TBS | Catalogue 2012/2013

OBO BETTERMANN

Transient and lightning protection systems

THINK CONNECTED.

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Use the direct line to OBO Customer Service! We are available on our Service Hotline on +49 (0)2373 89-1500 from 7.30 a.m. to 5.00 p.m. for any questions to do with the OBO complete product range for electrical installations. The newly structured OBO Customer Service can offer you the full service:

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- All the information on the OBO product range
- Knowledgeable advice on special application topics
- Quick, direct access to all the technical data of the OBO products – we also want to provide the best in customer relations!

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OBO TBS seminars: First-hand knowledge

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

Invitations to tender, product information and datasheets

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
- Information sheets
- Datasheets

These documents are continually updated and can be downloaded at no charge at any time from the Internet download area at www.obo.de.

Invitations to tender on the Internet at www.ausschreiben.de

More than 10,000 entries from the KTS, BSS, TBS, LFS, EGS and UFS ranges can be called up free of charge. Regular updates and expansions 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.
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Contents of planning and mounting aids

Minor cause, major effect: Damage caused by surge voltages

Our dependency on electrical and electronic equipment continues to increase, in both our professional or 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 though all manner of conductive connections and cause enormous damage.

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What are the consequences of damage caused by surge voltages in our daily lives?

The most obvious one is the destruction of electrical equipment. In private households, these are specifically:

- TV/DVD players
- Telephone systems
- Computer systems, stereo systems
- Kitchen appliances
- Monitoring systems
- Fire alarm systems

The failure of such equipment certainly incurs great expense. What happens when the following suffer outage times / consequential damage:

- Computers (loss of data)
- Heating/water heating systems
- Lift, garage door and roller shutter drives
- Triggering or destruction of fire / burglar alarm systems (costs through a false alarm)?

A vital topic perhaps, particularly in office buildings, because:

- Can work continue in your company without a central computer / server?
- Was all the important data backed up in time?

Growing sums of damage

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

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Creation of lightning discharges

Creation of lightning discharges: 1 = approx. 6,000 m, approx. −30 °C, 2 = approx. 15,000 m, approx. −70 °C

Discharge types

Some 90% of all lightning discharges between a cloud and the ground are negative cloud-earth strikes. The lightning begins in a negatively charged area of the cloud and spreads to the positively charged surface of the earth. Additional discharges are divided into:

- Negative earth-cloud strikes
- Positive cloud-earth strikes
- Positive earth-cloud strikes.

The most common discharges actually occur within a cloud or between different clouds.

Creation of lightning discharges

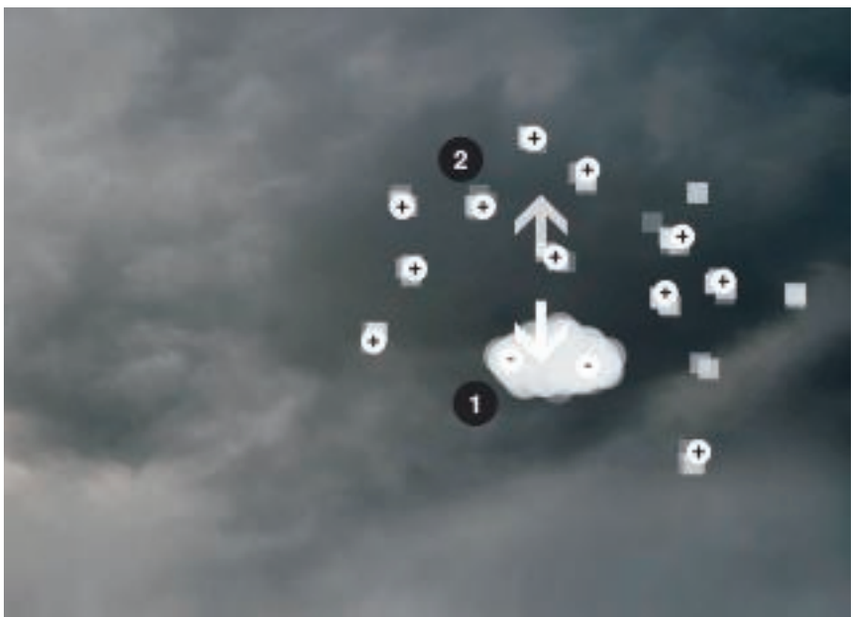
When warm, damp air masses rise, the air humidity condenses and ice crystals are formed at great heights. Storm fronts can occur when the clouds expand to heights of up to 15,000 m. The strong upwind of up to 100 kilometres per hour causes the light ice crystals to enter the higher area and the sleet particles enter the lower area. Knocks and friction cause electrical discharge.

Negative and positive charges

Studies have proved that the sleet falling down (area warmer than −15 °C) has a negative charge and the ice crystals being thrown upwards (area colder than −15 °C) has a positive charge. The light ice crystals are carried into the upper areas of the cloud by the upwind and the sleet falls to the central areas of the cloud. This divided the clouds into the three areas:

- Top: Positively charged zone
- Centre: Weakly negative charged zone
- Bottom: Weakly positive charged zone

This separation of charges forms a voltage in the cloud.



Negative and positive charges: 1 = Sleet, 2 = Ice crystals

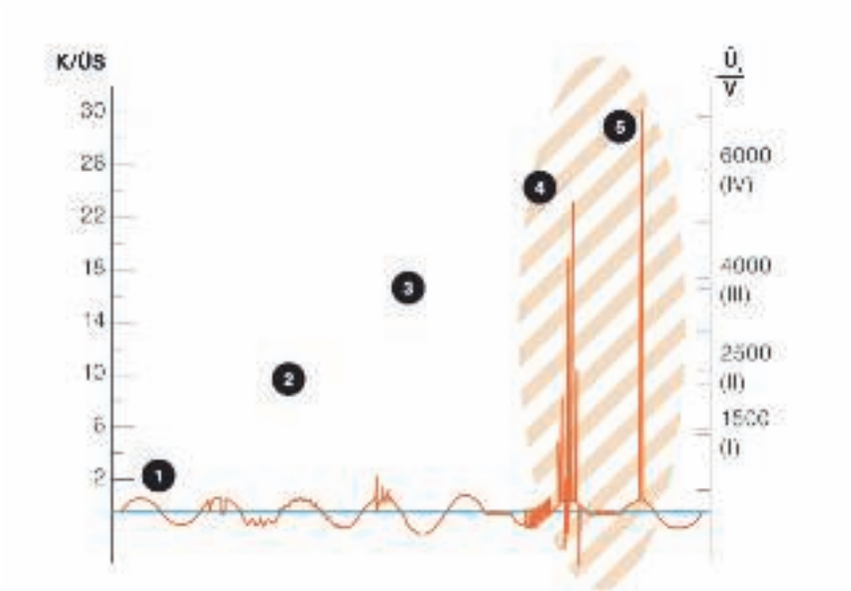
Load distribution

Typical load distribution:

- Positive at the top, negative in the centre and weakly positive at the bottom.
- Positive charges can also be found in the area near the ground.
- The field strength required to trigger lightning is dependent on the insulating ability of the air and is between 0.5 and 10 kV/cm.

Charge distribution: 1 = approx. 6,000 m, 2 = Electrical field

What are transient surges?



Transient surge voltages: 1 = Voltage drops/brief interruptions, 2 = Harmonic waves through slow and rapid voltage changes, 3 = Temporary voltage increases, 4 = Switching surges, 5 = Lightning surge voltages, hatched = application for surge protection devices

Transient surge voltages are brief voltage peaks lasting microseconds, which may be a multiple of the attached mains nominal voltage.

Direct strike

The largest voltage peaks in the low-voltage consumer network are caused by lightning discharges. The high energy content of lightning surges when a direct strike hits the external lightning protection system or a low-voltage open-wire line usually causes – without internal lightning and surge protection – total outage of the connected consumers and damage to the insulation.

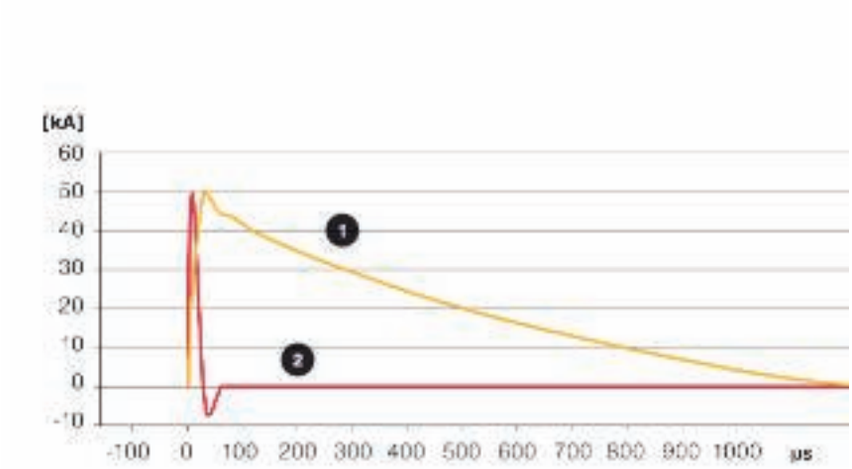
Induced voltage peaks and switching surge voltages

Yet induced voltage peaks in building installations and energy or data line supply cables can also reach many times the nominal operating voltage. Switching surges too, which in fact do not cause such high voltage peaks as lightning discharges but occur much more frequently, can result in immediate system failure. As a rule, switching surges amount to twice to three times the operating voltage, lightning surges on the other hand can sometimes reach 20 times the nominal voltage value and transport a high energy content.

Delayed failures

Often, failures occur only after a time delay as the aging process of electronic components in the affected devices triggered by smaller transients causes insidious damage. A number of different protection measures are required. These depend on the exact cause and/or impact point of the lightning discharge.

What pulse forms are there?



Pulse types and their characteristics: Yellow = pulse shape 1, direct lightning strike, 10/350 µs simulated lightning pulse, red = pulse shape 2, remote lightning strike or switching operation, 8/20 µs simulated lightning pulse (Surge)

Testing currents simulate potential increase

High lightning currents can flow to the ground during a storm. If a building with external lightning protection receives a direct hit, a voltage drop occurs on the earthing resistor of the lightning protection equipotential bonding system, which represents a surge voltage against the distant environment. This rise in potential poses a threat to the electrical systems (e.g. voltage supply, telephone systems, cable TV, control cables, etc.) that are routed into the building. Suitable test currents for testing different lightning and surge protectors have been defined in national and international standards.

Direct lightning strike: Pulse shape 1

Lightning currents that can occur during a direct lightning strike can be imitated with the surge current of wave form 10/350 µs. The lightning test current imitates both the fast rise and the high energy content of natural lightning. Lightning current arrestor type 1 and external lightning protection components are tested using this current.

Remote lightning strikes or switching operations: Pulse shape 2

The surges created by remote lightning strikes and switching operations are imitated with test impulse 8/20 µs. The energy content of this impulse is significantly lower than the lighting test current of surge current wave 10/350 µs. Surge arrestor type 2 and type 3 are impacted with this test impulse.

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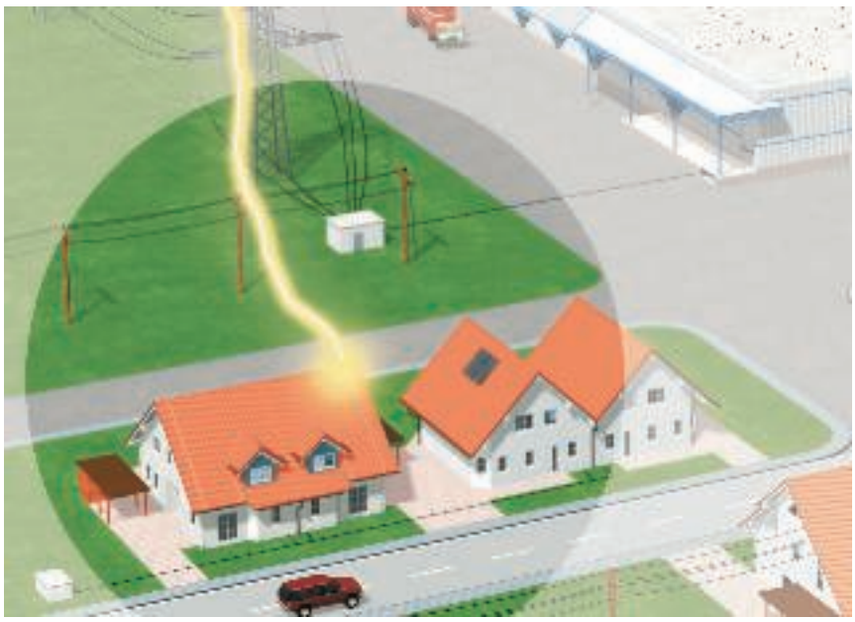
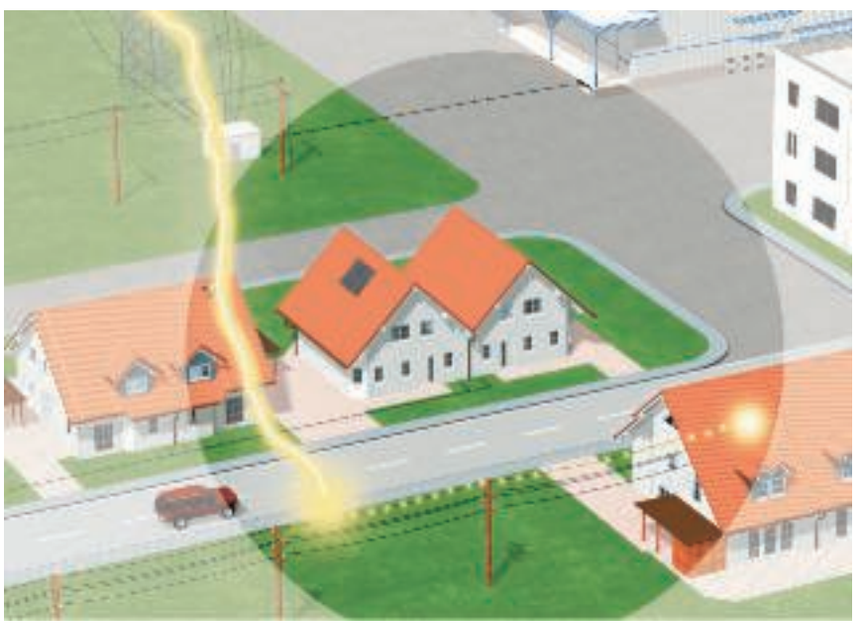
Causes of lightning currents

Direct lightning strike into a building
If a lightning strike hits the external lightning protection system or earthed roof structures capable of carrying lightning current (e.g. roof aerial), then the lightning energy can be arrested to the ground in advance. However, a lightning protection system on its own is not enough: Due to its impedance, the building's entire earthing system is raised to a high potential. This potential increase causes the lightning current to spilt over the building's earthing system and also over the power supply systems and data cables to the adjacent earthing systems (adjacent building, low-voltage transformer).



Risk:
Lightning impulse (10/350)

Direct lightning strike into a low-voltage open-wire line
A direct lightning strike into a low-voltage open wire line or data cable can couple high partial lighting currents in an adjacent building. Electrical equipment in buildings at the end of the low-voltage open-wire line are at particular risk of damage caused by surges.



Risk:
Lightning impulse (10/350)

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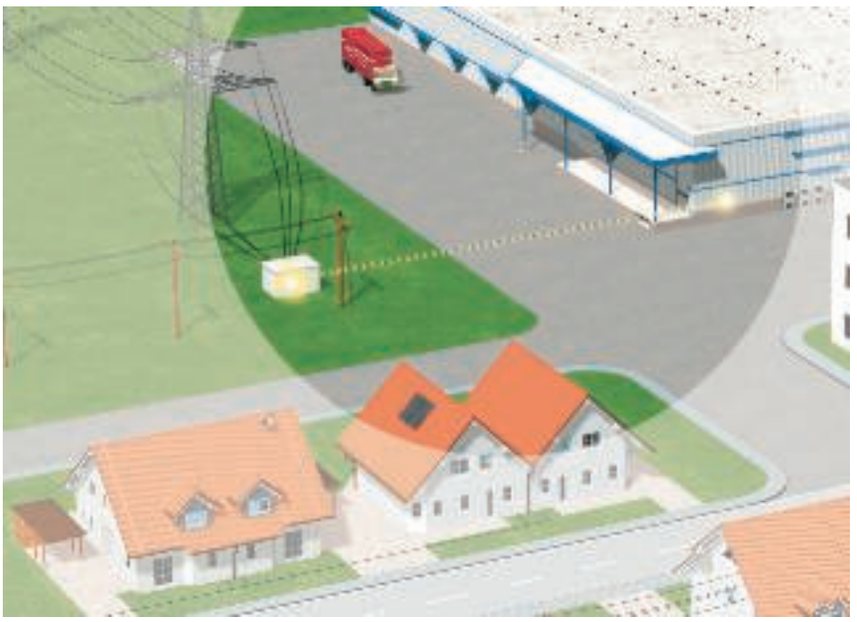
Causes of surges

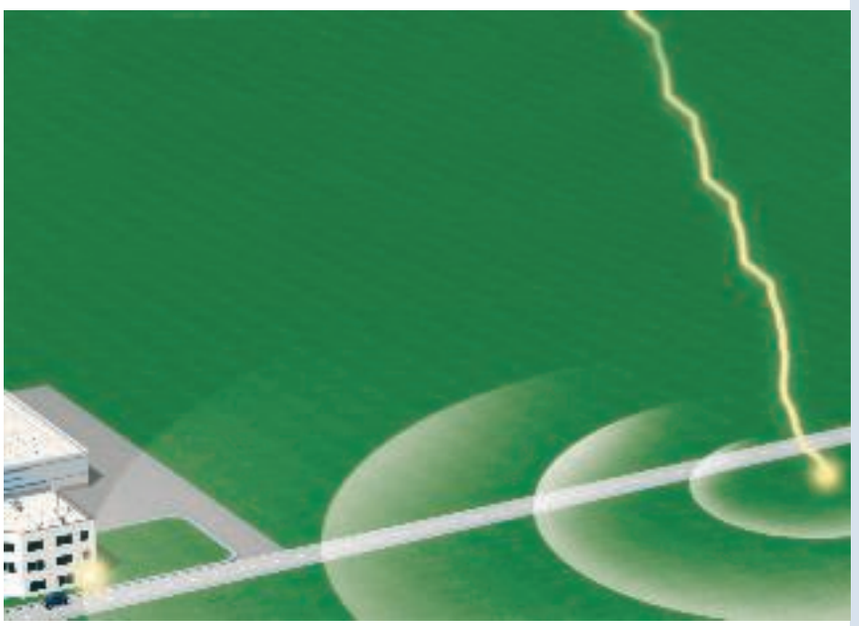
Switching surges in the low-voltage system
Switching surges are caused by switch-on and switch-off operations, by switching inductive and capacitive loads and by interrupting short-circuit currents. Particularly when production plants, lighting systems or transformers are switched off, electrical equipment located in close proximity can be damaged.

Risk:
Surge impulse (8/20)

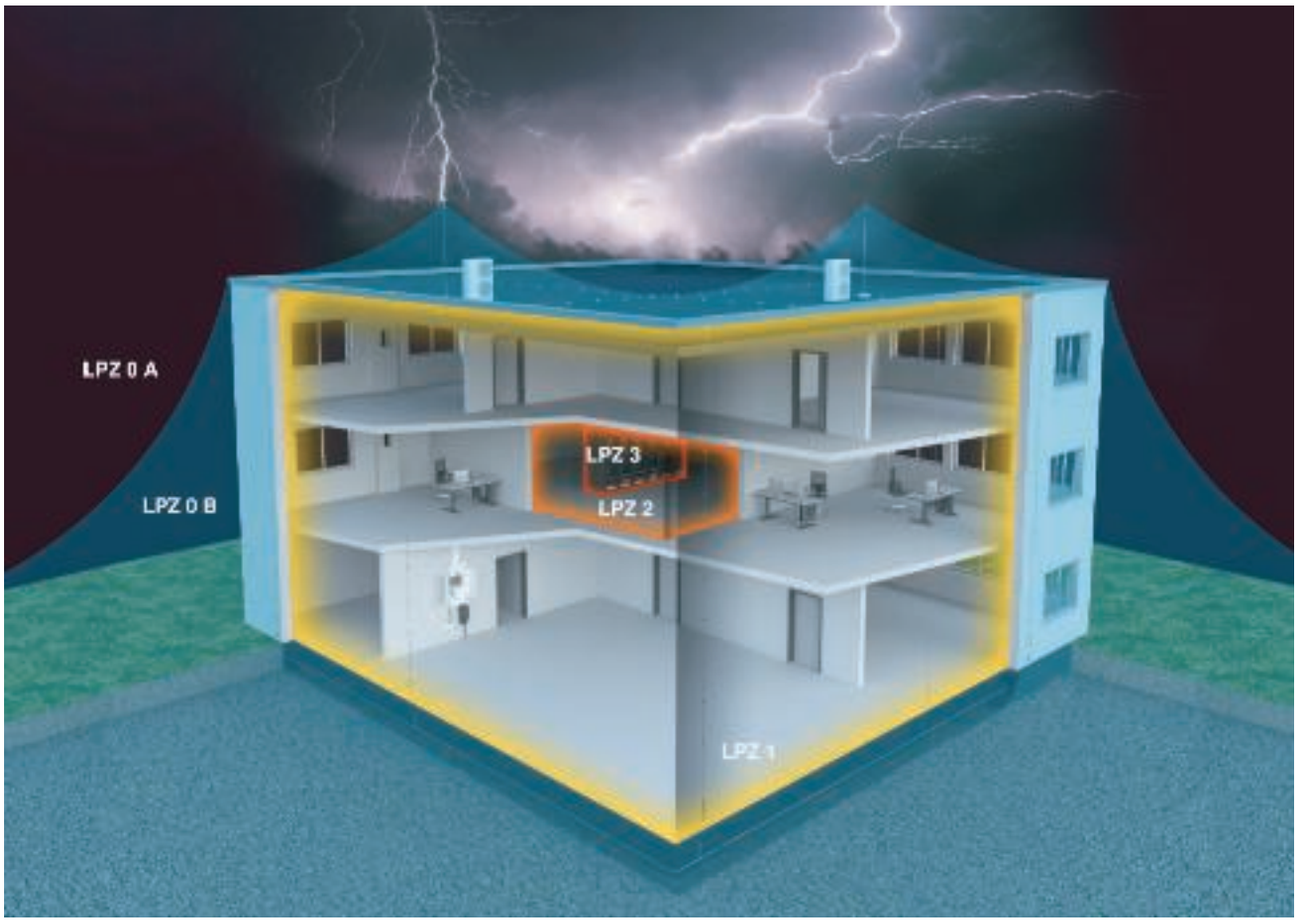


Coupling of surges through local or remote lightning strike
Even if lightning protection and surge protection measures are already installed: A local lightning strike creates additional high magnetic fields, which in turn induce high voltage peaks in line systems. Inductive or galvanic coupling can cause damage within a radius of up to 2 km around the lightning impact point.

Risk:
Surge impulse (8/20)



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 arrestor for equipotential bonding. These arrestors 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.

Zone transitions and protective devices

Benefits of the lightning protection zone concept

- Minimisation of the couplings into other cable systems through arresting the energy-rich, dangerous lightning currents directly at the point the cables enter the building.
- Malfunction prevention with magnetic fields.
- Economic, well-plannable individual protection concept for new and old buildings and reconstructions.

Type classes of the surge protection devices

OBO surge protection devices are classified in accordance with DIN EN 61643-11 into three type classes – type 1, type 2 and type 3 (previously B, C and D). These standards contain building regulations, requirements and tests for surge arrestors used in AC networks with nominal voltages of up to 1,000 V and nominal frequencies of between 50 and 60 Hz.

Correct selection of the arrestor

This classification enables arrestors to be matched to different requirements with regard to location, protection level and current-carrying capacity. The table below provides an overview of the zone transitions. It also shows which OBO surge protection devices can be installed in the energy supply network and their respective function.

Zone transitions

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 DIN VDE 0185-3 for direct or close lightning strikes. • Devices: type 1 (Class I, requirements class B), e.g. MC50-B • Max. protection level according to standard: 4 kV • Installation e.g. in the main distributor/at building entry	MCD Item no.: 5096 87 9	
LPZ 1 to LPZ 2	Protection device for surge protection to DIN VDE 0100-443 for surge voltages arriving through the supply network due to remote strikes or switching operations. • Devices: type 2 (Class II, requirements class C), e.g. V20-C • Max. protection level according to standard: 2.5 kV • Installation e.g. in the power distributor, subdistributor	V20 Item no.: 5094 65 6	
LPZ 2 to LPZ 3	Protection device, designed for surge protection of portable consumers at sockets and power supplies. • Devices: type 3 (Class III, requirements class D), e.g. FineController FC-D • Max. protection level according to standard: 1.5 kV • Installation e.g. on the end consumer	FC-D Item no.: 5092 80 0	

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

Lightning current test

BET with countless tasks

If only lightning current, environmental and electrical testing was possible at BET up to now, the BET Test Centre is now a competent partner for 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 the Soest Technical College. Due to the intensive planning and scientific support in the construction of the test system, it has worked for 12 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 protection devices and lightning arrestors. Tests for lightning protection components are carried out according to DIN EN 50164-1, for spark gaps according to DIN EN 50164-3 and for lightning and surge protection 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.

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Load test

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 DIN EN 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 DIN EN 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.

Standards, surge protection

You must take various standards into account when erecting surge protection. You can find the most important specifications here.

Standard	Contents
DIN VDE 0100-410 (IEC 60364-4-41)	Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock
DIN VDE 0100-540 (IEC 60364-5-54)	Low-voltage electrical installations – Part 5-54: Selection and erection of electrical equipment – Earthing arrangements, protective conductors and protective bonding conductors
DIN 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
DIN 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
DIN EN 61643-11 (IEC 61643-1)	Low-voltage surge protection devices – Part 11: Surge protection devices connected to low-voltage power systems – Requirements and tests

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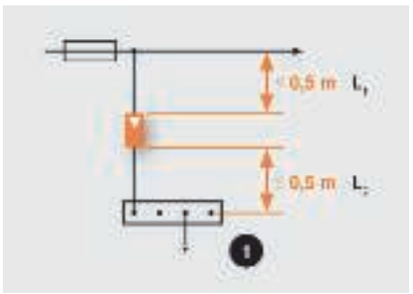
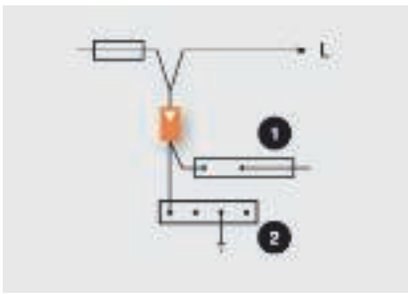
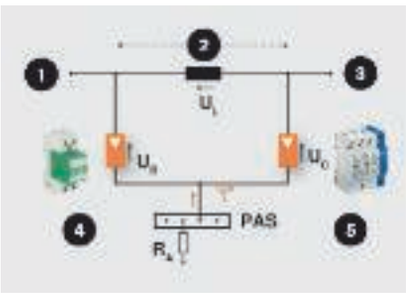


Length of the feed line, 1 = Equipotential bonding rail or terminal or protective conductor rail



V wiring, 1 = Protective conductor rail, 2 = Main equipotential bonding rail or terminal



1= Power supply, 2 = Cable length, 3 = Consumer, 4 = Response voltage 2 kV, e.g. MC 50-B VDE 5 = Response voltage 1.4 kV, e.g. V20 C

Minimum cross-sections for lightning protection equipotential bonding

The following minimum cross-sections must be observed for lightning protection equipotential bonding: for copper 16 mm², for aluminium 25 mm² and for iron 50 mm².

At the lightning protection zone, transition from LPZ0 to LPZ1, all metal installations must be integrated into the equipotential bonding system. Active lines must be earthed using suitable arrestors.

Connection length, V-wiring

The connection cable to the protector is crucial for achieving an optimum protection level. In accordance with IEC installation directives, the length of the branch line to the arrestor and the length of the line from the protection device to the equipotential bonding should in each case be less than 0.5 m. If the cables are longer than 0.5 m, then V-wiring must be chosen.

Decoupling

Lightning current and surge arrestors perform a number of functions. These arrestors must be used in coordination. This coordination is guaranteed by the existing line length or special lightning current arrestors (MCD series). For example, in the protection set, type 1 and type 2 arrestors (Classes B and C) can be used adjacent to each other.

Example cable length > 5 m

- No additional decoupling required

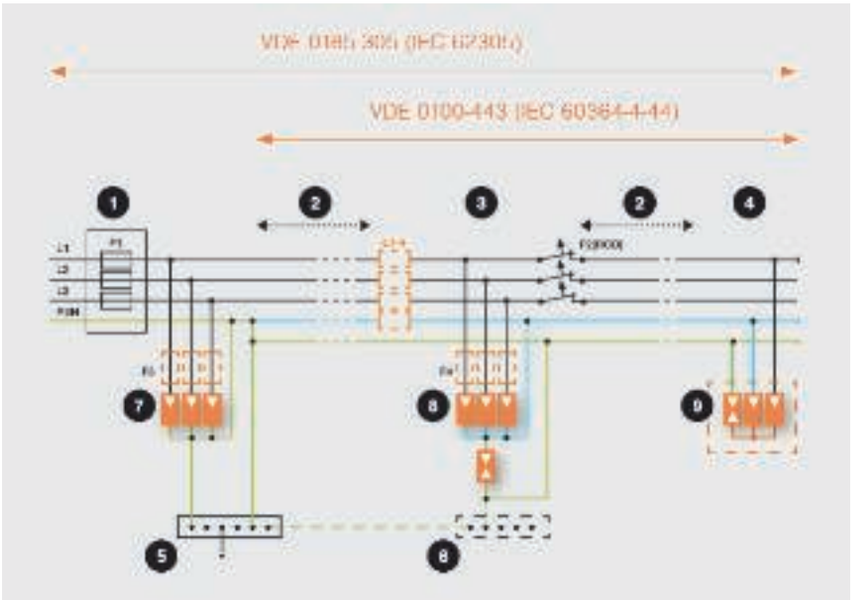
Example cable length < 5 m

- Use decoupling: MC 50-B VDE + LC 63 + V20-C
- Alternatively: MCD 50-B + V20-C, no additional decoupling required (e.g. protection set)

Minimum dimensions of cables, protection class I to IV

Material	Cross-section of cables, which interconnect different equipotential bonding rails or which connect to the earthing system	Cross-section of cables, which connect the internal metallic installations with the equipotential bonding rail
Copper	16 mm²	6 mm²
Aluminium	25 mm²	10 mm²
Steel	50 mm²	16 mm²

4-cable networks, TN-C network system



1 = Main distributor, 2 = Cable length, 3 = Circuit distributor, e.g. subdistributor, 4 = Fine power protection, 5 = Main EBS, 6 = Local EBS, 7 = Type 1, 8 = type 2, 9 = type 3

In the TN-C-S network system, the electrical unit is supplied through the three external lines (L1, L2, L3) and the combined PEN line. Usage is described in DIN VDE 0100-534 (DIN EN 61643-11).

Lightning current arrestor Type 1
Type 1 lightning current arrestors are used in the 3-pole circuit (e.g.: 3x MC 50-B). The connection is effected parallel to the external lines, which are connected to the PEN via the arrestor. Following consultation with the local energy provider and in accordance with the VDN Directive, use before the main meter device is also possible.

Surge arrestor, type 2
Surge arrestors of type 2 are usually used after the split in the PEN line. If the split is more than 0.5 m away, the network from here onwards is 5-line. The arrestors are used in the 3+1 circuit (e.g. V20-C 3+NPE). With the 3+1 circuit, the external lines (L1, L2, L3) are connected to the neutral cable (N) via arrestors. The neutral cable (N) is connected to the protective earth via a collective spark gap. The arrestors must be used before a residual current protective device (RCD), as it would otherwise interpret the surge current as a residual current and interrupt the power circuit.

Surge arrestor, type 3
Surge arrestors of type 3 are used to protect against surges in the device power circuits. These transverse surges occur primarily between L and N. A Y circuit protects the L and N lines with varistor circuits and makes the connections to the PE line through a collective spark gap (e.g. KNS-D). This protection circuit between L and N prevents surge currents from transverse voltages being conducted towards PE, the RCD thus interprets no residual current. The relevant technical data is contained on the product pages.

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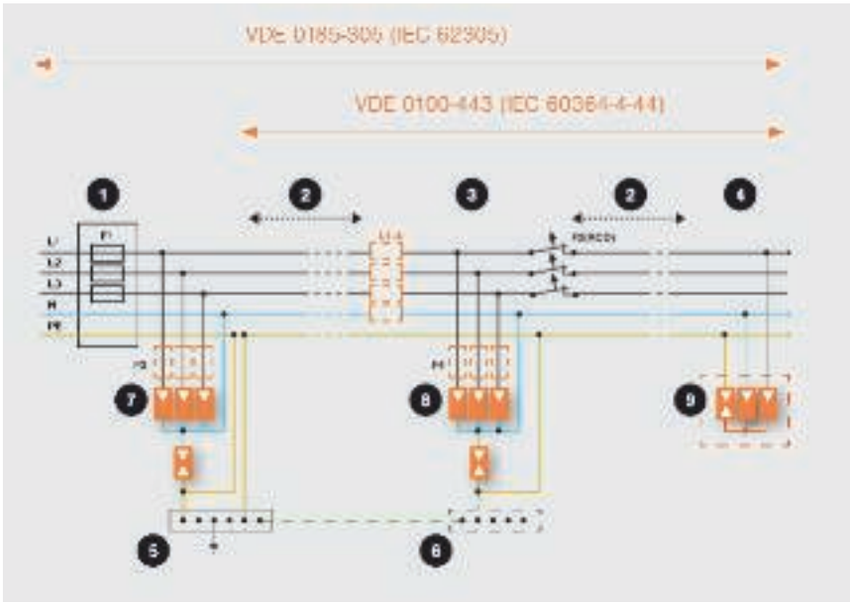
5-cable networks, TN-S and TT network system



1 = Main distributor, 2 = Cable length, 3 = Circuit distributor, e.g. subdistributor, 4 = Fine power protection, 5 = Main EBS, 6 = Local EBS, 7 = Type 1, 8 = Type 2, 9 = Type 3

In the TN-S network system, the electrical unit is supplied through the three external lines (L1, L2, L3), the neutral cable (N) and the earth cable (PE). In the TT network, however, the electrical unit is supplied through the three external lines (L1, L2, L3), the neutral cable (N) and the earth cable (PE). Usage is described in DIN VDE 0100-534 (DIN EN 61643-11).

Lightning current arrestor type 1
Type 1 lightning current arrestors are used in the 3+1 circuit (e.g. 3x MC 50-B and one MC 125-B NPE). With the 3+1 circuit, the external lines (L1, L2, L3) are connected to the neutral cable (N) via arrestors. The neutral cable (N) is connected to the protective earth via a collective spark gap. Following consultation with the local energy provider and in accordance with the VDN Directive, use before the main meter device is also possible.

Surge arrestor, type 2
Surge arrestors of type 2 are used in the 3+1 circuit (e.g. V20-C 3+NPE). With the 3+1 circuit, the external lines (L1, L2, L3) are connected to the neutral cable (N) via arrestors. The neutral cable (N) is connected to the protective earth via a collective spark gap. The arrestors must be used before a residual current protective device (RCD), as it would otherwise interpret the surge current as a residual current and interrupt the power circuit.

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Selection aid, energy technology
AC combination arrestor and surge protection; type 1+2, type 2 and type 3

Installation location 2
Installation in the subdistributor
Medium protection / type 2
Only required if distance ≥ 10m

Description	Type	Item no.	Product figure
TN/TT Type 2 + 3 2.5 SU	V10 Compact	**5093380** Page: 200	
	V10 Compact-AS, with acoustic remote signalling	**5093391** Page: 200	
TN/TT Type 2 4 SU	V20-C 3+NPE	**5094656** Page: 179	
	V20-C 3+NPE+FS with remote signalling	**5094765** Page: 180	
TN/TT Type 2 4 SU	V20-C 3+NPE	**5094656** Page: 179	
	V20-C 3+NPE+FS with remote signalling	**5094765** Page: 180	
TN/TT Type 2 4 SU	VC20-C 3+NPE	**5094656** Page: 179	
	V20-C 3+NPE+FS with remote signalling	**5094765** Page: 180	

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Test marks

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

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Pictogram explanation

Lightning protection classes

Type 1	Protection device to DIN EN 61643-11 or IEC 61643-11
Type 1+2	Combination protection device made of type 1 and type 2
Type 2	Protection device to DIN EN 61643-11 or IEC 61643-11
Type 2+3	Protection device to DIN EN 61643-11 or IEC 61643-11
Type 3	Protection device to DIN EN 61643-11 or IEC 61643-11

Lightning protection zone

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

Applications

FS	Remote signalling
FS-SÜ	Remote signalling with fuse monitoring
AS	Acoustic signalling
ISDN	Integrated Service Digital Network, ISDN applications
DSL	Digital Subscriber Line, DSL applications
Analog TK	Analogue telecommunication
Cat 5	Category 5 TwisterPair
Cat 6_A	Channel Performance to American EIA/TIA standard
MSR	Measuring, controlling and regulating systems
TV	TV applications
SAT	SAT-TV applications
Mu	Multibase base
	LifeControl
EX	Intrinsically safe protection device for areas with a risk of explosions
Class E_A	Channel Performance to ISO / IEC 11801
PoE	Power over Ethernet
230/ 400 V System	230/400 V system
M	Metric

Applications

IP 65	Degree of protection of enclosure IP 65

Metals

Alu	Aluminium
VA	Stainless steel, grade 304
VA	Stainless steel, grade 316
VA	Stainless steel, grade 316 L
VA	Stainless steel, grade 316 Ti
Cu	Copper
CuZn 37	Brass
St	Steel
TG	Cast iron
Zn	Die-cast zinc

Plastics

GFK	Fibre-glass-reinforced plastic
P	Petrolatum
PA	Polyamide
PC	Polycarbonate
PE	Polyethylene
PP	Polypropylene
PS	Polystyrene

Surfaces

FS	Strip-galvanised
F	Hot-dip galvanised
G	Electro-galvanised
FT	Hot-dip galvanised
Cu	Copper-plated
N	Nickel-plated
ZD	Galvanised, Deltatone 500

Metallic materials

Alu — Aluminium

VA (1.4301) — Stainless steel, grade 304

VA (1.4401) — Stainless steel, grade 316

VA (1.4404) — Stainless steel, grade 316 L

VA (1.4571) — Stainless steel, grade 316 Ti

Cu — Copper

CuZn — Brass

St — Steel

TG — Cast iron
Electrogalvanised

Zn — Die-cast zinc

GFK — Fibre-glass-reinforced plastic

Temperature resistance:
-50 to 130 °C.
Resistant to
High chemical resistance
Corrosion resistance
UV light resistance

PETR — Petrolatum

PA — Polyamide

Temperature resistance:
permanently up to approx. 90 °C, briefly up to about 130 °C and to about minus 40 °C*.
Chem. resistance generally as for polyethylene.
Resistant to
Petrol, benzene, diesel oil, acetone, solvents for paints and lacquers, oils and greases.
Unstable with
Bleach, most acids, chlorine.
Risk of tension cracking
Low in air-humid conditions; only with some aqueous salt solutions. Highly desiccated parts (high temperature and extremely low air humidity) are highly sensitive to fuels and various solvents.

PA/PP — Polyamide/Polyethylene

PC — Polycarbonate

Temperature resistance:
permanently up to approx. 110 °C (in water 60 °C), briefly up to 125 °C, and to below minus 35 °C.
Resistant to
Petrol, turpentine, most weak acids.
Unstable with
Acetone, benzene, chlorine, methylene chloride, most concentrated acids.
Risk of tension cracking
Relatively low.
Media which can cause tension cracking include benzene, aromatic hydrocarbons, methanol, butanol, acetone, turpentine.

PE — Polyethylene

Temperature resistance:
hard types permanently up to about 90 °C, briefly up to about 105 °C, soft types permanently up to about 80 °C, briefly up to about 100 °C and to about minus 40 °C*.
Resistant to
Alkalis and inorganic acids.
Conditionally resistant to
Acetone, organic acids, petrol, benzene, diesel oil, most oils.
Unstable with
Chlorine, hydrocarbons, oxidising acids.
Risk of tension cracking
Relatively high.
Stress cracks can be caused by, among other things, acetone, various alcohols, formic acid, ethanol, petrol, benzene, butyric acid, acetic acid, formaldehyde, various oils, petroleum, propanol, nitric acid, hydrochloric acid, sulphuric acid, soap solutions, turpentine, trichloroethylene, citric acid.

PP — Polypropylene

Temperature resistance:
permanently up to approx. 90 °C, briefly up to about 110 °C and to about minus 30 °C*.
Chem. resistance generally as for polyethylene.
Resistant to
Alkalis and inorganic acids.
Conditionally resistant to
Acetone, organic acids, petrol, benzene, diesel oil, most oils.
Unstable with
Chlorine, hydrocarbons, oxidising acids.
Risk of tension cracking
Low, only with some acids such as chromic acid, hydrofluoric acid and hydrochloric acid, as well as nitrogen oxide.

PS — Polystyrene

Temperature resistance:
Because of its relatively high sensitivity to the effects of chemicals, its use is not recommended at temperatures above normal room temperature, about 25 °C.
Resistance to cold: to about minus 40 °C*.
Resistant to
Alkalis, most acids, alcohol.
Conditionally resistant to
Oils and greases.
Unstable with
Butyric acid, concentrated nitric acid, concentrated acetic acid, acetone, ether, petrol and benzene, solvents for paints and lacquers, chlorine, diesel fuel.
Risk of tension cracking
Relatively high.
Stress cracks can be caused by, amongst other things, acetone, ether, petrol, cyclohexane, heptane, methanol, propanol and the softeners used in some PVC cable mixes.

*The minus values apply only for parts in the quiescent condition with no severe impact stress.
There is no plastic that is resistant to every chemical. The agents listed are only a small selection. Plastic parts are especially at risk in the presence of chemicals and high temperatures. Stress cracks may occur. If in doubt, please consult us and/or ask for a detailed chemical resistance table.
Stress crack formation: stress cracks may occur if plastic parts under tension are exposed to chemicals at the same time. Parts made of polystyrene and polyethylene are particularly susceptible. Stress cracks may even be caused by agents to which the plastic in question is resistant in the absence of stress. Typical examples of parts under constant stress when used as intended: grip clips, intermediate supports of cable glands, ribbon clips.

Tested lightning protection components

Tightening torques

M5 = 4 Nm

M6 = 6 Nm

M8 = 12 Nm

M10 = 20 Nm

Detailed data can be provided on request.

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Brief glossary of overvoltage protection

100% response lightning impulse voltage

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

Arrestor

Arrestors are resources, which primarily consist of voltage-dependent resistors and/or spark gaps. Both elements can be switched in series or in parallel or used individually.
Arrestors are used to protect other electrical resources and electrical systems against surge voltages.

Arrestor measured voltage Vc

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

Back-up fuse before the arrestors

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

Cut-off unit

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

Equipotential bonding

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

Equipotential bonding rail (PAS)

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

Error current protection unit (RCD)

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

Lightning protection equipotential bonding system

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

Lightning protection system (LPS)

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

Lightning protection zone (LPZ)

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

Lightning surge current (Iimp)

A lightning surge current (lightning current carrying capacity per path) is a standardised surge current curve of the shape 10/350 µs. With its parameters
- Peak value
- Charge
- Specific energy

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

Line follow current quenching (If)

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

Nominal current (In)

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

Nominal discharge surge current (In)

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

Nominal frequency (fn)

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

Nominal voltage (Vn)

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

Surge protection device (ÜSG)

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

Protection level (Up)

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

Residual voltage (Vres)

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

Short-circuit resistance

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

Response time (ta)

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

SPD

Surge protection device.

Surge arrestor, type 1

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

Surge arrestor, type 2

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

Surge arrestor, type 3

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

Surge voltage

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

Temperature range

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

Transient surge voltage (TOV)

Temporary surge voltages are short-term (i.e. temporary) surge voltages, which may occur due to errors within the medium and low-voltage network.

Transmission frequency (fg)

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

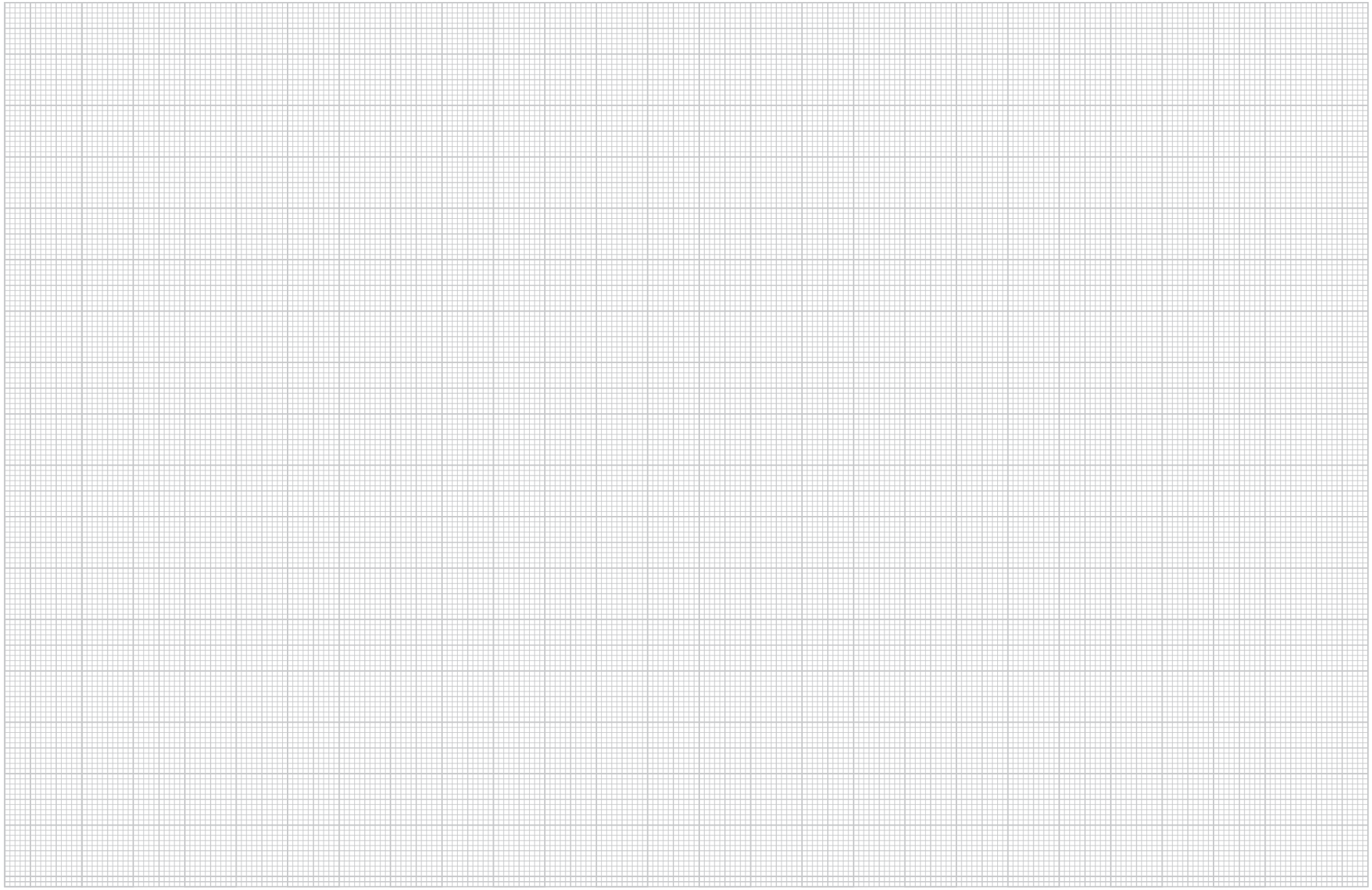
Volume resistance per path, series resistance

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

Conversion table, cable material

Conversion table, cable material

Designation	Item number	Weight approx. (kg/m)	Weight approx. (kg/100 m)	Length approx. (m/kg)
Flat conductor St/FT, 20x2.5	5019340	0.41	41	2.44
Flat conductor St/FT, 25x3	5019342	0.60	59.7	1.68
Flat conductor St/FT, 30x3	5019344	0.71	70.65	1.42
Flat conductor St/FT, 30x3.5	5019345/5019347	0.84	84	1.19
Flat conductor St/FT, 30x4	5019350	0.97	97	1.03
Flat conductor St/FT, 40x4	5019355	1.28	128	0.78
Flat conductor St/FT, 40x5	5019360	1.62	162	0.62
Flat conductor copper, 20x2.5	5021804	0.45	44.5	2.25
Flat conductor VA, 30x3.5	5018501 (V2A) 5018706 (V4A) 5018730 (V4A)	0.83	82.5	1.21
St/FT round cable, 8 mm	5021081	0.40	40	2.50
St/FT round cable, 10 mm	5021103	0.63	63	1.59
Aluminium round cable, 8 mm	5021286 5021294	0.14	13.5	7.41
Aluminium round cable, 10 mm	5021308	0.21	21	4.76
Copper round cable, 8 mm	5021480	0.45	45	2.22
Copper round cable, 10 mm	5021502	0.70	70	1.43
VA round cable, 8 mm	5021235 (V2A) 5021644 (V4A)	0.40	40	2.50
VA round cable, 10 mm	5021227 (V2A) 5021239 (V2A) 5021642 (V4A) 5021647 (V4A)	0.63	63	1.59
St/FT round cable with PVC jacket, 10 mm	5021162	0.67	67.2	1.49
Aluminium round cable with PVC jacket, 8 mm	5021332	0.20	20	5.00
Copper cable, 9 mm	5021650	0.45	44.5	2.25
Copper cable, 10.5 mm	5021654	0.59	58.6	1.71



Surge protection energy technology, arrestor, Type 2

Surge protection energy technology: the plus of the V20-C family

+ Connectable surge arrestor
+ High arresting capacity
+ Visual status display
+ Available with optional remote signalling
+ Optional leak current-free version
+ Vibration-proof through Shock Guard
+ Simple standard hat rail mounting
+ Labelled connections

Function and areas of use

The surge arrestors V20 meet the type 2 requirement class according to IEC 61643-11. These devices protect low voltage consumer systems from overvoltages of all types, and are available in single-pole to four-pole versions. The voltage-limiting high-performance zinc oxide varistor provides several benefits. An extremely short response time, a low protection level and high current leakage capability with long service life. In addition, the devices do not produce any line follow current. If circumstances are uncertain and there is a risk of fire from overloads, the cut-off unit disconnects the arrestor safely from the mains.

Surge arrestor V20, 150 V for TN and TT networks

Type 2 | LPZ 1→2

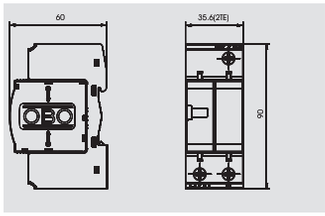
Surge arrestor, type 2, 150 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

Surge arrestor, 1-pole + NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1+NPE-150	150	1 + NPE		1	21.500	**5094 63 9**

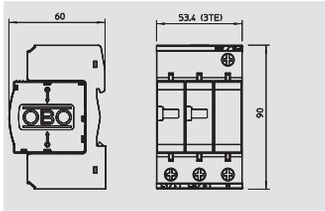
/pc.



Surge arrestor, 2-pole + NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2+NPE-150	150	2 + NPE		1	32.000	**5094 64 1**

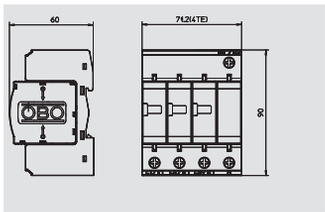
/pc.

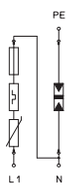
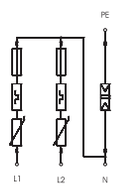
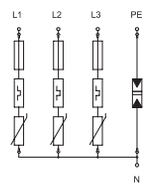


Surge arrestor, 3-pole + NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+NPE-150	150	3 + NPE		1	39.600	**5094 64 4**

/pc.



			V20-C 1+NPE-150	V20-C 2+NPE-150	V20-C 3+NPE-150
					
Nominal voltage	U_N	V	130	130	130
SPD to EN 61643-11			Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20
Total discharge current (8/20)	I_{Total}	kA	40	60	80
Maximum discharge current	I_{max}	kA	40	40	40
Voltage protection level	U_p	kV	< 0,8	< 0,8	< 0,8
Response time	t_A	ns	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			2	3	4
Degree of protection of enclosure			IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 63 9**	**5094 64 1**	**5094 64 4**

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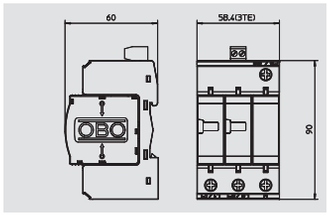
Always indicate the item number when ordering.

Surge arrestor V20, 150 V for TN and TT networks

Surge arrestor, type 2, 150 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

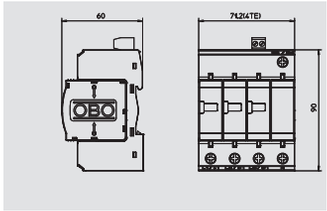
Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.



Surge arrestor, 2-pole + NPE with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2+NPEFS15	150	2 + NPE		1	32.200	**5094 75 0**

/pc.

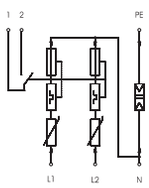


Surge arrestor, 3-pole + NPE with remote signalling

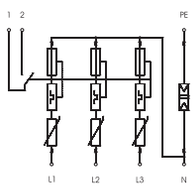
Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V 20-C 3+NPE+FS	150	3 + NPE		1	41.300	**5094 76 4**

/pc.

V20-C 2+NPEFS15



V 20-C 3+NPE+FS



Nominal voltage	U_N	V	130	130
SPD to EN 61643-11			Type 2	Type 2
SPD to IEC 61643-11			class II	class II
Lightning protection Zone LPZ			1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20
Total discharge current (8/20)	I_{Total}	kA	60	80
Maximum discharge current	I_{max}	kA	40	40
Voltage protection level	U_p	kV	< 0,8	< 0,8
Response time	t_A	ns	< 25	< 25
Maximum back-up fuse		A	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			3	4
Degree of protection of enclosure			IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25
Item No.			**5094 75 0**	**5094 76 4**

Always indicate the item number when ordering.

Surge arrestor V20, 150 V for TN networks

Type 2 | LPZ 1→2

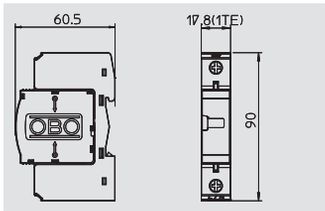
Surge arrestor, type 2, 150 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

Surge arrestor, 1-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1-150	150	1-pole		1	11.300	**5094 67 7**

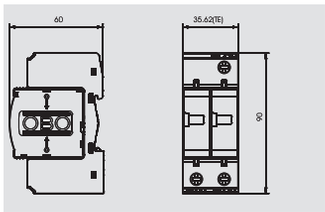
/pc.



Surge arrestor, 2-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2-150	150	2-pole		1	21.300	**5094 67 9**

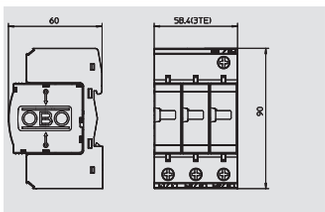
/pc.

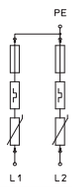
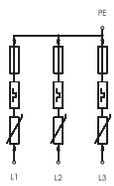


Surge arrestor, 3-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3-150	150	3-pole		1	31.500	**5094 68 0**

/pc.



			V20-C 1-150	V20-C 2-150	V20-C 3-150
					
Nominal voltage	U_N	V	130	130	130
SPD to EN 61643-11			Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20
Total discharge current (8/20)	I_{Total}	kA	20	40	60
Maximum discharge current	I_{max}	kA	40	40	40
Voltage protection level	U_p	kV	< 0,8		< 0,8
Response time	t_A	ns	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			1	2	3
Degree of protection of enclosure			IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 67 7**	**5094 67 9**	**5094 68 0**

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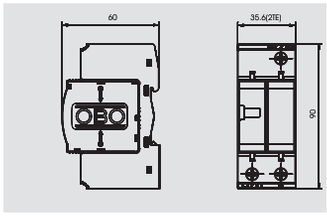
Always indicate the item number when ordering.

Surge arrestor V20, 280 V for TN and TT networks

Surge arrestor, type 2, 280 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

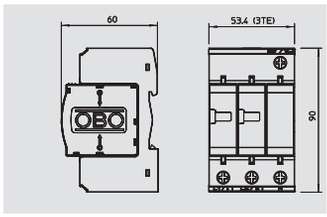
230/400 V System | Type 2 | LPZ 1→2



Surge arrestor, 1-pole + NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1+NPE-280	280	1 + NPE		1	22.300	**5094 65 0**

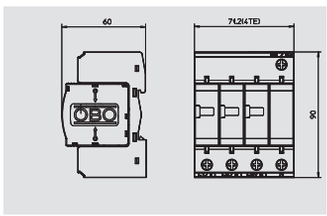
/pc.



Surge arrestor, 2-pole + NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2+NPE-280	280	2 + NPE		1	32.300	**5094 65 3**

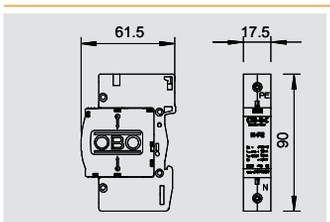
/pc.



Surge arrestor, 3-pole + NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+NPE-280	280	3 + NPE		1	41.700	**5094 65 6**

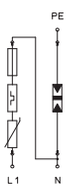
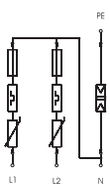
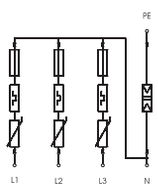
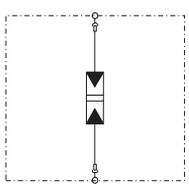
/pc.



Surge arrestor, 1-pole NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
C 25-B+C 1	255	NPE		1	12.500	**5095 60 6**

/pc.

			V20-C 1+NPE-280	V20-C 2+NPE-280	V20-C 3+NPE-280	C 25-B+C 1
						
Nominal voltage	U_N	V	230	230	230	230
SPD to EN 61643-11			Type 2	Type 2	Type 2	Type 1+2
SPD to IEC 61643-11			class II	class II	class II	class I+II
Lightning protection Zone LPZ			1→2	1→2	1→2	0→2
Nominal discharge current (8/20)	I_n	kA	20	20	20	30
Total discharge current (8/20)	I_{Total}	kA	40	60	120	
Maximum discharge current	I_{max}	kA	40	40	40	50
Voltage protection level	U_p	kV	< 1,3	< 1,3	< 1,3	<1,2
Response time	t_A	ns	< 25	< 25	< 25	< 100
Maximum back-up fuse		A	125	125	125	
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			2	3	4	1
Degree of protection of enclosure			IP20	IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25	2,5 - 25
Lightning impulse current (10/350) (N-PE)	I_{imp}	kA				25
Follow current interrupt rating	I_{fi}	kA				0.1
Item No.			**5094 65 0**	**5094 65 3**	**5094 65 6**	**5095 60 6**

Always indicate the item number when ordering.

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Surge arrestor V20, 280 V for TN and TT networks

230/ 400 V System | Type 2 | LPZ 1→2

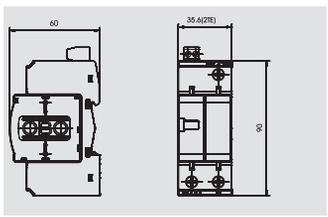
Surge arrestor, type 2, 280 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

Surge arrestor, 1-pole + NPE with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1+NPE+FS	280	1 + NPE		1	22.500	**5094 76 0**

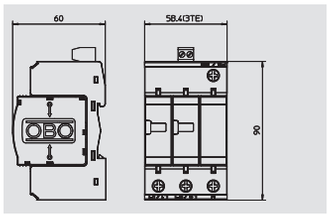
/pc.



Surge arrestor, 2-pole + NPE with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2+NPE+FS	280	2 + NPE		1	32.500	**5094 76 2**

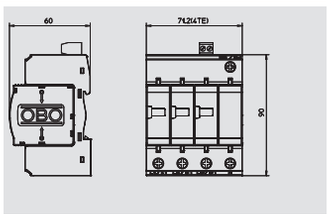
/pc.



Surge arrestor, 3-pole + NPE with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+NPE+FS	280	3 + NPE		1	43.300	**5094 76 5**

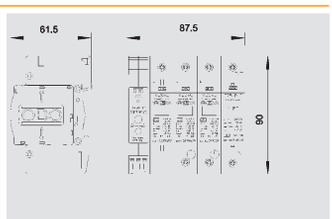
/pc.

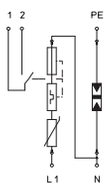
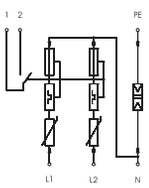
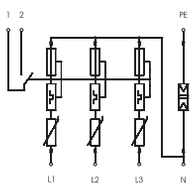
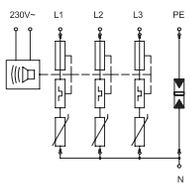


Surge arrestor, 3-pole + NPE with acoustic signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+NPE+AS	280	3 + NPE		1	57.000	**5096 39 7**

/pc.



			V20-C 1+NPE+FS	V20-C 2+NPE+FS	V20-C 3+NPE+FS	V20-C 3+NPE+AS
						
Nominal voltage	U_N	V	230	230	230	230
SPD to EN 61643-11			Type 2	Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20	20
Total discharge current (8/20)	I_{Total}	kA	40	60	80	80
Maximum discharge current	I_{max}	kA	40	40	40	40
Voltage protection level	U_p	kV	< 1,3	< 1,3	< 1,3	< 1,3
Response time	t_A	ns	< 25	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			2	3	4	5
Degree of protection of enclosure			IP20	IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 76 0**	**5094 76 2**	**5094 76 5**	**5096 39 7**

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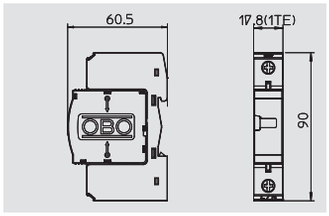
Always indicate the item number when ordering.

Surge arrestor V20, 280 V for TN networks

Surge arrestor, type 2, 280 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

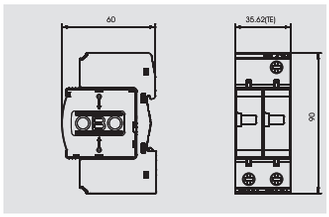
Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.



Surge arrestor, 1-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1-280	280	1-pole		1	12.000	**5094 61 8**

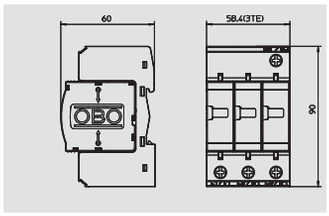
/pc.



Surge arrestor, 2-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2-280	280	2-pole		1	22.700	**5094 62 1**

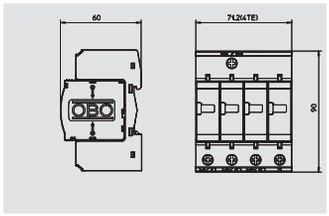
/pc.



Surge arrestor, 3-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3-280	280	3-pole		1	33.500	**5094 62 4**

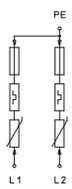
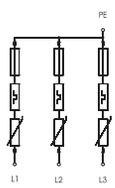
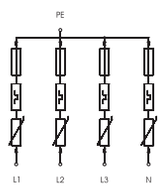
/pc.



Surge arrestor, 4-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 4-280	280	4-pole		1	43.000	**5094 62 7**

/pc.

			V20-C 1-280	V20-C 2-280	V20-C 3-280	V20-C 4-280
						
Nominal voltage	U_N	V	230	230	230	230
SPD to EN 61643-11			Type 2	Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20	20
Total discharge current (8/20)	I_{Total}	kA	20	40	60	80
Maximum discharge current	I_{max}	kA	40	40	40	40
Voltage protection level	U_p	kV	< 1,3	< 1,3	< 1,3	< 1,3
Response time	t_A	ns	< 25	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			1	2	3	4
Degree of protection of enclosure			IP20	IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 61 8**	**5094 62 1**	**5094 62 4**	**5094 62 7**

Always indicate the item number when ordering.

Surge arrestor V20, 280 V for TN networks

Type 2 | LPZ 1→2

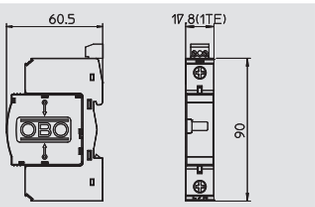
Surge arrestor, type 2, 280 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

Surge arrestor, 1-pole with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1+FS-280	280	1-pole		1	12.400	**5094 72 7**

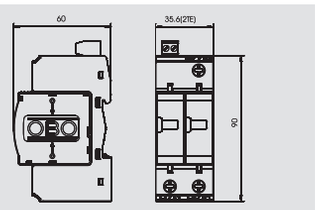
/pc.



Surge arrestor, 2-pole with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2+FS-280	280	2-pole		1	22.500	**5094 63 2**

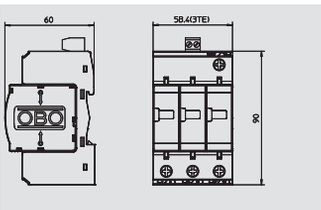
/pc.



Surge arrestor, 3-pole with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+FS-280	280	3-pole		1	33.700	**5094 73 1**

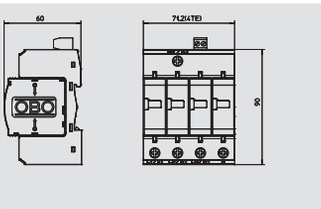
/pc.

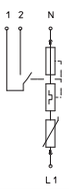
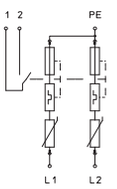
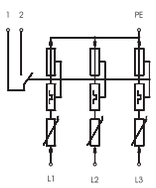
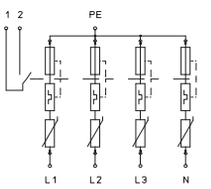


Surge arrestor, 4-pole with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 4+FS-280	280	4-pole		1	43.000	**5094 73 4**

/pc.



			V20-C 1+FS-280	V20-C 2+FS-280	V20-C 3+FS-280	V20-C 4+FS-280
						
Nominal voltage	U_N	V	230	230	230	230
SPD to EN 61643-11			Type 2	Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20	20
Total discharge current (8/20)	I_{Total}	kA	20	40	60	80
Maximum discharge current	I_{max}	kA	40	40	40	40
Voltage protection level	U_p	kV	< 1,3	< 1,3	< 1,3	< 1,3
Response time	t_A	ns	< 25	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			1	2	3	4
Degree of protection of enclosure			IP20	IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 72 7**	**5094 63 2**	**5094 73 1**	**5094 73 4**

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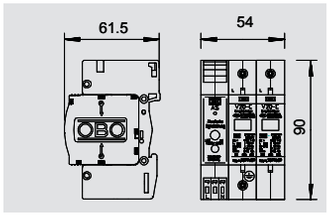
Always indicate the item number when ordering.

Surge arrestor V20, 280 V for TN networks

Surge arrestor, type 2, 280 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

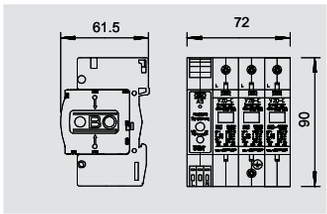
Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.



Surge arrestor, 2-pole, with acoustic signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2+AS-280	280	2-pole		1	35.000	**5096 37 5**

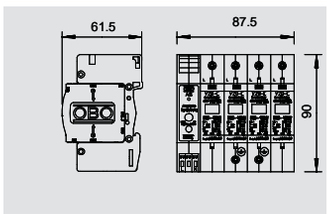
/pc.



Surge arrestor, 3-pole with acoustic signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+AS-280	280	3-pole		1	44.000	**5096 38 3**

/pc.

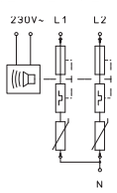


Surge arrestor, 4-pole with acoustic signalling

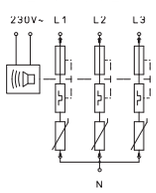
Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 4+AS-280	280	4-pole		1	57.000	**5096 39 1**

/pc.

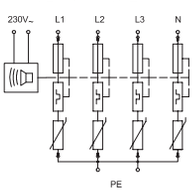
V20-C 2+AS-280



V20-C 3+AS-280



V20-C 4+AS-280



Nominal voltage	U_N	V	230	230	230
SPD to EN 61643-11			Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20
Total discharge current (8/20)	I_{Total}	kA	40	60	80
Maximum discharge current	I_{max}	kA	40	40	40
Voltage protection level	U_p	kV	< 1,3	< 1,3	< 1,3
Response time	t_A	ns	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			3	4	5
Degree of protection of enclosure			IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5096 37 5**	**5096 38 3**	**5096 39 1**

Always indicate the item number when ordering.

02_TBS_Masterkatalog_Länder_2012 / en / 29/05/2012 (LLExport_01433) / 29/05/2012

Surge arrestor V20, 280 V for TN networks

Type 2 | LPZ 1→2

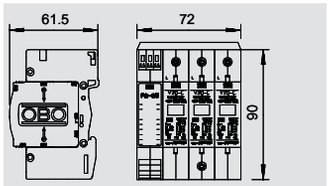
Surge arrestor, type 2, 280 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

Surge arrestor, 3-pole with fuse monitoring

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+FS-SÜ	280	3-pole		1	45.000	**5096 25 1**

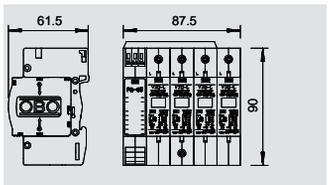
/pc.



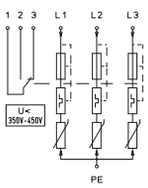
Surge arrestor, 4-pole with fuse monitoring

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 4+FS-SÜ	280	4-pole		1	56.500	**5096 27 8**

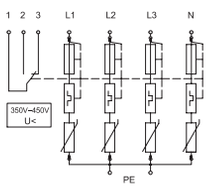
/pc.



V20-C 3+FS-SÜ



V20-C 4+FS-SÜ



Nominal voltage	U_N	V	230	230
SPD to EN 61643-11			Type 2	Type 2
SPD to IEC 61643-11			class II	class II
Lightning protection Zone LPZ			1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20
Total discharge current (8/20)	I_{Total}	kA	60	80
Maximum discharge current	I_{max}	kA	40	40
Voltage protection level	U_p	kV	< 1,3	< 1,3
Response time	t_A	ns	< 25	< 25
Maximum back-up fuse		A	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			4	5
Degree of protection of enclosure			IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25
Item No.			**5096 25 1**	**5096 27 8**

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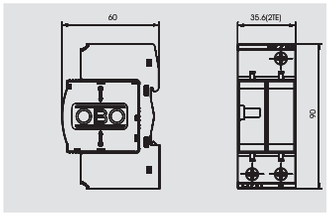
Always indicate the item number when ordering.

Surge arrestor V20, 385 V for TN and TT networks

Surge arrestor, type 2, 385 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

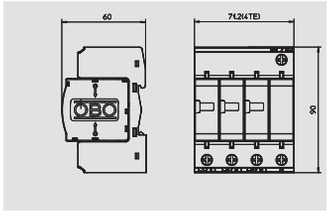
Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.



Surge arrestor, 1-pole + NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1+NPE-385	385	1 + NPE		1	23.300	**5094 66 6**

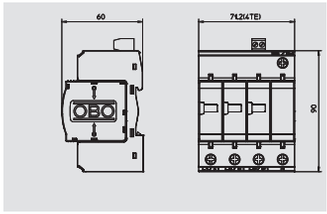
/pc.



Surge arrestor, 3-pole + NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+NPE-385	385	3 + NPE		1	42.600	**5094 66 8**

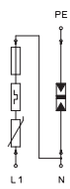
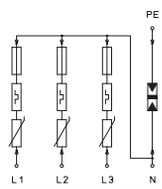
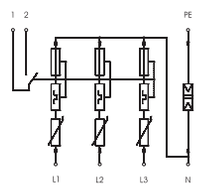
/pc.



Surge arrestor, 3-pole + NPE with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+NPEFS38	385	3 + NPE		1	45.200	**5094 78 8**

/pc.

			V20-C 1+NPE-385	V20-C 3+NPE-385	V20-C 3+NPEFS38
					
Nominal voltage	U_N	V	350	350	350
SPD to EN 61643-11			Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20
Total discharge current (8/20)	I_{Total}	kA	40	80	80
Maximum discharge current	I_{max}	kA	40	40	40
Voltage protection level	U_p	kV	< 1,7	< 1,7	< 1,7
Response time	t_A	ns	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			2	4	4
Degree of protection of enclosure			IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 66 6**	**5094 66 8**	**5094 78 8**

Always indicate the item number when ordering.

Surge arrestor V20, 385 V for TN networks

Type 2 | LPZ 1→2

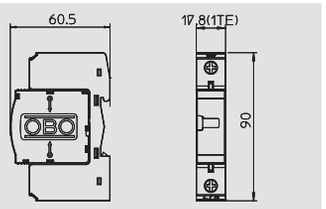
Surge arrestor, type 2, 385 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

Surge arrestor, 1-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1-385	385	1-pole		1	12.500	**5094 70 3**

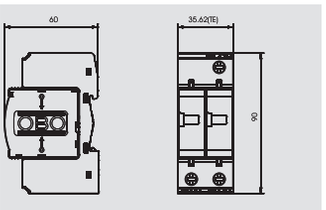
/pc.



Surge arrestor, 2-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2-385	385	2-pole		1	23.700	**5094 70 4**

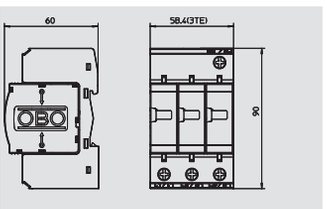
/pc.



Surge arrestor, 3-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3-385	385	3-pole		1	34.500	**5094 70 5**

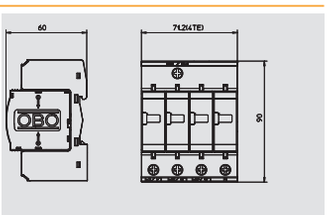
/pc.

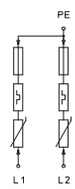
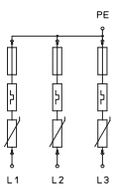
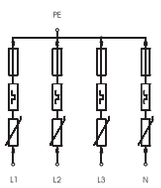


Surge arrestor, 4-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 4-385	385	4-pole		1	44.000	**5094 70 8**

/pc.



			V20-C 1-385	V20-C 2-385	V20-C 3-385	V20-C 4-385
						
Nominal voltage	U_N	V	350	350	350	350
SPD to EN 61643-11			Type 2	Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20	20
Total discharge current (8/20)	I_{Total}	kA	20	40	60	80
Maximum discharge current	I_{max}	kA	40	40	40	40
Voltage protection level	U_p	kV	< 1,7	< 1,7	< 1,7	< 1,7
Response time	t_A	ns	< 25	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			1	2	3	4
Degree of protection of enclosure			IP20	IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 70 3**	**5094 70 4**	**5094 70 5**	**5094 70 8**

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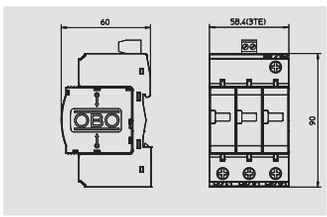
Always indicate the item number when ordering.

Surge arrestor, type 2, 385 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

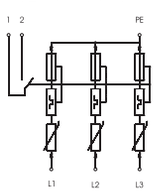


Surge arrestor, 3-pole with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+FS-385	385	3-pole		1	34.700	**5094 78 0**

/pc.

V20-C 3+FS-385



Nominal voltage	U_N	V	350
SPD to EN 61643-11			Type 2
SPD to IEC 61643-11			class II
Lightning protection Zone LPZ			1→2
Nominal discharge current (8/20)	I_n	kA	20
Total discharge current (8/20)	I_{Total}	kA	60
Maximum discharge current	I_{max}	kA	40
Voltage protection level	U_p	kV	< 1,7
Response time	t_A	ns	< 25
Maximum back-up fuse		A	125
Temperature range	ϑ	°C	-40 - +80
Division unit TE (17.5 mm)			3
Degree of protection of enclosure			IP20
Connection cross-section, rigid		mm²	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25
Item No.			**5094 78 0**

Always indicate the item number when ordering.

Surge arrestor V20, 550 V for TN networks

Type 2 | LPZ 1→2

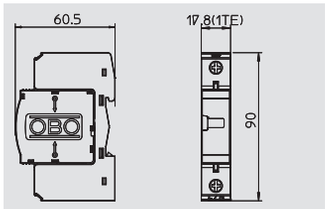
Surge arrestor, type 2, 550 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.

Surge arrestor, 1-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 1-550	550	1-pole		1	12.900	**5094 71 3**

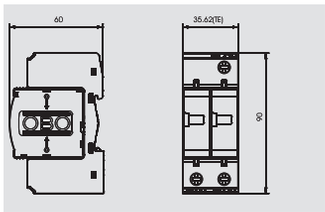
/pc.



Surge arrestor, 2-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2-550	550	2-pole		1	24.300	**5094 71 4**

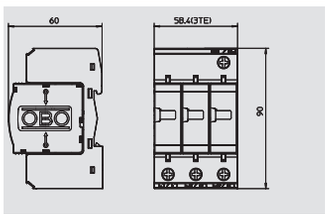
/pc.



Surge arrestor, 3-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3-550	550	3-pole		1	36.000	**5094 71 5**

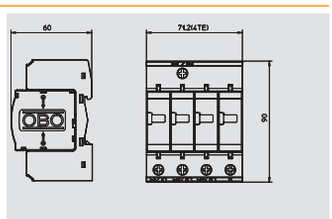
/pc.

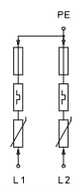
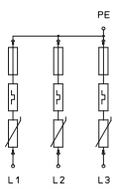
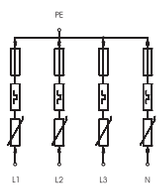


Surge arrestor, 4-pole

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 4-550	550	4-pole		1	45.500	**5094 71 8**

/pc.



			V20-C 1-550	V20-C 2-550	V20-C 3-550	V20-C 4-550
						
Nominal voltage	U_N	V	500	500	500	500
SPD to EN 61643-11			Type 2	Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	15	15	15	15
Total discharge current (8/20)	I_{Total}	kA	15	30	45	60
Maximum discharge current	I_{max}	kA	40	40	40	40
Voltage protection level	U_p	kV	< 2,4	< 2,4	< 2,4	< 2,4
Response time	t_A	ns	< 25	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			1	2	3	4
Degree of protection of enclosure			IP20	IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 71 3**	**5094 71 4**	**5094 71 5**	**5094 71 8**

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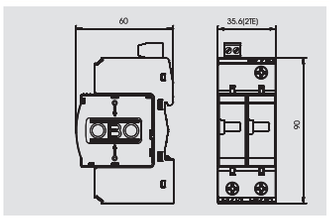
Always indicate the item number when ordering.

Surge arrestor V20, 550 V for TN networks

Surge arrestor, type 2, 550 V
- VDE-tested
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 40 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing zinc oxide varistor arrestor for use in distributor housings
- Base with multiple connection terminals

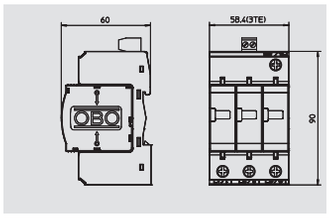
Application: Equipotential bonding (LPZ 1 to 2) and device protection in main and subdistributors.



Surge arrestor, 2-pole with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 2+FS-550	550	2-pole		1	24.100	**5094 63 6**

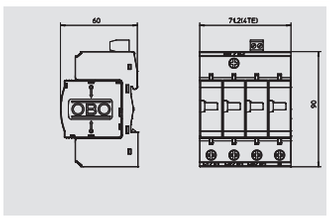
/pc.



Surge arrestor, 3-pole with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+FS-550	550	3-pole		1	36.200	**5094 79 2**

/pc.

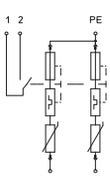


Surge arrestor, 4-pole with remote signalling

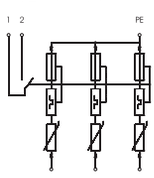
Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 4+FS-550	550	4-pole		1	45.700	**5094 79 5**

/pc.

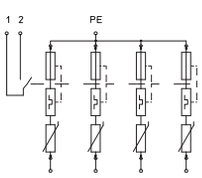
V20-C 2+FS-550



V20-C 3+FS-550



V20-C 4+FS-550



Nominal voltage	U_N	V	500	500	500
SPD to EN 61643-11			Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	15	15	15
Total discharge current (8/20)	I_{Total}	kA	30	45	60
Maximum discharge current	I_{max}	kA	40	40	40
Voltage protection level	U_p	kV	< 2,4	< 2,4	< 2,4
Response time	t_A	ns	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			2	3	4
Degree of protection of enclosure			IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	2,5 - 25
Item No.			**5094 63 6**	**5094 79 2**	**5094 79 5**

Always indicate the item number when ordering.

Surge protection energy technology: the plus of the V20-C3+NPE400 for wind power plants

+ Connectable type 2 surge arrestor for 400/690 V networks
+ NPE spark gap designed for max. 440 V AC (IEC 60364-5-53)
+ Arresting capacity of the spark gap MB25 up to 25 kA(10/350)
+ Available with remote signalling
+ Visual status display
+ Vibration-proof through Shock Guard
+ Particularly suitable for use in wind power plants

Function and areas of use
The specially-developed NPE spark gap of type MB25 means that this arrestor can be used in 400 V/690 V according to IEC 60364-5-53, as installed in wind power plants.
The international standard for "Lightning protection of wind turbine generators", refers in particular to the selection of electrical protection devices according to IEC 60364-5-53 "Selection and erection of electrical equipment" and their vibration resistance.
In addition, the surge arrestor V20-C 3+NPE400 corresponds to the VDE standard 0100-443, "Protection against overvoltages of atmospheric origin or due to switching" with the requirements class, type 2. The high-performance zinc oxide varistor achieves a lower protection level and combines a high current leakage capability with a long lifespan.
To protect against the risk of fire from overloads, the cut-off unit disconnects the arrestor safely from the mains.

Always indicate the item number when ordering.

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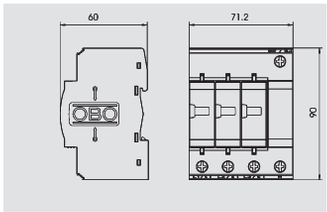
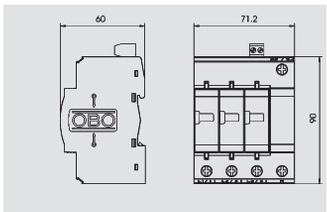


Surge arrestor, 3-pole with NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 3+NPE400	440	3 + NPE		1	47.000	**5094 90 0**

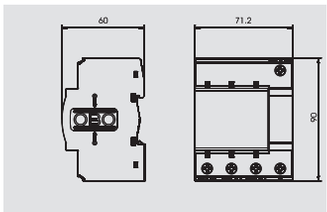
/pc.



Surge arrestor, 3-pole with NPE and remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C3+NPE400+FS	440	3 + NPE		1	47.400	**5094 90 2**

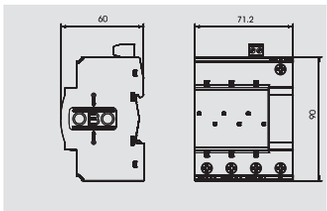
/pc.



Multibase MB25 base

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
MB25-3+NPE	440	3 + NPE		1	27.000	**5096 67 2**

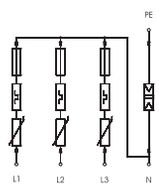
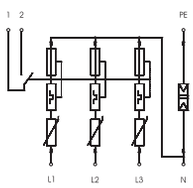
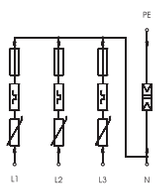
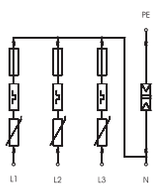
/pc.



Multibase MB25 base with remote signalling

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
MB25-3+NPE+FS	440	3 + NPE		1	29.000	**5096 67 3**

/pc.

			V20-C 3+NPE400	V20-C3+NPE400+FS	MB25-3+NPE	MB25-3+NPE+FS
						
Nominal voltage	U_N	V	400	400	400	400
SPD to EN 61643-11			Type 2	Type 2	Type 1+2	Type 1+2
SPD to IEC 61643-11			class II	class II	class I+II	class I+II
Lightning protection Zone LPZ			1→2	1→2	0→2	0→2
Nominal discharge current (8/20)	I_n	kA	20	20		
Total discharge current (8/20)	I_{Total}	kA	50	50	50	50
Maximum discharge current	I_{max}	kA	40	40		
Voltage protection level	U_p	kV	<2,0	<2,0	<2,0	<2,0
Response time	t_A	ns	<100	<100	100	100
Maximum back-up fuse		A	125	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			4	4	4	4
Degree of protection of enclosure			IP20	IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 35	2,5 - 35	2,5 - 35	2,5 - 35
Item No.			**5094 90 0**	**5094 90 2**	**5096 67 2**	**5096 67 3**

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Always indicate the item number when ordering.

Surge arrestor V20, leakage current-free version

LPZ 1→2 | Type 2

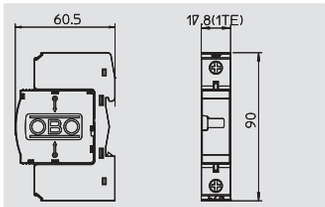
Surge arrestor, type 2, VA version
- Leak current-free varistor spark gap arrestor, use, for example, for permanent insulation monitoring
- For surge voltage protection equipotential bonding to VDE 0100-443 (IEC 60364-4-44)
- Arresting capacity to 25 kA (8/20) per pin
- Arrestor, connectable with dynamic cut-off unit and visual function display
- Encapsulated, non-extinguishing varistor spark gap arrestor for use in distributor housings
- Base with multiple connection terminals

Application: Pre-meter area and industrial systems with strong power variations.

Surge arrestor, 1-pole, leakage current-free

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-VA 1-385	385	1-pole		1	12.500	**5099 47 5**

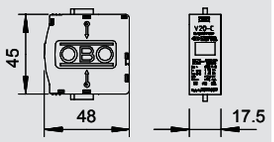
/pc.



V20-VA 1-385

Nominal voltage	U_N	V	350
SPD to EN 61643-11			Type 2
SPD to IEC 61643-11			class II
Lightning protection Zone LPZ			1→2
Nominal discharge current (8/20)	I_n	kA	20
Total discharge current (8/20)	I_{Total}	kA	20
Maximum discharge current	I_{max}	kA	25
Voltage protection level	U_p	kV	< 1,8
Response time	t_A	ns	< 100
Maximum back-up fuse		A	125
Temperature range	ϑ	°C	-40 - +80
Division unit TE (17.5 mm)			1
Degree of protection of enclosure			IP20
Connection cross-section, rigid		mm²	2,5 - 35
Connection cross-section, multi-wire		mm²	2,5 - 35
Connection cross-section, flexible		mm²	2,5 - 25
Item No.			**5099 47 5**

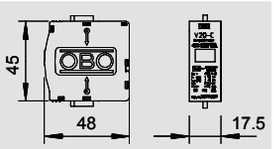
Always indicate the item number when ordering.



Upper part, surge arrestor 75 V

Type	Max. continuous operating voltage V	U max DC V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 0-75	75	100	1-pole		1	5.160	**5099 57 9**

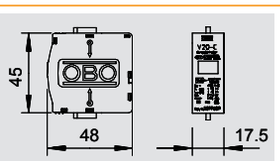
/pc.



Upper part, surge arrestor 150 V

Type	Max. continuous operating voltage V	U max DC V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 0-150	150	200	1-pole		1	4.790	**5096 70 7**

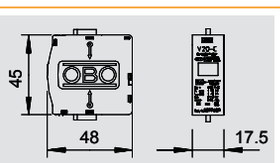
/pc.



Upper part, surge arrestor 280 V

Type	Max. continuous operating voltage V	U max DC V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 0-280	280	350	1-pole		1	8.500	**5099 60 9**

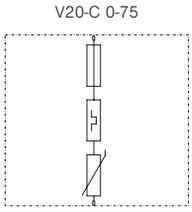
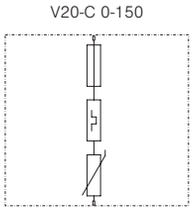
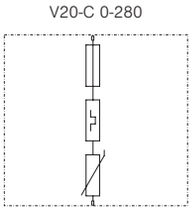
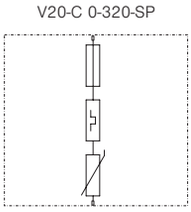
/pc.



Upper part, surge arrestor 320 V

Type	Max. continuous operating voltage V	U max DC V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 0-320-SP	320	420	1-pole		1	5.550	**5099 84 8**

/pc.

			V20-C 0-75	V20-C 0-150	V20-C 0-280	V20-C 0-320-SP
						
Max. continuous operating voltage	U_C	V	75	150	280	320
U max DC	U_c DC	V	100	200	350	420
SPD to EN 61643-11			Type 2	Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	15	20	20	20
Maximum discharge current	I_{max}	kA	40	40	40	40
Voltage protection level	U_p	kV	< 0,5	< 0,8	< 1,3	< 1,4
Response time	t_A	ns	< 25	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80	-40 - +80
Degree of protection of enclosure			IP 20	IP 20	IP 20	IP 20
Division unit TE (17.5 mm)			1	1	1	1
Item No.			**5099 57 9**	**5096 70 7**	**5099 60 9**	**5099 84 8**

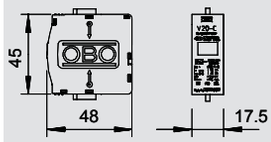
Always indicate the item number when ordering.

Accessories, upper parts and bases V20

Upper part, surge arrestor 335 V

Type	Max. continuous operating voltage V	U max DC V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 0-335	335	420	1-pole		1	5.550	**5099 85 0**

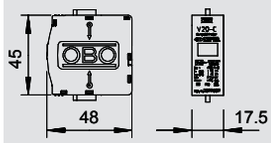
/pc.



Upper part, surge arrestor 385 V

Type	Max. continuous operating voltage V	U max DC V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 0-385	385	505	1-pole		1	5.830	**5099 59 5**

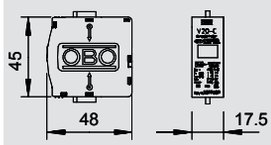
/pc.



Upper part, surge arrestor 440 V

Type	Max. continuous operating voltage V	U max DC V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 0-440	440	585	1-pole		1	6.450	**5099 70 6**

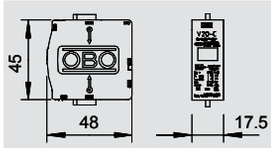
/pc.

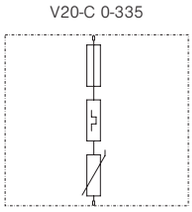
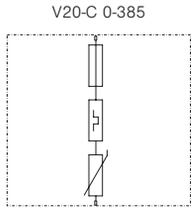
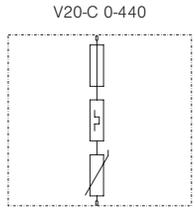
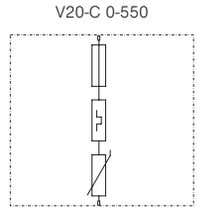


Upper part, surge arrestor 550 V

Type	Max. continuous operating voltage V	U max DC V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C 0-550	550	745	1-pole		1	6.450	**5099 61 7**

/pc.



			V20-C 0-335	V20-C 0-385	V20-C 0-440	V20-C 0-550
						
Max. continuous operating voltage	U_C	V	335	385	440	550
U max DC	U_c DC	V	420	505	585	745
SPD to EN 61643-11			Type 2	Type 2	Type 2	Type 2
SPD to IEC 61643-11			class II	class II	class II	class II
Lightning protection Zone LPZ			1→2	1→2	1→2	1→2
Nominal discharge current (8/20)	I_n	kA	20	20	20	15
Maximum discharge current	I_{max}	kA	40	40	40	40
Voltage protection level	U_p	kV	< 1,4	< 1,7	< 2,0	< 2,4
Response time	t_A	ns	< 25	< 25	< 25	< 25
Maximum back-up fuse		A	125	125	125	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80	-40 - +80
Degree of protection of enclosure			IP 20	IP 20	IP 20	IP 20
Division unit TE (17.5 mm)			1	1	1	1
Item No.			**5099 85 0**	**5099 59 5**	**5099 70 6**	**5099 61 7**

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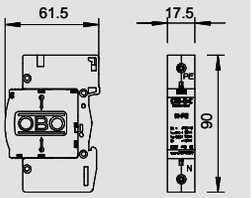
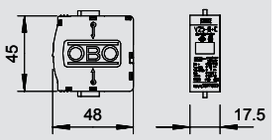
Always indicate the item number when ordering.



Surge arrestor, 1-pole NPE

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
C 25-B+C 1	255	NPE		1	12.500	**5095 60 6**

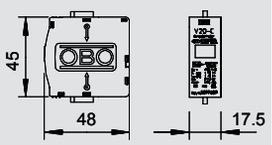
/pc.



Upper part total spark gap between N and PE 255 V

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
C 25-B+C 0	255	NPE		1	5.200	**5095 60 3**

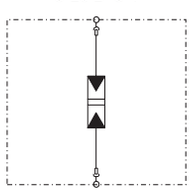
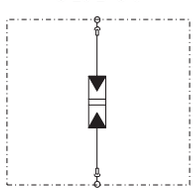
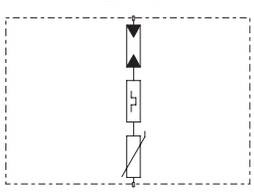
/pc.



Upper part, surge protection, leak current-free

Type	Max. continuous operating voltage V	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-VA 0	385	1-pole		1	6.020	**5099 61 3**

/pc.

			C 25-B+C 1	C 25-B+C 0	V20-VA 0
					
Nominal voltage	U_N	V	230	230	
SPD to EN 61643-11			Type 1+2	Type 1+2	Type 2
SPD to IEC 61643-11			class I+II	class I+II	class II
Lightning protection Zone LPZ			0→2	0→2	1→2
Lightning impulse current (10/350) (N-PE)	I_{imp}	kA	25	25	
Nominal discharge current (8/20)	I_n	kA	30	30	20
Maximum discharge current	I_{max}	kA	50	50	25
Voltage protection level	U_p	kV	<1,2	<1,2	< 1,8
Response time	t_A	ns	< 100	< 100	< 100
Follow current interrupt rating	I_{fi}	kA	0.1	0.1	
Maximum back-up fuse		A		160	125
Temperature range	ϑ	°C	-40 - +80	-40 - +80	-40 - +80
Division unit TE (17.5 mm)			1	1	1
Degree of protection of enclosure			IP20	IP20	IP20
Connection cross-section, rigid		mm²	2,5 - 35	2,5 - 35	
Connection cross-section, multi-wire		mm²	2,5 - 35	2,5 - 35	
Connection cross-section, flexible		mm²	2,5 - 25	2,5 - 25	
Max. continuous operating voltage	U_C	V			385
Item No.			**5095 60 6**	**5095 60 3**	**5099 61 3**

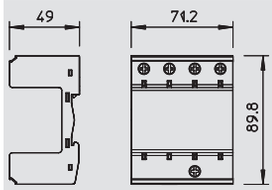
Always indicate the item number when ordering.

Accessories, upper parts and bases V20

Base, Multibase

Type	Version	Dividing unit TE (17.5 mm)		Pack. pcs	Weight kg/100 pcs.	Item No.
MB 1	1-pole	1		1	6.200	**5096 64 8**
MB 2	2-pole	2		1	11.200	**5096 65 3**
MB 3	3-pole	3		1	16.000	**5096 66 5**
MB 4	4-pole	4		1	21.000	**5096 68 0**

/pc.

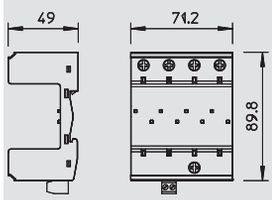


- Suitable for V25-B+C, V20-C and V10-C
- Pre-mounted and ready for connection
- For TN systems
- Multifunction terminals for easy circuit of series-mounted devices
- Upper parts can be rotated through 180 degrees

Base, Multibase with remote signalling

Type	Version	Dividing unit TE (17.5 mm)		Pack. pcs	Weight kg/100 pcs.	Item No.
MB 1+FS	1-pole	1		1	6.700	**5096 64 9**
MB 2+FS	2-pole	2		1	11.700	**5096 65 4**
MB 3+FS	3-pole	3		1	16.500	**5096 66 7**
MB 4+FS	4-pole	4		1	21.000	**5096 68 2**

/pc.

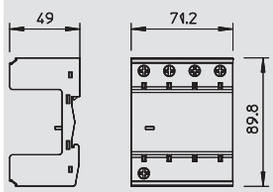


- Suitable for V 25-B+C, V 20-C and V10-C
- Pre-mounted and ready for connection
- Multifunction terminals for easy connection to series-mounted devices
- Upper parts can be rotated through 180 degrees
- With remote signalling, potential-free NO contact, for function monitoring

Base, Multibase + NPE

Type	Version	Dividing unit TE (17.5 mm)		Pack. pcs	Weight kg/100 pcs.	Item No.
MB 1+NPE	1 + NPE	2		1	11.500	**5096 65 0**
MB 2+NPE	2 + NPE	3		1	16.100	**5096 65 5**
MB 3+NPE	3 + NPE	4		1	20.000	**5096 66 9**

/pc.

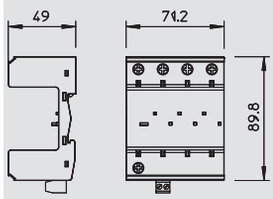


- Suitable for V 25-B+C, V 20-C and V10-C
- Pre-mounted and ready for connection
- Multifunction terminals for easy connection to series-mounted devices
- Upper parts can be rotated through 180 degrees
- For TN-S and TT network systems

Base, Multibase + NPE with remote signalling

Type	Version	Dividing unit TE (17.5 mm)		Pack. pcs	Weight kg/100 pcs.	Item No.
MB 1+NPE+FS	1 + NPE	2		1	11.600	**5096 65 1**
MB 2+NPE+FS	2 + NPE	3		1	16.000	**5096 65 7**
MB 3+NPE+FS	3 + NPE	4		1	21.300	**5096 67 1**

/pc.

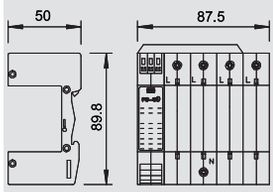


- Suitable for V 25-B+C, V 20-C and V10-C
- Pre-mounted and ready for connection
- Multifunction terminals for easy connection to series-mounted devices
- Upper parts can be rotated through 180 degrees
- With remote signalling, potential-free NO contact, for function monitoring
- 3+1 protection circuit for TN-S and TT network systems

Base, Multibase with fuse monitoring

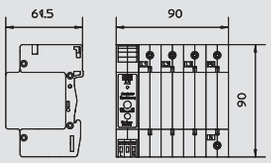
Type	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C U-3 FS-SÜ	3-pole		1	26.000	**5096 35 9**
V20-C U-4 FS-SÜ	4-pole		1	33.000	**5096 36 7**

/pc.



- Suitable for V 25-B+C, V 20-C and V 10-C
- With voltage monitoring of phases and function monitoring of arrestor upper part, remote signalling
- With remote signaling, potential-free changeover contact, for function monitoring
- Pre-mounted and ready for connection

Always indicate the item number when ordering.

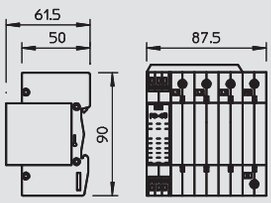


Base, Multibase with acoustic signalling

Type	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C U-2 AS	2-pole		1	23.000	**5096 41 3**
V20-C U-3 AS	3-pole		1	29.000	**5096 42 1**
V20-C U-4 AS	4-pole		1	35.000	**5096 44 8**
V20-C U-3+NPE-AS	3 + NPE		1	32.500	**5096 37 2**

/pc.

- Suitable for V 25-B+C, V 20-C and V 10-C
- With remote signaling, potential-free changeover contact, for function monitoring
- With acoustic signalling for function monitoring, signal tone can be shut down for 24 h
- Pre-mounted and ready for connection

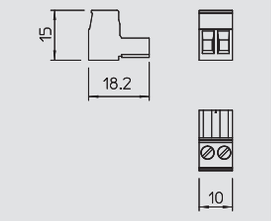


Base, Multibase + NPE with fuse monitoring

Type	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
V20-C U-3+NPE	3-NPE with FS-SÜ		1	30.000	**5096 37 0**

/pc.

- Suitable for V 25-B+C, V 20-C and V 10-C
- With voltage monitoring of phases and function monitoring of arrestor upper part, remote signalling
- With remote signalling, potential-free changeover contact, for function monitoring
- For TN-S and TT network systems
- Pre-mounted and ready for connection

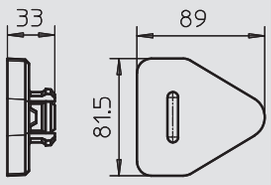


Remote signalling replacement connector for Multibase

Type	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
MB-FS	2-pole		25	0.310	**5096 69 3**

/pc.

Replacement telephony connector, 2-pin version, for Multibase base



Shock Guard locking

Type	Colour	Version		Pack. pcs	Weight kg/100 pcs.	Item No.
MB-SG	Blue	Locking system for upper parts		100	0.060	**5096 69 5**

PA Polyamide

/pc.

Shock Guard: Locking for connector technology on MultiBase bases
Locking system for the plug-in modules/covers
Vibration and shock-tested
Use in housing hole of the connection terminals
Upper parts can be removed without tools

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Numeric directory

Structure of the GTIN: Country code **40** Manufacturer code **1219** Individual GTIN **5647589**

GTIN	Art. no.	Price	Page	GTIN	Art. no.	Price	Page	GTIN	Art. no.	Price	Page	GTIN	Art. no.	Price	Page
		/100 m				/100 pc.				/pc.				/100 pc.	
504651	**1117 02 5**		306	525039	**3133 02 8**		378	569934	**5015 83 6**		301	538551	**5040 13 2**		304
504657	**1117 03 3**		306	525045	**3133 03 6**		378	500226	**5015 84 2**		301	538557	**5040 15 9**		304
				525057	**3133 23 0**		378	569935	**5015 84 4**		301	538593	**5040 50 7**		304
		/100 pc.						569936	**5015 84 7**		301				
543237	**1167 00 6**		306			/pc.		569940	**5015 84 9**		301	538599	**5043 01 8**		306
543243	**1167 01 4**		306	537129	**5000 01 7**		313	500227	**5015 85 4**		301	538605	**5043 10 7**		306
543249	**1167 02 2**		306	537135	**5000 02 5**		313	500228	**5015 86 6**		301				
543255	**1167 03 0**		306	537147	**5000 20 3**		313	503361	**5015 88 0**		301	538611	**5050 03 0**		304
543261	**1167 04 9**		306	501800	**5000 29 7**		312	503367	**5015 88 4**		301	538617	**5050 05 7**		304
				561735	**5000 30 0**		312	503373	**5015 89 0**		301	538623	**5050 07 3**		304
511671	**1362 01 1**		352	570883	**5000 33 5**		312					538629	**5050 08 1**		304
511683	**1362 04 6**		354	537171	**5000 50 5**		313	537909	**5016 02 9**		302	538635	**5050 11 1**		304
				501804	**5000 74 2**		312	537915	**5016 03 7**		302	538641	**5050 13 8**		304
565536	**2146 16 4**		389	581445	**5000 75 0**		312	537921	**5016 04 5**		302	538647	**5050 15 4**		304
559571	**2146 20 7**		389	511104	**5000 76 9**		312	592221	**5016 09 6**		302	538653	**5050 17 0**		304
501606	**2146 50 9**		389	574065	**5000 85 8**		312	580035	**5016 11 8**		302	538659	**5050 19 7**		304
				537183	**5000 86 6**		312	592227	**5016 12 6**		302				
				537189	**5000 94 7**		312	537927	**5016 14 2**		323	538665	**5051 50 9**		305
574167	**2153 73 4**		390	537195	**5000 95 5**		312								
550539	**2153 78 7**		390							/100 m		538683	**5052 07 6**		305
				537237	**5001 21 8**		318	580041	**5018 50 1**		310	538689	**5052 09 2**		305
				537243	**5001 22 6**		318	580047	**5018 70 6**		310	538695	**5052 11 4**		305
589692	**2332 78 4**		393	563547	**5001 36 6**		318	502201	**5018 73 0**		310	538701	**5052 13 0**		305
				537255	**5001 40 4**		318					538707	**5052 15 7**		305
522885	**2349 04 3**		378	537261	**5001 41 2**		318	568046	**5019 34 0**		310	538719	**5052 18 1**		305
522891	**2349 05 1**		378	537285	**5001 56 0**		318	569400	**5019 34 2**		310				
522897	**2349 07 8**		378	563523	**5001 61 7**		318	569401	**5019 34 4**		310	538851	**5057 50 7**		303
522903	**2349 08 6**		378	575265	**5001 62 5**		318	568047	**5019 34 5**		310	538857	**5057 51 5**		303
522915	**2349 10 8**		378	586269	**5001 63 3**		318	568048	**5019 34 7**		310	538863	**5057 52 3**		303
522921	**2349 12 4**		378	537291	**5001 64 1**		318	568049	**5019 35 0**		310	538869	**5057 55 8**		303
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501618	**2351 70 6**		389	590125	**5001 67 2**		318	568051	**5019 36 0**		310			/100 m	
						/pc.						580545	**5057 92 2**		303
		/pc.		575487	**5001 74 9**		318	538155	**5021 08 1**		310			/100 pc.	
523053	**2360 05 5**		326					538161	**5021 10 3**		310	580551	**5057 93 0**		303
523059	**2360 10 1**		326	537357	**5003 00 8**		316	538173	**5021 16 2**		310				
				537363	**5003 01 6**		316	580137	**5021 22 7**		311	538887	**5059 35 6**		326
				537369	**5003 02 4**		316	568052	**5021 23 5**		311	538905	**5059 49 6**		326
551841	**2362 97 0**		377	537375	**5003 03 2**		316	568056	**5021 23 9**		311				
				537381	**5003 04 0**		316	538191	**5021 28 6**		311	538923	**5064 01 5**		306
				537399	**5003 25 3**		316	590127	**5021 29 4**		311				
524271	**3041 20 4**		313	537405	**5003 26 1**		316	538197	**5021 30 8**		311				
524277	**3041 21 2**		313	537411	**5003 28 8**		316	506747	**5021 33 2**		311			/pc.	
524283	**3041 25 5**		313	537417	**5003 29 6**		316	538203	**5021 48 0**		311	591597	**5080 05 3**		255
561723	**3041 40 9**		313	537423	**5003 31 8**		316	538209	**5021 50 2**		311	591627	**5080 06 1**		256
524295	**3041 95 6**		313	537471	**5003 77 6**		317	590205	**5021 64 2**		311	591603	**5080 15 0**		255
				537477	**5003 78 4**		317	568057	**5021 64 4**		311	591621	**5080 27 4**		255
524313	**3042 20 0**		314					568058	**5021 64 7**		311	591639	**5080 28 2**		256
524319	**3042 25 1**		314	537687	**5009 21 9**		317	538221	**5021 65 0**						
561729	**3042 30 8**		313	537693	**5009 22 7**		317	583620	**5021 65 4**			588945	**5081 54 8**		239
				537699	**5009 23 5**		317	538233	**5021 80 4**		310	550263	**5081 64 5**		253
												550269	**5081 64 7**		253
524331	**3043 20 7**		314			/100 pc.				/100 pc.		583479	**5081 68 8**		237
524337	**3043 25 8**		314	537771	**5012 01 5**		322	538269	**5025 20 6**		325	523995	**5081 72 6**		252
571749	**3043 31 2**		314									523989	**5081 73 4**		252
524355	**3043 40 1**		314			/pc.		538305	**5028 03 5**		325	523983	**5081 74 2**		252
524361	**3043 45 2**		314	537789	**5014 01 8**		323	538311	**5028 04 3**		325	546243	**5081 79 3**		250
511116	**3043 60 2**		315	537795	**5014 02 6**		323					561436	**5081 80 0**		250
561741	**3043 60 6**		315	537801	**5014 21 2**		323	538341	**5030 02 1**		325	568053	**5081 92 0**		237
508707	**3043 61 0**		315	590193	**5014 42 5**		322	538365	**5030 23 4**			568041	**5081 93 9**		238
508713	**3043 61 4**		315	510501	**5014 46 8**		322	538371	**5030 24 2**			579111	**5081 96 3**		238
511164	**3043 61 8**		315	510507	**5014 47 6**		322					579105	**5081 97 1**		238
542162	**3043 62 8**		315					538383	**5032 03 2**		324				
524379	**3043 70 3**		314	537807	**5015 01 4**		299	538389	**5032 04 0**		324	568533	**5082 38 2**		251
524385	**3043 75 4**		314	537813	**5015 05 7**		298	538395	**5032 23 7**		324	568491	**5082 41 2**		250
564231	**3043 90 8**		314	537819	**5015 06 5**			538401	**5032 24 5**		324	568485	**5082 42 0**		250
545379	**3043 91 6**		315	537825	**5015 07 3**		297	538413	**5032 53 9**		324	568507	**5082 42 2**		251
				537831	**5015 08 1**		298	538419	**5032 54 7**		324				
564297	**3044 83 1**		315	595942	**5015 11 1**		300					591759	**5083 06 0**		257
564303	**3044 90 4**		315	580011	**5015 20 0**		298	538443	**5033 03 9**		324	591771	**5083 08 7**		257
545397	**3044 91 2**		315	537837	**5015 50 2**		298	543375	**5033 20 9**		324	502297	**5083 40 0**		248
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				537849	**5015 55 3**		299	538455	**5038 01 4**		304	552513	**5084 00 8**		241
		/100 pc.		547783	**5015 55 7**			538461	**5038 03 0**		304	552519	**5084 01 2**		241
563169	**3049 20 5**		326	537855	**5015 65 0**		296	538467	**5038 05 7**		304	552525	**5084 01 6**		241
563163	**3049 22 1**		326	537861	**5015 70 7**		297	538473	**5038 07 3**		304	552531	**5084 02 0**		241
563157	**3049 25 6**		326	537867	**5015 71 5**		297	538479	**5038 08 1**		304	552537	**5084 02 4**		242
563151	**3049 30 2**		326	537873	**5015 72 3**		297	538485	**5038 11 1**		304	552543	**5084 02 8**		242
563145	**3049 32 9**		326	537879	**5015 73 1**		296	538491	**5038 13 8**		304	552549	**5084 03 2**		242
563139	**3049 34 5**		326	537885	**5015 75 8**		296	538497	**5038 15 4**		304	552555	**5084 03 6**		242
				537891	**5015 76 6**		296					552561	**5084 04 0**		243
				545583	**5015 77 4**		297	538521	**5040 03 5**		304	511075	**5084 04 8**		243
		/pc.		537897	**5015 80 4**		297	538527	**5040 05 1**		304				
524421	**3051 01 3**		378	537903	**5015 81 2**		297	538533	**5040 07 8**		304	501738	**5086 01 9**		207
				500225	**5015 83 0**		301	538539	**5040 09 4**		304	501744	**5086 02 3**		207
524481	**3059 00 6**		378	569933	**5015 83 2**		301	538545	**5040 11 6**		304	501750	**5086 02 7**		207

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		/pc.	
589080	**5088 60 5**		230
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587265	**5088 62 9**		224
582946	**5088 64 6**		224
582947	**5088 64 8**		224
578070	**5088 65 0**		226
578071	**5088 65 1**		225
578072	**5088 65 2**		225
570895	**5088 67 0**		229
570896	**5088 67 2**		229
570900	**5088 67 6**		229
570901	**5088 67 8**		229
561370	**5088 69 1**		226
561371	**5088 69 2**		226
561372	**5088 69 3**		226
537109	**5088 69 4**		230
583564	**5088 69 5**		227
583565	**5088 69 6**		227
547320	**5088 69 9**		230
570401	**5088 70 3**		228
504715	**5088 87 9**		164
553101	**5089 20 0**		138
553107	**5089 21 2**		139
523734	**5089 65 0**		201
529940	**5089 65 2**		201
523735	**5089 65 5**		164
570935	**5089 66 0**		206
570936	**5089 66 2**		206
575978	**5089 74 8**		167
540552	**5089 75 4**		168
580681	**5089 75 5**		168
540553	**5089 75 6**		168
581661	**5089 75 7**		168
540554	**5089 76 1**		167
540555	**5089 76 3**		167
540556	**5089 76 8**		170
540557	**5089 77 0**		169
540558	**5089 77 5**		170
540559	**5089 77 7**		169
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546129	**5091 43 8**		293
546147	**5091 52 7**		293
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546165	**5091 68 3**		293
589611	**5091 69 1**		293
508088	**5092 45 1**		212
524709	**5092 46 0**		212
547580	**5092 46 6**		212
561358	**5092 47 0**		212
561359	**5092 47 2**		212
531483	**5092 60 4**		211
595281	**5092 70 1**		211
503505	**5092 80 0**		210
503511	**5092 80 8**		210
504722	**5092 81 2**		211
503517	**5092 81 6**		210
503523	**5092 82 4**		210
504725	**5092 82 8**		211
539067	**5093 01 5**		245
539073	**5093 02 3**		245
503088	**5093 17 1**		247
539097	**5093 23 6**		245
539103	**5093 25 2**		245
539109	**5093 26 0**		246
508725	**5093 27 0**		246
502261	**5093 27 2**		247
502273	**5093 27 5**		247
586705	**5093 27 7**		247
524626	**5093 37 8**		200
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512604	**5093 38 4**		200
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501282	**5093 40 2**		204
501283	**5093 40 4**		204
500466	**5093 40 6**		204
538279	**5093 41 8**		202
547854	**5093 62 3**		220
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542512	**5093 65 4**		148
583679	**5093 65 5**		148
568843	**5093 66 1**		149
542513	**5093 66 2**		149
536195	**5093 72 4**		151
570884	**5093 72 6**		231
596224	**5093 98 8**		246
580599	**5093 99 6**		246
568193	**5094 40 0**		151
545747	**5094 40 1**		155
538281	**5094 40 3**		155
540655	**5094 41 8**		158
538282	**5094 42 1**		158
523973	**5094 42 3**		158
523974	**5094 42 6**		158
540656	**5094 43 1**		162
538283	**5094 43 4**		162
523975	**5094 43 7**		162
523976	**5094 44 0**		162
537488	**5094 44 4**		157
538284	**5094 44 8**		154
523981	**5094 45 4**		154
538285	**5094 45 7**		156
523982	**5094 46 0**		156
523986	**5094 46 3**		156
523988	**5094 47 8**		161
523992	**5094 49 0**		159
523993	**5094 49 3**		159
523994	**5094 51 0**		157
523999	**5094 52 6**		161
524001	**5094 55 2**		160
570907	**5094 57 2**		222
564848	**5094 57 4**		223
570908	**5094 57 6**		222
570887	**5094 60 5**		222
547862	**5094 60 8**		223
570888	**5094 61 3**		222
570911	**5094 61 5**		223
547866	**5094 61 7**		223
540659	**5094 61 8**		181
538286	**5094 62 1**		181
524002	**5094 62 4**		181
524003	**5094 62 7**		181
537492	**5094 63 2**		182
537498	**5094 63 6**		189
538296	**5094 63 9**		176
524004	**5094 64 1**		176
524005	**5094 64 4**		176
538297	**5094 65 0**		179
524006	**5094 65 3**		179
524009	**5094 65 6**		179
538298	**5094 66 6**		185
524011	**5094 66 8**		185
540661	**5094 67 7**		178
538288	**5094 67 9**		178
524012	**5094 68 0**		178
540665	**5094 70 3**		186
538289	**5094 70 4**		186
524015	**5094 70 5**		186
524016	**5094 70 8**		186
540666	**5094 71 3**		188
538290	**5094 71 4**		188
524017	**5094 71 5**		188
524018	**5094 71 8**		188
540667	**5094 72 7**		182
524019	**5094 73 1**		182
524020	**5094 73 4**		182
524022	**5094 75 0**		177
538291	**5094 76 0**		180
524023	**5094 76 2**		180
561638	**5094 76 4**		177
524024	**5094 76 5**		180
524028	**5094 78 0**		187
524030	**5094 78 8**		185
524033	**5094 79 2**		189
524034	**5094 79 5**		189
587125	**5094 90 0**		191
587126	**5094 90 2**		191
536390	**5094 92 0**		202
536393	**5094 92 4**		203
536394	**5094 93 1**		202
591939	**5095 60 3**		164
554295	**5095 60 6**		156
539319	**5096 25 1**		184
539325	**5096 27 8**		184
539355	**5096 35 9**		165
539361	**5096 36 7**		165
506340	**5096 37 0**		166
524710	**5096 37 2**		166
539367	**5096 37 5**		183
539373	**5096 38 3**		183
539379	**5096 39 1**		183
561747	**5096 39 7**		180
539385	**5096 41 3**		166
539391	**5096 42 1**		166
539397	**5096 44 8**		166
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506754	**5096 66 9**		165
506755	**5096 67 1**		165
587120	**5096 67 2**		191
587124	**5096 67 3**		191
542514	**5096 67 5**		152
542515	**5096 67 7**		152
506756	**5096 68 0**		165
506759	**5096 68 2**		165
581348	**5096 69 3**		164
561637	**5096 69 5**		164
551913	**5096 70 7**		193
542518	**5096 78 6**		292
592173	**5096 81 2**		292
548073	**5096 82 0**		142
554451	**5096 82 2**		142
505142	**5096 82 5**		142
505147	**5096 82 7**		142
528828	**5096 83 5**		137
528829	**5096 83 6**		136
548079	**5096 83 9**		143
596638	**5096 84 7**		141
554115	**5096 84 9**		137
505141	**5096 85 1**		141
505146	**5096 85 2**		137
596644	**5096 86 3**		140
554139	**5096 86 5**		136
536202	**5096 87 4**		139
536203	**5096 87 5**		138
507704	**5096 87 6**		141
507707	**5096 87 7**		137
507708	**5096 87 8**		140
507709	**5096 87 9**		136
553113	**5096 88 4**		143
553119	**5096 88 6**		143
550989	**5096 97 0**		143
539409	**5097 05 3**		163
576663	**5097 06 1**		163
570889	**5097 06 5**		231
596566	**5097 08 8**		163
554205	**5097 11 1**		161
594531	**5097 18 5**		159
539421	**5097 19 3**		159
571155	**5097 29 0**		163
539439	**5097 35 5**		160
561753	**5097 43 2**		157
547868	**5097 44 7**		221
570912	**5097 44 8**		221
557811	**5097 45 3**		214
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547869	**5097 45 7**		221
570913	**5097 45 8**		221
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557813	**5097 61 5**		214
557814	**5097 62 3**		214
557815	**5097 63 1**		215
557816	**5097 65 0**		215
557818	**5097 82 0**		216
581225	**5097 82 2**		261
581226	**5097 82 4**		262
557819	**5097 84 6**		216
557821	**5097 85 8**		216
557824	**5097 93 1**		217
557825	**5097 93 5**		217
557826	**5097 93 9**		217
557827	**5097 97 6**		265
568333	**5098 38 0**		282
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568338	**5098 39 0**		282
568339	**5098 39 2**		282
540683	**5098 40 4**		274
540684	**5098 40 7**		274
540685	**5098 41 1**		274
584851	**5098 41 2**		284
562512	**5098 41 3**		277
578737	**5098 41 5**		278
577361	**5098 41 9**		278
540686	**5098 42 2**		275
578738	**5098 42 5**		279
540687	**5098 42 7**		275
540688	**5098 43 1**		275
584852	**5098 43 2**		284
562513	**5098 43 3**		279
540689	**5098 44 2**		276
540690	**5098 44 6**		276
540691	**5098 45 0**		276
584853	**5098 45 2**		284
541046	**5098 47 0**		280
581352	**5098 47 5**		280
557828	**5098 49 2**		266
557829	**5098 50 6**		266
557830	**5098 51 4**		266
557831	**5098 52 2**		266
557833	**5098 55 7**		267
557834	**5098 57 1**		265
557835	**5098 57 5**		265
557836	**5098 60 0**		269
557837	**5098 60 3**		269
557838	**5098 61 1**		269
557839	**5098 63 0**		269
557840	**5098 63 8**		270
557841	**5098 64 6**		270
557842	**5098 72 7**		268
557843	**5098 79 4**		268
557844	**5098 80 8**		271
557845	**5098 81 6**		271
557846	**5098 82 4**		271
557851	**5098 85 9**		272
557852	**5098 86 7**		271
540671	**5099 47 5**		192
539673	**5099 57 9**		193
539685	**5099 59 5**		194
539691	**5099 60 9**		193
570890	**5099 61 1**		231
580761	**5099 61 3**		195
539697	**5099 61 7**		194
594249	**5099 70 6**		194
570893	**5099 70 8**		231
539745	**5099 80 3**		289
557031	**5099 84 8**		193
548127	**5099 85 0**		194
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539985	**5102 07 3**		371
539991	**5102 08 1**		371
539997	**5102 11 1**		371
540003	**5102 13 8**		371
540009	**5102 15 4**		371
540015	**5102 19 7**		371
540021	**5102 21 9**		371
540027	**5102 23 5**		371
540033	**5102 25 1**		371

Numeric directory

Structure of the GTIN: Country code **40** Manufacturer code **1219** Individual GTIN **5647589**

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		/100 pc.				/100 pc.				/100 pc.				/100 pc.	
540039	**5102 27 8**		371	540879	**5218 68 3**		345	541647	**5304 60 1**		358	543368	**5316 45 0**		365
				540885	**5218 69 1**		345	581775	**5304 66 0**		358	543372	**5316 45 9**		365
		/pc.		590451	**5218 74 8**		345	541695	**5304 97 0**		358	543373	**5316 46 8**		365
540087	**5106 00 1**		376	581463	**5218 75 6**		345	541707	**5304 99 7**		322	542031	**5316 51 0**		367
540093	**5106 02 8**		376	540891	**5218 81 0**		346					542037	**5316 55 3**		367
590037	**5106 13 3**		376	540897	**5218 82 9**		346								
590043	**5106 14 1**		376	540903	**5218 86 1**		345	541731	**5311 03 9**		359	542043	**5317 01 0**		363
						/pc.		541737	**5311 10 1**		359	542049	**5317 05 3**		363
		/100 pc.		567458	**5218 88 2**		345	541743	**5311 15 2**		360	542055	**5317 20 7**		363
540159	**5201 10 1**		336			/100 pc.		541749	**5311 20 9**		360	589315	**5317 20 8**		363
				562305	**5218 88 5**		345	541755	**5311 26 8**		360			/100 pc.	
590433	**5202 21 3**		344	540909	**5218 92 6**		369	581658	**5311 41 0**		355	542061	**5317 22 3**		364
540213	**5202 24 8**		344	595221	**5218 97 7**		346	581659	**5311 41 7**		356	542067	**5317 25 8**		364
540303	**5202 51 5**		340	562588	**5218 99 7**		346	541767	**5311 50 0**		355	542073	**5317 27 4**		364
590229	**5202 56 6**		341					573706	**5311 50 3**		305	542079	**5317 40 1**		364
589412	**5202 56 8**		341	540945	**5223 07 5**		350	541773	**5311 51 9**		355	542085	**5317 42 8**		365
589422	**5202 56 9**		344	540951	**5223 10 5**		350	541779	**5311 52 7**		355	542091	**5317 45 2**		364
590223	**5202 59 0**		341	540963	**5223 15 6**		350	583539	**5311 53 0**		301	542097	**5317 47 9**		365
540381	**5202 83 3**		340	540975	**5223 20 2**		350	541785	**5311 53 5**		355	585086	**5317 48 1**		364
578492	**5202 83 6**		340	540993	**5223 60 1**		350	541791	**5311 55 1**		355				
590217	**5202 86 8**		340					583534	**5311 55 4**		301	542103	**5318 08 4**		363
				541041	**5226 57 0**		350	569378	**5311 57 3**		306	542109	**5318 14 9**		363
503826	**5203 01 5**		340					546619	**5311 58 5**		305				
578496	**5203 01 8**		340	541053	**5227 07 0**		351	592544	**5311 59 0**		356	542127	**5320 01 1**		368
528974	**5203 02 3**		340	541059	**5227 08 9**		351			/100 pc.		542133	**5320 05 4**		368
				541065	**5227 10 0**		351	545199	**5311 70 5**		355	542151	**5320 69 0**		369
540465	**5207 25 8**		348	541071	**5227 15 1**		351	545205	**5311 71 3**		355	542157	**5320 70 4**		369
511039	**5207 26 6**		348									542163	**5320 71 2**		369
540477	**5207 33 9**		347	541083	**5228 02 6**		351	541797	**5312 03 5**		361				
573576	**5207 34 2**		347	541095	**5228 12 3**		351	541803	**5312 13 2**		361	542187	**5325 30 7**		367
540483	**5207 34 7**		347	541101	**5228 13 1**		351	541809	**5312 31 0**		320	542193	**5325 31 5**		367
506954	**5207 37 1**		347	585101	**5228 13 4**		351	570086	**5312 31 8**		320				
540489	**5207 44 4**		348	541107	**5228 22 0**		353	541815	**5312 34 5**		320	542241	**5326 30 3**		368
500972	**5207 45 1**		348	541119	**5228 32 8**		351					542247	**5326 31 1**		368
540495	**5207 46 0**		348					589310	**5312 34 6**		320	542253	**5326 33 8**		368
540501	**5207 48 7**		348	541149	**5229 16 2**		349								
590499	**5207 74 6**		348	541155	**5229 36 7**		350			/100 pc.		545361	**5328 20 9**		359
590505	**5207 75 4**		348	541161	**5229 38 3**		350	541821	**5312 41 8**		320	545367	**5328 28 4**		359
590511	**5207 76 2**		348	541167	**5229 46 4**		350	541827	**5312 44 2**		320				
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590493	**5207 81 9**		347	541197	**5229 55 3**		350	541839	**5312 65 5**		321				
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533481	**5207 87 8**		348	541221	**5229 96 0**		349	589314	**5312 65 6**		321	542337	**5331 01 3**		369
591583	**5207 90 1**		347	584088	**5229 96 1**		349					588558	**5331 01 7**		369
										/100 pc.		542343	**5331 50 1**		369
		/100 pc.		544623	**5230 21 7**		349	541857	**5312 80 9**		320				
540525	**5208 01 7**		351	562953	**5230 32 2**		349	541869	**5312 90 6**		321	562911	**5334 93 4**		323
				562947	**5230 36 5**		349	541875	**5312 92 2**		321	595966	**5334 94 2**		323
590367	**5215 27 7**		343	573999	**5230 44 6**		324	570087	**5312 92 5**		321				
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581187	**5215 37 4**		343	595960	**5230 52 7**		353	574053	**5313 01 5**		321	589011	**5335 16 7**		372
581193	**5215 38 2**		343					574047	**5313 02 3**		321	542361	**5335 20 5**		372
540717	**5215 43 9**		343					554301	**5313 03 1**		321	542367	**5335 25 6**		372
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578497	**5215 50 4**		342	541263	**5240 05 0**		289	541899	**5314 03 8**		361	542427	**5336 02 3**		373
590259	**5215 54 4**		341	541269	**5240 06 9**		288	541911	**5314 13 5**		361	542433	**5336 05 8**		372
540729	**5215 55 2**		341	541275	**5240 07 7**		288					542439	**5336 07 4**		373
578498	**5215 55 5**		341	541281	**5240 08 5**		288	541917	**5314 51 8**		319	542445	**5336 09 0**		373
581223	**5215 57 9**		341					541923	**5314 53 4**		319	542463	**5336 30 9**		373
578501	**5215 58 2**		341	541299	**5240 22 0**		288	541929	**5314 61 5**		319	542475	**5336 34 1**		373
581229	**5215 58 7**		341	541305	**5240 23 9**		288	589309	**5314 61 6**		319	542481	**5336 37 6**		373
581235	**5215 59 5**		341	541311	**5240 24 7**		288			/100 pc.		542487	**5336 45 7**		373
578502	**5215 59 8**		341	541317	**5240 25 5**		288	541935	**5314 62 3**		319	542493	**5336 50 3**		374
581241	**5215 60 9**		341	541323	**5240 30 1**		288	541947	**5314 65 8**		319				
540735	**5215 62 5**		342	541329	**5240 32 8**		288	589308	**5314 65 9**		319	542499	**5340 01 2**		374
581253	**5215 66 8**		342	541335	**5240 33 6**		288			/100 pc.					
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590235	**5215 80 3**		343					592587	**5314 72 0**		319	542565	**5350 09 3**		370
590241	**5215 83 8**		343									542571	**5350 10 7**		370
590247	**5215 85 4**		343			/100 pc.						542577	**5350 11 5**		370
553179	**5215 87 5**		342	541569	**5304 00 8**		356	541971	**5315 50 6**		358	542583	**5350 12 3**		370
553185	**5215 87 9**		342	541587	**5304 10 5**		356	574041	**5315 51 4**		322	542625	**5350 68 9**		370
				585803	**5304 10 7**		356	573707	**5315 51 7**		368	542631	**5350 69 7**		370
590265	**5216 18 4**		342	541593	**5304 11 3**		356	574035	**5315 52 2**		322	542637	**5350 70 0**		370
590253	**5216 19 2**		341	581751	**5304 16 4**		357	523719	**5315 55 7**		322	542643	**5350 71 9**		370
581301	**5216 20 6**		341	581757	**5304 17 2**		357	541977	**5315 65 4**		359	542649	**5350 72 7**		370
581307	**5216 21 4**		342	589280	**5304 17 6**		357	541983	**5315 70 0**		359	542679	**5350 86 7**		369
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581319	**5216 26 5**		342	541605	**5304 20 2**		356	541989	**5316 01 4**		366	542691	**5350 90 5**		370
581325	**5216 81 8**		344	589284	**5304 27 0**		357	541995	**5316 15 4**		366				
						/100 pc.		581835	**5316 17 0**		366	542697	**5351 05 7**		370
540795	**5217 07 5**		344	541623	**5304 31 8**		357	542001	**5316 21 9**		366	542703	**5351 07 3**		370
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590427	**5218 31 4**		346	541641	**5304 50 4**		362	542013	**5316 30 8**		365	542715	**5351 28 6**		371
540873	**5218 67 5**		345	550305	**5304 52 0**		363	542019	**5316 32 4**		366	589065	**5351 35 9**		370

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542757	**5400 15 5**		315
562905	**5400 62 7**		315
590133	**5401 77 1**		334
542781	**5401 80 1**		334
542787	**5401 83 6**		334
589839	**5401 85 2**		334
590211	**5401 87 9**		334
503481	**5401 97 0**		332
510561	**5401 98 0**		332
510777	**5401 98 3**		332
510867	**5401 98 6**		332
510873	**5401 98 9**		332
504535	**5401 99 3**		332
505080	**5401 99 5**		332
542805	**5402 10 7**		335
542817	**5402 15 8**		335
542841	**5402 80 8**		334
542847	**5402 85 9**		334
		/pc.	
567473	**5402 86 4**		337
567474	**5402 86 6**		337
567475	**5402 86 8**		337
567476	**5402 87 0**		337
567479	**5402 87 2**		337
567480	**5402 87 4**		337
567481	**5402 87 6**		337
567482	**5402 87 8**		337
567485	**5402 88 0**		337
		/100 pc.	
542853	**5402 89 1**		335
589791	**5402 95 6**		335
573842	**5403 10 0**		334
507005	**5403 10 3**		333
507006	**5403 11 0**		333
507007	**5403 11 7**		334
507008	**5403 12 4**		334
554871	**5403 20 0**		333
511063	**5403 20 5**		333
554877	**5403 21 9**		334
554889	**5403 22 7**		333
554895	**5403 23 5**		333
592632	**5403 23 8**		338
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503487	**5403 30 8**		332
503493	**5403 32 4**		332
561357	**5403 33 0**		336
581390	**5403 33 3**		336
567073	**5403 33 5**		335
		/100 pc.	
542865	**5405 06 8**		332
		/pc.	
542871	**5405 76 9**		336
		/100 m	
588812	**5407 99 5**		388
588815	**5407 99 7**		388
567457	**5408 00 2**		388
567462	**5408 00 4**		388
585426	**5408 00 6**		388
		/pc.	
567463	**5408 00 9**		388
567464	**5408 01 1**		388
567468	**5408 02 2**		388
586417	**5408 02 4**		391
567469	**5408 02 6**		392
567470	**5408 02 8**		392
587156	**5408 03 1**		391
567471	**5408 03 6**		388
567486	**5408 04 3**		390
567487	**5408 04 7**		390
567488	**5408 04 9**		390
567472	**5408 05 2**		389
567491	**5408 05 4**		389
569966	**5408 05 6**		389
581377	**5408 05 8**		
581378	**5408 06 0**		
		/100 pc.	
587269	**5408 06 4**		389
587270	**5408 06 6**		389
587274	**5408 06 8**		389
587275	**5408 07 2**		390
587276	**5408 07 4**		390
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567492	**5408 10 1**		384
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569073	**5408 10 5**		382
561320	**5408 10 7**		382
561321	**5408 10 8**		382
561322	**5408 10 9**		382
563673	**5408 14 8**		382
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589581	**5408 24 5**		383
561324	**5408 24 7**		383
589587	**5408 29 6**		383
561325	**5408 29 8**		383
567447	**5408 35 0**		383
561326	**5408 35 2**		383
567441	**5408 39 3**		383
561327	**5408 39 5**		383
567435	**5408 45 8**		386
567429	**5408 50 4**		384
561328	**5408 50 6**		384
567423	**5408 55 5**		384
561329	**5408 55 7**		384
567417	**5408 62 8**		384
561331	**5408 63 0**		384
567381	**5408 68 7**		383
561330	**5408 68 9**		383
567375	**5408 73 3**		386
554277	**5408 80 6**		387
554283	**5408 81 4**		387
577049	**5408 82 0**		387
500460	**5408 84 9**		386
500973	**5408 85 2**		386
585955	**5408 93 0**		337
585956	**5408 93 2**		337
587161	**5408 93 4**		338
587162	**5408 93 6**		338
587166	**5408 93 8**		337
587167	**5408 94 0**		337
567005	**5408 94 2**		337
578533	**5408 94 3**		337
567006	**5408 94 6**		337
578534	**5408 94 7**		337
567007	**5408 95 0**		338
567008	**5408 95 2**		338
567009	**5408 95 4**		338
584936	**5408 95 5**		339
567010	**5408 95 6**		339
584939	**5408 95 7**		339
567011	**5408 95 8**		339
584940	**5408 95 9**		339
567012	**5408 96 0**		339
567013	**5408 96 4**		339
580243	**5408 96 6**		337
580244	**5408 96 7**		337
567014	**5408 96 8**		337
567493	**5408 96 9**		337
567494	**5408 97 1**		338
567497	**5408 97 2**		338
567498	**5408 97 3**		338
561332	**5408 97 6**		382
561333	**5408 97 8**		382
561334	**5408 98 0**		382
561335	**5408 98 2**		382
561336	**5408 98 4**		385
561337	**5408 98 6**		385
561338	**5408 98 8**		385
561341	**5408 99 0**		385
561342	**5408 99 2**		385
561343	**5408 99 4**		385
561344	**5408 99 6**		386
		/100 pc.	
542889	**5410 09 6**		353
542907	**5410 30 4**		353
542961	**5412 60 9**		352
544641	**5412 63 3**		352
575235	**5412 80 3**		353
575229	**5412 81 1**		353
542967	**5416 56 6**		374
		/pc.	
590049	**5420 00 8**		322
562929	**5420 01 6**		322
		/100 pc.	
575157	**5420 50 4**		315
533157	**5420 53 9**		315
543009	**5424 10 0**		335
543021	**5424 15 1**		316
543033	**5424 20 8**		316
		/pc.	
590145	**5430 01 1**		316
590157	**5430 06 2**		316
		/100 pc.	
543057	**5430 15 1**		316
		/pc.	
611761	**6117 46 5**		213
500622	**6117 46 7**		213
611767	**6117 47 3**		213
500621	**6117 47 5**		213
		/100 pc.	
604908	**6404 00 6**		306
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101 20-3000	3000/ GFK	5690733	5408 10 5		382
101 20-6000	6000/ GFK	5636731	5408 14 8		382
101 3B-4000	2000/ AI	5674733	5402 86 4		337
101 3B-4500	2500/ AI	5674740	5402 86 6		337
101 3B-5000	3000/ AI	5674757	5402 86 8		337
101 3B-5500	3500/ AI	5674764	5402 87 0		337
101 3B-6000	4000/ AI	5674795	5402 87 2		337
101 3B-6500	4500/ AI	5674801	5402 87 4		337
101 3B-7000	5000/ AI	5674818	5402 87 6		337
101 3B-7500	5500/ AI	5674825	5402 87 8		337
101 3B-8000	5500/ AI	5674856	5402 88 0		337
101 3-ES-16	750	5613329	5408 97 6		382
				/100 pc.	
101 A-1500	1500/ St / FT	5427575	5400 15 5		315
101 A-1500	1500/ St / FT	5427575	5400 15 5		332
101 A-1500	1500/ St / FT	5427575	5400 15 5		375
				/pc.	
101 A-16	1660/ AI	5613268	5408 35 2		383
				/100 pc.	
101 A-CU	1500/ Cu	5629054	5400 62 7		315
101 A-CU	1500/ Cu	5629054	5400 62 7		333
101 A-CU	1500/ Cu	5629054	5400 62 7		375
101 A-L100	1000/ St / FT	5428411	5402 80 8		334
101 A-L150	1500/ St / FT	5428473	5402 85 9		334
101 ALU-1000	1000/ AI	5901334	5401 77 1		334
101 ALU-1500	1500/ AI	5427810	5401 80 1		334
101 ALU-2000	2000/ AI	5427872	5401 83 6		334
101 ALU-2500	2500/ AI	5898399	5401 85 2		334
101 ALU-3000	3000/ AI	5902119	5401 87 9		334
				/pc.	
101 A-M16	2060/ AI	5674474	5408 35 0		383
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				/pc.	
101 BB-16	1640	5613381	5408 98 8		385
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				/100 pc.	
101 F1000	1000/ St / FT	5430094	5424 10 0		335
101 F1500	1500/ St / FT	5430216	5424 15 1		316
101 F1500	1500/ St / FT	5430216	5424 15 1		375
101 F1500	1500/ St / FT	5430216	5424 15 1		335
				/pc.	
101 F-16	16121	5613428	5408 99 2		385
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				/pc.	
101 FS-16	750	5613343	5408 98 0		382
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101 G1000	1000/ St / FT	5428053	5402 10 7		335
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101 HV-16	1690	5613411	5408 99 0		385
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				/100 pc.	
101 J1000	1000/ AI	5034810	5401 97 0		332
				/pc.	
101 MA-16	1691	5613442	5408 99 6		386
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101 RH-16	Black/ PA	5674924	5408 10 1		384
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101 VL1500	1500/ AI	5105619	5401 98 0		332
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112 DIN-100	100/ St / F	5428893	5410 09 6		353
112 DIN-CU-100	100/ Cu	5429074	5410 30 4		353
113 8-10	/ Zn / Cu	5446231	5230 21 7		349
113 B-HD-16	/ Zn / Cu	5752295	5412 81 1		353
113 B-MS-HD 8-10	/ Zn / Cu	5629474	5230 36 5		349
113 BZ-FL	/ Zn / G	5739999	5230 44 6		324
113 B-Z-HD	/ Zn / VZ	5629535	5230 32 2		349
113 B-Z-HD	/ Zn / VZ	5752356	5412 80 3		353
113 B-Z-HD-FL	/ Zn / G	5740056	5230 46 2		324
113 Z-16	/ Zn / VZ	5429616	5412 60 9		352
113 Z-20	/ Zn / VZ	5959601	5230 52 7		353
113 Z-20	/ Zn / VZ	5959601	5230 52 7		386
113 Z8-10	/ Zn / G	5412212	5229 96 0		349
113 Z-K 8-10	/ Zn / G	5840886	5229 96 1		349
113 ZN-16	/ Zn / Cu	5446415	5412 63 3		352
120 A	/ Zn / G	5428657	5405 06 8		332
				/pc.	
128 F	/ St / FT	5428718	5405 76 9		336
				/100 pc.	
132 CU	/ Cu	5902171	5202 86 8		340
132 GB-M8	/ St / FT	5894124	5202 56 8		341
132 K-CU	/ Cu	5902232	5202 59 0		341
132 K-VA	/ V2A	5403036	5202 51 5		340
132 N-DK	/ St / FT	5902294	5202 56 6		341
132 U	/ V2A	5038269	5203 01 5		340
132 U 35	/ V2A	5784968	5203 01 8		340
132 U-CU	/ V2A / Cu	5289746	5203 02 3		340
132 VA	/ V2A	5403814	5202 83 3		340
132 VA 35	/ V2A	5784920	5202 83 6		340
133 A	/ PA	5402138	5202 24 8		344
133 NB	/ PA	5904335	5202 21 3		344
156 16	/ St / FT	5411079	5228 22 0		353
156 8-10	/ St / FT	5410836	5228 02 6		351
156 FL	/ St / FT	5411192	5228 32 8		351
156 K8-10 CU	/ Cu	5411017	5228 13 1		351
156 K8-10 ST	/ St / FT	5410959	5228 12 3		351
156 K8-10 VA	/ V2A	5851011	5228 13 4		351
157 E-CU	265/ Cu	5902355	5215 80 3		343
157 EK-CU	265/ Cu	5902478	5215 85 4		343
157 EK-VA	265/ V2A	5902416	5215 83 8		343
157 E-VA	265/ V2A	5407232	5215 50 1		342
157 E-VA 35	265/ V2A	5784975	5215 50 4		342
157 F-CU 230	/ Cu	5902539	5216 19 2		341
157 F-CU 280	/ Cu	5813019	5216 20 6		341
157 F-CU 410	/ Cu	5813132	5216 25 7		341
157 FK-CU 230	/ Cu	5902652	5216 18 4		342
157 FK-CU 280	/ Cu	5813071	5216 21 4		342
157 FK-CU 410	/ Cu	5813194	5216 26 5		342
157 FK-VA 230	/ V2A	5902591	5215 54 4		341
157 FK-VA 280	/ V2A	5812296	5215 58 7		341
157 FK-VA 410	/ V2A	5812418	5215 60 9		341
157 F-VA 230	/ V2A	5407294	5215 55 2		341
157 F-VA 230 35	/ V2A	5784982	5215 55 5		341
157 F-VA 280	/ V2A	5812234	5215 57 9		341
157 F-VA 280 35	/ V2A	5785019	5215 58 2		341
157 F-VA 410	/ V2A	5812357	5215 59 5		341
157 F-VA 410 35	/ V2A	5785026	5215 59 8		341
157 FX-AL	/ AI	5531791	5215 87 5		342
157 FX-CU	/ Cu	5531852	5215 87 9		342
157 GB-M8	260/ V2A	5894223	5202 56 9		344
157 I-CU	/ Cu	5812593	5215 74 9		342
157 IK-VA	/ V2A	5812531	5215 66 8		342
157 I-VA	/ V2A	5407355	5215 62 5		342
157 L-CU	212/ Cu	5812111	5215 47 1		343
157 LK-CU	212/ Cu	5811930	5215 38 2		343
157 LK-VA	212/ V2A	5811879	5215 37 4		343

Type	Dimensions/Colour/Div.	GTIN	Art. no.	Price	Page
				/100 pc.	
157 L-VA	212/ V2A	5407171	5215 43 9		343
157 NB-VA	260/ V2A	5903673	5215 27 7		343
157 ND-VA	260/ V2A	5903796	5215 30 7		344
159 K-VA	/ V2A	5813255	5216 81 8		344
159 VA-V	/ V2A	5407959	5217 07 5		344
163 100 CU	100/ Cu	5409939	5223 60 1		350
163 100 FT	100/ St / FT	5409519	5223 10 5		350
163 150 FT	150/ St / FT	5409632	5223 15 6		350
163 200 FT	200/ St / FT	5409755	5223 20 2		350
163 70 FT	70/ St / FT	5409458	5223 07 5		350
165 B 100	/ St / FT	5408970	5218 82 9		346
165 B 60	/ St / FT	5408918	5218 81 0		346
165 KR	/ PE	5409038	5218 86 1		345
165 KRB SO		5952213	5218 97 7		346
165 MBG HFL	Black/ PP	5623052	5218 88 5		345
				/pc.	
165 MBG UH	Black/ PP	5674580	5218 88 2		345
165 MBG UH	Black/ PP	5674580	5218 88 2		390
				/100 pc.	
165 MBG-10	/ PA/PE	5408734	5218 67 5		345
165 MBG-10 200	/ PE	5814634	5218 75 6		345
165 MBG-8	/ PA/PE	5408857	5218 69 1		345
165 MBG-8 200	/ PE	5904519	5218 74 8		345
165 NBK 55	55/ PA	5904274	5218 31 4		346
165 OBG-8	/ PE	5408796	5218 68 3		345
165 R-8-10	/ PE	5625889	5218 99 7		346
166 LS 70	70/ St / FT	5410416	5226 57 0		350
168 8-10 M6	M6/ Zn / G	5411499	5229 16 2		349
168 DIN 30	56/ Zn / G	5411734	5229 48 0		350
168 DIN-K-M8	M8/ Zn / G	5412151	5229 83 9		349
168 DIN-K-M8	M8/ Zn / Cu	5411611	5229 38 3		350
168 FL30-M6	56/ Zn / VZ	5411673	5229 46 4		350
168 FL40-M8	66/ TG / FT	5411970	5229 55 3		350
168 ZN-M6	M6/ Zn / Cu	5411550	5229 36 7		350
172 AR	/ Al	5409090	5218 92 6		369
176 A 100	100/ TG / F	5410652	5227 10 0		351
176 A 150	150/ TG / F	5410713	5227 15 1		351
176 A 65	65/ TG / F	5410539	5227 07 0		351
176 A 80	80/ TG / F	5410591	5227 08 9		351
177 20 CU	/ PA	5904991	5207 74 6		348
177 20 KL	/ PA	5009726	5207 45 1		348
177 20 M8	/ PA	5404897	5207 44 4		348
177 20 VA B-HD	/ V2A	5915836	5207 90 1		347
				/100 pc.	
177 20 VA M6	/ V2A	5404774	5207 33 9		347
177 20 VA M8	/ V2A	5404835	5207 34 7		347
177 20 VA-VK M6	/ V2A / Cu	5904878	5207 80 0		347
177 20 VA-VK M8	/ V2A / Cu	5904939	5207 81 9		347
177 30 CU	/ PA	5905059	5207 75 4		348
177 30 M8	/ PA	5404958	5207 46 0		348
177 35 VA M6	/ V2A	5735762	5207 34 2		347
177 55 CU	/ PA	5905110	5207 76 2		348
177 55 M8	/ PA	5405016	5207 48 7		348
177 B-HD20	/ PA	5336433	5207 85 1		348
177 B-HD30	/ PA	5334811	5207 87 8		348
177 U	Light grey/ PP	5069546	5207 37 1		347
194	Grey M8/ PA	5404651	5207 25 8		348
194 K	Grey M8/ PA	5110392	5207 26 6		348
				/kg	
198 60	2160	5399674	5101 06 9		377
				/100 pc.	
199 DIN	M8/ St / FS	5405252	5208 01 7		351
200 V4A-1500	1500/ V4A	5751571	5420 50 4		315
200 V4A-1500	1500/ V4A	5751571	5420 50 4		333
200 V4A-1500	1500/ V4A	5751571	5420 50 4		375
200 V4A-2000	2000/ V4A	5331575	5420 53 9		315
200 V4A-2000	2000/ V4A	5331575	5420 53 9		333
200 V4A-2000	2000/ V4A	5331575	5420 53 9		375
204 KL-1500	/ St	5430575	5430 15 1		316
204 KL-1500	/ St	5430575	5430 15 1		375
				/pc.	
204 KS-2000	2000/ St / F	5901457	5430 01 1		316
204 KS-2000	2000/ St / F	5901457	5430 01 1		375
204 KS-2500	2500/ St / F	5901570	5430 06 2		316
204 KS-2500	2500/ St / F	5901570	5430 06 2		375
205 B-M10 VA	M10/ V4A	5900498	5420 00 8		322
205 B-M12 VA	M12/ V4A	5629290	5420 01 6		322
213 1000 DIN	1000/ St / FT	5373575	5003 00 8		316
213 1000 M	1000/ St / FT	5373995	5003 25 3		316
213 1500 DIN	1500/ St / FT	5373636	5003 01 6		316
213 1500 F	1500/ St / FT	5374718	5003 77 6		317
213 1500 M	1500/ St / FT	5374053	5003 26 1		316
213 2000 DIN	2000/ St / FT	5373698	5003 02 4		316
213 2000 F	2000/ St / FT	5374770	5003 78 4		317
213 2000 M	2000/ St / FT	5374114	5003 28 8		316
213 2500 DIN	2500/ St / FT	5373759	5003 03 2		316
213 2500 M	2500/ St / FT	5374176	5003 29 6		316
213 3000 DIN	3000/ St / FT	5373810	5003 04 0		316
213 3000 M	3000/ St / FT	5374237	5003 31 8		316
219 20 BP CU	1500/ St / Cu	5371717	5000 50 5		313
219 20 BP FT	1500/ St / FT	5371892	5000 94 7		312
219 20 BP V4A	1000/ V4A	5740650	5000 85 8		312
219 20 BP V4A	1500/ V4A	5371830	5000 86 6		312
219 20 OMEX FT	1500/ St / FT	5371298	5000 01 7		313
219 20 OMEX FT	2000/ St / FT	5371472	5000 20 3		313
219 20 ST FT	1000/ St / FT	5018049	5000 74 2		312
219 20 ST FT	1500/ St / FT	5814450	5000 75 0		312
219 25 BP FT	1500/ St / FT	5371953	5000 95 5		312
219 25 OMEX FT	1500/ St / FT	5371359	5000 02 5		313
219 25 ST FT	1500/ St / FT	5111047	5000 76 9		312
				/100 pc.	
223 DIN MS	/ Zn / Cu	5423676	5335 25 6		372
223 DIN ZN	/ Zn / G	5423614	5335 20 5		372
223 O DIN MS	/ Zn / Cu	5890119	5335 16 7		372
223 O DIN ZN	/ Zn / G	5890058	5335 14 0		372
226 8-10	/ St / FT	5424215	5336 00 7		372
226 CU	/ Cu	5424277	5336 02 3		373
226 VA	/ V2A	5424338	5336 05 8		372
226 ZV CU	/ V2A	5424451	5336 09 0		373
226 ZV VA	/ Cu	5424390	5336 07 4		373
233 8	/ St / FT	5424635	5336 30 9		373
233 A VA	/ V2A	5424871	5336 45 7		373
233 A ZV	/ Cu	5424932	5336 50 3		374
233 VA	/ V2A	5424758	5336 34 1		373
233 ZV	/ V2A	5424819	5336 37 6		373
237 N CU	/ Cu	5453673	5328 28 4		359
237 N FT	/ St / F	5453611	5328 20 9		359
239	/ Zn / G	5423195	5329 07 8		359
244	/ Zn / G	5417316	5311 03 9		359
245 8-10 CU	/ Cu	5417439	5311 15 2		360
245 8-10 FT	/ St / FT	5417378	5311 10 1		359
247 8-10 CU	/ Cu	5417552	5311 26 8		360
247 8-10 FT	/ St / FT	5417491	5311 20 9		360
249 6-10 CU	40/ Cu	5816591	5311 41 7		356
249 6-10 ST	40/ St / FT	5816584	5311 41 0		355
249 8-10 ALU	44/ Al	5417736	5311 51 9		355
249 8-10 ALU-OT	44/ Al	5466192	5311 58 5		305
249 8-10 ALU-OT	44/ Al	5466192	5311 58 5		352
249 8-10 ALU-OT	44/ Al	5466192	5311 58 5		367
249 8-10 CU	40/ Cu	5417798	5311 52 7		355
249 8-10 CU-OT	40/ Cu	5835394	5311 53 0		301
249 8-10 CU-OT	40/ Cu	5835394	5311 53 0		305
249 8-10 CU-OT	40/ Cu	5835394	5311 53 0		352
249 8-10 CU-OT	40/ Cu	5835394	5311 53 0		367
249 8-10 ST	40/ St / FT	5417675	5311 50 0		355
249 8-10 ST-OT	40/ St / FT	5737063	5311 50 3		305
249 8-10 ST-OT	40/ St / FT	5737063	5311 50 3		352
249 8-10 ST-OT	40/ St / FT	5737063	5311 50 3		367
249 8-10 VA	40/ V2A	5417910	5311 55 1		355
249 8-10 VA-OT	40/ V2A	5835349	5311 55 4		301
249 8-10 VA-OT	40/ V2A	5835349	5311 55 4		305
249 8-10 VA-OT	40/ V2A	5835349	5311 55 4		352
249 8-10 VA-OT	40/ V2A	5835349	5311 55 4		367
249 8-10 ZV	44/ Cu	5417859	5311 53 5		355

Type listing

Structure of the GTIN: Country code **40** Manufacturer code **1219** Individual GTIN **5647589**

Type	Dimensions/Colour/Div.	GTIN	Art. no.	Price	Page
249 8-10X16 VA	/ V2A	5925446	5311 59 0	/100 pc.	356
249 B ALU	44/ Al	5452058	5311 71 3		355
249 B ST	40/ FT	5451990	5311 70 5		355
249 VA-OT	/ V2A	5693789	5311 57 3		306
249 VA-OT	/ V2A	5693789	5311 57 3		353
249 VA-OT	/ V2A	5693789	5311 57 3		368
250	/ St / FT	5418696	5312 90 6		321
250	/ St / FT	5418696	5312 90 6		360
250 A-BO	25/ St / F	5806530	5313 06 6		321
250 A-FT	40/ St / FT	5740537	5313 01 5		321
250 AS-FT	20/ St / FT	5543015	5313 03 1		321
250 A-VA	40/ V2A	5740476	5313 02 3		321
250 V4A	/ V4A	5700876	5312 92 5		321
250 V4A	/ V4A	5700876	5312 92 5		360
250 VA	/ V2A	5418757	5312 92 2		321
250 VA	/ V2A	5418757	5312 92 2		360
251 8-10	/ St / FT	5417972	5312 03 5		361
251 CU	/ Cu	5418030	5312 13 2		361
252 8-10 CU	/ Cu	5418214	5312 41 8		320
252 8-10 CU	/ Cu	5418214	5312 41 8		362
252 8-10 FT	/ St / FT	5418092	5312 31 0		320
252 8-10 FT	/ St / FT	5418092	5312 31 0		361
252 8-10 V4A	/ V4A	5700869	5312 31 8		320
252 8-10 V4A	/ V4A	5700869	5312 31 8		362
252 8-10X16 CU	/ Cu	5418276	5312 44 2		320
252 8-10X16 CU	/ Cu	5418276	5312 44 2		362
252 8-10X16 FT	/ St / FT	5418153	5312 34 5		320
252 8-10X16 FT	/ St / FT	5418153	5312 34 5		362
252 8-10x16 V4A	/ V4A	5893103	5312 34 6		320
252 8-10x16 V4A	/ V4A	5893103	5312 34 6		362
252 8-10XFL30 FT	/ St / F	5418399	5312 65 5	/100 pc.	321
252 8-10XFL30 FT	/ St / F	5418399	5312 65 5		360
252 8-10xFL30V4A	/ V4A	5893141	5312 65 6		321
252 8-10xFL30V4A	/ V4A	5893141	5312 65 6		360
253 10X16	/ St / F	5418573	5312 80 9	/100 pc.	320
253 10X16	/ St / F	5418573	5312 80 9		362
253 8X8	/ St / F	5418337	5312 60 4		319
253 8X8	/ St / F	5418337	5312 60 4		361
254 DIN 8-10 CU	/ Cu	5419112	5314 13 5		361
254 DIN 8-10 FT	/ St / FT	5418993	5314 03 8		361
255 30	52/ St / FT	5419174	5314 51 8		319
255 A-FL30 FT	60/ St / FT	5419235	5314 53 4		319
256 A-DIN 30 FT	60/ St / FT	5419471	5314 65 8		319
256 A-DIN 30 V4A	60/ V4A	5893080	5314 65 9		319
256 A-DIN 30 VA	60/ V2A	5925873	5314 72 0	/100 pc.	319
256 A-DIN 40 FT	80/ St / FT	5419532	5314 66 6		319
256 DIN 30 FT	60/ St / FT	5419297	5314 61 5		319
256 DIN 30 V4A	60/ V4A	5893097	5314 61 6		319
256 DIN 40 FT	80/ St / FT	5419358	5314 62 3	/100 pc.	319
259 8-10	/ TG / FT	5419716	5315 50 6		358
259 A FT	/ St / FT	5740414	5315 51 4		322
259 A FT 8-OT	/ St / FT	5737070	5315 51 7		368
259 A ST	/ St	5237198	5315 55 7		322
259 A VA	/ V2A	5740353	5315 52 2		322
260 8	/ Zn / G	5419839	5315 70 0		359
260 8-10 MS	/ CuZn / Cu	5419778	5315 65 4		359
262	/ St / FT	5419891	5316 01 4		366
262 A-DIN CU	/ Cu	5420071	5316 25 1		366
262 A-DIN FT	/ St / FT	5420019	5316 21 9		366
262 CU	/ Cu	5419952	5316 15 4		366
262 ZM	/ St / FT	5818359	5316 17 0		366
264	/ St / F	5420316	5316 51 0		367
264 CU	/ Cu	5420378	5316 55 3	/100 pc.	367
267	/ St / FT	5420132	5316 30 8		365
267 VA	/ V2A	5420194	5316 32 4		366
269 8-10	/ Zn / G	5420439	5317 01 0		363
269 MS	/ Zn / Cu	5420491	5317 05 3		363
270 8-10 CU	/ Cu	5420675	5317 25 8		364
270 8-10 FT	/ St / FT	5420552	5317 20 7		363
270 8-10 VA	/ V2A	5893158	5317 20 8		363
271 8-10	/ St / FT	5420798	5317 40 1	/100 pc.	364
271 8-10 VA	/ V2A	5850861	5317 48 1		364
271 CU	/ Cu	5420910	5317 45 2		364
272 14	/ TG / FT	5421092	5318 14 9		363
272 8	/ TG / FT	5421030	5318 08 4		363
273 8-10	/ St / FT	5420613	5317 22 3		364
273 CU	/ Cu	5420736	5317 27 4		364
274 8-10	/ St / FT	5420859	5317 42 8		365
274 CU	/ Cu	5420972	5317 47 9		365
280 8-10	/ Zn / G	5421276	5320 01 1		368
280 VK	/ Zn	5421337	5320 05 4		368
287	/ Al	5421573	5320 70 4		369
287 CU	/ Cu	5421511	5320 69 0		369
288 DIN	/ Al	5421634	5320 71 2		369
292 DIN	/ TG / F	5424994	5340 01 2		374
301 CU-100	/ Cu	5426370	5350 70 0		370
301 CU-110	/ Cu	5426431	5350 71 9		370
301 CU-120	/ Cu	5426493	5350 72 7		370
301 CU-80	/ Cu	5426257	5350 68 9		370
301 CU-90	/ Cu	5426318	5350 69 7		370
301 DIN-100	/ St / FS	5425717	5350 10 7		370
301 DIN-110	/ St / FS	5425779	5350 11 5		370
301 DIN-120	/ St / FS	5425830	5350 12 3		370
301 DIN-80	/ St / FS	5425595	5350 08 5		370
301 DIN-90	/ St / FS	5425656	5350 09 3		370
301 S-100	/ St / FS	5426974	5351 05 7		370
301 S-120	/ St / FS	5427032	5351 07 3		370
301 S-AL-100	/ Al	5890652	5351 35 9		370
301 S-AL-120	/ Al	5890713	5351 37 5		370
301 S-CU-100	/ Cu	5427216	5351 45 6		371
301 S-CU-120	/ Cu	5427278	5351 47 2		371
301 S-VA-100	/ V2A	5427094	5351 25 1		371
301 S-VA-120	/ V2A	5427155	5351 28 6		371
301 V	/ St / FS	5426790	5350 86 7		369
301 V-CU	/ Cu	5426851	5350 88 3		370
301 V-VA	/ V2A	5426912	5350 90 5		370
303 DIN-1	/ St / FT	5399971	5102 11 1		371
303 DIN-1 1/2	/ St / FT	5400097	5102 15 4		371
303 DIN-1 1/4	/ St / FT	5400035	5102 13 8		371
303 DIN-1/2	/ St / FT	5399858	5102 07 3		371
303 DIN-2	/ St / FT	5400158	5102 19 7		371
303 DIN-2 1/2	/ St / FT	5400219	5102 21 9		371
303 DIN-3	/ St / FT	5400271	5102 23 5		371
303 DIN-3 1/2	/ St / FT	5400332	5102 25 1		371
303 DIN-3/4	/ St / FT	5399919	5102 08 1		371
303 DIN-3/8	/ St / FT	5399797	5102 05 7		371
303 DIN-4	/ St / FT	5400394	5102 27 8		371
311 N-ALU 16	/ Al	5631392	3049 34 5		326
311 N-ALU 16	/ Al	5631392	3049 34 5		374
311 N-ALU 8-10		5631576	3049 25 6		326
311 N-ALU 8-10		5631576	3049 25 6		374
311 N-CU 16	/ Cu	5631514	3049 30 2		326
311 N-CU 16	/ Cu	5631514	3049 30 2		374
311 N-CU 8-10	/ Cu	5631699	3049 20 5		326
311 N-CU 8-10	/ Cu	5631699	3049 20 5		374
311 N-VA 16	/ V2A	5631453	3049 32 9		326
311 N-VA 16	/ V2A	5631453	3049 32 9		374
311 N-VA 8-10	/ V2A	5631637	3049 22 1		326
311 N-VA 8-10	/ V2A	5631637	3049 22 1		374
319 10	/ TG / F	5421931	5325 31 5		367

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				/100 pc.	
319 8	/ TG / F	5421870	5325 30 7		367
324 S-CU	/ Cu	5422532	5326 33 8		368
324 S-FT	/ St / FT	5422419	5326 30 3		368
324 S-VA	/ V2A	5422471	5326 31 1		368
330 K	/ PA	5401599	5201 10 1		336
				/pc.	
356 100	100 10	5230595	2360 10 1		326
356 100	100 10	5230595	2360 10 1		377
356 50	50 10	5230533	2360 05 5		326
356 50	50 10	5230533	2360 05 5		377
364	297 / St / FT	5244219	3051 01 3		378
				/100 pc.	
366 35	35 / St / FT	5388876	5059 35 6		326
366 50	50 / St / FT	5389057	5059 49 6		326
370 H	55 / St / FT	5382690	5025 20 6		325
470 4-16	/ CuZn / N	5389231	5064 01 5		306
				/pc.	
480 180		5412571	5240 03 4		288
480 250		5412755	5240 07 7		288
480 350		5412694	5240 06 9		288
481		5412816	5240 08 5		288
482		5412632	5240 05 0		289
484 M12	13 / St / F	5412991	5240 22 0		288
484 M16	17 / St / F	5413059	5240 23 9		288
484 M20	21 / St / F	5413110	5240 24 7		288
484 M24	25 / St / F	5413172	5240 25 5		288
485 M10	11 / St / F	5413233	5240 30 1		288
485 M12	13 / St / F	5413295	5240 32 8		288
485 M16	17 / St / F	5413356	5240 33 6		288
485 M20	21 / St / F	5413417	5240 34 4		288
				/100 pc.	
555 7.6x380 SWUV	7.6 x 380 102 / PA	5896920	2332 78 4		393
708 30 HG	52 / St / G	5383659	5030 23 4		
708 30 SP	52 / St / G	5383413	5030 02 1		325
708 40 HG	52 / St / G	5383710	5030 24 2		
710 30	52 / St / G	5383055	5028 03 5		325
710 40	62 / St / G	5383116	5028 04 3		325
733 16 VA	14-16 6,5 x 10 / V2A	5116714	1362 01 1		352
733 21 VA	19-21 6,5 x 10 / V2A	5116837	1362 04 6		354
831 30	54 / St / FT	5383833	5032 03 2		324
831 30 M6	54 / St / FT	5383956	5032 23 7		324
831 40	65 / St / FT	5383895	5032 04 0		324
831 40 M6	65 / St / FT	5384014	5032 24 5		324
832 30	55 / St / FT	5384137	5032 53 9		324
832 40	65 / St / FT	5384199	5032 54 7		324
833 35	60 / St / FT	5384434	5033 03 9		324
835	/ St / FT	5433750	5033 20 9		324
853 200	200 / Cu	5885573	5331 00 8		369
853 300	300 / Cu	5423379	5331 01 3		369
853 400	400 / Cu	5885580	5331 01 7		369
856	/ Cu	5423430	5331 50 1		369
910 N 10x50 GRW	1050 / PA	5229155	2349 10 8		378
910 N 12x60 GRW	1260 / PA	5229216	2349 12 4		378
910 N 5x25 GRW	525 / PA	5228851	2349 04 3		378
910 N 6x30 GRW	630 / PA	5228912	2349 05 1		378
910 N 6x60 GRW	660 / PA	5228974	2349 07 8		378
910 N 8x40 GRW	840 / PA	5229032	2349 08 6		378
925 1	70 31,7-33,7 / St / G	5385455	5040 11 6		304
925 1 1/2	88 46,3-48,3 / St / G	5385578	5040 15 9		304
925 1 1/4	81 40,4-42,4 / St / G	5385516	5040 13 2		304
925 1/2	56 19,3-21,3 / St / G	5385332	5040 07 8		304
925 1/4	48 11,5-13,5 / St / G	5385219	5040 03 5		304
925 3/4	62 24,9-26,9 / St / G	5385394	5040 09 4		304
925 3/8	52 15,2-17,2 / St / G	5385271	5040 05 1		304
927 0	/ CuZn / N	5388517	5057 50 7		303
927 1	/ V2A	5388579	5057 51 5		303
927 2	/ V2A	5388630	5057 52 3		303
927 2 6-K	/ V2A	5699651	5057 59 9		392
927 4	/ V2A	5388692	5057 55 8		303
927 BAND-VA	230,3 / V2A	5805458	5057 92 2	/100 m	303
927 SCH-K-VA	/ V2A	5805519	5057 93 0	/100 pc.	303
928	240 / CuZn / N	5385936	5040 50 7		304
937 50	100 / St / FT	5385998	5043 01 8		306
939	150 / St / G	5386056	5043 10 7		306
942 11	44 8-11 / Cu / N	5384557	5038 01 4		304
942 15	50 13-15 / Cu / N	5384618	5038 03 0		304
942 18	52 16-18 / Cu / N	5384670	5038 05 7		304
942 22	55 19-22 / Cu / N	5384731	5038 07 3		304
942 28	63 24-28 / Cu / N	5384793	5038 08 1		304
942 35	71 30-35 / Cu / N	5384854	5038 11 1		304
942 43	81 39-43 / Cu / N	5384915	5038 13 8		304
942 49	86 44-49 / Cu / N	5384977	5038 15 4		304
950 Z 1	66 31,5-34,5 / Zn / G	5386353	5050 11 1		304
950 Z 1 1/2	84 46,5-49,5 / Zn / G	5386476	5050 15 4		304
950 Z 1 1/4	78 40,5-43,5 / Zn / G	5386414	5050 13 8		304
950 Z 1 3/4	88 51-54 / Zn / G	5386537	5050 17 0		304
950 Z 1/2	54 20-22,5 / Zn / G	5386230	5050 07 3		304
950 Z 1/4	45 12-14 / Zn / G	5386117	5050 03 0		304
950 Z 2	96 58,5-61,5 / Zn / G	5386599	5050 19 7		304
950 Z 3/4	61 25-28 / Zn / G	5386292	5050 08 1		304
950 Z 3/8	50 15,5-17,5 / Zn / G	5386179	5050 05 7		304
951	120 / V2A	5386650	5051 50 9		305
952 Z 1	77 30,5-33,5 / St / FT	5386957	5052 11 4		305
952 Z 1 1/2	94 45,5-48,5 / St / FT	5387077	5052 15 7		305
952 Z 1 1/4	87 39,5-42,5 / St / FT	5387015	5052 13 0		305
952 Z 1/2	65 18,5-21,5 / St / FT	5386834	5052 07 6		305
952 Z 2	105 57-60 / St / FT	5387190	5052 18 1		305
952 Z 3/4	71 24-27 / St / FT	5386896	5052 09 2		305
985 M6 25	25 4,3 / St / G	5250395	3133 02 8		378
985 M6 35	35 4,3 / St / G	5250456	3133 03 6		378
985 M8 35	35 10 / St / G	5250579	3133 23 0		378
1801 AH	Grey / PS	5378617	5015 70 7	/pc.	297
1801 KL1	212 / CuZn	5378730	5015 72 3		297
1801 KL2	430 / CuZn	5378976	5015 80 4		297
1801 KL3	645 / CuZn	5379034	5015 81 2		297
1801 RK25	/ St / G	5378853	5015 75 8		296
1801 RK30	/ St / G	5378792	5015 73 1		296
1801 RK40	/ St / G	5455837	5015 77 4		297
1801 RK95	/ St / G	5378914	5015 76 6		296
1801 SCH	Grey / PS	5378679	5015 71 5		297
1801 VDE	Grey / CuZn	5378556	5015 65 0		296
1802 10 CU	40 / Cu	5002260	5015 84 2		301
1802 10 VA	40 / V2A	5002284	5015 86 6		301
1802 12 CU	40 / Cu	5699354	5015 84 4		301
1802 14 CU	40 / Cu	5699361	5015 84 7		301
1802 20 CU	40 / Cu	5699408	5015 84 9		301
1802 5 CU	40 / Cu	5002253	5015 83 0		301
1802 5 VA	40 / V2A	5002277	5015 85 4		301
1802 6 CU	40 / Cu	5699330	5015 83 2		301
1802 8 CU	40 / Cu	5699347	5015 83 6		301
1802 AH 10	/ V2A	5033677	5015 88 4		301
1802 AH 5	/ V2A	5033615	5015 88 0		301
1802 KL	/ V2A	5033738	5015 89 0		301
1804	/ CuZn	5378495	5015 55 3		299
1804 AP	/ PE	5477839	5015 55 7		

Type listing

Structure of the GTIN: Country code **40** Manufacturer code **1219** Individual GTIN **5647589**

Type	Dimensions/Colour/Div.	GTIN	Art. no.	Price	Page
				/pc.	
1804 UP	/ CuZn	5378433	5015 54 5		299
1805 2 FT	200110/ St / FT	5379096	5016 02 9		302
1805 2 FT	200110/ St / FT	5379096	5016 02 9		323
1805 2 VA	200110/ V4A	5922216	5016 09 6		323
1805 2 VA	200110/ V4A	5922216	5016 09 6		302
1805 4 FT	302212/ St / FT	5379157	5016 03 7		302
1805 4 FT	302212/ St / FT	5379157	5016 03 7		323
1805 4 VA	302212/ V4A	5800354	5016 11 8		323
1805 4 VA	302212/ V4A	5800354	5016 11 8		302
1805 6 FT	404314/ St / FT	5379218	5016 04 5		302
1805 6 FT	404314/ St / FT	5379218	5016 04 5		323
1805 6 VA	404314/ V4A	5922278	5016 12 6		323
1805 6 VA	404314/ V4A	5922278	5016 12 6		302
1807	/ Al	5379270	5016 14 2		323
1808	/ CuZn	5378075	5015 01 4		299
1809	Grey/ CuZn	5378259	5015 07 3		297
1809 30 AH	Grey/ PS	5800118	5015 20 0		298
1809 A	Black/ V2A	5959427	5015 11 1		300
1809 BG	Grey/ CuZn	5378372	5015 50 2		298
1809 M	Grey/ CuZn	5378310	5015 08 1		298
1809 UP	/ CuZn	5378198	5015 06 5		
1810	/ St / F	5378136	5015 05 7		298
1811	250/ St / FT	5377894	5014 01 8		323
1811 L	400/ St / FT	5377955	5014 02 6		323
1813 DIN	/ St / FT	5378013	5014 21 2		323
1813 KL	/ St / FT	5901938	5014 42 5		322
1814 FT	/ St / FT	5105015	5014 46 8		322
1814 ST	/ St	5105077	5014 47 6		322
1816 F-1000X1000	/ St / FT	5376996	5009 23 5		317
1816 F-500X1000	/ St / FT	5376934	5009 22 7		317
1816 F-500X500	/ St / FT	5376873	5009 21 9		317
				/100 pc.	
1818	/ St / FT	5377719	5012 01 5		322
				/pc.	
1819 20	/ TG / FT	5242710	3041 20 4		313
1819 20BP	/ TG / FT	5242772	3041 21 2		313
1819 25	/ TG / FT	5242833	3041 25 5		313
1819 25BP	/ TG / FT	5242956	3041 95 6		313
1820 20	/ St	5243137	3042 20 0		314
1820 25	/ St	5243199	3042 25 1		314
				/100 pc.	
2056N SAS 12 VA	8-12 / V2A	5432432	1167 01 4		306
2056N SAS 16 VA	12-16 / V2A	5432494	1167 02 2		306
2056N SAS 22 VA	16-22 / V2A	5432555	1167 03 0		306
2056N SAS 28 VA	22-28 / V2A	5432616	1167 04 9		306
2056N SAS 8 VA	4-8 / V2A	5432371	1167 00 6		306
				/100 m	
2066 2M F	25 x 12/ St / F	5046516	1117 02 5		306
2066 2M FS	25 x 12/ St / FS	5046578	1117 03 3		306
				/pc.	
2500 20	/ St	5243311	3043 20 7		314
2500 25	/ St	5243373	3043 25 8		314
2510 20	/ St	5717492	3043 31 2		314
2520 20	/ St	5243793	3043 70 3		314
2520 25	/ St	5243854	3043 75 4		314
2530 20	/ St	5243557	3043 40 1		314
2530 25	/ St	5243618	3043 45 2		314
2531 20	/ St	5642312	3043 90 8		314
2535 20	/ St	5453796	3043 91 6		315
2535 25	/ St	5453970	3044 91 2		315
2536 20	/ St	5643036	3044 90 4		315
2536 25	/ St	5642978	3044 83 1		315

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				/pc.	
2710 20	84/ St / FT	5372370	5001 21 8		318
2710 25	89/ St / FT	5372431	5001 22 6		318
2730 20 FT	84/ St / FT	5372554	5001 40 4		318
2730 20 VA	84/ V2A	5635475	5001 36 6		318
2730 25 FT	89/ St / FT	5372615	5001 41 2		318
2745 20 MS	/ CuZn / Cu	5372851	5001 56 0		318
2745 20 MS	/ CuZn / Cu	5372851	5001 56 0		374
2760 20 FT	101/ St / FT	5372912	5001 64 1		318
2760 20 V4A	101/ V4A	5862697	5001 63 3		318
2760 20 VA	101/ V2A	5635239	5001 61 7		318
2760 25 FT	110/ St / FT	5372974	5001 66 8		318
2760 25 V4A	110/ V4A	5901259	5001 67 2		318
				/pc.	
2760 B-20 FT	101/ St / FT	5754879	5001 74 9		318
2760 B-20 VA	101/ V2A	5752653	5001 62 5		318
				/100 pc.	
5000	/ St / F	5415695	5304 00 8		356
5001 DIN-FT	/ St / FT	5415879	5304 10 5		356
5001 DIN-FT+VA	/ St / FT	5858034	5304 10 7		356
5001 N-CU	/ Cu	5817574	5304 17 2		357
5001 N-FT	/ St / FT	5817512	5304 16 4		357
5001 N-VA	/ V2A	5892809	5304 17 6		357
				/100 pc.	
5001 ZN-CU	/ Zn / Cu	5415930	5304 11 3		356
5002 DIN-FT	/ St / FT	5416050	5304 20 2		356
5002 N-VA	/ V2A	5892847	5304 27 0		357
				/100 pc.	
5003	/ TG / FT	5416234	5304 31 8		357
5004 DIN-FT 12	/ TG / FT	5416357	5304 40 7		362
5004 DIN-FT 20	/ TG / FT	5416418	5304 50 4		362
5005 DIN-FT	/ St / F	5416470	5304 60 1		358
5005 N-FT	/ St / FT	5817758	5304 66 0		358
5009	/ St / F	5416951	5304 97 0		358
5010 20 FT	/ St / FT	5503057	5304 52 0		363
5011	/ St / FT	5417071	5304 99 7		322
5011	/ St / FT	5417071	5304 99 7		358
5011 VA M10	/ V4A	5629115	5334 93 4		323
5011 VA M10	/ V4A	5629115	5334 93 4		358
5011 VA M12	/ V4A	5959663	5334 94 2		323
5011 VA M12	/ V4A	5959663	5334 94 2		358
				/100 m	
5052 DIN 20X2.5	20 x 2,5/ St / FT	5680468	5019 34 0		310
5052 DIN 20X2.5	20 x 2,5/ St / FT	5680468	5019 34 0		330
5052 DIN 25X3	25 x 3/ St / FT	5694007	5019 34 2		310
5052 DIN 25X3	25 x 3/ St / FT	5694007	5019 34 2		330
5052 DIN 30X3	30 x 3/ St / FT	5694014	5019 34 4		310
5052 DIN 30X3	30 x 3/ St / FT	5694014	5019 34 4		330
5052 DIN 30X3.5	30 x 3,5/ St / FT	5680475	5019 34 5		310
5052 DIN 30X3.5	30 x 3,5/ St / FT	5680475	5019 34 5		330
5052 DIN 30X3.5	30 x 3,5/ St / FT	5680482	5019 34 7		310
5052 DIN 30X3.5	30 x 3,5/ St / FT	5680482	5019 34 7		330
5052 DIN 30X4	30 x 4/ St / FT	5680499	5019 35 0		310
5052 DIN 30X4	30 x 4/ St / FT	5680499	5019 35 0		330
5052 DIN 40X4	40 x 4/ St / FT	5680505	5019 35 5		310
5052 DIN 40X4	40 x 4/ St / FT	5680505	5019 35 5		330
5052 DIN 40X5	40 x 5/ St / FT	5680512	5019 36 0		310
5052 DIN 40X5	40 x 5/ St / FT	5680512	5019 36 0		330
5052 V2A 30X3.5	30 x 3,5/ V2A	5800415	5018 50 1		310
5052 V2A 30X3.5	30 x 3,5/ V2A	5800415	5018 50 1		330
5052 V4A 30X3.5	30 x 3,5/ V4A	5800477	5018 70 6		310
5052 V4A 30X3.5	30 x 3,5/ V4A	5800477	5018 70 6		330
5052 V4A 30X3.5	30 x 3,5/ V4A	5022015	5018 73 0		310
5052 V4A 30X3.5	30 x 3,5/ V4A	5022015	5018 73 0		330
				/pc.	
5700 A DIN		5400936	5106 02 8		376
5700 DIN		5400875	5106 00 1		376
5800 VA	/ V2A	5900436	5106 14 1		376
5800 VZ	/ St / FS	5900375	5106 13 3		376

Always indicate the item number when ordering.

Type	Dimensions/Colour/Div.	GTIN	Art. no.	Price	Page
				/pc.	
5900	/ St	5244813	3059 00 6		378
ASP-V11EI 4		5917717	5083 08 7		257
ASP-V24T 4		5917595	5083 06 0		257
				/100 pc.	
B 33020	228/ CuZn	6049080	6404 00 6		306
B 33021	2610/ CuZn	6049202	6404 01 4		306
				/pc.	
C 25-B+C 0		5919391	5095 60 3		164
C 25-B+C 0		5919391	5095 60 3		195
C 25-B+C 1		5542957	5095 60 6		156
C 25-B+C 1		5542957	5095 60 6		179
C 25-B+C 1		5542957	5095 60 6		195
CNS 3-D-D	EN Black	5952817	5092 70 1		211
CNS-D-D	EN Light grey	5314837	5092 60 4		211
DLS-BS		5685333	5082 38 2		251
DS-7 16 M/W		5030881	5093 17 1		247
DS-BNC M/M		5391098	5093 26 0		246
DS-BNC M/W		5391036	5093 25 2		245
DS-BNC W/W		5390978	5093 23 6		245
DS-F M/W		5022732	5093 27 5		247
DS-F W/W		5022619	5093 27 2		247
DS-N M/W		5805991	5093 99 6		246
DS-N W/W		5962243	5093 98 8		246
DS-SMA W/W		5867050	5093 27 7		247
DS-TNC M/W		5087250	5093 27 0		246
FC-D	EN Pure white	5035053	5092 80 0		210
FC-ISDN-D	EN Pure white	5047223	5092 81 2		211
FC-RJ-D	EN Pure white	5047254	5092 82 8		211
FC-SAT-D	EN Pure white	5035176	5092 81 6		210
FC-TAE-D	EN Pure white	5035237	5092 82 4		210
FC-TV-D	EN Pure white	5035114	5092 80 8		210
FDB-2 24-M	3222	5683339	5098 38 0		282
FDB-2 24-N	3222	5683384	5098 39 0		282
FDB-3 24-M	3222	5683346	5098 38 2		282
FDB-3 24-N	3222	5683391	5098 39 2		282
				/100 pc.	
F-FIX-10		5070054	5403 10 3		333
F-FIX-10B		5070061	5403 11 0		333
				/pc.	
F-FIX-132	110/ V2A	5613572	5403 33 0		336
F-Fix-132-300	300/ V2A	5813903	5403 33 3		336
				/100 pc.	
F-FIX-16		5548713	5403 20 0		333
F-FIX-16B		5110637	5403 20 5		333
F-FIX-B10	/ PP	5070085	5403 12 4		334
F-FIX-B10	/ PP	5070085	5403 12 4		385
F-FIX-B16	/ PP	5548959	5403 23 5		333
F-FIX-B16	/ PP	5548959	5403 23 5		384
F-FIX-B16 3B	25/ PP	5926320	5403 23 8		338
F-FIX-B16 3B	25/ PP	5926320	5403 23 8		392
				/pc.	
F-FIX-BASIS	/ PP	5034933	5403 32 4		332
F-FIX-JUNIOR	1000/ Al	5034872	5403 30 8		332
				/100 pc.	
F-FIX-KL	/ V2A	5548775	5403 21 9		334
F-FIX-S10		5070078	5403 11 7		334
F-FIX-S10		5070078	5403 11 7		384
F-FIX-S16		5548898	5403 22 7		333
F-FIX-S16		5548898	5403 22 7		338
F-FIX-S16		5548898	5403 22 7		384
F-FIX-S16		5548898	5403 22 7		392

Type	Dimensions/Colour/Div.	GTIN	Art. no.	Price	Page
				/100 m	
FL 20-CU	20 x 2,5/ Cu	5382331	5021 80 4		310
FL 20-CU	20 x 2,5/ Cu	5382331	5021 80 4		330
				/pc.	
FLD 110		5578413	5098 64 6		270
FLD 12		5578376	5098 60 3		269
FLD 2-110		5578512	5098 85 9		272
FLD 2-12		5578444	5098 80 8		271
FLD 2-24		5578451	5098 81 6		271
FLD 24		5578383	5098 61 1		269
FLD 2-48		5578468	5098 82 4		271
FLD 2-5		5578529	5098 86 7		271
FLD 48		5578390	5098 63 0		269
FLD 5		5578369	5098 60 0		269
FLD 60		5578406	5098 63 8		270
FRD 110		5578338	5098 55 7		267
FRD 12		5578291	5098 50 6		266
FRD 2-24		5578420	5098 72 7		268
FRD 24		5578307	5098 51 4		266
FRD 24 HF		5578352	5098 57 5		265
FRD 2-5		5578437	5098 79 4		268
FRD 48		5578314	5098 52 2		266
FRD 5		5578284	5098 49 2		266
FRD 5 HF		5578345	5098 57 1		265
FS-V20		5397458	5099 80 3		289
ISAV1000R	/ GFK	5004608	5408 84 9		386
ISAV1000W	/ GFK	5009733	5408 85 2		386
				/100 m	
isCon 750 LGR	Light grey	5888123	5407 99 5		388
isCon 750 LGR	Light grey	5888154	5407 99 7		388
isCon 750 SW	Black	5674573	5408 00 2		388
isCon 750 SW	Black	5674627	5408 00 4		388
isCon 750 SW	Black	5854265	5408 00 6		388
				/pc.	
isCon AP1-16 VA	/ V2A	5674696	5408 02 6		392
isCon AP2-16 VA	/ V2A	5674702	5408 02 8		392
isCon connect	/ V2A	5674689	5408 02 2		388
isCon cut		5674641	5408 01 1		388
isCon DH	23-26 / GFK	5674863	5408 04 3		390
				/100 pc.	
isCon EPPA 004	140200/ Z-PP-P	5813781	5408 06 0		
				/pc.	
isCon H 26 VA	/ V2A	5872696	5408 06 4		389
isCon H VA	/ V2A	5699668	5408 05 6		389
isCon H280 26 PA	Light grey/ PA	5872757	5408 07 2		390
isCon H280 26 VA	/ V2A	5872764	5408 07 4		390
isCon H280 PA	Black/ PA	5674887	5408 04 9		390
isCon H280 VA	/ V2A	5674870	5408 04 7		390
isCon HS 26 PA	Light grey/ PA	5872702	5408 06 6		389
isCon HS 26 VA	/ V2A	5872740	5408 06 8		389
isCon HS PA	Black/ PA	5674917	5408 05 4		389
isCon HS VA	/ V2A	5674726	5408 05 2		389
isCon HWS	/ PS	5813774	5408 05 8		
isCon IN connect	M16/ V2A	5864172	5408 02 4		391
isCon IN PAE	49,9/ Al	5871569	5408 03 1		391
isCon PAE	/ V2A	5674719	5408 03 6		388
isCon stripper	23-26	5674634	5408 00 9		388
isFang 3B-100	1000/ V2A	5670148	5408 96 8		337
isFang 3B-100	1000/ V2A	5670148	5408 96 8		391
isFang 3B-100 AL	1000/ Al	5802433	5408 96 6		337
isFang 3B-100 AL	1000/ Al	5802433	5408 96 6		391
isFang 3B-100-A	1026/ V2A	5859550	5408 93 0		337
isFang 3B-100-A	1026/ V2A	5859550	5408 93 0		391
isFang 3B-150	1500/ V2A	5674931	5408 96 9		337
isFang 3B-150	1500/ V2A	5674931	5408 96 9		391
isFang 3B-150 AL	1500/ Al	5802440	5408 96 7		337
isFang 3B-150 AL	1500/ Al	5802440	5408 96 7		391
isFang 3B-150-A	1500/ V2A	5859567	5408 93 2		337
isFang 3B-150-A	1500/ V2A	5859567	5408 93 2		391
isFang 3B-G1	270/ V2A	5674948	5408 97 1		338
isFang 3B-G1	270/ V2A	5674948	5408 97 1		392
isFang 3B-G2	340/ V2A	5674979	5408 97 2		338
isFang 3B-G2	340/ V2A	5674979	5408 97 2		392
isFang 3B-G3	430/ V2A	5674986	5408 97 3		338
isFang 3B-G3	430/ V2A	5674986	5408 97 3		392
isFang 4000	1240/ GFK	5670056	5408 94 2		337
isFang 4000	1240/ GFK	5670056	5408 94 2		391

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isFang 4000 AL	1240/ GFK	5785330	5408 94 3		337
isFang 4000 AL	1240/ GFK	5785330	5408 94 3		391
isFang 6000	3340/ GFK	5670063	5408 94 6		337
isFang 6000	3340/ GFK	5670063	5408 94 6		391
isFang 6000 AL	3340/ GFK	5785347	5408 94 7		337
isFang 6000 AL	3340/ GFK	5785347	5408 94 7		391
isFang IN 4000	1325/ GFK	5871613	5408 93 4		338
isFang IN 4000	1325/ GFK	5871613	5408 93 4		393
isFang IN 6000	3325/ GFK	5871620	5408 93 6		338
isFang IN 6000	3325/ GFK	5871620	5408 93 6		393
isFang IN-A 4000	1325/ GFK	5871668	5408 93 8		337
isFang IN-A 4000	1325/ GFK	5871668	5408 93 8		390
isFang IN-A 6000	3325/ GFK	5871675	5408 94 0		337
isFang IN-A 6000	3325/ GFK	5871675	5408 94 0		390
isFang TR100	40/ V2A	5670100	5408 95 6		339
isFang TR100	40/ V2A	5670100	5408 95 6		393
isFang TR100 100	100/ V2A	5849360	5408 95 5		339
isFang TR100 100	100/ V2A	5849360	5408 95 5		394
isFang TR100 200	200/ V2A	5849391	5408 95 7		339
isFang TR100 200	200/ V2A	5849391	5408 95 7		394
isFang TR100 300	300/ V2A	5849407	5408 95 9		339
isFang TR100 300	300/ V2A	5849407	5408 95 9		394
isFang TS40-50	40/ V2A	5670117	5408 95 8		339
isFang TS40-50	40/ V2A	5670117	5408 95 8		394
isFang TS50-60	30/ V2A	5670124	5408 96 0		
isFang TS50-60	30/ V2A	5670124	5408 96 0		339
isFang TS50x50	30/ V2A	5670131	5408 96 4		
isFang TS50x50	30/ V2A	5670131	5408 96 4		339
isFang TW200	300/ V2A	5670094	5408 95 4		338
isFang TW200	300/ V2A	5670094	5408 95 4		393
isFang TW30	30/ V2A	5670087	5408 95 2		338
isFang TW30	30/ V2A	5670087	5408 95 2		393
isFang TW80	80/ V2A	5670070	5408 95 0		338
isFang TW80	80/ V2A	5670070	5408 95 0		393
ISO-A-1030	1080/ Al	5770497	5408 82 0		387
ISO-A-500	500/ Al	5542773	5408 80 6		387
ISO-A-800	800/ Al	5542834	5408 81 4		387
ISOLAB	D/GB	5921738	5096 81 2		292
KB MB		5709350	5089 66 0		206
KB MB		5709367	5089 66 2		206
KOAX B-E2 MF-C		5684916	5082 41 2		250
KOAX B-E2 MF-F		5684855	5082 42 0		250
KoaxB-E2 FF-F		5685074	5082 42 2		251
LC 63		5509899	5096 97 0		143
LE ERDER FT	1000/ St / FT	5018001	5000 29 7		312
LE ERDER FT	1500/ St / FT	5617358	5000 30 0		312
LE ERDER V4A	1500/ V4A	5708834	5000 33 5		312
LE HAMMER-AC	/ St	5111641	3043 61 8		315
LE HAMMER-B	/ St	5087137	3043 61 4		315
LE HAMMER-B-II	/ St	5421627	3043 62 8		315
LE HAMMER-H	/ St	5087076	3043 61 0		315
LE HAMMER-SDS-M	/ St	5111160	3043 60 2		315
LE HAMMER-W	/ St	5617419	3043 60 6		315
LE KOPF	/ St / FT	5617297	3042 30 8		313
LE SPITZE	/ St / FT	5617235	3041 40 9		313
LFC		5425182	5096 78 6		292
LSA-A-LEI	Grey	5525134	5084 00 8		241
LSA-BF-180		5525370	5084 02 4		242
LSA-BF-24		5525431	5084 02 8		242
LSA-B-MAG		5525318	5084 02 0		241
LSA-E		5525493	5084 03 2		242
LSA-E-LEI	Red	5525257	5084 01 6		241
LSA-G	Light grey/ PA	5110750	5084 04 8		243
LSA-M	/ St	5525554	5084 03 6		242
LSA-T-LEI	White	5525196	5084 01 2		241
LSA-TOOL		5525615	5084 04 0		243
MB 1		5415732	5096 64 8		165
MB 1		5415732	5096 64 8		196
MB 1		5415732	5096 64 8		205
MB 1+FS		5415749	5096 64 9		165
MB 1+FS		5415749	5096 64 9		196
MB 1+FS		5415749	5096 64 9		205
MB 1+NPE		5415770	5096 65 0		165
MB 1+NPE		5415770	5096 65 0		196
MB 1+NPE		5415770	5096 65 0		205
MB 1+NPE+FS		5415787	5096 65 1		165
MB 1+NPE+FS		5415787	5096 65 1		196
MB 1+NPE+FS		5415787	5096 65 1		205
MB 2		5415794	5096 65 3		165
MB 2		5415794	5096 65 3		196
MB 2		5415794	5096 65 3		205
MB 2+FS		5415800	5096 65 4		165
MB 2+FS		5415800	5096 65 4		196
MB 2+FS		5415800	5096 65 4		205
MB 2+NPE		5067481	5096 65 5		165
MB 2+NPE		5067481	5096 65 5		196
MB 2+NPE		5067481	5096 65 5		205
MB 2+NPE+FS		5067498	5096 65 7		165
MB 2+NPE+FS		5067498	5096 65 7		196
MB 2+NPE+FS		5067498	5096 65 7		205
MB 3		5067504	5096 66 5		165
MB 3		5067504	5096 66 5		196
MB 3		5067504	5096 66 5		205
MB 3+FS		5067535	5096 66 7		165
MB 3+FS		5067535	5096 66 7		196
MB 3+FS		5067535	5096 66 7		205
MB 3+NPE		5067542	5096 66 9		165
MB 3+NPE		5067542	5096 66 9		196
MB 3+NPE		5067542	5096 66 9		205
MB 3+NPE+FS		5067559	5096 67 1		165
MB 3+NPE+FS		5067559	5096 67 1		196
MB 3+NPE+FS		5067559	5096 67 1		205
MB 4		5067566	5096 68 0		165
MB 4		5067566	5096 68 0		196
MB 4		5067566	5096 68 0		205
MB 4+FS		5067597	5096 68 2		165
MB 4+FS		5067597	5096 68 2		196
MB 4+FS		5067597	5096 68 2		205
MB 50-3+NPE		5425144	5096 67 5		152
MB 50-3+NPE+FS		5425151	5096 67 7		152
MB25-3+NPE		5871200	5096 67 2		191
MB25-3+NPE+FS		5871248	5096 67 3		191
MB-FS		5813484	5096 69 3		
MB-FS		5813484	5096 69 3		164
MB-FS		5813484	5096 69 3		197
MB-SG	Blue/ PA	5616375	5096 69 5		
MB-SG	Blue/ PA	5616375	5096 69 5		164
MB-SG	Blue/ PA	5616375	5096 69 5		206
MC 125-B NPE		5966449	5096 86 3		140
MC 50-B 0 VDE		5480730	5096 82 0		142
MC 50-B 0-OS		5051428	5096 82 5		142
MC 50-B 3		5077046	5096 87 6		141
MC 50-B 3+1		5077084	5096 87 8		140
MC 50-B U VDE		5480792	5096 83 9		143
MC 50-B VDE		5966388	5096 84 7		141
MC 50-B-OS		5051411	5096 85 1		141
MC V3	/ Cu	5531135	5096 88 4		143
MC V4	/ Cu	5531197	5096 88 6		143
MCD 125-B NPE		5541394	5096 86 5		136
MCD 50-B		5541158	5096 84 9		137
MCD 50-B 0		5544517	5096 82 2		142
MCD 50-B 0-OS		5051473	5096 82 7		142
MCD 50-B 3		5077077	5096 87 7		137
MCD 50-B 3+1		5077091	5096 87 9		136
MCD 50-B 3+1-OS		5288299	5096 83 6		136
MCD 50-B 3+1-VG		5362036	5096 87 5		138
MCD 50-B 3-OS		5288282	5096 83 5		137
MCD 50-B 3-VG		5362029	5096 87 4		139
MCD 50-B-OS		5051466	5096 85 2		137
MDP-2 D-12-T-10		5787372	5098 41 5		278
MDP-2 D-24-T		5406860	5098 42 2		275
MDP-2 D-24-T-10		5787389	5098 42 5		279

Always indicate the item number when ordering.

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MDP-2 D-48-T		5406891	5098 44 2		276
MDP-2 D-5-T		5406839	5098 40 4		274
MDP-3 D-24-T		5406877	5098 42 7		275
MDP-3 D-48-T		5406907	5098 44 6		276
MDP-3 D-5-T		5406846	5098 40 7		274
MDP-4 D-12-T-10		5773610	5098 41 9		278
MDP-4 D-24-EX		5848523	5098 43 2		284
MDP-4 D-24-T		5406884	5098 43 1		275
MDP-4 D-24-T-10		5625131	5098 43 3		279
MDP-4 D-48-EX		5848530	5098 45 2		284
MDP-4 D-48-T		5406914	5098 45 0		276
MDP-4 D-5-EX		5848516	5098 41 2		284
MDP-4 D-5-T		5406853	5098 41 1		274
MDP-4 D-5-T-10		5625124	5098 41 3		277
				/VPE	
MK-B		5461111	5091 32 2		293
MK-B		5461111	5091 32 2		376
				/100 pc.	
M-Quick M25 SW	Jet black 20-25 / PA	5505396	2153 78 7		390
M-Quick M32 LGR	Light grey 25-32 / PA	5741671	2153 73 4		390
				/pc.	
ND-CAT6A/EA		5614364	5081 80 0		250
				/VPE	
PCS		5461296	5091 43 8		293
PCS		5461296	5091 43 8		376
				/pc.	
PCS-CS-D	EN	5461654	5091 68 3		293
PCS-CS-D	EN	5461654	5091 68 3		377
PCS-CS-GB	GB	5896111	5091 69 1		293
PCS-CS-GB	GB	5896111	5091 69 1		377
				/VPE	
PCS-H		5461470	5091 52 7		293
PCS-H		5461470	5091 52 7		377
				/pc.	
PS 2-B+C/TT+TNS		5759782	5089 74 8		167
PS3-B+C TNC		5405528	5089 75 4		168
PS3-B+C TNC+FS		5405535	5089 75 6		168
PS3-B+C-320		5806813	5089 75 5		168
PS3-B+C-320+FS		5816614	5089 75 7		168
PS3-VA TNC		5405566	5089 76 8		170
PS3-VA TNC+FS		5405580	5089 77 5		170
PS4-B+C TNS+FS		5405559	5089 76 3		167
PS4-B+C TT+TNS		5405542	5089 76 1		167
PS4-VA TT+FS		5405597	5089 77 7		169
PS4-VA TT+TNS		5405573	5089 77 0		169
P-TK		5017387	5086 01 9		207
P-TK+SAT		5017448	5086 02 3		207
P-TK+TV		5017509	5086 02 7		207
				/100 m	
RD 10	/ St / FT	5381617	5021 10 3		310
RD 10	/ St / FT	5381617	5021 10 3		330
RD 10-ALU	/ Al	5381976	5021 30 8		311
RD 10-ALU	/ Al	5381976	5021 30 8		331
RD 10-CU	/ Cu	5382096	5021 50 2		311
RD 10-CU	/ Cu	5382096	5021 50 2		331
RD 10-PVC	Black 10 / St / FT	5381730	5021 16 2		310
RD 10-PVC	Black 10 / St / FT	5381730	5021 16 2		330
RD 10-V2A	/ V2A	5801375	5021 22 7		311
RD 10-V2A	/ V2A	5801375	5021 22 7		331
RD 10-V2A	/ V2A	5680567	5021 23 9		311
RD 10-V2A	/ V2A	5680567	5021 23 9		331
RD 10-V4A	/ V4A	5902058	5021 64 2		311
RD 10-V4A	/ V4A	5902058	5021 64 2		331
RD 10-V4A	/ V4A	5680581	5021 64 7		311
RD 10-V4A	/ V4A	5680581	5021 64 7		331
RD 8-ALU	/ Al	5381914	5021 28 6		311
RD 8-ALU	/ Al	5381914	5021 28 6		331
RD 8-ALU-T	/ Al	5901273	5021 29 4		311
RD 8-ALU-T	/ Al	5901273	5021 29 4		331
RD 8-CU	/ Cu	5382034	5021 48 0		311
RD 8-CU	/ Cu	5382034	5021 48 0		331
RD 8-FT	/ St / FT	5381556	5021 08 1		310

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				/100 m	
RD 8-FT	/ St / FT	5381556	5021 08 1		330
RD 8-PVC	Cream 8 / Al	5067474	5021 33 2		311
RD 8-PVC	Cream 8 / Al	5067474	5021 33 2		331
RD 8-V2A	/ V2A	5680529	5021 23 5		311
RD 8-V2A	/ V2A	5680529	5021 23 5		331
RD 8-V4A	/ V4A	5680574	5021 64 4		311
RD 8-V4A	/ V4A	5680574	5021 64 4		331
				/pc.	
RJ11-TELE 4-C		5680536	5081 92 0		237
RJ11-TELE 4-C		5680536	5081 92 0		238
RJ11-TELE 4-F		5680413	5081 93 9		238
RJ45 S-ATM 8-F		5462439	5081 79 3		250
RJ45 S-E100 4-B		5239956	5081 72 6		252
RJ45 S-E100 4-C		5239895	5081 73 4		252
RJ45 S-E100 4-F		5239833	5081 74 2		252
RJ45-ISDN 4-C-G		5889458	5081 54 8		239
RJ45S-V24T 4-F		5502630	5081 64 5		253
RJ45S-V24T 8-F		5502692	5081 64 7		253
RJ45-TELE 4-C		5791119	5081 96 3		238
RJ45-TELE 4-F		5791058	5081 97 1		238
				/100 pc.	
RK-FIX	/ St / FT	5433682	5316 45 0		365
RK-FIX CU	/ V2A / Cu	5433736	5316 46 8		365
RK-FIX VA	/ V2A	5433729	5316 45 9		365
				/100 m	
S 11-CU	10,5 / Cu	5836209	5021 65 4		
S 11-CU	10,5 / Cu	5836209	5021 65 4		
S 9-CU	9 / Cu	5382218	5021 65 0		
S 9-CU	9 / Cu	5382218	5021 65 0		
				/pc.	
SC-TELE 4-C-G		5834793	5081 68 8		237
SD09-V11 9		5916277	5080 06 1		256
SD09-V24 9		5915973	5080 05 3		255
SD15-V24 15		5916031	5080 15 0		255
SD25-V11 25		5916390	5080 28 2		256
SD25-V24 25		5916215	5080 27 4		255
SD-Fix	/ V2A	5670735	5403 33 5		335
				/100 pc.	
SQ M6	Light grey M6 / PC	5016069	2146 50 9		389
SQ PP	630 / PA	5016182	2351 70 6		389
SQ-20 SW	Jet black 23 / PP	5655367	2146 16 4		389
SQ-25 LGR	Light grey 26 / PA	5595717	2146 20 7		389
				/pc.	
S-UHF M/W		5390732	5093 02 3		245
S-UHF W/W		5390671	5093 01 5		245
TKS-B		5578277	5097 97 6		265
				/100 pc.	
TrayFix		5738428	5403 10 0		334
TrayFix		5738428	5403 10 0		377
				/pc.	
TV 4+1		5022978	5083 40 0		248
ÜSM-A		5080886	5092 45 1		212
ÜSM-A-150		5475804	5092 46 6		212
ÜSM-A-2		5247098	5092 46 0		212
ÜSM-A-4		5613596	5092 47 2		212
ÜSM-A-TW		5613589	5092 47 0		212
ÜSS 45-A-ALU	Aluminium painted	5006220	6117 46 7		213

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ÜSS 45-A-RW	Pure white	6117611	6117 46 5		213
ÜSS 45-O-ALU	Aluminium painted	5006213	6117 47 5		213
ÜSS 45-O-RW	Pure white	6117673	6117 47 3		213
V 20-C 3+NPE+FS		5616382	5094 76 4		177
V 50-B+C 0-150	200	5681939	5094 40 0		151
V10 COMPACT 150		5246268	5093 37 8		200
V10 COMPACT 255		5076551	5093 38 0		200
V10 COMPACT 385		5126041	5093 38 4		200
V10 COMPACT-AS		5299448	5093 39 1		200
V10-C 0-150		5158103	5093 40 0		204
V10-C 0-280		5012825	5093 40 2		204
V10-C 0-320		5012832	5093 40 4		204
V10-C 0-385		5004660	5093 40 6		204
V10-C 1+NPE-280		5382799	5093 41 8		202
V10-C 3+NPE		5363903	5094 92 0		202
V10-C 3+NPE+FS		5363941	5094 93 1		202
V10-C 3+NPE-320		5363934	5094 92 4		203
V20-C 0-150	200	5519133	5096 70 7		193
V20-C 0-280	350	5396918	5099 60 9		193
V20-C 0-300PV	300	5708902	5099 61 1		231
V20-C 0-320-SP	420	5570318	5099 84 8		193
V20-C 0-335	420	5481270	5099 85 0		194
V20-C 0-385	505	5396857	5099 59 5		194
V20-C 0-440	585	5942498	5099 70 6		194
V20-C 0-500PV	500	5708933	5099 70 8		231
V20-C 0-550	745	5396970	5099 61 7		194
V20-C 0-75	100	5396734	5099 57 9		193
V20-C 1+FS-280		5406679	5094 72 7		182
V20-C 1+NPE+FS		5382911	5094 76 0		180
V20-C 1+NPE-150		5382966	5094 63 9		176
V20-C 1+NPE-280		5382973	5094 65 0		179
V20-C 1+NPE-385		5382980	5094 66 6		185
V20-C 1-150		5406617	5094 67 7		178
V20-C 1-280		5406594	5094 61 8		181
V20-C 1-385		5406655	5094 70 3		186
V20-C 1-550		5406662	5094 71 3		188
V20-C 2+AS-280		5393672	5096 37 5		183
V20-C 2+FS-280		5374923	5094 63 2		182
V20-C 2+FS-550		5374985	5094 63 6		189
V20-C 2+NPE+FS		5240235	5094 76 2		180
V20-C 2+NPE-150		5240044	5094 64 1		176
V20-C 2+NPE-280		5240068	5094 65 3		179
V20-C 2+NPEFS15		5240228	5094 75 0		177
V20-C 2-150		5382881	5094 67 9		178
V20-C 2-280		5382867	5094 62 1		181
V20-C 2-385		5382898	5094 70 4		186
V20-C 2-550		5382904	5094 71 4		188
V20-C 2-PH-1000	1000	5478669	5094 61 7		223
V20-C 2PH-600	600	5708889	5094 61 3		222
V20-C 2PHFS-1000	1000	5709114	5094 61 5		223
V20-C 2PHFS-600	600	5709077	5094 57 2		222
V20-C 3+AS-280		5393733	5096 38 3		183
V20-C 3+FS-280		5240198	5094 73 1		182
V20-C 3+FS-385		5240280	5094 78 0		187
V20-C 3+FS-550		5240334	5094 79 2		189
V20-C 3+FS-SÜ		5393191	5096 25 1		184
V20-C 3+NPE+AS		5617471	5096 39 7		180
V20-C 3+NPE+FS		5240242	5094 76 5		180
V20-C 3+NPE-150		5240051	5094 64 4		176
V20-C 3+NPE-280		5240099	5094 65 6		179
V20-C 3+NPE-385		5240112	5094 66 8		185
V20-C 3+NPE400		5871255	5094 90 0		191
V20-C 3+NPEFS38		5240303	5094 78 8		185
V20-C 3-150		5240129	5094 68 0		178
V20-C 3-280		5240020	5094 62 4		181
V20-C 3-385		5240150	5094 70 5		186
V20-C 3-550		5240174	5094 71 5		188
V20-C 3PH-1000	1000	5478621	5094 60 8		223
V20-C 3PH-600	600	5708872	5094 60 5		222
V20-C 3PHFS-1000	1000	5648482	5094 57 4		223
V20-C 3PHFS-600	600	5709084	5094 57 6		222
V20-C 4+AS-280		5393795	5096 39 1		183
V20-C 4+FS-280		5240204	5094 73 4		182
V20-C 4+FS-550		5240341	5094 79 5		189
V20-C 4+FS-SÜ		5393252	5096 27 8		184
V20-C 4-280		5240037	5094 62 7		181
V20-C 4-385		5240167	5094 70 8		186
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V20-C U-2 AS		5393856	5096 41 3		166
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V20-C U-3 AS		5393917	5096 42 1		166
V20-C U-3 AS		5393917	5096 42 1		197
V20-C U-3 AS		5393917	5096 42 1		206
V20-C U-3 FS-SÜ		5393559	5096 35 9		165
V20-C U-3 FS-SÜ		5393559	5096 35 9		196
V20-C U-3 FS-SÜ		5393559	5096 35 9		205
V20-C U-3+NPE		5063407	5096 37 0		166
V20-C U-3+NPE		5063407	5096 37 0		197
V20-C U-3+NPE		5063407	5096 37 0		206
V20-C U-3+NPE-AS		5247104	5096 37 2		166
V20-C U-3+NPE-AS		5247104	5096 37 2		197
V20-C U-3+NPE-AS		5247104	5096 37 2		206
V20-C U-3PH-Y		5299455	5096 64 7		232
V20-C U-3PH-Y-FS		5648499	5096 64 6		232
V20-C U-4 AS		5393979	5096 44 8		166
V20-C U-4 AS		5393979	5096 44 8		197
V20-C U-4 AS		5393979	5096 44 8		206
V20-C U-4 FS-SÜ		5393610	5096 36 7		165
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V20-C U-4 FS-SÜ		5393610	5096 36 7		205
V20-C3+NPE400+FS		5871262	5094 90 2		191
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V25-B+C 0-150	200	5965664	5097 08 8		163
V25-B+C 0-280	350	5394099	5097 05 3		163
V25-B+C 0-320	420	5711551	5097 29 0		163
V25-B+C 0-385	505	5766636	5097 06 1		163
V25-B+C 0-450PV	450	5708896	5097 06 5		231
V25-B+C 1+NPE		5382850	5094 45 7		156
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V25-B+C 1-150		5457473	5094 40 1		155
V25-B+C 1-280		5406556	5094 41 8		158
V25-B+C 1-385		5406563	5094 43 1		162
V25-B+C 1NPE150		5382843	5094 44 8		154
V25-B+C 2+NPE		5239826	5094 46 0		156
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V25-B+C 3+AS		5945314	5097 18 5		159
V25-B+C 3+NPE		5239864	5094 46 3		156
V25-B+C 3+NPE+AS		5617532	5097 43 2		157
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V25-B+C 3-280		5239734	5094 42 3		158
V25-B+C 3-385		5239758	5094 43 7		162
V25-B+C 3-FS280		5239925	5094 49 0		159
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V25-B+C 3NPEAS38		5542056	5097 11 1		161
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V25-B+C 3PHFS900	900	5709121	5097 44 8		221
V25-B+C 4+AS280		5394211	5097 19 3		159
V25-B+C 4+FS-SÜ		5394396	5097 35 5		160
V25-B+C 4-280		5239741	5094 42 6		158
V25-B+C 4-385		5239765	5094 44 0		162
V25-B+C 4-FS280		5239932	5094 49 3		159
V25-B+C 4-FS-G		5240013	5094 55 2		160
V50-B+C 0-280	350	5361954	5093 72 4		151
V50-B+C 0-300PV	300	5708841	5093 72 6		231
V50-B+C 1+NPE		5688426	5093 65 3		148
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V50-B+C 3+NPE+FS		5425137	5093 66 2		149
V50-B+C 3-280		5361893	5093 62 7		150
V50-B+C 3-PH600	600	5478546	5093 62 3		220
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V50-B+C 4		5361909	5093 63 1		150
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VB-MDP 10-MD	/ Cu	5410461	5098 47 0		280
VB-MULTIBASE250		5237358	5089 65 5		164
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Always indicate the item number when ordering.

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VF110-AC DC-FS	200150	5578192	5097 84 6		262
VF12-AC DC	13,5	5578116	5097 45 3		214
VF12-AC DC	13,5	5578116	5097 45 3		259
VF12-AC/DC-FS	1813,5	5736561	5097 45 4		261
VF2-110-AC/DCFS	150200	5578253	5097 93 5		217
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VF230-AC/DC	255	5578161	5097 65 0		215
VF230-AC/DC	255	5578161	5097 65 0		260
VF230-AC-FS	255	5578215	5097 85 8		216
VF230-AC-FS	255	5578215	5097 85 8		262
VF24-AC/DC	34	5578123	5097 60 7		214
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VF24-AC/DC-FS	4634	5578185	5097 82 0		216
VF24-AC/DC-FS	4634	5578185	5097 82 0		261
VF48-AC/DC	60	5578130	5097 61 5		214
VF48-AC/DC	60	5578130	5097 61 5		259
VF48-AC/DC-FS	8060	5812258	5097 82 2		261
VF60-AC/DC	80	5578147	5097 62 3		214
VF60-AC/DC	80	5578147	5097 62 3		259
VF60-AC/DC-FS	11080	5812265	5097 82 4		262
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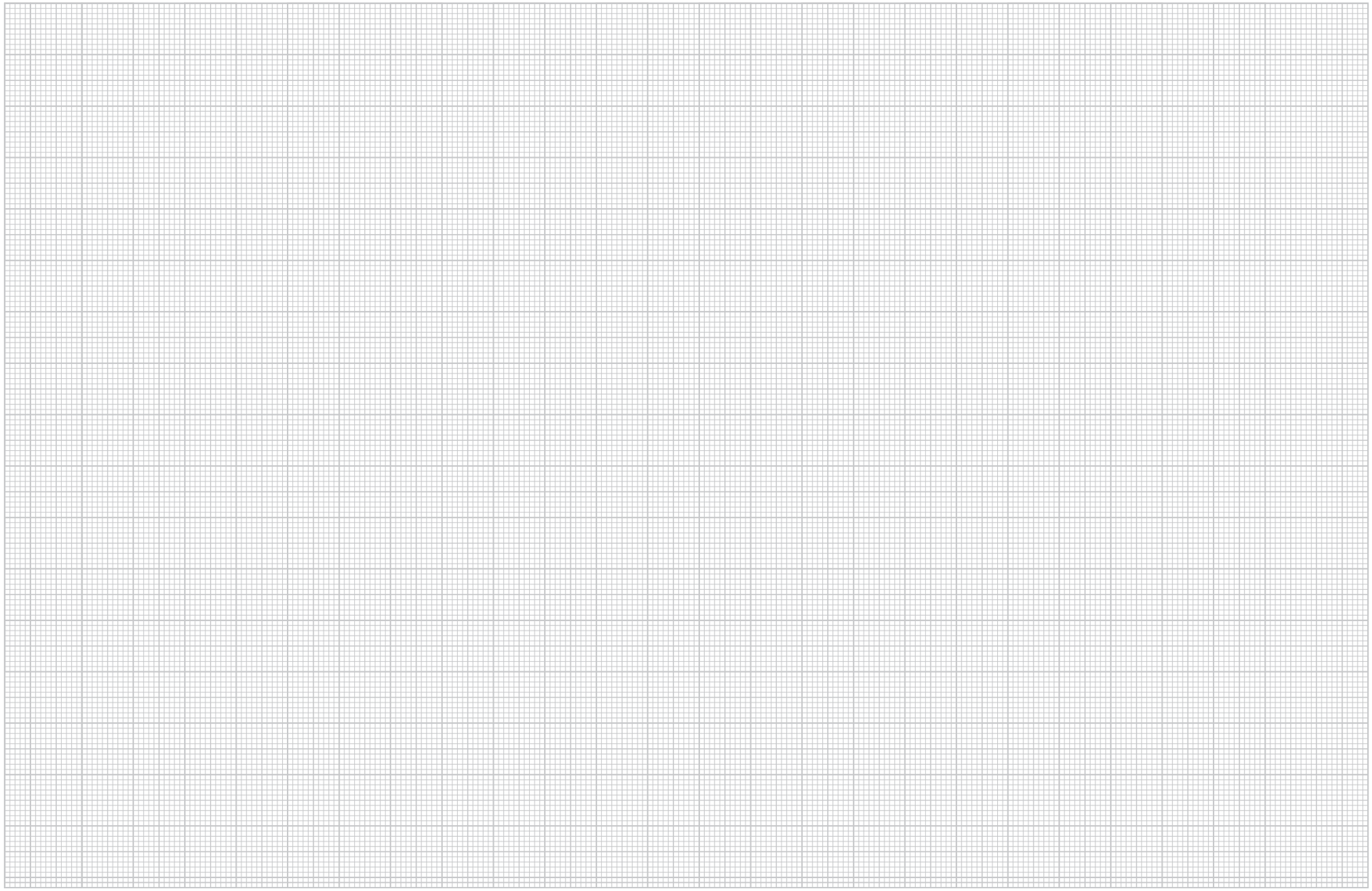
VG 3-B TNC		5531074	5089 21 2		139
VG 4-B TNS+TT		5531012	5089 20 0		138
VG LM	/ PA	5047155	5088 87 9		164
VG-BC DC-MSFS600	600	5835646	5088 69 5		227
VG-BC DC-MSFS900	900	5835653	5088 69 6		227
VG-BC DCPH900-21	900	5872641	5088 62 5		224
VG-BC DCPH900-31	900	5872658	5088 62 9		224
VG-BC DCPH-MS600	600	5613725	5088 69 3		226
VG-BC DCPH-MS900	900	5613718	5088 69 2		226
VG-BC DCPH-Y600	600	5709008	5088 67 6		229
VG-BC DCPH-Y900	900	5709015	5088 67 8		229
VG-C DCPH1000-21	1000	5829461	5088 64 6		224
VG-C DCPH1000-31	1000	5829478	5088 64 8		224
VG-C DC-PH1000-4	1000	5704010	5088 70 3		228
VG-C DCPH1000-4K	1000	5780700	5088 65 0		226
VG-C DCPH1000-4S	1000	5780717	5088 65 1		225
VG-C DCPH1000-6S	1000	5780724	5088 65 2		225
VG-C DC-PH-21	1000	5890805	5088 60 5		230
VG-C DC-PH-31	1000	5890812	5088 60 9		230
VG-C DC-PH-MS	1000	5371090	5088 69 4		230
VG-C DCPH-MS1000	1000	5613701	5088 69 1		226
VG-C DC-PH-Y	1000	5473206	5088 69 9		230
VG-C DCPH-Y1000	1000	5708964	5088 67 2		229
VG-C DCPH-Y600	600	5708957	5088 67 0		229
ZSF		5518419	2362 97 0		377



Terms and conditions of sale and delivery of OBO BETTERMANN GmbH & Co. KG, OBO BETTERMANN Projekt und Systemtechnik GmbH and OBO Befestigungselemente GmbH, Menden.

1. All our supplies and services shall be governed exclusively by the following terms and conditions, including our additional terms and conditions for cable tray business transactions. Any terms and conditions of business and purchasing of the customer shall be valid only if we have acknowledged them in writing. Our quotations are without engagement; they are mere invitations to submit contract offers. Any and all transactions and agreements, including those entered into by our employees and agents shall only be binding upon our written confirmation or invoicing. The foregoing provision shall also apply to any modifications of the agreed formal requirements.

2. The documents and data pertaining to the quotation, such as illustrations, brochures, drawings, dimensions, loading capacity values and weight details are approximate only, unless they are expressly stipulated to be binding.

Samples are non-binding samples for inspection. Any purchase according to sample will be subject to customary deviations and deviations resulting from normal production processes. The properties of the sample shall be no guaranteed quality of the purchase object unless expressly stated otherwise in the confirmation of order. Samples must be returned to us at the latest within four weeks in perfect condition. If they are not returned within this period in proper condition, we shall be entitled to charge the purchase price for the sample in accordance with our current price list. All information on our products, in particular the illustrations, drawings, weight, dimension and performance data included in our quotations and printed matter shall be regarded as approximate average values and shall not represent any quality guarantee.

With regard to products made according to customer drawings, samples and other instructions of the customer, we will not provide any warranty nor assume any liability for the due and proper functioning of the product or for any other defects if and to the extent they are based upon the customer's specifications. The customer shall indemnify us from any third party claims, including claims for product liability as may be asserted against us for damages resulting from the products unless we have caused such damages by intent or gross negligence. The customer shall warrant that the manufacture and supply of products made in accordance with his instructions will not infringe any proprietary rights of third parties. Should any proprietary rights be asserted against us, we shall be entitled, without any legal review of the third party claims, to withdraw from the contract after hearing the customer, unless the third party withdraws the claims asserted against us under its proprietary rights within eight days by written declaration. The customer shall compensate us for any damage sustained as a result of the assertion of proprietary rights. In case of withdrawal, the work we have carried out so far shall be remunerated. Further rights under the statutory provisions shall not be affected thereby.

Any moulds, tools and design data produced by us for the execution of the order shall be our exclusive property. Unless expressly agreed otherwise, the customer shall not have any claims thereto, even if he has contributed to the costs of producing any such moulds, tools and design data.

3. The packing, shipping route and means of transportation shall be left to our discretion in the absence of any other agreements. They shall be charged at their cost price. We will take back undamaged cases, when being returned carriage paid, at 2/3 of the amount invoiced. The one-way or pool pallets used for transport shall be either exchanged upon taking delivery or returned. The smallest packing units stocked and listed may not be broken up for rationalisation reasons. In case of orders for different quantities, the nearest packing unit will be supplied.

We reserve the right to deviate from the agreed delivery quantity, in particular in the case of custom-made products, to a customary extent or in conformity with national or international standards. In case of a demand for adhering to a precise quantity, an express reference is necessary and subject to confirmation.

Master and call orders shall oblige the customer to accept the total quantity on which the master/call order is based. Where no particular call orders are specified in the contract, the total quantity of the master call order must be called within twelve months. If the customer fails to adhere to call deadlines, we shall be entitled to deliver and charge the total quantity in full after four weeks from written notice with reference to the consequences of any failure to call. Our rights arising from any default of the customer shall not be affected thereby.

4. Unless otherwise agreed, our prices are quoted ex works and do not include packing and insurance. The value added tax at the rate applicable on the date of dispatch will be added to our prices. The purchaser shall ensure the correctness of his VAT identification number, which he must notify to us immediately without being asked. He shall undertake to inform both us and the competent domestic tax authority without delay of any change in his name, address and VAT identification number.

Delivery shall be franco domicile within Germany, i.e. carriage and packing prepaid, if the net order value is in excess of € 1,200. For small orders below € 100 (net excluding value added tax), we shall invoice a lower quantity surcharge of € 10 (net) per order. Upon transfer of our supplies and services to a carrier or forwarding agent, at the latest upon their leaving our warehouse or supply plant, the risk shall pass to the recipient, even in case of deliveries free place of destination.

5. Delivery periods and delivery deadlines shall be approximate only unless we have expressly stated in writing that they are binding. Delivery periods shall commence upon receipt of our confirmation of order, but not before clarification of all execution details, ex place of delivery. The customer shall only be entitled to withdraw from the contract after having granted a reasonable extension of time. We reserve the right to make partial deliveries. Claims for damages and reimbursement of expenses - for any reason whatsoever - shall be subject to the provisions set out in article 10.

In the event of any circumstances that are beyond our control within the scope of normal operating risks and obstruct or make impracticable any delivery, we shall be entitled to suspend delivery by the duration of such obstruction plus a reasonable start-up period or to withdraw from the contract for the part not yet fulfilled. The purchaser can demand a statement from us as to whether we wish to deliver within a reasonable period or withdraw. If we fail to make such a statement, the purchaser may withdraw. Our notice to the purchaser shall be deemed to be sufficient evidence that we have been prevented from delivering.

Delivery time is extended in case of such events as labour disputes, strikes and lockouts, orders from the authorities, difficulties with the procurement of materials, spoiled work or post-processing, shutdowns and staff shortage as well as shortage of means of transport, and general occurrence of unforeseen events beyond our scope of influence, by the length of duration of these events.

6. Payments shall be made upon receipt of invoice less a 3% cash discount for payment within 10 days or net after 30 days from date of invoice. Erection work and all paid labour work must be paid within 10 days without deduction of any cash discount. In case of non-cash payments, the date of the credit note will be deemed to be the date of receipt of payment. Payments received shall always be credited first against costs, then against interest and then against the earliest liability. Cheques and bills of exchange shall only be accepted as means of payment.

Any payment by bill of exchange shall be subject to a prior separate and written agreement, whereby all bill costs shall be borne by the customer and no discount can be granted. The customer shall have no right to refuse performance and no right of retention - for any legal reason whatsoever - unless we have acknowledged his claim beforehand in writing or his claim has the force of law.

The customer shall only be entitled to set off claims which have the force of law, are undisputed or acknowledged by us in writing.

7. We shall retain title to the goods supplied by us until all our claims arising from our business transactions with the customer have been satisfied - current account clause - and all bills of exchange or cheques submitted for payment by the customer have been honoured.

Any treatment or processing of goods subject to our retention of title (reserved goods) shall be carried out for us as the manufacturer in accordance with § 950 BGB (German Civil Code) without any obligation on our part. If our reserved goods are to be regarded as the main item or the main item is owned by the customer, full title to the new item shall pass to us when it is created. In other cases, we shall acquire a co-ownership interest in the new item in the proportion of the sales value of our reserved goods to the other goods used for the new item at the time of processing, intermingling, joining or mixing. The customer shall take custody of our ownership or co-ownership interest free of charge; it shall be treated as reserved goods.

Before transfer of title, our goods shall be neither pledged nor assigned as collateral without our prior consent. In addition, any third party rights or pledges shall be notified to us immediately and we shall be given all details and provided all documents necessary for intervention; otherwise the customer must bear our loss. In the latter case, our total claims against the customer shall also be immediately payable.

The customer shall be entitled to sell or to use our reserved goods in the ordinary course of business subject to the condition that the relevant claims are transferred in accordance with article 8 below. This right shall lapse upon the customer's failure to promptly meet his payment obligations towards us or in the event of any cheque or bill protests or his suspension of payments. In such cases, we shall be entitled to take back the goods provisionally at the customer's expense and to sell them at our duly exercised discretion after a corresponding reminder has been sent to the customer. We will then pass the due amount to the customer's credit.

8. If our goods are sold before payment of our claim, the customer shall be obliged to retain our title against his purchaser until the goods have been paid for in full by the purchaser. The claim arising against the purchaser from such resale as well as any other ancillary rights or security interests of the customer resulting from the sale and any claims for compensation in case of damage to or destruction of our reserved property, including the relevant insurance sum shall hereby be assigned to us. We hereby accept this assignment. Where our co-ownership interest is sold, the relevant claims shall be assigned in the amount corresponding to the value of our interest.

The customer shall, at our request, inform us of his purchasers, notify them of the assignment made and provide us with any and all documents required to assert our rights.

As long as the customer meets his contractual obligations without delay, he shall be authorised to collect the claims assigned. He shall keep the amounts collected on our behalf separately and remit them to us immediately as soon and as far as our claims become due. The authorisation shall lapse in case of any cheque or bill protest of the customer or his definite suspension of payments. The customer shall bear the costs incurred for any action taken against third parties and shall advance them upon request.

If the security provided to us by the retention of title and the anticipatory assignment should exceed the claims to be secured by more than 20%, we shall, at the customer's request, release paid supplies of our choice. Upon payment of all our claims by the customer, assigned claims shall pass to the customer.

9. Any complaints for obvious defects regarding the quantity or quality of our supplies and services that are identifiable upon careful inspection shall without delay, but at the latest within the period of limitation of eight days from arrival of the goods at the address of the customer or the person appointed by him, be notified in writing to us, not to our representatives. Slight deviations in dimensions and designs within the scope of defined technical tolerances shall not give rise to any right of complaint. Any rejected goods may only be returned to us with our prior written authorisation.

In case of justified complaints within the prescribed period, we shall, at our option, take remedial action by way of subsequent performance, by rectifying the defect, supplying non-defective goods or providing a credit note for the lower value calculated.

We shall be entitled to refuse subsequent performance in accordance with the statutory provisions. If we refuse subsequent performance, if any subsequent performance remains unsuccessful or if the customer cannot be reasonably expected to accept any subsequent performance, the latter shall be entitled to withdraw from the contract in compliance with the provisions of the following sentences. The customer shall only be entitled to withdraw from the contract - where a withdrawal is not excluded by law - upon the unsuccessful expiry of a reasonable period for subsequent performance set by him, unless this period was not required under the statutory provisions (§§ 281 para. 2, 323 para. 2, 440, 441 para. 1 BGB (German Civil Code)).

In case of his withdrawal, the customer shall be liable for any deterioration, destruction or loss of use resulting from any negligence or intent on his part. Any claims for damages or reimbursement of expenses of the customer shall be subject to the provisions set out in article 10.

In the case of any fraudulent concealment of a defect or in the case of any provision of a quality guarantee for the goods sold at the time of the passing of risk within the meaning of § 444 BGB (German Civil Code) (seller's declaration that the object sold has a specific property at the time of the passing of risk and that the seller, regardless of any fault on his part, intends to be answerable for any and all consequences resulting from its absence), the customer's rights shall be exclusively governed by the statutory provisions.

We shall - in addition to the statutory grounds for refusal - also be entitled to refuse subsequent performance if and as long as the customer fails to send us, at our request, the rejected goods or a sample thereof; the customer shall have no right of withdrawal for any such refusal. We may further refuse any subsequent performance if the goods concerned have been altered or modified without our consent unless the customer can prove that the defect was not caused by such alteration or modification.

The limitation period for any claims arising from defects shall be one year; in the case of goods which have been used in accordance with their intended purpose for a building and have caused its defectiveness, the limitation period shall be two years. The provisions of §§ 478, 479 BGB (German Civil Code) on recourse in the chain of suppliers shall not be affected thereby.

10. In the case of a pre-contractual, contractual or non-contractual breach of duty, including unsatisfactory delivery, tortious conduct and producer's liability, we shall only be liable for compensatory damages and reimbursement of expenses - subject to further contractual or statutory liability requirements - in the case of intent, gross negligence or slightly negligent breach of a material contractual duty (contractual duty the infringement of which jeopardises the fulfilment of the object of the contract). However - except in the case of intent - our liability shall be limited to the typical contractual damage that was foreseeable at the time the contract was entered into.

The purchaser shall not be permitted to make a claim for expenses incurred in vain.

Except for any breach of material duties, our liability for slight negligence shall be excluded, but in any case be limited to the amount of the purchase price.

Any claim asserted by the customer or a third party for payment of a contractual penalty shall be excluded.

With regard to damages caused by delay, we shall only be liable for slight negligence up to the amount of 5% of the purchase price agreed with us.

The exclusions and limitations of liability set forth above shall not apply in the event that a guarantee is given with respect to the quality of the object sold within the meaning of § 444 BGB (German Civil Code) if a defect is fraudulently concealed or in the event of injury to life, physical injury or injury to health, or strict liability under the German Product Liability Act.

Any and all claims for damages against us, for any legal reason whatsoever, shall become statute-barred at the latest after one year from delivery of the goods to the customer, in the case of tortious liability from the time of knowledge, or grossly negligent ignorance, of the circumstances giving rise to the claim and the person liable to pay damages. This provision shall not apply in the case of liability for intent and in the event that a guarantee is given for the quality of the object sold, in the case of fraudulent concealment of a defect or in the event of injury to life, physical injury or injury to health, or strict liability under the German Product Liability Act. Any shorter limitation periods shall take precedence.

11. We shall be entitled to process and store any customer data obtained with regard to or in connection with the business relationship in accordance with the German Federal Data Protection Act, irrespective of whether such data is provided by the purchaser himself or by any third parties.

12. Place of performance for delivery and payment is Menden/Sauerland. The court of competent jurisdiction for any and all disputes, including disputes with regard to bills of exchange and cheques, is the Local Court (Amtsgericht) of Menden or, at our option, the District Court (Landgericht) of Arnsberg, irrespective of the value of the object in dispute. We shall, however, also be entitled to take legal proceedings against the customer at the place of his registered office.

German law shall be exclusively applicable. The application of international purchase laws is hereby excluded.

Should, for any reason whatsoever, individual provisions of our terms and conditions of sale and delivery be invalid, the validity and binding nature of the other provisions shall not be affected thereby. The customer agrees, that the invalid provision shall be replaced by a valid provision that comes as close as possible to the economic meaning of the invalid provision.

13. The prices of products made of brass and copper are subject to certain fluctuations that are based on the relevant DEL listings. The prices of our brass articles are based on a DEL listing of € 150 for Ms 58, those of our copper products on a DEL value for electrolyte copper of € 200.

In case of any increase or reduction in these prices by more than € 15, a five per cent surcharge or deduction shall be made for each 15 points. The calculation of any such surcharges or deductions shall be based on the DEL listing of the date of our receipt of the order.

Valid from January 2010

Terms and conditions of sale and delivery of OBO BETTERMANN GmbH & Co. KG, OBO BETTERMANN Projekt und Systemtechnik GmbH and OBO Befestigungselemente GmbH, Menden.

1. All our supplies and services shall be governed exclusively by the following terms and conditions, including our additional terms and conditions for cable tray business transactions. Any terms and conditions of business and purchasing of the customer shall be valid only if we have acknowledged them in writing. Our quotations are without engagement; they are mere invitations to submit contract offers. Any and all transactions and agreements, including those entered into by our employees and agents shall only be binding upon our written confirmation or invoicing. The foregoing provision shall also apply to any modifications of the agreed formal requirements.

2. The documents and data pertaining to the quotation, such as illustrations, brochures, drawings, dimensions, loading capacity values and weight details are approximate only, unless they are expressly stipulated to be binding.

Samples are non-binding samples for inspection. Any purchase according to sample will be subject to customary deviations and deviations resulting from normal production processes. The properties of the sample shall be no guaranteed quality of the purchase object unless expressly stated otherwise in the confirmation of order. Samples must be returned to us at the latest within four weeks in perfect condition. If they are not returned within this period in proper condition, we shall be entitled to charge the purchase price for the sample in accordance with our current price list. All information on our products, in particular the illustrations, drawings, weight, dimension and performance data included in our quotations and printed matter shall be regarded as approximate average values and shall not represent any quality guarantee.

With regard to products made according to customer drawings, samples and other instructions of the customer, we will not provide any warranty nor assume any liability for the due and proper functioning of the product or for any other defects if and to the extent they are based upon the customer's specifications. The customer shall indemnify us from any third party claims, including claims for product liability as may be asserted against us for damages resulting from the products unless we have caused such damages by intent or gross negligence. The customer shall warrant that the manufacture and supply of products made in accordance with his instructions will not infringe any proprietary rights of third parties. Should any proprietary rights be asserted against us, we shall be entitled, without any legal review of the third party claims, to withdraw from the contract after hearing the customer, unless the third party withdraws the claims asserted against us under its proprietary rights within eight days by written declaration. The customer shall compensate us for any damage sustained as a result of the assertion of proprietary rights. In case of withdrawal, the work we have carried out so far shall be remunerated. Further rights under the statutory provisions shall not be affected thereby.

Any moulds, tools and design data produced by us for the execution of the order shall be our exclusive property. Unless expressly agreed otherwise, the customer shall not have any claims thereto, even if he has contributed to the costs of producing any such moulds, tools and design data.

3. The packing, shipping route and means of transportation shall be left to our discretion in the absence of any other agreements. They shall be charged at their cost price. We will take back undamaged cases, when being returned carriage paid, at 2/3 of the amount invoiced. The one-way or pool pallets used for transport shall be either exchanged upon taking delivery or returned. The smallest packing units stocked and listed may not be broken up for rationalisation reasons. In case of orders for different quantities, the nearest packing unit will be supplied.

We reserve the right to deviate from the agreed delivery quantity, in particular in the case of custom-made products, to a customary extent or in conformity with national or international standards. In case of a demand for adhering to a precise quantity, an express reference is necessary and subject to confirmation.

Master and call orders shall oblige the customer to accept the total quantity on which the master/call order is based. Where no particular call orders are specified in the contract, the total quantity of the master call order must be called within twelve months. If the customer fails to adhere to call deadlines, we shall be entitled to deliver and charge the total quantity in full after four weeks from written notice with reference to the consequences of any failure to call. Our rights arising from any default of the customer shall not be affected thereby.

4. Unless otherwise agreed, our prices are quoted ex works and do not include packing and insurance. The value added tax at the rate applicable on the date of dispatch will be added to our prices. The purchaser shall ensure the correctness of his VAT identification number, which he must notify to us immediately without being asked. He shall undertake to inform both us and the competent domestic tax authority without delay of any change in his name, address and VAT identification number.

Delivery shall be franco domicile within Germany, i.e. carriage and packing prepaid, if the net order value is in excess of € 1,200. For small orders below € 100 (net excluding value added tax), we shall invoice a lower quantity surcharge of € 10 (net) per order. Upon transfer of our supplies and services to a carrier or forwarding agent, at the latest upon their leaving our warehouse or supply plant, the risk shall pass to the recipient, even in case of deliveries free place of destination.

5. Delivery periods and delivery deadlines shall be approximate only unless we have expressly stated in writing that they are binding. Delivery periods shall commence upon receipt of our confirmation of order, but not before clarification of all execution details, ex place of delivery. The customer shall only be entitled to withdraw from the contract after having granted a reasonable extension of time. We reserve the right to make partial deliveries. Claims for damages and reimbursement of expenses - for any reason whatsoever - shall be subject to the provisions set out in article 10.

In the event of any circumstances that are beyond our control within the scope of normal operating risks and obstruct or make impracticable any delivery, we shall be entitled to suspend delivery by the duration of such obstruction plus a reasonable start-up period or to withdraw from the contract for the part not yet fulfilled. The purchaser can demand a statement from us as to whether we wish to deliver within a reasonable period or withdraw. If we fail to make such a statement, the purchaser may withdraw. Our notice to the purchaser shall be deemed to be sufficient evidence that we have been prevented from delivering.

Delivery time is extended in case of such events as labour disputes, strikes and lockouts, orders from the authorities, difficulties with the procurement of materials, spoiled work or post-processing, shutdowns and staff shortage as well as shortage of means of transport, and general occurrence of unforeseen events beyond our scope of influence, by the length of duration of these events.

6. Payments shall be made upon receipt of invoice less a 3% cash discount for payment within 10 days or net after 30 days from date of invoice. Erection work and all paid labour work must be paid within 10 days without deduction of any cash discount. In case of non-cash payments, the date of the credit note will be deemed to be the date of receipt of payment. Payments received shall always be credited first against costs, then against interest and then against the earliest liability. Cheques and bills of exchange shall only be accepted as means of payment.

Any payment by bill of exchange shall be subject to a prior separate and written agreement, whereby all bill costs shall be borne by the customer and no discount can be granted. The customer shall have no right to refuse performance and no right of retention - for any legal reason whatsoever - unless we have acknowledged his claim beforehand in writing or his claim has the force of law.

The customer shall only be entitled to set off claims which have the force of law, are undisputed or acknowledged by us in writing.

7. We shall retain title to the goods supplied by us until all our claims arising from our business transactions with the customer have been satisfied - current account clause - and all bills of exchange or cheques submitted for payment by the customer have been honoured.

Any treatment or processing of goods subject to our retention of title (reserved goods) shall be carried out for us as the manufacturer in accordance with § 950 BGB (German Civil Code) without any obligation on our part. If our reserved goods are to be regarded as the main item or the main item is owned by the customer, full title to the new item shall pass to us when it is created. In other cases, we shall acquire a co-ownership interest in the new item in the proportion of the sales value of our reserved goods to the other goods used for the new item at the time of processing, intermingling, joining or mixing. The customer shall take custody of our ownership or co-ownership interest free of charge; it shall be treated as reserved goods.

Before transfer of title, our goods shall be neither pledged nor assigned as collateral without our prior consent. In addition, any third party rights or pledges shall be notified to us immediately and we shall be given all details and provided all documents necessary for intervention; otherwise the customer must bear our loss. In the latter case, our total claims against the customer shall also be immediately payable.

The customer shall be entitled to sell or to use our reserved goods in the ordinary course of business subject to the condition that the relevant claims are transferred in accordance with article 8 below. This right shall lapse upon the customer's failure to promptly meet his payment obligations towards us or in the event of any cheque or bill protests or his suspension of payments. In such cases, we shall be entitled to take back the goods provisionally at the customer's expense and to sell them at our duly exercised discretion after a corresponding reminder has been sent to the customer. We will then pass the due amount to the customer's credit.

8. If our goods are sold before payment of our claim, the customer shall be obliged to retain our title against his purchaser until the goods have been paid for in full by the purchaser. The claim arising against the purchaser from such resale as well as any other ancillary rights or security interests of the customer resulting from the sale and any claims for compensation in case of damage to or destruction of our reserved property, including the relevant insurance sum shall hereby be assigned to us. We hereby accept this assignment. Where our co-ownership interest is sold, the relevant claims shall be assigned in the amount corresponding to the value of our interest.

The customer shall, at our request, inform us of his purchasers, notify them of the assignment made and provide us with any and all documents required to assert our rights.

As long as the customer meets his contractual obligations without delay, he shall be authorised to collect the claims assigned. He shall keep the amounts collected on our behalf separately and remit them to us immediately as soon and as far as our claims become due. The authorisation shall lapse in case of any cheque or bill protest of the customer or his definite suspension of payments. The customer shall bear the costs incurred for any action taken against third parties and shall advance them upon request.

If the security provided to us by the retention of title and the anticipatory assignment should exceed the claims to be secured by more than 20%, we shall, at the customer's request, release paid supplies of our choice. Upon payment of all our claims by the customer, assigned claims shall pass to the customer.

9. Any complaints for obvious defects regarding the quantity or quality of our supplies and services that are identifiable upon careful inspection shall without delay, but at the latest within the period of limitation of eight days from arrival of the goods at the address of the customer or the person appointed by him, be notified in writing to us, not to our representatives. Slight deviations in dimensions and designs within the scope of defined technical tolerances shall not give rise to any right of complaint. Any rejected goods may only be returned to us with our prior written authorisation.

In case of justified complaints within the prescribed period, we shall, at our option, take remedial action by way of subsequent performance, by rectifying the defect, supplying non-defective goods or providing a credit note for the lower value calculated.

We shall be entitled to refuse subsequent performance in accordance with the statutory provisions. If we refuse subsequent performance, if any subsequent performance remains unsuccessful or if the customer cannot be reasonably expected to accept any subsequent performance, the latter shall be entitled to withdraw from the contract in compliance with the provisions of the following sentences. The customer shall only be entitled to withdraw from the contract - where a withdrawal is not excluded by law - upon the unsuccessful expiry of a reasonable period for subsequent performance set by him, unless this period was not required under the statutory provisions (§§ 281 para. 2, 323 para. 2, 440, 441 para. 1 BGB (German Civil Code)).

In case of his withdrawal, the customer shall be liable for any deterioration, destruction or loss of use resulting from any negligence or intent on his part. Any claims for damages or reimbursement of expenses of the customer shall be subject to the provisions set out in article 10.

In the case of any fraudulent concealment of a defect or in the case of any provision of a quality guarantee for the goods sold at the time of the passing of risk within the meaning of § 444 BGB (German Civil Code) (seller's declaration that the object sold has a specific property at the time of the passing of risk and that the seller, regardless of any fault on his part, intends to be answerable for any and all consequences resulting from its absence), the customer's rights shall be exclusively governed by the statutory provisions.

We shall - in addition to the statutory grounds for refusal - also be entitled to refuse subsequent performance if and as long as the customer fails to send us, at our request, the rejected goods or a sample thereof; the customer shall have no right of withdrawal for any such refusal. We may further refuse any subsequent performance if the goods concerned have been altered or modified without our consent unless the customer can prove that the defect was not caused by such alteration or modification.

The limitation period for any claims arising from defects shall be one year; in the case of goods which have been used in accordance with their intended purpose for a building and have caused its defectiveness, the limitation period shall be two years. The provisions of §§ 478, 479 BGB (German Civil Code) on recourse in the chain of suppliers shall not be affected thereby.

10. In the case of a pre-contractual, contractual or non-contractual breach of duty, including unsatisfactory delivery, tortious conduct and producer's liability, we shall only be liable for compensatory damages and reimbursement of expenses - subject to further contractual or statutory liability requirements - in the case of intent, gross negligence or slightly negligent breach of a material contractual duty (contractual duty the infringement of which jeopardises the fulfilment of the object of the contract). However - except in the case of intent - our liability shall be limited to the typical contractual damage that was foreseeable at the time the contract was entered into.

The purchaser shall not be permitted to make a claim for expenses incurred in vain.

Except for any breach of material duties, our liability for slight negligence shall be excluded, but in any case be limited to the amount of the purchase price.

Any claim asserted by the customer or a third party for payment of a contractual penalty shall be excluded.

With regard to damages caused by delay, we shall only be liable for slight negligence up to the amount of 5% of the purchase price agreed with us.

The exclusions and limitations of liability set forth above shall not apply in the event that a guarantee is given with respect to the quality of the object sold within the meaning of § 444 BGB (German Civil Code) if a defect is fraudulently concealed or in the event of injury to life, physical injury or injury to health, or strict liability under the German Product Liability Act.

Any and all claims for damages against us, for any legal reason whatsoever, shall become statute-barred at the latest after one year from delivery of the goods to the customer, in the case of tortious liability from the time of knowledge, or grossly negligent ignorance, of the circumstances giving rise to the claim and the person liable to pay damages. This provision shall not apply in the case of liability for intent and in the event that a guarantee is given for the quality of the object sold, in the case of fraudulent concealment of a defect or in the event of injury to life, physical injury or injury to health, or strict liability under the German Product Liability Act. Any shorter limitation periods shall take precedence.

11. We shall be entitled to process and store any customer data obtained with regard to or in connection with the business relationship in accordance with the German Federal Data Protection Act, irrespective of whether such data is provided by the purchaser himself or by any third parties.

12. Place of performance for delivery and payment is Menden/Sauerland. The court of competent jurisdiction for any and all disputes, including disputes with regard to bills of exchange and cheques, is the Local Court (Amtsgericht) of Menden or, at our option, the District Court (Landgericht) of Arnsberg, irrespective of the value of the object in dispute. We shall, however, also be entitled to take legal proceedings against the customer at the place of his registered office.

German law shall be exclusively applicable. The application of international purchase laws is hereby excluded.

Should, for any reason whatsoever, individual provisions of our terms and conditions of sale and delivery be invalid, the validity and binding nature of the other provisions shall not be affected thereby. The customer agrees, that the invalid provision shall be replaced by a valid provision that comes as close as possible to the economic meaning of the invalid provision.

13. The prices of products made of brass and copper are subject to certain fluctuations that are based on the relevant DEL listings. The prices of our brass articles are based on a DEL listing of € 150 for Ms 58, those of our copper products on a DEL value for electrolyte copper of € 200.

In case of any increase or reduction in these prices by more than € 15, a five per cent surcharge or deduction shall be made for each 15 points. The calculation of any such surcharges or deductions shall be based on the DEL listing of the date of our receipt of the order.

Valid from January 2010

QR-Code
With the QR Code you have direct access to our products on the Internet.

You can find further information on the QR Code at www.obo-bettermann.com.

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