

Equipotential bonding and earthing

Building Connections

Digitalisation, the Energiewende (energy transition), mobility – the future is gathering speed. At OBO Bettermann, we're proud to be a driving force. And as a facilitator, we make connections. Today, we are already developing the innovative electrical infrastructure systems and solutions of tomorrow. Reliably, flexibly, sustainably.

Already today, OBO is one of the leading manufacturers of installation systems for the electrical infrastructure in buildings and plants. When it comes to the friction-free flow of power, energy and data, engineers and tradespeople worldwide rely on the comprehensive range from OBO.



Schutzinstallation - Erdung und Potentialausgleich / en / 2023/07/27 10:31:19 (LLEExport_03603) / 2023/07/27 10:31:40 10:31:40

OBO applies its slogan "Building Connections" to around 30,000 high-quality branded electrical products and services, which are used in application solutions for projects in industry, business and infrastructure.

OBO operates a global network and employs more than 4,200 people in more than 60 countries. The headquarters of the family company, which was founded in 1911, is located in Menden, Germany. In addition, more than 40 subsidiaries are present in markets on all continents.



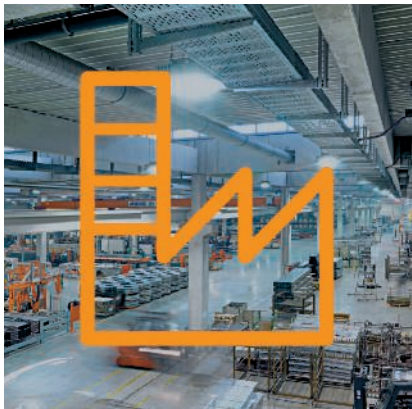
Improved structure, sharpened profile



Each of our products carries a benefit which only the OBO brand can offer. Products are developed, manufactured and tested with a high level of competence – from the idea through to the final check. From flawless logistics through to practical information – we can provide support at every level. We can offer additional security through certificates on the conformity of our products with the most important standards and directives. In a nutshell – OBO helps you more. In every location and in every phase of a project.

To maintain this, we continually challenge ourselves. Not as an end in itself but for the better processing of each customer's requests – fast, reliably and future-oriented. That is the reason we have not only established our three central application areas, but also reworked our catalogue structure. In this way, we can display our service offers more clearly, highlight the product benefits more effectively and illustrate the respective application areas more tangibly.

OBO Product Worlds



Industrial installations

- Cable support systems
- Connection and routing systems
- Fastening material



Building installations

- Cable routing systems
- Device installation ducts, trunking and poles
- Floor installation systems and underfloor applications
- Installation systems



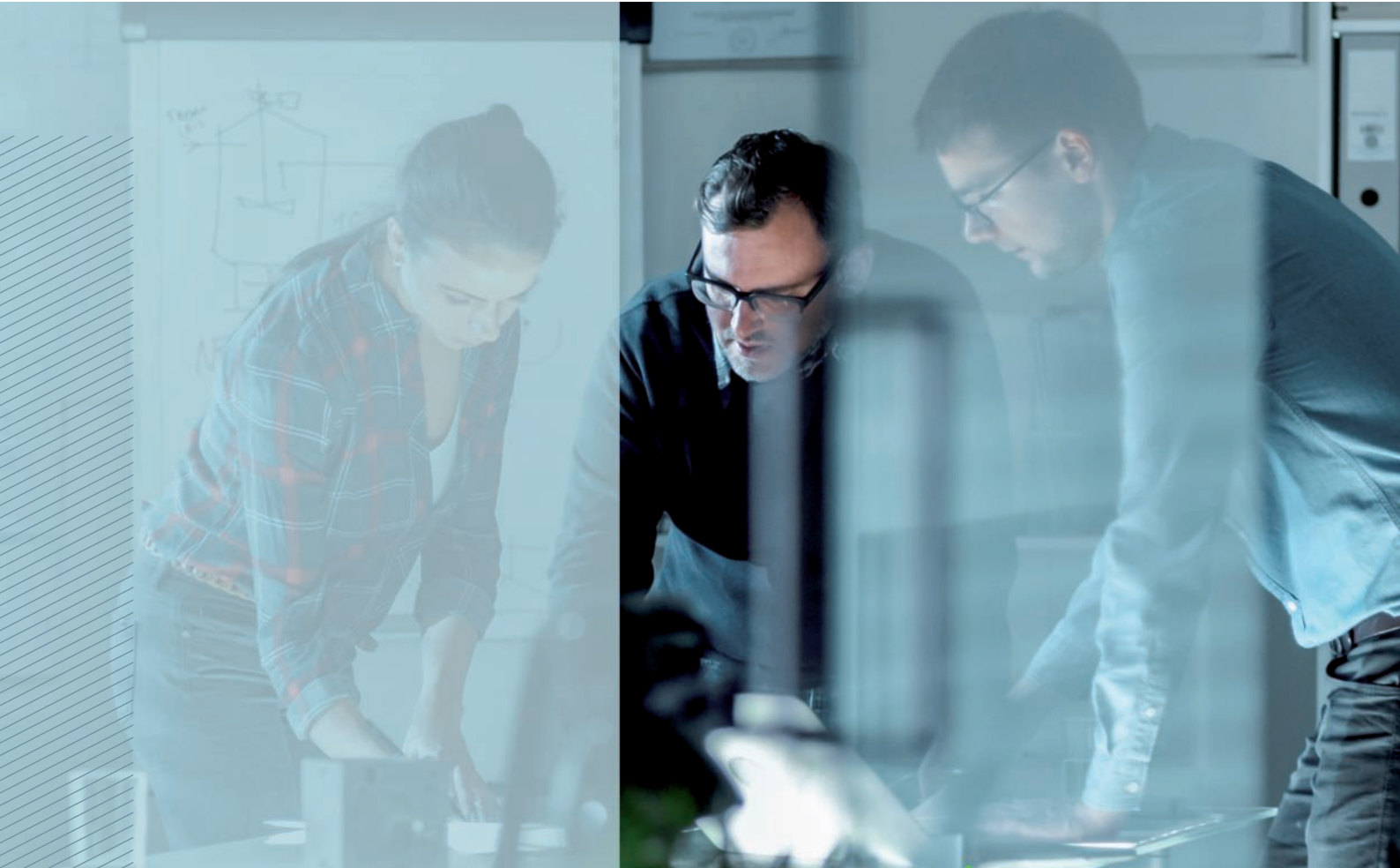
Safety and protection installations

- Surge protection
- External lightning protection
- Equipotential bonding and earthing
- Insulation and cable bandages
- Fire-tested support and routing systems
- Fire protection ducts



It's your choice – from now on there's a catalogue for each OBO product category. Simply select the catalogues and order together with a collection case.

OBO Support & *contact*



***You have a
problem?
We have the
solution!***

OBO Bettermann is more than the sum of its products. In any situation, we are the reliable partner right by your side. You have a problem? We have the solution!

It doesn't matter in which area of industry our support is needed – from industrial and plant engineering to private, public and administrative buildings, as well as in the areas of mobility and renewable energies – we have everything that you need.

OBO can not only provide the entire electro-technical infrastructure with the best possible products. We can also support you with sound expert knowledge and more than 100 years of experience, right from the planning phase through to the realisation of your projects. OBO – solutions you can rely on.

You can contact our Customer Service department on:

Customer Service

Tel.:+49 23 73 89 - 17 00

Monday–Thursday
07.30–17.00

Friday
07.30–15.00

export@obo.de

What is OBO Support?

Every OBO product carries a plus inside it, which only a branded product can offer. It is developed, manufactured and tested with a high level of competence, from the idea right through to the final check. In addition, our specialists are available for consultation and can offer you assistance and training courses for products at any time.

Together with you, we plan your project and help you choose the right products, and are also available to you at any time should you need us. From flawless logistics through to practical information – we can provide support at every level. We can offer security through certificates on the conformity of our products with the most important standards and directives.

We are as flexible as you are – because we know how practical people work and what is important to them. Each step is a plus – that is the OBO Support concept.



Service



Training



Handling



Certification

Service – OBO can help

Everywhere and in every project phase:

- Highly competent hotline
- Product and system information, digitally or printed
- Selection and planning aids on the web, as an app, as a CAD application or in printed form
- 2D and 3D product data for planning
- Field service, branch offices and subsidiaries in 60 countries
- Engineering services for major projects

Training courses from OBO

- Seminars and workshops
- Local consultation and training courses
- Planner days

Handling – OBO delivers reliably

With optimised delivery processes:

- Reliable logistics
- Practical transport systems and packaging
- Loading gear handling and disposal concepts

Certification and guarantee

OBO offers safety. Our products fulfil the most important country-specific regulations:

- Conformity (e.g. IEC, VDE, CE, KEMA, KEUR, UL)
- Certification (e.g. DIN EN, DGNB)
- 5-year guarantee for surge protection products
- Guarantee management



Planning aids

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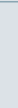
Conductor material

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Earth rods

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Equipotential busbars

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Earthing clamps and earthing terminals

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Protection and spark gaps

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Directories

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Planning aids

OBO Construct planning aids

Lightning protection guide

First-hand support and knowledge

Damage caused by surge voltages

Financial implications of lightning and surge damage

Lightning and surge protection standards

Gradual surge reduction with lightning protection zones

Choosing the right surge protective devices

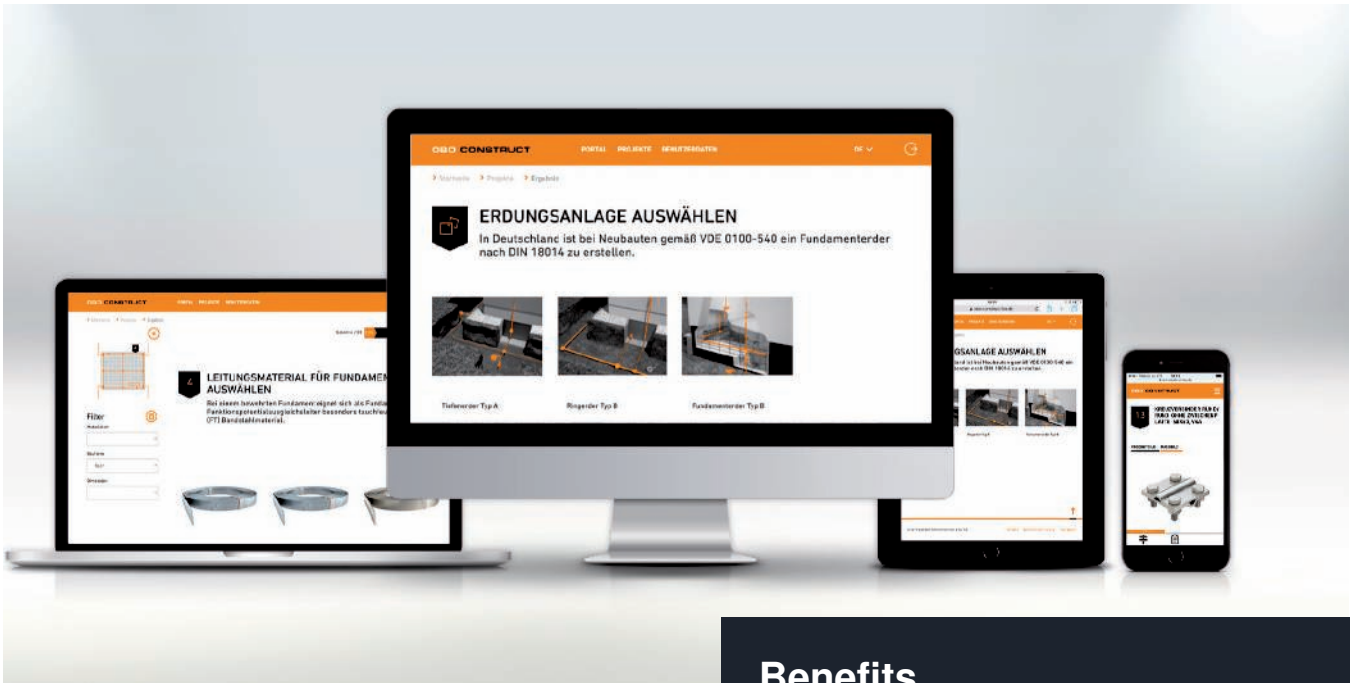
BET – testing centre for lightning protection, electrical engineering and support systems

Certification

Types of pulse and their characteristics



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 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

OBO Construct for earthing systems

Earthing systems can be planned and configured easily using the digital selection aid. 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.



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 23 73 89 - 17 00 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 earth electrode to current DIN 18014
- The internal lightning protection system
- Equipotential bonding systems
- Overvoltage protection systems
- Current standards
- New selection and planning aids
- Examples



First-hand support and knowledge



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

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

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

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

OBO manufactures 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.



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.

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.

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.



- Production location
- Subsidiary
- Representative

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 damage



Additional 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)
- Faulty heating system
- Costs due to faults and false alarms in fire or burglar alarm systems

Financial losses are on the rise

Recent statistics and numbers show: Surge voltage damages per year have been on the decline since 2014. The positive development could be a result, amongst other things, of the mandatory use of surge protection measures to VDE 0100-443. At the same time, the figures also show that the costs per year are rising significantly. A reason for this is the growing dependency on electrical devices and the increasing number of smart home solutions. Therefore it is always recommended to retrofit surge protection systems, even when they are not required by norms. Although costs will be covered by insurance policies, the annoyance about the preventable damage is initially large. Information on protection measures can be found in, for example, the German Directive VdS 2010.

Financial losses can only be considered in isolation when no legal or insurance requirements for the safety of people 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

Year	Amount of lightning and surge voltage damage	Paid damages for lightning and surge voltage damage
2010	290,000	€170 million
2011	380,000	€230 million
2012	360,000	€230 million
2013	290,000	€170 million
2014	380,000	€250 million
2015	350,000	€240 million
2016	320,000	€250 million
2017	300,000	€240 million
2018	280,000	€250 million
2019	230,000	€250 million
2020	200,000	€260 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 guidelines 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



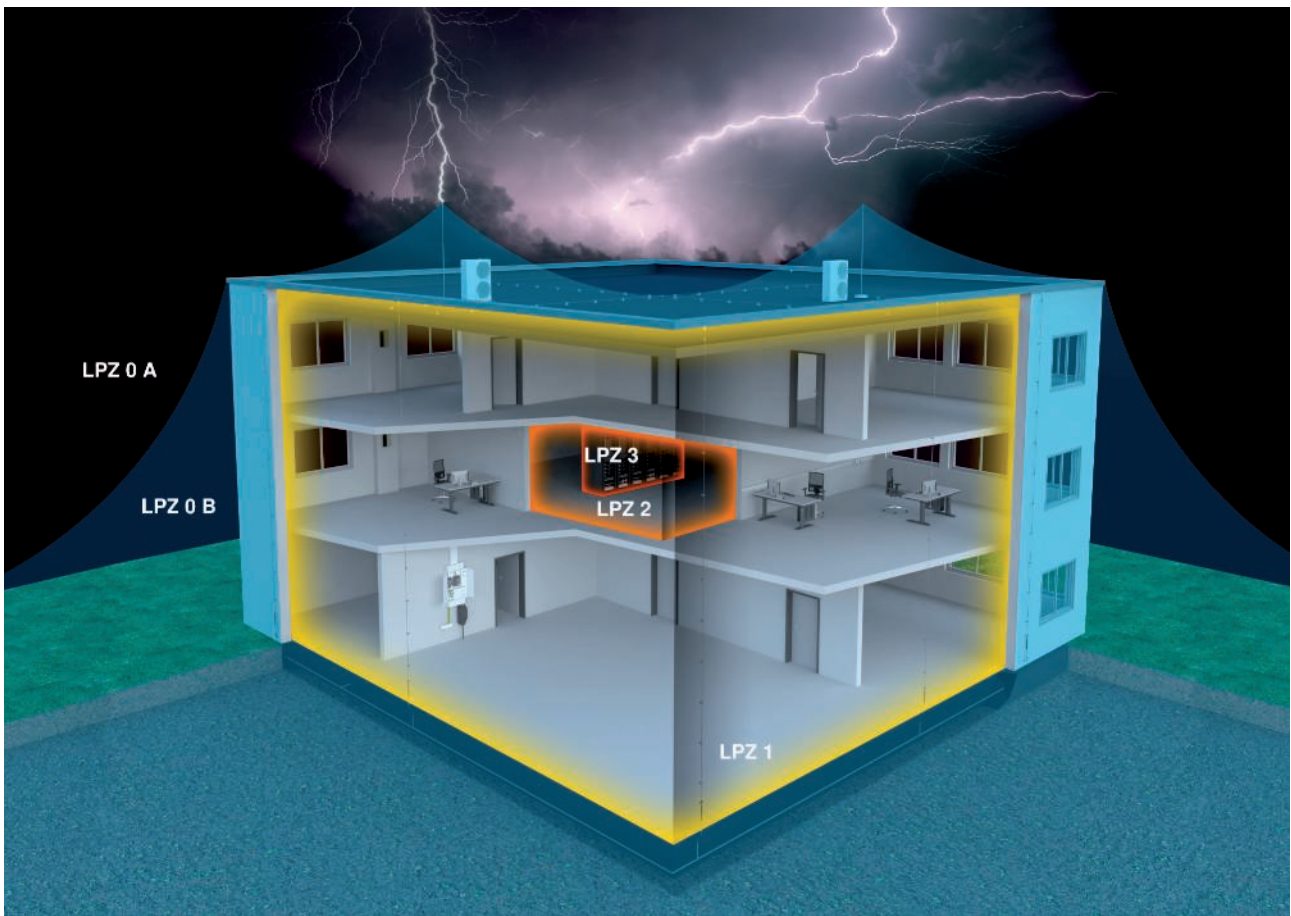
Standard	German supplement	Contents
VDE 0185-305-1 (IEC 62305-1)		Protection against lightning – Part 1: General principles
VDE 0185-305-2 (IEC 62305-2)		Protection against lightning – Part 2: Risk management
	1	Lightning risk in Germany
	2	Calculation aids for estimating the risk of damage for buildings
	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 6075-6-11)		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

LPZ 0 A	Unprotected zone outside the building. Direct lightning strike, no shielding against electromagnetic interference pulses LEMP (Lightning Electromagnetic Pulse).
LPZ 0 B	Through the area protected by the external lightning protection system. No shielding against LEMP.
LPZ 1	Zone inside the building. Low partial lightning energies possible.
LPZ 2	Zone inside the building. Low surges possible.
LPZ 3	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 Test Centre – for lightning protection, electrical engineering and support systems



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 conductors. 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.

Certification

In development, manufacture and marketing, the products of OBO Bettermann are subject to high, standardised quality standards and international standards. For decades now, OBO Bettermann has operated an ISO 9001-certified quality management system, which also fulfils the high requirements of the ATEX 2014/34/EU directive for EX products. In addition, OBO has run a certified energy management system according to ISO 50001 and is a long-standing member of Industrieverband Feuerverzinken e.V.

The BET Test Centre is a testing laboratory, recognised and certified by VDE, for the execution of countless tests according to international standards for lightning protection systems.



Industrieverband Feuerverzinken e.V. · Postfach 14 04 61 · 4020 Düsseldorf

Confirmation

Herewith we confirm, that

OBO BETTERMANN GmbH & Co. KG
Hüngser Ring 52
58710 Menden

is a member of our association

Industrieverband Feuerverzinken e. V., Düsseldorf.

The company OBO BETTERMANN GmbH & Co. KG provides among other things corrosion protection for fabricated iron and steel articles by hot dip galvanizing and examines that business in accordance with the requirements of the standard

DIN EN ISO 1461
"Hot dip galvanized coatings on fabricated iron and steel articles – specifications and test methods".

Industrieverband Feuerverzinken e.V. Düsseldorf, February 3rd, 2017
- Director -

Industrieverband Feuerverzinken e.V.
Hüngser Weg 206
40200 Düsseldorf

Mark Huckhold
Mark Huckhold

Mitglied der European General Galvanizers Association EGGGA · SIC DBU / DEDB/DUE · IBAN DE42 3307 0224 0589 1643 00

Zertifikat zur Anerkennung
Certificate of acceptance

von / of
OBO Bettermann GmbH & Co. KG
BET Testcenter
Hüngser Ring 52
58710 Menden
GERMANY

durch die / by the
VDE Prüf- und Zertifizierungsinstitut GmbH
VDE Testing and Certification Institute

Zertifikat
Mitteilung über die Bewertung des Qualitätssicherungssystems

1. Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen
Richtlinie 2014/34/EU
Anhang IV - Modul D: Konformität mit dem Baumuster auf der Grundlage einer Qualitätssicherung bezogen auf den Produktionsprozess
Anhang VII - Modul E: Konformität mit dem Baumuster auf der Grundlage der Qualitätssicherung bezogen auf das Produkt

2. Nummer des Zertifikates: **BVS 16 ATEX ZQS/E310**

3. Produktkategorie: **Geräte und Komponenten**
Gerätegruppe II, Kategorien 1G, 2G; Transienten- und Blitzschutz-Systeme

4. für das / for the
Acceptance Program
Stufe 2 / in Stage 2
40046136
2019-08-22
5022908-9501-0001237781

in mit dem gültigen Dokument „TDAP SCOPE“. Es berechtigt in geschützten Zeichens des VDE.
in with the valid document „TDAP SCOPE“. It does not exceed VDE marks.

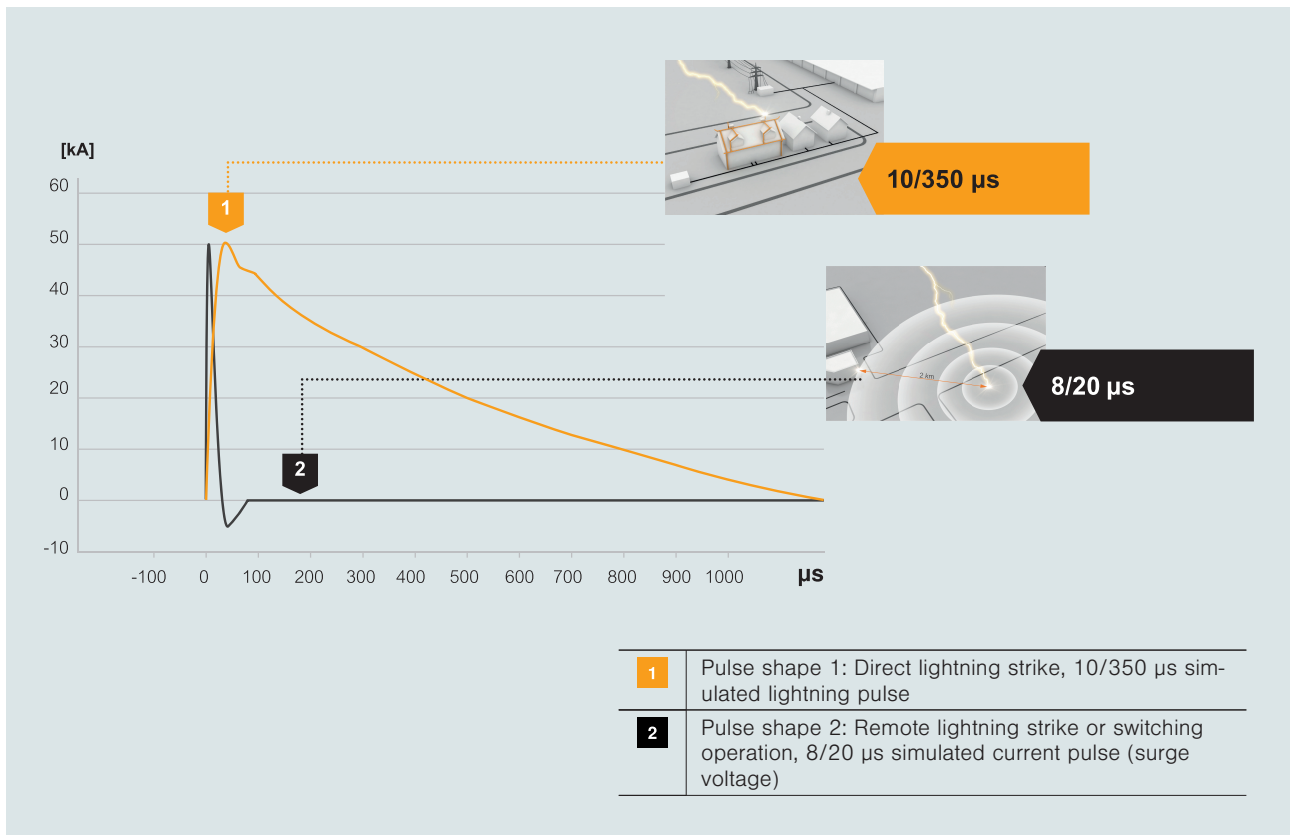
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stermann Hungary Kft., Alsórádó 2, 2347 Bogyi, Ungarn
r DEKRA EXAM GmbH, benannte Stelle Nr. 0158 gemäß Artikel 17 der 404/EU vom 26. Februar 2014, bescheinigt, dass der Hersteller ein system in Übereinstimmung mit Anhang IV der Richtlinie entspricht
Anlage werden alle überwachten Produkte mit den Baumusterprüf- ufgeliefert.
im Auditbericht Nr. ZQS/E310/16, ausgestellt am 21.12.2016.
achungsaudits des Qualitätssicherungssystems werden Bestandteil dieses
n 20.08.2016 bis 19.08.2019 und kann zurückgezogen werden, wenn der forderungen an die Qualitätssicherung nach Anhang IV und VII erfüllt.
Richtlinie 2014/34/EU ist hinter der CE-Kennzeichnung die Kennnummer GmbH als der benannten Stelle anzugeben, die in der Phase der rd.

Fachschriftsteller

Seite 1 von 1
Zertifikat darf nur vollständig und unverändert weitervertrieben werden.
Tel. +49(0) 234 3696-100, Telefax +49(0) 234 3696-110, zc-enr@vde.com

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

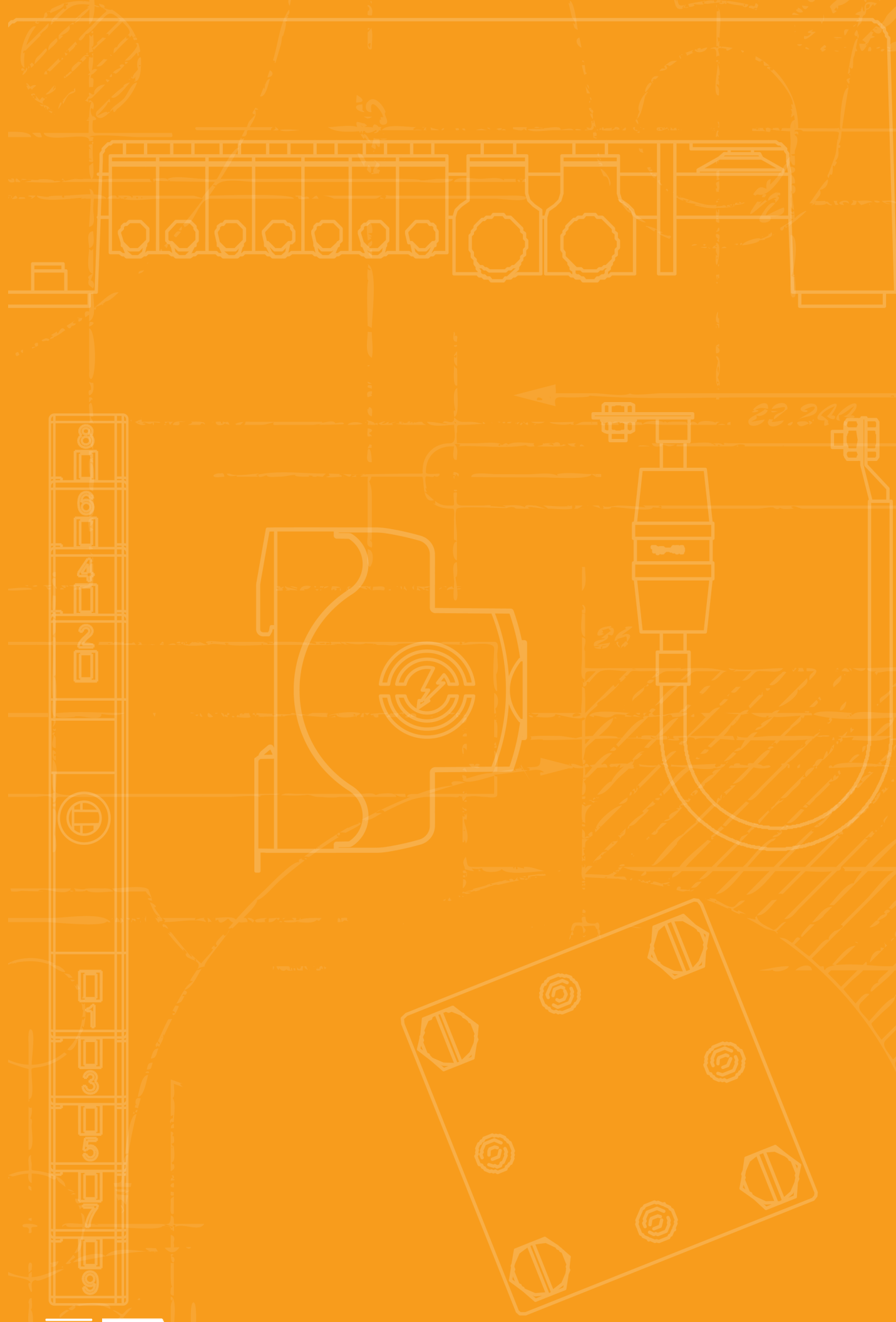
chamber. Depending on the test, the test length and the concentration of the salt spray or sulphur dioxide in the testing chambers may vary. This means that it is possible to conduct tests according to IEC 60068-2-52, ISO 7253, ISO 9227 and EN ISO 6988.

Testing cable support systems





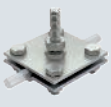

The well-known KTS testing system, newly installed in the BET Test Centre, allows the investigation of the load capacities of any cable support system manufactured by OBO. The basis for this is IEC 61537 and VDE 0639.

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.



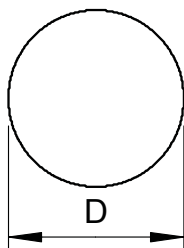


Conductor material

	Conductor material	28
	Cable brackets	32
	Connection clamps and connection terminals	34
	Connection and separating terminals	42
	Connection material	44
	Accessories	50



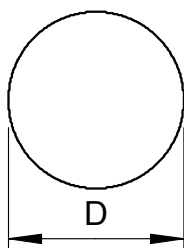
Round conductor, galvanised steel



Type	Nominal size Ø mm	Cross-section mm ²	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 8-FT 50	8	50	50	20	50	40.000	5021050
RD 10	10	78	80	50	80	63.000	5021103

- 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: ≥ 350 g/m² (approx. 50 µm in mean value)

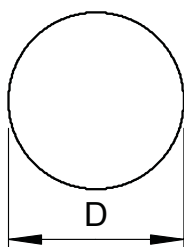
Round conductor, stainless steel A2



Type	Nominal size Ø mm	Cross-section mm ²	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
RD 10-V2A	10	78	50	32	50	63.000	5021227
RD 8-V4A	8	50	125	50	125	40.000	5021644
RD 10-V4A 20	10	78	20	12	20	63.000	5021640
RD 10-V4A	10	78	50	32	50	63.000	5021642

- 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 earth electrode standard DIN 18014, V4A is required in the earth

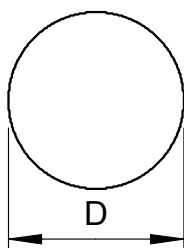
Round conductor, copper



Type	Nominal size Ø mm	Cross-section mm ²	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
RD 8-CU	8	50	100	45	100	45.000	5021480
RD 10-CU	10	78	50	35	50	70.000	5021502

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

Round conductor, aluminium



Type	Nominal size Ø mm	Cross-section mm ²	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
RD 8-ALU-T	8	50	150	20	150	13.500	5021294

- 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

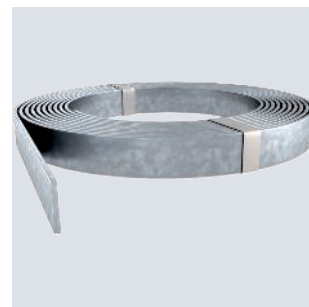
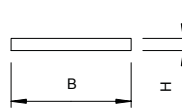
St FT



Galvanised steel flat conductor for earth

Type	Dim. B mm	Dim. H mm	Cross-section mm ²	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
5052 DIN 30X3.5	30	3.5	105	25	30	84.000	5019345
5052 DIN 30X3.5	30	3.5	105	50	60	84.000	5019347

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Meets the requirements of VDE 0185-305 (IEC 62305)
- Zinc coating: ≥ 500 g/m² (approx. 70 µm in mean value)
- For lightning protection, earthing systems and ring equipotential bonding



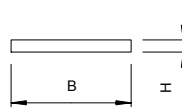
VA



Stainless steel flat conductor

Type	Dim. B mm	Dim. H mm	Cross-section mm ²	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
5052 V4A 30X3.5	30	3.5	105	21	25	82.425	5018730

- According to DIN EN 62561-2 (VDE 0185-561-2)
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)
- According to the foundation earth electrode 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

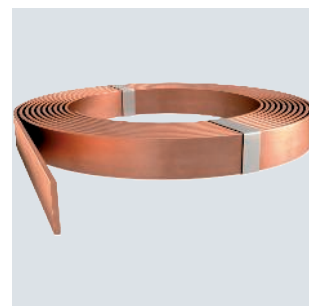
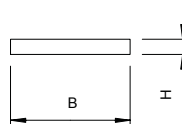


Cu

Flat conductor, copper

Type	Dimension W x H mm	Cross-section mm ²	Normal ring ca. m	Normal ring ca. kg	Pack m	Weight kg/100 m	Item no.
FL 25-CU	25x3	75	50	33	50	67.000	5021830

- 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

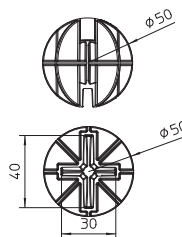


PE

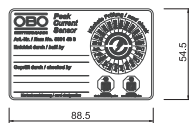
Protective cap for connection lugs, reflective

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
ProtectionBall	RD 8-10/ FL 25/ 30/ 40	25	2.050	5018014

- For snapping onto round conductors or flat conductors
- Noticeable, reflective label
- For accident protection during the construction phase



Magnetic card PCS

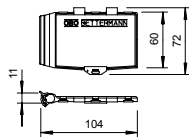


Type	Pack Weight		Item no.
	PU	kg/100 PUs	
PCS	1	5.000	5091438

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

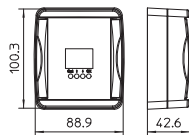


Type	Pack Weight		Item no.
	PU	kg/100 PUs	
PCS-H	1	31.000	5091527

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

Lightning strike and surge counter



Type	Measuring range	Pack Weight		Item no.
		Piece	kg/100 pc.	
LSC I-II	1 kA - 100 kA	1	32.500	5091722

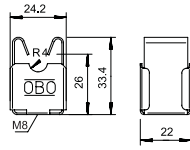
The LSC I-II lightning current meter measures and permanently saves pulse currents, together with the date and time. This ensures constant monitoring in order to notice if any lightning has struck the lightning protection system. Should this be the case, then the lightning protection system must be maintained 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 protective device
- Long lifespan of the internal lithium batteries
- LCD display
- Internal battery
- Tested according to VDE 0185-561-6 (IEC 62561-6)



Cable bracket for Rd 8 mm, through-way Ø 7 mm

A2



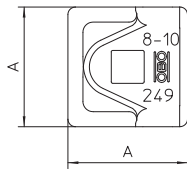
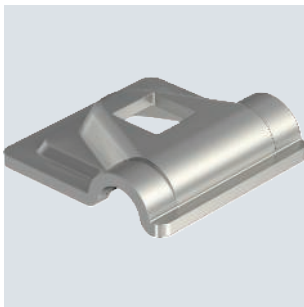
Type	Fit	Installation height	Pack Piece	Weight kg/100 pc.	Item no.
177 20 VA M8	Rd 8	20	20	1.838	5207347

- With female thread M8 or through hole Ø 5 mm
- From stainless steel (V2A)

Quick connector, upper parts

Quick connector, upper part Rd 8–10 mm

A2

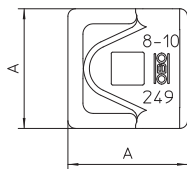
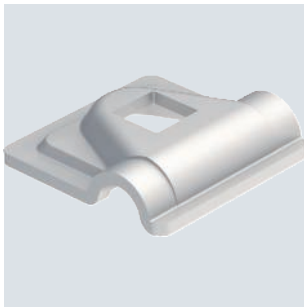


Type	Fit	Dim. A	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 VA-OT	Rd 8-10	40	100	3.130	5311554

- For round conductor Rd 8-10
- Suitable for M10 bolts

Quick connector, upper part Rd 8–10 mm

Alu



Type	Fit	Dim. A	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 ALU-OT	Rd 8-10	44	100	2.100	5311585

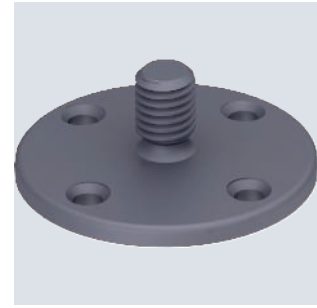
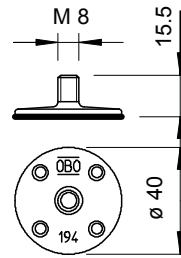
- For round conductor fastening Rd 8-10
- Suitable for M10 bolts

PA

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

- 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 conductors, expansion elements are to be used for thermal compensation
- Use on film roofs after consultation with the responsible roof construction company

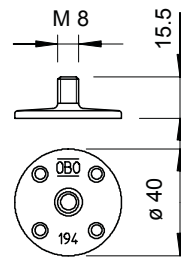


PA

Bonding base

Type	Colour	Thread	Pack Piece	Weight kg/100 pc.	Item no.
194	Grey	M8	100	0.389	5207258

- 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 conductors, expansion elements are to be used for thermal compensation

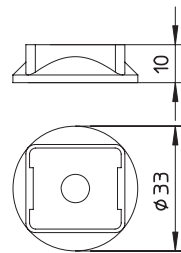


PP

Washer for cable bracket, type 177

Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
177 U	Light grey	20	0.286	5207371

- For simple wall installation
- UV-resistant

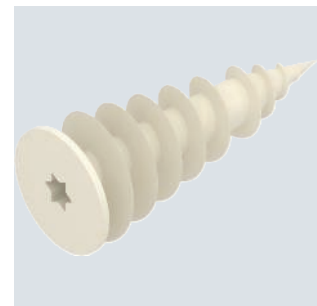


PA

Hard foam plate anchor

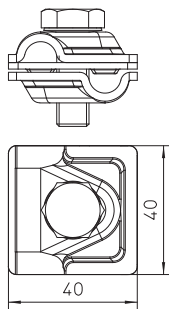
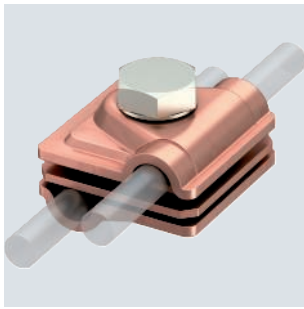
Type	Length mm	Dowel Ø mm	Wood screws Ø mm	Break load kN	Pack Piece	Weight kg/100 pc.	Item no.
177 WDVS 64x25 B	63.5	9	4-5	0.05	50	0.658	5207375

Anchor for universal light-duty fastening in plastered composite heat insulation systems (WDVS). The self-tapping point makes pre-drilling superfluous.



Variable earthing connector Rd 6-8 / 8-10 mm

Cu

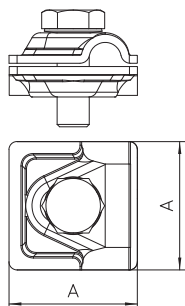
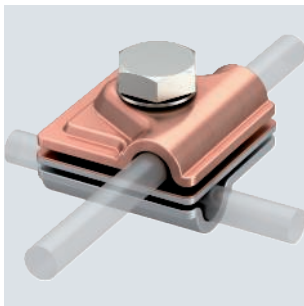


Type	Fit mm	Dim. A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
249 6-10 CU	Rd 6-8 / 8-10	40	H/100	10	14.540	5311417

- For T, cross-over and parallel connections with adapter plates
- Quick mounting using an M10 x 30 bolt, made from rustproof stainless steel A2
- With sprung washer to DIN 137
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)

Variable bi-metal quick connector

Cu

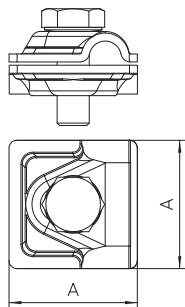
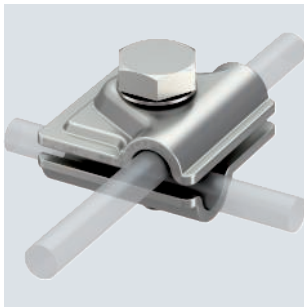


Type	Fit mm	Dim. A mm	Lightning current carrying capacity kA	Material	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 ZV	Rd 8-10	44	H/100	Cu	10	14.220	5311535

- 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 spring washer according to DIN 137
- Conforms to the requirements according to DIN VDE 0185-305 (IEC 62305)

Vario quick connector

A2

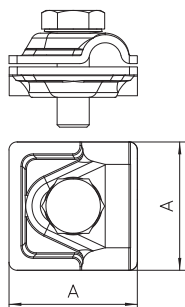
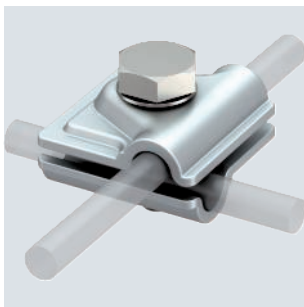


Type	Fit mm	Dim. A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 VA	Rd 8-10	40	H/100	10	9.276	5311551

- 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

Alu



Type	Fit mm	Dim. A mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 ALU	Rd 8-10	44	H/100	30	6.600	5311519

- 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)

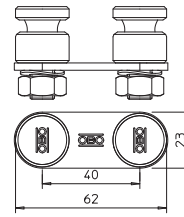
A2



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.
5002 N-VA	Rd 8-10	N/50	10	16.200	5304270

- With 2 Fix contact clamping screws, nuts and serrated washers
- With pre-mounted pressure trough made of VA
- Corresponds to the requirements of VDE 0185-305 (IEC 62305)



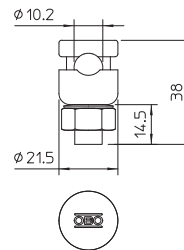
Cu



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-CU	Rd 8-10	H/100	10	6.750	5304172

- 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)



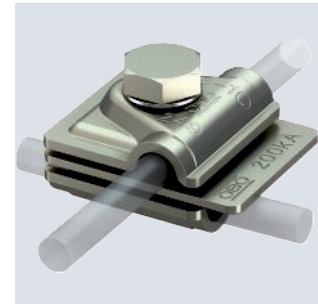
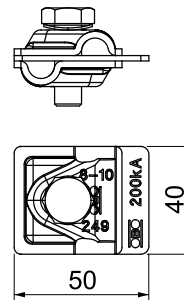
A2



Vario quick connector 200 kA

Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 V2A 200	Rd 8-10	H2/200	10	12.374	5311595

- 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



Cross-connectors

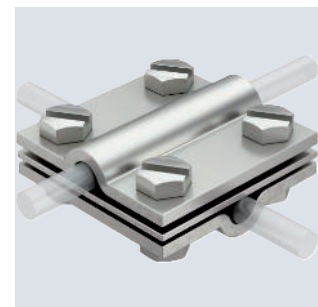
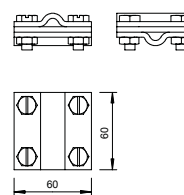
A4



Cross-connector with intermediate plate for Rd 8–10 mm

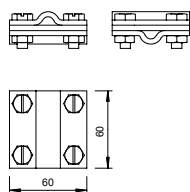
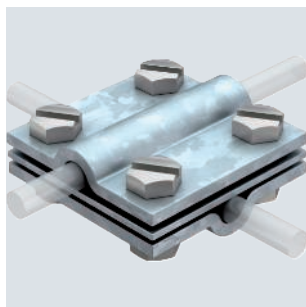
Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
252 8-10 V4A	Rd 8-10	H/100	10	33.530	5312318

- 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

St FT
TEST TESTED

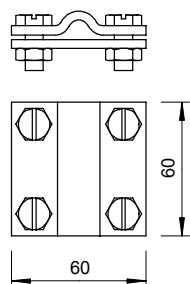
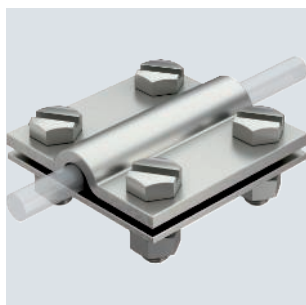


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
252 8-10 FT	Rd 8-10	H/100	25	33.530	5312310

- 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 for round cables and flat conductors

VA
TEST TESTED

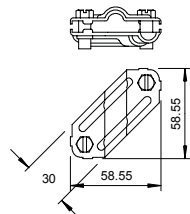


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
252 S4 V4A	Rd 8-10/FL30	H/100	3600	23.200	5312308

- 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

A2 A4
TEST TESTED

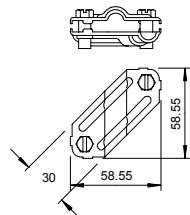
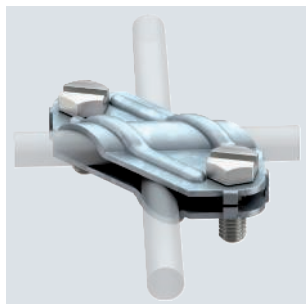


Type	Fit mm	Lightning current carrying capacity kA	Short-circuit current (50 HZ) (1 s; ≤300 °C) kA	Pack Piece	Weight kg/100 pc.	Item no.
250 VA	Rd 8-10/FL30	H/100	1.4	25	10.260	5312922
250 V4A	Rd 8-10/FL30	H/100	1.4	10	10.260	5312925

- 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

St FT
TEST TESTED



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.
250	Rd 8-10/FL30	N/50	5.6	25	10.260	5312906

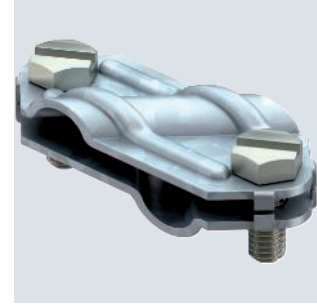
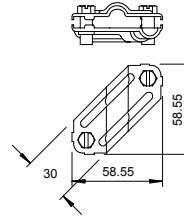
- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- Fit: Rd 8-10 x Rd 8-10
- Fit: Rd 8-10 x FL 30
- Fit: FL 30 x FL 30
- Mounted with 2 hexagonal bolts M8 x 20 (F)

A4

Cross-connector 250 VA

Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
250 VA-FR	Rd 8-10/FL30	H/100	25	8.700	5312930

Cross-connector to connect round and flat conductors. Conforms to the requirements according to VDE 0185-305-3 (IEC/EN 62305-3). With separator plate. Mounted with 2 hexagonal bolts.

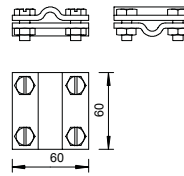


VA

Cross-connector round/round without intermediate plate

Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
253 S3 V4A	Rd 8-10	H/100	3400	25.900	5312594

- 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)



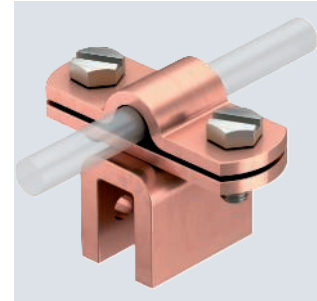
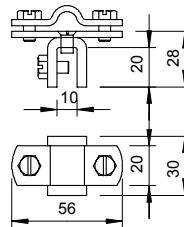
Folding clamps

Cu

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.
270 8-10 CU	Rd 8-10	-10	H/100	10	14.740	5317258

- 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

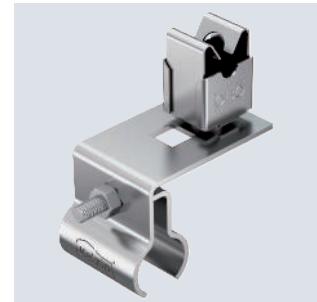
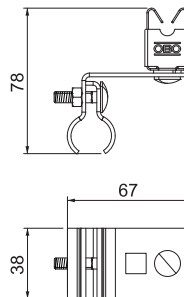


A2

Folding and construction clamp

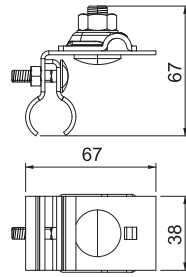
Type	Fit mm	Clamping range mm	Pack Piece	Weight kg/100 pc.	Item no.
RSF 177 20 VA M8	8	8	50	13.400	5317512

- For round standing seam systems, loose cable routing
- Manufacturer release by Kalzip
- Tested according to VDE 0185-561-4 (IEC/EN 62561-4)



Folding and construction clamp

A2



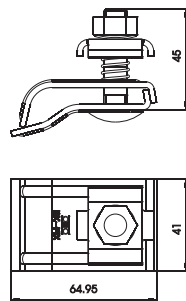
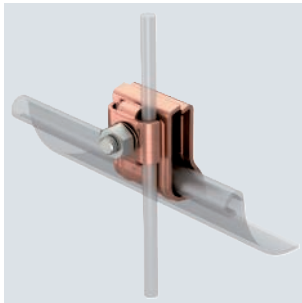
Type	Fit mm	Clamping range mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
RSF 249 8-10 VA	Rd 8-10	- 10	N/50	50	14.200	5317502

- For round standing seam systems, fixed cable routing
- Manufacturer release by Kalzip
- Tested according to VDE 0185-561-1 (IEC/EN 62561-1)

Roof gutter clamps

Gutter clamp RK-FIX

A2 Cu

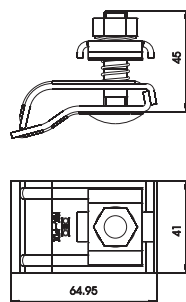
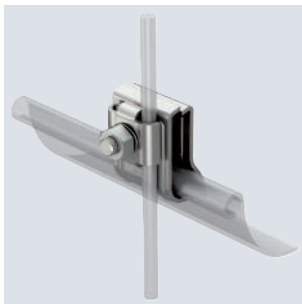


Type	Fit mm	Lightning current carrying capacity kA	Material	Pack Piece	Weight kg/100 pc.	Item no.
RK-FIX CU	2 x Rd 8/ 2 x Rd 6	H/100	A2	10	21.000	5316468

- For up to 2 conductors Rd 6 or Rd 8
- 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 on rain gutter
- Tested to VDE 0185-561-1 (IEC/EN 62561-1)

Gutter clamp RK-FIX

A2



Type	Fit mm	Lightning current carrying capacity kA	Material	Pack Piece	Weight kg/100 pc.	Item no.
RK-FIX VA	2 x Rd 8/ 2 x Rd 6	H/100	A2	10	19.100	5316459

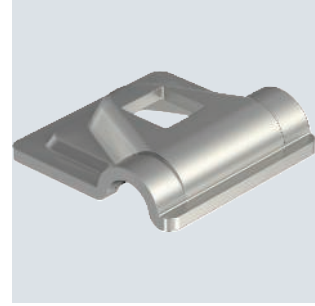
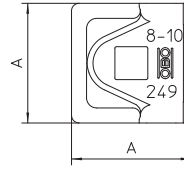
- For up to 2 round conductors Rd 6 or Rd 8
- Suitable for all bead thicknesses (15–25 mm)
- With 1 truss-head bolt M10 x 45
- Nut and bolt made of VA stainless steel
- With spring for prefixing on rain gutter
- Tested to VDE 0185-561-1 (IEC/EN 62561-1)

A2

Quick connector, upper part Rd 8–10 mm

Type	Fit mm	Dim. A mm	Pack Piece	Weight kg/100 pc.	Item no.

- For round conductor Rd 8-10
- Suitable for M10 bolts

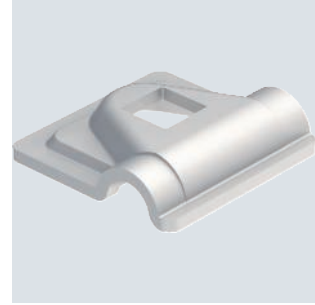
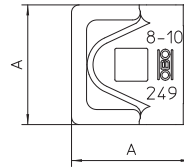


Alu

Quick connector, upper part Rd 8–10 mm

Type	Fit mm	Dim. A mm	Pack Piece	Weight kg/100 pc.	Item no.

- For round conductor fastening Rd 8-10
- Suitable for M10 bolts



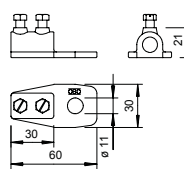
End pieces

Zn G

End piece

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

- With Ø 11 mm attaching hole
- 2 hexagonal bolts M6 x 12, bolts hot-dip galvanised steel or VA
- Clamping element from die-cast zinc or copper-plated die-cast zinc



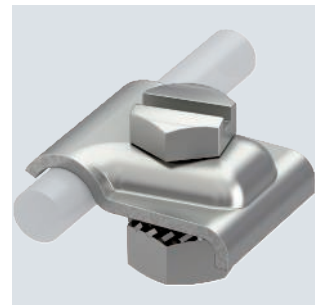
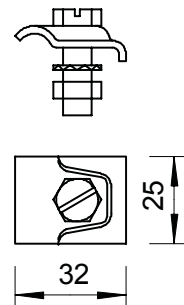
Universal clamping block

A2

Universal clamping block Rd 8–10 mm

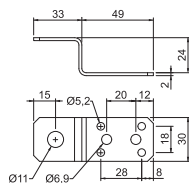
Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.

- Including hexagonal bolt M8 x 25, washer and nuts



Connection component

Alu



Type

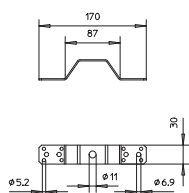
287

Pack Piece	Weight kg/100 pc.	Item no.
20	1.600	5320704

- With 1 attaching hole Ø 11 mm
- 4 mounting holes Ø 5.2 mm
- 2 mounting holes Ø 6.9 mm

Connection and bridging component

Alu



Type

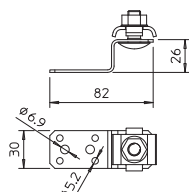
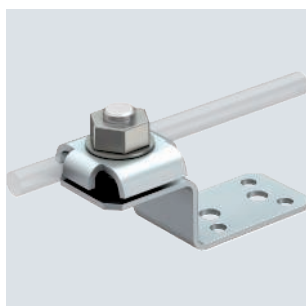
288 DIN

Pack Piece	Weight kg/100 pc.	Item no.
20	2.900	5320712

- With 1 attaching hole Ø 11 mm
- With 2 x 4 mounting holes Ø 5.2 mm
- With 2 x 2 mounting holes Ø 6.9 mm

Connection component with double crossbar

Alu



Type

287 DCT

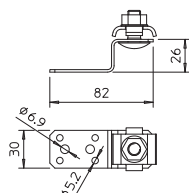
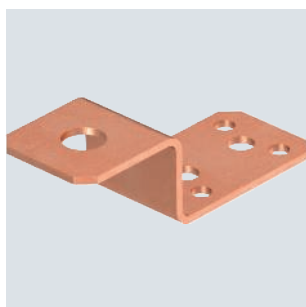
Lightning current carrying capacity	Fit mm	mm kA
	8	N/50

Pack Piece	Weight kg/100 pc.	Item no.
10	6.450	5320707

- Quick mounting thanks to an M10 x 30 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 component

Cu



Type

287 CU

Pack Piece	Weight kg/100 pc.	Item no.
10	5.600	5320690

- With 1 attaching hole Ø 11 mm
- 4 mounting holes Ø 5.2 mm
- 2 mounting holes Ø 6.9 mm

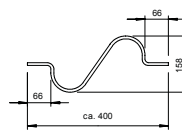
Alu



Expansion piece

Type	Pack Piece	Weight kg/100 pc.	Item no.
172 AR	10	7.500	5218926

- For equalising temperature-related length changes
- Necessary on conductor lengths over 20 m
- From round conductor Rd 8-Al

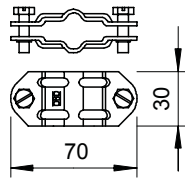
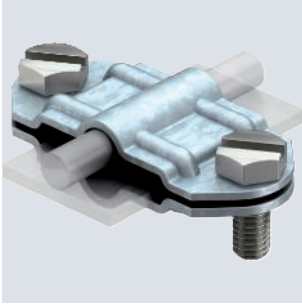


Conductor material



Separating piece for Rd 8–10 and FL 30 mm

St FT

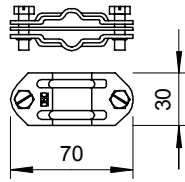
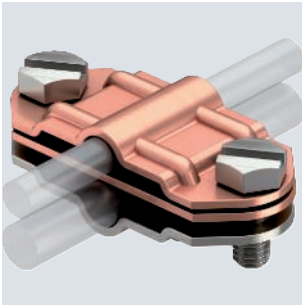


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
233 8	Rd 8-10/FL30 x Rd 8-10/FL30	20	8.200	5336309

- 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_k (50 Hz), time 0.6 s, temp. max. 300 °C: 8.5 kA

Bi-metal separating piece for Rd 8–10 and FL 30 mm

A2

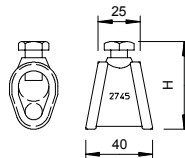


Type	Fit mm	Material upper part	Material lower part	Pack Piece	Weight kg/100 pc.	Item no.
233 ZV	Rd 8-10/FL30 x Rd 8-10/FL30	Cu	VA	10	10.100	5336376

- 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

Connection clamp for earth rod or cables

CuZn 37 Cu



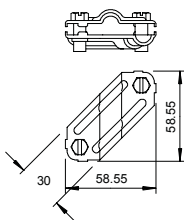
Type	For earth rods	Fit Ø mm	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
2745 20 MS	20	7-12,5/S95	mm ²	5	16.000	5001560

- For earth rods Ø 20 or conductors of 95 mm²
- For round conductor attachments Rd 7–12.5 with hexagonal bolts M10 x 25



Cross-connector for flat conductors and round conductors

A2 A4

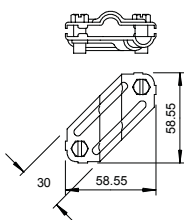
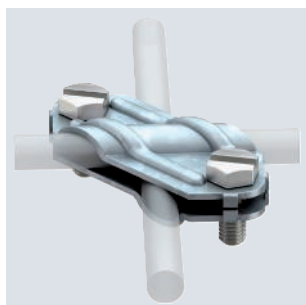


Type	Fit mm	Lightning current carrying capacity kA	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Pack Piece	Weight kg/100 pc.	Item no.
250 VA	Rd 8-10/FL30	H/100	1.4	25	10.260	5312922
250 V4A	Rd 8-10/FL30	H/100	1.4	10	10.260	5312925

- 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

St FT

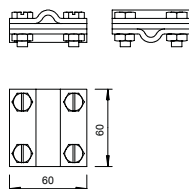
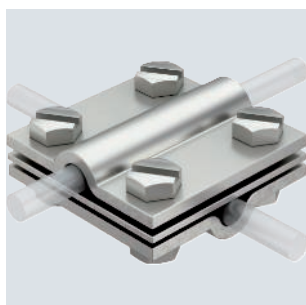


Type	Fit mm	Lightning current carrying capacity kA	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Pack Piece	Weight kg/100 pc.	Item no.
250	Rd 8-10/FL30	N/50	5.6	25	10.260	5312906

- 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 with intermediate plate for Rd 8–10 mm

A4

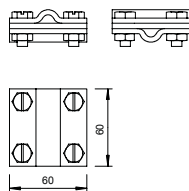
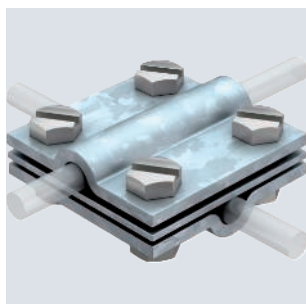


Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
252 8-10 V4A	Rd 8-10	H/100	10	33.530	5312318

- 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

St FT



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
252 8-10 FT	Rd 8-10	H/100	25	33.530	5312310

- 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)

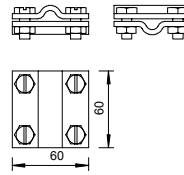
VA

Cross-connector round/round without intermediate plate



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
253 8-10 V4A	Rd 8-10	H/100	25	23.650	5312582

- 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)



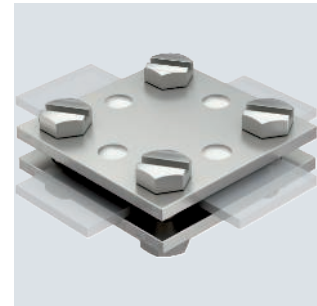
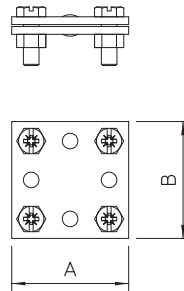
A4

DIN cross-connector for flat conductor



Type	Fit mm	Dim. A mm	Dim. B mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
256 A-DIN 30 V4A	max. FL30	60	60	H/100	10	26.400	5314659

- 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



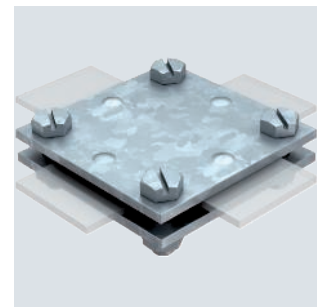
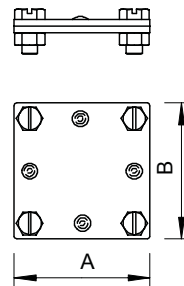
St FT

DIN cross-connector for flat conductor



Type	Fit mm	Dim. A mm	Dim. 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	22.550	5314658

- 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)



Connection clamps

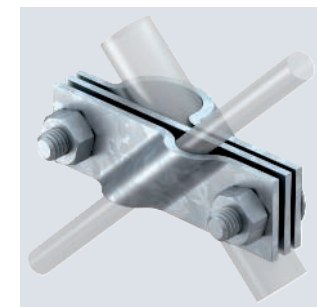
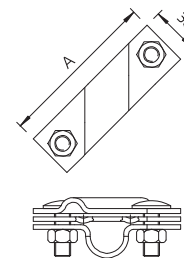
St FT

Connection clamp for earth rod, universal



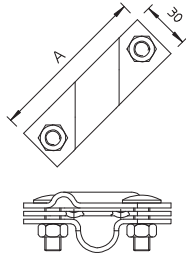
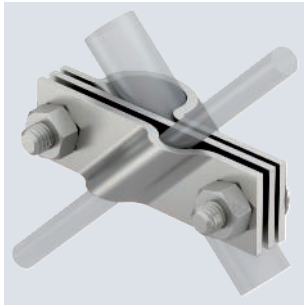
Type	For earth rods Dim. A mm	Fit mm	Short-circuit current (50 HZ) (1 s; ≤300 °C) kA	Pack Piece	Weight kg/100 pc.	Item no.
2760 20 FT	101	20	Rd 8-10/FL40	5	28.335	5001641
2760 25 FT	110	25	Rd 8-10/FL40	5	38.400	5001668

- 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

VA

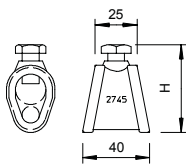


Type	Dim. A mm	For earth rods		Fit	Pack Piece	Weight kg/100 pc.	Item no.
		Ø mm	mm				
2760 20 V4A	101	20	Rd 8-10/FL40		5	32.400	5001633

- 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

CuZn 37 Cu

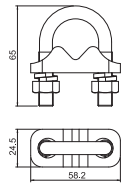
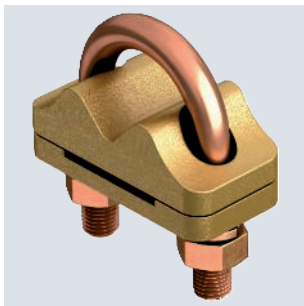


Type	For earth rods		Fit	Pack Piece	Weight kg/100 pc.	Item no.
	Ø mm	mm				
2745 20 MS	20	7-12,5/S95 mm ²		5	16.000	5001560

- For earth rods Ø 20 or conductors of 95 mm²
- For round conductor attachments Rd 7–12.5 with hexagonal bolts M10 x 25

Connection clamp

CuSn

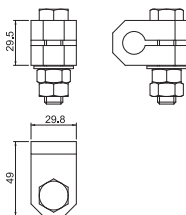


Type	For earth rods		Fit	Pack Piece	Weight kg/100 pc.	Item no.
	Ø mm	mm				
2740 16	14.2	FL/ Rd		10	12.900	5001511
2740 16 KL	14.2	Rd 8-10/FL max. 26		10	17.500	5001513

- Suitable for connecting round conductors Rd 8-10 or flat conductors with earth rod 219 16 CU

Connection clamp

CuSn



Type	For earth rods		Pack Piece	Weight kg/100 pc.	Item no.
	Ø mm	mm			
2760 16	14.2		5	35.000	5001601

- For the connection of conductor materials with conductor shoes to earth rod 219 16 CU

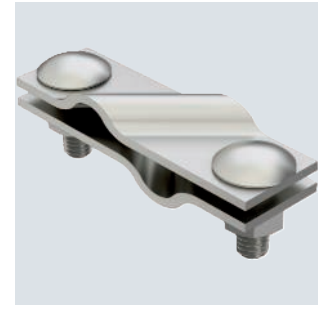
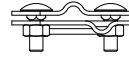
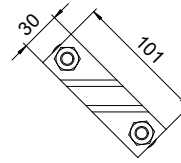
VA VA

Diagonal connector for round conductor



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
2760 S8 V4A	Rd 8-10	H/100	3600	20.600	5313012
2760 8-10 V4A	Rd 8-10	H/100	25	21.364	5313013

- Meets the requirements of VDE 0185-305-3 (IEC/ EN 62305-3)
- To connect round conductors 8–10 mm
- Mounted with 2 truss-head bolts M10 x 30 and 2 hexagonal bolts M10



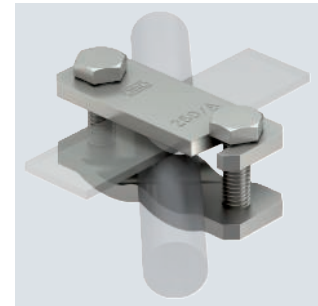
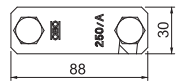
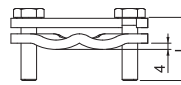
A2



Diagonal clamp for flat conductors and round conductors

Type	Dim. L mm	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
250 A-VA	40	Rd 6-22/max. FL50	H/100	10	28.800	5313023

- For reinforced steels Ø 6-22 mm and flat conductor 50 x 4
- Installed with bolts M10 x 40
- AS version with bolts M10 x 20
- Simple installation with open slot



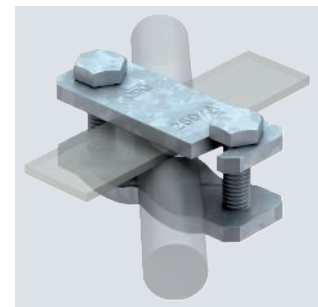
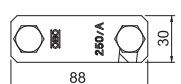
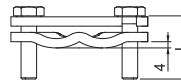
St FT



Diagonal clamp for flat conductors and round conductors

Type	Dim. L mm	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
250 A-FT	40	Rd 6-22/ max. FL50	H/100	25	28.800	5313015

- For reinforced steels Ø 6-22 mm and flat conductor 50 x 4
- Installed with bolts M10 x 40
- AS version with bolts M10 x 20
- Simple installation with open slot



Connection terminals

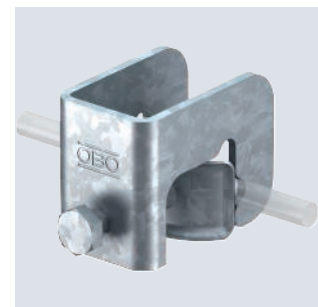
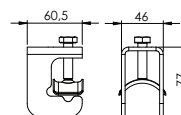
St FT



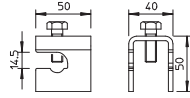
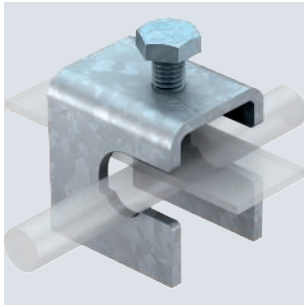
VARIO earthing terminal for large reinforced steels

Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
1814 ST D37	FL30x34mm/ Rd 10 x Rd 16-37	H/100	25	30.000	5014477
1814 FT D37	FL30x34mm/ Rd 10 x Rd 16-37	H/100	25	30.000	5014469

- For armoured steel with 16-37 mm diameter and round conductors and flat conductors
- Rapid installation using open slot and only one M10 bolt
- Rotatable metal pressure trough for simple, safe mounting



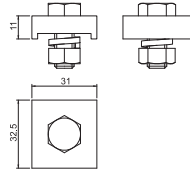
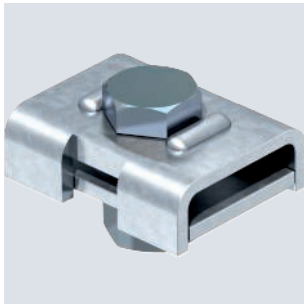
VARIO earthing terminal for reinforced steels



Type	Fit mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
1814 FT	FL30x5 xRd8-14	N/50	25	20.000	5014468

- For reinforced steels with diameters 8-14 mm and FL 30 x 5
- Simple mounting through open slot
- Side suspension possible

Connection clamp for flat conductors

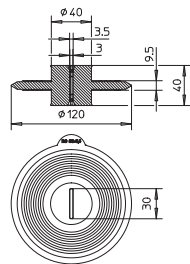
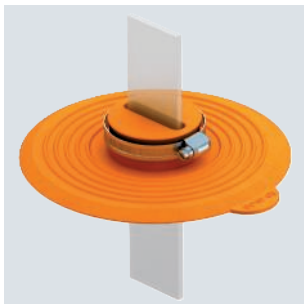


Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
1818 FL CU	FL 20 ÷ FL 26	10	10.000	5012270

- For connecting round conductor Rd 8-10
- With 1 hexagonal bolt M12 x 40, 1 hexagonal nut M12 and 1 lock washer, stainless steel

Sealing sleeves

Sealing sleeve for flat conductors



Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
DW FL30x3,5	FL 30x3,5	1	18.000	2360043

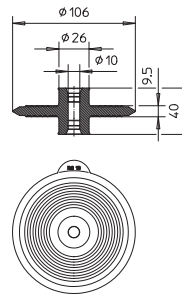
- Sealing sleeve for penetrations of waterproof foundation plates/walls (e.g. white trough)
- For mounting on connection lugs with stainless steel tightening straps
- With pressurised water testing to 5 bar
- According to DIN EN 62561-5 (VDE 0185-561-5)

TPE

Sealing sleeve for round conductors

Type	Fit mm	Pack Piece	Weight kg/100 pc.	Item no.
DW RD10	RD 10	1	13.000	2360041

- 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)



Fixed earthing terminals

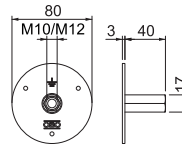
VA



Fixed earthing terminal 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.
205 DG V4A	M10/M12	6.2	H/100	10	14.800	5420020

- For connection to earthing systems, conductors and reinforcements
- Contact plate: Ø 80 mm made of stainless steel, rustproof (V4A)
- Double thread M10/M12
- Incl. plastic cover for simple installation



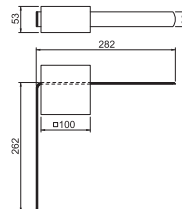
Connection material

A2

Expansion strip for foundation earth electrode systems

Type	Dimension W x H mm	Pack Piece	Weight kg/100 pc.	Item no.
1807 DB	30x3,5	1	40.000	5016160

- Expansion strip according to VDE 0185-561-2 (IEC 62561-2)
- To pass the foundation earth electrode through movement joints



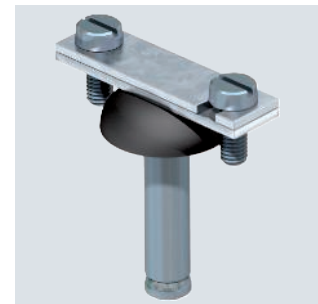
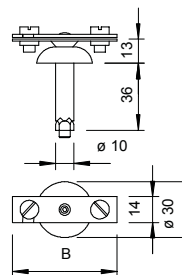
Spacer

St G

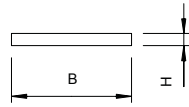
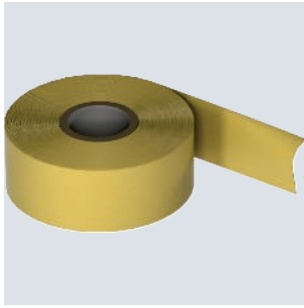
Spacer for flat conductor, with steel spreading anchor Ø 10

Type	Fit mm	Dim. B mm	Pack Piece	Weight kg/100 pc.	Item no.
710 30	max. FL30	52	25	5.044	5028035

- Fit: FL 30 and FL 40
- With steel straddling dowel Ø 10 mm, spacer and 2 cylinder bolts M5 x 14 (G)



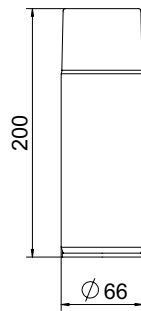
Corrosion protection strip



Type	Dimension		Pack Piece	Weight kg/100 pc.	Item no.
	Width mm	Length m			
356 50	50	10	1	59.000	2360055
356 100	100	10	1	122.200	2360101

- Approx. 1.1 mm thick
- Width: 50 mm or 100 mm, made of petrolatum-coated chemical fibre fabric
- Can be processed cold

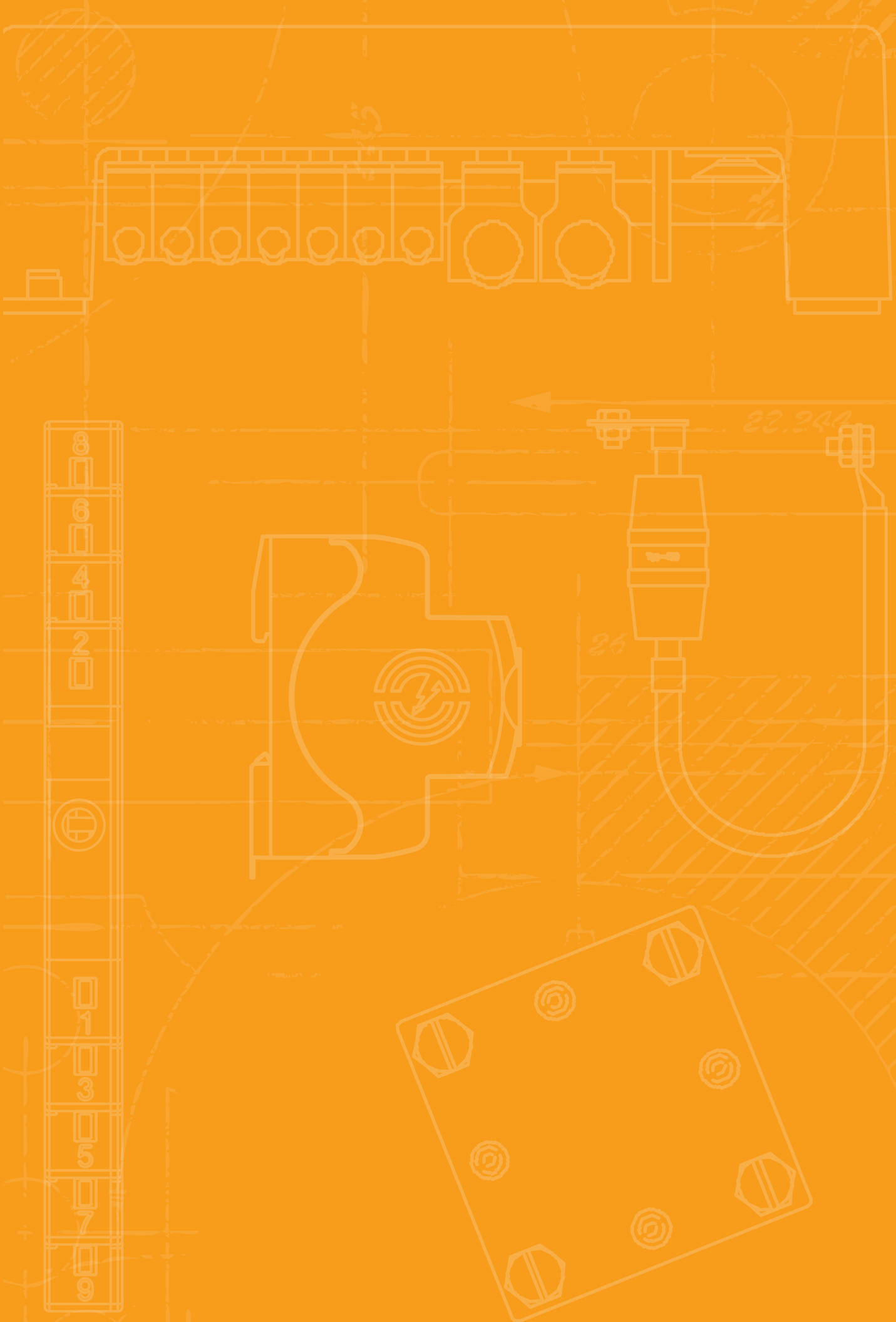
Zinc repairs






Type	Dimension		Pack Piece	Weight kg/100 pc.	Item no.
	Width mm	Length m			
ZSF	400ml		1	45.000	2362970

Zinc spray for treatment of unprotected surfaces and cutting edges. Can contents: 400 ml.



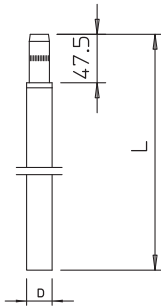


Earth rods

	Earth rods	54
	Accessories	56
	Profile rod earth connection	58

Pipe earth rod LE

St FT



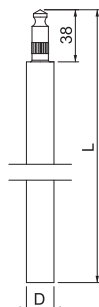
Type	Length mm	External		Pack Piece	Weight kg/100 pc.	Item no.
		Length mm	Ø mm			
LE ERDER FT	1500	25		5	235.000	5000300

- Expandable earth rod system for erecting earthing connections (type A)
- The pipe earth rod system LE is connected using the pre-mounted sleeve
- Complies with requirements according to DIN VDE 0185-305 (IEC 62305) and DIN EN 62561-2
- For use with antenna earthing systems, lightning earthing systems, etc.

Earth rod

Earth rod BP with copper sheath

St Cu

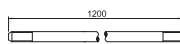


Type	Length mm	External Ø mm	Short-circuit current (50 Hz) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.

- "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/mm²
- Conforms to the requirements according to VDE 0185-305 (IEC 62305)

Earth rod BS with copper sheath

St Cu

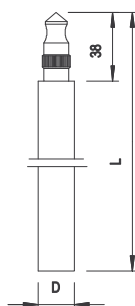


Type	Length mm	External		Pack Piece	Weight kg/100 pc.	Item no.
		Length mm	Ø mm			
219 16 CU	1200	14.2		5	192.000	5000481

- Made of steel with a copper jacket of min. 0.25 mm
- With thread for linking together
- Tensile strength min. 600 N/mm²
- Meets the requirements of VDE 0185-305 (IEC 62305)

Earth rod BP

VA



Type	Length mm	External 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.
219 20 BP V4A	1500	20	4.2	H1/150	5	365.000	5000866

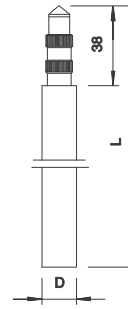
- "BP" system (Bundespost)
- Very good contacting properties with soft metal inlay in the bore hole
- With peg and bore for linking together
- Conforms to the requirements according to VDE 0185-305 (IEC 62305) and DIN EN 62561-2
- Short circuit current I_k (50 Hz), time 1 s, max. temp. 300 °C: 4.5 kA (219 20 BP V4A)

St FT

Earth rod for standard applications

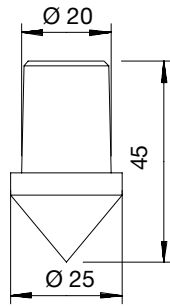
Type	Length mm	External Ø mm	Short-circuit current (50 HZ) (1 s; ≤300 °C) kA	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
219 20 ST FT	1500	20	7.9	H/100	5	360.000	5000750

- High corrosion resistance
- Zinc support 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) and DIN EN 62561-2
- Short-circuit current I_k (50 Hz), time 1 s, max. temp 300 °C: 7.9 kA (219 20 ST)



Driving spike for pipe earth rod LE

St FT

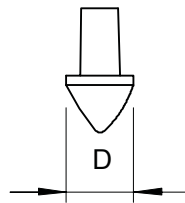
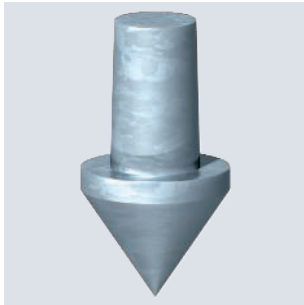


Type	For earth rods		Dim. D	Pack Piece	Weight kg/100 pc.	Item no.
	Ø mm	mm				
LE SPITZE	25	25		5	10.000	3041409

• Suitable for pipe earth rod system LE

Driving spike for ST and BP earth rod

TG FT



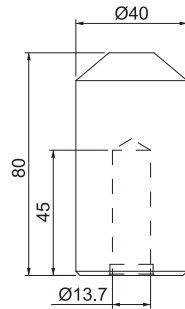
Type	For earth rods		Dim. D	Pack Piece	Weight kg/100 pc.	Item no.
	Ø mm	mm				
1819 20BP	20	20		5	3.768	3041212

• Suitable for ST and BP system

Driving heads

Driving head for ST, BP and OMEX earth rods

St

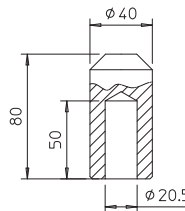


Type	Material	For earth rods		Pack Piece	Weight kg/100 pc.	Item no.
		Ø mm	mm			
1820 20	St	20		1	62.600	3042200

• Suitable for ST, BP and OMEX systems
• Hardened
• DIN 48852, Form SP

Driving head for LightEarth earth rod

St FT



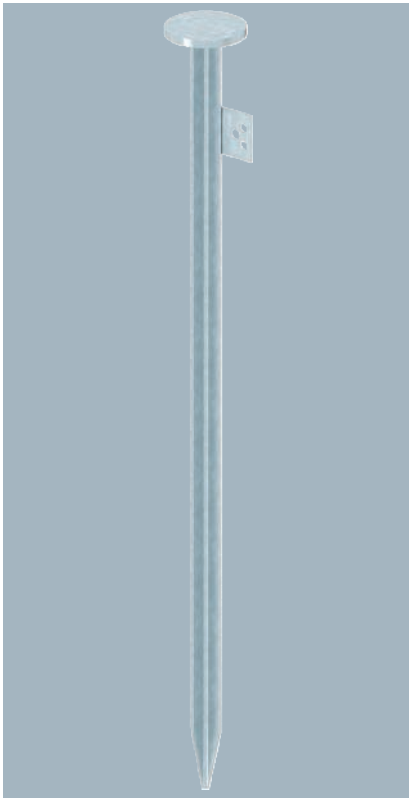
Type	Material	For earth rods		Pack Piece	Weight kg/100 pc.	Item no.
		Ø mm	mm			
LE KOPF	St	25		1	0.550	3042308

• Suitable for LightEarth system
• For driving earth rods using hand-held hammer
• Hardened



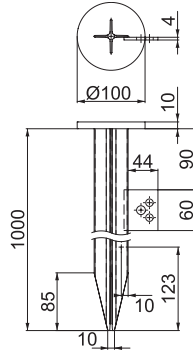
Profile earth rod with connection strap/hand protection

St FT



Type	Length mm	Pack Piece	Weight kg/100 pc.	Item no.
213 1000 DIN HS	1000	5	300.000	5003081

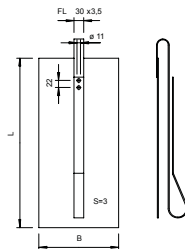
- Cross-profile 50 x 50 x 3 mm
- Hand protection Ø 100 mm
- With connecting strap
- 1 gland hole Ø 13 mm
- 2 gland holes Ø 11 mm
- Round conductor fastening, e.g. with type 5001 DIN-FT possible
- For the construction of earthing systems, e.g. antennas or earthing of building site distribution boards



Earth plates

St FT

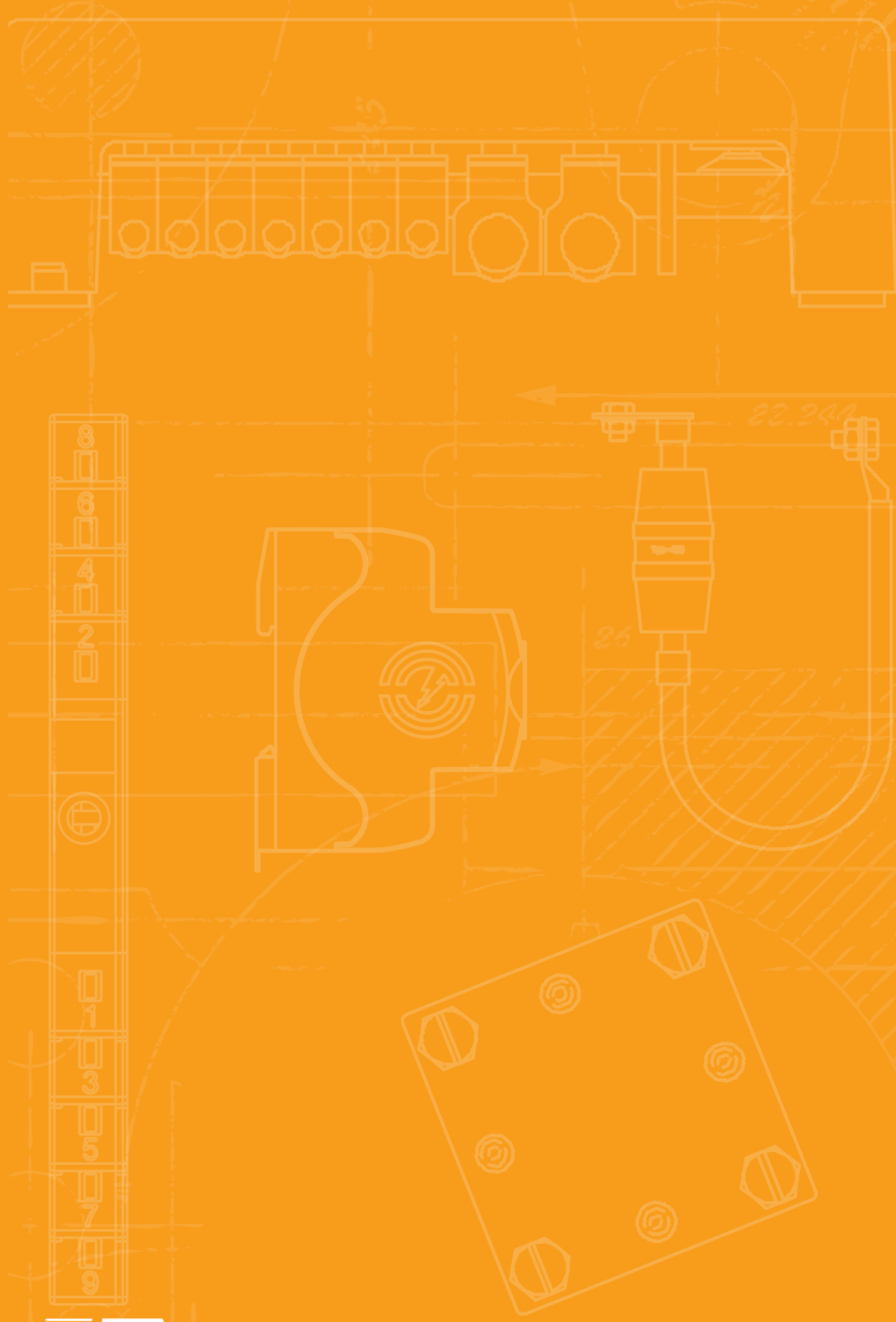
Earth plate



Type	Dimension B x L x S mm	Pack Piece	Weight kg/100 pc.	Item no.
1816 F-1000X1000	1000x1000x3	1	2,700.000	5009235

- With 3 m strip steel section FL30 x 3.5
- With 2 attaching holes Ø 11 mm





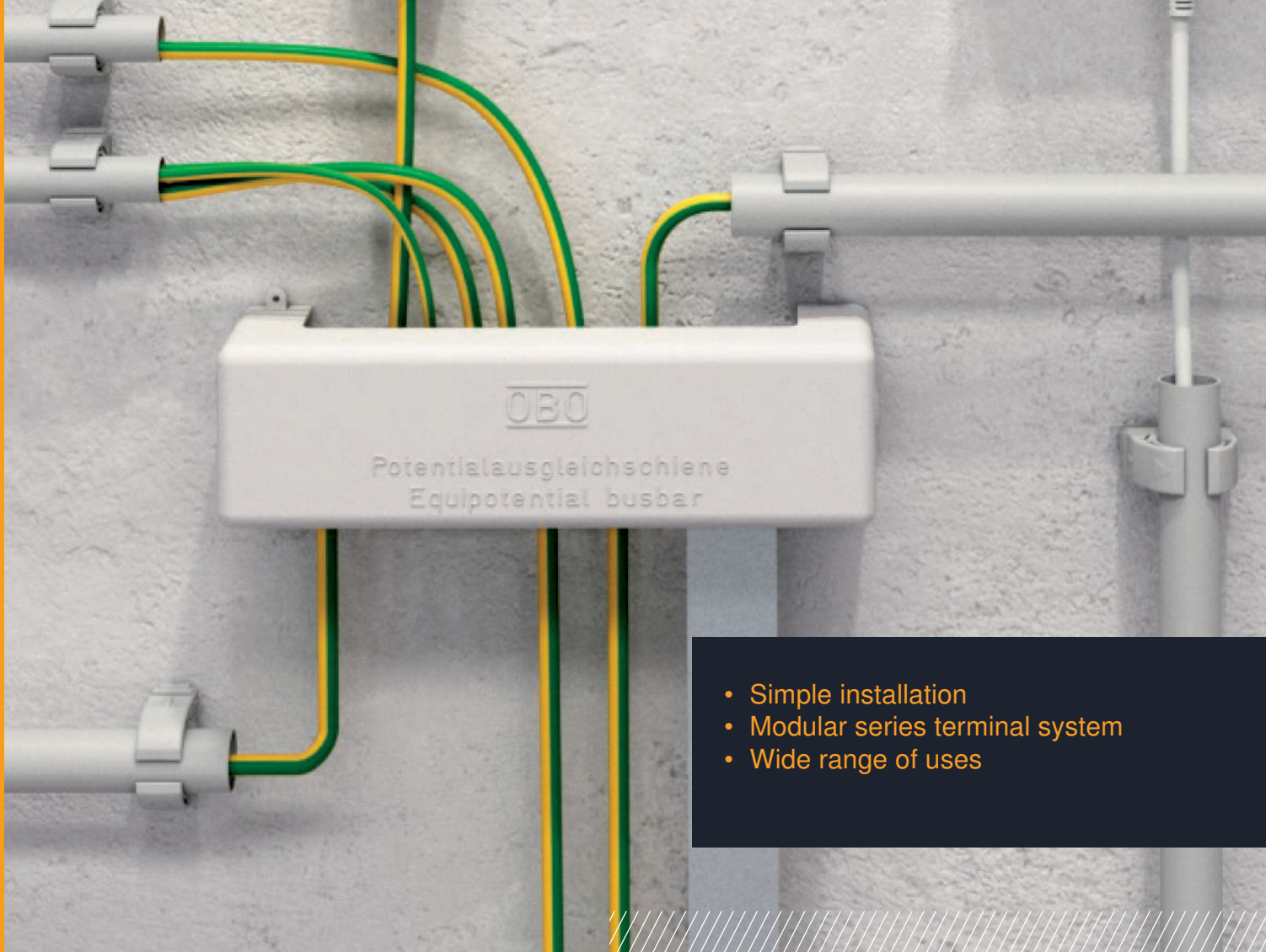
Equipotential busbars



Equipotential busbars

62

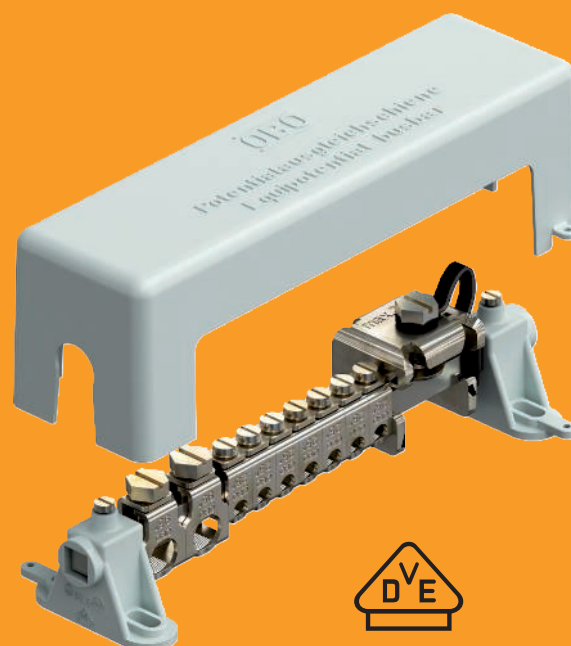




- Simple installation
- Modular series terminal system
- Wide range of uses

Equipotential busbars for indoor use

The equipotential busbars for interior areas are available as a modular, VDE-tested series terminal system 1801 or as a ready-for-installation equipotential busbar 1809 with plastic or metal footplate. The OBO Green 1809 is a solution made from renewable resources. The simple versions of the 1809 and 1804 are available as both surface-mounted and concealed versions. The equipotential busbars are used for the installation of protection and functional equipotential bonding according to DIN VDE 0100-410/540 and the lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305).



Equipotential busbar for indoors, VDE-tested

CuZn 37



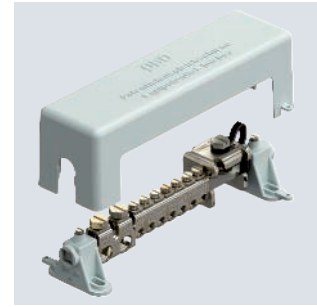
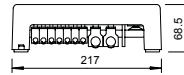
Type	Colour	Pack Piece	Weight kg/100 pc.	Item no.
1801 VDE	Grey	1	55.000	5015650

Equipotential busbar for equipotential bonding to DIN VDE 0100-410/-540 as well as lightning protection equipotential bonding to DIN VDE 0185-305

- 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 mm² or fine-wire cables to 16 mm² (max. Ø 7 mm)
- 2 single or multi-wire cable 25–95 mm² or fine-wire cables to 70 mm² (max. Ø 13.5 mm)
- 1 flat conductor 30 x 3.5 mm



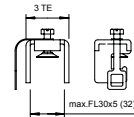
St G



Flat conductor terminal to FL 30 for 1801 VDE

Type	Connection option	Pack Piece	Weight kg/100 pc.	Item no.
1801 RK30	FL 30x5	1	10.643	5015731

- For flat conductors to FL 30 and thickness to 5 mm
- Captive design with plastic safety strap
- 3 division units
- Lightning current carrying capacity 100 kA (10/350)
- Electrogalvanised steel



CuZn 37



Equipotential busbar with plastic base plate

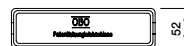
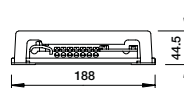
Type	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
1809	H/100	1	23.000	5015073

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 of 100 kA (10/350)

Connection options:

- 7x single or multi-core cables to 25 mm² or fine-core cables to 16 mm²
- 1 round conductor Rd 8–10
- 1 flat strip to FL30 or round conductor Rd 8–10



CuZn 37



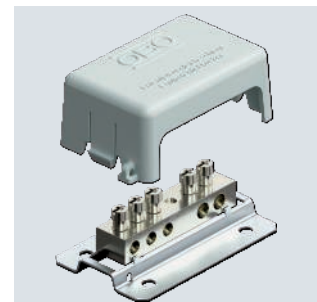
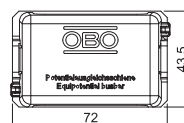
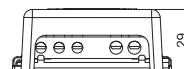
Equipotential busbar for small systems

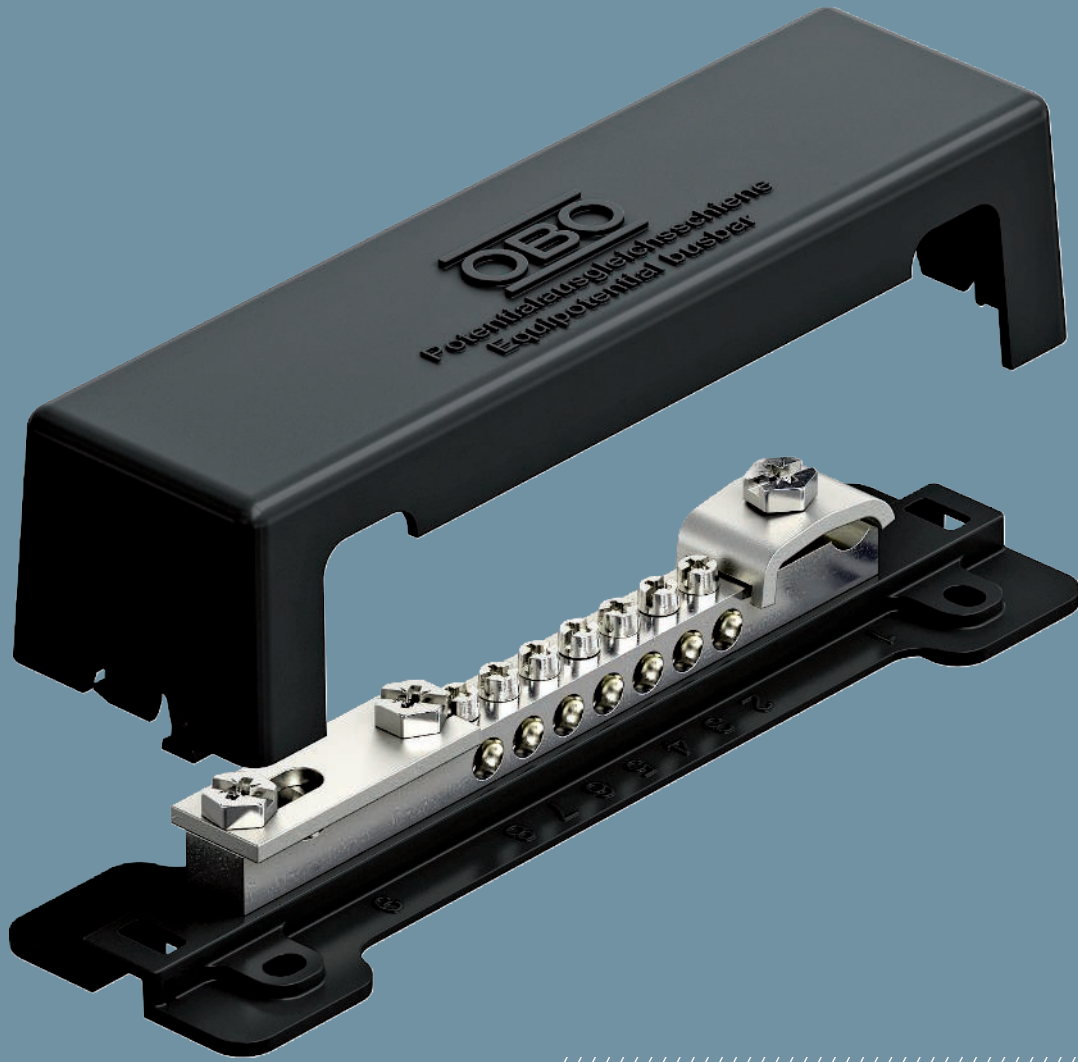
Type	Colour	Length mm	Width mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
1809 BG	Grey	72	43.5	29	1	9.000	5015502

- Cover made of polystyrene, grey
- Sealable/labellable
- 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 mm²
- 2 x multi-core cables to 16 mm²



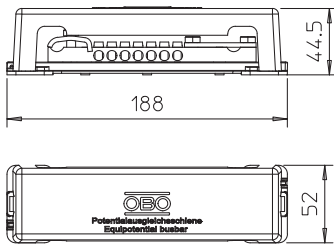


Equipotential busbars for outdoor areas

The equipotential busbar for outdoor areas, 1809 A, is used for installation of the protection and functional equipotential bonding according to DIN VDE 0100-410/540 (IEC 60364-4-41,-5-54) and the lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305). Thanks to corrosion-resistant and UV-stabilised materials, the equipotential busbar is suitable for both outdoor areas and systems in aggressive environments.

- UV-stabilised
- Corrosion-resistant
- Simple installation
- Sealable
- Labelling in the cover

A2



Equipotential busbar for outside installation



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)

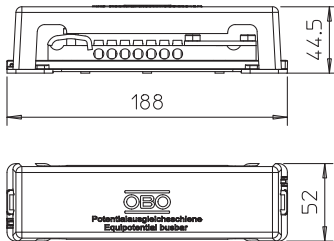
Connection options:

- 7 x single or multi-core cables to 25 mm² or fine-core cables to 16 mm²
- 1 x round conductor Rd 8-10
- 1 x flat strip to FL30 or round conductor Rd 8-10

Lightning current carrying capacity

Type	Colour	kA	Pack Piece	Weight kg/100 pc.	Item no.
1809 A	Black	N/50	1	24.210	5015111

A2



Equipotential busbar for outside installation, metal base plate



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)

Connection options:

- 7 single or multi-wire cables to 25 mm² or fine-wire cables to 16 mm²
- 1 round conductor Rd 8-10
- 1 flat strip to FL30 or round conductor Rd 8-10

Lightning current carrying capacity

Type	Colour	kA	Pack Piece	Weight kg/100 pc.	Item no.
1809 AM	Black	H/100	1	23.000	5015105

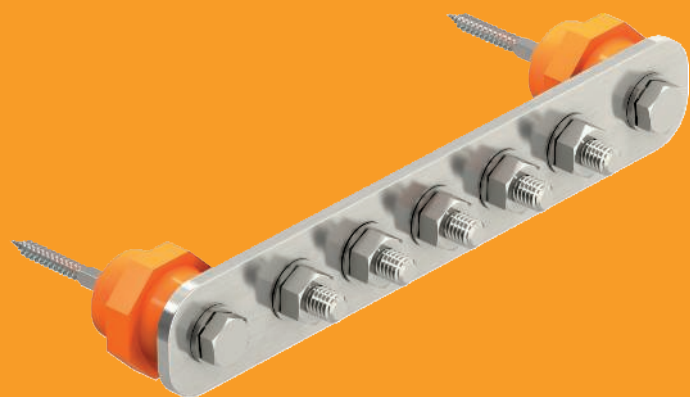




- Corrosion-resistant
- UV-stabilised
- Quick and easy mounting

Equipotential busbars for industrial use

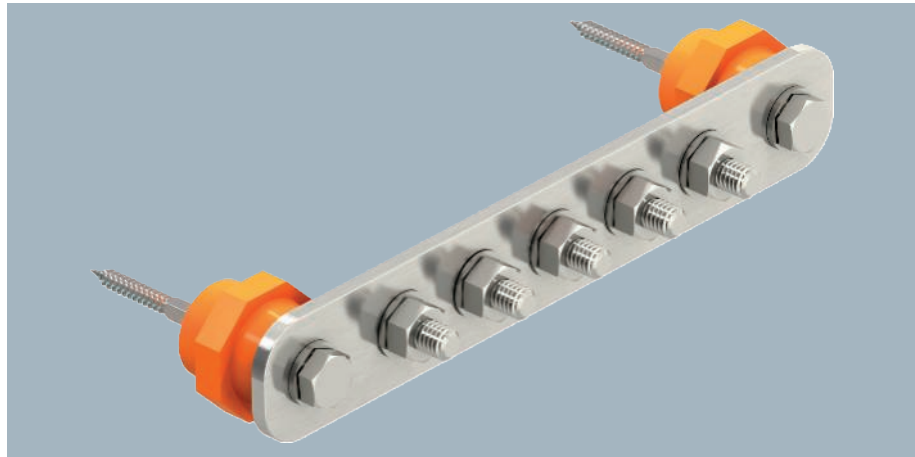
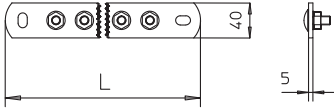
The equipotential busbars for industry, BigBar 1802 and 1805, are used for the installation of protection and functional equipotential bonding according to DIN VDE 0100-410/540 (IEC 60364-4-41,-5-54) and the lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305). Due to the combination of corrosion resistant materials and their simple installation, the equipotential busbars are especially suitable for use in the industrial sector. The stainless steel (V4A, 1.4571, 316 Ti) variants of the 1805 can be used in a wide range of applications thanks to the fastening holes with their 11 mm diameter.



A2



Equipotential busbar BigBar for industrial application



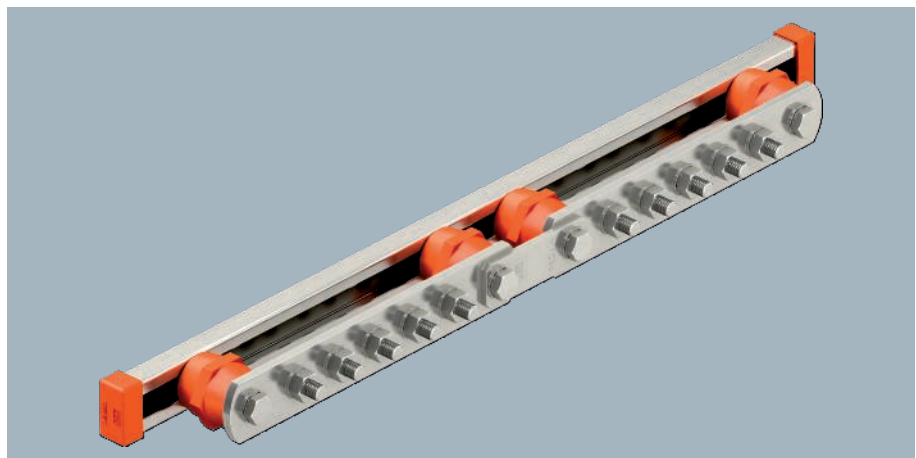
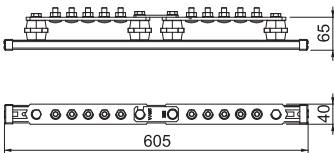
- Main potential equalisation to VDE 0100 Part 410 and Part 540, and also lightning protection potential equalisation to VDE 0185-305 (IEC 62305)
- Insulation feet
- Quick, simple assembly of connection conductors to the contact rail using lock bolts M10
- The high-grade stainless steel versions (V2A) 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)

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 10 VA	10	40	408.5	5	1	138.210	5015866

A2



Equipotential busbar for flexible wall mounting with separation point



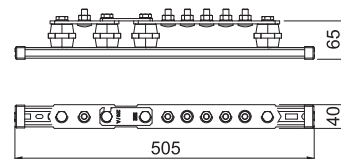
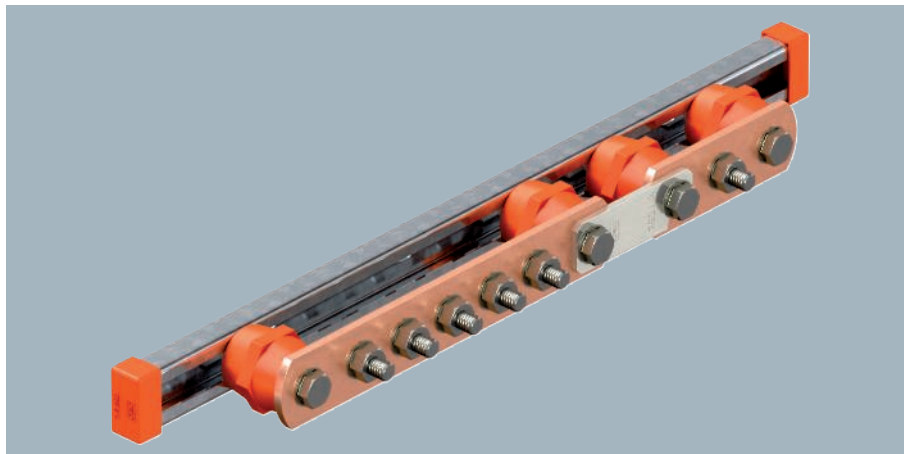
- Main potential equalisation to VDE 0100 Part 410 and Part 540, and also lightning protection potential equalisation to VDE 0185-305 (IEC 62305)
- Insulation feet
- Quick, simple assembly of connection conductors to the contact rail using lock bolts M10
- The high-grade stainless steel versions (V2A) 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)

Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
1802 DC 5+5 VA	10	40	605	85	1	237.000	5015876



Equipotential busbar for flexible wall mounting with separation point

Cu



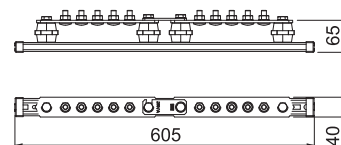
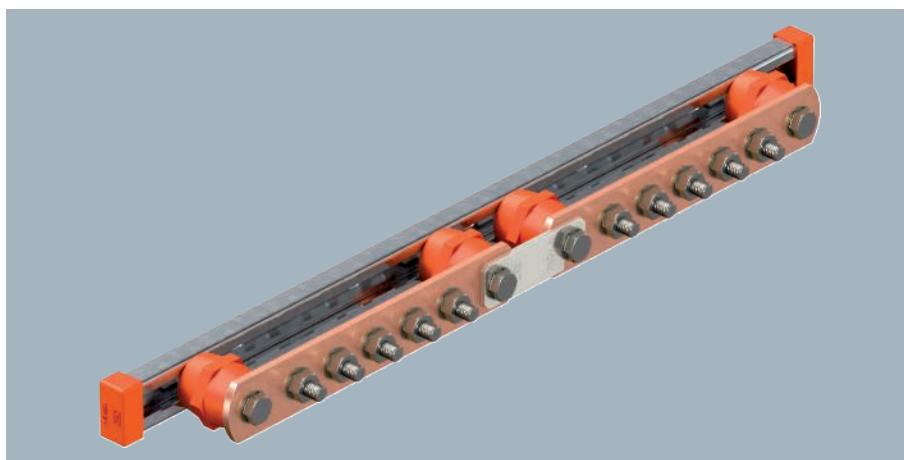
Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
1802 DC 5+1 CU	6	40	505	85	1	209.000	5015870

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)

Equipotential busbar for flexible wall mounting with separation point

Cu



Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
1802 DC 5+5 CU	10	40	605	85	1	251.000	5015874

Main equipotential busbar to VDE 0100 Part 410 and Part 540, and also lightning protection equipotential bonding to VDE 0185-305 (IEC 62305)

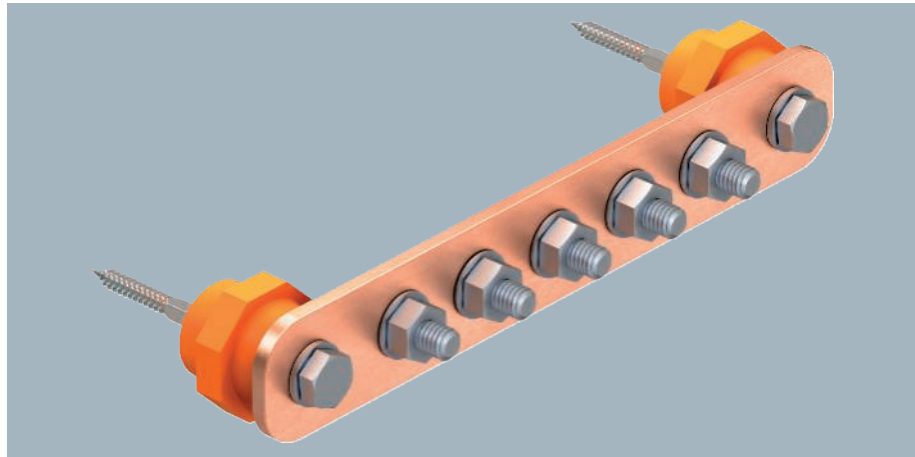
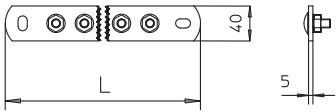
- Insulation feet
- Quick, simple mounting of connection cables using lock bolts M10
- Complete with anchors and bolts for wall mounting
- With lock washer (DIN 137) for bolt locking against loosening (e.g. required in industry and explosion-protected areas)



Cu



Equipotential busbar BigBar for industrial applications



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)

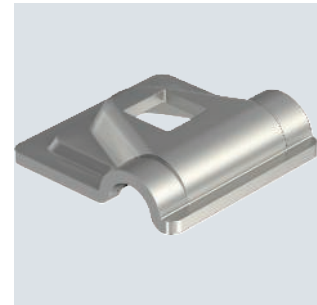
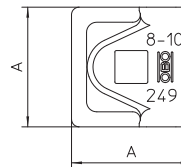
Type	Number of connections	Width mm	Length mm	Height mm	Pack Piece	Weight kg/100 pc.	Item no.
1802 5 CU	5	40	246	5	1	80.000	5015830
1802 6 CU	6	40	278.5	5	1	98.400	5015832
1802 8 CU	8	40	343.5	5	1	116.550	5015836
1802 10 CU	10	40	408.5	5	1	180.000	5015842
1802 12 CU	12	40	473.5	5	1	152.850	5015844
1802 14 CU	14	40	538.5	5	1	171.000	5015847
1802 20 CU	20	40	733.5	5	1	225.450	5015849

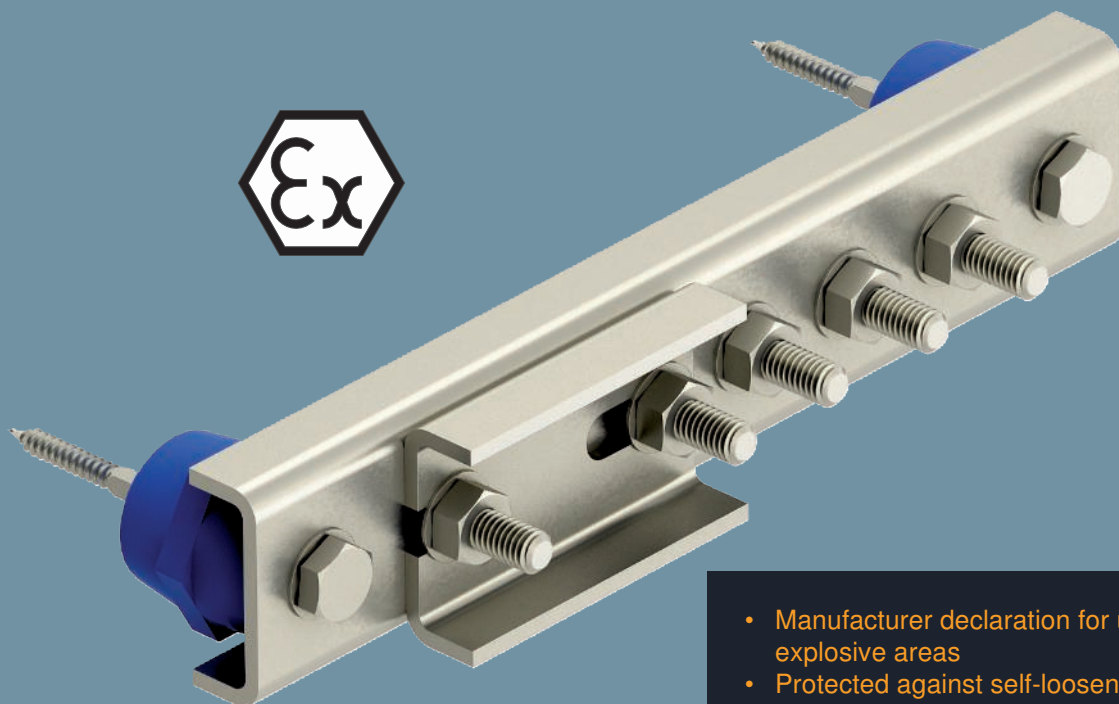
A2

Quick connector, upper part Rd 8–10 mm

Type	Fit mm	Dim. A mm	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 VA-OT	Rd 8-10	40	100	3.130	5311554

- For round conductor Rd 8-10
- Suitable for M10 bolts





- Manufacturer declaration for use in potentially explosive areas
- Protected against self-loosening
- UV-stabilised and halogen-free insulation feet
- For single, multi and fine-wire connection cables and flat conductors
- Suitable for FT, VA, CU and AL material
- Corrosion-resistant

Equipotential busbars for Ex areas

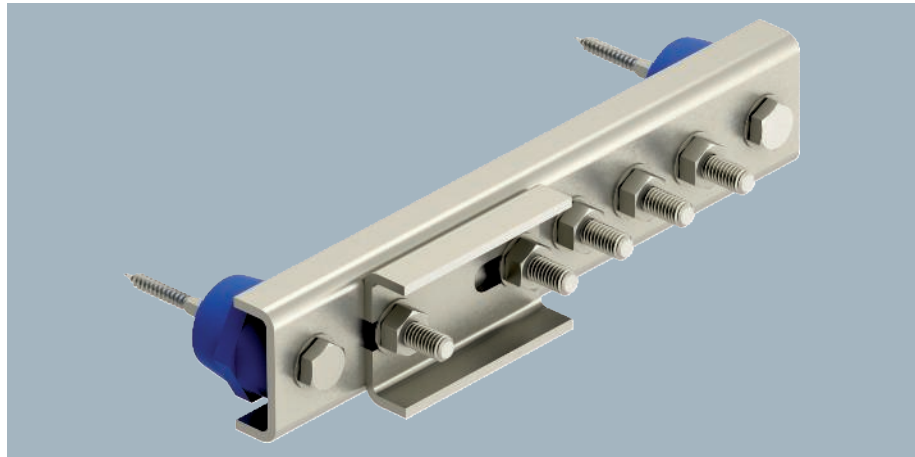
The lightning protection components for equipotential bonding in Ex areas can be used as part of the erection according to VDE 0165 Part 1 (IEC 60079-14) and VDE 0185-305-3 (IEC 62305-3). They are secured against self-loosening in accordance with VDE 0185-305-3 Supplementary sheet 2 (DIN EN 62305-3 Supplementary sheet 2). The equipotential busbars are used for lightning protection equipotential bonding according to VDE 0185-305-3 (IEC 62305-3) and protective/functional equipotential bonding according to DIN VDE 0100 Part 410/540 (IEC 60364-4-41,-5-54). The Vario quick connectors and the connectors with pressure

trough are connected with lightning current carrying capacity according to VDE 0185-305-3 (IEC 62305-3) and VDE 0185-561-1 (IEC 62561-1). The components are suitable for use in potentially explosive areas of Zone 2 (gases, vapours, mist) as well as Zone 22 (dusts). They do not possess their own potential source of ignition and thus cannot be evaluated according to the European Directive 2014/34/EU. This means that an approval according to the European Directive 2014/34/EU is not legally possible and also not required in the context of explosion protection.

A2



Equipotential busbar for EX zone 1/21, 2/22



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

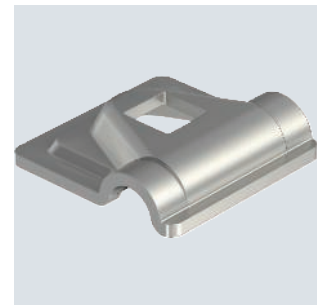
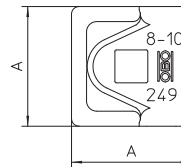
Type	Number of connections	Length mm	Lightning current carrying capacity kA	Pack Piece	Weight kg/100 pc.	Item no.
EX PAS 5	5	279	H/100	1	152.000	5015265
EX PAS 10	10	441	H/100	1	214.000	5015270

A2

Quick connector, upper part Rd 8–10 mm

Type	Fit mm	Dim. A mm	Pack Piece	Weight kg/100 pc.	Item no.
249 8-10 VA-OT	Rd 8-10	40	100	3.130	5311554

- For round conductor Rd 8-10
- Suitable for M10 bolts





Earthing clamps and earthing terminals



Earthing clamps

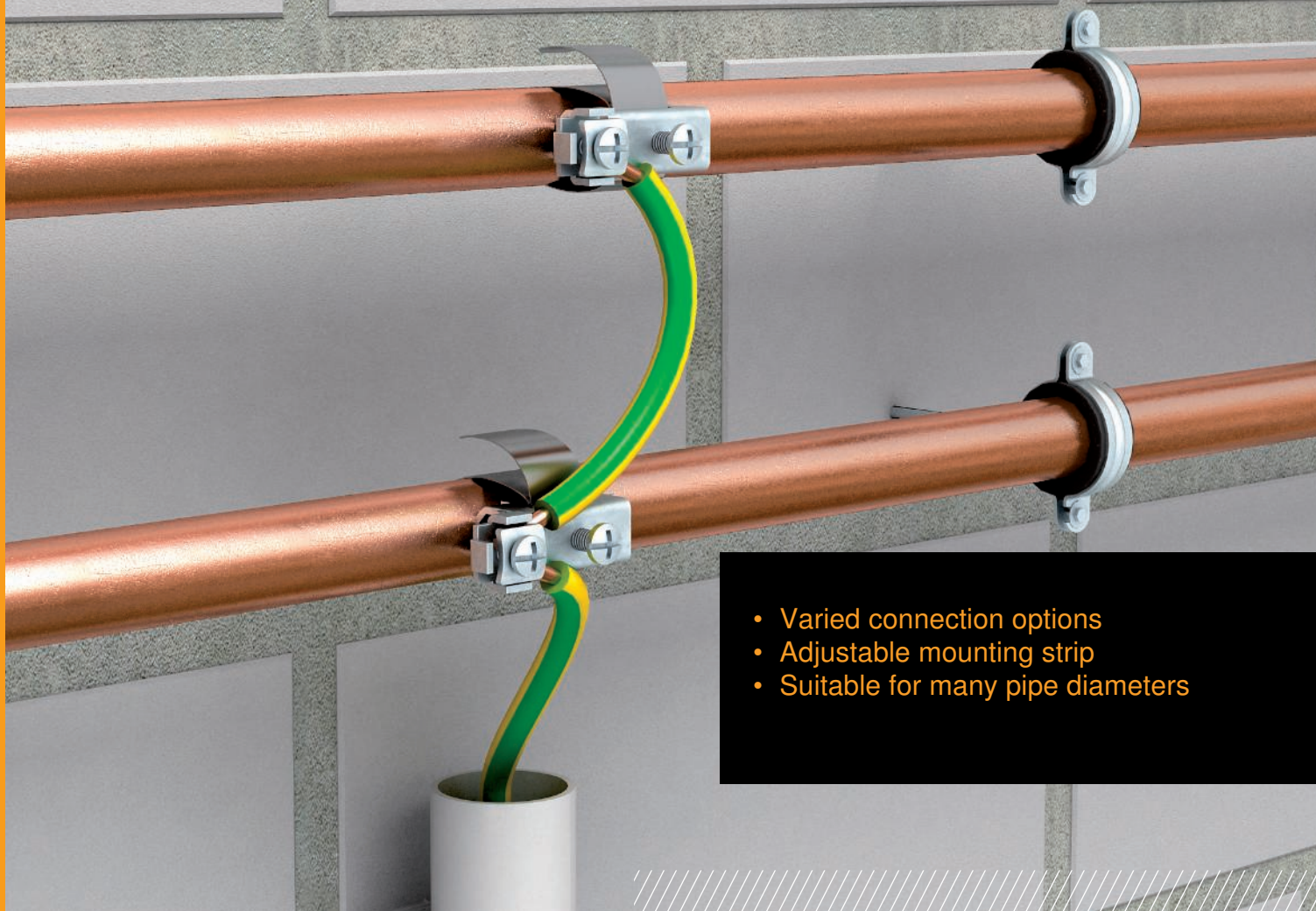
74



Earthing terminals

78

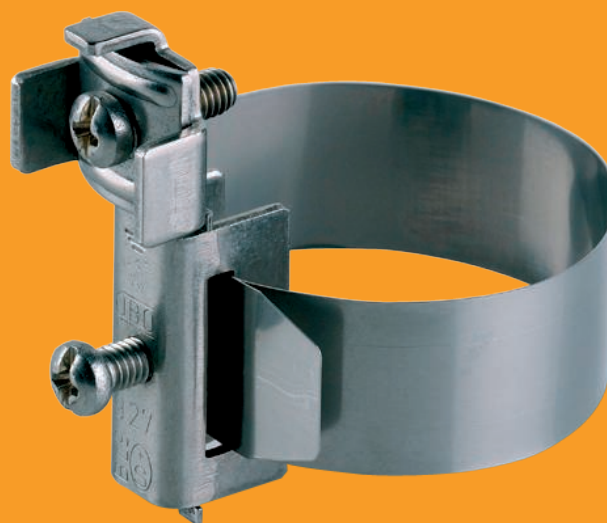




- Varied connection options
- Adjustable mounting strip
- Suitable for many pipe diameters

Earthing pipe clamps

Each system has different environmental and normative requirements relating to equipotential bonding. To implement equipotential bonding correctly, it is therefore necessary to select the right components to use. Equipotential busbars and earthing pipe clamps are key components of this kind of installation. In the context of lightning protection equipotential bonding, these must fulfil the requirements and undergo tests as defined in VDE 0185-561-1 (IEC 62561-1). When connecting metallic pipes to the equipotential bonding, earthing pipe clamps such as OBO type 927 are generally used. These offer a wide range of advantages over pipe clamps during assembly. With their rustproof stainless steel tightening strap, they are suitable for a wide range of pipe diameters and materials.



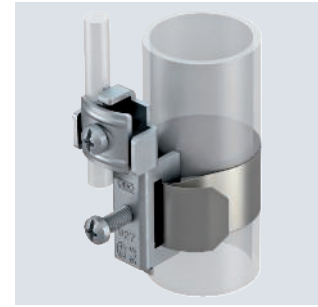
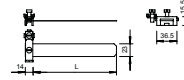
A2



Earthing pipe clamp VA

Type	For pipe Ø inch	Dim. L mm	For pipe Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
927 1	3/8-11/2	200	172-48	10	7.780	5057515
927 2	3/8-4	395	172-114	10	8.550	5057523
927 4	3/8-6	555	172-165	10	8.022	5057558

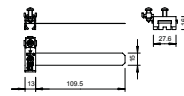
- For pipes of Ø 3/8 - 6"
- Connection options: Max. 2 cables 2.5-25 mm²
- Round conductor Rd 8
- Clamp element, bolts and tightening strap made of rustproof stainless steel (VA)



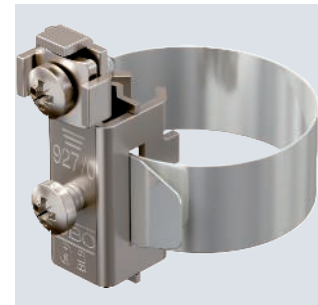
CuZn 37 N

Type	Dim. L mm	For pipe Ø mm	Pack Piece	Weight kg/100 pc.	Item no.
927 0	109.5	8-22	10	5.000	5057507

- For pipe Ø 8-22 mm
- Connection options: max. 2 conductors 2.5-10 mm²
- Clamp elements and screws from nickel-plated brass
- Tightening strap from high-grade stainless steel (V2A)



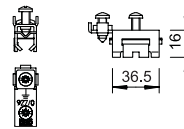
Earthing pipe clamp, nickel-plated



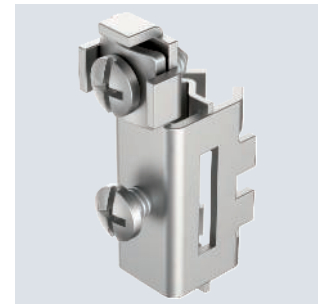
A2

Type	Pack Piece	Weight kg/100 pc.	Item no.
927 SCH-K-VA	20	4.700	5057930

- Connection option: max. 2 conductors 2.5-25 mm²
- Possible to connect round conductor Rd 8

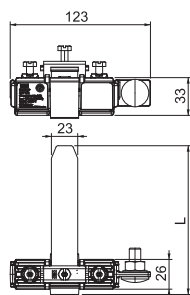


Clamp lock for earthing pipe clamp





Earthing pipe clamp for EX Zone 1/21, 2/22



Type	For pipe Ø mm	Dim. 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

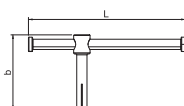
For ignition spark-free protection/functional equipotential bonding according to DIN VDE 0100-410/-540 and ignition spark-free lightning protection equipotential bonding according to VDE 0185-305 (IEC 62305) in systems according to VDE 0165-1 (IEC/EN 60079-14).

- 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

Tool

Pre-tensioning tool

A2



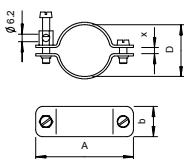
Type	Dim. L mm	Dim. b mm	Pack Piece	Weight kg/100 pc.	Item no.
927 BES VSW 25	153	73	1	14.700	5057690

To tension earthing pipes and earthing pipe clamps.

Earthing clamps

Earthing clamp, type 942

Cu N



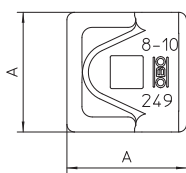
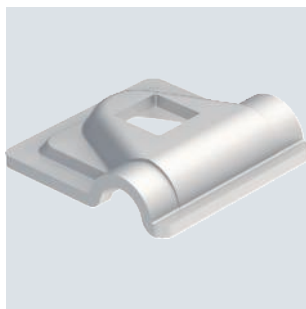
Type	Dim. A mm	Clamping range D mm	Dim. X mm	For pipe Ø inch	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.
942 18	52	16-18	2	3/8	200	10	5.170	5038057
942 22	55	19-22	3	1/2	180	10	5.550	5038073

- For pipes 1/8–1 1/2" or Ø 8–49 mm
- Connection options: Cables up to 25 mm²
- With connection clip and cylinder bolt M6 x 16 made of brass, nickel-plated
- Clamp cover and base made of copper, nickel-plated



Quick connector, upper part Rd 8–10 mm

Alu

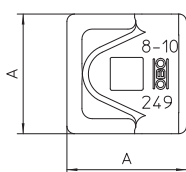
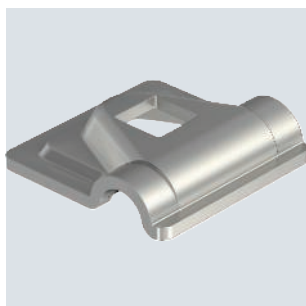


Type	Fit mm	Dim.		Pack Piece	Weight kg/100 pc.	Item no.
		A mm				
249 8-10 ALU-OT	Rd 8-10	44		100	2.100	5311585

- For round conductor fastening Rd 8-10
- Suitable for M10 bolts

Quick connector, upper part Rd 8–10 mm

A2

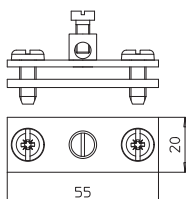
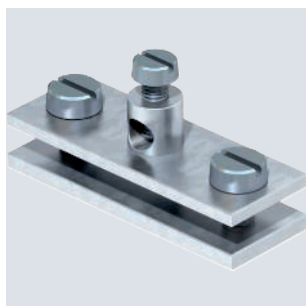


Type	Fit mm	Dim.		Pack Piece	Weight kg/100 pc.	Item no.
		A mm				
249 8-10 VA-OT	Rd 8-10	40		100	3.130	5311554

- For round conductor Rd 8-10
- Suitable for M10 bolts

Earthing terminal for cables and flat conductors

St G

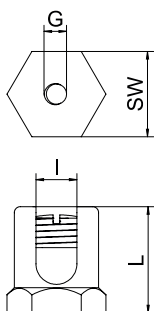
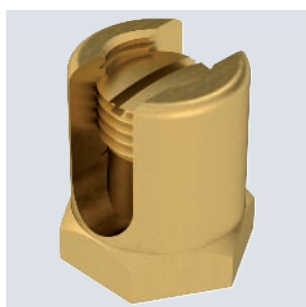


Type	Shipping box Piece	Pack Piece	Weight kg/100 pc.	Item no.

- For cables to 16 mm² and flat conductors
- Fit: cable to 16 mm² x max. FL 30
- With riveted brass connection terminal and one cylinder bolt, M5 x 12, with two cylinder bolts, M6 x 16

Earthing terminal with fastening thread

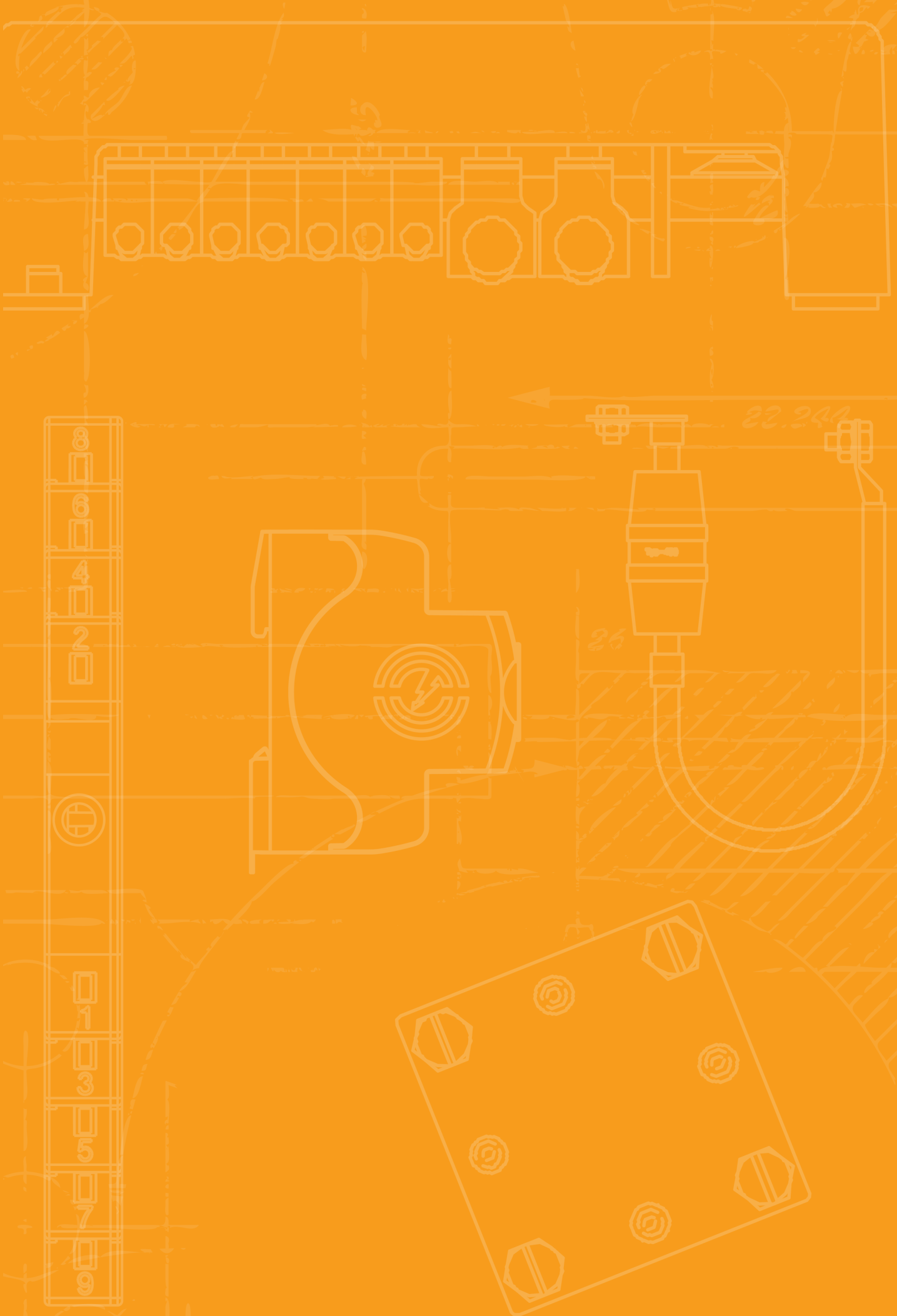
CuZn
37
CEUK
CA



Type	Dim.		Cross- section mm ²	Thread metric	Pack Piece	Weight kg/100 pc.	Item no.
	L mm	l mm					
EKL 25 M6	22	8	50	6	50	3.100	6404006

- Earthing terminal for fastening the equipotential bonding wire to the cable support system.
- Suitable for conductor cross sections of 4–50 mm².





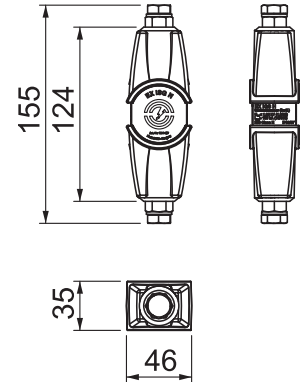
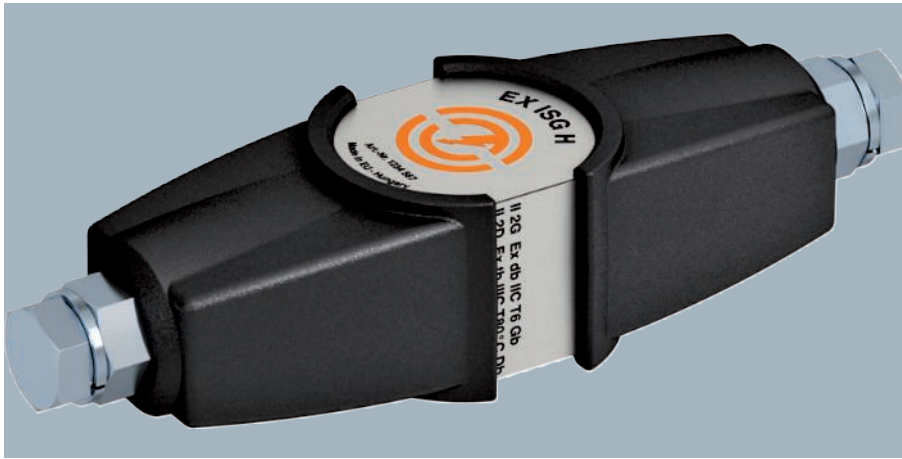
Protection and spark gaps



Protection and spark gaps

82

EX ISG H spark gap, with 2 cables

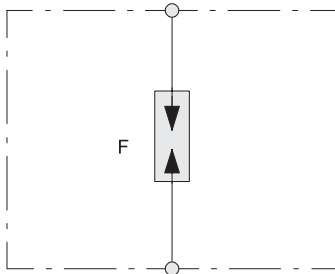


Type	Pack Piece	Weight kg/100 pc.	Item no.
EX ISG H 350 2L	1	74.155	5240033

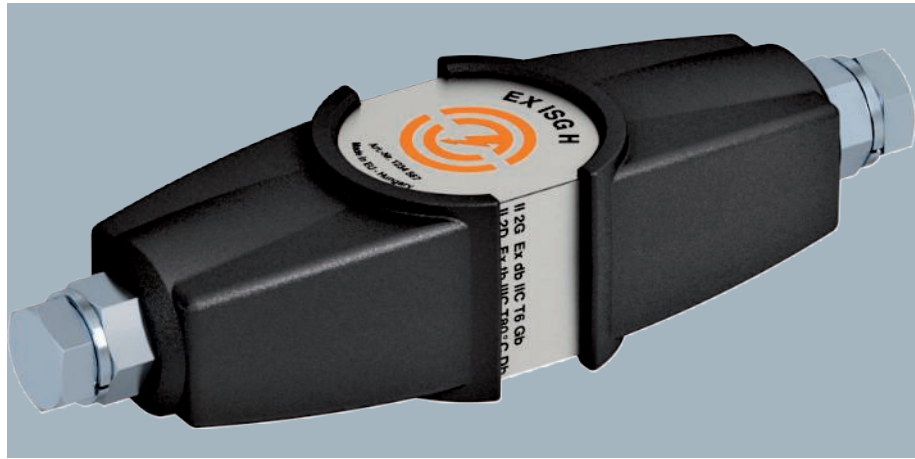
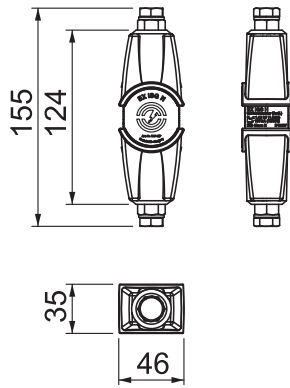
- Spark gap to VDE 0185-561-3 (IEC 62561-3)
- Ex certificate to ATEX
- Labelling to EN 60079-0/-1: II 2 G Ex db IIC T6 Gb
- Labelling to EN 60079-0/-31: II 2 D Ex td IIIC T80 °C Db IP67
- Ex certificate to IECEx
- Labelling to IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to IEC 60079-0/-31: Ex td IIIC 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 tb IIIC T80 °C Db IP67

Application: In potentially explosive areas zones 1/21 and 2/22, indirect bridging of insulating flanges and insulating glands, e.g. in cathodic, corrosion-protected (KKS) systems.

Connection options



EX ISG H spark gap, jacketed

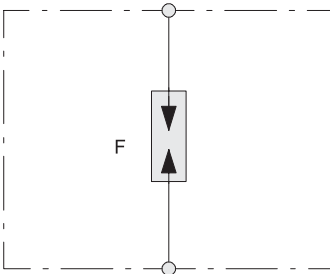


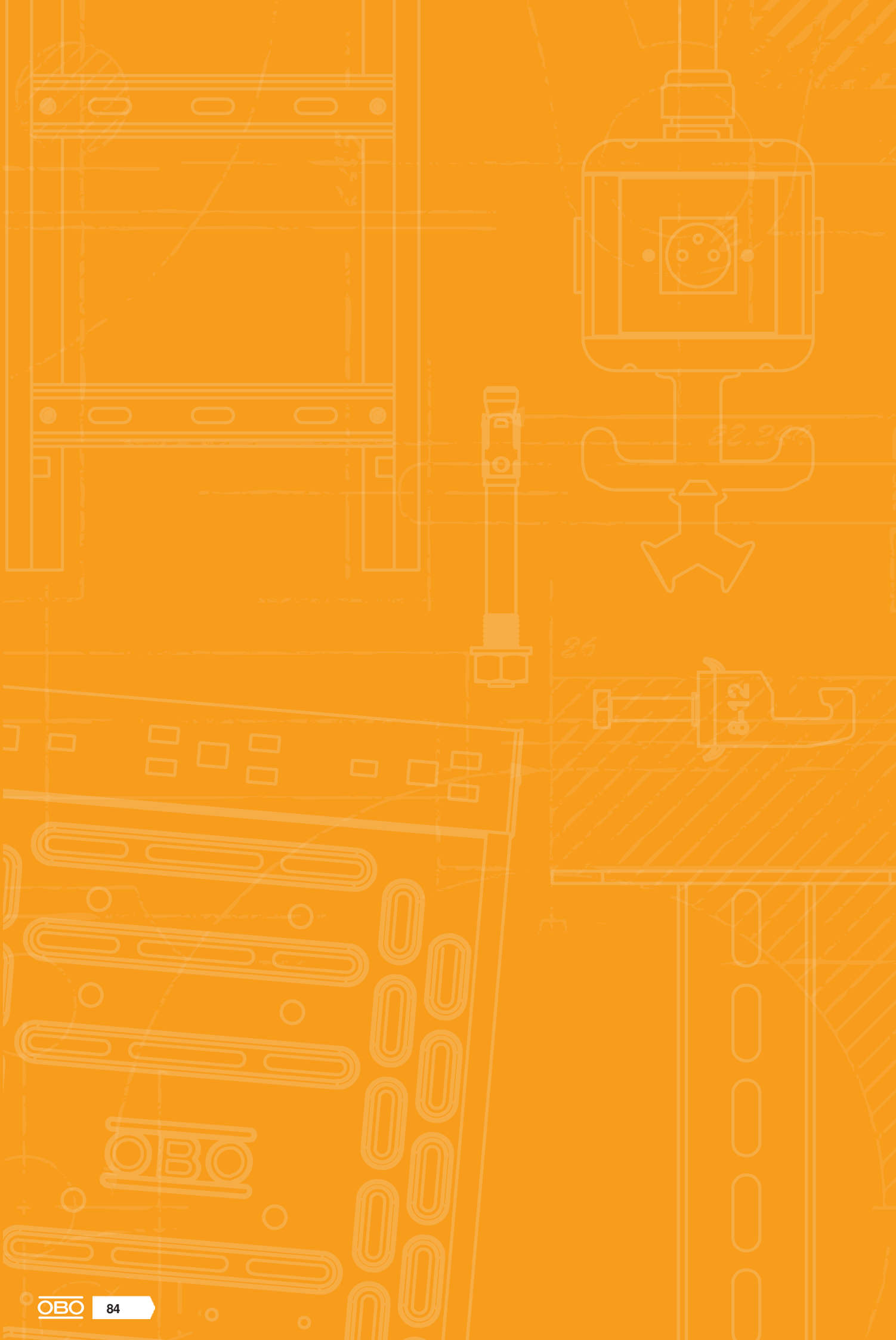
- Spark gap to VDE 0185-561-3 (IEC 62561-3)
- Ex certificate to ATEX
- Labelling to EN 60079-0/-1: II 2 G Ex db IIC T6 Gb
- Labelling to EN 60079-0/-31: II 2 D Ex td IIIC T80 °C Db IP67
- Ex certificate to IECEx
- Labelling to IEC 60079-0/-1: Ex db IIC T6 Gb
- Labelling to IEC 60079-0/-31: Ex td IIIC 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 tb IIIC T80 °C Db IP67

Application: In potentially explosive areas zones 1/21 and 2/22, indirect bridging of insulating flanges and insulating glands, e.g. in cathodic, corrosion-protected (KKS) systems.







Type	Pack Piece	Weight kg/100 pc.	Item no.
EX ISG H KU	1	210.300	5240032

Connection options




































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	For the latest general conditions of sale and delivery please see www.obo.global/general-purchasing-conditions/	


























Test marks

	American Bureau of Shipping, USA		Underwriters Laboratories Inc., USA + CSA, Canada
	AENOR, Producto Certificado, Spain		Österreichischer Verband für Elektrotechnik, Austria
	STOWARZYSZENIE ELEKTRYKÓW POLSKICH, Poland		ISTITUTO ITALIANO DEL MARCHO DI QUALITÀ, Italy
	Lightning current-tested		RINA 1861, Ship Classification, Certification and Services
	Lightning current-tested, Class H (100 kA)		Underwriters Laboratories Inc., USA
	CEBEC, Belgium		SEMKO An Inchcape Testing Services Company, Sweden
	Canadian Standards Association, Canada		Eidgenössisches Starkstrominspektorat, Switzerland
	DEMKO, Danmarks Elektriske Materielkontrol, Denmark		South African Bureau of Standards
	Deutsches Institut für Bautechnik Berlin, Germany		Shock-tested, Bundesamt für Zivilschutz, Germany
	Det Norske Veritas		Sähkötarkastuskeskus Elinspektionscentralen Electrical Inspectorate, Finland
	ENEC Austria		Underwriters Laboratories Inc., USA
	ATEX certificate for explosive areas		Underwriters Laboratories Inc., USA
	ELEKTROTECHNICKÝ ZKUŠEBNÍ ÚSTAV, Czech Republic		Verband der Elektrotechnik, Elektronik, Informationstechnik e.V., Germany
	FIMKO, Finland		German Association of Electricians, tested safety
	Forschungs- und Materialprüfungsanstalt, Germany		5-year warranty
	Russia, GOST The State Committee for Standards		
	Test marks for technical resources, VDE Prüf- und Zertifizierungsinstitut Offenbach, Germany		
	Halogen-free; without chlorine, fluorine and bromine		
	INMETRO, Brazil		
	KEMA-KEUR, Netherlands		
	Indication of metric products		
	MAGYAR ELEKTROTECHNIKAI ELLENŐRZŐ INTÉZET Budapest, Hungary		
	NEMKO, Norway		
	AFNOR Quality symbol of the French standardisation institute		





Pictogram explanation






Surfaces

 FS	Strip galvanised
 FSK	Strip galvanised/plastic-coated
 DD	Strip galvanised zinc/aluminium, double dip
 BK	Bright
 2B	Bright, reworked
 EL	Anodised
 F	Hot-dip galvanised
 G	Electrogalvanised
 GK	Electrogalvanised/plastic-coated
 GCL	Electrogalvanised, yellow-chromatised
 GGP	Electrogalvanised, yellow passivated
 GTP	Electrogalvanised, transparently passivated
 GR	Primed
 L	Painted
 SG	Welding primed
 FT	Hot-dip galvanised
 FT SO	Hot-dip galvanised 85 µm
 Cu	Copper-plated
 N	Nickel-plated
 ZD	Galvanised, Deltatone 500
 ZDM	Galvanised, MAGNI 565
 GA	Zinc-aluminium coated, Galfan
 ZL	Zinc scale






Conformity symbol

	Communautés Européennes, EC declaration of conformity according to EC directives
	RoHS-conformant



















Quality marks

	Halogen-free; without chlorine, fluorine and bromine
	Flame resistant 650 °C
	Flame resistant 750 °C
	Flame resistant 960 °C
	UV-resistant




Specific product symbols

	Diameter 60 mm
	Diameter 68 mm
	Protection device to DIN EN 61643-11 or IEC 61643-11
	Transition from LPZ 2 to LPZ 3
	Acoustic signalling

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 potentially explosive areas
	Channel Performance to ISO/IEC 11801
	Power over Ethernet
	230/400 V system
	Protection rating IP 54
	Protection rating IP 65

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








Lightning protection classes

	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



BSS maintenance of electrical function installation

	Fire-tested systems
	Escape route ceiling mounting with pressure clip
	OBO Grip, wall routing type
	OBO Grip, ceiling routing type
	Pressure clip for maintenance of electrical function, ceiling mounting




BSS anchor

	Fire protection anchor
	Fire protection bolt tie

BSS test marks/material class

	Maintenance of electrical function class E30
	Maintenance of electrical function class E90














Clamp clip base shapes

	Clamp clip for C profile rail, slot width 11–12 mm
	Clamp clip for C profile rail, slot width 16–17 mm
	Clamp clip for C profile rail, slot width 18–22 mm



Diameter

	Diameter 60 mm
	Diameter 68 mm
	Diameter 70 mm
	Diameter 74 mm





Entries

	4 cable entries
	6 cable entries
	7 cable entries
	8 cable entries
	9 cable entries
	10 cable entries
	12 cable entries
	10 cable entries ECO
	12 cable entries ECO
	14 cable entries ECO
	16 cable entries
	18 cable entries ECO
	24 cable entries






Gland thread

	Thread metric
	Thread Pg





Entry size

	M20 entry
	M25 entry
	M32 entry
	M40 entry

KTS side heights










	Cable tray, side height 35 mm
	Cable tray, side height 60 mm
	Cable tray, side height 85 mm
	Mesh cable tray, side height 35 mm
	Mesh cable tray, side height 55 mm

Materials




	Flat steel
	Angular steel
	U steel
	Round material

Pictogram explanation

Nominal cross-section

	Nominal cross-section 1.5 mm ²
	Nominal cross-section 1.5–2.5 mm ²
	Nominal cross-section 2.5 mm ²
	Nominal cross-section 2.5–4 mm ²
	Nominal cross-section 4 mm ²
	Nominal cross-section 4–6 mm ²
	Nominal cross-section 6 mm ²
	Nominal cross-section 10 mm ²
	Nominal cross-section 16 mm ²

Nominal voltage

	Nominal voltage 400 V
	Nominal voltage 500 V
	Nominal voltage 660 V





Polarity

	3-pole
	5-pole
	7-pole
	8-pole
	10-pole
	12-pole



Slot widths

	Slot width 7.5 mm
	Slot width 11 mm
	Slot width 11–12 mm
	Slot width 12 mm
	Slot width 15 mm
	Slot width 16 mm
	Slot width 16.5 mm
	Slot width 16–17 mm
	Slot width 17 mm
	Slot width 18 mm
	Slot width 22 mm
	Slot width 35 mm











Screw heads

	Philips screw
	Torx screw
	Phillips screw
	Pozidriv









Firing devices

	Bolt-firing tool
	Nail device





Protection rating

	Protection rating IP 20
	Protection rating IP 30
	Protection rating IP 31
	Protection rating IP 44
	Protection rating IP 54
	Protection rating IP 55
	Protection rating IP 65
	Protection rating IP 66
	Protection rating IP 67
	Protection rating IP 68

Metals

	Aluminium
	Aluminium/steel
	Stainless steel, rustproof
	Stainless steel, rustproof
	Stainless steel, rustproof
	Copper
	Brass
	Steel
	Malleable iron
	Die-cast zinc

Plastics

	Acrylonitrile butadiene styrene
	Duroplast, Aminoplast, type 131.5
	Duroplast, melamine resin, type 150
	Ethylene vinyl acetate

Plastics

FA	Fibre-proof material DIN 28091
GFK	Fibreglass-reinforced plastic
NBR SBR	Rubber mixture
NBR	Nitrile rubber
PETR	Petrolatum
PA	Polyamide
PA/ GF	Polyamide, fibreglass reinforced
PBPT	Polybutylene terephthalate
PC	Polycarbonate
PE	Polyethylene
PP	Polypropylene
PP/ GF	Polypropylene, fibreglass reinforced
PS	Polystyrene
PVC	Polyvinylchloride
ZELL PC	Cellular polyethylene



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	/pc.		5461296	5091438	30			
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5376996	5009235	58	6657940	5207375	33			
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