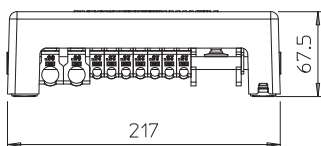
Pack Weight  
Piece kg/100 pc.

1 | 55.000 | 5015650

CuZn | Brass

Equipotential busbar for equipotential bonding to DIN VDE 0100-410/-540 as well as lightning protection equipotential bonding to DIN VDE 0185-305

## Dimensions

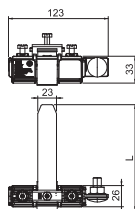


- According to VDE 0618, Part 1
- With 10 x 10 mm clamping rail made of nickel-plated brass
- With contact-secure series terminals made of electrogalvanised steel
- Cover and rail stands made of grey polystyrene
- Sealable/labellable cover
- Lightning current carrying capacity 100 kA (10/350)
- Tension clamp with screw lock against self-loosening (e.g. required in industry)

Connection options:

- 7 single or multi-wire cables 2.5–25 mm<sup>2</sup> or fine-wire cables to 16 mm<sup>2</sup> (max. Ø 7 mm)
- 2 single or multi-wire cable 25–95 mm<sup>2</sup> or fine-wire cables to 70 mm<sup>2</sup> (max. Ø 13.5 mm)
- 1 flat conductor 30 x 3.5 mm

## Earthing pipe clamp for EX Zone 1/21, 2/22



For pipe  
Ø mm

Dimen-  
sion L  
mm

Lightning current  
carrying capacity  
kA

Pack Weight  
Piece kg/100 pc.

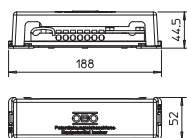
Type

Type	For pipe Ø mm	Dimen- sion L mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
EX BES 28	6 - 28	215	H/100	1	30.580	5057630
EX BES 300	28 - 300	1170	H/100	1	35.800	5057640
EX BES 500	300 - 500	1800	H/100	1	39.430	5057645

For ignition spark-free protection/functional equipotential bonding according to DIN VDE 0100-410/-540 and ignition spark-free lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305) in systems according to VDE 0165-1 (IEC/EN 60079-14).

- For pipes of 6-500 mm external diameter
- Use in potentially explosive areas, Ex zone 1 and 2/21 and 22
- Tested according to explosion group IIC
- Lightning current carrying capacity class H (100 kA) to VDE 0185-561-1 (IEC/EN 62561-1)
- UV-stabilised and halogen-free plastic hood
- Secured with bolts against self-loosening to VDE 0185-305-3, Supplementary Sheet 2
- Suitable for indoor and outdoor applications

## Equipotential busbar with plastic base plate



Lightning current  
carrying capacity  
kA

Pack Weight  
Piece kg/100 pc.

Type

Type	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
1809	H/100	1	23.000	5015073

CuZn | Brass

Equipotential busbar for equipotential bonding according to DIN VDE 0100-410/-540 and lightning protection equipotential bonding according to DIN VDE 0185-305

- Base plate and cover hood made of polystyrene, grey
- Sealable / labellable cover
- Contact strip made of nickel-plated brass
- Screws and crossbar made of electrogalvanised steel
- Capable of carrying lightning current 100 kA (10/350)

Connection options:

- 7 x single or multi-core cables to 25 mm<sup>2</sup> or fine-core cables to 16 mm<sup>2</sup>
- 1 x round cable Rd 8-10
- 1 x flat strip to FL30 or round cable Rd 8-10

## Equipotential busbar with metal base plate



Lightning current  
carrying capacity

Type	kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1809 M</b>	H/100	1	28.100	<b>5015081</b>

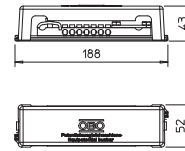
CuZn Brass

Equipotential busbar with metal foot for equipotential bonding according to DIN VDE 0100-410/-540 and lightning protection equipotential bonding according to DIN VDE 0185-305

- Cover hood from polystyrene, grey
- Sealable/labellable cover
- Base plate made of strip-galvanised steel
- Contact strip made of nickel-plated brass
- Screws and crossbar made of electrogalvanised steel
- Capable of carrying lightning current 100 kA (10/350)

Connection options:

- 7x single or multi-core cables to 25 mm<sup>2</sup> or fine-core cables to 16 mm<sup>2</sup>
- 1x round cable Rd 8–10
- 1x flat strip to FL30 or round cable Rd 8–10



## Equipotential busbar OBO Green



Lightning current  
carrying capacity

Type	kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1809 NR</b>	H/100	1	22.300	<b>5015075</b>

CuZn Brass

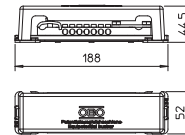
Natural product protects against natural influences.

The OBO Green equipotential busbar is a solution manufactured from cellulose acetate CA for the installation of the equipotential bonding according to DIN VDE 0100-410/-540 and lightning protection equipotential bonding according to DIN VDE 0185-305. The basic material is widely used in the paper industry.

- Base plate and cover hood made of CA, white
- Sealable and labellable cover
- Contact strip made of nickel-plated brass
- Bolts and crossbar made of electrogalvanised steel
- Capable of carrying lightning current 100 kA (10/350)

Connection options:

- 7x single or multi-wire cables to 25 mm<sup>2</sup> or fine-wire cables to 16 mm<sup>2</sup>
- 1x round cable Rd 8–10
- 1x flat strip to FL 30 or round cable Rd 8–10



## Equipotential bonding rail for small systems



Colour

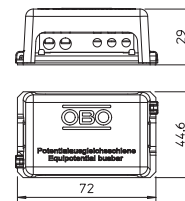
Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
<b>1809 BG</b>	Grey	1	9.000	<b>5015502</b>

CuZn Brass

- Cover made of polystyrene, grey
- Sealable/labelable
- Base plate made of strip galvanised steel
- Contact strip and screws made of nickel-plated brass

Connection options:

- 3 x multi-core cables to 6 mm<sup>2</sup>
- 2 x multi-core cables to 16 mm<sup>2</sup>



## Equipotential busbar for outside installation



Lightning current carrying capacity

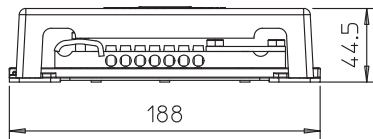
Type	Colour	kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1809 A</b>	<b>Black</b>	N/50	1	23.000	<b>5015111</b>

A2 Stainless steel, rustproof 1.4301

Equipotential busbar for equipotential bonding according to DIN VDE 0100-410/-540 and lightning protection equipotential bonding according to DIN VDE 0185-305

- Cover hood and base plate made of polystyrene
- Colour: Black, UV-resistant
- Screws and crossbar made of VA
- Capable of carrying lightning current 50 kA (10/350)

### Dimensions



## Equipotential busbar for outside installation



Lightning current carrying capacity

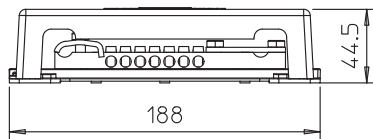
Type	Colour	kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1809 AM</b>	<b>Black</b>	H/100	1	23.000	<b>5015105</b>

A2 Stainless steel, rustproof 1.4301

Equipotential busbar for equipotential bonding according to DIN VDE 0100-410/-540 and lightning protection equipotential bonding according to DIN VDE 0185-305

- Cover hood made of polystyrene
- Base plate made of steel, zinc-iron surface
- Colour: Black, UV-resistant
- Screws and crossbar made of VA
- Capable of carrying lightning current 100 kA (10/350)

### Dimensions



Connection options:

- 7 single or multi-wire cables to 25 mm<sup>2</sup> or fine-wire cables to 16 mm<sup>2</sup>
- 1 round conductor Rd 8-10
- 1 flat strip to FL30 or round conductor Rd 8-10

## Equipotential busbar, solid version

## Type

1810

S1 Steel

F Hot galvanised

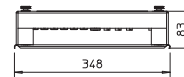
- Base plate and screw-on cover made of strip-galvanised steel
- Sealable / labellable cover
- Contact strip made of strip-galvanised steel
- Screws and crossbar made of steel, hot-dip galvanised or electrogalvanised

## Connection options:

- 6 cables 6-16 mm<sup>2</sup>
- 1 round conductor Rd 8-10
- 1 flat conductor to FL 40
- 2 cable shoe M8

Pack Weight  
Piece kg/100 pc. Item no.

1 173.000 5015057



## Equipotential busbar for industrial application

## Equipotential busbar BigBar for industrial application



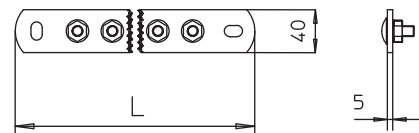
Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
1802 5 VA	5	40	246	5	1	90.000	5015854
1802 DC 5+5 VA	10	40	605	85	1	237.000	5015876

A2 Stainless steel, rustproof 1.4301

- Main potential equalisation to VDE 0100 Part 410 and Part 540, and also lightning protection potential equalisation to VDE 0185-305 (IEC 62305)
- Insulation feet
- Quick, simple assembly of connection conductors to the contact rail using lock bolts M10
- The high-grade stainless steel versions (V2A) are suitable for outdoor use
- Complete with anchors and bolts for wall mounting
- With lock washer (DIN 137) for bolt locking against loosening (e.g. required in industry and explosion-protected areas)



## Dimensions



## Equipotential busbar for industrial application

### Equipotential busbar BigBar for industrial application

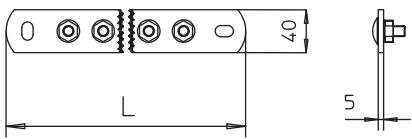


Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1802 10 VA</b>	10	40	408.5	5	1	138.210	<b>5015866</b>

A2 Stainless steel, rustproof 1.4301

- Main potential equalisation to VDE 0100 Part 410 and Part 540, and also lightning protection potential equalisation to VDE 0185-305 (IEC 62305)
- Insulation feet
- Quick, simple assembly of connection conductors to the contact rail using lock bolts M10
- The high-grade stainless steel versions (V2A) are suitable for outdoor use
- Complete with anchors and bolts for wall mounting
- With lock washer (DIN 137) for bolt locking against loosening (e.g. required in industry and explosion-protected areas)

#### Dimensions



### Equipotential busbar BigBar for industrial application



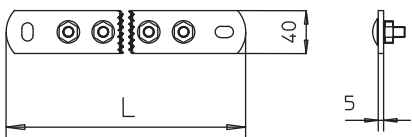
Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1802 5 CU</b>	5	40	246	5	1	80.000	<b>5015830</b>
<b>1802 6 CU</b>	6	40	278.5	5	1	98.400	<b>5015832</b>
<b>1802 8 CU</b>	8	40	343.5	5	1	116.550	<b>5015836</b>
<b>1802 10 CU</b>	10	40	408.5	5	1	180.000	<b>5015842</b>
<b>1802 12 CU</b>	12	40	473.5	5	1	152.850	<b>5015844</b>
<b>1802 14 CU</b>	14	40	538.5	5	1	171.000	<b>5015847</b>
<b>1802 20 CU</b>	20	40	733.5	5	1	225.450	<b>5015849</b>
<b>1802 DC 5+1 CU</b>	6	40	505	85	1	209.000	<b>5015870</b>
<b>1802 DC 5+5 CU</b>	10	40	605	85	1	251.000	<b>5015874</b>

Cu Copper

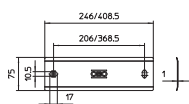
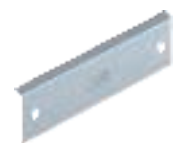
Main equipotential busbar to VDE 0100 Part 410 and Part -540, and also lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)

- Insulation feet
- Quick, simple mounting of connection cables using lock bolts M10
- Complete with anchors and bolts for wall mounting
- With lock washer (DIN 137) for bolt locking against loosening (e.g. required in industry and explosion-protected areas)

#### Dimensions



### Cover for BigBar equipotential busbar



Type	Number of connections	Pack Piece	Weight kg/100 pc.	Item no.
<b>1802 AH 5</b>	5	1	25.800	<b>5015880</b>
<b>1802 AH 10</b>	10	1	34.299	<b>5015884</b>

A2 Stainless steel, rustproof 1.4301

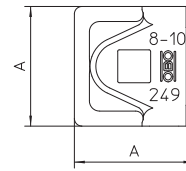
- Complete with all mounting components
- Labellable

## Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimen- sion A mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 VA-OT</b>	Rd 8-10	40	100	3.130	<b>5311554</b>

A2 Stainless steel, rustproof 1.4301

- For round conductor Rd 8-10
- Suitable for M10 bolts

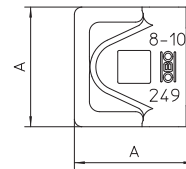


## Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimen- sion A mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 CU-OT</b>	Rd 8-10	40	100	3.580	<b>5311530</b>

Cu Copper

- For round conductor fastening RD 8-10
- Suitable for M10 bolts



## Earthing connection bar



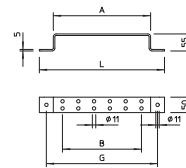
Type	Dimen- sion L mm	Dimen- sion A mm	Dimen- sion B mm	Dimen- sion G mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1805 2 FT</b>	200	110	51	155	1	54.800	<b>5016029</b>
<b>1805 4 FT</b>	302	212	153	257	1	77.000	<b>5016037</b>
<b>1805 6 FT</b>	404	314	255	359	1	97.100	<b>5016045</b>

St Steel

FT Hot-dip galvanised

1805/...: For connecting different earthing systems

- With 2 mounting holes  $\varnothing$  11 mm
- 1805/2: With 4 attaching holes
- 1805/4: With 8 attaching holes
- 1805/6: With 12 attaching holes



## Earthing connection bar

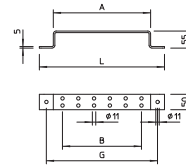


Type	Dimen- sion L mm	Dimen- sion A mm	Dimen- sion B mm	Dimen- sion G mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1805 2 VA</b>	200	110	51	155	1	54.800	<b>5016096</b>
<b>1805 4 VA</b>	302	212	153	257	1	77.000	<b>5016118</b>
<b>1805 6 VA</b>	404	314	255	359	1	97.100	<b>5016126</b>

A4 Stainless steel, rustproof 1.4571

1805/...: For connecting different earthing systems

- With 2 mounting holes  $\varnothing$  11 mm
- 1805/2: With 4 attaching holes
- 1805/4: With 8 attaching holes
- 1805/6: With 12 attaching holes



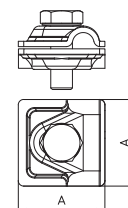
## Vario quick connector



Type	Fit mm	Dimen- sion A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 VA</b>	Rd 8-10	40	H/100	10	10.700	<b>5311551</b>

A2 Stainless steel, rustproof 1.4301

- For T, cross and parallel connectors
- Quick installation using hexagonal bolt M10 x 30, high-grade stainless steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



## Equipotential busbar for EX zone 1/21, 2/22



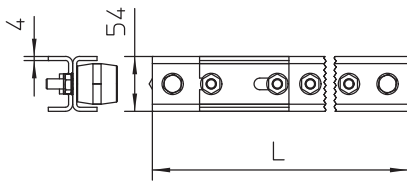
Type	Number of connections	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>EX PAS 5</b>	5	H/100	1	152.000	<b>5015265</b>
<b>EX PAS 10</b>	10	H/100	1	214.000	<b>5015270</b>

A2 Stainless steel, rustproof 1.4301

For ignition spark-free protection/functional equipotential bonding to DIN VDE 0100-410/-540 as well as ignition spark-free lightning protection equipotential bonding to VDE 0185-305 (IEC 62305) in systems to VDE 0165-1 (IEC/ EN 60079-14)

- Use in potentially explosive areas, Ex zone 1 and 2/21 and 22
- Tested according to explosion group IIC
- Lightning current carrying capacity class H (100 kA) to VDE 0185-561-1 (IEC/EN 62561-1)
- UV-stabilised and halogen-free insulation feet
- With spring washer for locking screws against self-loosening to VDE 0185-305-3 Supplementary sheet 2
- Suitable for indoor and outdoor applications

### Dimensions



## Equipotential busbar BigBar for industrial application

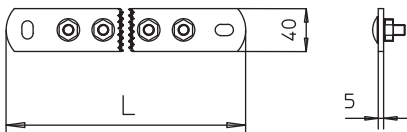


Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1802 5 VA</b>	5	40	246	5	1	90.000	<b>5015854</b>
<b>1802 10 VA</b>	10	40	408.5	5	1	138.210	<b>5015866</b>

A2 Stainless steel, rustproof 1.4301

- Main potential equalisation to VDE 0100 Part 410 and Part 540, and also lightning protection potential equalisation to VDE 0185-305 (IEC 62305)
- Insulation feet
- Quick, simple assembly of connection conductors to the contact rail using lock bolts M10
- The high-grade stainless steel versions (V2A) are suitable for outdoor use
- Complete with anchors and bolts for wall mounting
- With lock washer (DIN 137) for bolt locking against loosening (e.g. required in industry and explosion-protected areas)

### Dimensions





## Equipotential busbar BigBar for industrial application



Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
1802 5 CU	5	40	246	5	1	80.000	5015830
1802 6 CU	6	40	278.5	5	1	98.400	5015832
1802 8 CU	8	40	343.5	5	1	116.550	5015836
1802 10 CU	10	40	408.5	5	1	180.000	5015842
1802 12 CU	12	40	473.5	5	1	152.850	5015844
1802 14 CU	14	40	538.5	5	1	171.000	5015847
1802 20 CU	20	40	733.5	5	1	225.450	5015849

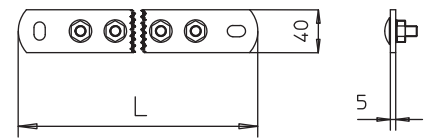
Cu Copper

Main equipotential busbar to VDE 0100 Part 410 and Part -540, and also lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)

- Insulation feet
- Quick, simple mounting of connection cables using lock bolts M10
- Complete with anchors and bolts for wall mounting
- With lock washer (DIN 137) for bolt locking against loosening (e.g. required in industry and explosion-protected areas)



## Dimensions

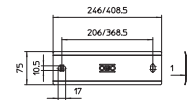


## Cover for BigBar equipotential busbar

Type	Number of connections	Pack Piece	Weight kg/100 pc.	Item no.
1802 AH 5	5	1	25.800	5015880
1802 AH 10	10	1	34.299	5015884

A2 Stainless steel, rustproof 1.4301

- Complete with all mounting components
- Labellable

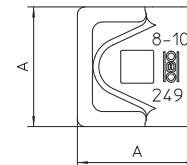


## Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 VA-OT	Rd 8-10	40	100	3.130	5311554

A2 Stainless steel, rustproof 1.4301

- For round conductor Rd 8-10
- Suitable for M10 bolts

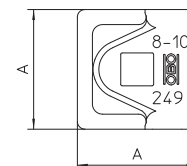


## Quick connector, cover Rd 8–10 mm

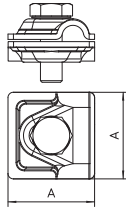
Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 CU-OT	Rd 8-10	40	100	3.580	5311530

Cu Copper

- For round conductor fastening RD 8-10
- Suitable for M10 bolts



### Vario quick connector

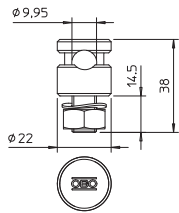


Type	Fit mm	Dimen- sion A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 VA</b>	Rd 8-10	40	H/100	10	10.700	<b>5311551</b>

A2 Stainless steel, rustproof 1.4301

- For T, cross and parallel connectors
- Quick installation using hexagonal bolt M10 x 30, high-grade stainless steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Connector, Rd 8–10 mm with pressure trough

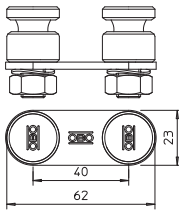


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>5001 N-VA</b>	Rd 8-10	N/50	10	6.800	<b>5304176</b>

A2 Stainless steel, rustproof 1.4301

- With 1 fix contact clamping screw, nut and serrated washer
- Including pre-mounted pressure sump, steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Connector, Rd 8–10 mm, double, with pressure trough

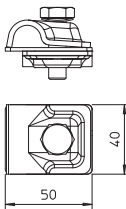


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>5002 N-VA</b>	Rd 8-10	N/50	10	16.200	<b>5304270</b>

A2 Stainless steel, rustproof 1.4301

- With 2 Fix-Kontakt clamping bolts, nuts and serrated washers
- With pre-mounted pressure trough made of VA
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

### Vario quick connector Rd 8-10x16



Type	Fit mm	Dimen- sion A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10X16 VA</b>	8-10X16	40	H/100	10	16.300	<b>5311590</b>

A2 Stainless steel, rustproof 1.4301

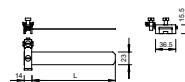
- For T, intersection and parallel connections with adapter plates
- Quick mounting using an M10 x 30 bolt, made from rustproof stainless steel
- With sprung washer to DIN 137
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

### Earthing pipe clamp VA

Type	For pipe Ø	Dimension L	For pipe Ø	Pack Piece	Weight kg/100 pc.	Item no.
	inch	mm	mm			
927 1	3/8-11/2	200	17.2 - 48	10	7.780	5057515
927 2	3/8-4	395	17.2 - 114	10	8.550	5057523
927 4	3/8-6	555	17.2 - 165	10	8.022	5057558

A2 Stainless steel, rustproof 1.4301

- For pipes of Ø 3/8 - 6"
- Connection options: Max. 2 cables 2.5-25 mm<sup>2</sup>
- Round conductor Rd 8
- Clip element, bolts and tightening strap made of rustproof stainless steel (VA)



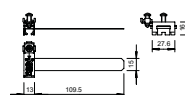
### Earthing pipe clamp, nickel-plated

Type	Dimension L	For pipe Ø	Pack Piece	Weight kg/100 pc.	Item no.
	mm	mm			
927 0	109.5	8 - 22	10	5.000	5057507

CuZn Brass

N Nickel-plated

- For pipe Ø 8-22 mm
- Connection options: max. 2 conductors 2.5-10 mm<sup>2</sup>
- Clip elements and screws from nickel-plated brass
- Tightening strip from high-grade stainless steel (V2A)

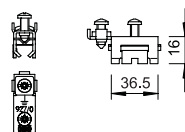


### Clamp lock for earthing pipe clamp

Type	Pack Piece	Weight kg/100 pc.	Item no.
927 SCH-K-VA	20	4.700	5057930

A2 Stainless steel, rustproof 1.4301

- Connection option: max. 2 conductors 2.5-25 mm<sup>2</sup>
- Possible to connect round conductor Rd 8

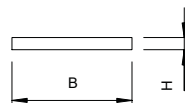


### Installation strip for earthing pipe clamp

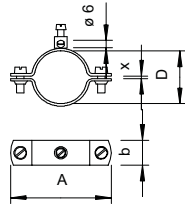
Type	Dimension B	Dimension H	Pack m	Weight kg/100 m	Item no.
927 BAND-VA	23	0.3	40	6.000	5057922

A2 Stainless steel, rustproof 1.4301

- 40 m roll
- Ready for transport and installation in unroll pack



### Earthing clamp, type 925



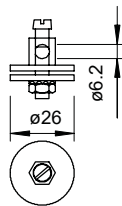
Type	Dimension A mm	Clamping range D mm	Dim. X mm	For pipe Ø inch	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
925 1/4	48	11.5 - 13.5	2	1/4	300	25	4.100	5040035
925 3/8	52	15.2 - 17.2	2	3/8	300	25	4.360	5040051
925 1/2	56	19.3 - 21.3	2	1/2	300	25	4.788	5040078
925 3/4	62	24.9 - 26.9	2	3/4	250	25	5.316	5040094
925 1	70	31.7 - 33.7	2	1	250	25	5.956	5040116
925 1 1/4	81	40.4 - 42.4	2	1 1/4	300	25	7.744	5040132
925 1 1/2	88	46.3 - 48.3	2	1 1/2	240	20	9.615	5040159

Sl Steel

G Electrogalvanised

- For pipes 1/4"-1 1/2" or Ø 11.5-48.3 mm
- Connection options: conductors to 16 mm<sup>2</sup> with connecting terminal, riveted with brass and 1 cylinder screw M5 x 12
- To 1 1/2" with 2 cylinder screws M6 x 16 (G)

### Earthing terminal for fastening on earthing strap



CE

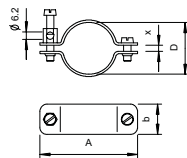
Type	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
928	240	10	5.700	5040507

CuZn Brass

N Nickel-plated

- For use in bathtubs or shower tubs etc.
- Connection option: conductors to 16 mm<sup>2</sup>
- Clamping element with threaded connection M6, 1 hexagonal nut M6, 1 serrated dimension washer and 1 cylinder screw M5 x 8
- Clamping element, nut and screws from copper-plated brass
- Serrated washer from stainless steel; 2 washers from galvanised steel

### Earthing clamp, type 942



Type	Dimension A mm	Clamping range D mm	Dim. X mm	For pipe Ø inch	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
942 11	44	8 - 11	3.5	1/8	420	10	4.480	5038014
942 15	50	13 - 15	3	1/4	320	10	4.800	5038030
942 18	52	16 - 18	2	3/8	200	10	5.170	5038057
942 22	55	19 - 22	3	1/2	180	10	5.550	5038073
942 28	63	24 - 28	3	3/4	180	10	6.170	5038081
942 35	71	30 - 35	5	1	120	10	8.570	5038111
942 43	81	39 - 43	5	1 1/4	100	10	9.740	5038138
942 49	86	44 - 49	5	1 1/2	100	10	10.540	5038154

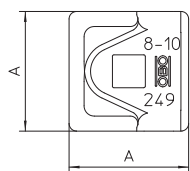
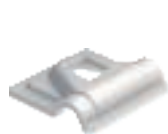
Cu Copper

N Nickel-plated

- For pipes 1/8–1 1/2" or Ø 8–49 mm
- Connection options: Cables up to 25 mm<sup>2</sup>
- With connection clip and cylinder bolt M6 x 16 made of brass, nickel-plated
- Clip cover and base made of copper, nickel-plated



### Quick connector, cover Rd 8–10 mm

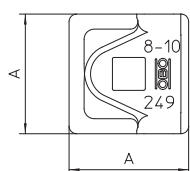
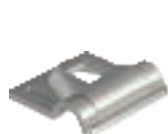


Type	Dimension A mm	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 ALU-OT</b>	44	Rd 8-10	100	2.100	5311585

**Alu** Aluminium

- For round conductor fastening RD 8-10
- Suitable for M10 bolts

### Quick connector, cover Rd 8–10 mm

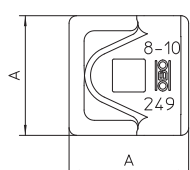


Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 VA-OT</b>	Rd 8-10	40	100	3.130	5311554

**A2** Stainless steel, rustproof 1.4301

- For round conductor Rd 8-10
- Suitable for M10 bolts

### Quick connector, cover Rd 8–10 mm

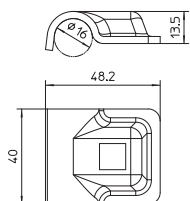


Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 CU-OT</b>	Rd 8-10	40	100	3.580	5311530

**Cu** Copper

- For round conductor fastening RD 8-10
- Suitable for M10 bolts

### Quick connector, cover Rd 16 mm

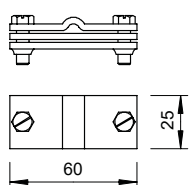


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 VA-OT</b>	16	100	5.700	5311573

**A2** Stainless steel, rustproof 1.4301

- For round conductor fastening RD 16
- Suitable for M10 bolts

### Earth connection terminal for round conductor and flat conductor

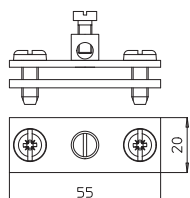


Type	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
<b>937 50</b>	100	10	11.750	5043018

**St** Steel  
**FT** Hot-dip galvanised

- For round and flat conductors
- Fit: cable 50 mm<sup>2</sup> x max. FL 40
- Rd 8 x max. FL 40
- With 2 hexagonal bolts M6 x 20 (F)

### Earthing terminal for cables and flat conductors



Type	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
<b>939</b>	150	25	5.932	5043107

**St** Steel  
**G** Electrogalvanised

- For cables to 16 mm<sup>2</sup> and flat conductors
- Fit: cable to 16 mm<sup>2</sup> x max. FL 30
- With riveted brass connection terminal and one cylinder bolt, M5 x 12, with two cylinder bolts, M6 x 16

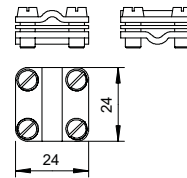
### Clip branch terminal

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>470 4-16</b>	50	2.856	<b>5064015</b>

**CuZn** Brass

**N** Nickel-plated

- Seat: 4-8 mm x 4-8 mm
- With 4 cylinder bolts M4 x 16



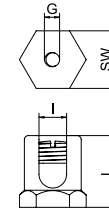
### Earthing terminal with fastening thread

CE

Type	Dimen- sion L mm	Dimen- sion I mm	Cross- section mm <sup>2</sup>	Thread	Pack Piece	Weight kg/100 pc.	Item no.
<b>EKL 25 M6</b>	22	8	25	M6	50	3.100	<b>6404006</b>
<b>EKL 35 M6</b>	26	10	35	M6	50	4.800	<b>6404014</b>

**CuZn** Brass

Earthing terminal for fastening the equipotential bonding wire to the cable support system.



### Clamp clip for screen connection

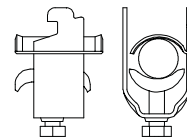
CE 11-12

Type	Clamping range D mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>2056N SAS 8 A2</b>	4 - 8	50	2.900	<b>1167006</b>
<b>2056N SAS 12 A2</b>	8 - 12	50	3.700	<b>1167014</b>
<b>2056N SAS 16 A2</b>	12 - 16	50	4.200	<b>1167022</b>
<b>2056N SAS 22 A2</b>	16 - 22	50	4.850	<b>1167030</b>
<b>2056N SAS 28 A2</b>	22 - 28	50	6.600	<b>1167049</b>

**A2** Stainless steel, rustproof 1.4301

**2B** Bright, reworked

For electrical connection of the braided shield of stripped cables.  
 Delivery complete with counter-trough; pressure trough and VA counter-trough.  
 A cable screen for protection against electromagnetic influences, can also contribute towards equipotential bonding as both ends are connected to the reference potential.



Pre-tensioning tool

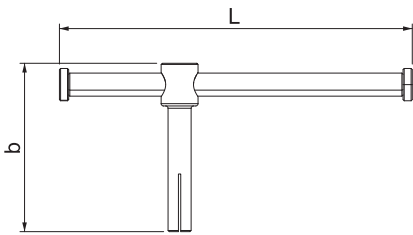


Type	Dimension L mm	Dimension b mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>927 BES VSW 25</b>	153	73	1	14.700	<b>5057690</b>

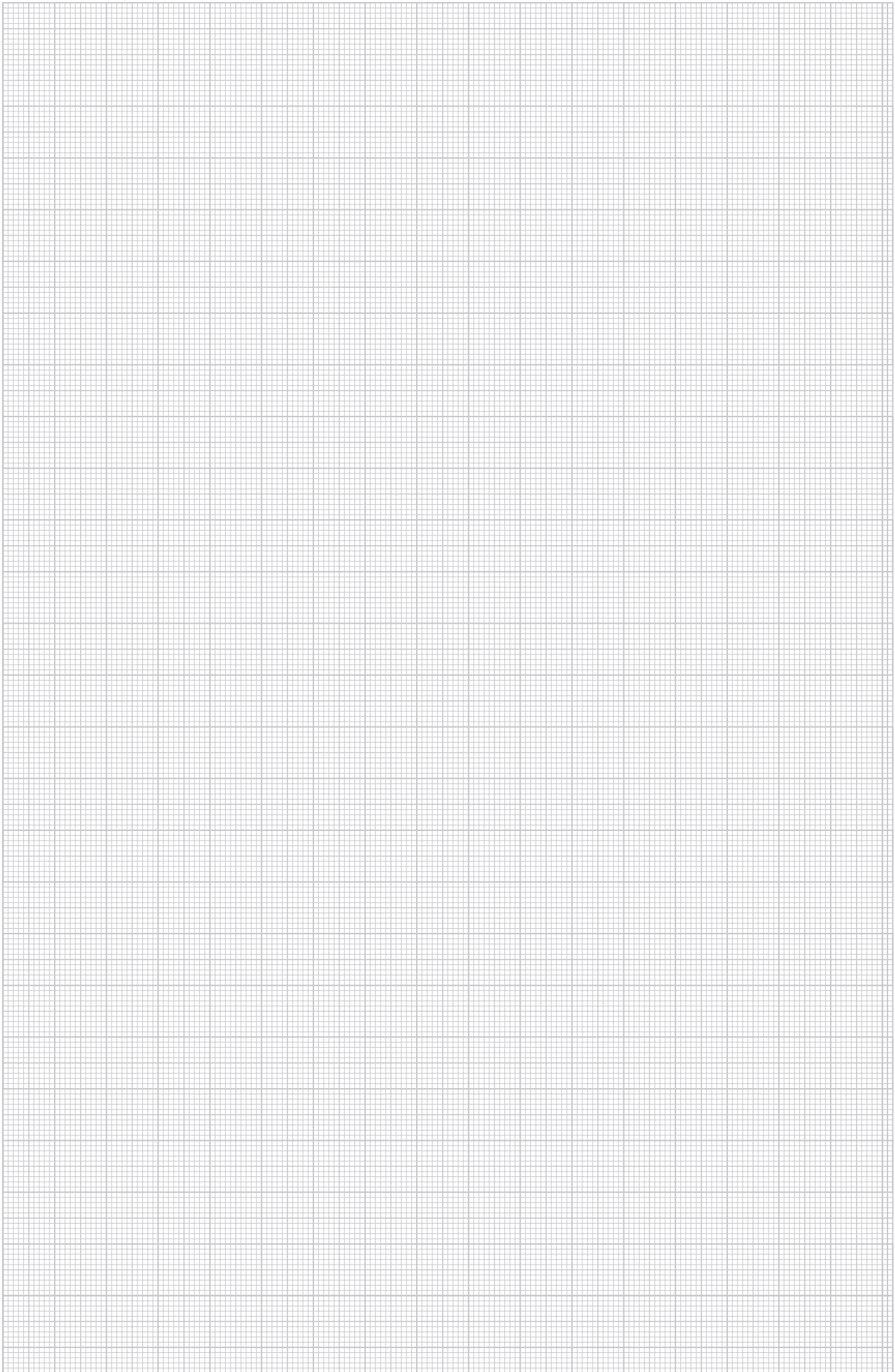
A2 Stainless steel, rustproof 1.4301

To tension earthing pipes and earthing pipe clamps.

Dimensions











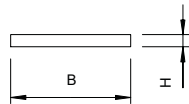


# Earthing systems

	<b>Conductor material</b>	380
	<b>Earth rods and plates</b>	383
	<b>Connection material</b>	389
	<b>Holders and accessories</b>	403



## Galvanised steel flat conductor for earth



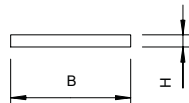
Type	Dimension W x H mm	Cross- section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
5052 DIN 20X2.5	20 x 2,5	50	122	50	122	41.000	5019340
5052 DIN 25X3	25 x 3	75	84	50	84	59.700	5019342
5052 DIN 30X3	30 x 3	90	71	50	71	70.650	5019344
5052 DIN 30X3.5	30 x 3,5	105	30	25	30	84.000	5019345
5052 DIN 30X3.5	30 x 3,5	105	60	50	60	84.000	5019347
5052 DIN 30X4	30 x 4	120	52	50	52	97.000	5019350
5052 DIN 40X4	40 x 4	160	40	51	40	128.000	5019355
5052 DIN 40X5	40 x 5	200	30	50	30	162.000	5019360

St Steel

FT Hot-dip galvanised

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Meets the requirements of VDE 0185-305 (IEC 62305)
- Zinc coating:  $\geq 500 \text{ g/m}^2$  (approx.  $70 \mu\text{m}$  in mean value)
- For lightning protection, earthing systems and ring equipotential bonding

## Stainless steel flat conductor

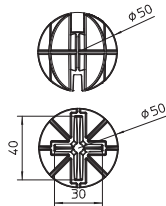


Type	Dimension W x H mm	Cross- section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
5052 V2A 30X3.5	30 x 3,5	105	50	42	50	82.500	5018501
5052 V4A 30X3.5	30 x 3,5	105	50	42	50	82.425	5018706
5052 V4A 30X3.5	30 x 3,5	105	25	21	25	82.425	5018730

A2 Stainless steel, rustproof 1.4301 A4 Stainless steel, rustproof 1.4571/1.4404

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- According to the foundation earther standard DIN 18014, V4A is required in the earth
- For use in areas at risk of corrosion
- For lightning protection, earthing systems and ring equipotential bonding

## Protective cap for connection lugs, reflective

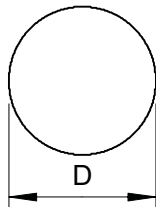


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
ProtectionBall	RD 8-10/ FL 25/ 30/ 40	25	2.050	5018014

PE Polyethylene

- For snapping onto round conductors or flat conductors
- Noticeable, reflective label
- For accident protection during the construction phase

## Round conductor, galvanised steel



Type	Nominal size $\varnothing$ mm	Cross- section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
RD 8-FT	8	50	125	50	125	40.000	5021081
RD 10	10	78	80	50	80	63.000	5021103

St Steel

FT Hot-dip galvanised

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 10 can also be used in the earth
- Zinc coating:  $\geq 350 \text{ g/m}^2$  (approx.  $50 \mu\text{m}$  in mean value)

## Round conductor, galvanised steel with PVC jacketing

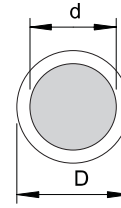


Type	Colour	Dimension d mm	Dimension D mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 10-PVC</b>	Black	10	13	78	75	50	75	67.000	5021162

St Steel

FT Hot-dip galvanised

- Corresponds to the requirements according to VDE 0185-305 (IEC 62305)
- Zinc coating: ≥ 350 g/m<sup>2</sup> (approx. 50 µm in mean value)
- With PVC jacketing



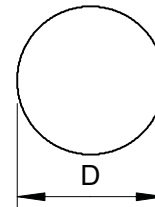
## Round conductor, aluminium



Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-ALU</b>	8	50	150	20	150	13.500	5021286
<b>RD 8-ALU-T</b>	8	50	150	20	150	13.500	5021294
<b>RD 10-ALU</b>	10	78	95	20	95	21.000	5021308

Alu Aluminium

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 8 ALU: Semi-hard (E-ALMgSi0.5 corresponds to DIN 48801)
- RD 8 ALU-T: Can be subjected to torsion (E-ALMgSi0.5 corresponds to DIN 48801)
- RD 10 ALU: Pure aluminium (E-Al corresponds to DIN 48801)
- AL and ALMgSi may not be routed directly on, in or under plaster, mortar or concrete, nor routed in the earth



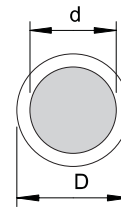
## Round conductor, aluminium, with PVC sheathing



Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-PVC</b>	8/11	50	100	20	100	20.000	5021332

Alu Aluminium

- Meets the requirements of VDE 0185-305 (IEC 62305)
- With PVC jacketing (halogen-free)
- Suitable for routing on, in or under plasterwork, mortar or concrete



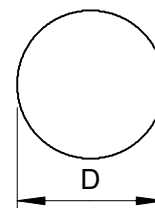
## Round conductor, stainless steel A2



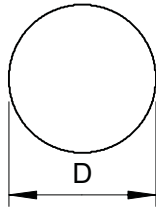
Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-V2A</b>	8	50	125	50	125	40.000	5021235
<b>RD 10-V2A</b>	10	78	80	50	80	63.000	5021239
<b>RD 10-V2A</b>	10	78	50	32	50	63.000	5021227

A2 Stainless steel, rustproof 1.4301

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 10-V4A for applications in the earth
- According to the foundation earthing standard DIN 18014, V4A is required in the earth



### Round conductor, stainless steel A4

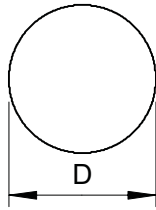


Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-V4A</b>	8	50	125	50	125	40.000	<b>5021644</b>
<b>RD 10-V4A 20</b>	10	78	20	12	20	63.000	<b>5021640</b>
<b>RD 10-V4A</b>	10	78	80	50	80	63.000	<b>5021647</b>
<b>RD 10-V4A</b>	10	78	50	32	50	63.000	<b>5021642</b>

A4 Stainless steel, rustproof 1.4571/1.4404

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 10-V4A for applications in the earth
- According to the foundation earther standard DIN 18014, V4A is required in the earth

### Round conductor, copper

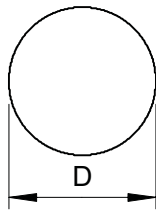


Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-CU</b>	8	50	100	45	100	45.000	<b>5021480</b>
<b>RD 8-CU 25</b>	8	50	55	25	55	45.000	<b>5021484</b>
<b>RD 10-CU</b>	10	78	50	35	50	70.000	<b>5021502</b>

Cu Copper

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

### Round conductor, copper sheathed

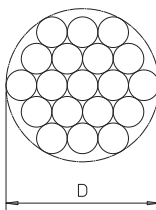


Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Pack m	Weight kg/100 m	Item no.
<b>RD 8-ST CU</b>	8	50	100	40.000	<b>5021380</b>

St Steel  
Cu Copper-plated

- According to IEC/ EN 62561-2 (VDE 0185-561-2)
- Meets the requirements of VDE 0185-305 (IEC 62305)
- Copper layer thickness: Min. 250 µm

### Copper cable

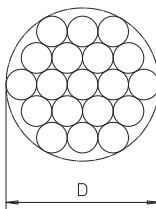


Type	Dimension D mm	Individual wires	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Weight kg/100 m	Item no.
<b>S 11-CU</b>	10.5	19x Ø 2,1	70	50	30	58.600	<b>5021654</b>
<b>S 9-CU</b>	9	19x Ø 1,8	50	100	45	45.000	<b>5021652</b>

Cu Copper

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

### Copper cable Tin-plated



Type	Dimension D mm	Individual wires	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Weight kg/100 m	Item no.
<b>S-11-CU SN</b>	10.5	19x Ø 2,1	70	50	30	58.600	<b>5021656</b>

Cu Copper  
Sn Tin-plated

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)



## Earth rod for standard applications

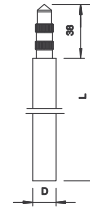


Type	Length mm	Outer-Ø mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>219 20 ST FT</b>	1000	20	7.9	H/100	5	250.000	<b>5000742</b>

St Steel

FT Hot-dip galvanised

- High corrosion resistance
- Zinc support approx. 130 µm
- With peg and bore for linking together
- Round pegs with two knurls
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)
- Short-circuit current I<sub>k</sub> (50 Hz), time 1 s, temp. max. 300 °C: 7.9 kA



## Earth rod for standard applications

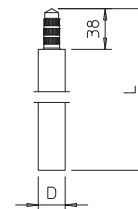


Type	Length mm	Outer-Ø mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>219 25 ST FT</b>	1500	25	12.3	H/100	5	573.000	<b>5000769</b>

St Steel

FT Hot-dip galvanised

- High corrosion resistance
- Zinc support approx. 130 µm
- With peg and bore for linking together
- Round pegs with three knurls
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)
- Short-circuit current I<sub>k</sub> (50 Hz), time 1 s, temp. max. 300 °C: 12.3 kA



## Earth rod BP

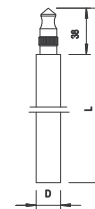


Type	Length mm	Outer-Ø mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>219 20 BP FT</b>	1500	20	7.9	H/100	5	360.000	<b>5000947</b>
<b>219 25 BP FT</b>	1500	25	12.3	H/100	5	573.000	<b>5000955</b>

St Steel

FT Hot-dip galvanised

- "BP" system (Bundespost)
- Very good contacting properties with soft metal inlay in the bore hole
- With peg and bore for linking together
- FT version with zinc coating approx. 130 µm
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)



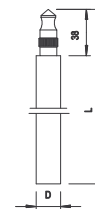
## Earth rod BP



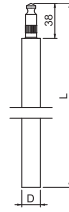
Type	Length mm	Outer-Ø mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>219 20 BP V4A</b>	1000	20	4.2	H/100	5	250.000	<b>5000858</b>
<b>219 20 BP V4A</b>	1500	20	4.2	H/100	5	365.000	<b>5000866</b>

A4 Stainless steel, rustproof 1.4401

- "BP" system (Bundespost)
- Very good contacting properties with soft metal inlay in the bore hole
- With peg and bore for linking together
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)
- Short circuit current I<sub>k</sub> (50 Hz), time 1 s, max. temp. 300 °C: 4.5 kA (219 20 BP V4A)



### Earth rod BP with copper sheath



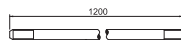
Type	Length mm	Outer-Ø mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>219 20 BP CU</b>	1500	20	7.9	H/100	5	365.400	<b>5000500</b>

**St** Steel

**Cu** Copper-plated

- "BP" system (Bundespost)
- Made of steel with a copper jacket of min. 0.25 mm
- Very good contacting properties with soft metal inlay in the bore hole
- With peg and bore for linking together
- Tensile strength min. 600 N/mm<sup>2</sup>
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)

### Earth rod BS with copper sheath



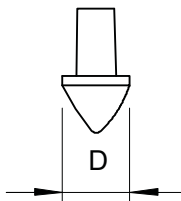
Type	Length mm	Outer-Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>219 16 CU</b>	1200	14.2	5	192.000	<b>5000481</b>

**St** Steel

**Cu** Copper-plated

- Made of steel with a copper jacket of min. 0.25 mm
- With thread for linking together
- Tensile strength min. 600 N/mm<sup>2</sup>
- Meets the requirements of VDE 0185-305 (IEC 62305)

### Driving spike for ST and BP earth rod



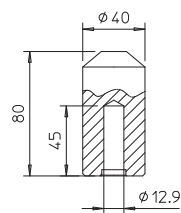
Type	For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1819 20BP</b>	20	5	3.768	<b>3041212</b>
<b>1819 25BP</b>	25	5	6.700	<b>3041956</b>

**TG** Malleable iron

**FT** Hot-dip galvanised

- Suitable for ST and BP system

### Impact head for ST, BP and OMEX earth rods

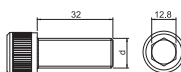


Type	Material	For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1820 20</b>	St	20	1	62.600	<b>3042200</b>
<b>1820 25</b>	St	25	1	70.000	<b>3042251</b>

**St** Steel

- Suitable for ST, BP and OMEX systems
- Hardened
- DIN 48852, Form SP

### Impact head for earth rod with thread



Type	For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1820 16</b>	14.2	5	5.800	<b>3042270</b>

A2 Stainless steel, rustproof 1.4301

- Suitable for earth rods, type 2019 16 CU



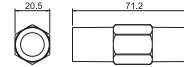


### Coupling for earth rod with thread

Type	For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
2019 16	14.2	10	8.000	5001190

CuSn Red bronze

- Suitable for earth rods, type 2019 16 CU

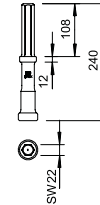


### Hammer insert type 2500, for earth rod

Type	For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
2500 20	20	1	120.000	3043207
2500 25	25	1	140.000	3043258

St Steel

- Manufactured by Cobra BBM 47 SPA-Super, Tex11 and COBRA 248
- Fits earth rod system ST, BP and OMEX
- Hardened

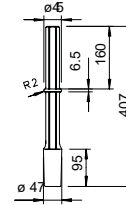


### Hammer insert type 2510, for earth rod

Type	For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
2510 20	20	1	300.000	3043312

St Steel

- Manufactured by Atlas Copco, type FB 60 S-Super
- Fits earth rod system ST, BP and OMEX
- Hardened

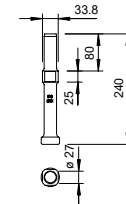


### Hammer insert type 2520, for earth rod

Type	For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
2520 20	20	1	197.000	3043703
2520 25	25	1	197.000	3043754

St Steel

- Manufactured by Wacker BHF 25, BHF 30S, EHU 25/220
- Fits earth rod system ST, BP and OMEX
- Hardened

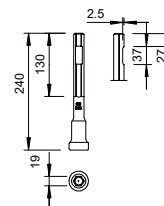


### Hammer insert type 2530, for earth rod

Type	For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
2530 20	20	1	125.000	3043401
2530 25	25	1	125.000	3043452

St Steel

- Manufactured by Bosch USH 10, HSH 10
- Fits earth rod system ST, BP and OMEX
- Hardened



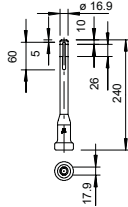
### Hammer insert type 2531, for earth rod



Type		For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
2531 20		20	1	200.000	3043908

- Steel
- Make: Bosch GSH 27, USH 27 (WAF 28 mm)
- Suitable for ST, BP and OMEX earth rod systems
- Hardened

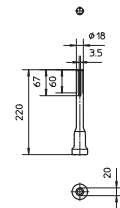
### Hammer insert type 2535, for earth rod



Type		For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
2535 20		20	1	58.000	3043916
2535 25		25	1	100.000	3044912

- Steel
- Manufactured by Hilti TE 52/42, TE 72/60, TE 92
- Fits earth rod system ST, BP and OMEX
- Hardened

### Hammer insert type 2536, for earth rod



Type		For earth rods Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
2536 20		20	1	55.000	3044904
2536 25		25	1	61.000	3044831

- Steel
- Fits earth rod system ST, BP and OMEX
- For vibration hammers with SDS- Max/TEY- mounting
- Hardened

### Hammer insert for LightEarth earth rod



Type	Seat systems	Pack Piece	Weight kg/100 pc.	Item no.
LE HAMMER-W	Wacker	1	132.000	3043606
LE HAMMER-H	Hilti	1	76.000	3043610
LE HAMMER-B	Bosch	1	87.000	3043614
LE HAMMER-SDS-M	SDS-max	1	76.000	3043602
LE HAMMER-AC	Atlas Copco	1	76.000	3043618
LE HAMMER-B-II	Other	1	200.000	3043628

- Steel
- Suitable for LightEarth system
- 3043606 for Wacker (BHF 25, BHF 30S)
- 3043610 for Hilti (TE 52/42, TE72/60, TE92)
- 3043614 for Bosch (USH 10, HSH 10)
- 3043602 for SDS-Max
- 3043618 for Atlas Copco (Hexagon seat)
- 3043628 for Bosch GSH27/UH27 (11304) / HS28 (12314)  
Hitachi H65SD  
Makita HM 1500B / HM1800
- Hardened

### Air-termination/earth entry rod, rounded-off on both ends



Type	Nominal Length mm	size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 A-1500	1500	16	10	240.000	5400155

- Steel
- Hot-dip galvanised
- Full material Ø 16 mm
- Rounded on both ends
- Suitable for FangFix stand system

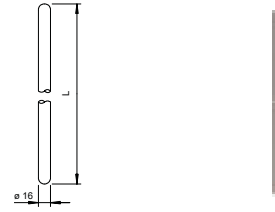


### Air-termination/earth entry rod, rounded-off on both ends

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
200 V4A-1500	1500	16	10	242.000	5420504
200 V4A-2000	2000	16	10	320.000	5420539

A4 Stainless steel, rustproof 1.4571

- Full material Ø 16 mm
- Both ends rounded

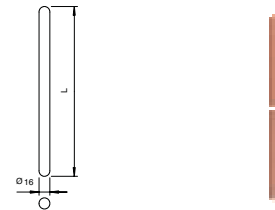


### Air-termination/earth entry rod, rounded-off on both ends

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 A-CU	1500	16	10	272.100	5400627

Cu Copper

- Full material Ø 16 mm
- Both ends rounded



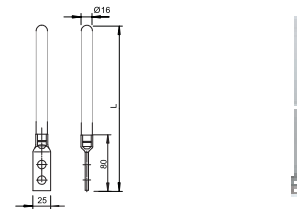
### Air-termination/earth entry rod with connection tabs

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 F1500	1500	16	10	240.000	5424151
101 F2000	2000	16	10	320.000	5424208

St Steel

FT Hot-dip galvanised

- With 2 attaching holes Ø 12 mm
- One end rounded



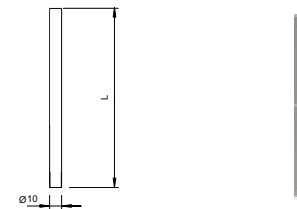
### Connection lug/earth entry rod made of stainless steel



Type	Nominal size Ø mm	Cross- section mm <sup>2</sup>	Dimen- sion L mm	Pack Piece	Weight kg/100 pc.	Item no.
AF RD 10 V4A	10	75	2000	5	123.600	5430720

A4 Stainless steel, rustproof 1.4571/1.4404

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 10-V4A for applications in the earth
- According to the foundation earther standard DIN 18014, V4A is required in the earth



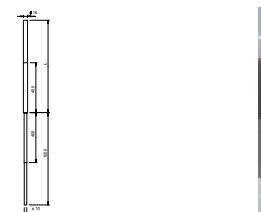
### Earth entry rod, tapered and partially insulated

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
204 KS-2000	2000	16/10	1	230.000	5430011
204 KS-2500	2500	16/10	1	310.000	5430062

St Steel

F Hot galvanised

- 16 mm earth entry with 10 mm connection
- With mounted heat-shrinkable sleeve (corrosion protection)



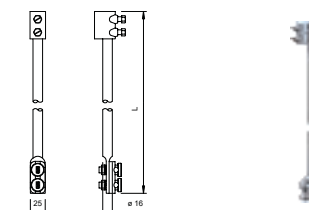
### Earth entry rod with separating piece and connector

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
204 KL-1500	Rd 8-10	10	260.700	5430151

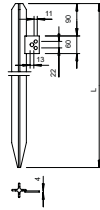
St Steel

FT Hot-dip galvanised

- With separating piece type 223 DIN and connector type 5002 DIN



### Profile earthing rod with connecting lug



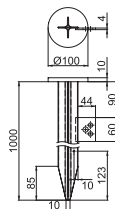
Type	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>213 1000 DIN</b>	1000	5	240.500	<b>5003008</b>
<b>213 1500 DIN</b>	1500	5	364.500	<b>5003016</b>
<b>213 2000 DIN</b>	2000	5	488.400	<b>5003024</b>
<b>213 2500 DIN</b>	2500	3	612.400	<b>5003032</b>
<b>213 3000 DIN</b>	3000	3	736.400	<b>5003040</b>

**SI** Steel

**FT** Hot-dip galvanised

- Cross-profile 50 x 50 x 3 mm
- With connecting strap
- 1 through hole Ø 13 mm
- 2 through holes Ø 11 mm
- Round conductor fastening e.g. with type 5001 DIN-FT possible
- For the construction of earthing systems e.g. antenna or earthing of building site distribution boards

### Profile earth rod with connection strap/hand protection



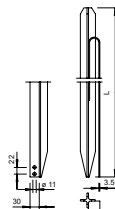
Type	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>213 1000 DIN HS</b>	1000	5	300.000	<b>5003081</b>

**SI** Steel

**FT** Hot-dip galvanised

- Cross-profile 50 x 50 x 3 mm
- Hand protection Ø 100 mm
- With connecting strap
- 1 gland hole Ø 13 mm
- 2 gland holes Ø 11 mm
- Round conductor fastening e.g. with type 5001 DIN-FT possible
- For the construction of earthing systems e.g. antennas or earthing of building site distribution boards

### Profile earth rod connection with strip steel lug



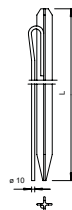
Type	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>213 1500 M</b>	1500	3	527.600	<b>5003261</b>
<b>213 2000 M</b>	2000	3	651.600	<b>5003288</b>
<b>213 2500 M</b>	2500	3	783.800	<b>5003296</b>
<b>213 3000 M</b>	3000	3	899.500	<b>5003318</b>

**SI** Steel

**FT** Hot-dip galvanised

- With 2 m strip steel section FL 30 x 3.5
- With 2 through holes Ø 11 mm
- For the construction of earthing systems e.g. antenna or earthing of building site distribution boards

### Profile earth rod connection with round conductor lug



Type	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>213 1500 F</b>	1500	3	486.900	<b>5003776</b>
<b>213 2000 F</b>	2000	3	610.900	<b>5003784</b>

**SI** Steel

**FT** Hot-dip galvanised

- With 2 m round conductor lugs Rd 10
- For the construction of earthing systems e.g. antenna or earthing of building site distribution boards

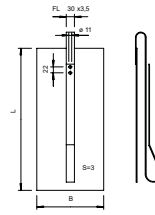
Earthing plate

Type	Dimension B x L x S mm	Pack Piece	Weight kg/100 pc.	Item no.
1816 F-500X1000	500 x 1000 x 3	1	1,329.300	5009227
1816 F-1000X1000	1000 x 1000 x 3	1	2,700.000	5009235

St Steel

FT Hot-dip galvanised

- With 3 m strip steel section FL30 x 3.5
- With 2 attaching holes Ø 11 mm

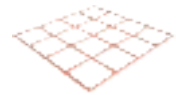
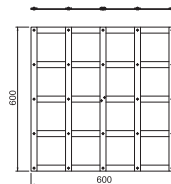


Earth mats

Type	Length mm	Width mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
1816 CU 6	600	600	3	1	403.000	5009250
1816 CU 9	900	900	3	1	605.000	5009256

Cu Copper

- To reduce the step and contact voltage
- In accordance with IEC 62561-2 and IEC 62305-3



Connection material

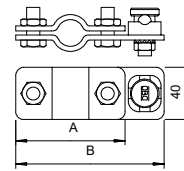
Connection clamp for earth rod to round conductors Rd 8–10

Type	For earth rods Ø mm	Dimen- sion A mm	Dimen- sion B mm	Pack Piece	Weight kg/100 pc.	Item no.
2710 20 FT	20	84	114	5	39.900	5001218
2710 25 FT	25	89	119	5	42.300	5001226

St Steel

FT Hot-dip galvanised

- ST, BP, OMEX and LightEarth system
- On round conductor Rd 8-10
- Incl. connector, type 5001 DIN



Connection clamp for earth rod on flat conductor

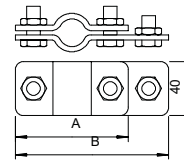


Type	For earth rods Ø mm	Dimen- sion A mm	Short-circuit current (50 HZ) (1 s; ≤300 °C) kA	Dimen- sion B mm	Pack Piece	Weight kg/100 pc.	Item no.
2730 25 FT	25	89	8.5	119	5	38.800	5001412
2730 20 FT	20	84	7.9	114	5	35.900	5001404

St Steel

FT Hot-dip galvanised

- ST, BP, OMEX and LightEarth systems
- On flat conductors
- Including hex-head screw for attaching flat conductors



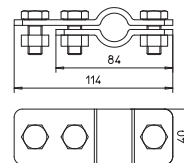
Connection clamp for earth rod on flat conductor



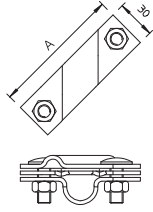
Type	For earth rods Ø mm	Dimen- sion A mm	Dimen- sion B mm	Pack Piece	Weight kg/100 pc.	Item no.
2730 20 VA	20	84	114	5	33.764	5001366

A2 Stainless steel, rustproof 1.4301

- ST, BP, OMEX and LightEarth systems
- On flat conductors
- Including hex-head screw for attaching flat conductors



### Connection clamp for earth rod, universal



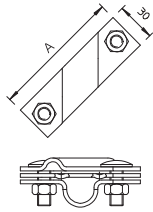
Type	Dimension A mm	For earth rods Ø mm	Fit mm	Short-circuit current (50 HZ) (1 s; ≤300 °C) kA	Pack Piece	Weight kg/100 pc.	Item no.
2760 20 FT	101	20	Rd 8-10/FL40	7.9	5	28.335	5001641
2760 B-20 FT	101	20	Rd 8-10/FL40	7.9	20	32.400	5001749
2760 25 FT	110	25	Rd 8-10/FL40	8.5	5	38.400	5001668

**St** Steel

**FT** Hot-dip galvanised

- Suitable for attaching round conductors Rd 8-10 or flat conductors to FL 40
- With separator plate
- Installed with 2 hexagonal bolts M10 x 30 and 2 hexagonal nuts M10

### Connection clamp for earth rod, universal

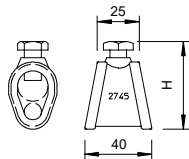


Type	Dimension A mm	For earth rods Ø mm	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
2760 20 VA	101	20	Rd 8-10/FL40	5	32.400	5001617
2760 B-20 VA	101	20	Rd 8-10/FL40	20	32.400	5001625
2760 20 V4A	101	20	Rd 8-10/FL40	5	32.400	5001633
2760 25 V4A	110	25	Rd 8-10/FL40	5	32.400	5001672

**A2** Stainless steel, rustproof 1.4301 **A4** Stainless steel, rustproof 1.4404

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Suitable for connecting round conductors Rd 8-10 or flat conductors to FL 40
- With adapter plate
- Mounted with 2 hexagonal bolts M10 x 30 and 2 hexagonal bolts M10

### Connection clamp for earth rod or cables



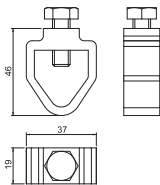
Type	For earth rods Ø mm	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
2745 20 MS	20	7-12,5/S95 mm <sup>2</sup>	5	16.000	5001560

**CuZn** Brass

**Cu** Copper-plated

- For earth rods Ø 20 or conductors of 95 mm<sup>2</sup>
- For round conductor attachments Rd 7–12.5 with hexagonal bolts M10 x 25

### Connection clip



Type	For earth rods Ø mm	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
2745 16 25	—	Rd 14,2/ FL max. 26 x 12	10	12.000	5001590
2745 16 30	—	Rd 14,2/ FL max. 40 x 12	10	19.000	5001592
2745 16 70	—	Rd 14,2/ Rope 16-70 mm <sup>2</sup>	10	6.400	5001594

**CuAl** Aluminium bronze **CuSn** Red bronze

- For connection of the copper-plated earth rod, type 219 16 CU, to conductor material
- Type A terminal

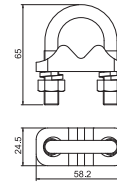
Connection clip



Type	For earth rods Ø mm	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
2740 16	14.2	FL/ Rd	10	12.900	5001511
2740 16 KL	14.2	Rd 8-10/FL max. 26	10	17.500	5001513

**CuSn** Red bronze

- Suitable for connecting round conductors Rd 8-10 or flat conductors with earth rod 219 16 CU



Cross-connector for flat conductor

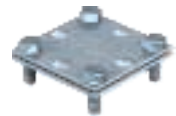
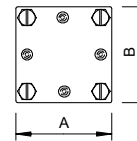
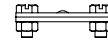


Type	Fit mm	Dimension A mm	Dimension B mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
255 A-FL30 FT	max. FL30	52	52	H/100	20	11.500	5314534

**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Max FL 30 x FL 30
- Without adapter plate
- Mounted with 4 hexagonal bolts M6 x 20 (F)



Cross-connector for flat conductor, with intermediate plate

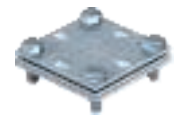
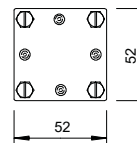


Type	Fit mm	Dimension A mm	Dimension B mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
255 30	max. FL30	52	52	H/100	20	16.650	5314518

**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Max FL 30 x FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M6 x 20 (F)



DIN cross-connector for flat conductor

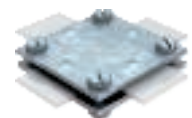
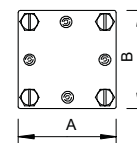
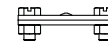


Type	Fit mm	Dimension A mm	Dimension B mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
256 A-DIN 30 FT	max. FL30	60	60	H/100	10	27.800	5314658
256 A-DIN 40 FT	max. FL40	80	80	H/100	10	35.436	5314666

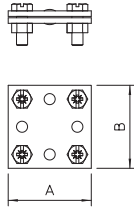
**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Max. FL 30 x FL 30 or max. FL 40 x FL 40
- Without adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)



### DIN cross-connector for flat conductor

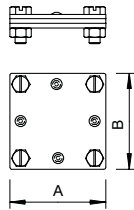


Type	Fit mm	Dimen- sion A mm	Dimen- sion B mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>256 A-DIN 30 VA</b>	max. FL30	60	60	H/100	10	27.800	<b>5314720</b>
<b>256 A-DIN 30 V4A</b>	max. FL30	60	60	H/100	10	26.400	<b>5314659</b>

A2 Stainless steel, rustproof 1.4301 A4 Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Max. FL 30 x FL 30
- Without adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### DIN cross-connector for flat conductor, with intermediate plate



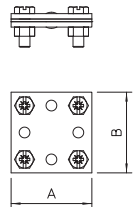
Type	Fit mm	Dimen- sion A mm	Dimen- sion B mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>256 DIN 30 FT</b>	max. FL30	60	60	H/100	10	35.860	<b>5314615</b>
<b>256 DIN 40 FT</b>	max. FL40	80	80	H/100	10	54.650	<b>5314623</b>

Sl Steel

FT Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Max. FL 30 x FL 30 or max. FL 40 x FL 40
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### DIN cross-connector for flat conductor, with intermediate plate

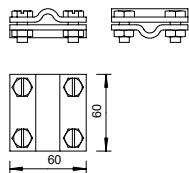


Type	Fit mm	Dimen- sion A mm	Dimen- sion B mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>256 DIN 30 V4A</b>	max. FL30	60	60	H/100	10	29.100	<b>5314616</b>

A4 Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Max. FL 30 x FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Cross-connector Rd 8–10



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>253 8X8</b>	Rd 8-10	H/100	25	30.700	<b>5312604</b>

Sl Steel

FT Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)





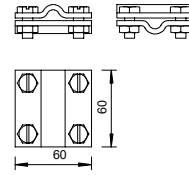
### Cross-connector round/round without intermediate plate



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>253 8-10 V4A</b>	Rd 8-10	H/100	25	23.650	<b>5312582</b>
<b>253 S3 V4A</b>	Rd 8-10	H/100	3400	25.900	<b>5312594</b>

A4 Stainless steel, rustproof 1.4401 A4 Stainless steel, rustproof 1.4571/1.4404

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)



### Cross-connector with intermediate plate for Rd 8-10

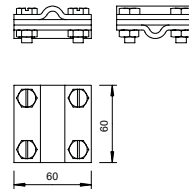


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10 FT</b>	Rd 8-10	H/100	25	33.530	<b>5312310</b>

Sl Steel

FT Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)



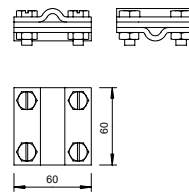
### Cross-connector with intermediate plate for Rd 8-10



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10 V4A</b>	Rd 8-10	H/100	10	33.530	<b>5312318</b>

A4 Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



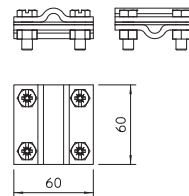
### Cross-connector with intermediate plate for Rd 8-10



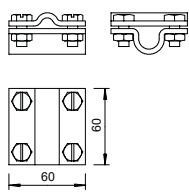
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10 CU</b>	Rd 8-10	H/100	10	38.940	<b>5312418</b>

Cu Copper

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



### Cross-connector for Rd 8–10 x Rd 16



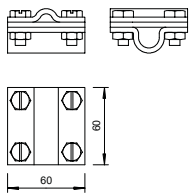
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>253 10X16</b>	Rd 8-10 x 16	H/100	25	29.800	<b>5312809</b>

**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 16 / FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)

### Cross-connector with intermediate plate for Rd 8–10 x Rd 16



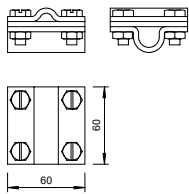
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10X16 FT</b>	Rd 8-10 x 16	H/100	25	38.800	<b>5312345</b>

**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 16 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Cross-connector with intermediate plate for Rd 8–10 x Rd 16

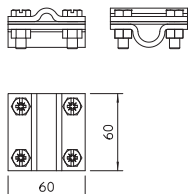


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10x16 V4A</b>	Rd 8-10 x 16	H/100	10	39.000	<b>5312346</b>

**A4** Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 16 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Cross-connector with intermediate plate for Rd 8–10 x Rd 16



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10X16 CU</b>	Rd 8-10 x 16	H/100	10	43.985	<b>5312442</b>

**Cu** Copper

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 16 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Cross-connector for round and flat conductors

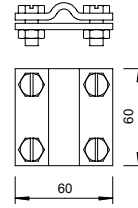


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10xFL30 FT</b>	8-10 x FL30	H/100	25	28.500	<b>5312655</b>
<b>252 S4 FT</b>	8-10 x FL30	H/100	3600	25.000	<b>5312302</b>

St Steel

FT Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



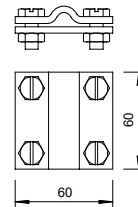
### Cross-connector for round conductors and flat conductors



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10xFL30V4A</b>	8-10 x FL30	H/100	10	28.500	<b>5312656</b>

A4 Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



### Cross-connector for flat conductors and round conductors

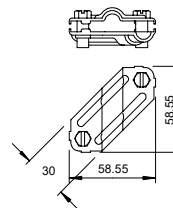


Type	Fit mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>250</b>	Rd 8-10/FL30	5.6	N/50	25	10.260	<b>5312906</b>

St Steel

FT Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10
- Fit: Rd 8-10 x FL 30
- Fit: FL 30 x FL 30
- Mounted with 2 hexagonal bolts M8 x 20 (F)



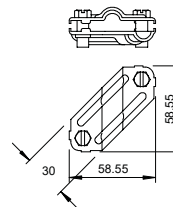
### Cross-connector for flat conductors and round conductors



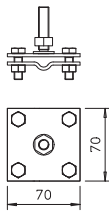
Type	Fit mm	Lightning current carrying capacity kA	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>250 VA</b>	Rd 8-10/FL30	H/100	1.4	25	10.260	<b>5312922</b>
<b>250 V4A</b>	Rd 8-10/FL30	H/100	1.4	10	10.260	<b>5312925</b>

A2 Stainless steel, rustproof 1.4301 A4 Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10
- Fit: Rd 8-10 x FL 30
- Fit: FL 30 x FL 30
- Mounted with 2 hexagonal bolts M8 x 20



## Cross-connector for flat conductors and round conductors with threaded bolt M10x45



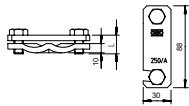
Type	Fit mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 GB 10x45</b>	8-10 x FL30	4.2	H/100	10	34.800	<b>5312657</b>

A2 Stainless steel, rustproof 1.4301

FT/VA Hot-dip galvanised/stainless steel 1.4301

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

## Diagonal clamp for flat conductors and round conductors



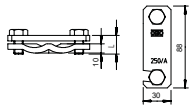
Type	Fit mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>250 A-FT</b>	Rd 6-22/max. FL50	7.3	H/100	25	28.800	<b>5313015</b>
<b>250 AS-FT</b>	Rd 6-22/max. FL50	7.3	H/100	25	26.000	<b>5313031</b>
<b>250 A</b>	Rd 6-22/max. FL50	7.3	H/100	25	28.800	<b>5313058</b>

St Steel

FT Hot-dip galvanised

- For reinforced steels Ø 6-22 mm and flat conductor 50 x 4
- Installed with screws M10 x 40
- AS version with screws M10 x 20
- Simple installation with open slot

## Diagonal clamp for flat conductors and round conductors

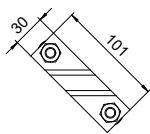


Type	Dimension L mm	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>250 A-VA</b>	40	Rd 6-22/max. FL50	H/100	10	28.800	<b>5313023</b>

A2 Stainless steel, rustproof 1.4301

- For reinforced steels Ø 6-22 mm and flat conductor 50 x 4
- Installed with screws M10 x 40
- AS version with screws M10 x 20
- Simple installation with open slot

## Diagonal connector for round cable



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>2760 S8 V4A</b>	Rd 8-10	H/100	3600	20.600	<b>5313012</b>
<b>2760 8-10 V4A</b>	Rd 8-10	H/100	25	21.364	<b>5313013</b>

A4 Stainless steel, rustproof 1.4401 A4 Stainless steel, rustproof 1.4571/1.4404

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- To connect round cables 8–10 mm
- Mounted with 2 truss-head bolts M10 x 30 and 2 hexagonal bolts M10

### Diagonal clamp with bolt

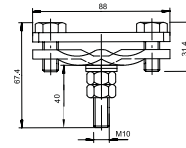


Type	Dimension L mm	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>250 A-BO</b>	25	Rd 6-22/max. FL50	H/100	25	30.994	<b>5313066</b>

St Steel

F Hot galvanised

- For reinforced steels Ø 6-22 mm and flat conductor 50 x 4
- Installed with screws M10 x 25
- Simple installation with open slot
- With flange-welded bolts M10 x 40, inc. 2 washers and 2 nuts



### Parallel clamp for the connecting of reinforcing steels

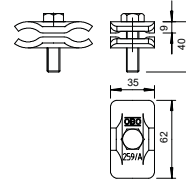


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>259 A ST</b>	Ø 10-20	H/100	25	18.800	<b>5315557</b>
<b>259 A FT</b>	Ø 10-20	H/100	25	18.800	<b>5315514</b>

St Steel

FT Hot-dip galvanised

- For connecting reinforced steels Ø 10–20 mm
- Mounted with M10 x 40 bolts



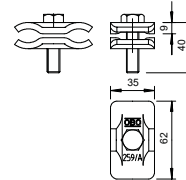
### Parallel clamp for the connecting of reinforcing steels



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>259 A VA</b>	Ø 10-20	H/100	10	15.880	<b>5315522</b>

A2 Stainless steel, rustproof 1.4301

- For connecting reinforced steels Ø 10–20 mm
- Mounted with M10 x 40 bolts



### Variable earthing terminal

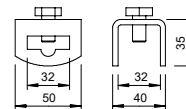


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1813 KL</b>	FL30 x Rd 8-10	H/100	50	18.000	<b>5014425</b>

St Steel

FT Hot-dip galvanised

- Suitable for connection for Rd 10 x FL 30, FL 30 x FL 30
- Quick mounting using a hexagonal bolt M10 x 20 (F)



### Connection terminal for round conductors

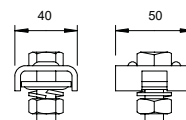


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1818</b>	Rd 8-10	N/50	10	17.600	<b>5012015</b>

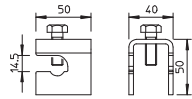
St Steel

FT Hot-dip galvanised

- For connecting round conductor Rd 8-10
- With 1 hexagonal bolt M12 x 40, 1 hexagonal nut M12 and 1 lock washer, stainless steel



## VARIO earthing terminal for reinforced steels



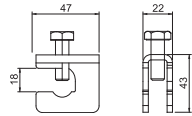
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1814 ST</b>	FL30x5 x Rd8-14	N/50	25	20.000	<b>5014476</b>
<b>1814 FT</b>	FL30x5 x Rd8-14	N/50	25	20.000	<b>5014468</b>

**SI** Steel

**FT** Hot-dip galvanised

- For reinforced steels with diameters 8-14 mm and FL 30 x 5
- Simple mounting through open slot
- Side suspension possible

## VARIO earthing terminal for reinforced steels



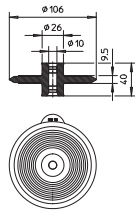
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1814 FT D14</b>	FL30x3-4mm /Rd 8-10 x Rd 6-14	N/50	25	15.340	<b>5014471</b>

**SI** Steel

**FT** Hot-dip galvanised

- For reinforced steel with 6-14 mm diameter and round cables and flat conductors
- Rapid installation using open slot and only one M10 screw

## Sealing sleeve for round conductors

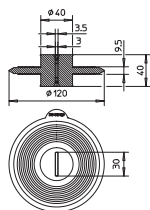


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>DW RD10</b>	RD 10	1	13.000	<b>2360041</b>

**TPE** Thermoplastic elastomer

- Sealing sleeve for penetrations of waterproof foundation plates/walls (e.g. white trough)
- For mounting on connection lugs with stainless steel tightening straps
- With pressurised water testing to 5 bar
- According to DIN EN 62561-5 (VDE 0185-561-5)

## Sealing sleeve for flat conductors

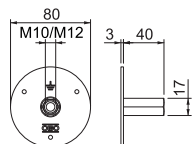


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>DW FL30x3,5</b>	FL 30x3,5	1	18.000	<b>2360043</b>

**TPE** Thermoplastic elastomer

- Sealing sleeve for penetrations of waterproof foundation plates/walls (e.g. white trough)
- For mounting on connection lugs with stainless steel tightening straps
- With pressurised water testing to 5 bar
- According to DIN EN 62561-5 (VDE 0185-561-5)

## Earthing fixed point with double thread



Type	Thread	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>205 DG V4A</b>	M10/M12	6.2	H/100	10	14.800	<b>5420020</b>

**A4** Stainless steel, rustproof 1.4404

- For connection to earthing systems, arresters and reinforcements
- Contact plate: Ø 80 mm made of stainless steel, rustproof (V4A)
- Double thread M10/M12
- Incl. plastic cover for simple installation



### Earthing fixed point with axis and double thread

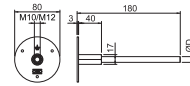


Type	Thread	Short-circuit current (50 Hz) (1 s; ≤300 °C)		Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
		kA	H/100				
<b>205 DG L180 FT</b>	M10/M12	4.9		H/100	10	23.900	<b>5420024</b>

St Steel

FT Hot-dip galvanised

- For connection to earthing systems, arresters and reinforcements
- Contact plate: Ø 80 mm made of stainless steel, rustproof (V4A)
- Clamping bolt Ø 10 mm
- Incl. plastic cover for simple installation



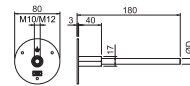
### Earthing fixed point with axis and double thread



Type	Thread	Short-circuit current (50 Hz) (1 s; ≤300 °C)		Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
		kA	H/100				
<b>205 DG L180 V4A</b>	M10/M12	3.3		H/100	10	23.900	<b>5420022</b>

A4 Stainless steel, rustproof 1.4404

- For connection to earthing systems, arresters and reinforcements
- Contact plate: Ø 80 mm made of stainless steel, rustproof (V4A)
- Clamping bolt Ø 10 mm
- Incl. plastic cover for simple installation



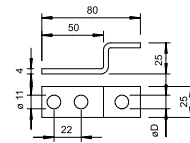
### Connection and end piece

Type	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.

St Steel

FT Hot-dip galvanised

- For attaching to steel structures or bolting to fixed earthing terminals
- For attachments: Round conductor Rd 8-10 and flat conductor FL 30 x 3.5
- 2 attaching holes Ø 11 mm
- 1 attaching holes Ø D mm

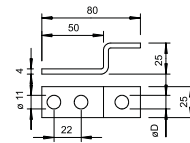


### Connection and end piece

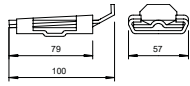
Type	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>5011 VA M12</b>	13	10	7.048	<b>5334942</b>

A4 Stainless steel, rustproof 1.4571

- For attaching to steel structures or bolting to fixed earthing terminals
- For attachments: Round conductor Rd 8-10 and flat conductor FL 30 x 3.5
- 2 attaching holes Ø 11 mm
- 1 attaching holes Ø D mm



## Wedge connector



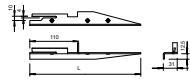
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1813 DIN</b>	10/FL30 x FL30	H/100	5	21.144	<b>5014212</b>

**St** Steel

**FT** Hot-dip galvanised

- DIN 48834, Form A
- Suitable for connecting Rd 10 x FL 30, FL 30 x FL 30
- Quick installation with high contact force

## Spacer



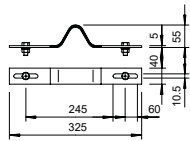
Type	Fit mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1811</b>	10/FL30 x 3,5	250	25	19.000	<b>5014018</b>
<b>1811 L</b>	10/FL30 x 3,5	400	25	31.500	<b>5014026</b>

**St** Steel

**FT** Hot-dip galvanised

- For professional laying of round conductors and flat conductors according to DIN VDE 0185-305 (IEC 62305)
- DIN 48833
- Suitable for mounting round conductors Rd 10 or flat conductors FL 30 x 3.5

## Expansion piece

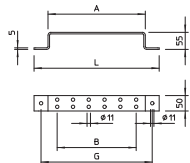


Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>1807</b>	1	27.000	<b>5016142</b>

**Alu** Aluminium

- For expansion joints, for a connection of the foundation earth electrode outside the concrete
- To VDE 0185-561-2 (IEC 62561-2)
- 2 hexagonal nuts M10 x 30, 2 steel washers, hot galvanised and 2 serrated washers made of rustproof steel

## Earthing connection bar



Type	Dimen- sion L mm	Dimen- sion A mm	Dimen- sion B mm	Dimen- sion G mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1805 2 FT</b>	200	110	51	155	1	54.800	<b>5016029</b>
<b>1805 4 FT</b>	302	212	153	257	1	77.000	<b>5016037</b>
<b>1805 6 FT</b>	404	314	255	359	1	97.100	<b>5016045</b>

**St** Steel

**FT** Hot-dip galvanised

1805/...: For connecting different earthing systems

- With 2 mounting holes Ø 11 mm
- 1805/2: With 4 attaching holes
- 1805/4: With 8 attaching holes
- 1805/6: With 12 attaching holes





### Earthing connection bar

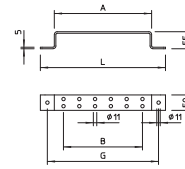


Type	Dimension L mm	Dimension A mm	Dimension B mm	Dimension G mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1805 2 VA</b>	200	110	51	155	1	54.800	<b>5016096</b>
<b>1805 4 VA</b>	302	212	153	257	1	77.000	<b>5016118</b>
<b>1805 6 VA</b>	404	314	255	359	1	97.100	<b>5016126</b>

A4 Stainless steel, rustproof 1.4571

1805/...: For connecting different earthing systems

- With 2 mounting holes  $\varnothing$  11 mm
- 1805/2: With 4 attaching holes
- 1805/4: With 8 attaching holes
- 1805/6: With 12 attaching holes



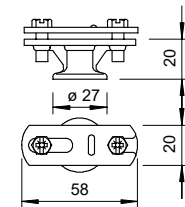
### Cable bracket for flat conductor

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>113 BZ-FL</b>	100	6.280	<b>5230446</b>
<b>113 B-Z-HD-FL</b>	100	7.000	<b>5230462</b>

Zn Die-cast zinc

G Electrogalvanised

- With female thread M8 or through hole for wood screws
- For flat conductor FL 30
- Sliding over-piece for quick installation



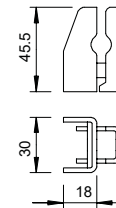
### Cable bracket for Rd 8–10 and FL 30

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>835</b>	Rd 8/10/ FL 30x3,5	1	8.907	<b>5033209</b>

St Steel

FT Hot-dip galvanised

- For round conductor Rd 8-10 and flat conductor FL 30 x 3.5
- Supplied with hexagonal wood bolt 6 x 70 and straddling dowel 910/N

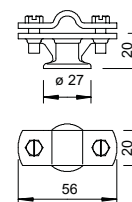


### Cable bracket with Cu crossbar Rd 8–10 mm

Type	Material	Surface	Pack Piece	Weight kg/100 pc.	Item no.
<b>113 B-Z16</b>	Zn	VZ	100	6.000	<b>5412706</b>

Zn Die-cast zinc

VZ Galvanised



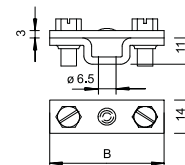
### Spacer clip for flat conductor with fastening hole $\varnothing$ 6.5

Type	Fit mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>831 30</b>	max. FL30	54	25	3.580	<b>5032032</b>
<b>831 40</b>	max. 40 mm flach	65	25	3.894	<b>5032040</b>

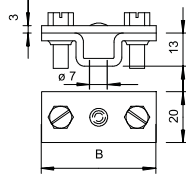
St Steel

FT Hot-dip galvanised

- Fit: FL 30 and FL 40
- With mounting hole  $\varnothing$  6.5 and 2 hexagonal bolts M6 x 16 (F)



### Spacer clip for flat conductor, with fastening hole Ø 7



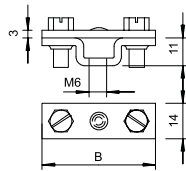
Type	Fit mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>832 30</b>	max. FL30	55	25	7.416	<b>5032539</b>
<b>832 40</b>	max. FL40	65	25	7.612	<b>5032547</b>

SI Steel

FI Hot-dip galvanised

- Fit: FL 30 and FL 40
- With mounting hole Ø 7 mm and 2 hexagonal bolts M6 x 16

### Spacer clip for flat conductor, with threaded connection M6



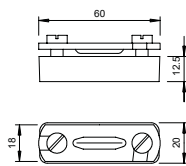
Type	Fit mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>831 30 M6</b>	max. FL30	54	25	3.712	<b>5032237</b>
<b>831 40 M6</b>	max. FL40	65	25	3.880	<b>5032245</b>

SI Steel

FI Hot-dip galvanised

- Fit: FL 30 and FL 40
- With attaching thread M6 and 2 hexagonal bolts M6 x 16 (F)

### Spacer clip for flat conductor, with polyamide base



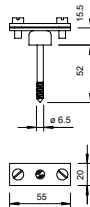
Type	Fit mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>833 35</b>	max. FL30	60	25	4.228	<b>5033039</b>

SI Steel

FI Hot-dip galvanised

- Fit: FL 30
- With mounting hole 6.2 x 22 mm
- With 2 cylinder bolts M6 x 16 and over-piece from hot-dip galvanised steel
- Bottom section from polyamide, black

### Spacer clip for flat conductor, with wood screw and spacer



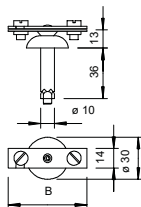
Type	Fit mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>370 H</b>	max. FL30	55	100	10.200	<b>5025206</b>

SI Steel

FI Hot-dip galvanised

- Fit: FL 30
- With spacer and cylinder bolts M6 x 16 (G)
- With wood bolts

### Spacer clip for flat conductor, with steel spreading anchor Ø 10



Type	Fit mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>710 30</b>	max. FL30	52	25	5.044	<b>5028035</b>
<b>710 40</b>	max. FL40	62	25	5.360	<b>5028043</b>

SI Steel

G Electrogalvanised

- Fit: FL 30 and FL 40
- With steel straddling dowel Ø 10 mm, spacer and 2 cylinder bolts M5 x 14 (G)

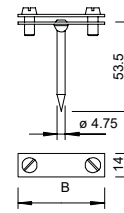
### Spacer clip for flat conductor, with square pin

Type	Fit mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>708 30 SP</b>	max. FL30	52	50	3.148	<b>5030021</b>

**St** Steel

**G** Electrogalvanised

- Fit: FL 30 and FL 40
- With 2 cylinder bolts M5 x 12 (G) and over-piece
- With square pin



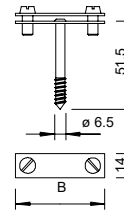
### Spacer clip for flat conductor, with wood screw

Type	Fit mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>708 30 HG</b>	max. FL30	52	50	3.148	<b>5030234</b>
<b>708 40 HG</b>	max. FL40	62	50	2.827	<b>5030242</b>

**St** Steel

**G** Electrogalvanised

- Fit: FL 30 and FL 40
- With 2 cylinder bolts M5 x 12 (G) and over-piece
- With wood screw



### Connection clip

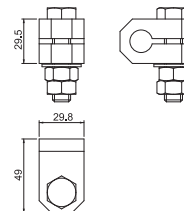


For  
earth  
rods

Type	Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>2760 16</b>	14.2	5	35.000	<b>5001601</b>

**CuSn** Red bronze

- For the connection of conductor materials with conductor shoes to earth rod 219 16 CU

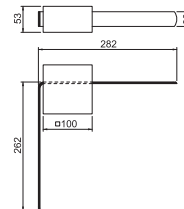


### Expansion strip for foundation earth electrode systems

Type	Dimension W x H mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1807 DB</b>	30x3,5	1	40.000	<b>5016160</b>

**A2** Stainless steel, rustproof 1.4301

- Expansion strip according to VDE 0185-561-2 (IEC 62561-2)
- To pass the foundation earther through movement joints



### Holders and accessories

### Earthing enhancing compound

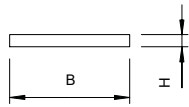


Type	Dimension	Pack Piece	Weight kg/100 pc.	Item no.
<b>OEC 25</b>	25kg	1	2,500.000	<b>5009200</b>

- To improve and maintain a constant earth electrode resistance
- Highly swellable and powdery special clay
- Tested according to IEC 62561-7 (VDE 0185-561-7)



## Corrosion protection strip

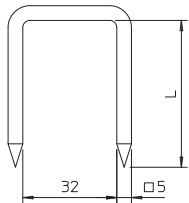


Type	Width Length		Pack Piece	Weight kg/100 pc.	Item no.
	mm	m			
<b>356 50</b>	50	10	1	71.500	<b>2360055</b>
<b>356 100</b>	100	10	1	122.200	<b>2360101</b>

**PETRO** Petrolatum

- Approx. 1.1 mm thick
- Width: 50 mm or 100 mm, made of petrolatum-coated chemical fibre fabric
- Can be processed cold

## Strip steel crimp



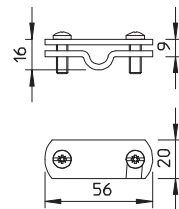
Type	Length Fit		Pack Piece	Weight kg/100 pc.	Item no.
	mm	mm			
<b>366 35</b>	35	max. FL30	100	1.737	<b>5059356</b>
<b>366 50</b>	50	max. FL30	100	2.300	<b>5059496</b>

**St** Steel

**FT** Hot-dip galvanised

- Fit: FL 30

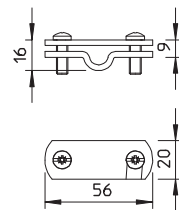
## Number plates



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>311 N-ALU 16</b>	RD 16 - FL30	5	2.800	<b>3049345</b>

- To identify the point of separation to DIN 48821
- Suitable for universal labelling (e.g. stamped numbers)

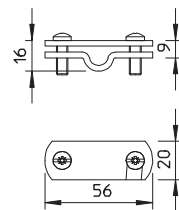
## Number plates



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>311 N-VA 16</b>	RD 16 - FL30	5	6.400	<b>3049329</b>

- To identify the point of separation to DIN 48821
- Suitable for universal labelling (e.g. stamped numbers)

## Number plates

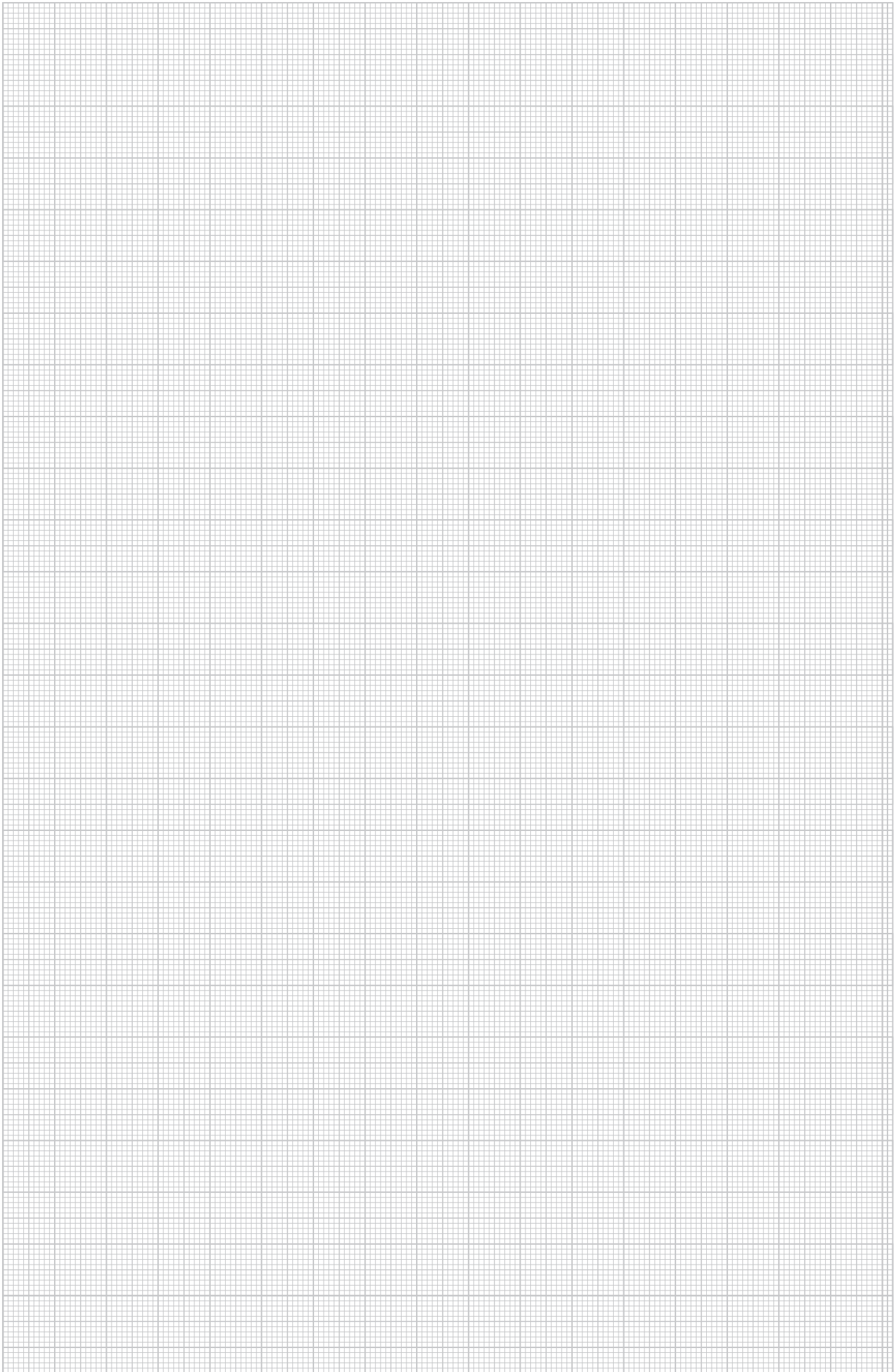


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

**Cu** Copper







- To identify the point of separation to DIN 48821
- Suitable for universal labelling (e.g. stamped numbers)





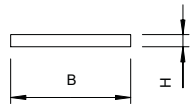


## Air-termination and down-conductor systems

	<b>Conductor material</b>	408
	<b>Air-termination systems</b>	411
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	<b>Roof conductor holder</b>	422
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	<b>Connection and separating terminals</b>	465
	<b>Earth entries</b>	468
	<b>Accessories</b>	470



## Galvanised steel flat conductor for earth



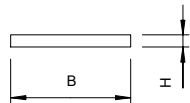
Type	Dimension W x H mm	Cross- section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
5052 DIN 20X2.5	20 x 2,5	50	122	50	122	41.000	5019340
5052 DIN 25X3	25 x 3	75	84	50	84	59.700	5019342
5052 DIN 30X3	30 x 3	90	71	50	71	70.650	5019344
5052 DIN 30X3.5	30 x 3,5	105	30	25	30	84.000	5019345
5052 DIN 30X3.5	30 x 3,5	105	60	50	60	84.000	5019347
5052 DIN 30X4	30 x 4	120	52	50	52	97.000	5019350
5052 DIN 40X4	40 x 4	160	40	51	40	128.000	5019355
5052 DIN 40X5	40 x 5	200	30	50	30	162.000	5019360

St Steel

FT Hot-dip galvanised

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Meets the requirements of VDE 0185-305 (IEC 62305)
- Zinc coating:  $\geq 500 \text{ g/m}^2$  (approx.  $70 \mu\text{m}$  in mean value)
- For lightning protection, earthing systems and ring equipotential bonding

## Stainless steel flat conductor



Type	Dimension W x H mm	Cross- section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
5052 V2A 30X3.5	30 x 3,5	105	50	42	50	82.500	5018501
5052 V4A 30X3.5	30 x 3,5	105	50	42	50	82.425	5018706
5052 V4A 30X3.5	30 x 3,5	105	25	21	25	82.425	5018730

A2 Stainless steel, rustproof 1.4301

A4 Stainless steel, rustproof 1.4571/1.4404

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- According to the foundation earther standard DIN 18014, V4A is required in the earth
- For use in areas at risk of corrosion
- For lightning protection, earthing systems and ring equipotential bonding

## Flat conductor, copper

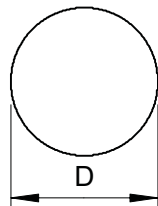


Type	Dimension W x H mm	Cross- section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
FL 25-CU	25 x 3	75	50	33	50	67.000	5021830

Cu Copper

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Meets the requirements of VDE 0185-305 (IEC 62305)
- For lightning protection, earthing systems and ring equipotential bonding

## Round conductor, galvanised steel



Type	Nominal size $\varnothing$ mm	Cross- section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
RD 8-FT	8	50	125	50	125	40.000	5021081
RD 10	10	78	80	50	80	63.000	5021103

St Steel

FT Hot-dip galvanised

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 10 can also be used in the earth
- Zinc coating:  $\geq 350 \text{ g/m}^2$  (approx.  $50 \mu\text{m}$  in mean value)



## Round conductor, galvanised steel with PVC jacketing

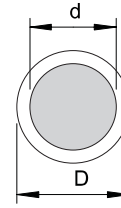


Type	Colour	Dimension d mm	Dimension D mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 10-PVC</b>	Black	10	13	78	75	50	75	67.000	5021162

St Steel

FT Hot-dip galvanised

- Corresponds to the requirements according to VDE 0185-305 (IEC 62305)
- Zinc coating: ≥ 350 g/m<sup>2</sup> (approx. 50 µm in mean value)
- With PVC jacketing



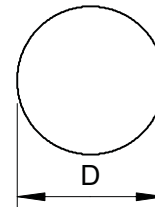
## Round conductor, aluminium



Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-ALU</b>	8	50	150	20	150	13.500	5021286
<b>RD 8-ALU-T</b>	8	50	150	20	150	13.500	5021294
<b>RD 10-ALU</b>	10	78	95	20	95	21.000	5021308

Alu Aluminium

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 8 ALU: Semi-hard (E-AlMgSi0.5 corresponds to DIN 48801)
- RD 8 ALU-T: Can be subjected to torsion (E-AlMgSi0.5 corresponds to DIN 48801)
- RD 10 ALU: Pure aluminium (E-Al corresponds to DIN 48801)
- AL and ALMgSi may not be routed directly on, in or under plaster, mortar or concrete, nor routed in the earth



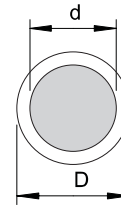
## Round conductor, aluminium, with PVC sheathing



Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-PVC</b>	8/11	50	100	20	100	20.000	5021332

Alu Aluminium

- Meets the requirements of VDE 0185-305 (IEC 62305)
- With PVC jacketing (halogen-free)
- Suitable for routing on, in or under plasterwork, mortar or concrete



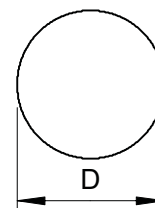
## Round conductor, stainless steel A2



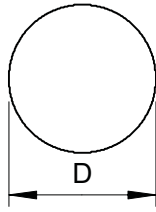
Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-V2A</b>	8	50	125	50	125	40.000	5021235
<b>RD 10-V2A</b>	10	78	80	50	80	63.000	5021239
<b>RD 10-V2A</b>	10	78	50	32	50	63.000	5021227

A2 Stainless steel, rustproof 1.4301

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 10-V4A for applications in the earth
- According to the foundation earthing standard DIN 18014, V4A is required in the earth



### Round conductor, stainless steel A4

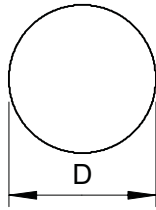


Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-V4A</b>	8	50	125	50	125	40.000	<b>5021644</b>
<b>RD 10-V4A 20</b>	10	78	20	12	20	63.000	<b>5021640</b>
<b>RD 10-V4A</b>	10	78	80	50	80	63.000	<b>5021647</b>
<b>RD 10-V4A</b>	10	78	50	32	50	63.000	<b>5021642</b>

A4 Stainless steel, rustproof 1.4571/1.4404

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 10-V4A for applications in the earth
- According to the foundation earther standard DIN 18014, V4A is required in the earth

### Round conductor, copper sheathed

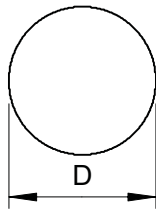


Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Pack m	Weight kg/100 m	Item no.
<b>RD 8-ST CU</b>	8	50	100	40.000	<b>5021380</b>

**St** Steel  
**Cu** Copper-plated

- According to IEC/ EN 62561-2 (VDE 0185-561-2)
- Meets the requirements of VDE 0185-305 (IEC 62305)
- Copper layer thickness: Min. 250 µm

### Round conductor, copper

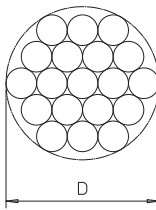


Type	Nominal size Ø mm	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
<b>RD 8-CU</b>	8	50	100	45	100	45.000	<b>5021480</b>
<b>RD 8-CU 25</b>	8	50	55	25	55	45.000	<b>5021484</b>
<b>RD 10-CU</b>	10	78	50	35	50	70.000	<b>5021502</b>

**Cu** Copper

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

### Copper cable

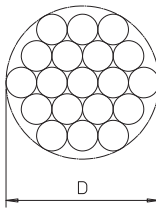


Type	Dimension D mm	Individual wires	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Weight kg/100 m	Item no.
<b>S 11-CU</b>	10.5	19x Ø 2,1	70	50	30	58.600	<b>5021654</b>
<b>S 9-CU</b>	9	19x Ø 1,8	50	100	45	45.000	<b>5021652</b>

**Cu** Copper

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

### Copper cable Tin-plated



Type	Dimension D mm	Individual wires	Cross-section mm <sup>2</sup>	Normal ring ca. m	Normal ring ca. kg	Weight kg/100 m	Item no.
<b>S-11-CU SN</b>	10.5	19x Ø 2,1	70	50	30	58.600	<b>5021656</b>

**Cu** Copper  
**Sn** Tin-plated

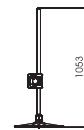
- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

## Stand for FangFix Junior system

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.

Alu Aluminium

- Incl. aluminium air-termination rod 1,000 mm long (Ø 10 mm)
- Quick mounting of the air-termination rod in the base using plug technology
- With Vario quick connector 249



## Air-termination rod for FangFix-Junior

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.

Alu Aluminium

- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Ø 10 mm, aluminium
- Without thread
- Suitable for use in FangFix-Junior

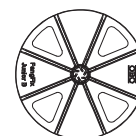
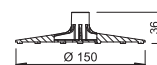


## Base for FangFix Junior

Type	Pack Piece	Weight kg/100 pc.	Item no.

PP Polypropylene

- For mounting Ø 10 mm air-termination rods up to an overall length of 1,000 mm
- Quick installation of air-termination rod in base using plug-in system
- Quick and easy installation



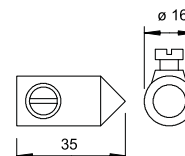
## Air-termination tip

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

Zn Die-cast zinc

G Electrogalvanised

- To be used for Rd 8–10 (corrosion protection)
- With cylinder bolt M6 x 10
- Made of die-cast zinc, bolts made of hot-galvanised steel

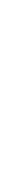
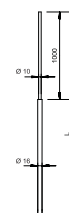


## Tapered pipe air-termination rod

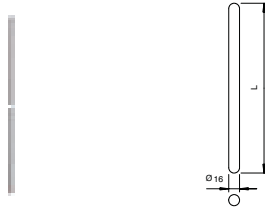
Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 VL2000</b>	2000	10/16	10	55.000	5401983
<b>101 VL2500</b>	2500	10/16	10	72.000	5401986
<b>101 VL3000</b>	3000	10/16	10	88.000	5401989
<b>101 VL3500</b>	3500	10/16	10	105.000	5401993
<b>101 VL4000</b>	4000	10/16	10	120.000	5401995

Alu Aluminium

- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- From a free length of > 2.5 m, an additional fastening, e.g. insulated spacer is recommended
- Last metre is tapered from Ø 16 mm to Ø 10 mm, material: AlMgSi
- Matches stand system FangFix



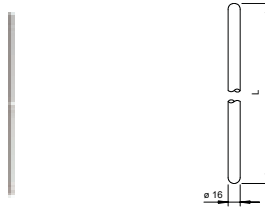
### Air-termination/earth entry rod, rounded-off on both ends



Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 A-1500</b>	1500	16	10	240.000	<b>5400155</b>

- St** Steel
- FI** Hot-dip galvanised
- Full material Ø 16 mm
- Rounded on both ends
- Suitable for FangFix stand system

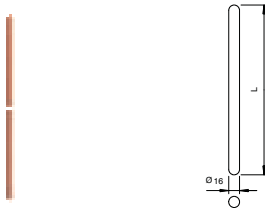
### Air-termination/earth entry rod, rounded-off on both ends



Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>200 V4A-1500</b>	1500	16	10	242.000	<b>5420504</b>
<b>200 V4A-2000</b>	2000	16	10	320.000	<b>5420539</b>

- A4** Stainless steel, rustproof 1.4571
- Full material Ø 16 mm
- Both ends rounded

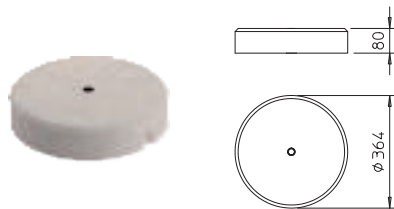
### Air-termination/earth entry rod, rounded-off on both ends



Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 A-CU</b>	1500	16	10	272.100	<b>5400627</b>

- Cu** Copper
- Full material Ø 16 mm
- Both ends rounded

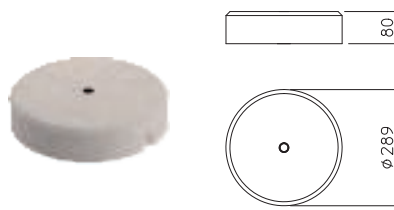
### Concrete base for FangFix system, min. 16 kg



Type	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>F-FIX-S16</b>	365	1	1,700.000	<b>5403227</b>

- BET** Concrete
- Min. 16 kg block of Ø 365 mm, high level of stability
- Frost-resistant concrete
- Stackable

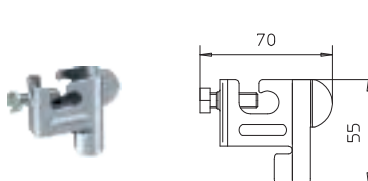
### Concrete base for FangFix system, min. 10 kg



Type	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>F-FIX-S10</b>	289	1	1,000.000	<b>5403117</b>

- BET** Concrete
- Min. 10 kg block of Ø 289 mm, high level of stability
- Frost-resistant concrete
- Stackable

### Terminal for FangFix system



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>F-FIX-KL</b>	Rd 8	5	8.700	<b>5403219</b>

- A2** Stainless steel, rustproof 1.4301
- FangFix terminal, VA for RD 8 mm
- Tested with H (100 kA) to DIN EN 50164-1
- Round conductor installed on the air-termination rod with only one screw

## Air-termination rod, one end rounded, M16 thread

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 ALU-1000	1000	16	10	55.000	5401771
101 ALU-1500	1500	16	10	81.000	5401801
101 ALU-2000	2000	16	10	109.000	5401836
101 ALU-2500	2500	16	10	136.000	5401852
101 ALU-3000	3000	16	5	162.000	5401879

Alu Aluminium

- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- From a free length of > 2.5 m, an additional fastening, e.g. insulated spacer is recommended
- Ø 16 mm, aluminium
- For stand system with M16 internal thread



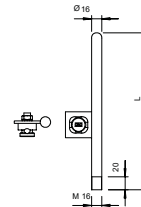
## Air-termination rod, one end rounded, M16 thread

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 A-L100	1000	16	10	160.000	5402808
101 A-L150	1500	16	10	240.000	5402859

St Steel

FT Hot-dip galvanised

- With thread M16 x 20
- With connecting strap
- Including pre-mounted connector type 5001 DIN for round conductor Rd 8-10
- For stands with female thread M16

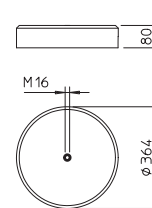


## Concrete base min. 16 kg with female thread

Type	Nominal size Ø mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
101 B2-16 M16	364	M16	1	1,600.000	5402958

BET Concrete

- Weight min. 16 kg
- Frost-resistant concrete
- Female thread M16
- Recommended air-termination rod length max. 3.0 m, depending on wind load zone

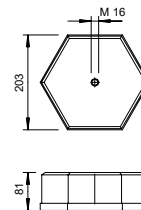


## Stand 6.9 kg with female thread

Type	Thread	Pack Piece	Weight kg/100 pc.	Item no.
101 ST   M16	M16	4	690.000	5402891

BET Concrete

- Weight 6.9 kg
- Frost-resistant concrete
- Female thread M16
- Recommended air-termination rod length max. 1.0 m



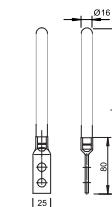
## Air-termination/earth entry rod with connection tabs

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 F1000	1000	16	10	160.000	5424100
101 F1500	1500	16	10	240.000	5424151
101 F2000	2000	16	10	320.000	5424208

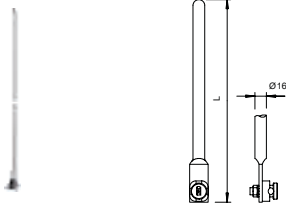
St Steel

FT Hot-dip galvanised

- With 2 attaching holes Ø 12 mm
- One end rounded



### Air-termination/earth entry rod with connection tabs and connector



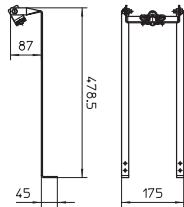
Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 G1000	1000	16	10	164.300	5402107
101 G1500	1500	16	10	240.000	5402158

SI Steel

FI Hot-dip galvanised

- 1 attaching hole Ø 12 mm
- With pre-mounted conductor for Rd 8-10
- One end rounded

### Air-termination rod holder for sloping roof



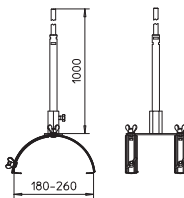
Type	Pack Piece	Weight kg/100 pc.	Item no.
SD-Fix	1	81.000	5403335

A2 Stainless steel, rustproof 1.4301

Stand system: rod holder for sloping roofs, for simple, quick and secure fastening of Ø 16 mm air-termination rods.

- System consists of a bracket made of V2A stainless steel
- Quick and easy mounting
- Adjustable angle
- In the case of high air-termination rods (> 1 m), additional fastening with insulated spaces is necessary

### Air-termination rod holder for ridge tiles



Type	Dimen- sion L mm	Pack Piece	Weight kg/100 pc.	Item no.
F-FIX-132	110	1	62.000	5403330
F-Fix-132-300	300	1	78.000	5403333

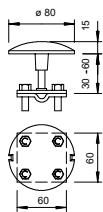
A2 Stainless steel, rustproof 1.4301

Rod holder for ridge tiles, for simple, quick and safe fastening of Ø 16 mm air-termination rods

- System consisting of holder made of V2A stainless steel and aluminium air-termination rods
- Quick and easy mounting thanks to pre-mounted air-termination rod
- Air-termination rod length: 1,000 mm
- Width adjustable between 180–260 mm
- Spacing of the ridge holders: 110 mm (5403330)
- Spacing of the ridge holders: 300 mm (5403333)

Application: To protect roof structures such as photovoltaic and TV/SAT systems.

### Mushroom-shaped air-termination with connectors



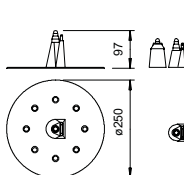
Type	Fit mm	Dimen- sion D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
128 F	Rd 8-10/ FL30	80	5	40.000	5405769

SI Steel

FI Hot-dip galvanised

- Mushroom-shaped air-termination from aluminium
- With pre-mounted cross-piece and hexagonal bolt M8 x 25, hot-dip galvanised steel
- For round conductor Rd 8-10 and flat conductor FL 30

### Roof penetration



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
330 K	Rd 8-16/ FL20 u. FL30	5	14.400	5201101

PA Polyamide

- For round conductors 8-10, air-termination rods 16 mm
- Flat conductors 20 mm/30 mm
- Colour: Black, UV-resistant
- For penetration and sealing of roofs

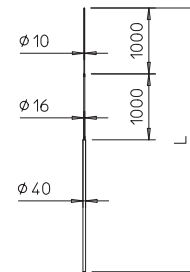
## isFang air-termination rod

Type	Dimension B mm	Dimension D mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 3B-4000</b>	2000	1000	4000	1	400.000	<b>5402864</b>
<b>101 3B-4500</b>	2500	1000	4500	1	480.000	<b>5402866</b>
<b>101 3B-5000</b>	3000	1000	5000	1	550.000	<b>5402868</b>
<b>101 3B-5500</b>	3000	1500	5500	1	630.000	<b>5402870</b>
<b>101 3B-6000</b>	4000	1000	6000	1	700.000	<b>5402872</b>
<b>101 3B-6500</b>	4500	1000	6500	1	780.000	<b>5402874</b>
<b>101 3B-7000</b>	5000	1000	7000	1	850.000	<b>5402876</b>
<b>101 3B-7500</b>	5500	1000	7500	1	930.000	<b>5402878</b>
<b>101 3B-8000</b>	5500	1000	8000	1	1,000.000	<b>5402880</b>

**Alu** Aluminium

- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Tapered air-termination rod
- Suitable for 40 mm isFang tripod stand and isFang support systems

Dimensions



## Insulated air-termination rod

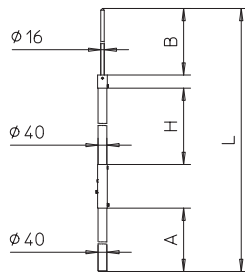


Type	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang 4000 AL</b>	1240	1500	1000	4000	1	580.000	<b>5408943</b>
<b>isFang 6000 AL</b>	3340	1500	1000	6000	1	600.000	<b>5408947</b>
<b>isFang 4000</b>	1240	1500	1000	4000	1	680.000	<b>5408942</b>
<b>isFang 6000</b>	3340	1500	1000	6000	1	680.000	<b>5408946</b>

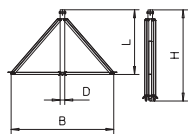
**GFK** Fibre-glass-reinforced plastic

- For isolated creation of air-termination systems
- Suitable for isFang air-termination rod stands, type isFang 3B-100/150
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- For installation on the building structure with isFang support
- Fastening of the OBO isCon® conductor possible using accessories
- Suitable for externally routed isCon® conductors

### Dimensions



## isFang tripod



Type	Dimension B mm	Dimension D Ø mm	Dimension L mm	Dimension H mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang 3B-100 AL</b>	1000	40	600	885	1	380.000	<b>5408966</b>
<b>isFang 3B-150 AL</b>	1500	40	900	1275	1	560.000	<b>5408967</b>
<b>isFang 3B-100</b>	1000	40	600	885	1	620.000	<b>5408968</b>
<b>isFang 3B-150</b>	1500	40	900	1275	1	950.000	<b>5408969</b>

**A2** Stainless steel, rustproof 1.4301 **Alu** Aluminium

- Installation of free-standing air-termination rods as well as insulated air-termination rods with 40 mm diameter
- Roof slope to max. 5 degrees
- Incl. Rd 8–10 crossbar for quick round conductor fastening
- Concrete bases as well as threaded rods should be ordered separately





## Insulated air-termination rod for inner-routed isCon conductor with side exit



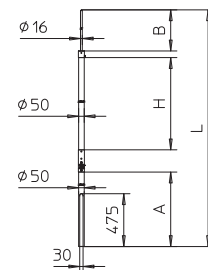
Type	Dimension D Ø mm	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang IN-A 4000</b>	50	1325	1500	1000	4000	1	535.000	<b>5408938</b>
<b>isFang IN-A 6000</b>	50	3325	1500	1000	6000	1	835.000	<b>5408940</b>
<b>isFang IN-A 8000</b>	50	5335	1500	1000	8000	1	1,385.000	<b>5408888</b>
<b>isFang IN-A10000</b>	50	6000	1733	2000	10000	1	1,540.000	<b>5408890</b>

**GFK** Fibre-glass-reinforced plastic

- For installation of the OBO isCon® Pro+ conductor in the pipe
- With side conductor outlet matching isFang air-termination rod stand with side outlet, type isFang 3B-A
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Inclusive connection element (type isCon IN connect)
- Inclusive potential connection (type isCon In PAE)



### Dimensions



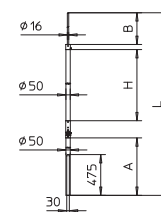
## Insulated air-termination rod for inner-routed isCon® conductor



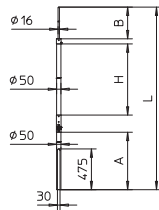
Type	Dimension D Ø mm	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang IN L4</b>	50	1325	1500	1000	4000	1	535.741	<b>5408854</b>
<b>isFang IN L6</b>	50	3325	1500	1000	6000	1	835.741	<b>5408856</b>
<b>isFang IN L8</b>	50	5335	1500	1000	8000	1	1,315.741	<b>5408858</b>
<b>isFang IN L10</b>	50	6000	1733	2000	10000	1	1,540.741	<b>5408860</b>

**GFK** Fibre-glass-reinforced plastic

- For routing OBO isCon® conductors in pipes
- For installation on the building structure with isFang support
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Tested according to VDE V 0185-561-8 (IEC TS 62561-8)



## Insulated air-termination rod for inner-routed isCon® conductor with side exit

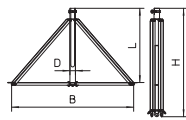


Type	Dimension D Ø mm	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang IN-A L4</b>	50	1325	1500	1000	4000	1	535.000	<b>5408874</b>
<b>isFang IN-A L6</b>	50	3325	1500	1000	6000	1	835.741	<b>5408876</b>
<b>isFang IN-A L8</b>	50	5335	1500	1000	8000	1	1,385.741	<b>5408878</b>
<b>isFang IN-A L10</b>	50	6000	1733	2000	10000	1	1,540.741	<b>5408880</b>

**GFK** Fibre-glass-reinforced plastic

- For routing OBO isCon® conductors in pipes
- For mounting on the building structure with isFang support
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Tested according to VDE V 0185-561-8 (IEC TS 62561-8)

## isFang tripod with side outlet

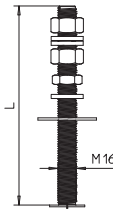


Type	Dimension B mm	Dimension D Ø mm	Dimension L mm	Dimension H mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang 3B-100-A</b>	1026	50	600	885	1	610.000	<b>5408930</b>
<b>isFang 3B-150-A</b>	1500	50	900	1275	1	950.000	<b>5408932</b>
<b>isFang 3B-250-A</b>	2900	50	1450	2055	1	2,500.000	<b>5408902</b>

**A2** Stainless steel, rustproof 1.4301

- Screwless installation of freestanding air-termination rods as well as insulated air-termination rods with 50 mm diameter
- E.g. for internal OBO isCon® conductor
- Roof slope to max. 5 degrees
- Incl. Rd 8–10 crossbar for quick round conductor fastening
- Concrete plinths as well as threaded rods should be ordered separately

## isFang-3B threaded rod

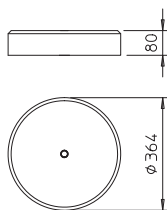


Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang 3B-G1</b>	270	3	48.000	<b>5408971</b>
<b>isFang 3B-G2</b>	340	3	60.400	<b>5408972</b>
<b>isFang 3B-G3</b>	430	3	69.500	<b>5408973</b>
<b>isFang 3B-G4</b>	500	3	75.000	<b>5408905</b>

**A2** Stainless steel, rustproof 1.4301

- For fastening on one, two, three or four FangFix concrete bases with tripod stand

## Concrete base for FangFix system, min. 16 kg

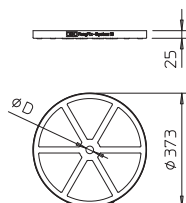


Type	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>F-FIX-S16</b>	365	1	1,700.000	<b>5403227</b>

**BET** Concrete

- Min. 16 kg block of Ø 365 mm, high level of stability
- Frost-resistant concrete
- Stackable

## Base for FangFix system 16 kg for mounting the isFang tripod



Type	Nominal size Ø mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>F-FIX-B16 3B</b>	373	25	10	15.800	<b>5403238</b>

**PP** Polypropylene

- Edge protection with through hole
- For mounting isFang-3B threaded rod and FangFix concrete block F-FIX-S16

## isFang, insulated air-termination rod for inner-routed isCon® conductor Professional Plus



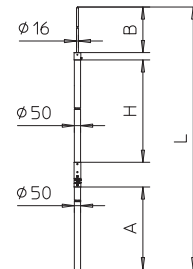
Type	Dimension D Ø mm	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang IN 4000</b>	50	1325	1500	1000	4000	1	535.000	<b>5408934</b>
<b>isFang IN 6000</b>	50	3325	1500	1000	6000	1	835.000	<b>5408936</b>
<b>isFang IN 8000</b>	50	5335	1500	1000	8000	1	1,315.000	<b>5408868</b>
<b>isFang IN 10000</b>	50	6000	1733	2000	10000	1	1,540.000	<b>5408870</b>

**GFK** Fibre-glass-reinforced plastic

- For installation of the OBO isCon® Pro+ conductor in the pipe
- For mounting on the building structure with isFang support
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Inclusive connection element (type isCon IN connect)
- Inclusive potential connection (type IsCon In PAE)



### Dimensions

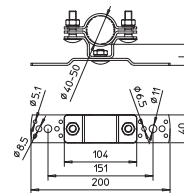


## isFang support for wall mounting, 30 mm spacing

Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TW30</b>	30	2	62.000	<b>5408952</b>

**A2** Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or on the wall.

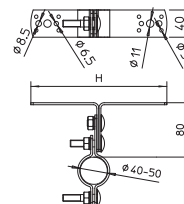


## isFang support for wall mounting, 80 mm spacing

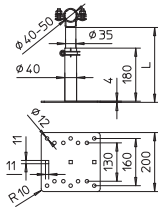
Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TW80</b>	80	2	63.000	<b>5408950</b>

**A2** Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or on the wall.



### isFang support for wall mounting, 200–300 mm spacing

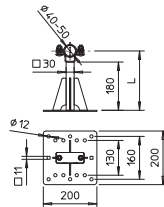


Type	Dimension D mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TW200</b>	300		2	230.000	<b>5408954</b>

A2 Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or on the wall.

### Support for wall mounting, 200 mm spacing

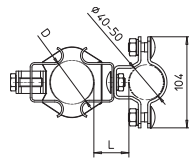


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TW200 12</b>	50	200	2	240.000	<b>5408910</b>

A2 Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or on the wall.

### isFang support for pipe mounting, $\phi$ 50–300 mm

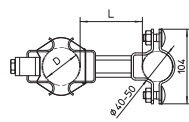


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TR100</b>	300	40	2	77.000	<b>5408956</b>

A2 Stainless steel, rustproof 1.4301

Tightening strap clip to fasten the insulated support pipes on the structure to be protected or for construction-side pipes of  $\phi$  50–300mm.

### isFang support for spaced pipe mounting, $\phi$ 50–300 mm

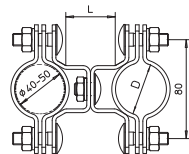


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TR100 100</b>	300	100	2	95.500	<b>5408955</b>
<b>isFang TR100 200</b>	300	200	2	121.000	<b>5408957</b>
<b>isFang TR100 300</b>	300	300	2	146.000	<b>5408959</b>

A2 Stainless steel, rustproof 1.4301

Tightening strap clip to fasten the insulated support pipes on the structure to be protected or for construction-side pipes of  $\phi$  50–300 mm.

### isFang support for pipe mounting, $\phi$ 40–50 mm

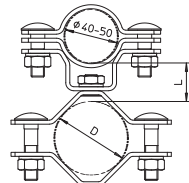


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TS40-50</b>	50	40	2	90.000	<b>5408958</b>

A2 Stainless steel, rustproof 1.4301

Tightening strap clip to fasten the insulated support pipes on the structure to be protected or for construction-side pipes of  $\phi$  40–50 mm.

### isFang support for pipe mounting, $\phi$ 50–60 mm



Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TS50-60</b>	60	30	2	76.000	<b>5408960</b>

A2 Stainless steel, rustproof 1.4301

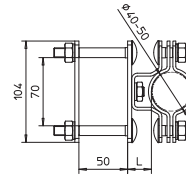
Tightening strap clip to fasten the insulated support pipes on the structure to be protected or for construction-side pipes of  $\phi$  50–60 mm.

## isFang support for corner pipe mounting, 50 x 50 mm

Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TS50x50</b>	30	2	82.000	<b>5408964</b>

A2 Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or for construction-side corner pipes of 50x50 mm.



## Tele air-termination rod systems irod

## 10 m air-termination rod with 6-legged air-termination rod stand

Type	Dimension D Ø mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>irod 10</b>	48.3	1800	10000	1	6,500.000	<b>5400810</b>

A2 Stainless steel, rustproof 1.4301

- Tele lightning protection system against direct lightning strikes into plants, such as biogas plants
- Consisting of air-termination rod and air-termination rod stand
- Please order concrete foot, edge protection and threaded rods separately

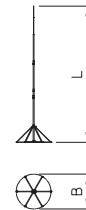


## 12 m air-termination rod with 6-legged air-termination rod stand

Type	Dimension D Ø mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>irod 12</b>	85	3000	12000	1	10,900.000	<b>5400812</b>

A2 Stainless steel, rustproof 1.4301

- Tele lightning protection system against direct lightning strikes into plants, such as biogas plants
- Consisting of air-termination rod and air-termination rod stand
- Please order concrete foot, edge protection and threaded rods separately



## 14 m air-termination rod with 8-legged air-termination rod stand

Type	Dimension D Ø mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>irod 14</b>	85	3200	14000	1	15,400.000	<b>5400814</b>

A2 Stainless steel, rustproof 1.4301

- Tele lightning protection system against direct lightning strikes into plants, such as biogas plants, gas pressure regulation plants, control and greenfield photovoltaic systems
- Consisting of air-termination rod and air-termination rod stand
- Please order concrete foot, edge protection and threaded rods separately



## 19 m air-termination rod with 12-legged air-termination rod stand

Type	Dimension D Ø mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>irod 19</b>	198	3400	19500	1	41,500.000	<b>5400817</b>

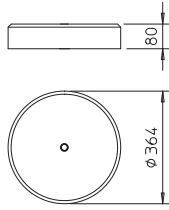
A2 Stainless steel, rustproof 1.4301

- Tele lightning protection system against direct lightning strikes into plants, such as biogas plants, gas-pressure regulation plants, control and greenfield photovoltaic systems
- Consisting of air-termination rod and air-termination rod stand
- Please order concrete foot and edge protection separately
- Including 800-mm threaded rods



## Tele air-termination rod systems irod

### Concrete base for FangFix system, min. 16 kg

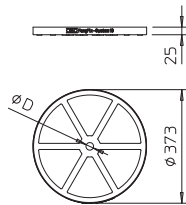


Type	Nominal size Ø mm	Pack		Weight kg/100 pc.	Item no.
		Piece	kg/100 pc.		
<b>F-FIX-S16</b>	365	1	1,700.000		<b>5403227</b>

**BET** Concrete

- Min. 16 kg block of Ø 365 mm, high level of stability
- Frost-resistant concrete
- Stackable

### Base for FangFix system 16 kg for mounting the isFang tripod



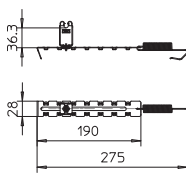
Type	Nominal size Ø mm	Dimension D Ø mm	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>F-FIX-B16 3B</b>	373	25	10	15.800		<b>5403238</b>

**PP** Polypropylene

- Edge protection with through hole
- For mounting isFang-3B threaded rod and FangFix concrete block F-FIX-S16

## Roof conductor holder, ridge

### Ridge conductor holder with tensioning spring

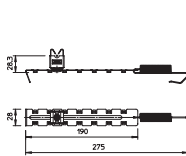


Type	Fit mm	Installation height mm	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>132 U 35</b>   RD 8	8	35	20	6.800		<b>5203018</b>

A2 Stainless steel, rustproof 1.4301

- For round conductor Rd 8
- Clamping range 280-380 mm

### Ridge conductor holder with tensioning spring

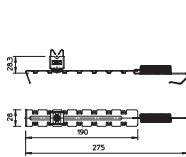


Type	Fit mm	Installation height mm	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>132 U</b>   RD 8	8	20	20	6.000		<b>5203015</b>

A2 Stainless steel, rustproof 1.4301

- For round conductor Rd 8
- Clamping range 280-380 mm

### Ridge conductor holder with tensioning spring



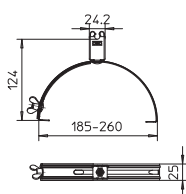
Type	Fit mm	Installation height mm	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>132 U-CU</b>   RD 8	8	20	10	0.600		<b>5203023</b>

A2 Stainless steel, rustproof 1.4301

**Cu** Copper-plated

- For round conductor Rd 8
- Clamping range 280-380 mm

### Roof conductor holder for ridge tiles, 185–260 mm, Rd 8



Type	Fit mm	Installation height mm	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>132 VA 35</b>   RD 8	8	35	20	13.700		<b>5202836</b>

A2 Stainless steel, rustproof 1.4301

- Adjustable width from 185-260 mm
- Fast installation using wing screw

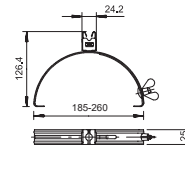


### Roof conductor holder for ridge tiles, 185–260 mm, Rd 8

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.

A2 Stainless steel, rustproof 1.4301

- Adjustable width from 185-260 mm
- Fast installation using wing screw

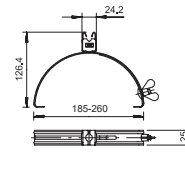


### Roof conductor holder for ridge tiles, 185–260 mm, Rd 8

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.

Cu Copper

- Adjustable width from 185-260 mm
- Fast installation using wing screw

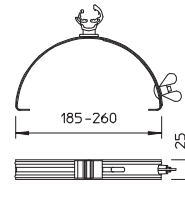


### Roof conductor holder for ridge tiles, 185–260 mm, Rd 8–10

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.

A2 Stainless steel, rustproof 1.4301

- Adjustable width from 185-260 mm
- Bottom part made of non-rusting stainless steel (V2A)
- Infinitely adjustable conductor holder
- Conductor holder of polyamide
- Fast installation using wing screw

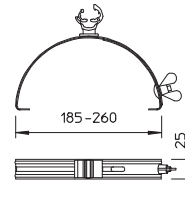


### Roof conductor holder for ridge tiles, 185–260 mm, Rd 8–10

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.

Cu Copper

- Adjustable width from 185-260 mm
- Bottom part made of copper
- Infinitely adjustable conductor holder
- Conductor holder of polyamide
- Fast installation using wing screw



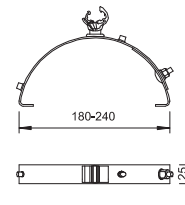
### Roof cable holder for ridge tiles, 180–240 mm, Rd 8–10

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.

St Steel

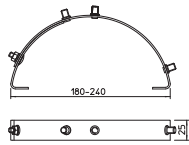
FT Hot-dip galvanised

- Adjustable from 180–240 mm
- With conductor 177/20, polyamide, grey
- With 3 M8 threaded nipples for positioning the holder



## Roof conductor holder, ridge

### Roof conductor holder for ridge tiles with M8 threaded bolts

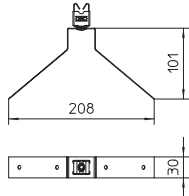


Type	Installation height mm	Pack	Weight	Item no.
		Piece	kg/100 pc.	
<b>132 GB-M8</b>	20	20	18.700	<b>5202568</b>

- St** Steel
- F1** Hot-dip galvanised

- Adjustable from 180–240 mm
- With conductor 177/20, polyamide, grey
- With 3 M8 threaded nipples for positioning the holder

### Roof conductor holder for ridge tiles, metal roofs, Rd 8



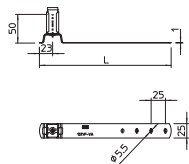
Type	Fit mm	Installation height mm	Pack	Weight	Item no.
			Piece	kg/100 pc.	
<b>132 P VA</b>	Rd 8	20	20	8.420	<b>5202510</b>

A2 Stainless steel, rustproof 1.4301

- For round conductors Rd 8
- Suitable for metal roofs

## Roof conductor holder, tiled roof

### Roof cable holder for tiled roofs, Rd 8

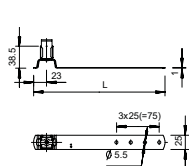


Type	Fit mm	Installation height mm	Length mm	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>157 F-VA 230 35</b>	Rd 8	50	230	20	8.300	<b>5215552</b>
<b>157 F-VA 280 35</b>	Rd 8	50	280	20	9.700	<b>5215582</b>

A2 Stainless steel, rustproof 1.4301

- Conductor holder from stainless steel (V2A)
- Including drill hole in bottom section for quick installation

### Roof cable holder for tiled roofs, Rd 8

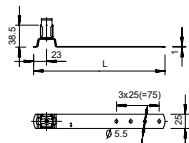


Type	Fit mm	Installation height mm	Length mm	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>157 F-VA 230</b>	Rd 8	38.5	230	20	8.350	<b>5215552</b>
<b>157 F-VA 280</b>	Rd 8	38.5	280	20	10.170	<b>5215579</b>
<b>157 F-VA 410</b>	Rd 8	38.5	410	20	14.880	<b>5215595</b>

A2 Stainless steel, rustproof 1.4301

- Conductor holder from stainless steel (V2A)
- Including drill hole in bottom section for quick installation

### Roof cable holder for tiled roofs, Rd 8



Type	Fit mm	Installation height mm	Length mm	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>157 F-CU 230</b>	Rd 8	38.5	230	10	10.300	<b>5216192</b>
<b>157 F-CU 280</b>	Rd 8	38.5	280	10	11.100	<b>5216206</b>
<b>157 F-CU 410</b>	Rd 8	38.5	410	10	14.500	<b>5216257</b>

**Cu** Copper

- Conductor holder from copper plated stainless steel (V2A)
- Including drill hole in bottom section for quick installation

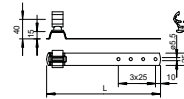


## Roof conductor holder for tiled roofs, Rd 8-10

Type	Fit mm	Installation height mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
157 FK-VA 230	Rd 8-10	40	230	20	7.800	5215544
157 FK-VA 280	Rd 8-10	40	280	20	10.170	5215587
157 FK-VA 410	Rd 8-10	40	410	20	14.880	5215609

A2 Stainless steel, rustproof 1.4301

- Conductor holder of polyamide
- Including drill hole in bottom section for quick installation

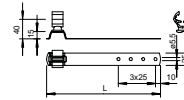


## Roof conductor holder for tiled roofs, Rd 8-10

Type	Fit mm	Installation height mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
157 FK-CU 230	Rd 8-10	40	230	10	8.800	5216184
157 FK-CU 280	Rd 8-10	40	280	10	9.600	5216214

Cu Copper

- Conductor holder of polyamide
- Including drill hole in bottom section for quick installation

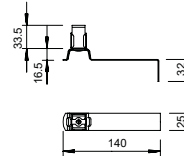


## Roof cable holder for tiled roofs, angled, Rd 8

Type	Fit mm	Installation height mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
157 I-VA	Rd 8	26.5	140	20	7.150	5215625

A2 Stainless steel, rustproof 1.4301

- Conductor holder high-grade stainless steel (V2A)
- Curved bottom strip for quick installation

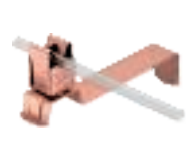
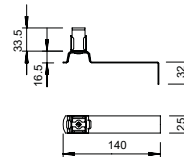


## Roof cable holder for tiled roofs, angled, Rd 8

Type	Fit mm	Installation height mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
157 I-CU	Rd 8	26.5	140	10	7.800	5215749

Cu Copper

- Conductor holder copper plated high-grade stainless steel (V2A)
- Curved bottom strip for quick installation

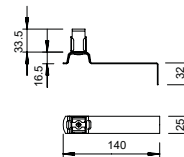


## Roof cable holder for tiled roofs, angled, Rd 8

Type	Fit mm	Installation height mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
157 FX-AL	Rd 8	26.5	140	20	3.900	5215875

Alu Aluminium

- With flexible bottom section from aluminium for matching to roof tiles (easy to flex)
- Holder from stainless steel (V2A)
- Curved bottom section for quick installation

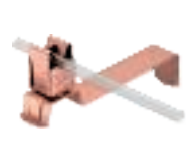
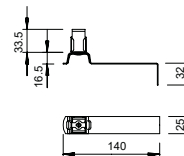


## Roof cable holder for tiled roofs, angled, Rd 8

Type	Fit mm	Installation height mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
157 FX-CU	Rd 8	26.5	140	10	7.500	5215879

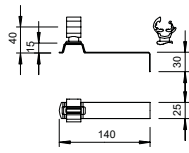
Cu Copper

- With flexible bottom section from copper for matching to roof tiles (easy to flex)
- Holder from copper plated stainless steel (V2A)
- Curved bottom section for quick installation



## Roof conductor holder, tiled roof

### Roof conductor holder for tiled roofs, angled, Rd 8–10

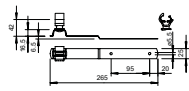


Type	Fit mm	Installation		Pack Piece	Weight kg/100 pc.	Item no.
		Length mm	height mm			
<b>157 IK-VA</b>	Rd 8-10	40	140	20	7.150	<b>5215668</b>

- A2 Stainless steel, rustproof 1.4301
- Conductor holder of polyamide
  - Curved bottom strip for quick installation

## Roof conductor holder, slate roof

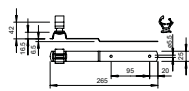
### Roof conductor holder for slated roofs, crimped, Rd 8–10



Type	Fit mm	Installation		Pack Piece	Weight kg/100 pc.	Item no.
		Length mm	height mm			
<b>157 EK-VA</b>	Rd 8-10	265	42	20	7.800	<b>5215838</b>

- A2 Stainless steel, rustproof 1.4301
- Conductor holder of polyamide
  - With Ø 5.5 mm drill hole

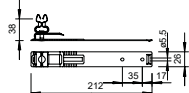
### Roof conductor holder for slated roofs, crimped, Rd 8–10



Type	Fit mm	Installation		Pack Piece	Weight kg/100 pc.	Item no.
		Length mm	height mm			
<b>157 EK-CU</b>	Rd 8-10	265	42	10	8.800	<b>5215854</b>

- Cu Copper
- Conductor holder of polyamide
  - With Ø 5.5 mm drill hole

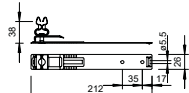
### Roof conductor holder for slated roofs, Rd 8



Type	Fit mm	Installation		Pack Piece	Weight kg/100 pc.	Item no.
		Length mm	height mm			
<b>157 L-VA</b>	Rd 8	212	32	20	8.000	<b>5215439</b>

- A2 Stainless steel, rustproof 1.4301
- With Ø 5.5 mm drill hole and beading

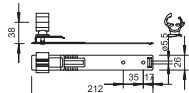
### Roof conductor holder for slated roofs, Rd 8



Type	Fit mm	Installation		Pack Piece	Weight kg/100 pc.	Item no.
		Length mm	height mm			
<b>157 L-CU</b>	Rd 8	212	32	10	9.900	<b>5215471</b>

- Cu Copper
- With Ø 5.5 mm drill hole and beading

### Roof conductor holder for slated roofs, Rd 8–10



Type	Fit mm	Installation		Pack Piece	Weight kg/100 pc.	Item no.
		Length mm	height mm			
<b>157 LK-VA</b>	Rd 8-10	212	38	20	8.000	<b>5215374</b>

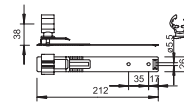
- A2 Stainless steel, rustproof 1.4301
- With Ø 5.5 mm drill hole and beading
  - Conductor holder of polyamide

### Roof conductor holder for slated roofs, Rd 8-10

Type	Fit mm	Length mm	Installation height mm	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>157 LK-CU</b>	Rd 8-10	212	38	10	8.400	<b>5215382</b>

**Cu** Copper

- With Ø 5.5 mm drill hole and beading
- Conductor holder of polyamide

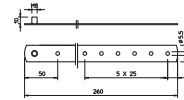


### Roof conductor holder for slated roofs

Type	Fit mm	Length mm	Installation height mm	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>157 GB-M8</b>	Rd 8-10	260	27	20	5.000	<b>5202569</b>

**A2** Stainless steel, rustproof 1.4301

- With Ø 5.5 mm drill hole
- With 3 M8 threaded nipples for positioning the holder



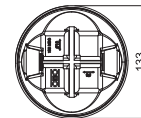
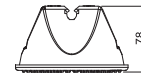
### Roof conductor holder, flat roof

#### Roof conductor holder for flat roofs, black

Type	Fit mm	Pack	Weight kg/100 pc.	Item no.
<b>165 MBG-8-10</b>	Rd 8-10	12	97.220	<b>5218700</b>
<b>165 MBG-8-10 FO</b>	Rd 8-10	12	100.000	<b>5218704</b>

**PA/PE** Polyamide/polyethylene

- Closed form with base
- With double conductor holder
- Filling weight 1 kg (frost-resistant concrete)
- Sleeve made of polyethylene, black, bottom polypropylene, black
- Base made of polyamide PA 6, black, UV-stabilised and weather-resistant
- Base can be used on almost all roofing felt systems (bitumen, PVC)
- Types 165 MBG...FO: Packed in foil bag



#### Roof conductor holder for flat roofs, with increased base section

Type	Fit mm	Pack	Weight kg/100 pc.	Item no.
<b>165 MBG-8-10 200</b>	Rd 8-10	12	100.000	<b>5218716</b>

**PA/PE** Polyamide/polyethylene

- DIN 48829 Form B 1
- Closed form with bottom
- With double conductor holder
- Filling weight 1 kg (frost-resistant concrete)
- Sleeve from polyethylene, black, bottom polypropylene, black
- With larger bottom section (Ø 200 mm) for improved stability

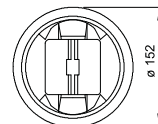


#### Roof conductor holder for flat roofs, without base

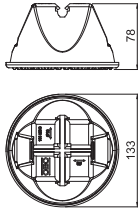
Type	Fit mm	Pack	Weight kg/100 pc.	Item no.
<b>165 OBG-8</b>	Rd 8	12	100.000	<b>5218683</b>

**PE** Polyethylene

- Without bottom
- With double conductor holder
- Filling weight 1 kg (frost-resistant concrete)
- Sleeve from polyethylene, black



### Roof conductor holder for flat roofs, grey

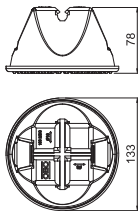


Type	Fit		Colour	Pack	Weight	Item no.
	mm			Piece	kg/100 pc.	
<b>165 MBG-8-10 GR</b>	Rd 8-10		Grey	12	100.000	<b>5218708</b>

PA/PE Polyamide/polyethylene

- Closed form with base
- With double conductor holder
- Filling weight 1 kg (frost resistant concrete)
- Case made from polyethylene, light grey, UV-stabilised and weatherproof
- Base made from polyamide PA 6, light grey, UV-stabilised and weatherproof
- Base suitable for nearly all roofing membrane systems (Bitumen, PVC)

### Roof conductor holder for flat roofs, black



Type	Fit		Colour	Pack	Weight	Item no.
	mm			Piece	kg/100 pc.	
<b>165 MBL-8-10</b>	Rd 8-10			100	7.679	<b>5218616</b>

PE Polyethylene

- Closed form with base
- With double conductor holder
- Filling weight 1 kg (frost-resistant concrete)
- Sleeve made of polyethylene, black, bottom polypropylene, black
- Base made of polyamide PA 6, black, UV-stabilised and weather-resistant
- Base can be used on almost all roofing felt systems (bitumen, PVC)
- Types 165 MBG...FO: Packed in foil bag

### Flat conductor adapter for roof conductor holder, type 165/MBG

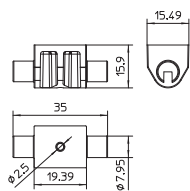


Type	Fit		Colour	Pack	Weight	Item no.
	mm			Piece	kg/100 pc.	
<b>165 MBG HFL</b>	Rd 8		Black	12	0.658	<b>5218885</b>

PP Polypropylene

- Flat conductor holder FL 30 x 3.5 mm
- For fastening to 165/MBG in fit Rd 8

### Universal flat conductor adapter for roof conductor holder, type 165/MBG

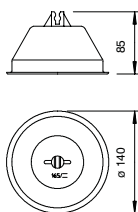


Type	Fit		Colour	Pack	Weight	Item no.
	mm			Piece	kg/100 pc.	
<b>165 MBG UH</b>	Rd 8		Black	25	0.254	<b>5218882</b>

PP Polypropylene

- Universal adapter with drill hole  $\varnothing$  2.5 mm
- E.g. for OBO Golden Sprint screw, type 4758 4 x L (L = depending on application)
- For fastening to 165/MBG

### Roof cable holder for flat roofs, only plastic sleeve

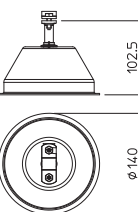


Type	Fit		Colour	Pack	Weight	Item no.
	mm			Piece	kg/100 pc.	
<b>165 KR</b>	Rd 8			50	5.449	<b>5218861</b>

PE Polyethylene

- For self-filling with concrete
- Potential filling weight: approx. 1.3 kg
- Sleeve from polyethylene, black

### Roof conductor holder for flat roofs, with raised cable bracket



Type	Fit		Colour	Pack	Weight	Item no.
	mm			Piece	kg/100 pc.	
<b>165 KRB SO</b>	Rd 8-10			9	144.000	<b>5218977</b>

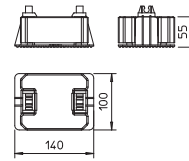
- Filling weight 1.3 kg (frost-resistant concrete)
- With conductor holder, type 168 DIN-K
- Die-cast zinc conductor holder, electrogalvanised
- Polyethylene sleeve, black

Roof cable holder for flat roofs

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
165 R-8-10	Rd 8-10	10	106.000	5218997

PE Polyethylene

- For round cables Rd 8 to 10
- With polyethylene plastic holder, black
- Block made of frost-resistant concrete
- Weight 1 kg
- Block can be split into plastic and concrete (recyclable)



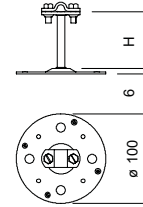
Roof conductor holder, suitable for direct bonding

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
165 B 60	Rd 8-10	60	50	26.100	5218810
165 B 100	Rd 8-10	100	50	27.700	5218829

St Steel

FT Hot-dip galvanised

- With conductor holder and bottom section, hot-dip galvanised steel
- Bottom section Ø 100 mm

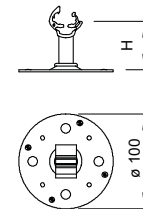


Roof conductor holder 55 mm

Type	Fit mm	Dimension H mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
165 NBK 55	Rd 8-10	55	100	75	13.540	5218314

PA Polyamide

- Suitable for bonding straight to flat roofs
- Conductor holder of polyamide
- Bottom section, hot-dip galvanised steel
- Bottom section Ø 100 mm



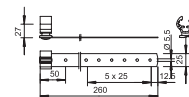
Roof conductor holder, tiled, slated and corrugated roofs

Roof cable holder for tiled and slated roofs

Type	Fit mm	Length mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
157 NB-VA	Rd 8-10	260	27	20	6.000	5215277

A2 Stainless steel, rustproof 1.4301

- With Ø 5.5 mm drill hole
- Conductor holder of polyamide

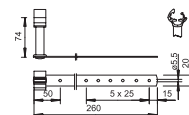


Roof cable holder for tiled and slated roofs

Type	Fit mm	Length mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
157 ND-VA	Rd 8-10	260	74	20	6.000	5215307

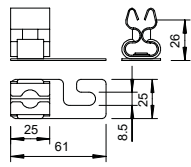
A2 Stainless steel, rustproof 1.4301

- High roof conductor holder: 74 mm
- With perforation Ø 5.5 mm
- Polyamide cable bracket



## Roof conductor holder, tiled, slated and corrugated roofs

### Roof conductor holder for tiled, slated and corrugated roofs, Rd 8

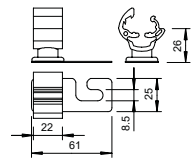


Type	Fit mm	Installation height mm	Pack	Weight	Item no.
			Piece	kg/100 pc.	
<b>159 VA-V</b>	Rd 8	21	20	3.900	<b>5217075</b>

A2 Stainless steel, rustproof 1.4301

- Bottom section and conductor holder stainless steel (V2A)
- Bottom section with Ø 8.5 mm slot

### Roof conductor holder for tiled, slated and corrugated roofs, Rd 8–10

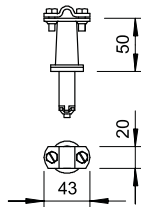


Type	Fit mm	Installation height mm	Pack	Weight	Item no.
			Piece	kg/100 pc.	
<b>159 K-VA</b>	Rd 8-10	21	20	2.540	<b>5216818</b>

A2 Stainless steel, rustproof 1.4301

- Bottom section stainless steel (V2A)
- Bottom section with Ø 8.5 mm slot
- Conductor holder of polyamide

### Roof conductor holder for tiled, slated and corrugated roofs, with crossbar

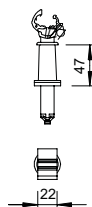


Type	Fit mm	Installation height mm	Pack	Weight	Item no.
			Piece	kg/100 pc.	
<b>133 A</b>	Rd 8-10	50	20	8.217	<b>5202248</b>

PA Polyamide

- With weatherproof clamping collar from soft PVC
- Required drill hole Ø = 16 mm
- Spacer from polyamide, grey

### Roof conductor holder for tiled, slated and corrugated roofs, with cable bracket



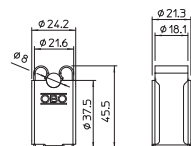
Type	Fit mm	Installation height mm	Pack	Weight	Item no.
			Piece	kg/100 pc.	
<b>133 NB</b>	Rd 8-10	67	20	4.338	<b>5202213</b>

PA Polyamide

- With weather-proof clamping collar from soft-PVC
- Required drill hole Ø = 16 mm
- Spacer and conductor holder from polyamide, grey

## Conductor bracket

### Cable bracket, raised construction type, for Rd 8 mm, through-way Ø 5 mm



Type	Fit mm	Installation height mm	Pack	Weight	Item no.
			Piece	kg/100 pc.	
<b>177 35 VA M6</b>	Rd 8	35	20	2.680	<b>5207342</b>

A2 Stainless steel, rustproof 1.4301

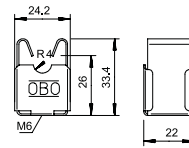
- With female thread M6 or through hole Ø 5 mm
- From stainless steel (V2A)

### Cable bracket for Rd 8 mm, through-way Ø 5 mm

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 20 VA M6</b>	Rd 8	20	20	2.500	<b>5207339</b>

A2 Stainless steel, rustproof 1.4301

- With female thread M6 or through hole Ø 5 mm
- From stainless steel (V2A)



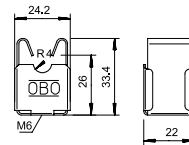
### Cable bracket for Rd 8 mm, through-way Ø 5 mm, copper-plated

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 20 VA-VK M6</b>	Rd 8	20	20	2.500	<b>5207800</b>

A2 Stainless steel, rustproof 1.4301

Cu Copper-plated

- With female thread M6 or through hole Ø 5 mm
- From stainless steel (V2A)
- VA-VK: copper-plated

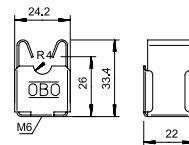


### Cable bracket for Rd 8 mm, through-way Ø 7 mm

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 20 VA M8</b>	Rd 8	20	20	1.838	<b>5207347</b>

A2 Stainless steel, rustproof 1.4301

- With female thread M8 or through hole Ø 5 mm
- From stainless steel (V2A)



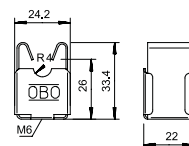
### Cable bracket for Rd 8 mm, through-way Ø 7 mm, copper-plated

Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 20 VA-VK M8</b>	Rd 8	20	20	1.900	<b>5207819</b>

A2 Stainless steel, rustproof 1.4301

Cu Copper-plated

- With female thread M8 or through hole Ø 5 mm
- From stainless steel (V2A)
- VA-VK: copper-plated

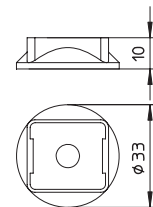


### Washer for cable bracket, type 177

Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 U</b>	Light grey	20	0.286	<b>5207371</b>

PP Polypropylene

- For simple wall installation
- UV-resistant



### Hard foam plate anchor

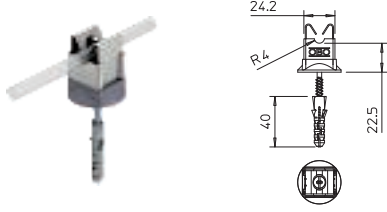
Type	Length mm	Dowel Ø mm	Wood screws Ø mm	Break load kN	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 WDVS 64x25 B</b>	63.5	9	4 - 5	0.05	50	0.658	<b>5207375</b>

PA Polyamide

Anchor for universal light-duty fastening in plastered composite heat insulation systems (WDVS). The self-tapping point makes pre-drilling superfluous.



### Cable bracket for Rd 8 mm, fastening with screw and anchor

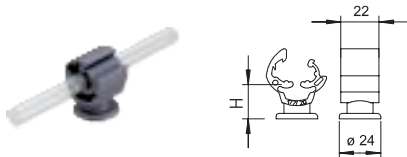


Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 20 VA B-HD</b>	Rd 8	20	50	2.900	<b>5207901</b>

A2 Stainless steel, rustproof 1.4301

- With female thread M8 or through hole Ø 5 mm
- From stainless steel (V2A)
- With pre-mounted wood screws (5 x 60) and plastic dowels (8 x 40).

### Cable bracket Rd 8–10 mm

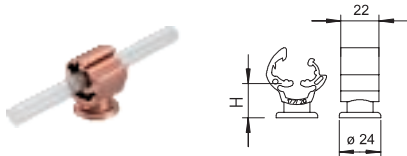


Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 20 M8</b>	Rd 8-10	20	20	0.723	<b>5207444</b>
<b>177 30 M8</b>	Rd 8-10	30	20	0.790	<b>5207460</b>
<b>177 55 M8</b>	Rd 8-10	55	20	1.007	<b>5207487</b>

PA Polyamide

- With female thread M8 or through hole Ø 7 mm
- Weather and temperature-resistant from -35 °C to +90 °C

### Cable bracket Rd 8–10 mm, copper-plated

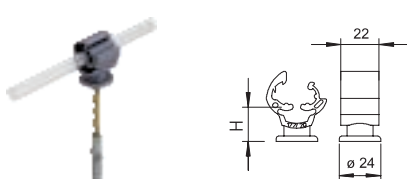


Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 20 CU</b>	Rd 8-10	20	10	0.718	<b>5207746</b>
<b>177 30 CU</b>	Rd 8-10	30	10	0.784	<b>5207754</b>
<b>177 55 CU</b>	Rd 8-10	55	10	1.450	<b>5207762</b>

PA Polyamide

- With female thread M8 for screwing and through hole for wood screws
- Colour: copper
- Weather and temperature-resistant from -35 °C to +90 °C

### Cable bracket Rd 8–10 mm with pre-mounted wood screw

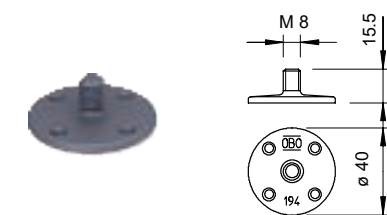


Type	Fit mm	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>177 B-HD20</b>	Rd 8-10	20	50	1.930	<b>5207851</b>
<b>177 B-HD30</b>	Rd 8-10	30	50	1.503	<b>5207878</b>

PA Polyamide

- With female thread M8 for screwing and through hole for wood screws
- For round conductor Rd 8-10
- Weather and temperature-resistant from -35 °C to +90 °C
- With pre-mounted wood screws (5 x 60) and plastic dowels (8 x 40).

### Bonding base



Type	Colour	Thread	Pack Piece	Weight kg/100 pc.	Item no.
<b>194</b>	Grey	M8	100	0.389	<b>5207258</b>

PA Polyamide

- With threaded stem M8
- For mounting cable supports with M8 female thread
- For bonding to concrete, steel or brickwork
- When installing flat conductors and round cables, expansion elements are to be used for thermal compensation

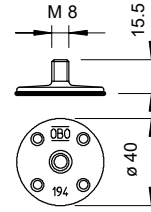


### Bonding base including industrial bonding pad

Type	Colour	Thread	Pack Piece	Weight kg/100 pc.	Item no.
194 K	Grey	M8	20	0.600	5207266

PA Polyamide

- With threaded stem M8
- For mounting cable supports with M8 female thread
- For bonding to concrete, steel or smooth substrates
- Not suitable for rough surfaces such as plaster, wood, bitumen strips
- Processing at > +15 °C and on cleaned substrate
- When installing flat conductors and round cables, expansion elements are to be used for thermal compensation
- Use on film roofs after consultation with the responsible roof construction company

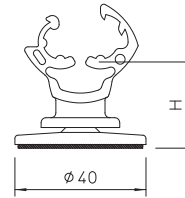


### Cable bracket, Rd 8–10 mm with bonding base

Type	Dimension H mm	Pack Piece	Weight kg/100 pc.	Item no.
177 20 KL	25	50	1.239	5207451

PA Polyamide

- For bonding to concrete, steel or smooth substrates
- Not suitable for rough surfaces such as plaster, wood, bitumen strips
- Processing at > +15 °C and on cleaned substrate
- When installing flat conductors and round cables, expansion elements are to be used for thermal compensation
- Use on film roofs after consultation with the responsible roof construction company



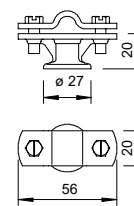
### Cable bracket with crossbar Rd 8–10 mm

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
113 Z8-10	Rd 8-10	20	5.956	5229960

Zn Die-cast zinc

G Electroplated

- With female thread M8 or through hole Ø 7 mm
- Over-piece installed with 2 hexagonal bolts
- Version HD with wood screws (5 x 60) and plastic dowels (8 x 40)



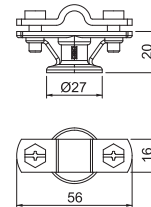
### Cable bracket Rd 8–10 mm

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
113 8-10	Rd 8-10	20	9.600	5230217

Zn Die-cast zinc

Cu Copper-plated

- With female thread M8 or through hole Ø 7 mm
- Over-piece installed with 2 hexagonal bolts



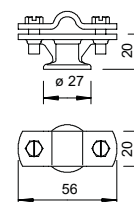
### Cable bracket Rd 8–10 mm with wood screw, plastic anchor

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
113 B-Z-HD	Rd 8-10	100	6.580	5230322

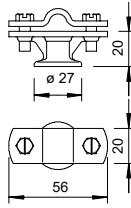
Zn Die-cast zinc

VZ Galvanised

- With female thread M8 or through hole Ø 7 mm
- Over-piece installed with 2 hexagonal bolts
- Version HD with wood screws (5 x 60) and plastic dowels (8 x 40)



### Cable bracket Rd 8–10 mm with wood screw, plastic anchor

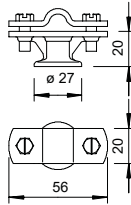


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>113 B-MS-HD 8-10</b>	Rd 8-10	100	7.280	<b>5230365</b>

Zn Die-cast zinc  
Cu Copper-plated

- With female thread M8 or through hole Ø 7 mm
- Over-piece installed with 2 hexagonal bolts
- Version HD with wood screws (5 x 60) and plastic dowels (8 x 40)

### Cable bracket with hinged crossbar Rd 8–10 mm

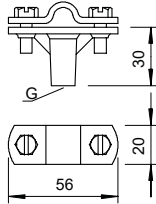


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>113 Z-K 8-10</b>	Rd 8-10	20	6.202	<b>5229961</b>

Zn Die-cast zinc  
G Electrogalvanised

- With female thread M8 or through hole Ø 7 mm
- Hinge crossbar for quick swivel mounting
- Crossbar mounted with 2 hexagonal bolts

### Cable bracket Rd 8–10 mm, 30 mm mounting height

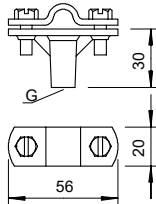


Type	Fit mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
<b>168 8-10 M6</b>	Rd 8-10	M6	20	7.800	<b>5229162</b>
<b>168 DIN-K-M8</b>	Rd 8-10	M8	20	7.780	<b>5229839</b>

Zn Die-cast zinc  
G Electrogalvanised

- With female thread (G)
- With over-piece and 2 hexagonal bolts
- Installed height 30 mm

### Cable bracket with hinged crossbar

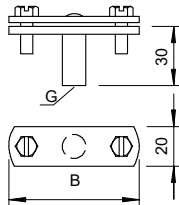


Type	Fit mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
<b>168 ZN-M6</b>	Rd 8-10	M6	20	8.660	<b>5229367</b>
<b>168 DIN-K-M8</b>	Rd 8-10	M8	20	8.440	<b>5229383</b>

Zn Die-cast zinc  
Cu Copper-plated

- With female thread (G)
- With over-piece and 2 hexagonal bolts
- Installed height 30 mm

### Cable bracket for flat conductors



Type	Dimension B mm	Fit mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
<b>168 FL40-M8</b>	66	FL 40	M8	20	8.200	<b>5229553</b>

TG Malleable iron  
FT Hot-dip galvanised

- For flat strip
- With female thread (G)
- Installed height 30 mm



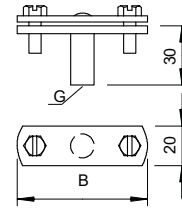
### Cable bracket for flat conductors

Type	Dimension B		Thread	Pack Piece	Weight kg/100 pc.	Item no.
	mm	mm				
168 FL30-M6	56	FL 30	M6	20	7.640	5229464
168 DIN 30	56	FL 30	M8	20	6.570	5229480

Zn Die-cast zinc

G Electrogalvanised VZ Galvanised

- For flat strip
- With female thread (G)
- Installed height 30 mm



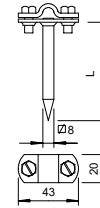
### Cable bracket Rd 8–10 mm, with square pin

Type	Fit mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
163 100 FT	Rd 8-10	100	50	10.056	5223105
163 150 FT	Rd 8-10	150	50	14.400	5223156
163 200 FT	Rd 8-10	200	20	18.880	5223202

St Steel

FT Hot-dip galvanised

- Complete with crossbar and hexagonal bolts
- With square pin for rapid mounting
- With hexagonal bolts made of VA

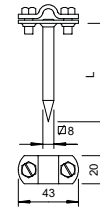


### Cable bracket Rd 8–10 mm, with square pin, copper-plated

Type	Fit mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.

Cu Copper

- Complete with crossbar and hexagonal bolts
- With square pin for rapid mounting
- With hexagonal bolts made of VA



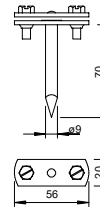
### Cable bracket for flat conductors, with round pin

Type	Fit mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.

St Steel

FT Hot-dip galvanised

- With crossbar and 2 hexagonal bolts (VA)
- With loose round pin Ø 9 mm



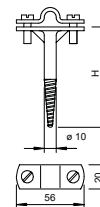
### Cable bracket Rd 8–10 mm, with wood screw thread

Type	Fit mm	Dimension H mm	Pack Piece	Weight kg/100 pc.	Item no.
176 A 80	Rd 8-10	80	50	10.025	5227089
176 A 100	Rd 8-10	100	50	11.500	5227100
176 A 150	Rd 8-10	150	20	13.100	5227151

TG Malleable iron

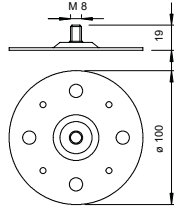
F Hot galvanised

- Also for flat conductor to FL 30
- With wood screw thread
- Bottom section, hot-dip galvanised cast iron
- Over-piece and screws, hot dipped galvanised steel



## Conductor bracket

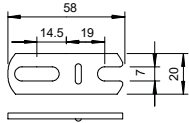
### Base plate



Type	Thread	Pack Piece	Weight kg/100 pc.	Item no.
<b>199 DIN</b>	M8	10	14.200	<b>5208017</b>
<b>SI</b> Steel				
<b>FS</b> Strip galvanised				

- With threaded pin M8
- Suitable for direct bonding
- Threaded pin brass and base plate hot-dip galvanised steel

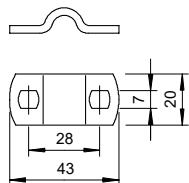
### Cable bracket, upper part for FL 30 mm



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>156 FL</b>	FL30	50	2.460	<b>5228328</b>
<b>SI</b> Steel				
<b>FT</b> Hot-dip galvanised				

- With slot for quick installation

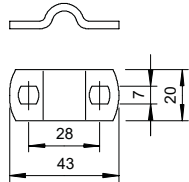
### Cable bracket, upper part for Rd 8–10 mm, steel



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>156 K8-10 ST</b>	Rd 8-10	100	2.000	<b>5228123</b>
<b>SI</b> Steel				
<b>FT</b> Hot-dip galvanised				

- For Rd 8–10 mm

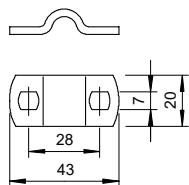
### Cable bracket, cover for Rd 8–10 mm, stainless steel



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>156 K8-10 VA</b>	Rd 8-10	100	2.100	<b>5228134</b>
<b>A2</b> Stainless steel, rustproof 1.4301				

- For Rd 8–10 mm

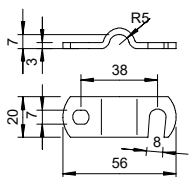
### Cable bracket, cover for Rd 8–10 mm, copper



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>156 K8-10 CU</b>	Rd 8-10	100	2.260	<b>5228131</b>
<b>Cu</b> Copper				

- For Rd 8–10 mm

### Cable bracket, upper part for Rd 8–10 mm



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>156 8-10</b>	Rd 8-10	100	2.680	<b>5228026</b>
<b>SI</b> Steel				
<b>FT</b> Hot-dip galvanised				

- With open slot for quick installation



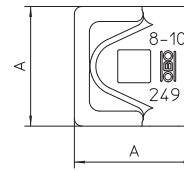
Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 ST-OT</b>	Rd 8-10	40	100	3.240	<b>5311503</b>

**St** Steel

**FT** Hot-dip galvanised

- For round conductor fastening RD 8-10
- Suitable for M10 bolts

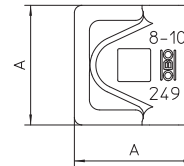


Quick connector, cover Rd 8–10 mm

Type	Dimension A mm	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 ALU-OT</b>	44	Rd 8-10	100	2.100	<b>5311585</b>

**Alu** Aluminium

- For round conductor fastening RD 8-10
- Suitable for M10 bolts

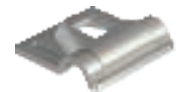
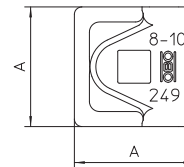


Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 VA-OT</b>	Rd 8-10	40	100	3.130	<b>5311554</b>

**A2** Stainless steel, rustproof 1.4301

- For round conductor Rd 8-10
- Suitable for M10 bolts

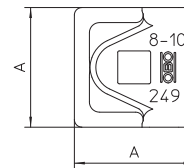


Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 CU-OT</b>	Rd 8-10	40	100	3.580	<b>5311530</b>

**Cu** Copper

- For round conductor fastening RD 8-10
- Suitable for M10 bolts



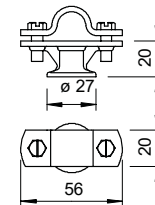
Rod holder, 16 mm

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>113 Z-16</b>	Rd 16	10	6.000	<b>5412609</b>

**Zn** Die-cast zinc

**VZ** Galvanised

- For lightning and ground insertion rods Rd 16
- Installed with over-piece and hex-head screws M6 x 16
- With female thread M8 or through hole Ø 7 mm



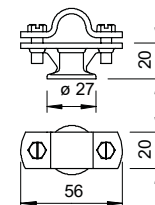
Rod holder, 16 mm

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>113 ZN-16</b>	Rd 16	10	10.100	<b>5412633</b>

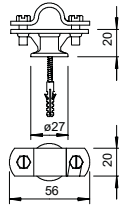
**Zn** Die-cast zinc

**Cu** Copper-plated

- For lightning and ground insertion rods Rd 16
- Installed with over-piece and hex-head screws M6 x 16
- With female thread M8 or through hole Ø 7 mm



Rod holder, 16 mm, with screw and anchor

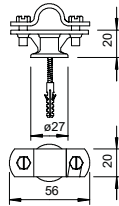


Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>113 B-Z-HD</b>	Rd 16	100	6.000	<b>5412803</b>

- Zn Die-cast zinc
- VZ Galvanised

- For lightning and ground insertion rods Rd 16
- Installed with over-piece and hexagonal bolts M6 x 16 (VA)
- Female thread M8 for screwing and through hole for wood screws
- Pre-mounted with wood screw 5 x 60 and plastic dowels 8 x 40

Rod holder, 16 mm, with screw and anchor

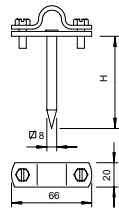


Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>113 B-HD-16</b>	Rd 16	100	10.100	<b>5412811</b>

- Zn Die-cast zinc
- Cu Copper-plated

- For lightning and ground insertion rods Rd 16
- Installed with over-piece and hexagonal bolts M6 x 16 (VA)
- Female thread M8 for screwing and through hole for wood screws
- Pre-mounted with wood screw 5 x 60 and plastic dowels 8 x 40

Rod holder, 16 mm, with square pin

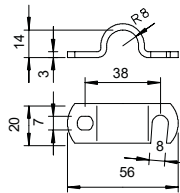


Type	Fit	Dimension H	Pack	Weight	Item no.
	mm	mm	Piece	kg/100 pc.	
<b>112 DIN-100</b>	Rd 16	100	10	12.412	<b>5410096</b>

- St Steel
- F Hot galvanised

- For lightning and ground insertion rods
- Over-piece with 2 hexagonal bolts M6 x 16 (VA)
- With square pin

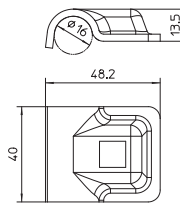
Crossbar, round conductors and air-termination rods 16 mm



Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>156 16</b>	Rd 16	50	3.230	<b>5228220</b>

- St Steel
- FT Hot-dip galvanised
- With open slot for quick installation

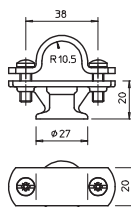
Quick connector, cover Rd 16 mm



Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>249 VA-OT</b>	16	100	5.700	<b>5311573</b>

- A2 Stainless steel, rustproof 1.4301
- For round conductor fastening RD 16
- Suitable for M10 bolts

Rod holder, 20 mm



Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>113 Z-20</b>	Rd 20	20	8.200	<b>5230527</b>

- Zn Die-cast zinc
- VZ Galvanised

- Installed with over-piece and hex-head screws M6 x 16
- With female thread M8 or through hole Ø 7 mm

### Vario quick connector

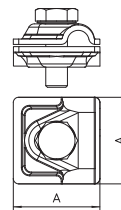


Type	Fit mm	Dimension A mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 ST</b>	Rd 8-10	40	5.6	H/100	20	9.306	<b>5311500</b>
<b>249 B ST</b>	Rd 8-10	40	5.6	H/100	100	10.800	<b>5311705</b>

St Steel

FT Hot-dip galvanised

- For T, cross and parallel connectors
- Quick installation using hexagonal bolt M10 x 30, high-grade stainless steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



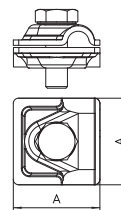
### Vario quick connector



Type	Fit mm	Dimension A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 ALU</b>	Rd 8-10	44	H/100	30	6.600	<b>5311519</b>
<b>249 B ALU</b>	Rd 8-10	44	H/100	100	7.250	<b>5311713</b>

Alu Aluminium

- For T, cross and parallel connectors
- Quick installation using hexagonal bolt M10 x 30, high-grade stainless steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



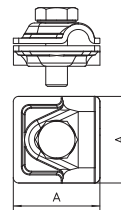
### Vario quick connector



Type	Fit mm	Dimension A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 VA</b>	Rd 8-10	40	H/100	10	10.700	<b>5311551</b>

A2 Stainless steel, rustproof 1.4301

- For T, cross and parallel connectors
- Quick installation using hexagonal bolt M10 x 30, high-grade stainless steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



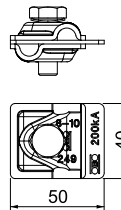
### Vario quick connector 200 kA



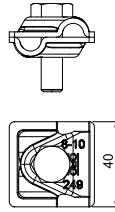
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 V2A 200</b>	Rd 8-10	H2/200	10	12.374	<b>5311595</b>

A2 Stainless steel, rustproof 1.4301

- For T, intersection and parallel connections
- Quick mounting using an M10 x 30 bolt, made from rustproof stainless steel
- Meets the requirements of VDE 0185-305 (IEC 62305)
- Tested according to VDE 0185-561-1 (IEC/EN 62561-1) with 200 kA
- For use in lightning protection class I with the isCon® Premium conductor



### Vario quick connector

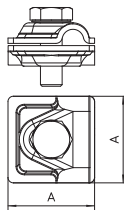


Type	Fit mm	Lightning current carrying capacity kA	Short-circuit current (50 HZ) (1 s; ≤300 °C) kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 V4A</b>	Rd 8-10	H/100	1.4	10	9.500	<b>5311404</b>

A4 Stainless steel, rustproof 1.4571/1.4404

- For T, cross and parallel connectors
- Quick installation using hexagonal bolt M10 x 30, high-grade stainless steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Vario quick connector

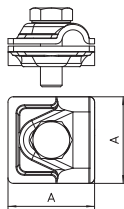


Type	Fit mm	Dimen- sion A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 CU</b>	Rd 8-10	40	H/100	10	11.900	<b>5311527</b>

Cu Copper

- For T, cross and parallel connectors
- Quick installation using hexagonal bolt M10 x 30, high-grade stainless steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Variable bi-metal quick connector

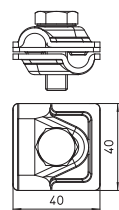


Type	Fit mm	Lightning current carrying capacity kA	Dimen- sion A mm	Material	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 ZV</b>	Rd 8-10	H/100	44	Cu	10	14.220	<b>5311535</b>

Cu Copper

- Intermediate plate, copper/aluminium, top section copper and aluminium
- For T, cross and parallel connectors
- Quick installation using hexagonal bolt M10 x 30, high-grade stainless steel
- With sprung washer according to DIN 137
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Variable earthing connector Rd 6-8 / 8-10 mm



Type	Fit mm	Dimen- sion A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 6-10 ST</b>	RD 6-8 / 8-10	40	H/100	20	13.100	<b>5311410</b>

St Steel

FT Hot-dip galvanised

- For T, intersection and parallel connections with adapter plates
- Quick mounting using an M10 x 30 bolt, made from rustproof stainless steel
- With sprung washer to DIN 137
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)





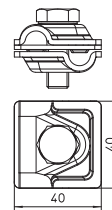
### Variable earthing connector Rd 6-8 / 8-10 mm



Type	Fit mm	Dimen- sion A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 6-10 CU</b>	RD 6-8 / 8-10	40	H/100	10	14.540	<b>5311417</b>

**Cu** Copper

- For T, intersection and parallel connections with adapter plates
- Quick mounting using an M10 x 30 bolt, made from rustproof stainless steel
- With sprung washer to DIN 137
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)



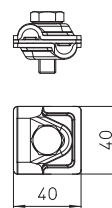
### Vario quick connector Rd 6-8 / Rd 6-8 mm



Type	Fit mm	Dimen- sion A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 6-8 CU</b>	RD 6-8 / 6-8	40	H/100	10	12.710	<b>5311407</b>

**Cu** Copper

- For T, intersection and parallel connections with adapter plates
- Quick mounting using an M10 x 30 bolt, made from rustproof stainless steel
- With sprung washer to DIN 137
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)



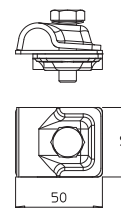
### Vario quick connector Rd 8-10x16



Type	Fit mm	Dimen- sion A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10x16 VA</b>	8-10x16	40	H/100	10	16.300	<b>5311590</b>

**A2** Stainless steel, rustproof 1.4301

- For T, intersection and parallel connections with adapter plates
- Quick mounting using an M10 x 30 bolt, made from rustproof stainless steel
- With sprung washer to DIN 137
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)



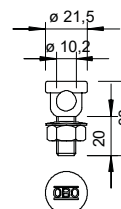
### Connector, Rd 8-10 mm with M10 thread

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>5000</b>	Rd 8-10	20	4.630	<b>5304008</b>

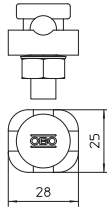
**St** Steel

**F** Hot galvanised

- With bore hole 10.2 mm
- With thread M10
- Including pre-mounted nut M10 and serrated washer
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



### Connector Rd 8–10 mm, single



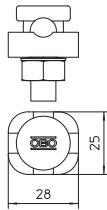
Type	Fit	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
5001 DIN-FT	H/100		20	7.450	5304105
5001 DIN-FT+VA	N/50		20	7.450	5304107

Si Steel

FT Hot-dip galvanised

- With fix contact clamping screw, nut and serrated washer
- With bore hole 10.2 mm
- With pre-mounted pressure piece, die-cast zinc
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Connector Rd 8–10 mm, single, copper



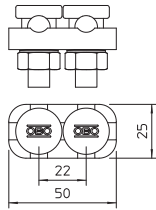
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
5001 ZN-CU	Rd 8-10	H/100	10	8.760	5304113

Zn Die-cast zinc

Cu Copper-plated

- With fix contact clamping screw, nut and serrated washer
- With bore hole 10.2 mm
- With pre-mounted pressure piece, die-cast zinc
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Connector Rd 8–10 mm, double



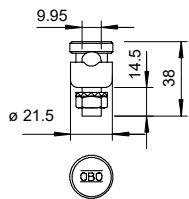
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
5002 DIN-FT	Rd 8-10	H/100	20	14.240	5304202

Si Steel

FT Hot-dip galvanised

- With 2 fix contact clamping screws, nut and serrated washer
- Including pre-mounted connecting pressure piece, die-cast zinc or copper-plated die-cast zinc
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Connector, Rd 8–10 mm with pressure trough



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
5001 N-FT	Rd 8-10	N/50	20	5.900	5304164

Si Steel

FT Hot-dip galvanised

- With 1 fix contact clamping screw, nut and serrated washer
- Including pre-mounted connecting pressure sump, steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



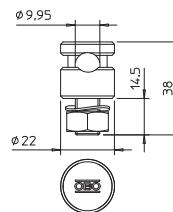
### Connector, Rd 8–10 mm with pressure trough



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>5001 N-VA</b>	Rd 8-10	N/50	10	6.800	<b>5304176</b>

A2 Stainless steel, rustproof 1.4301

- With 1 fix contact clamping screw, nut and serrated washer
- Including pre-mounted pressure sump, steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



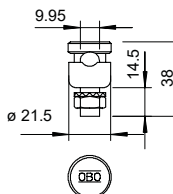
### Connector, Rd 8–10 mm with pressure trough



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>5001 N-CU</b>	Rd 8-10	H/100	10	6.750	<b>5304172</b>

Cu Copper

- With 1 fix contact clamping screw, nut and serrated washer
- Including pre-mounted pressure sump, steel
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



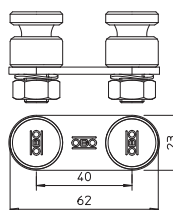
### Connector, Rd 8–10 mm, double, with pressure trough



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>5002 N-VA</b>	Rd 8-10	N/50	10	16.200	<b>5304270</b>

A2 Stainless steel, rustproof 1.4301

- With 2 Fix-Kontakt clamping bolts, nuts and serrated washers
- With pre-mounted pressure trough made of VA
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)



### Connection and end piece with connector

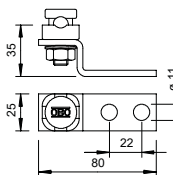


Type	Material	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>5009</b>	St	Rd 8-10	H/100	10	14.500	<b>5304970</b>

St Steel

F Hot galvanised

- With 2 attaching holes Ø 11 mm
- Installed with connector (single-piece) type 5001 DIN-FT
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



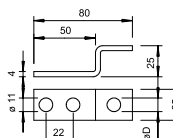
### Connection and end piece

Type	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>5011</b>	11	10	7.064	<b>5304997</b>

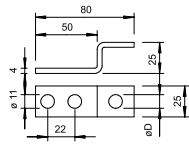
St Steel

FT Hot-dip galvanised

- For attaching to steel structures or bolting to fixed earthing terminals
- For attachments: Round conductor Rd 8-10 and flat conductor FL 30 x 3.5
- 2 attaching holes Ø 11 mm
- 1 attaching holes Ø D mm



### Connection and end piece

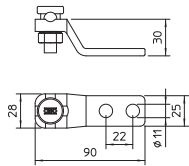


Type	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
5011 VA M10	11	10	7.064	5334934
5011 VA M12	13	10	7.048	5334942

A4 Stainless steel, rustproof 1.4571

- For attaching to steel structures or bolting to fixed earthing terminals
- For attachments: Round conductor Rd 8-10 and flat conductor FL 30 x 3.5
- 2 attaching holes Ø 11 mm
- 1 attaching holes Ø D mm

### Connection and end piece, DIN version

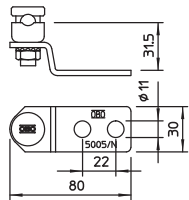


Type	Fit mm	Material	Pack Piece	Weight kg/100 pc.	Item no.
5005 DIN-FT	Rd 8-10	St	10	15.518	5304601

- St Steel
- F Hot galvanised

- With 2 attaching holes and 1 fix contact clamping screw 5000...
- With 2 attaching holes Ø 11 mm
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Connection and end piece with connector and pressure trough

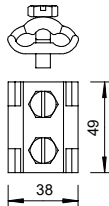


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
5005 N-FT	Rd 8-10	10	11.600	5304660

- St Steel
- FT Hot-dip galvanised

- With 2 attaching holes Ø 11 mm
- Including pre-mounted connector 5001 N
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Parallel connector Rd 8–10 mm, M8 x 25

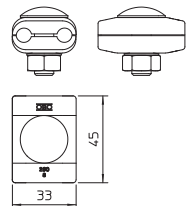
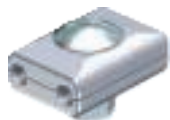


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
259 8-10	Rd 8-10	N/50	25	13.230	5315506

- TG Malleable iron
- FT Hot-dip galvanised

- With 2 hex-head screws M8 x 25, hot-dip galvanised steel

### Parallel connector Rd 8 mm, M10 x 30



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
260 8	Rd 8	H/100	50	13.930	5315700

- Zn Die-cast zinc
- G Electrogalvanised

- With flat, round screw M10 x 30 and hexagonal nut, hot-dip galvanised steel



### Parallel connector Rd 6–10 mm, M6 x 20

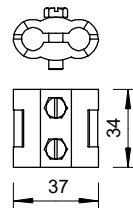


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>260 8-10 MS</b>	Rd 6-10		50	15.820	<b>5315654</b>

**CuZn** Brass

**Cu** Copper-plated

- With 2 hexagonal bolts M6 x 20 made of stainless steel (V2A)



### Straight connector Rd 8 mm

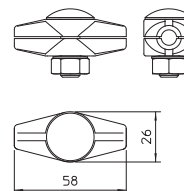


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>239</b>	Rd 8	N/50	20	12.510	<b>5329078</b>

**Zn** Die-cast zinc

**G** Electrogalvanised

- With truss-head bolt M10 x 30 and hexagonal nut M10
- Complies with the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)



### Straight connector Rd 8–10 mm



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>237 N FT</b>	Rd 8-10	H/100	20	8.560	<b>5328209</b>

**St** Steel

**F** Hot galvanised

- With 4 hexagonal bolts M6 x 10
- Complies with the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)



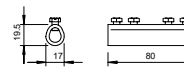
### Straight connector Rd 6–10 mm



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>237 N CU</b>	Rd 6-10	H/100	10	8.760	<b>5328284</b>

**Cu** Copper

- With 4 hexagonal bolts M6 x 12
- Complies with the requirements of VDE 0185-305-3 (IEC/EN 62305-3)



### T connector Rd 8 mm

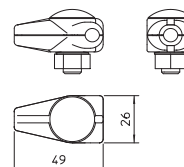


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>244</b>	Rd 8	N/50	10	11.580	<b>5311039</b>

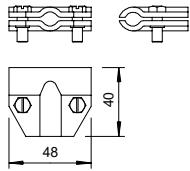
**Zn** Die-cast zinc

**G** Electrogalvanised

- With truss-head bolt M10 x 30 and hexagonal nut M10
- Complies with the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)



### T connector Rd 8–10 mm



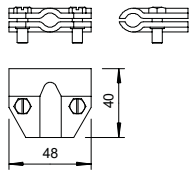
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>245 8-10 FT</b>	Rd 8-10	N/50	10	9.401	<b>5311101</b>

**St** Steel

**FT** Hot-dip galvanised

- With 2 hexagonal bolts M6 x 16 (VA)
- Complies with the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)

### T connector Rd 8–10 mm

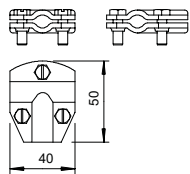


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>245 8-10 CU</b>	Rd 8-10	N/50	10	11.560	<b>5311152</b>

**Cu** Copper

- With 2 hexagonal bolts M6 x 16 (VA)
- Complies with the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)

### T connector Rd 8-10 mm, triple-screwed



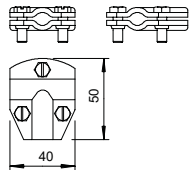
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>247 8-10 FT</b>	Rd 8-10	N/50	10	10.934	<b>5311209</b>

**St** Steel

**FT** Hot-dip galvanised

- With 3 hexagonal bolts M6 x 16 (VA)

### T connector Rd 8-10 mm, triple-screwed

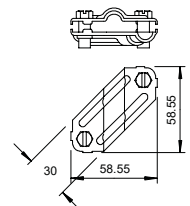


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>247 8-10 CU</b>	Rd 8-10	N/50	10	10.750	<b>5311268</b>

**Cu** Copper

- With 3 hexagonal bolts M6 x 16 (VA)
- Complies with the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)

### Cross-connector for flat conductors and round conductors



Type	Fit mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>250</b>	Rd 8-10/FL30	5.6	N/50	25	10.260	<b>5312906</b>

**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10
- Fit: Rd 8-10 x FL 30
- Fit: FL 30 x FL 30
- Mounted with 2 hexagonal bolts M8 x 20 (F)



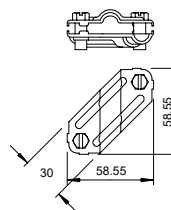
### Cross-connector for flat conductors and round conductors



Type	Fit mm	Lightning current carrying capacity kA	Short-circuit current (50 HZ) (1 s; ≤300 °C) kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>250 VA</b>	Rd 8-10/FL30	H/100	1.4	25	10.260	<b>5312922</b>
<b>250 V4A</b>	Rd 8-10/FL30	H/100	1.4	10	10.260	<b>5312925</b>

**A2** Stainless steel, rustproof 1.4301 **A4** Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10
- Fit: Rd 8-10 x FL 30
- Fit: FL 30 x FL 30
- Mounted with 2 hexagonal bolts M8 x 20



### Cross-connector for round and flat conductors

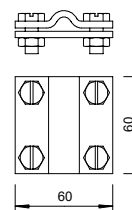


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10XFL30 FT</b>	8-10 x FL30	H/100	25	28.500	<b>5312655</b>

**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



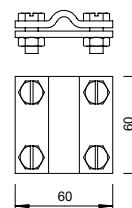
### Cross-connector for round conductors and flat conductors



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10xFL30V4A</b>	8-10 x FL30	H/100	10	28.500	<b>5312656</b>

**A4** Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



### Cross-connector Rd 8–10 mm

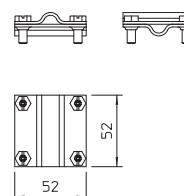


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>251 8-10</b>	Rd 8-10	H/100	25	11.690	<b>5312035</b>

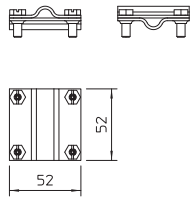
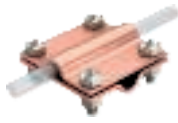
**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- For round conductors, fit: Rd 8-10 x Rd 8-10
- With 4 hexagonal bolts M6 x 16 (VA)



### Cross-connector Rd 8–10 mm

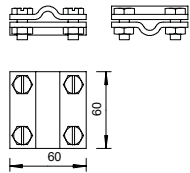


Type	Fit mm	Lightning current carrying capacity kA	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>251 CU</b>	Rd 8-10	H/100	10	12.400		<b>5312132</b>

**Cu** Copper

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10
- With 4 hexagonal bolts M6 x 16, must of rust-proof steel (VA)

### Cross-connector Rd 8–10

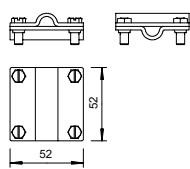


Type	Fit mm	Lightning current carrying capacity kA	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>253 8X8</b>	Rd 8-10	H/100	25	30.700		<b>5312604</b>

**St** Steel  
**FI** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)

### Cross-connector with intermediate plate for Rd 8–10 mm

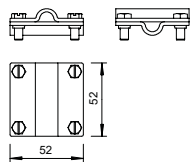
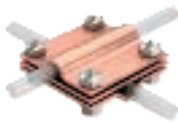


Type	Fit mm	Lightning current carrying capacity kA	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>254 DIN 8-10 FT</b>	Rd 8-10	H/100	25	16.660		<b>5314038</b>

**St** Steel  
**FI** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- For round conductors, fit: Rd 8-10 x Rd 8-10
- With adapter plate
- Mounted with 4 hexagonal bolts M6 x 20 and 4 hexagonal nuts M6

### Cross-connector with intermediate plate for Rd 8–10 mm



Type	Fit mm	Lightning current carrying capacity kA	Pack		Weight kg/100 pc.	Item no.
			Piece	kg/100 pc.		
<b>254 DIN 8-10 CU</b>	Rd 8-10	H/100	10	17.410		<b>5314135</b>

**Cu** Copper

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10
- With adapter plate
- Mounted with 4 hexagonal bolts M6 x 20 and 4 hexagonal nuts M6 (F) made of rustproof steel (VA)





### Cross-connector with intermediate plate for Rd 8–10

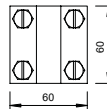
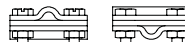


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10 FT</b>	Rd 8-10	H/100	25	33.530	<b>5312310</b>

St Steel

FT Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)



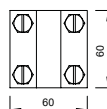
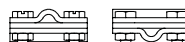
### Cross-connector with intermediate plate for Rd 8–10



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10 V4A</b>	Rd 8-10	H/100	10	33.530	<b>5312318</b>

A4 Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



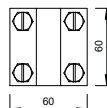
### Cross-connector with intermediate plate for Rd 8–10 x Rd 16



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10x16 V4A</b>	Rd 8-10 x 16	H/100	10	39.000	<b>5312346</b>

A4 Stainless steel, rustproof 1.4571

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 16 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



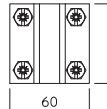
### Cross-connector with intermediate plate for Rd 8–10



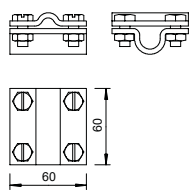
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10 CU</b>	Rd 8-10	H/100	10	38.940	<b>5312418</b>

Cu Copper

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8



### Cross-connector for Rd 8–10 x Rd 16



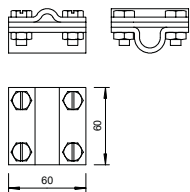
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>253 10X16</b>	Rd 8-10 x 16	H/100	25	29.800	<b>5312809</b>

**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 16 / FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)

### Cross-connector with intermediate plate for Rd 8–10 x Rd 16



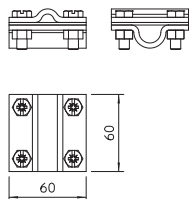
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10X16 FT</b>	Rd 8-10 x 16	H/100	25	38.800	<b>5312345</b>

**St** Steel

**FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 16 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Cross-connector with intermediate plate for Rd 8–10 x Rd 16

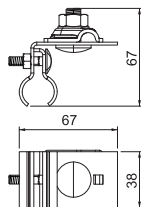


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 8-10X16 CU</b>	Rd 8-10 x 16	H/100	10	43.985	<b>5312442</b>

**Cu** Copper

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 16 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Folding and construction clamp



Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>RSF 249 8-10 VA</b>	Rd 8-10	max. 10	N/50	50	14.200	<b>5317502</b>

**A2** Stainless steel, rustproof 1.4301

- For round standing seam systems, fixed cable routing
- Manufacturer release by Kalzip
- Tested according to VDE 0185-561-1 (IEC/EN 62561-1)

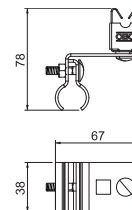
### Folding and construction clamp



Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>RSF 177 20 VA M8</b>	8	8		50	13.400	<b>5317512</b>

A2 Stainless steel, rustproof 1.4301

- For round standing seam systems, loose cable routing
- Manufacturer release by Kalzip
- Tested according to VDE 0185-561-1 (IEC/EN 62561-1)



### Folding and construction clamp, 10–20 mm

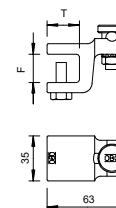


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>5004 DIN-FT 12</b>	Rd 8-10	max. 12	N/50	10	18.730	<b>5304407</b>
<b>5004 DIN-FT 20</b>	Rd 8-10	10 - 20	N/50	10	30.600	<b>5304504</b>

TG Malleable iron

FT Hot-dip galvanised

- Flange thickness to 12 or 10–20 mm
- With pre-mounted Fix-Kontakt clamping screw 5000
- 2 hexagonal bolts M8 x 20, screws made of hot galvanised steel,
- Terminal block made of malleable iron, hot galvanised
- Mounting of the round conductors either vertical or transverse to structure
- Corresponds to the requirements of DIN VDE 0185-305-3



### Construction clamp to 20 mm

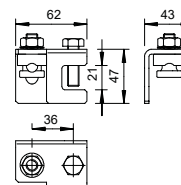


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>5010 20 FT</b>	Rd 8-10	4 - 20	N/50	10	30.600	<b>5304520</b>

St Steel

FT Hot-dip galvanised

- Mounting of the round conductor possible vertically or transverse to construction
- For fastening to constructions up to a flange thickness of 20 mm
- Fastening to constructions using a hexagonal bolt M10
- Meets the requirements of VDE 0185-305 (IEC 62305)



### Connection terminal to 14 mm

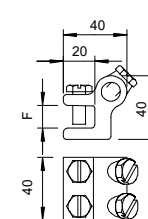


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack	Weight	Item no.
				Piece	kg/100 pc.	
<b>272 8</b>	Rd 8-10	max. 8	N/50	20	22.800	<b>5318084</b>
<b>272 14</b>	Rd 8-10	max. 14	N/50	20	25.230	<b>5318149</b>

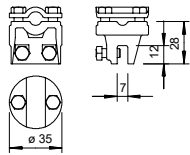
TG Malleable iron

FT Hot-dip galvanised

- Flange thickness to 8 and/or 14 mm
- With 4 hexagonal bolts M8
- Conforms to the requirements according to DIN V VDE V 0185-3, Section 4.5



### Folding clamp up to 7 mm plate thickness



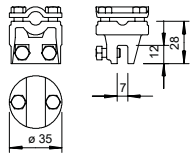
Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>269 8-10</b>	Rd 8-10	max. 7	N/50	20	14.460	<b>5317010</b>

Zn Die-cast zinc

G Electrogalvanised

- Plate thickness to 7 mm
- For conductor arrangement transverse and parallel to plate with 4 hexagonal bolts M6 x 16
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Folding clamp up to 7 mm plate thickness



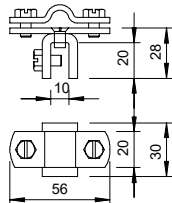
Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>269 MS</b>	Rd 8-10	max. 7	H/100	10	14.480	<b>5317053</b>

Zn Die-cast zinc

Cu Copper-plated

- Plate thickness to 7 mm
- For conductor arrangement transverse and parallel to plate with 4 hexagonal bolts M6 x 16
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Folding clamp Rd 8-10 up to 10 mm plate thickness



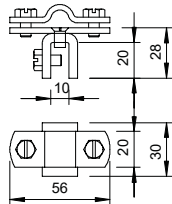
Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>270 8-10 FT</b>	Rd 8-10	max. 10	N/50	20	13.810	<b>5317207</b>

St Steel

FT Hot-dip galvanised

- Metal thickness to 10 mm
- For conductor routing transverse and in parallel to the plate
- Corresponds to the requirements to DIN V VDE V 0185-3 section 4.5

### Folding clamp Rd 8-10 up to 10 mm plate thickness

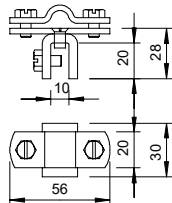


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>270 8-10 VA</b>	Rd 8-10	max. 10	N/50	10	13.800	<b>5317208</b>

A2 Stainless steel, rustproof 1.4301

- Metal thickness to 10 mm
- For conductor routing transverse and in parallel to the plate
- Corresponds to the requirements to DIN V VDE V 0185-3 section 4.5

### Folding clamp Rd 8-10 up to 10 mm plate thickness



Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>270 8-10 CU</b>	Rd 8-10	max. 10	H/100	10	14.740	<b>5317258</b>

Cu Copper

- Metal thickness to 10 mm
- For conductor routing transverse and in parallel to the plate
- Corresponds to the requirements to DIN V VDE V 0185-3 section 4.5



### Folding clamp up to 5 mm plate thickness

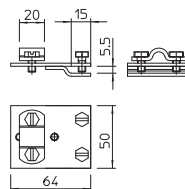


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>271 8-10</b>	Rd 8-10	max. 5	N/50	20	14.060	<b>5317401</b>

**St** Steel

**FT** Hot-dip galvanised

- Plate thickness to 5 mm
- For conductor routing transverse and longitudinal to plate
- With 4 hexagonal bolts M6 x 12
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)
- 271 Cu: with hexagonal bolts stainless steel (VA)



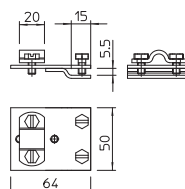
### Folding clamp up to 5 mm plate thickness



Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>271 8-10 VA</b>	Rd 8-10	max. 5	N/50	10	15.000	<b>5317481</b>

**A2** Stainless steel, rustproof 1.4301

- Plate thickness to 5 mm
- For conductor routing transverse and longitudinal to plate
- With 4 hexagonal bolts M6 x 12
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)
- 271 Cu: with hexagonal bolts stainless steel (VA)



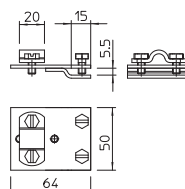
### Folding clamp up to 5 mm plate thickness



Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>271 CU</b>	Rd 8-10	max. 5	N/50	10	15.230	<b>5317452</b>

**Cu** Copper

- Plate thickness to 5 mm
- For conductor routing transverse and longitudinal to plate
- With 4 hexagonal bolts M6 x 12
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)
- 271 Cu: with hexagonal bolts stainless steel (VA)



### Folding clamp up to 10 mm plate thickness

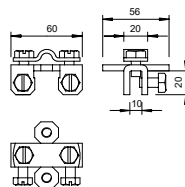


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>273 8-10</b>	Rd 8-10	max. 10	N/50	50	17.200	<b>5317223</b>

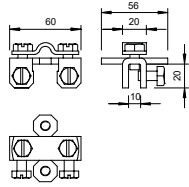
**St** Steel

**FT** Hot-dip galvanised

- Plate thickness to 10 mm
- Conductor routing transverse and longitudinal to plate with 2 hexagonal bolts M8 x 10 and 2 hexagonal bolts M8 x 16 (F)



### Folding clamp up to 10 mm plate thickness

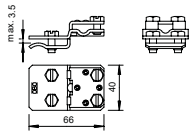


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>273 CU</b>	Rd 8-10	max. 10	N/50	10	18.500	<b>5317274</b>

**Cu** Copper

- Plate thickness to 10 mm
- Conductor routing transverse and longitudinal to plate with 2 hexagonal bolts M8 x 10 and 2 hexagonal bolts M8 x 16 (F)
- 273 Cu: with hexagonal bolts, stainless steel (VA)

### Folding clamp and connection terminal up to 10 mm plate thickness

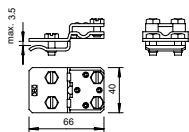


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>274 8-10</b>	Rd 8-10	max. 10	N/50	20	10.400	<b>5317428</b>

**St** Steel  
**FT** Hot-dip galvanised

- Plate thickness to 10 mm
- For conductor routing transverse and longitudinal to plate
- 4 hexagonal bolts M6 x 16
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Folding clamp and connection terminal up to 10 mm plate thickness

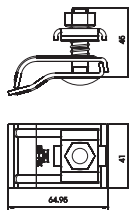


Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>274 CU</b>	Rd 8-10	max. 10	N/50	10	11.340	<b>5317479</b>

**Cu** Copper

- Plate thickness to 10 mm
- For conductor routing transverse and longitudinal to plate
- 4 hexagonal bolts M6 x 16
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

### Gutter clamp RK-FIX



Type	Fit mm	Material	Surface	Pack Piece	Weight kg/100 pc.	Item no.
<b>RK-FIX</b>	2 x Rd 8	St	FT	25	19.100	<b>5316450</b>

**St** Steel  
**FT** Hot-dip galvanised

- For up to 2 conductors Rd 8
- With double crossbar
- Suitable for all bead thicknesses (15–25 mm)
- With 1 truss-head bolt M10 x 45
- Nut and bolt made of VA stainless steel
- With spring for prefixing for rain gutter



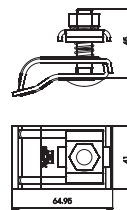
### Gutter clamp RK-FIX



Type	Fit mm	Material	Pack Piece	Weight kg/100 pc.	Item no.
<b>RK-FIX VA</b>	2 x Rd 8	A2	10	19.100	5316459

A2 Stainless steel, rustproof 1.4301

- For up to 2 conductors Rd 8
- With double crossbar
- Suitable for all bead thicknesses (15–25 mm)
- With 1 truss-head bolt M10 x 45
- Nut and bolt made of VA stainless steel
- With spring for prefixing for rain gutter
- Tested to DIN EN 50164-1



### Gutter clamp RK-FIX

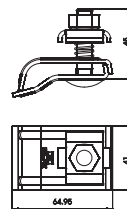


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>RK-FIX CU</b>	2 x Rd 8/ 2 x Rd 6	H/100	10	21.000	5316468

A2 Stainless steel, rustproof 1.4301

Cu Copper-plated

- For up to 2 conductors Rd 6 or Rd 8
- With double crossbar
- Suitable for all bead thicknesses (15–25 mm)
- With 1 truss-head bolt M10 x 45
- Nut and bolt made of VA stainless steel
- With spring for prefixing for rain gutter
- Tested to VDE 0185-561-1 (IEC/EN 62561-1)



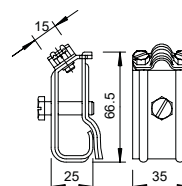
### Gutter clamp for all bead thicknesses

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>267</b>	Rd 8-10	25	13.950	5316308

St Steel

FT Hot-dip galvanised

- Fits all bead thicknesses
- With 1 hexagonal bolt M8 x 30
- 2 hexagonal bolts M6 x 12

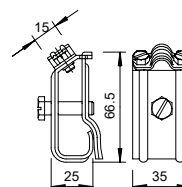


### Gutter clamp for all bead thicknesses

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>267 VA</b>	Rd 8-10	10	11.360	5316324

A2 Stainless steel, rustproof 1.4301

- Fits all bead thicknesses
- With 1 hexagonal bolt M8 x 30
- 2 hexagonal bolts M6 x 12
- VA version also for use as bimetal conductor (holder)



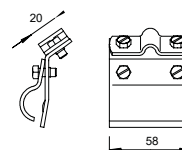
### Gutter clamp for bead thickness 15–22 mm

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>262 A-DIN FT</b>	Rd 8-10	25	19.610	5316219

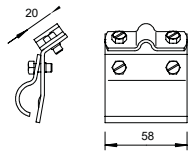
St Steel

FT Hot-dip galvanised

- Suitable for bulge thickness 15–22 mm
- With 4 hexagonal bolts M6 x 16 (VA)

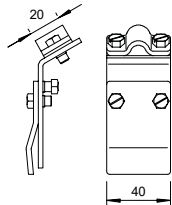


### Gutter clamp for bead thickness 15–22 mm



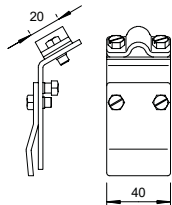
Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>262 A-DIN CU</b>	Rd 8-10	10	20.840	<b>5316251</b>
<b>Cu</b> Copper				
<ul style="list-style-type: none"> <li>• Suitable for bulge thickness 15–22 mm</li> <li>• With 4 hexagonal bolts M6 x 16 (VA)</li> </ul>				

### Roof gutter clamp for all bead thicknesses



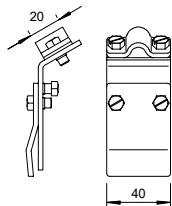
Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>262</b>	Rd 8-10	25	20.300	<b>5316014</b>
<b>St</b> Steel				
<b>FT</b> Hot-dip galvanised				
<ul style="list-style-type: none"> <li>• With 4 hexagonal bolts M6 x 16</li> <li>• Fits all bead thicknesses</li> </ul>				

### Roof gutter clamp for all bead thicknesses



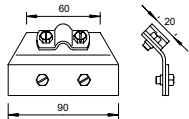
Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>262 CU</b>	Rd 8-10	10	20.940	<b>5316154</b>
<b>Cu</b> Copper				
<ul style="list-style-type: none"> <li>• With 4 hexagonal bolts M6 x 16</li> <li>• Fits all bead thicknesses</li> </ul>				

### Bi-metal roof gutter clamp for all bead thicknesses



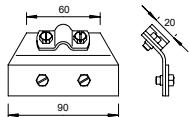
Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>262 ZM</b>	Rd 8-10	10	23.100	<b>5316170</b>
<b>St</b> Steel				
<b>FT</b> Hot-dip galvanised				
<ul style="list-style-type: none"> <li>• Fits all bead thicknesses</li> <li>• Bi-metal for attaching round conductors aluminium or steel to roof gutters without corrosion to different metals</li> </ul>				

### Snow catching grate clamp



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>264</b>	Rd 8-10	25	18.640	<b>5316510</b>
<b>St</b> Steel				
<b>F</b> Hot galvanised				
<ul style="list-style-type: none"> <li>• Plate thickness to 8 mm</li> <li>• With 4 hexagonal bolts M6 x 16</li> </ul>				

### Snow catching grate clamp



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>264 CU</b>	Rd 8-10	10	21.140	<b>5316553</b>
<b>Cu</b> Copper				
<ul style="list-style-type: none"> <li>• Plate thickness to 8 mm</li> <li>• With 4 hexagonal bolts M6 x 16</li> </ul>				



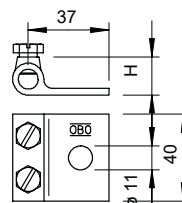


### Clamping shoe

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>31910</b>	Rd 10	25	9.650	<b>5325315</b>

- TG Malleable iron
- F Hot galvanised

- With Ø 11 mm attaching hole
- 2 hexagonal bolts M8 x 16
- Bolts hot-dip galvanised steel and clamping element hot dipped galvanised cast steel

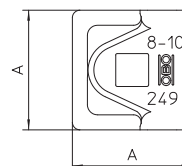


### Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.

- St Steel
- FT Hot-dip galvanised

- For round conductor fastening RD 8-10
- Suitable for M10 bolts

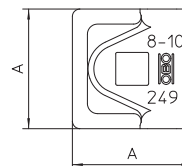


### Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.

- Alu Aluminium

- For round conductor fastening RD 8-10
- Suitable for M10 bolts

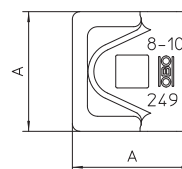


### Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.

- A2 Stainless steel, rustproof 1.4301

- For round conductor Rd 8-10
- Suitable for M10 bolts

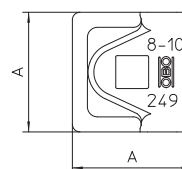


### Quick connector, cover Rd 8–10 mm

Type	Fit mm	Dimension A mm	Pack Piece	Weight kg/100 pc.	Item no.

- Cu Copper

- For round conductor fastening RD 8-10
- Suitable for M10 bolts

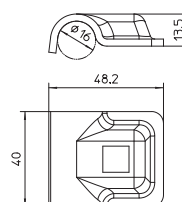


### Quick connector, cover Rd 16 mm

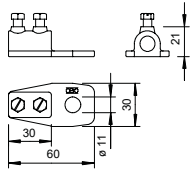
Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

- A2 Stainless steel, rustproof 1.4301

- For round conductor fastening RD 16
- Suitable for M10 bolts

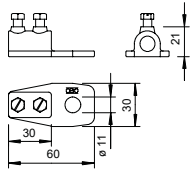


### End piece



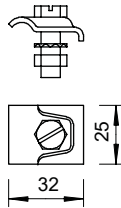
Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>280 8-10</b>	Rd 8-10	20	6.300	<b>5320011</b>
Zn Die-cast zinc G Electrogalvanised				
<ul style="list-style-type: none"> <li>• With Ø 11 mm attaching hole</li> <li>• 2 hexagonal bolts M6 x 12, bolts hot-dip galvanised steel or VA</li> <li>• Clamping element from die-cast zinc or copper-plated die-cast zinc</li> </ul>				

### End piece



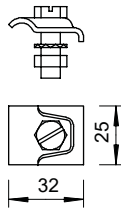
Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>280 VK</b>	Rd 8-10	20	9.000	<b>5320054</b>
Zn Die-cast zinc				
<ul style="list-style-type: none"> <li>• With Ø 11 mm attaching hole</li> <li>• 2 hexagonal bolts M6 x 12, bolts hot-dip galvanised steel or VA</li> <li>• Clamping element from die-cast zinc or copper-plated die-cast zinc</li> </ul>				

### Universal clamping block Rd 8–10 mm



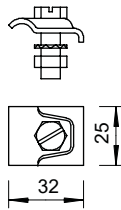
Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>324 S-FT</b>	Rd 8-10	20	3.400	<b>5326303</b>
SI Steel FT Hot-dip galvanised				
<ul style="list-style-type: none"> <li>• Including hexagonal bolt M8 x 25, washer and nuts</li> </ul>				

### Universal clamping block Rd 8–10 mm



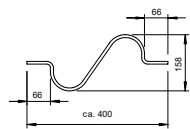
Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>324 S-VA</b>	Rd 8-10	10	3.400	<b>5326311</b>
A2 Stainless steel, rustproof 1.4301				
<ul style="list-style-type: none"> <li>• Including hexagonal bolt M8 x 25, washer and nuts</li> </ul>				

### Universal clamping block Rd 8–10 mm



Type	Fit	Pack	Weight	Item no.
	mm	Piece	kg/100 pc.	
<b>324 S-CU</b>	Rd 8-10	10	3.660	<b>5326338</b>
Cu Copper				
<ul style="list-style-type: none"> <li>• Including hexagonal bolt M8 x 25, washer and nuts</li> </ul>				

### Expansion piece



Type	Pack	Weight	Item no.
	Piece	kg/100 pc.	
<b>172 AR</b>	10	7.500	<b>5218926</b>
Alu Aluminium			
<ul style="list-style-type: none"> <li>• For equalising temperature-related length changes</li> <li>• Necessary on conductor lengths over 20 m</li> <li>• From round conductor Rd 8-Al</li> </ul>			

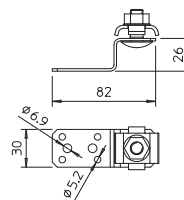


### Connection component

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>287</b>	20	1.600	<b>5320704</b>

Alu Aluminium

- With 1 attaching hole Ø 11 mm
- 4 mounting holes Ø 5.2 mm
- 2 mounting holes Ø 6.9 mm

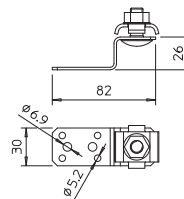


### Connection component

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>287 CU</b>	10	5.600	<b>5320690</b>

Cu Copper

- With 1 attaching hole Ø 11 mm
- 4 mounting holes Ø 5.2 mm
- 2 mounting holes Ø 6.9 mm



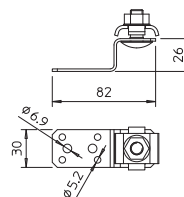
### Connection component with double crossbar



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>287 DCT</b>	8	N/50	10	6.450	<b>5320707</b>

Alu Aluminium

- Quick mounting thanks to an M10x30 bolt made of rustproof stainless steel
- With spring washer
- 4 fastening holes Ø 5.2 mm
- 2 fastening holes Ø 6.9 mm
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

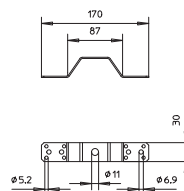


### Connection and bridging component

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>288 DIN</b>	20	2.900	<b>5320712</b>

Alu Aluminium

- With 1 attaching hole Ø 11 mm
- With 2 x 4 mounting hole Ø 5.2 mm
- With 2 x 2 mounting hole Ø 6.9 mm



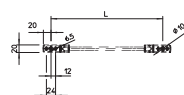
### Bridging cable



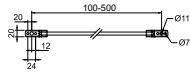
Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>853 200</b>	200	10	4.840	<b>5331008</b>
<b>853 300</b>	300	10	7.260	<b>5331013</b>
<b>853 400</b>	400	10	9.680	<b>5331017</b>

Cu Copper

- With aluminium cable lugs
- From flexible copper cable 16 mm<sup>2</sup>
- Coating: Black, chlorinated EM5 India rubber mixture
- With 1 fastening hole Ø 10.5 mm per attachment side
- With 2 fastening holes Ø 6.5 mm per attachment side
- Suitable for applications outside or inside
- Temperature range -25°C - +80°C (moved) and -40°C - +80°C (not moved)
- UV-stable



## Bridging cable



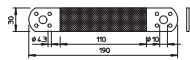
**Type**  
**853 400 SA**

**Cu** Copper

- With tin-plated copper cable lugs
- Made of flexible, insulated copper cable 16 mm<sup>2</sup>
- Coating: Black PVC
- With 1 mounting hole Ø 10.5 mm
- With 2 mounting holes Ø 6.5 mm
- Suitable for applications outside or inside
- Temperature range -10 °C - +80 °C

Pack Piece	Weight	Item no.
1		5331025

## Connection and expansion strip



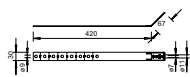
**Type**  
**856**

**Cu** Copper

- Copper strip 35 mm<sup>2</sup>, tin-plated
- Highly flexible with rigid ends
- Each end with 1 fastening hole Ø 10 mm and 4 fastening holes Ø 4.3 mm

Pack Piece	Weight kg/100 pc.	Item no.
10	8.125	5351501

## Universal downspout clamp 60–130 mm



**Type**  
**301 V**

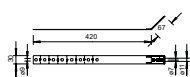
**St** Steel

**FS** Strip galvanised

- Adjustable for pipes from 60-130 mm
- With 2x attaching holes Ø 7 mm
- With 1x attaching hole Ø 9 mm
- With 1x attaching hole Ø 11 mm
- Including hexagonal bolt M6 x 20 and nuts M6

Pack Piece	Weight kg/100 pc.	Item no.
5	11.900	5350867

## Universal downspout clamp 60–130 mm



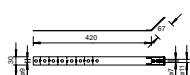
**Type**  
**301 V-VA**

**A2** Stainless steel, rustproof 1.4301

- Adjustable for pipes from 60-130 mm
- With 2x attaching holes Ø 7 mm
- With 1x attaching hole Ø 9 mm
- With 1x attaching hole Ø 11 mm
- Including hexagonal bolt M6 x 20 and nuts M6

Pack Piece	Weight kg/100 pc.	Item no.
5	11.800	5350905

## Universal downspout clamp 60–130 mm



**Type**  
**301 V-CU**

**Cu** Copper

- Adjustable for pipes from 60-130 mm
- With 2x attaching holes Ø 7 mm
- With 1x attaching hole Ø 9 mm
- With 1x attaching hole Ø 11 mm
- Including hexagonal bolt M6 x 20 and nuts M6

Pack Piece	Weight kg/100 pc.	Item no.
5	13.500	5350883



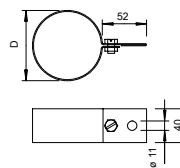
## Downspout clamp

Type	For pipe mm	Pack Piece	Weight kg/100 pc.	Item no.
301 DIN-80	80	10	19.580	5350085
301 DIN-90	90	10	21.880	5350093
301 DIN-100	100	10	19.880	5350107
301 DIN-110	110	10	24.920	5350115
301 DIN-120	120	10	26.240	5350123

St Steel

FS Strip galvanised

- To connect conductors and downspouts
- Similar to DIN 48818 C
- Strip galvanised (rd. 275 g/m<sup>2</sup> = 40 µm average value)
- With 1x hexagonal bolt M8 x 20
- With 1x hexagonal nut M8 and 1 stainless steel serrated washer
- With connection hole Ø 11 mm

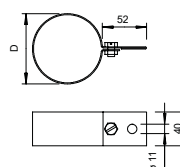


## Downspout clamp

Type	For pipe mm	Pack Piece	Weight kg/100 pc.	Item no.
301 CU-80	80	10	22.500	5350689
301 CU-100	100	10	26.230	5350700
301 CU-110	110	10	30.400	5350719
301 CU-120	120	10	31.400	5350727

Cu Copper

- With 1x hexagonal bolt M8 x 20
- With 1x hexagonal nut M8 and 1 serrated disc made of rustproof steel
- With connection hole Ø 11 mm



## Downspout clamp for routing Rd 8–10 mm behind pipe

Type	For pipe mm	Pack Piece	Weight kg/100 pc.	Item no.
301 S-100	100	10	5.200	5351057
301 S-120	120	10	5.950	5351073

St Steel

FS Strip galvanised

- With beading
- For round conductor Rd 8-10
- Including hexagonal bolt M6 x 20 and nuts M6



## Downspout clamp for routing Rd 8–10 mm behind pipe

Type	For pipe mm	Pack Piece	Weight kg/100 pc.	Item no.
301 S-AL-100	100	10	4.100	5351359
301 S-AL-120	120	10	4.600	5351375

Alu Aluminium

- With beading
- For round conductor Rd 8-10
- Including hexagonal bolt M6 x 20 and nuts M6



## Downspout clamp for routing Rd 8–10 mm behind pipe

Type	For pipe mm	Pack Piece	Weight kg/100 pc.	Item no.
301 S-VA-100	100	10	5.200	5351251
301 S-VA-120	120	10	5.950	5351286

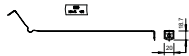
A2 Stainless steel, rustproof 1.4301

- With beading
- For round conductor Rd 8-10
- Including hexagonal bolt M6 x 20 and nuts M6



## Connection clamps and connection terminals

### Downspout clamp for routing Rd 8–10 mm behind pipe

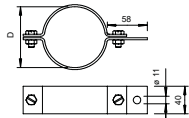


Type	For pipe mm	Pack	Weight	Item no.
		Piece	kg/100 pc.	
301 S-CU-100	100	10	5.850	5351456
301 S-CU-120	120	10	6.700	5351472

**Cu** Copper

- With beading
- For round conductor Rd 8-10
- Including hexagonal bolt M6 x 20 and nuts M6

### Pipe clamp



Type	For pipe mm	For pipe inch	Pack	Weight	Item no.
			Piece	kg/100 pc.	
303 DIN-3/8	17.2	3/8	5	22.600	5102057
303 DIN-1/2	21.3	1/2	5	23.280	5102073
303 DIN-3/4	26.9	3/4	5	25.640	5102081
303 DIN-1	33.7	1	5	28.300	5102111
303 DIN-1 1/4	42.4	1 1/4	5	31.300	5102138
303 DIN-1 1/2	48.3	1 1/2	5	33.220	5102154
303 DIN-2	60.3	2	5	36.840	5102197
303 DIN-2 1/2	76.1	2 1/2	10	39.400	5102219
303 DIN-3	88.9	3	10	43.300	5102235
303 DIN-3 1/2	100	3 1/2	10	64.900	5102251
303 DIN-4	114.3	4	10	66.800	5102278

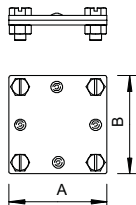
**St** Steel

**Fl** Hot-dip galvanised

- DIN 48818, Form D
- With Ø 11 mm mounting hole
- 2 hexagonal bolts M8 x 20 (4 inch = M10)
- 2 hex-head nuts M8 (4 inch = M10)

## Connection material

### Cross-connector flat/flat without adapter plate A4

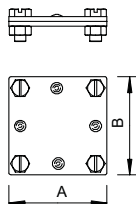


Type	Fit mm	Dimen- sion A mm	Dimen- sion B mm	Lightning current carrying capacity kA	Pack	Weight	Item no.
					Piece	kg/100 pc.	
256 S6 V4A	max. FL30	60	60	H/100	3600	24.100	5314574

**A4** Stainless steel, rustproof 1.4401

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Max. FL 30 x FL 30
- Without adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Cross-connector flat/flat without adapter plate FT



Type	Fit mm	Dimen- sion A mm	Dimen- sion B mm	Lightning current carrying capacity kA	Pack	Weight	Item no.
					Piece	kg/100 pc.	
256 S6 FT	max. FL30	—	—	H/100	3600	24.100	5314572

**St** Steel

**FT** Hot-dip galvanised

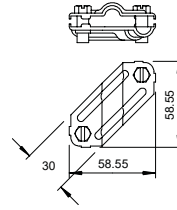
- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Max. FL 30 x FL 30 or max. FL 40 x FL 40
- Without adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)



### Cross-connector 250 VA

Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>250 VA-FR</b>	Rd 8-10/FL30	H/100	25	8.700	<b>5312930</b>

A4 Stainless steel, rustproof 1.4571

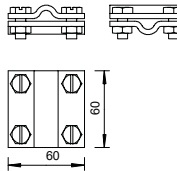


### Cross-connector round/round without intermediate plate



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>253 S3 V4A</b>	Rd 8-10	H/100	3400	25.900	<b>5312594</b>

A4 Stainless steel, rustproof 1.4401



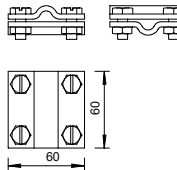
- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)

### Cross-connector Rd 8-10



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>253 S3 FT</b>	Rd 8-10	H/100	3400	23.300	<b>5312592</b>

- Sl** Steel
- FT** Hot-dip galvanised



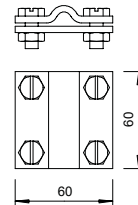
- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)

### Cross-connector for round cables and flat conductors



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 S4 V4A</b>	8-10 x FL30	H/100	3600	25.000	<b>5312308</b>

- A4 Stainless steel, rustproof 1.4401
- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
  - Fit: Rd 8-10 x FL 30
  - Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

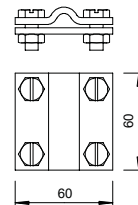


### Cross-connector for round cables and flat conductors DIN



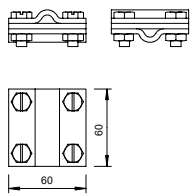
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 S4 FT</b>	8-10 x FL30	H/100	3600	25.000	<b>5312302</b>

- Sl** Steel
- FT** Hot-dip galvanised



- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x FL 30
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Cross-connector with intermediate plate for Rd 8–10 mm, wide version

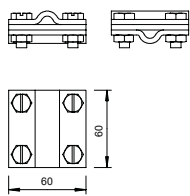


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 S1 V4A</b>	Rd 8-10	H/100	2800	28.800	<b>5312294</b>

A4 Stainless steel, rustproof 1.4401

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8

### Cross-connector with intermediate plate for Rd 8–10 mm, wide version

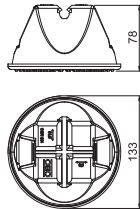


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>252 S1 FT</b>	Rd 8-10	H/100	2800	28.600	<b>5312292</b>

- Si** Steel
- FT** Hot-dip galvanised

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10 / FL 30
- With adapter plate
- Mounted with 4 hexagonal bolts M8 x 25 and 4 hexagonal nuts M8 (F)

### Roof conductor holder for flat roofs, black

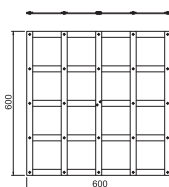
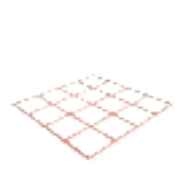


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>165 MBG-8-10</b>	Rd 8-10	12	97.220	<b>5218700</b>
<b>165 MBG-8-10 FO</b>	Rd 8-10	12	100.000	<b>5218704</b>

PA/PE Polyamide/polyethylene

- Closed form with base
- With double conductor holder
- Filling weight 1 kg (frost-resistant concrete)
- Sleeve made of polyethylene, black, bottom polypropylene, black
- Base made of polyamide PA 6, black, UV-stabilised and weather-resistant
- Base can be used on almost all roofing felt systems (bitumen, PVC)
- Types 165 MBG...FO: Packed in foil bag

### Earth mats

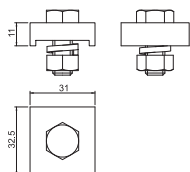


Type	Length mm	Width mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>1816 CU 6</b>	600	600	3	1	403.000	<b>5009250</b>
<b>1816 CU 9</b>	900	900	3	1	605.000	<b>5009256</b>

Cu Copper

- To reduce the step and contact voltage
- In accordance with IEC 62561-2 and IEC 62305-3

### Connection terminal for round conductors



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>1818 FL CU</b>	FL 20 ÷ FL 26	—	10	10.000	<b>5012270</b>

Cu Copper

- For connecting round conductor Rd 8-10
- With 1 hexagonal bolt M12 x 40, 1 hexagonal nut M12 and 1 lock washer, stainless steel

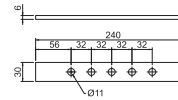


## Earthing rail for UF separation point

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>5700 CIP EB</b>	1	46.000	<b>5106071</b>

**Cu** Copper

- For UF test box 5700 CIP/PIP
- With 5 connection holes
- Diameter of drill hole 11 mm



## Connection and separating terminals

### Separating piece, open

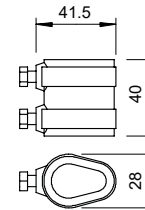


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

**Zn** Die-cast zinc

**G** Electrogalvanised

- With 2 hexagonal bolts, stainless steel (VA)
- Clamping element, die-cast zinc



### Separating piece, open

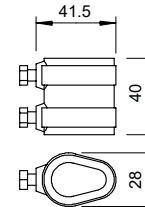


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

**Zn** Die-cast zinc

**Cu** Copper-plated

- With 2 hexagonal bolts, stainless steel (VA)
- Clamping element, copper-plated die-cast zinc



### Separating piece, closed

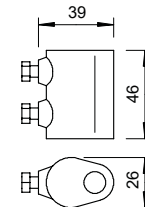


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

**Zn** Die-cast zinc

**G** Electrogalvanised

- For fitting round conductors Rd 8-10 to ground insertion rods Rd 16
- Including 2 hexagonal bolts, high-grade stainless steel (V2A)
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



### Separating piece, closed

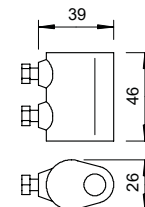


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

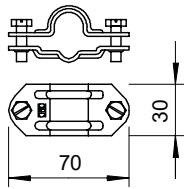
**Zn** Die-cast zinc

**Cu** Copper-plated

- For fitting round conductors Rd 8-10 to ground insertion rods Rd 16
- Including 2 hexagonal bolts, high-grade stainless steel (V2A)
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)



### Universal separating piece

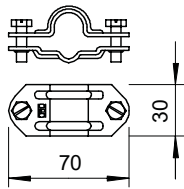


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>226 8-10</b>	Rd 8-10/FL30 x 16	20	8.600	<b>5336007</b>

- St** Steel
- FT** Hot-dip galvanised

- For fitting round conductors Rd 8–10 to Rd 16 or flat conductors FL30
- Including 2 hexagonal bolts M8 x 20 high-grade stainless steel (V2A)
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)

### Universal separating piece

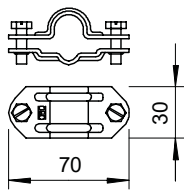


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>226 VA</b>	Rd 8-10/FL30 x 16	10	8.700	<b>5336058</b>

**A2** Stainless steel, rustproof 1.4301

- For fitting round conductors Rd 8–10 to Rd 16 or flat conductors FL30
- Including 2 hexagonal bolts M8 x 20 high-grade stainless steel (V2A)
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)

### Universal separating piece

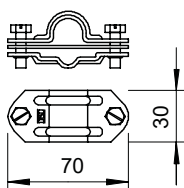


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>226 CU</b>	Rd 8-10/FL30 x 16	10	9.700	<b>5336023</b>

**Cu** Copper

- For fitting round conductors Rd 8–10 to Rd 16 or flat conductors FL30
- Including 2 hexagonal bolts M8 x 20 high-grade stainless steel (V2A)
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)

### Universal bi-metal separating piece

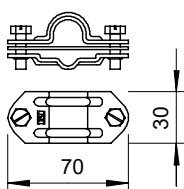


Type	Fit mm	Material upper part	Material lower part	Pack Piece	Weight kg/100 pc.	Item no.
<b>226 ZV VA</b>	Rd 8-10/FL30 x 16	VA	Cu	10	11.000	<b>5336074</b>

**Cu** Copper

- Fit: Rd 8-10 x 16, FL 30 x Rd 16
- With 2 hexagonal bolts M8 x 20, stainless steel (VA)
- Intermediate plate, aluminium/copper

### Universal bi-metal separating piece



Type	Fit mm	Material upper part	Material lower part	Pack Piece	Weight kg/100 pc.	Item no.
<b>226 ZV CU</b>	Rd 8-10/FL30 x 16	Cu	VA	10	11.900	<b>5336090</b>

**A2** Stainless steel, rustproof 1.4301

- Fit: Rd 8-10 x 16, FL 30 x Rd 16
- With 2 hexagonal bolts M8 x 20, stainless steel (VA)
- Intermediate plate, aluminium/copper

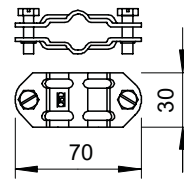
### Separating piece for Rd 8–10 and FL 30 mm

Type	Fit mm	Material	Pack Piece	Weight kg/100 pc.	Item no.
<b>233 8</b>	Rd 8-10/FL30 x Rd 8-10/FL30	Steel	20	8.200	5336309

**Sl** Steel

**FT** Hot-dip galvanised

- To fit round conductors Rd 8-10 or flat conductors FL 30
- With 2 hexagonal bolts M8 x 20 made of rustproof steel (VA)
- Short-circuit current I<sub>k</sub> (50 Hz), time 0.6 s, temp. max. 300 °C: 8.5 kA

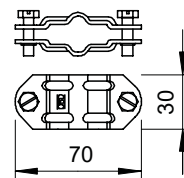


### Separating piece for Rd 8–10 and FL 30 mm

Type	Fit mm	Material	Pack Piece	Weight kg/100 pc.	Item no.
<b>233 VA</b>	Rd 8-10/FL30 x Rd 8-10/FL30	Stainless steel, rustproof 1.4301	10	8.300	5336341

**A2** Stainless steel, rustproof 1.4301

- For fitting round conductors Rd 8-10 or flat conductors FL 30
- With 2 hexagonal bolts M8 x 20, stainless steel (VA)

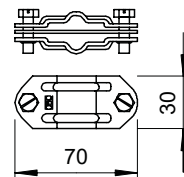


### Bi-metal separating piece for Rd 8–10 and FL 30 mm

Type	Fit mm	Material upper part	Material lower part	Pack Piece	Weight kg/100 pc.	Item no.
<b>233 ZV</b>	Rd 8-10/FL30 x Rd 8-10/FL30	Cu	VA	10	10.100	5336376

**A2** Stainless steel, rustproof 1.4301

- For fitting round conductors Rd 8-10 to flat conductors FL 30
- With 2 hexagonal bolts M8 x 20, stainless steel (VA)
- Intermediate plate aluminium/copper, top section copper, bottom section stainless steel

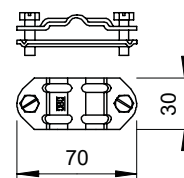


### Separating piece for Rd 8–10 and FL 30–40 mm

Type	Fit mm	Material	Pack Piece	Weight kg/100 pc.	Item no.
<b>233 A VA</b>	8-10xFL30-40	Stainless steel, rustproof 1.4301	10	7.851	5336457

**A2** Stainless steel, rustproof 1.4301

- Fit: Rd 8-10 x FL 30-40
- With 2 hexagonal bolts M8 x 20 (VA)

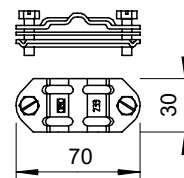


### Bi-metal separating piece for Rd 8–10 and FL 30–40 mm

Type	Fit mm	Material upper part	Material lower part	Pack Piece	Weight kg/100 pc.	Item no.
<b>233 A ZV</b>	Rd 8-10 x FL30-40	Cu	VA	10	10.400	5336503

**Cu** Copper

- Fit: Rd 8-10 x FL 30-40, FL 30 x FL 30-40
- With 2 hexagonal bolts M8 x 20, stainless steel (VA)
- Intermediate plate, aluminium/copper
- Top section copper, bottom section stainless steel



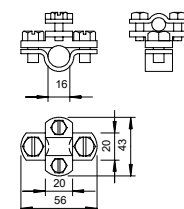
### Rod clamp

Type	Fit mm	Material	Pack Piece	Weight kg/100 pc.	Item no.
<b>108 B DIN</b>	Rd 8-10/16	Steel	10	13.970	5416566

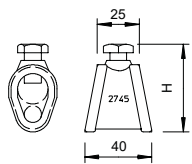
**Sl** Steel

**FT** Hot-dip galvanised

- Rod clamp for connecting round conductors Rd 8–10 to connector rods Rd 16
- Mounted with 2 hexagonal bolts M8 x 16 and M6 x 12
- Adapter from malleable iron
- Crossbar and bolts from hot dip galvanized steel



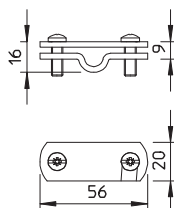
## Connection clamp for earth rod or cables



Type	For earth rods		Pack Piece	Weight kg/100 pc.	Item no.
	Ø mm	Fit mm			
<b>2745 20 MS</b>	20	7-12,5/S95 mm <sup>2</sup>	5	16.000	<b>5001560</b>
<b>CuZn</b>	Brass				
<b>Cu</b>	Copper-plated				

- For earth rods Ø 20 or conductors of 95 mm<sup>2</sup>
- For round conductor attachments Rd 7–12.5 with hexagonal bolts M10 x 25

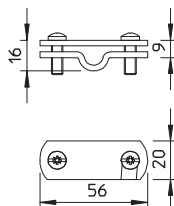
## Number plates



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>311 N-ALU 16</b>	RD 16 - FL30	5	2.800	<b>3049345</b>

- To identify the point of separation to DIN 48821
- Suitable for universal labelling (e.g. stamped numbers)

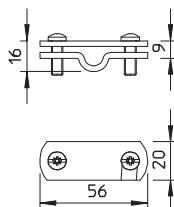
## Number plates



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>311 N-VA 16</b>	RD 16 - FL30	5	6.400	<b>3049329</b>

- To identify the point of separation to DIN 48821
- Suitable for universal labelling (e.g. stamped numbers)

## Number plates



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>Cu</b>	Copper			

- To identify the point of separation to DIN 48821
- Suitable for universal labelling (e.g. stamped numbers)

## Earth entries

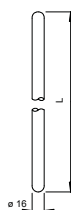
### Air-termination/earth entry rod, rounded-off on both ends



Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>St</b>	Steel				
<b>FT</b>	Hot-dip galvanised				

- Full material Ø 16 mm
- Rounded on both ends
- Suitable for FangFix stand system

### Air-termination/earth entry rod, rounded-off on both ends



Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>200 V4A-2000</b>	2000	16	10	320.000	<b>5420539</b>
<b>A4</b>	Stainless steel, rustproof 1.4571				

- Full material Ø 16 mm
- Both ends rounded

### Air-termination/earth entry rod, rounded-off on both ends

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.

**Cu** Copper

- Full material Ø 16 mm
- Both ends rounded



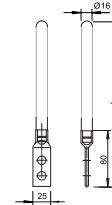
### Air-termination/earth entry rod with connection tabs

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 F2000</b>	2000	16	10	320.000	<b>5424208</b>

**St** Steel

**FT** Hot-dip galvanised

- With 2 attaching holes Ø 12 mm
- One end rounded



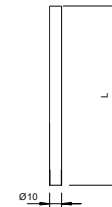
### Connection lug/earth entry rod made of stainless steel



Type	Nominal size Ø mm	Cross- section mm <sup>2</sup>	Dimen- sion L mm	Pack Piece	Weight kg/100 pc.	Item no.

**A4** Stainless steel, rustproof 1.4571/1.4404

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- RD 10-V4A for applications in the earth
- According to the foundation earther standard DIN 18014, V4A is required in the earth



### Earth entry rod, tapered and partially insulated

Type	Length mm	Nominal size Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>204 KS-2500</b>	2500	16/10	1	310.000	<b>5430062</b>

**St** Steel

**F** Hot galvanised

- 16 mm earth entry with 10 mm connection
- With mounted heat-shrinkable sleeve (corrosion protection)



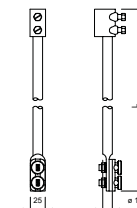
### Earth entry rod with separating piece and connector

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

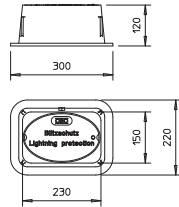
**St** Steel

**FT** Hot-dip galvanised

- With separating piece type 223 DIN and connector type 5002 DIN



### Underfloor test box



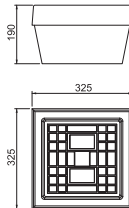
Type  
**5700**

EN-GJL Cast iron

- Without base
- Cast iron, painted black
- Without cut-off unit
- To VDE 0185-561-5 (IEC 62561-5) suitable for heavy loads (up to 40 kN/ 4.0 t)

Pack	Weight	Item no.
Piece	kg/100 pc.	
1	720.000	5106002

### Underfloor test box



Type

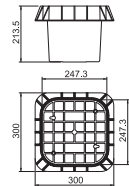
**5700 CIP**

BET Concrete

- Made of concrete
- Without separating piece
- According to VDE 0185-561-5 (IEC 62561-5)

Pack	Weight	Item no.
Piece	kg/100 pc.	
1	3,000.000	5106041

### Underfloor test box



Type

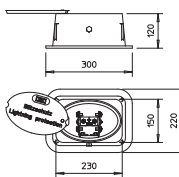
**5700 PIP**

Plastic

- Made of plastic
- Without separating piece
- According to VDE 0185-561-5 (IEC 62561-5)

Pack	Weight	Item no.
Piece	kg/100 pc.	
1	180.000	5106045

### Inspection pit with integrated separation piece



Type

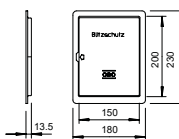
**5700 SP**

EN-GJL Cast iron

- Without base
- Cast iron, painted black
- With built-in cut-off unit for round conductors Rd 8-10 and flat conductors to FL 40
- To VDE 0185-561-5 (IEC 62561-5) suitable for heavy loads (up to 40 kN/ 4.0 t)

Pack	Weight	Item no.
Piece	kg/100 pc.	
1	770.000	5106003

### Inspection door



Type

**5800 VZ**

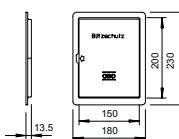
St Steel

FS Strip galvanised

- Lightweight design for flush-mounted separation points
- Claw length approx. 80 mm

Pack	Weight	Item no.
Piece	kg/100 pc.	
1	46.000	5106133

### Inspection door



Type

**5800 VA**

A2 Stainless steel, rustproof 1.4301

- Lightweight design for flush-mounted separation points
- Claw length approx. 80 mm

Pack	Weight	Item no.
Piece	kg/100 pc.	
1	46.000	5106141



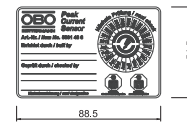
### Magnetic card PCS



Type	Pack	Weight	Item no.
PCS	PU	kg/100 PUs	
	1	5.000	5091438

Peak Current Sensor (PCS) card for recording pulsed/lightning currents. A continuous check of whether lightning has struck the lightning protection system and how high the most recent lightning current was in kA can thus be carried out in the simplest manner by the system operator, specialist lightning protection company or by a surveyor. Here, the printed maintenance circuit and the labelling panels support the maintenance work of the entire lightning protection system which must be performed at defined intervals according to VDE 0185-305-3 (IEC/EN 62305-3).

- Contents = 10 units
- Digital evaluation via the PCS card reading device
- Can be used in addition to the OBO lightning current meter LSC I-II
- With separate labelling panels: "Erected by", "Tested by", "Card code"
- Integrated maintenance circuit (year/month)



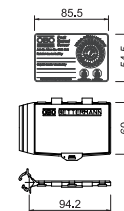
### Magnetic card and holder MK-B



Type	Pack	Weight	Item no.
MK-B	PU	kg/100 PUs	
	1	31.000	5091322

PCS magnetic card to record pulse/lightning currents including holder

- Holder can be leaded
- For mounting on round conductor Rd 8-10
- Simple holder mounting through clamping
- 1 PU = 10 units

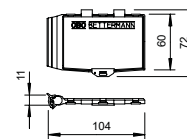


### Magnetic card holder PCS-H

Type	Pack	Weight	Item no.
PCS-H	PU	kg/100 PUs	
	1	31.000	5091527

Magnetic card holder for mounting PCS cards.

- Sealable holder
- For installing on round conductor Rd 8-10
- Simple holder installation by means of clamp
- 1 PU = 10 pieces



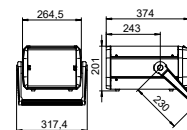
### Card reader PCS-CS..



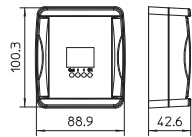
Type	Country version	Nom. voltage V	Measuring range	Measuring tolerances	Pack Piece	Weight kg/100 pc.	Item no.
PCS-CS-D	EN	230	3 -- 120 kA	< 2 kA (< 2%)	1	750.000	5091683
PCS-CS-GB	GB	230	3 -- 120 kA	< 2 kA (< 2%)	1	750.000	5091691

Magnetic card reader for reading and analysing PCS cards.

- Inc. rechargeable battery for 4 h continuous, no-mains operation
- Large, clear display



## Lightning strike counter



Type	Measuring range
<b>LSC I+II</b>	1 kA - 100 kA

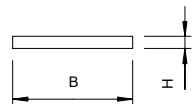
Plastic

Pack Piece	Weight kg/100 pc.	Item no.
1	32.500	<b>5091722</b>

The LSC I+II lightning current meter measures and permanently saves pulse currents, together with the date and time. This ensures constant monitoring in order to notice if any lightning has struck the lightning protection system. Should this be the case, then the lightning protection system must be maintained according to VDE 0185-305 (IEC 62305).

- Saving and display of time and date
- Usable both inside and outside due to its protection class of IP65
- Cable clip for round conductor or flat conductor
- Direct mounting on the conductor or the PE conductor of the surge protection device
- Long lifespan of the internal lithium batteries
- LCD display
- Internal battery
- Tested according to VDE 0185-561-6 (IEC 62561-6)

## Corrosion protection strip

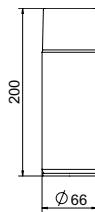


Type	Width mm	Length m	Pack Piece	Weight kg/100 pc.	Item no.
<b>356 50</b>	50	10	1	71.500	<b>2360055</b>
<b>356 100</b>	100	10	1	122.200	<b>2360101</b>

**PETRO** Petrolatum

- Approx. 1.1 mm thick
- Width: 50 mm or 100 mm, made of petrolatum-coated chemical fibre fabric
- Can be processed cold

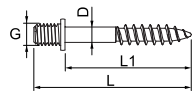
## Zinc repairs



Type	Dimension	Pack Piece	Weight kg/100 pc.	Item no.
<b>ZSF</b>	400ml	1	45.000	<b>2362970</b>

Zinc spray for treatment of unprotected surfaces and cutting edges. Can contents: 400 ml.

## Screw-in anchor with M6 thread



Type	Shank Ø mm	Wood external thread Ø mm	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
<b>985 M6 25</b>	4.3	5	3000	100	0.412	<b>3133028</b>
<b>985 M6 35</b>	4.3	5	2000	100	0.533	<b>3133036</b>

**St** Steel

**G** Electrogalvanised

With wood screw shank and M6 thread.





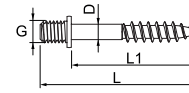
### Screw-in anchor with M8 thread



Type	Wood	Shipping	Pack	Weight	Item no.
	external	box			
	thread Ø	mm			
<b>985 M8 35</b>	6	1200	100	0.950	<b>3133230</b>

- St** Steel
- G** Electrogalvanised

With wood screw shank and M8 thread.

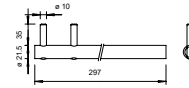


### Directional irons

Type	Length	Pack	Weight	Item no.
	mm			
<b>364</b>	297	1	35.000	<b>3051013</b>

- St** Steel
- FT** Hot-dip galvanised

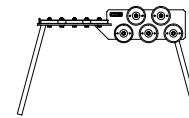
• Directional iron for bending and aligning conductors



### Wire straightening machine

Type	Pack	Weight	Item no.
<b>5900</b>	1	3,300.000	<b>3059006</b>

- St** Steel
- Factory-set for round conductor Rd 8
- Structure, steel, painted
- Straightening rolls, galvanised cast iron





# Insulated lightning protection



**Insulated lightning protection**

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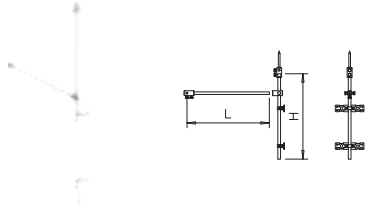


**OBO isCon® system**

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## Insulated lightning protection set, 3-corner fastening

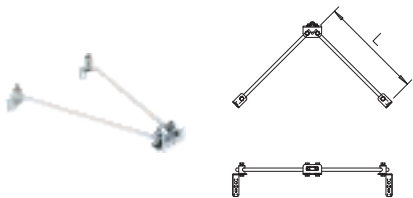


Type	Dimension D Ø mm	Dimension L mm	Dimension H mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 3-ES-16</b>	16	750	1500	1	207.100	<b>5408976</b>

3-corner fastening for an insulated air-termination unit at the separating distance s.

- Mounting on walls and roof structures with two fastening plates
- For maintenance of the separation distance to electrically conductive parts according to VDE 0185-305-3 (IEC 62305-3)
- Acceptance of air-termination rods and round conductors with 8, 16 and 20 mm diameter
- UV-stabilised and weatherproof
- Continuous temperature range -50°C to +100°C
- Material factor  $k_m = 0.7$

## Insulated lightning protection set, V fastening

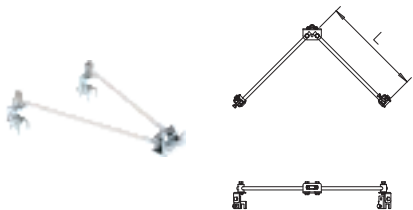


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 VS-16</b>	16	750	1	201.800	<b>5408978</b>

V fastening for an insulated air-termination unit at the separating distance s.

- Mounting on walls and roof structures with two wall connection brackets
- For maintenance of the separation distance to electrically conductive parts according to VDE 0185-305-3 (IEC 62305-3)
- Acceptance of air-termination rods and round conductors with 8, 16 and 20 mm diameter
- UV-stabilised and weatherproof
- Continuous temperature range -50°C to +100°C
- Material factor  $k_m = 0.7$

## Insulated lightning protection set, IR fastening

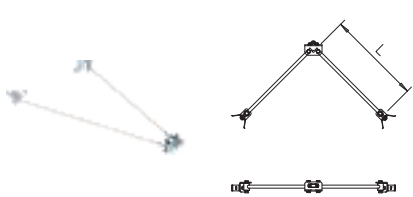


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 FS-16</b>	16	750	1	235.500	<b>5408980</b>

Fold fastening for an insulated air-termination unit at the separating distance s.

- Mounting on folds with a thickness of up to 20 mm
- For maintenance of the separation distance to electrically conductive parts according to VDE 0185-305-3 (IEC 62305-3)
- Acceptance of air-termination rods and round conductors with 8, 16 and 20 mm diameter
- UV-stabilised and weatherproof
- Continuous temperature range -50°C to +100°C
- Material factor  $k_m = 0.7$

## Insulated lightning protection set, VRS fastening



Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 VRS-16</b>	16	750	1	209.400	<b>5408982</b>

Pipe V fastening for an insulated air-termination unit at the separating distance s.

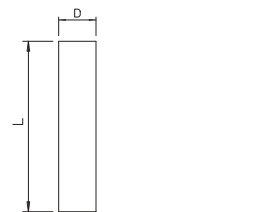
- Mounting on pipes with two pipe clips
- Including 2 m tightening strip and tension jack
- For maintenance of the separation distance to electrically conductive parts according to VDE 0185-305-3 (IEC 62305-3)
- Acceptance of air-termination rods and round conductors with 8, 16 and 20 mm diameter
- UV-stabilised and weatherproof
- Continuous temperature range -50°C to +100°C
- Material factor  $k_m = 0.7$

## Insulating rod

Type	Nominal size Ø mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
101 20-3000	20	3000	5	190.000	5408105
101 20-6000	20	6000	5	380.000	5408148
101 16-750	16	750	5	30.000	5408107
101 16-1500	16	1500	5	60.000	5408108
101 16-3000	16	3000	5	120.000	5408109

GFK Fibre-glass-reinforced plastic

- For the erection of insulated air-termination systems to VDE 0185-305 (IEC 62305)
- UV-stabilised and weatherproof
- Continuous temperature range -50°C to +100°C
- Material factor  $k_m = 0.7$

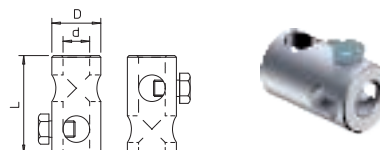


## T connector

Type	Dimension d Ø mm	Length mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 IT	20	65	40	10	16.120	5408156
101 IT-16	16	60	30	10	11.475	5408158

Alu Aluminium

- T connector for installation of insulating rods
- With M10 bolts

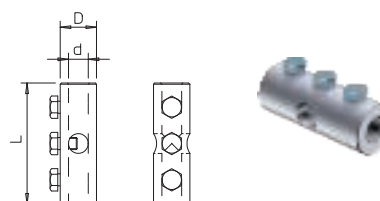


## K connector

Type	Dimension d Ø mm	Length mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 IK	20	100	40	10	20.000	5408296
101 IK-16	16	100	30	10	17.500	5408298

Alu Aluminium

- K connector for installation of insulating rods
- With M10 bolts

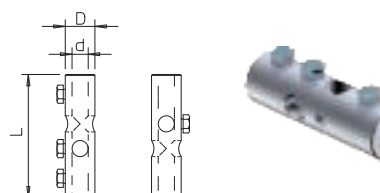


## DK connector

Type	Dimension d Ø mm	Length mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 IDK	20	125	40	10	40.000	5408245

Alu Aluminium

- DK connector link for installing insulating rods
- With M10 bolts

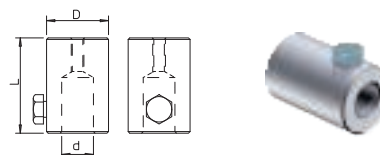


## Wall connection

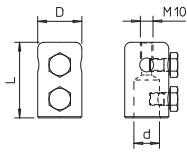
Type	Dimension d Ø mm	Length mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 IW-M10	20	60	40	10	20.000	5408687
101 W-16	16	60	30	10	14.200	5408689

Alu Aluminium

- For mounting insulating rods to structures or walls
- With M8 internal thread, e.g. for mounting the cable bracket type 177 (5207347) for loose conductor routing of round conductors
- Incl. M10 bolts



### End piece

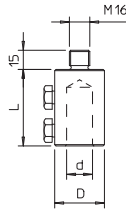


Type	Dimension d Ø mm	Length mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 IES	20	60	35	10	20.000	5408393
101 IES-16	16	60	30	10	10.000	5408395

Alu Aluminium

- End piece for attaching round conductors Rd 8-10 and air-termination tips, type 101 ISP
- With M10 internal thread, e.g. for mounting a Vario quick connector for fixed conductor routing at intersections
- With M10 bolts

### Connection piece

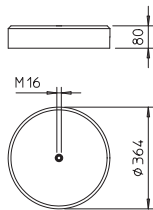


Type	Dimension d Ø mm	Length mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 A-M16	20	60	40	10	20.000	5408350
101 A-16	16	60	30	10	13.000	5408352

Alu Aluminium

- Fitting with M16 thread
- For mounting on stands with M16 female thread such as type 101 (5402891,5402958)
- With M10 bolts

### Concrete base min. 16 kg with female thread

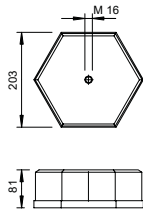


Type	Nominal size Ø mm	Thread	Pack Piece	Weight kg/100 pc.	Item no.
101 B2-16 M16	364	M16	1	1,600.000	5402958

BET Concrete

- Weight min. 16 kg
- Frost-resistant concrete
- Female thread M16
- Recommended air-termination rod length max. 3.0 m, depending on wind load zone

### Stand 6.9 kg with female thread

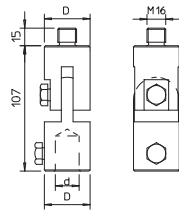


Type	Thread	Pack Piece	Weight kg/100 pc.	Item no.
101 ST	M16	4	690.000	5402891

BET Concrete

- Weight 6.9 kg
- Frost-resistant concrete
- Female thread M16
- Recommended air-termination rod length max. 1.0 m

### Connection joint

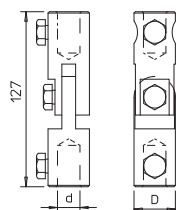


Type	Dimension d Ø mm	Length mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 IAG	20	107	40	10	40.000	5408504

Alu Aluminium

- Attaching link for installation on concrete stones
- With thread M16 on slanting roof surfaces
- With M10 bolts

### Articulated connector



Type	Dimension d Ø mm	Length mm	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
101 IGL-16	16	127	30	10	32.000	5408630

Alu Aluminium

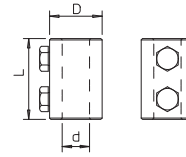
- Link for installation of insulation pipes, including M10 screws.

## Extension

Type	Dimension d mm	Length mm	Dimension D mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 IV-16</b>	16	60	30	10	16.000	<b>5408557</b>

Alu Aluminium

- Extension of insulating rods
- With M10 bolts

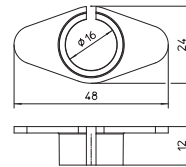


## FangFix reducing sleeve

Type	Colour	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 RH-16</b>	Black	16	25	0.187	<b>5408101</b>

PA Polyamide

Reduces the drill hole of the FangFix block from  $\varnothing 20$  mm to  $\varnothing 16$  mm. Suitable for the installation of GFK insulating rods of  $\varnothing 16$  mm.

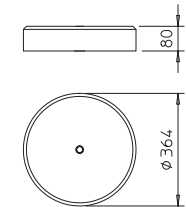


## Concrete base for FangFix system, min. 16 kg

Type	Nominal size $\varnothing$ mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>F-FIX-S16</b>	365	1	1,700.000	<b>5403227</b>

BET Concrete

- Min. 16 kg block of  $\varnothing 365$  mm, high level of stability
- Frost-resistant concrete
- Stackable

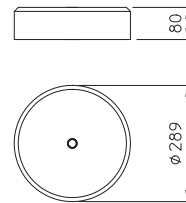


## Concrete base for FangFix system, min. 10 kg

Type	Nominal size $\varnothing$ mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>F-FIX-S10</b>	289	1	1,000.000	<b>5403117</b>

BET Concrete

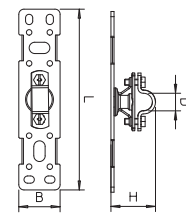
- Min. 10 kg block of  $\varnothing 289$  mm, high level of stability
- Frost-resistant concrete
- Stackable



## Fastening plate

Type	Length mm	Dimension B mm	Dimension H mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 BP-16</b>	175	40	42	1	21.200	<b>5408984</b>

To mount insulating rods on constructions or walls  
Plate made of VA stainless steel  
Holder and crosspiece for 16 and 20 mm rods and Rd 8–10 mm

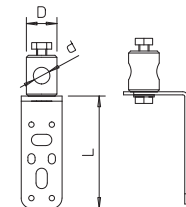


## Wall connection, angled

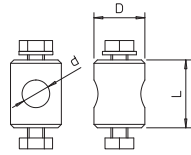
Type	Dimension d mm	Dimension L mm	Dimension D mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 WG-16</b>	16	110	30	1	27.960	<b>5408986</b>

A2 Stainless steel, rustproof 1.4301

- Wall connection for GFK rods
- Dimension D  $\varnothing$ : 16 mm



## Fastening bolts

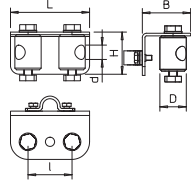


Type	Dimension d mm	Dimension L mm	Dimension D mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 BB-16</b>	16	40	30	1	13.920	<b>5408988</b>

Alu Aluminium

For GFK rods, Dimension D Ø: 16 mm

## Holder, V support

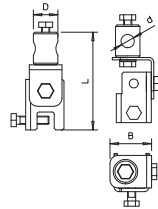


Type	Dimension d mm	Dimension L mm	Dimension H mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 HV-16</b>	16	90	55	48	1	50.700	<b>5408990</b>

A2 Stainless steel, rustproof 1.4301

- Rod holder to accept two GRP rods
- Bracket and crossbar for 16 and 20 mm rods and Rd 8-10 mm

## Fold fastening

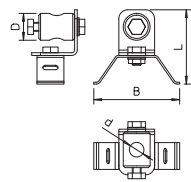


Type	Dimension d mm	Dimension L mm	Dimension D mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 F-16</b>	16	121	30	1	45.120	<b>5408992</b>

A2 Stainless steel, rustproof 1.4301

To fasten a GFK rod on constructions of 4 to 20 mm, Dimension D Ø: 16 mm

## Pipe fastening

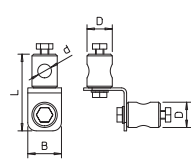


Type	Dimension d mm	Dimension L mm	Dimension D mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 R-16</b>	16	81	30	96	1	26.830	<b>5408994</b>

A2 Stainless steel, rustproof 1.4301

- For pipe fastening of a GRP rod using a tightening strap
- Slot width (l x w) 17 x 6 mm

## Multi adapter

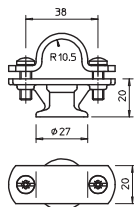


Type	Dimension d mm	Dimension L mm	Dimension D mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>101 MA-16</b>	16	91	30	40	1	36.280	<b>5408996</b>

A2 Stainless steel, rustproof 1.4301

- Connector for two GFK rods
- Dimension D Ø: 16 mm

## Rod holder, 20 mm



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>113 Z-20</b>	Rd 20	20	8.200	<b>5230527</b>

Zn Die-cast zinc

VZ Galvanised

- Installed with over-piece and hex-head screws M6 x 16
- With female thread M8 or through hole Ø 7 mm

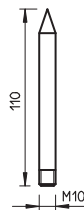


## Air-termination tip

Type	Length mm	Pack Piece	Weight kg/100 pc.	Item no.

Alu Aluminium

Air-termination tip for attaching to end piece, type 101 IES, with M10 thread

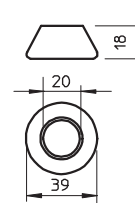


## Water repellent

Type	Length mm	Pack Piece	Weight kg/100 pc.	Item no.

Alu Aluminium

Water repellent for mounting on insulation rods with  $d = 20$  mm



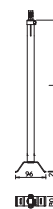
## Adjustable insulating beam – pipe

Type	Pack Piece	Weight kg/100 pc.	Item no.

GFK Fibre-glass-reinforced plastic

Variable spacer for conductors and air-termination rods to maintain the separation distance.

- Infinitely adjustable distance range (L = 550–1,000 mm)
- Made of fibre-glass-reinforced plastic ( $k_m = 0.7$ )
- For pipe mounting (including 2 m tightening strap and tension jack)



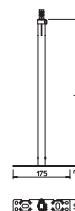
## Adjustable insulating beam – wall

Type	Pack Piece	Weight kg/100 pc.	Item no.

GFK Fibre-glass-reinforced plastic

Variable spacer for conductors and air-termination rods to maintain the separation distance.

- Infinitely adjustable distance range (L = 550–1,000 mm)
- Made of fibre-glass-reinforced plastic ( $k_m = 0.7$ )
- For wall mounting with 10 fastening holes (4.2 mm) and 4 fastening holes (6.9 mm)

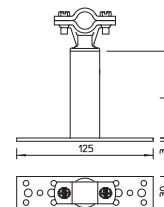


## Insulated spacer

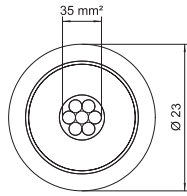
Type	Length mm	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>ISO-A-800</b>	800	Rd 16	15	55.000	<b>5408814</b>
<b>ISO-A-1030</b>	1030	Rd 16	15	68.000	<b>5408820</b>
<b>ISO-A-150 8</b>	150	Rd 8	15	13.800	<b>5408800</b>

Alu Aluminium PA Polyamide

- Mounting foot with 10 connection holes  $\varnothing 6.5$  mm and 4 connection holes  $\varnothing 8.5$  mm
- Type ...150 8 with holder suitable for round conductor RD 8
- Application for shelters, e.g. golf, barbecue or mountain huts



### isCon® conductor, professional plus black

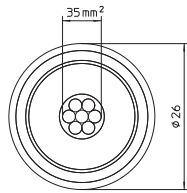


Type	Cross-section mm <sup>2</sup>	Nominal size Ø mm	Equivalent separation distance m	Pack m	Weight kg/100 m	Item no.
isCon Pro+ 75 SW	35	23	0.75	100	69.400	5408004
isCon Pro+ 75 SW	35	23	0.75	250	69.400	5408006

Please refer to the mounting instructions for information on routing the OBO isCon® conductor.

- Highly voltage-resistant, insulated conductor
- Floating discharge-free
- Additional mechanical protection (black protective jacket)
- For maintenance of the separation distance according to IEC 62305 (VDE 0185-305-3)
- Tested according to IEC/EN 62561-1 (VDE 0185-561-1) with H1/150 kA
- Equivalent separation distance  $se \leq 0.75$  m (air) and  $se \leq 1.5$  (solid material)
- Tested according to IEC TS 62561-8 (VDE V 0185-561-8)
- Halogen-free
- Fire load 4.3 kWh/m
- Can be used in potentially explosive areas Ex zone 1/2 and 21/22 when taking the current mounting instructions into account

### isCon® conductor, professional plus light grey

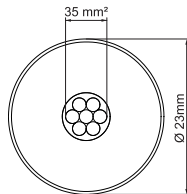


Type	Cross-section mm <sup>2</sup>	Nominal size Ø mm	Equivalent separation distance m	Pack m	Weight kg/100 m	Item no.
isCon Pro+ 75 GR	35	26	0.75	25	86.800	5407995
isCon Pro+ 75 GR	35	26	0.75	100	86.800	5407997

Please refer to the mounting instructions for information on routing the OBO isCon® conductor.

- Highly voltage-resistant, insulated conductor
- Protection against contact voltage during rain (VDE 0432-1 (IEC/EN 60060-1))
- Floating discharge-free
- Additional mechanical protection (double protective jacket)
- For maintenance of the separation distance according to IEC 62305 (VDE 0185-305-3)
- Tested according to IEC/EN 62561-1 (VDE 0185-561-1) with H1/150 kA
- Equivalent separation distance  $se \leq 0.75$  m (air) and  $se \leq 1.5$  (solid material)
- Tested according to IEC TS 62561-8 (VDE V 0185-561-8)
- Halogen-free
- Fire load 5.1 kWh/m
- Can be used in potentially explosive areas EX zone 1/2 and 21/22 when taking the current mounting instructions into account

### isCon® conductor, premium black



Type	Cross-section mm <sup>2</sup>	Nominal size Ø mm	Equivalent separation distance m	Pack m	Weight kg/100 m	Item no.
isCon PR 90 SW	35	23	0.9	100	66.600	5408018

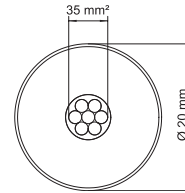
Please refer to the mounting instructions for information on routing the OBO isCon® Premium conductor.

- Highly voltage-resistant, insulated conductor
- Floating discharge-free
- Tested according to IEC/EN 62561-1 (VDE 0185-561-1) with H2/200 kA
- Equivalent separation distance  $se \leq 0.90$  m (air) and  $se \leq 1.8$  m (solid material)
- Tested according to IEC TS 62561-8 (VDE V 0185-561-8)
- Halogen-free
- Fire load 4.2 kWh/m

### isCon® conductor, professional black



Type	Cross-section	Nominal size	Equivalent separation distance	Pack m	Weight kg/100 m	Item no.
	mm <sup>2</sup>	mm	m			
<b>isCon Pro 75 SW</b>	35	20	0.75	100	57.000	<b>5408008</b>



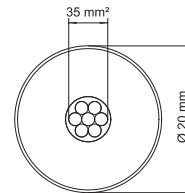
Please refer to the mounting instructions for information on routing the OBO isCon® Pro conductor.

- Highly voltage-resistant, insulated conductor
- Floating discharge-free
- For maintenance of the separation distance according to IEC 62305 (VDE 0185-305-3)
- Tested according to IEC/EN 62561-1 (VDE 0185-561-1) with H1/150 kA
- Equivalent separation distance  $se \leq 0.75$  m (air) and  $se \leq 1.5$  m (solid material)
- Tested according to IEC TS 62561-8 (VDE V 0185-561-8)
- Halogen-free
- Fire load 3.3 kWh/m

### isCon® conductor, basic black



Type	Cross-section	Nominal size	Equivalent separation distance	Pack m	Weight kg/100 m	Item no.
	mm <sup>2</sup>	mm	m			
<b>isCon BA 45 SW</b>	35	20	0.45	100	57.000	<b>5408014</b>



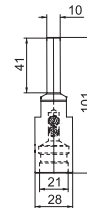
Please refer to the mounting instructions for information on routing the OBO isCon® Basic conductor.

- Highly voltage-resistant, insulated conductor
- For maintenance of the separation distance according to IEC 62305 (VDE 0185-305-3)
- Tested according to IEC/EN 62561-1 (VDE 0185-561-1) with H1/150 kA
- Equivalent separation distance  $se \leq 0.45$  m (air) and  $se \leq 0.90$  m (solid material)
- Tested according to IEC TS 62561-8 (VDE V 0185-561-8)
- Halogen-free
- Fire load 3.3 kWh/m

### isCon® connection element



Type	Dimension D	Fit	Lightning current carrying capacity	Pack Piece	Weight kg/100 pc.	Item no.
	mm	mm	kA			
<b>isCon con 2</b>	20	10	H1/150	2	21.500	<b>5408021</b>
<b>isCon connect</b>	23	10	H1/150	2	21.500	<b>5408022</b>
<b>isCon con PRE</b>	23	10	H2/200	2	21.500	<b>5408023</b>



A2 Stainless steel, rustproof 1.4301

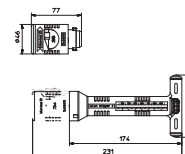
- Screw-on termination of the connection for the isCon® conductor
- Incl. heat-shrinkable sleeve, hexagonal
- Tested up to 200 kA (lightning protection class I)

### Stripping tool for isCon® conductor

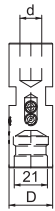
Type	Clamping range D	Pack Piece	Weight kg/100 pc.	Item no.
	mm			
<b>isCon stripper 2</b>	20 - 23	1	170.000	<b>5408013</b>

PA/PE Polyamide/polyethylene

Stripping tool to remove the insulation of the OBO isCon® conductor.



### Connection element for installation in the insulated air-termination rod isFang IN

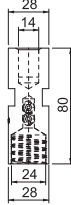


Type	Dimension D Ø mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon IN con 2</b>	20	H1/150	1	27.800	<b>5408019</b>
<b>isCon IN con PRE</b>	23	H2/200	1	27.800	<b>5408020</b>

A2 Stainless steel, rustproof 1.4301

- Screw-on termination of the connection for the isCon® conductor
- Connection and installation of the conductor in the insulated air-termination rod
- Tested up to 200 kA (lightning protection Class II)

### Connection element for installation in the insulated air-termination rod isFang IN

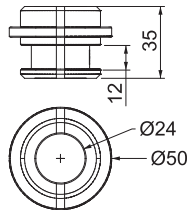


Type	Dimension D Ø mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon IN connect</b>	23	H1/150	1	26.900	<b>5408024</b>

A2 Stainless steel, rustproof 1.4301

- Screw-on termination of the connection for the isCon® conductor
- Connection and installation of the conductor in the insulated air-termination rod
- Tested up to 200 kA (lightning protection Class II)

### Potential connection for isCon® Professional+ and Premium in the isFang IN insulated air-termination rod

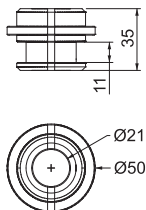


Type	Dimension D Ø mm	Dimension d mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon IN PAE</b>	23	49.9	35	1	5.900	<b>5408031</b>

Alu Aluminium

- To avoid surface discharges on the isCon® conductor
- Installation takes place after the first 1.5 metres in the insulated air-termination rod type isFang IN

### Potential connection for isCon® Basic and Professional IN in the isFang IN insulated air-termination rod

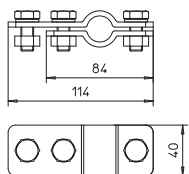


Type	Dimension D Ø mm	Dimension d mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon IN PAE 2</b>	20	49.9	35	1	5.900	<b>5408032</b>

Alu Aluminium

- To avoid surface discharges on the isCon® conductor
- Installation takes place after the first 1.5 metres in the insulated air-termination rod type isFang IN

### Potential connection



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon PAE</b>	Ø 17-25mm	2	36.500	<b>5408036</b>

A2 Stainless steel, rustproof 1.4301

- Potential connection
- To avoid floating discharges on the isCon® conductor
  - With sprung discs to protect screws against loosening

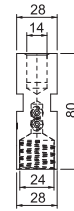
## Connection element for installation in the insulated air-termination rod isFang IN



Type	Dimension D Ø mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon IN connect</b>	23	H1/150	1	26.900	<b>5408024</b>

A2 Stainless steel, rustproof 1.4301

- Screw-on termination of the connection for the isCon® conductor
- Connection and installation of the conductor in the insulated air-termination rod
- Tested up to 200 kA (lightning protection Class II)

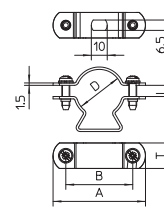


## VA cable bracket for isCon® conductor for mounting on roof/wall structures

Type	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon H VA</b>	21 - 23	50	2.850	<b>5408056</b>
<b>isCon H 26 VA</b>	26	20	3.400	<b>5408064</b>

A2 Stainless steel, rustproof 1.4301

- For isCon® conductor for mounting on roof/wall structures
- With sprung discs to protect the screws against loosening



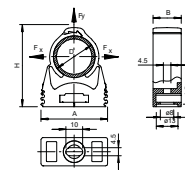
## starQuick clip, black



Type	Colour	Dimension D mm	Dimension A mm	Dimension B mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>SQ-20 SW</b>	Jet black	—	29	17	50	0.848	<b>2146164</b>
<b>SQ-25 LGR</b>	Light grey	—	40	17	50	0.970	<b>2146207</b>

PP Polypropylene PA Polyamide

Cable brackets for isCon® conductors for mounting on the building structure. Can also be used in the first 1.5 m. Can be arranged next to each other. Made from a UV and weather-resistant polyamide.

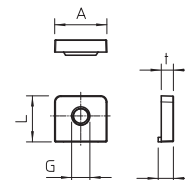


Type	Colour	Nominal size	Dimension L mm	Dimension h mm	Dimension t mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>SQ M6</b>	Light grey	M6	15	5	4	100	0.070	<b>2146509</b>

PC Polycarbonate

The starQuick nut was developed especially for the starQuick clip. Simply push into the intended opening of the clip. The nut is captive in the clip. Suitable for M6 threads.

## starQuick nut

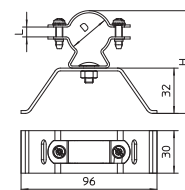


## VA cable bracket with tightening strap

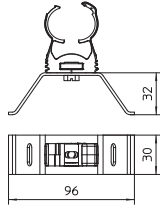
Type	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon HS VA</b>	23	10	25.200	<b>5408052</b>
<b>isCon HS 26 VA</b>	26	10	25.900	<b>5408068</b>

A2 Stainless steel, rustproof 1.4301

- For isCon® conductor for pipe mounting
- Including 2 m tightening strap
- Cable bracket with sprung discs to protect the screws against loosening



## PA cable bracket with tightening strap

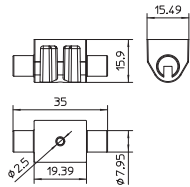


Type	Colour	Dimension	Dimension D Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon HS 26 PA</b>	Light grey	Ø 26mm	26	10	23.200	<b>5408066</b>

PA Polyamide

For isCon® conductor for pipe mounting including 2 m tightening strap.

## Universal flat conductor adapter for roof conductor holder, type 165/MBG

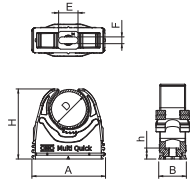


Type	Colour	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>165 MBG UH</b>	Black	Rd 8	25	0.254	<b>5218882</b>

PP Polypropylene

- Universal adapter with drill hole Ø 2.5 mm
- E.g. for OBO Golden Sprint screw, type 4758 4 x L (L = depending on application)
- For fastening to 165/MBG

## Multi-Quick clip, metric

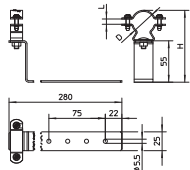


Type	Clamping range D mm	Pull- out value N	Colour	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
<b>M-Quick M32 LGR</b>	25 - 32	60	Light grey	600	50	1.390	<b>2153734</b>

PA Polyamide

- Multi-Quick metric
- Simple fastening
- Secure locking
- Radial arrangement
- Simplified storage
- Universally applicable

## VA roof conductor holder, sloping roof

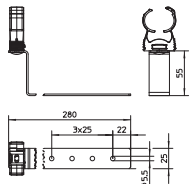


Type	Installation height mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon H280 VA</b>	55	25	16.100	<b>5408047</b>
<b>isCon H280 26 VA</b>	55	25	16.900	<b>5408074</b>

A2 Stainless steel, rustproof 1.4301

- For routing of the isCon® conductor on pitched roofs
- Cable bracket with sprung discs to protect the screws against loosening

## PA roof conductor holder, sloping roof

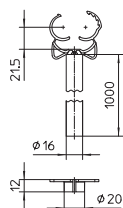


Type	Colour	Dimension	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon H280 PA</b>	Black	280mm	25	13.950	<b>5408049</b>
<b>isCon H280 26 PA</b>	Light grey	280mm	25	14.060	<b>5408072</b>

PA Polyamide

To route the isCon® conductor on pitched roofs.

## Spacer



Type	Clamping range D mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon DH</b>	23 - 26	2	41.400	<b>5408043</b>

GFK Fibre-glass-reinforced plastic

For stand-off installation of the isCon® conductor in the area of the connection, incl. reducing sleeve for mounting on FangFix concrete block 10 Kg.

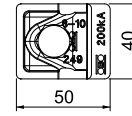
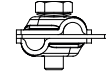
### Vario quick connector 200 kA



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
<b>249 8-10 V2A 200</b>	Rd 8-10	H2/200	10	12.374	<b>5311595</b>

A2 Stainless steel, rustproof 1.4301

- For T, intersection and parallel connections
- Quick mounting using an M10 x 30 bolt, made from rustproof stainless steel
- Meets the requirements of VDE 0185-305 (IEC 62305)
- Tested according to VDE 0185-561-1 (IEC/EN 62561-1) with 200 kA
- For use in lightning protection class I with the isCon® Premium conductor



### Insulated air-termination rod for inner-routed isCon conductor with side exit



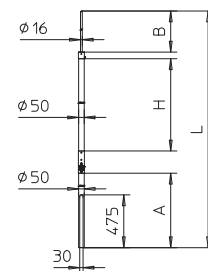
Type	Dimen- sion D Ø mm	Dimen- sion A mm	Dimen- sion H mm	Dimen- sion B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang IN-A 4000</b>	50	1325	1500	1000	4000	1	535.000	<b>5408938</b>
<b>isFang IN-A 6000</b>	50	3325	1500	1000	6000	1	835.000	<b>5408940</b>
<b>isFang IN-A 8000</b>	50	5335	1500	1000	8000	1	1,385.000	<b>5408888</b>
<b>isFang IN-A10000</b>	50	6000	1733	2000	10000	1	1,540.000	<b>5408890</b>

GFK Fibre-glass-reinforced plastic

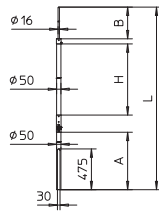
- For installation of the OBO isCon® Pro+ conductor in the pipe
- With side conductor outlet matching isFang air-termination rod stand with side outlet, type isFang 3B-A
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Inclusive connection element (type isCon IN connect)
- Inclusive potential connection (type IsCon In PAE)



#### Dimensions



## Insulated air-termination rod for inner-routed isCon® conductor with side exit

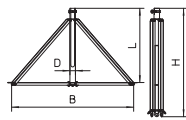


Type	Dimension D Ø mm	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang IN-A L4</b>	50	1325	1500	1000	4000	1	535.000	<b>5408874</b>
<b>isFang IN-A L6</b>	50	3325	1500	1000	6000	1	835.741	<b>5408876</b>
<b>isFang IN-A L8</b>	50	5335	1500	1000	8000	1	1,385.741	<b>5408878</b>
<b>isFang IN-A L10</b>	50	6000	1733	2000	10000	1	1,540.741	<b>5408880</b>

**GFK** Fibre-glass-reinforced plastic

- For routing OBO isCon® conductors in pipes
- For mounting on the building structure with isFang support
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Tested according to VDE V 0185-561-8 (IEC TS 62561-8)

## isFang tripod with side outlet

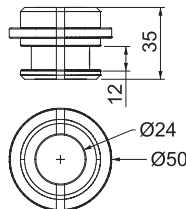


Type	Dimension B mm	Dimension D Ø mm	Dimension L mm	Dimension H mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang 3B-100-A</b>	1026	50	600	885	1	610.000	<b>5408930</b>
<b>isFang 3B-150-A</b>	1500	50	900	1275	1	950.000	<b>5408932</b>
<b>isFang 3B-250-A</b>	2900	50	1450	2055	1	2,500.000	<b>5408902</b>

**A2** Stainless steel, rustproof 1.4301

- Screwless installation of freestanding air-termination rods as well as insulated air-termination rods with 50 mm diameter
- E.g. for internal OBO isCon® conductor
- Roof slope to max. 5 degrees
- Incl. Rd 8–10 crossbar for quick round conductor fastening
- Concrete plinths as well as threaded rods should be ordered separately

## Potential connection for isCon® Professional+ and Premium in the isFang IN insulated air-termination rod



Type	Dimension D Ø mm	Dimension d mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon IN PAE</b>	23	49.9	35	1	5.900	<b>5408031</b>
<b>isCon IN PAE 2</b>	20	49.9	35	1	5.900	<b>5408032</b>

**Alu** Aluminium

- To avoid surface discharges on the isCon® conductor
- Installation takes place after the first 1.5 metres in the insulated air-termination rod type isFang IN



## Insulated air-termination rod



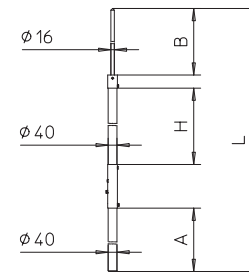
Type	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang 4000 AL	1240	1500	1000	4000	1	580.000	5408943
isFang 6000 AL	3340	1500	1000	6000	1	600.000	5408947
isFang 4000	1240	1500	1000	4000	1	680.000	5408942
isFang 6000	3340	1500	1000	6000	1	680.000	5408946

GFK Fibre-glass-reinforced plastic

- For isolated creation of air-termination systems
- Suitable for isFang air-termination rod stands, type isFang 3B-100/150
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- For installation on the building structure with isFang support
- Fastening of the OBO isCon® conductor possible using accessories
- Suitable for externally routed isCon® conductors



Dimensions



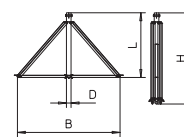
## isFang tripod



Type	Dimension B mm	Dimension D Ø mm	Dimension L mm	Dimension H mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang 3B-100 AL	1000	40	600	885	1	380.000	5408966
isFang 3B-150 AL	1500	40	900	1275	1	560.000	5408967
isFang 3B-100	1000	40	600	885	1	620.000	5408968
isFang 3B-150	1500	40	900	1275	1	950.000	5408969

A2 Stainless steel, rustproof 1.4301 Alu Aluminium

- Installation of free-standing air-termination rods as well as insulated air-termination rods with 40 mm diameter
- Roof slope to max. 5 degrees
- Incl. Rd 8–10 crossbar for quick round conductor fastening
- Concrete bases as well as threaded rods should be ordered separately

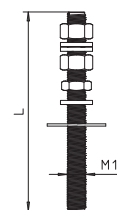


## isFang-3B threaded rod

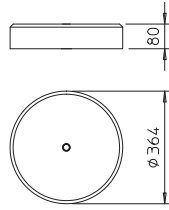
Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang 3B-G1	270	3	48.000	5408971
isFang 3B-G2	340	3	60.400	5408972
isFang 3B-G3	430	3	69.500	5408973
isFang 3B-G4	500	3	75.000	5408905

A2 Stainless steel, rustproof 1.4301

- For fastening on one, two, three or four FangFix concrete bases with tripod stand



## Concrete base for FangFix system, min. 16 kg

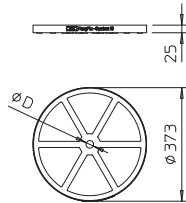


Type	Nominal size Ø mm	Pack		Weight kg/100 pc.	Item no.
		Piece	Weight		
<b>F-FIX-S16</b>	365	1	1,700.000		<b>5403227</b>

**BET** Concrete

- Min. 16 kg block of Ø 365 mm, high level of stability
- Frost-resistant concrete
- Stackable

## Base for FangFix system 16 kg for mounting the isFang tripod

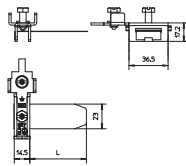


Type	Nominal size Ø mm	Dimension D Ø mm	Pack		Weight kg/100 pc.	Item no.
			Piece	Weight		
<b>F-FIX-B16 3B</b>	373	25	10	15.800		<b>5403238</b>

**PP** Polypropylene

- Edge protection with through hole
- For mounting isFang-3B threaded rod and FangFix concrete block F-FIX-S16

## Potential connection clamp for mounting on isFang

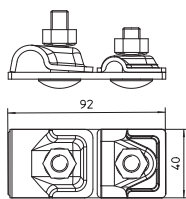


Type	Pack Piece	Weight kg/100 pc.	Item no.

A2 Stainless steel, rustproof 1.4301

Potential connection for isCon® conductor for mounting on insulated air-termination rods of type isFang.

## Connection plate for one isCon® conductor

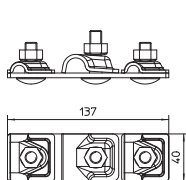


Type	Dimension	Pack		Weight kg/100 pc.	Item no.
		Piece	Weight		
<b>isCon AP1-16 VA</b>	16x8-10mm	1	27.400		<b>5408026</b>

A2 Stainless steel, rustproof 1.4301

Connection plate to connect an isCon® conductor with air-termination rod Ø 16 mm, tested up to 150 kA (lightning protection class II)

## Connection plate for two isCon® conductors



Type	Dimension	Pack		Weight kg/100 pc.	Item no.
		Piece	Weight		
<b>isCon AP2-16 VA</b>	16x8-10mm	1	39.500		<b>5408028</b>

A2 Stainless steel, rustproof 1.4301

Connection plate to connect two isCon® conductors with air-termination rod Ø 16 mm, tested up to 150 kA (lightning protection class II)

## Cable tie, black, UV and weather-resistant



Type	Dimension B mm	Dimension L mm	Dimension t mm	Dimension Ø mm	Max. bundle	Colour	Pack		Weight kg/100 pc.	Item no.
							Piece	Weight		
<b>565 7.6x380 SWUV</b>	7.6	380	1.8	105	Black	100	0.533		<b>2331924</b>	

**PA** Polyamide

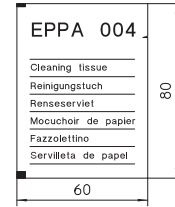
Cable ties are used for quick, uncomplicated fixing or bundling of cables and pipes to cable support systems or other mounting structures.

### Cleaning cloth

Type	Width mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon EPPA 004</b>	140	200	50	0.420	<b>5408060</b>

Z-PP-P Cellulose-polypropylene paper

- Cellulose polypropylene paper with abrasive sections, folded multiple times
- Doused with 2.8 ml impregnation solution
- For cleaning the external jacket of the OBO isCon® conductor



### isCon® information panel

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon HWS</b>	1	2.000	<b>5408058</b>

PS Polystyrene

Label: "NOTE! Insulated lightning protection with the OBO isCon® system. Only a lightning protection specialist may carry out changes"

- To label the lightning protection system
- Self-adhesive and with 4 fastening holes ø 6.5 mm



### isCon® information panel EN

Type	Pack Piece	Weight kg/100 pc.	Item no.
<b>isCon HWS EN</b>	1	2.000	<b>5408059</b>

PS Polystyrene

Label: "NOTE! Insulated lightning protection with the OBO isCon® system. Only a lightning protection specialist may carry out changes"

- To label the lightning protection system
- Self-adhesive and with 4 fastening holes ø 6.5 mm

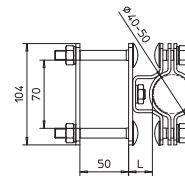


### isFang support for corner pipe mounting, 50 x 50 mm

Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TS50x50</b>	30	2	82.000	<b>5408964</b>

A2 Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or for construction-side corner pipes of 50x50 mm.

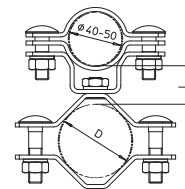


### isFang support for pipe mounting, ø 50–60 mm

Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TS50-60</b>	60	30	2	76.000	<b>5408964</b>

A2 Stainless steel, rustproof 1.4301

Tightening strap clip to fasten the insulated support pipes on the structure to be protected or for construction-side pipes of ø 50–60 mm.

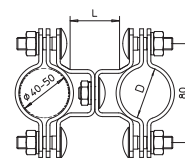


### isFang support for pipe mounting, ø 40–50 mm

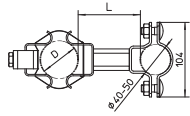
Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang TS40-50</b>	50	40	2	90.000	<b>5408958</b>

A2 Stainless steel, rustproof 1.4301

Tightening strap clip to fasten the insulated support pipes on the structure to be protected or for construction-side pipes of ø 40–50 mm.



### isFang support for spaced pipe mounting, ø 50–300 mm

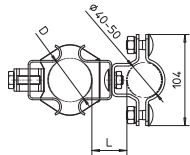


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang TR100 100	300	100	2	95.500	5408955
isFang TR100 200	300	200	2	121.000	5408957
isFang TR100 300	300	300	2	146.000	5408959

A2 Stainless steel, rustproof 1.4301

Tightening strap clip to fasten the insulated support pipes on the structure to be protected or for construction-side pipes of ø 50–300 mm.

### isFang support for pipe mounting, ø 50–300 mm

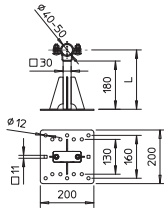


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang TR100	300	40	2	77.000	5408956

A2 Stainless steel, rustproof 1.4301

Tightening strap clip to fasten the insulated support pipes on the structure to be protected or for construction-side pipes of ø 50–300mm.

### Support for wall mounting, 200 mm spacing

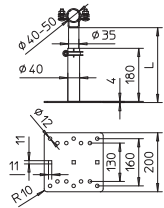


Type	Dimension D Ø mm	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang TW200 12	50	200	2	240.000	5408910

A2 Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or on the wall.

### isFang support for wall mounting, 200–300 mm spacing

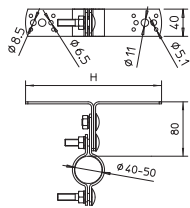


Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang TW200	300	2	230.000	5408954

A2 Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or on the wall.

### isFang support for wall mounting, 80 mm spacing

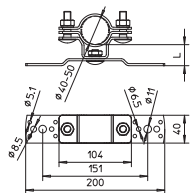


Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang TW80	80	2	63.000	5408950

A2 Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or on the wall.

### isFang support for wall mounting, 30 mm spacing



Type	Dimension L mm	Pack Piece	Weight kg/100 pc.	Item no.
isFang TW30	30	2	62.000	5408952

A2 Stainless steel, rustproof 1.4301

Fastening clip to fasten the insulated support pipes on the structure to be protected or on the wall.

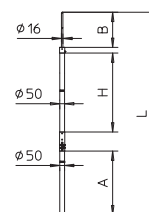
## isFang, insulated air-termination rod for inner-routed isCon® conductor Professional Plus



Type	Dimension D Ø mm	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang IN 4000</b>	50	1325	1500	1000	4000	1	535.000	<b>5408934</b>
<b>isFang IN 6000</b>	50	3325	1500	1000	6000	1	835.000	<b>5408936</b>
<b>isFang IN 8000</b>	50	5335	1500	1000	8000	1	1,315.000	<b>5408868</b>
<b>isFang IN 10000</b>	50	6000	1733	2000	10000	1	1,540.000	<b>5408870</b>

**GFK** Fibre-glass-reinforced plastic

- For installation of the OBO isCon® Pro+ conductor in the pipe
- For mounting on the building structure with isFang support
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Inclusive connection element (type isCon IN connect)
- Inclusive potential connection (type IsCon In PAE)



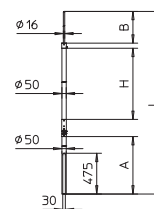
## Insulated air-termination rod for inner-routed isCon conductor with side exit



Type	Dimension D Ø mm	Dimension A mm	Dimension H mm	Dimension B mm	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
<b>isFang IN-A 4000</b>	50	1325	1500	1000	4000	1	535.000	<b>5408938</b>
<b>isFang IN-A 6000</b>	50	3325	1500	1000	6000	1	835.000	<b>5408940</b>
<b>isFang IN-A 8000</b>	50	5335	1500	1000	8000	1	1,385.000	<b>5408888</b>
<b>isFang IN-A 10000</b>	50	6000	1733	2000	10000	1	1,540.000	<b>5408890</b>
<b>isFang IN-A L4</b>	50	1325	1500	1000	4000	1	535.000	<b>5408874</b>
<b>isFang IN-A L6</b>	50	3325	1500	1000	6000	1	835.741	<b>5408876</b>
<b>isFang IN-A L8</b>	50	5335	1500	1000	8000	1	1,385.741	<b>5408878</b>
<b>isFang IN-A L10</b>	50	6000	1733	2000	10000	1	1,540.741	<b>5408880</b>
<b>isFang IN L4</b>	50	1325	1500	1000	4000	1	535.741	<b>5408854</b>
<b>isFang IN L6</b>	50	3325	1500	1000	6000	1	835.741	<b>5408856</b>
<b>isFang IN L8</b>	50	5335	1500	1000	8000	1	1,315.741	<b>5408858</b>
<b>isFang IN L10</b>	50	6000	1733	2000	10000	1	1,540.741	<b>5408860</b>

**GFK** Fibre-glass-reinforced plastic

- For installation of the OBO isCon® Pro+ conductor in the pipe
- With side conductor outlet matching isFang air-termination rod stand with side outlet, type isFang 3B-A
- Suitable for wind loads according to Eurocode 1: DIN EN 1991-1-4
- Inclusive connection element (type isCon IN connect)
- Inclusive potential connection (type IsCon In PAE)





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5432432	<b>1167014</b>	375	6431205	<b>5001513</b>	391	5800415	price/100 <b>5018501</b>	380	5386353	<b>5050111</b>	373	5525318	<b>5084020</b>	245
5432494	<b>1167022</b>	375	5372851	<b>5001560</b>	390	5800477	<b>5018706</b>	380	5386414	<b>5050138</b>	373	5525370	<b>5084024</b>	246
5432555	<b>1167030</b>	375	6431120	<b>5001590</b>	390	5022015	<b>5018730</b>	380	5386476	<b>5050154</b>	373	5525431	<b>5084028</b>	247
5432616	<b>1167049</b>	375	6431212	<b>5001592</b>	390	5680468	<b>5019340</b>	380	5386537	<b>5050170</b>	373	5525493	<b>5084032</b>	249
5655367	<b>2146164</b>	485	6431267	<b>5001594</b>	390	5694007	<b>5019342</b>	380	5386599	<b>5050197</b>	373	5525554	<b>5084036</b>	249
5595717	<b>2146207</b>	485	6431274	<b>5001601</b>	403	5694014	<b>5019344</b>	380	5386650	<b>5051509</b>	373	5525615	<b>5084040</b>	250
5016069	<b>2146509</b>	485	5635239	<b>5001617</b>	390	5680475	<b>5019345</b>	380	5386834	<b>5052076</b>	373	51110750	<b>5084048</b>	250
5741671	<b>2153734</b>	486	5752653	<b>5001625</b>	390	5680482	<b>5019347</b>	380	5386896	<b>5052092</b>	373	6440573	<b>5088564</b>	233
6417353	<b>2331924</b>	490	5862697	<b>5001633</b>	390	5680499	<b>5019350</b>	380	5386957	<b>5052114</b>	373	6190263	<b>5088566</b>	226
6421046	<b>2360041</b>	398	5372912	<b>5001641</b>	390	5680505	<b>5019355</b>	380	5387015	<b>5052130</b>	373	6037490	<b>5088585</b>	227
6421053	<b>2360043</b>	398	5372974	<b>5001668</b>	390	5680512	<b>5019360</b>	380	5387077	<b>5052157</b>	373	5872658	<b>5088629</b>	229
5230533	<b>2360055</b>	404	5901259	<b>5001672</b>	390	5381556	<b>5021081</b>	380	5387190	<b>5052181</b>	373	5780717	<b>5088651</b>	228
5230595	<b>2360101</b>	404	5754879	<b>5001749</b>	390	5381617	<b>5021103</b>	380	5388517	<b>5057507</b>	371	5613701	<b>5088691</b>	230
5518419	<b>2362970</b>	472	5373575	<b>5003008</b>	388	5381730	<b>5021162</b>	381	5388579	<b>5057515</b>	371	5613718	<b>5088692</b>	231
5242772	<b>3041212</b>	384	5373636	<b>5003016</b>	388	5801375	<b>5021227</b>	381	5388630	<b>5057523</b>	371	5613725	<b>5088693</b>	232
5242956	<b>3041956</b>	384	5373698	<b>5003024</b>	388	5680529	<b>5021235</b>	381	5388692	<b>5057558</b>	371	6441679	<b>5089736</b>	113
5243137	<b>3042200</b>	384	5373759	<b>5003032</b>	388	5680567	<b>5021239</b>	381	5388766	<b>5057599</b>	490	6441686	<b>5089738</b>	113
5243199	<b>3042251</b>	384	6527069	<b>5003081</b>	388	5381914	<b>5021286</b>	381	5699651	<b>5057630</b>	362			
6431243	<b>3042270</b>	384	5374053	<b>5003261</b>	388	5901273	<b>5021294</b>	381	6672813	<b>5057640</b>	362			
			5374114	<b>5003288</b>	388	5381976	<b>5021308</b>	381	6672820	<b>5057640</b>	362	5461111	price/pac <b>5091322</b>	358
			5374176	<b>5003296</b>	388	5067474	<b>5021332</b>	381	6672837	<b>5057645</b>	362	5461296	<b>5091438</b>	358
			5374237	<b>5003318</b>	388	6564804	<b>5021380</b>	382	6672844	<b>5057690</b>	376	5461470	<b>5091527</b>	358
			5374718	<b>5003776</b>	388	5382034	price/100 <b>5021480</b>	382	5805458	<b>5057922</b>	371	5461654	/pc. <b>5091683</b>	359
			5374770	<b>5003784</b>	388	6636822	<b>5021484</b>	382	5805519	/100 pc. <b>5057930</b>	371	5896111	<b>5091691</b>	359
			6427925	<b>5009200</b>	403	5382096	price/100 <b>5021502</b>	382	5388876	<b>5059356</b>	404	6465644	<b>5091722</b>	359
			5376934	<b>5009227</b>	389	6282425	<b>5021640</b>	382	5389057	<b>5059496</b>	404	6426713	<b>5092420</b>	202
			5376996	<b>5009235</b>	389	5902058	<b>5021642</b>	382				6426720	<b>5092422</b>	201
			6431298	<b>5009250</b>	389	5680574	<b>5021644</b>	382				6426751	<b>5092424</b>	200
			6431304	<b>5009256</b>	389	5680581	<b>5021647</b>	382	5389231	<b>5064015</b>	375	6426768	<b>5092426</b>	199
						6033768	<b>5021652</b>	382				6515400	<b>5092431</b>	197
						5836209	<b>5021654</b>	382				6515431	<b>5092433</b>	198
						5938668	<b>5021656</b>	382	5915973	/pc. <b>5080053</b>	278	6560844	<b>5092440</b>	211
						6431113	<b>5021830</b>	408	5916277	<b>5080061</b>	280	5080886	<b>5092451</b>	206
									5916031	<b>5080150</b>	279	5247098	<b>5092460</b>	208
									6741908	<b>5080301</b>	281	5475804	<b>5092466</b>	207
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									6741922	<b>5080305</b>	283	6035441	<b>5092480</b>	194
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									6741977	<b>5080315</b>	288	5030881	<b>5093171</b>	260
									6741984	<b>5080317</b>	289	5390978	<b>5093236</b>	254
									6741991	<b>5080319</b>	290	5391036	<b>5093252</b>	253
									6742004	<b>5080321</b>	291	5391098	<b>5093260</b>	255
									6742011	<b>5080323</b>	292	5087250	<b>5093270</b>	259
									6742028	<b>5080325</b>	293	5022619	<b>5093272</b>	262
									6742035	<b>5080327</b>	294	5022732	<b>5093275</b>	261
									6742042	<b>5080329</b>	295	5867050	<b>5093277</b>	263
									6742059	<b>5080331</b>	296	5246268	<b>5093378</b>	184
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												5382799	<b>5093418</b>	192
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												6398676	<b>5093452</b>	119
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												6398706	<b>5093462</b>	122
												6412952	<b>5093500</b>	123
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												6153718	<b>5093505</b>	134
												6159598	<b>5093508</b>	134
												6159604	<b>5093511</b>	125
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6603695	5094210	220	6608751	5096988	107	5904335	5202213	430	5409090	5218926	458	6416912	5311407	441
6603701	5094212	221				5402138	5202248	430	5952213	5218977	428	5816584	5311410	440
6603718	5094230	216	5995029	5096990	140	6379965	5202510	424	5625889	5218997	429	5816591	5311417	441
6603725	5094232	217	5995036	5096992	139	5403036	5202515	423				5417675	5311500	439
6603732	5094240	214	5995043	5096994	140	5902294	5202566	423	5409458	5223075	435	5737063	5311503	373
6603749	5094242	215				5894124	5202568	424	5409519	5223105	435	5417736	5311519	439
5648482	5094574	223	5578116	5097453	297	5894223	5202569	427	5409632	5223156	435	5417798	5311527	440
5709084	5094576	225	5736561	5097454	303	5902232	5202590	423	5409755	5223202	435	5835394	5311530	367
5708872	5094605	224	5578123	5097607	298	5403814	5202833	423	5409939	5223601	435	5417859	5311535	440
5478621	5094608	222	5578130	5097615	299	5784920	5202836	422				5417910	5311551	367
5363903	5094920	190	5578147	5097623	300	5902171	5202868	423	5410416	5226570	435	5835349	5311554	367
5363941	5094931	191	5578154	5097631	301							5693789	5311573	374
			5578161	5097650	302	5038269	5203015	422	5410539	5227070	435	5466192	5311585	374
6159727	5095141	144	5578185	5097820	304	5784968	5203018	422	5410591	5227089	435	5925446	5311590	370
6159741	5095142	146	5812258	5097822	305	5289746	5203023	422	5410652	5227100	435	6656141	5311595	439
6159758	5095151	147	5578215	5097858	306				5410713	5227151	435			
6159772	5095152	148	5578260	5097939	307	5404651	5207258	432				5451990	5311705	439
6159789	5095153	151	5578277	5097976	310	5110392	5207266	433	5410836	5228026	436	5452058	5311713	439
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6159826	5095163	161	5683346	5098382	346	5404835	5207347	431	5851011	5228134	436	5418030	5312132	448
6159833	5095164	163	5683384	5098390	347	5069546	5207371	431	5411079	5228220	438	6428038	5312292	464
6159949	5095201	169	5683391	5098392	348	6657940	5207375	431	5411192	5228328	436	6428045	5312294	464
6159956	5095211	170	5406839	5098404	325							6428106	5312302	395
6159963	5095212	171	5406846	5098407	326	5404897	5207444	432	5411499	5229162	434	6428113	5312308	463
6160006	5095213	173	5406853	5098411	327	5009726	5207451	433	5411550	5229367	434	5418092	5312310	393
6160013	5095214	175	5848516	5098412	342	5404958	5207460	432	5411611	5229383	434	5700869	5312318	393
6160020	5095221	145	5625124	5098413	334	5405016	5207487	432	5411673	5229464	435	5418153	5312345	394
6160051	5095231	152	5787372	5098415	335	5904991	5207746	432	5411734	5229480	435	5893103	5312346	394
6160075	5095232	149	5773610	5098419	336	5905059	5207754	432	5411970	5229553	434	5418214	5312418	393
6163847	5095233	153	5406860	5098422	328	5905110	5207762	432	5412151	5229839	434	5418276	5312442	394
6161140	5095251	165	5787389	5098425	337	5904878	5207800	431	5412212	5229960	433	6466306	5312582	393
6161324	5095252	159	5406877	5098427	329	5904939	5207819	431	5840886	5229961	434	6428083	5312592	463
6161331	5095253	167	5406884	5098431	330	5336433	5207851	432				6428090	5312594	393
6162000	5095281	156	5848523	5098432	343	5334811	5207878	432	5446231	5230217	433	5418337	5312604	392
6162185	5095282	158	5406891	5098442	331	5915836	5207901	432	5629535	5230322	433	5418399	5312655	395
6162338	5095283	162	5406907	5098446	332				5629474	5230365	434	5893141	5312656	395
6162819	5095284	164	5406914	5098450	333	5405252	5208017	436	5739999	5230446	401	6454563	5312657	396
6162901	5095312	172	5848530	5098452	344				5740056	5230462	401	5418573	5312809	394
6162949	5095313	174	5410461	5098470	338	5903673	5215277	429	5959601	5230527	438	5418696	5312906	395
6162956	5095314	176	5813521	5098475	338	5903796	5215307	429				5418757	5312922	395
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6163014	5095331	166	5578307	5098514	313	5407171	5215439	426	6521180	5240031	352			
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6163427	5095333	168	5578338	5098557	315	5902591	5215544	425	6522965	5240033	353	6466290	5313013	396
6163533	5095360	177	5578345	5098571	308	5407294	5215552	424	6521159	5240102	354	5740537	5313015	396
6163540	5095362	177	5578352	5098575	309	5784982	5215555	424	6521166	5240104	354	5740476	5313023	396
6163557	5095364	178	5578369	5098600	317	5812234	5215579	424	6521173	5240106	354	5543015	5313031	396
6163618	5095370	178	5578376	5098603	318	5785019	5215582	424	6524181	5240360	354	5237372	5313058	396
6163625	5095372	179	5578383	5098611	319	5812296	5215587	425	6524242	5240362	354	5806530	5313066	397
6163656	5095378	179	5578390	5098630	320	5812357	5215595	424	6524259	5240366	354			
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			5578444	5098808	322	5812531	5215668	426	6524433	5240380	354	5419174	5314518	391
			5578451	5098816	323	5812593	5215749	425	6524457	5240382	354	5419235	5314534	391
5648499	5096646	235	5578512	5098859	324	5902416	5215838	426	6524464	5240386	354	6428120	5314572	462
5299455	5096647	234				5902478	5215854	426	6524471	5240390	354	6428137	5314574	462
5425182	5096786	358				5531791	5215875	425	6524488	5240394	354	5419297	5314615	392
5544517	5096822	114				5531852	5215879	425				5893097	5314616	392
5051473	5096827	114	5399797	5102057	462							5419358	5314623	392
5288299	5096836	109	5399858	5102073	462							5419471	5314658	391
5541158	5096849	110	5399919	5102081	462	5902652	5216184	425	5415695	5304008	441	5893080	5314659	392
5051466	5096852	111	5399971	5102111	462	5902539	5216192	424	5415879	5304105	442	5419532	5314666	391
5541394	5096865	112	5400035	5102138	462	5813019	5216206	424	5858034	5304107	442	5925873	5314720	392
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GTIN	Item no.	Page	GTIN	Item no.	Page	GTIN	Item no.	Page	GTIN	Item no.	Page
5420132	/100 pc. <b>5316308</b>	455	5426974	/100 pc. <b>5351057</b>	461	5674696	/pc. <b>5408026</b>	490	5670131	/pc. <b>5408964</b>	421
5420194	<b>5316324</b>	455	5427032	<b>5351073</b>	461	5674702	<b>5408028</b>	490	5802433	<b>5408966</b>	416
5433682	<b>5316450</b>	454	5427094	<b>5351251</b>	461	5871569	<b>5408031</b>	484	5802440	<b>5408967</b>	416
5433729	<b>5316459</b>	455	5427155	<b>5351286</b>	461	6591633	<b>5408032</b>	484	5670148	<b>5408968</b>	416
5433736	<b>5316468</b>	455	5890652	<b>5351359</b>	461	5674719	<b>5408036</b>	484	5674931	<b>5408969</b>	416
5420316	<b>5316510</b>	456	5890713	<b>5351375</b>	461	5674863	<b>5408043</b>	486	5674948	<b>5408971</b>	418
5420378	<b>5316553</b>	456	5427216	<b>5351456</b>	462	5674870	<b>5408047</b>	486	5674979	<b>5408972</b>	418
			5427278	<b>5351472</b>	462	5674887	<b>5408049</b>	486	5674986	<b>5408973</b>	418
						5674726	<b>5408052</b>	485	5613329	<b>5408976</b>	476
5420439	<b>5317010</b>	452	5427575	<b>5400155</b>	386	5699668	<b>5408056</b>	485	5613336	<b>5408978</b>	476
5420491	<b>5317053</b>	452	5629054	<b>5400627</b>	387	5813774	<b>5408058</b>	491	5613343	<b>5408980</b>	476
5420552	<b>5317207</b>	452				6586981	<b>5408059</b>	491	5613350	<b>5408982</b>	476
5893158	<b>5317208</b>	452		/pc.					5613367	<b>5408984</b>	479
5420613	<b>5317223</b>	453	6219339	<b>5400810</b>	421		/100 pc.		5613374	<b>5408986</b>	479
5420675	<b>5317258</b>	452	6219346	<b>5400812</b>	421	5813781	<b>5408060</b>	491	5613381	<b>5408988</b>	480
5420736	<b>5317274</b>	454	6219353	<b>5400814</b>	421		/pc.		5613411	<b>5408990</b>	480
5420798	<b>5317401</b>	453	6219360	<b>5400817</b>	421	5872696	<b>5408064</b>	485	5613428	<b>5408992</b>	480
5420859	<b>5317428</b>	454				5872702	<b>5408066</b>	486	5613435	<b>5408994</b>	480
5420910	<b>5317452</b>	453				5872740	<b>5408068</b>	485	5613442	<b>5408996</b>	480
5420972	<b>5317479</b>	454	5901334	<b>5401771</b>	413	5872757	<b>5408072</b>	486			
5850861	<b>5317481</b>	453	5427810	<b>5401801</b>	413	5872764	<b>5408074</b>	486			
6622368	<b>5317502</b>	450	5427872	<b>5401836</b>	413		/100 pc.		5428893	<b>5410096</b>	438
6622375	<b>5317512</b>	451	5898399	<b>5401852</b>	413	5674924	<b>5408101</b>	479			
			5902119	<b>5401879</b>	413		/pc.		5429616	<b>5412609</b>	437
5421030	<b>5318084</b>	451	5034810	<b>5401970</b>	411	5690733	<b>5408105</b>	477	5446415	<b>5412633</b>	437
5421092	<b>5318149</b>	451	5105619	<b>5401980</b>	411	5613206	<b>5408107</b>	477	5459071	<b>5412706</b>	401
			5107774	<b>5401983</b>	411	5613213	<b>5408108</b>	477	5752356	<b>5412803</b>	438
5421276	<b>5320011</b>	458	5108672	<b>5401986</b>	411	5613220	<b>5408109</b>	477	5752295	<b>5412811</b>	438
5421337	<b>5320054</b>	458	5108733	<b>5401989</b>	411	5636731	<b>5408148</b>	477			
5421511	<b>5320690</b>	459	5045359	<b>5401993</b>	411	5681496	<b>5408156</b>	477	5429678	<b>5416566</b>	467
5421573	<b>5320704</b>	459	5050803	<b>5401995</b>	411	5613237	<b>5408158</b>	477			
6127504	<b>5320707</b>	459				5895817	<b>5408245</b>	477			
5421634	<b>5320712</b>	459	5428053	<b>5402107</b>	414	5895879	<b>5408296</b>	477		/pc.	
			5428176	<b>5402158</b>	414	5613251	<b>5408298</b>	477	6505869	<b>5420020</b>	398
5421870	<b>5325307</b>	457	5428411	<b>5402808</b>	413	5674474	<b>5408350</b>	478	6505890	<b>5420022</b>	399
5421931	<b>5325315</b>	457	5428473	<b>5402859</b>	413	5613268	<b>5408352</b>	478	6505906	<b>5420024</b>	399
						5674412	<b>5408393</b>	478		/100 pc.	
5422419	<b>5326303</b>	458	5674733	<b>5402864</b>	415	5613275	<b>5408395</b>	478	5751571	<b>5420504</b>	387
5422471	<b>5326311</b>	458	5674740	<b>5402866</b>	415	5674351	<b>5408458</b>	481	5331575	<b>5420539</b>	387
5422532	<b>5326338</b>	458	5674757	<b>5402868</b>	415	5674290	<b>5408504</b>	478			
			5674764	<b>5402870</b>	415	5613299	<b>5408557</b>	479	5430094	<b>5424100</b>	413
5453611	<b>5328209</b>	445	5674795	<b>5402872</b>	415	5613312	<b>5408630</b>	478	5430216	<b>5424151</b>	387
5453673	<b>5328284</b>	445	5674801	<b>5402874</b>	415	5673811	<b>5408687</b>	477	5430339	<b>5424208</b>	387
			5674818	<b>5402876</b>	415	5613305	<b>5408689</b>	477			
5423195	<b>5329078</b>	445	5674825	<b>5402878</b>	415	5673750	<b>5408733</b>	481		/pc.	
			5674856	<b>5402880</b>	415	6036226	<b>5408800</b>	481	5901457	<b>5430011</b>	387
5885573	<b>5331008</b>	459				5542773	<b>5408806</b>	481	5901570	<b>5430062</b>	387
5423379	<b>5331013</b>	459	5428534	<b>5402891</b>	413	5542834	<b>5408814</b>	481		/100 pc.	
5885580	<b>5331017</b>	459	6389766	<b>5402958</b>	413	5770497	<b>5408820</b>	481	5430575	<b>5430151</b>	387
6775743	<b>5331025</b>	460				5004608	<b>5408849</b>	481		/pc.	
			5070078	<b>5403117</b>	412	5009733	<b>5408852</b>	481	6456161	<b>5430720</b>	387
5423430	/100 pc. <b>5331501</b>	460	5548775	<b>5403219</b>	412	6647842	<b>5408854</b>	417			
			5548898	<b>5403227</b>	412	6647859	<b>5408856</b>	417	6117611	<b>6117465</b>	210
5629115	<b>5334934</b>	399	5926320	<b>5403238</b>	418	6647866	<b>5408858</b>	417	6117673	<b>6117473</b>	209
5959663	<b>5334942</b>	399				6647873	<b>5408860</b>	417			
			5034872	<b>5403308</b>	411	6219391	<b>5408868</b>	419		/100 pc.	
5890058	<b>5335140</b>	465	5034933	<b>5403324</b>	411	6219407	<b>5408870</b>	419	6049080	<b>6404006</b>	375
5890119	<b>5335167</b>	465	5613572	<b>5403330</b>	414	6647804	<b>5408874</b>	418	6049202	<b>6404014</b>	375
5423614	<b>5335205</b>	465	5813903	<b>5403333</b>	414	6647811	<b>5408876</b>	418			
5423676	<b>5335256</b>	465	5670735	<b>5403335</b>	414	6647828	<b>5408878</b>	418			
						6647835	<b>5408880</b>	418			
5424215	<b>5336007</b>	466				6219414	<b>5408888</b>	417			
5424277	<b>5336023</b>	466	5428657	/100 pc. <b>5405068</b>	411	6219421	<b>5408890</b>	417			
5424338	<b>5336058</b>	466				6219452	<b>5408902</b>	418			
5424390	<b>5336074</b>	466	5428718	<b>5405769</b>	414	6219469	<b>5408905</b>	418			
5424451	<b>5336090</b>	466				6219476	<b>5408910</b>	420			
5424635	<b>5336309</b>	467				5859550	<b>5408930</b>	418			
5424758	<b>5336341</b>	467	5888123	price/100 <b>5407995</b>	482	5859567	<b>5408932</b>	418			
5424819	<b>5336376</b>	467	5888154	<b>5407997</b>	482	5871613	<b>5408934</b>	419			
5424871	<b>5336457</b>	467				5871620	<b>5408936</b>	419			
5424932	<b>5336503</b>	467	5674627	<b>5408004</b>	482	5871668	<b>5408938</b>	417			
			5854265	<b>5408006</b>	482	5871675	<b>5408940</b>	417			
5425595	<b>5350085</b>	461	6591640	<b>5408008</b>	483	5670056	<b>5408942</b>	416			
5425656	<b>5350093</b>	461				5785330	<b>5408943</b>	416			
5425717	<b>5350107</b>	461	6095346	<b>5408013</b>	483	5670063	<b>5408946</b>	416			
5425779	<b>5350115</b>	461				5785347	<b>5408947</b>	416			
5425830	<b>5350123</b>	461	6591664	price/100 <b>5408014</b>	483	5670070	<b>5408950</b>	419			
5426257	<b>5350689</b>	461	6591657	<b>5408018</b>	482	5670087	<b>5408952</b>	419			
5426370	<b>5350700</b>	461				5670094	<b>5408954</b>	420			
5426431	<b>5350719</b>	461	6591695	<b>5408019</b>	484	5849360	<b>5408955</b>	420			
5426493	<b>5350727</b>	461	6591701	<b>5408020</b>	484	5670100	<b>5408956</b>	420			
5426790	<b>5350867</b>	460	6591671	<b>5408021</b>	483	5849391	<b>5408957</b>	420			
5426851	<b>5350883</b>	460	5674689	<b>5408022</b>	483	5670117	<b>5408958</b>	420			
5426912	<b>5350905</b>	460	6591688	<b>5408023</b>	483	5849407	<b>5408959</b>	420			
			5864172	<b>5408024</b>	484	5670124	<b>5408960</b>	420			



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		/pc.	
101 16-1500	5613213	5408108	477
101 16-3000	5613220	5408109	477
101 16-750	5613206	5408107	477
101 20-3000	5690733	5408105	477
101 20-6000	5636731	5408148	477
101 3B-4000	5674733	5402864	415
101 3B-4500	5674740	5402866	415
101 3B-5000	5674757	5402868	415
101 3B-5500	5674764	5402870	415
101 3B-6000	5674795	5402872	415
101 3B-6500	5674801	5402874	415
101 3B-7000	5674818	5402876	415
101 3B-7500	5674825	5402878	415
101 3B-8000	5674856	5402880	415
101 3-ES-16	5613329	5408976	476
		/100 pc.	
101 A-1500	5427575	5400155	386
101 A-1500	5427575	5400155	412
101 A-1500	5427575	5400155	468
		/pc.	
101 A-16	5613268	5408352	478
		/100 pc.	
101 A-CU	5629054	5400627	387
101 A-CU	5629054	5400627	412
101 A-CU	5629054	5400627	469
101 A-L100	5428411	5402808	413
101 A-L150	5428473	5402859	413
101 ALU-1000	5901334	5401771	413
101 ALU-1500	5427810	5401801	413
101 ALU-2000	5427872	5401836	413
101 ALU-2500	5898399	5401852	413
101 ALU-3000	5902119	5401879	413
		/pc.	
101 A-M16	5674474	5408350	478
		/100 pc.	
101 B2-16 M16	6389766	5402958	413
101 B2-16 M16	6389766	5402958	478
		/pc.	
101 BB-16	5613381	5408988	480
101 BP-16	5613367	5408984	479
		/100 pc.	
101 F1000	5430094	5424100	413
101 F1500	5430216	5424151	387
101 F1500	5430216	5424151	469
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