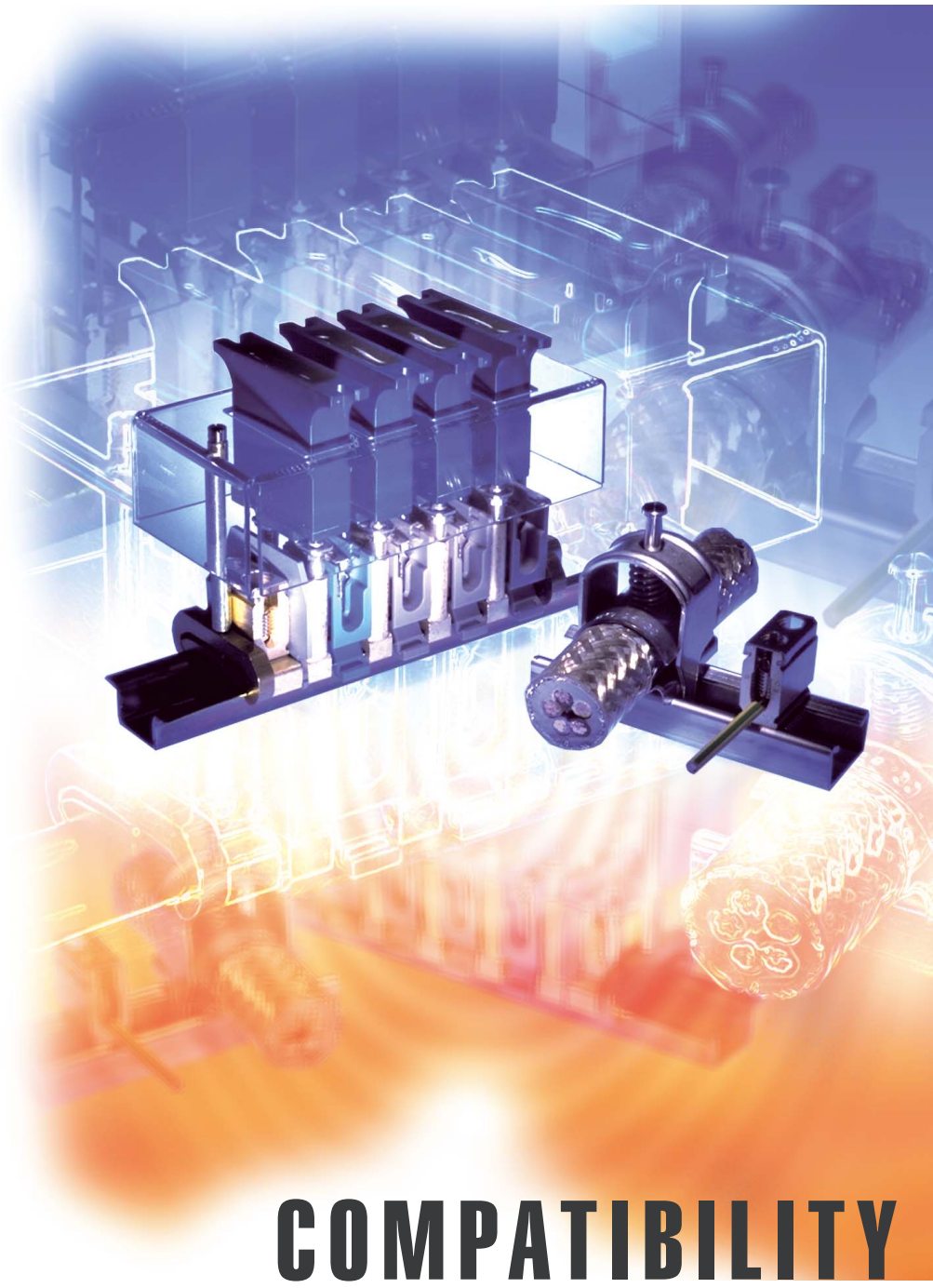
ELECTROMAGNETIC

woertz



COMPATIBILITY

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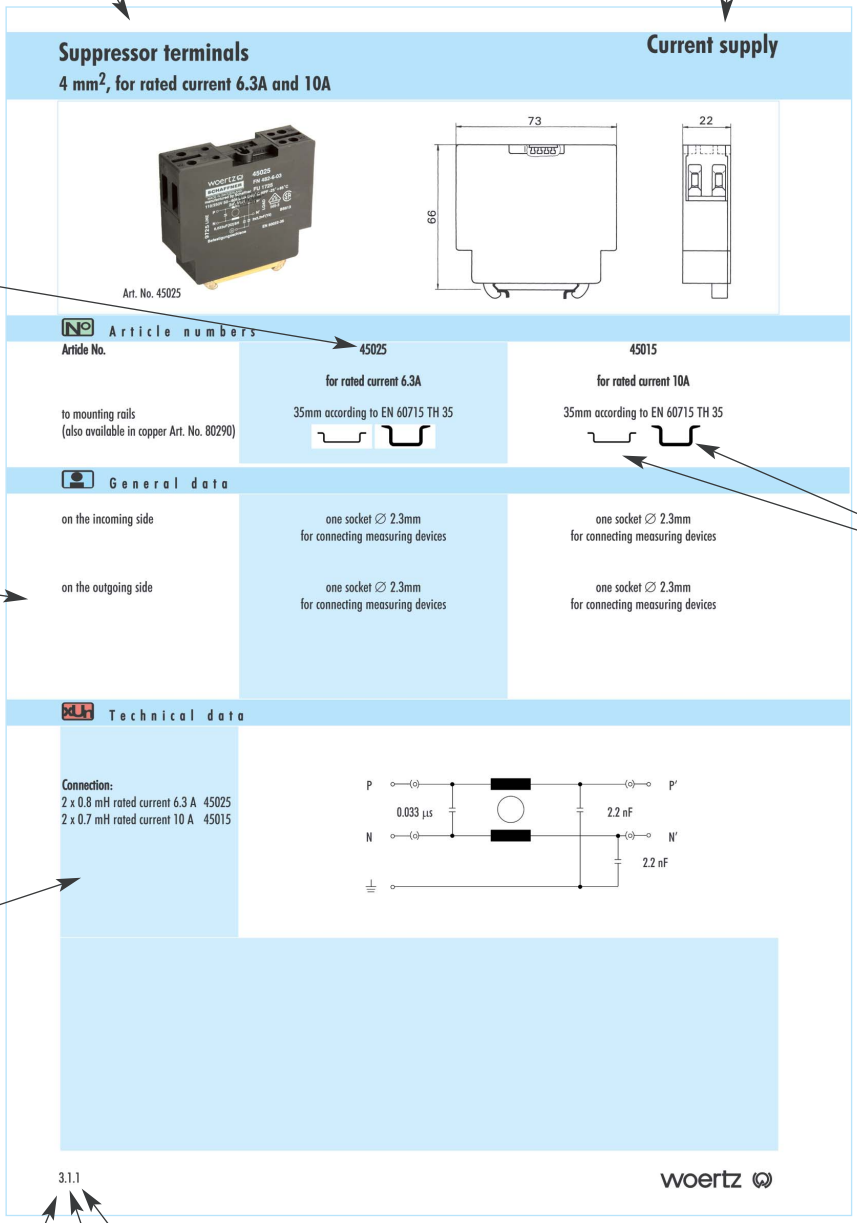
Structure of the catalog



Mounting rail according to EN 60715 TH 35-15

Mounting rail according to EN 60715 TH 35-7.5

Mounting rail according to EN 60715 G32

Introduction

Company profile

The Woertz company was founded in 1928; our head office is in Muttenz near Basle, Switzerland.

We are a family business with about 220 employees known as a quality manufacturer of circuitry accessories, installation systems and electronic control systems.

Our goals are:
- security,
- user-friendliness,
- and easy handling of our products.

We are certified according to ISO 9001 and ISO 14001.

Our range of products includes:
- terminals, junction boxes, grounding products, surge protection devices, anchor channels and anchoring studs
- flat cable installation systems
- floor ducts, double floor systems, under-window ducts
- electronic modules and interfaces.

The circuitry accessories and the electronic control systems are produced in our headquarters in Muttenz , the duct and double floor systems in the branch located in Hölstein.

Muttenz head office

Hofackerstrasse 47, CH-4132 Muttenz, Switzerland
Tel. ++41 (0)61 / 466 33 33
Fax ++41 (0)61 / 461 96 06

Hölstein branch

Bärenmattenstrasse 3, CH - 4434 Hölstein, Switzerland
Tel. ++ 41 (0)61 / 956 56 56
Fax ++ 41 (0)61 / 956 56 70

SQS

**The Swiss Association
for Quality and Management Systems**

SQS herewith certifies that the company named below has a management system
which meets the requirements of the normative bases specified below
and issues the company

Woertz AG

CH-4132 Muttenz 1

Certified area

Whole Company, location Muttenz and Hölstein

Field of activity

Electrical accessories, Installation systems

on the basis of the audit result the

SQS Certificate
ISO 9001:2000 / ISO 14001:1996

CH-3052 Zollikofen, 25 June 2002
This SQS Certificate is valid up to and including 24 June 2005
Scope numbers 19, 14
Registration number 10501-06

Managing Director SQS
T. Zahner

President SQS
Prof. Dr. H. D. Seghezzi

SCTS 002, 023

IQNet

The SQS certificate ISO 9001 was issued to us 1987 for the first time and renewed regularly. ISO 14001 since 1996.

Causes and effects

Users of telephone, telematics* and IT systems are not only faced with decreasing reliability, limited operating safety and declining operational availability of these systems, but more and more frequently also with the problem of overvoltages. The two main reasons for this are:

- The use of microchip has increased the susceptance to failure, and every year, the number of component parts in microchips goes up at the expense of insulation. Due to the very small insulation distances (µ magnitude), even a minor overvoltage leads to a flashover in the chip. This can start a chain reaction resulting in a total loss of one or more chips.
- The trend of networking has surged in the area of computing. The numerous inhouse and external data lines and the power supply lines of the single computers and peripherals are exposed to various external disturbances.

Causes of overvoltages

The overvoltages have four main causes:

- thunderstorms and lightnings
- industrial overvoltages caused by common machines, e.g. neon lamps, photocopying machines, the computer itself, motors of all kinds etc.
- electrostatic overvoltages
- nuclear electromagnetic pulse (NEMP)

Lightnings: a fantastic spectacle...

... if they did not cause damages of various kinds. Benjamin Franklin researched lightnings and developed the lightning conductor, which is still in use today. However, the lightning conductor offers no protection for our "electronic" society. It protects the buildings, but not the electronic appliances and systems within them.

How lightnings come about

A lightning is just an electric discharge, comparable to a huge short-circuit. There have to be two zones with different electric charge, usually two cloud layers or a cloud layer and the soil. Then, a current of several 10 000 Ampere circulates via the ionized channel between the two cloud layers or between the soil and the cloud.

Direct effects of lightning strokes

In the moment of discharge (lightning stroke), the pulse current rises from 1000 to 100 000 Ampere within about 1 µs. Because lightning strokes only occur at single spots, they can only be regarded as a partial cause of the destruction of electric and electronic systems. The best protection is the classic lightning conductor, whose task is to catch the lightning and to capture and channel the discharge current.

Indirect effects of lightning strokes

As far as electricity is concerned, there are four indirect effects:

- **Effect on overhead lines**
  The overhead lines can be hit directly by a lightning, which first leads to a total or partial destruction of the power poles and the cables. Then, an overvoltage wave spreads along the cables up to connected appliances. The intensity of the overvoltage depends on the distance between the appliances and the place where the lightning stroke occurred.

- **Electrostatic field**
  The increase in the electrostatic field (up to 50 kV/m) can cause an increase in the potential in the clearance close to a loaded thundercloud or the static discharge of the air. This results in high-frequency electromagnetic micro-pulses, which lead to the destruction of connected or adjacent appliances.

- **Increase in ground potential**
  The penetration of the lightning (the lightning current) into the soil leads to an increase in the ground potential, which depends on the amperage of the lightning and the specific local electric resistance of the earth. This overcharge undulates through the ground and damages all electronic devices in the vicinity.

- **Electromagnetic radiation**
  A lightning can be compared to an aerial with a length of several kilometers. Because of the pulse current of several kiloampere, a strong electromagnetic field is emitted (several kV/m over more than a kilometer). This radiation induces high voltages and currents in nearby conductors, which again leads to an overvoltage in connected electronic systems.

Industrial overcharge

The term "industrial overcharge" describes phenomena that are caused by switching on and off electrical power.
Typical causes are:

- switching on and off motors and current transformers
- switching on and off neon lamps, working with photocopiers
- switching on switch-mode power supplies, which are in all contemporary electronic devices
- switching on and off phase controlled modulators
- tripping a fuse, a relay or an interruptor
- electrical power outages of all kind, even micro-outages

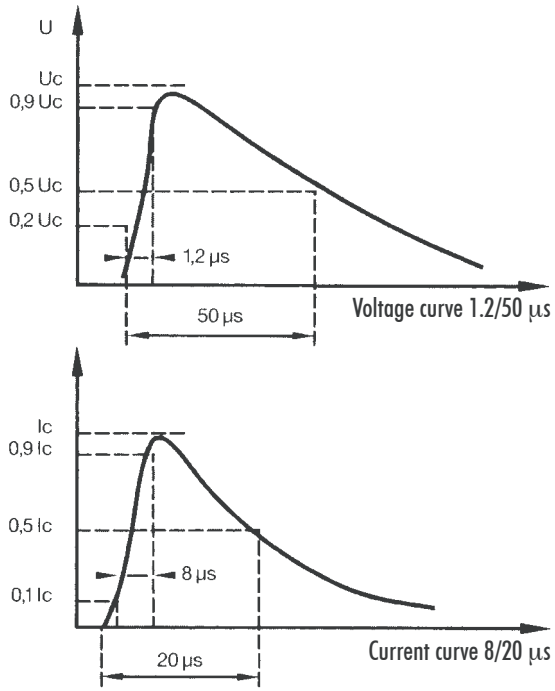
These phenomena cause temporary overvoltages of several kV with a rise time in the µs magnitude, which lead to the partial destruction of electronic appliances connected to the grid concerned.

* IT devices with their own current supply and data lines, which are connected to the telephone network.

Electrostatic overvoltages

Electrostatic discharges are caused by human beings. Human beings have an electrical capacity of 100-300 pf. Walking on carpets with synthetic fiber, they can become charged up to 15 kV and discharge in a few nanoseconds with a current of about 10 Ampere. In particular, highly integrated electronic systems (CMOS...) are very susceptible to this kind of disturbances. Their effect can be a complete destruction of the circuits.

Definition of the standard curves/waves



NEMP (nuclear electromagnetic pulse)

An extra-atmospheric nuclear explosion 40-400 km above ground causes an intense electromagnetic field (up to 50 kV/m), radiating towards the earth. The irradiated area can have a radius of up to 1200 km when the explosion takes place in an altitude of 400 km. The electromagnetic pulse reaches its peak within 10 ns and lasts about 1 µs. On the ground, a very high overvoltage is induced in all aerials, power supply and data lines. It is so high that unprotected lines are destroyed. All connected supply systems, such as current supply, communication systems like telephone, telex, wireless communication and data transfer are also exposed to these overvoltages. The increase in the electromagnetic field can amount to several kV/ns.

Although it is difficult to eliminate the overvoltage caused by electromagnetic pulses, there are means to reduce it.

Effects of overvoltage that can occur with all four kinds described:

- **destruction**
  - flashover in semiconductor components
  - destruction of the metallization of electric components
  - destruction of conductor paths on circuit boards and smouldering of contacts
  - destruction of triacs and thyristors

- **malfunction**
  - random functions of toggle switches, thyristors or triacs
  - partial destruction of data in computer memory
  - errors in computer programs
  - hang-up of computer programs
  - data storage and transmission errors

- **premature deterioration**
  All semiconductor components that are exposed to overvoltages have a shortened wear lifespan. According to a rule of thumb, the durability of electronic appliances is doubled if they are protected against overvoltages.

Standards

Because of the variedness and importance of overvoltages, international standard bodies have issued specifications for testing the sensitivity of electronic appliances to overvoltages. First, the kinds of overvoltages had to be characterized and standardized. This lead to a series of standard curves (voltage curve 1.2/50 µs and current curve 8/20 µs) and finally to different standards, such as NFC 1700, IEEE587, VDE, DIN - e.g. DIN 57 185/VDE 0185.

Woertz
offers effective protection against all known overvoltages in the areas of

telecommunication
information technology
current supply
HF transmission
military use

Selection aid

Class according to DIN VDE 0675/T6/E11.89	Application	Art. No.	Catalog page
Arrester Classes B, C, D	Lightning current arrester for mounting in low voltage mains	44994 (4pole) 44995 (1pole)	3.1.28
Class C	Surge arresters for use in low voltage subsystems	9105/9109 45050 / 45051 45040 / 45041 45066 / 45070 45067 / 45071 45030/220	3.1.17 3.1.18 3.1.19 3.1.20 3.1.21 3.1.22
Class D or based on class D	Surge arresters for use directly at protected objects		
	Surge protection module for mounting rails	45030/50	3.1.22
	Multiple socket outlets Citel with or without high frequency suppressor	44990 44991	3.1.27
	Suppressor terminals with overvoltage protection	45047	3.1.26

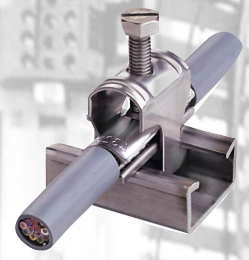
Field of application		Application	Art. No.	Catalog page
Passive EMC	Shielding terminals	**Shielding terminals** for easy connection between shield and busbar		
		to Woertz rail No. 4384	Series 43701	3.1.10
		to Woertz rail No. 4382/4383	Series 43711	3.1.11
		to Woertz rail No. 4382/4383	Series 43730	3.1.12
		to Woertz rail No. 4382IN/4383IN	Series 43230/F	3.1.13
		to busbar F18	Series 43741	3.1.14
Active EMC	Current supply	**Suppressor terminals** for protection against parasitic frequences; for switchboxes, under-window ducts, junction boxes	45025 6A 45015 10A	3.1.24
	Information technology	**Protective devices** for protecting MSR lines 24V inputs = 4 conductors	45021	3.1.30
		Indoor Protector for protecting data lines for interface RS232	45080 (D-Sub 9pole)	3.1.29
	Telephone	**Protective devices** for protection of telephone lines Protective element for ISDN applications	45098	3.1.31
		Protective elements for protection of telephone lines for 2- or 4-conductor telephone lines	45095 45096	3.1.32
		Suppressor terminals with overvoltage protection	45047	3.1.26

Passive EMC

Shielding terminals
of hardened aluminium alloy
with bolt and with spring
to rails 4384
Series 43701
page 3.1.10

Shielding terminals
of hardened aluminium alloy
with bolt and with spring
to rails 4382, 4383, 80291
Series 43711
page 3.1.11

Shielding terminals
of stainless steel A4
with bolt and with spring
to rails 4382IN, 4383IN
Series 43730
page 3.1.12



Shielding terminals
of stainless steel A4
with screw and with spring
for rails 4382IN, 4383IN
Series 43230/F
page 3.1.13

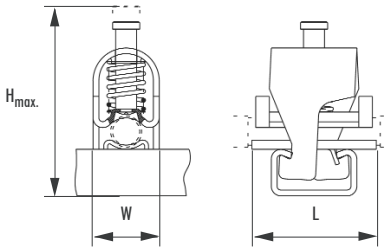
Shielding terminals
of nickel-plated brass
with bolt and with spring
for busbar 18x3 mm
Series 43741
page 3.1.14

Shielding terminals of hardened aluminium alloy

to profile bar No. 4384

- with clamping screw and spring
- profile bar No. 4384 is used as busbar
- bare cable, uncover shielding part
- same principle as cable fixing brackets
- with spring of steel that makes the electrical contact without damaging the shield

Cannot be used for fastening cables!



Mounting: Place the base plate diagonally on the profile bar. Put the bared shielding part of the cable on the base plate. Then push the shielding terminal on the cable shielding and fasten the base part of the terminal on the profile bar by rotating it. When the shielding terminal is released, the spring provides the pressure necessary for the contact.

Article numbers

Shielding terminals with base plate	43701	43702	43703	43704	43705	43706

Technical data

shield ∅	mm	7-11	9.5-13.5	12.5-16.5	15.5-20.5	19-27	26-34
W	mm	17	22	26	32	39	48
L	mm	32	32	32	32	32	35
$H_{max.}$	mm	49	54	58.5	66.5	73	84
spring pressure	N	14-24	20-35	28-47	70-95	85-107	105-130
Packing unit	pcs	50	50	50	50	50	50

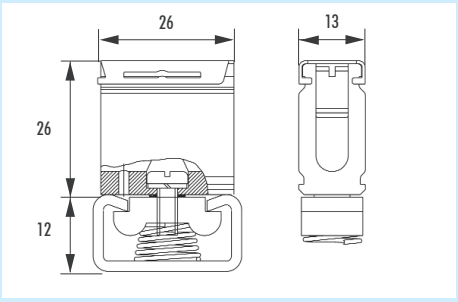
Accessories

Earthing terminals
If a separate grounding is needed, an insulated mounting of the rail has to be made with the rail holder No. 4048.

80160

A special earthing terminal is then required for the connection to the profile bar No. 4384.

- Nominal cross-section 16mm² (AWG 6)
- Terminal of brass
- Anchoring stud of galvanized steel
- Clamping screws of nickel-plated brass, slotted
- With sliding cover of stainless steel, for through conductors
- Packing unit 50 pcs



80160

UL 467 Short-Time-Current-Test

1530A during 6sec.

Rail holder
of thermosetting plastic, light grey

20 x 63 x 11 mm

4048

Packing unit 60 pcs

4048

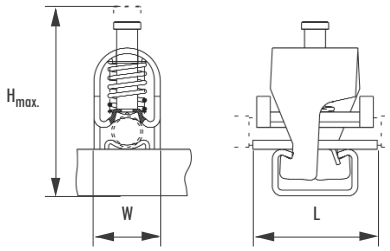
woertz

Shielding terminals of hardened aluminium alloy

to profile bars No. 4382, 4383 and 80291

- with clamping screw and spring
- profile bars are used as busbars
- bare cable, uncover shielding part
- same principle as cable fixing brackets
- with spring of steel that makes the electrical contact without damaging the shield

Cannot be used for fastening cables!



Mounting: Place the base plate diagonally on the profile bar. Put the bared shielding part of the cable on the base plate. Then push the shielding terminal on the cable shielding and fasten the base part of the terminal on the profile bar by rotating it. When the shielding terminal is released, the spring provides the pressure necessary for the contact.

Article numbers

Shielding terminals with base plate	43711	43712	43713	43714	43715	43716

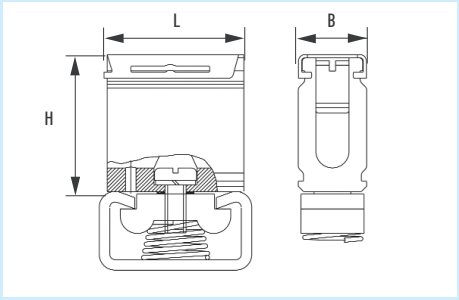
Technical data

shield ∅	mm	6-10	8.5-12.5	11.5-15.5	14.5-19.5	18-26	25-33
W	mm	17	22	26	32	39	48
L	mm	32	32	32	32	32	32
$H_{max.}$	mm	49	56	60.5	69	75	88
spring pressure	N	17-27	25-41	36-56	68-120	73-132	78-140
Packing unit	pcs	50	50	50	50	50	50

Accessories

Earthing terminals
If a separate grounding is needed, an insulated mounting of the rail has to be made with the rail holder No. 4048.

80170



Special earthing terminals are then required for the connection to the profile bars No. 4382, 4383 and 80291.
- Terminals of brass
- Anchoring studs of galvanized steel
- Clamping screws of nickel-plated brass, slotted
- With sliding cover of stainless steel, for through conductors
- Packing unit 25 pcs

		80170/16	80170/50
Nominal cross-section	mm^2	16 (AWG 6)	50 (AWG 2)
W x L x H	mm	13 x 26 x 26	17 x 34 x 30
UL 467 Short-Time-Current-Test		1530A during 6 sec.	3900A during 6 sec.

Rail holder
of thermosetting plastic, light grey

20 x 63 x 11 mm

4048

Packing unit 60 pcs

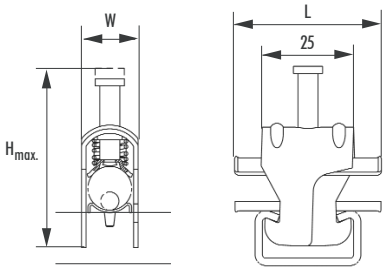
	4048

Shielding terminals of stainless steel A4

to profile bars No. 4382IN and 4383IN

- with clamping screw and spring
- profile bars are used as busbars
- bare cable, uncover shielding part
- same principle as cable fixing brackets
- with spring of niro that makes the electrical contact without damaging the shield

Cannot be used for fastening cables!



Mounting: Place the base plate diagonally on the profile bar. Put the bared shielding part of the cable on the base plate. Then push the shielding terminal on the cable shielding and fasten the base part of the terminal on the profile bar by rotating it. When the shielding terminal is released, the spring provides the pressure necessary for the contact.

Article numbers

Shielding terminals with base plate	43730	43731	43732	43733	43734	43735

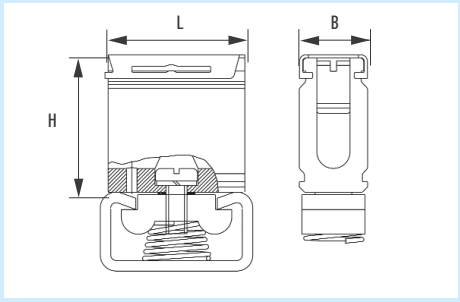
Technical data

shield ∅	mm	5-10	8-14	13-18	17-21	19-26	25-33
W	mm	16	19.5	24	29	36.5	45
L	mm	40	40	40	40	40	40
$H_{max.}$	mm	48	50	56	59	64	72
spring pressure	N	21-27	30-76	34-73	30-63	90-124	76-137
Packing unit	pcs	50	50	50	50	50	50

Accessories

Earthing terminals
If a separate grounding is needed, an insulated mounting of the rail has to be made with the rail holder No. 4048.

80170



Special earthing terminals are then required for the connection to the profile bars No. 4382IN and 4383IN.
- Terminals of brass
- Anchoring studs of galvanized steel
- Clamping screws of brass, slotted
- With sliding cover of stainless steel, for through conductors
- Packing unit 25 pcs

		80170/16	80170/50
Nominal cross-section	mm^2	16 (AWG 6)	50 (AWG 2)
W x L x H	mm	13 x 26 x 26	17 x 34 x 30
UL 467 Short-Time-Current-Test		1530A during 6 sec.	3900A during 6 sec.

Rail holder
of thermosetting plastic, light grey

20 x 63 x 11 mm

4048

Packing unit 60 pcs

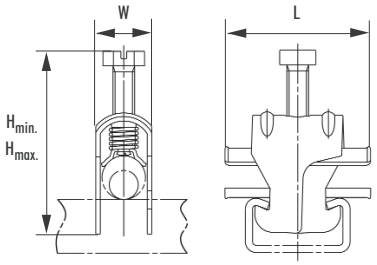
	4048

Shielding terminals of stainless steel A4

to profile bars No. 4382IN and 4383IN

- with screw and with spring of Niro
- profile bars are used as busbars
- for systems where high temperature variation and vibration can occur. Spring to prevent screw from working loose. Adapt force with which screw is tightened to the vulnerability of the shield.
- bare cable, uncover shielding part
- same principle as cable fixing brackets

Cannot be used for fastening cables!



Mounting: Place the base plate diagonally on the profile bar. Put the bared shielding part of the cable on the base plate. Then push the shielding terminal with screw loosened as much as possible on the cable shielding and fasten the base part of the terminal on the profile bar by rotating it. Tighten screw carefully in order not to damage the shield.

Article numbers

Shielding terminals with base plate	43230/F	43231/F	43232/F	43233/F	43234/F	43235/F	43236/F

Technical data

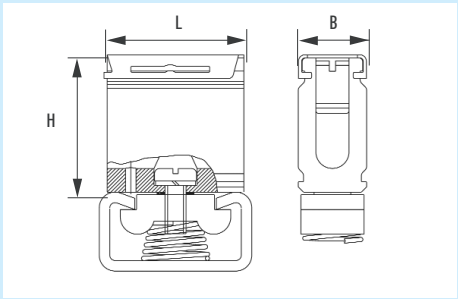
shield ∅	mm	8-12	12-16	16-20	20-25	25-32	32-40	40-48
W	mm	15.5	19.5	24	29.5	37	45.5	56
L	mm	40	40	40	40	40	40	60
$H_{min.}$	mm	37	41	45	50	57	65	88
$H_{max.}$	mm	56	60	64	69	76	84	106
Packing unit	pcs	100	100	100	100	100	50	25

Accessories

Earthing terminals
If a separate grounding is needed, an insulated mounting of the rail has to be made with the rail holder No. 4048.
Special earthing terminals are then required for the connection to the profile bars No. 4382IN and 4383IN


80170

- Terminals of brass
- Anchoring studs of galvanized steel
- Clamping screws of nickel-plated brass, slotted
- With sliding cover of stainless steel, for through conductors
- Packing unit 25 pcs



		80170/16	80170/50
Nominal cross-section	mm^2	16 (AWG 6)	50 (AWG 2)
W x L x H	mm	13 x 26 x 26	17 x 34 x 30
UL 467 Short-Time-Current-Test		1530A during 6 sec.	3900A during 6 sec.

Rail holder
of thermosetting plastic, light grey

20 x 63 x 11 mm


4048

Packing unit 60 pcs

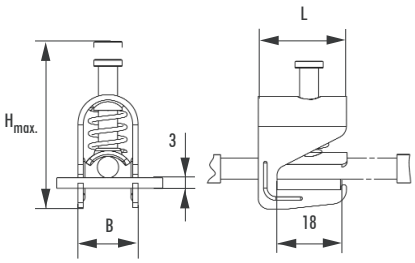
	4048

Shielding terminals

to busbar 18x3mm

- bare cable, uncover shielding part
- same principle as cable fixing brackets
- of nickel-plated brass
- with spring of steel that makes the electrical contact without damaging the shield

Cannot be used for fastening cables!



Mounting: Place the bared shielding part of the cable on the busbar. Press the shielding terminal on the shield and push the base part of the terminal under the busbar. When the shielding terminal is released, the spring provides the pressure necessary for the contact.

Article numbers

Shielding terminals of nickel-plated brass	43741	43742	43743	43744

Technical data

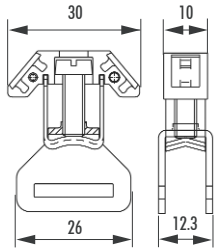
shield ∅	mm	1.5-6.5	5-11	10-17	16-24
W	mm	10	17	23	30
L	mm	25	25	25	25
$H_{max.}$	mm	40	47	63	78
spring pressure	N	8-13	22-31	32-58	37-53
Packing unit	pcs	50	50	50	50

Accessories

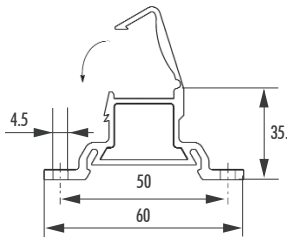
Busbar terminal
If a separate grounding is needed, an insulated mounting of the rail has to be made with the rail holder No. 30958.

30953E

A special busbar terminal 35mm² is then required for the connection.
- For mounting on busbars 18x3 mm No. 30959
- Brackets and screws of corrosion-proof steel
- Bow of stainless steel
- Insulating part of polyamide 66, halogen-free
- Marking facilities on both sides with labels RB/6x9
- Packing unit 100 pcs



30953E



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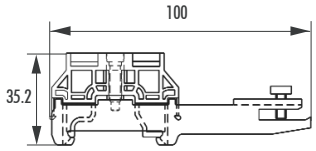
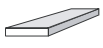


30960

30953E	

Busbar
18x3x1000 mm of tinned electrolytic copper



30959	

Rail holder for insulated mounting for screwing or clipping on DIN35 rail, of thermoplatic, black. 12 mm wide

30958	

Rail holder for non-insulated mounting for clipping on DIN35 rail. Metal bars of galvanized steel. 10 mm wide

30960	

woertz

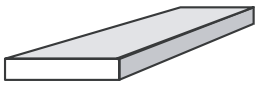
Profile bars

Type	Illustration	kind of material	material width	standard lengths	for shielding terminals
4384 see leaflet "Fixing Technology" page 2.1.7		bare steel galvanized steel	1.5 mm 1.5 mm	3 m 3 m	Series 43701-43706 page 3.1.10
4382 see leaflet "Fixing technology" page 2.1.10		aluminium alloy bare steel galvanized steel stainless Inox A2	2 mm 2 mm 2 mm 2 mm	3 m and 6 m 3 m and 6 m 3 m and 6 m 3 m and 6 m	Series 43711-43716 page 3.1.11 Series 43730-43735 page 3.1.12 Series 43230/F-43236/F page 3.1.13
4383 see leaflet "Fixing technology" page 2.1.11		aluminium alloy bare steel galvanized steel stainless Inox A2	3 mm 3 mm 3 mm 3 mm	3 m and 6 m 3 m and 6 m 3 m and 6 m 3 m and 6 m	Series 43711-43716 page 3.1.11 Series 43730-43735 page 3.1.12 Series 43230/F-43236/F page 3.1.13

Combined rail with external flanks according to EN 60715TH35

Type	Illustration	kind of material	material width	standard lengths	for shielding terminals
80291 see leaflet "Fixing technology" page 2.1.12		aluminium alloy	1.8 mm	2 m, 3 m or 6 m	Series 43711-43716 page 3.1.11

Busbar 18 x 3 mm

Type	Illustration	kind of material	material width	standard lengths	for shielding terminals
30959		tinned electrolytic copper	3 mm	1 m	Series 43741-43744 page 3.1.14

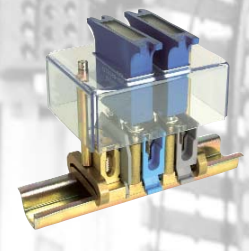
Active EMC

Surge arrester terminal 4 mm² for ABB arrester Art. No. 9105 page 3.1.17

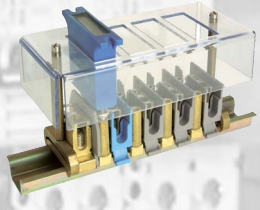
Surge arresters Supersafe Art. No. 45050, 45051

page 3.1.18

Surge arrester terminals 16 mm² with ABB varistor Art. No. 45040, 45041 page 3.1.19



Sets of surge arresters P+N+PE 2.5-35 mm² for Siemens arrester SIOV Art. No. 45066, 45070 page 3.1.20



Sets of surge arresters 3P+N+PE 2.5-35 mm² for Siemens arrester SIOV Art. No. 45067, 45071 page 3.1.21

Surge arrester terminals 4 mm²,10A for Siemens arrester SIOV, series 45030

page 3.1.22

Suppressor terminals 4 mm², for rated current 6.3A + 10A Art. No. 45025, 45015 pages 3.1.23+3.1.24

Suppressor terminal 4 mm² for rated current 6A Art. No. 45003/1 page 3.1.25

Suppressor terminal 4 mm² for rated current 6.3A Art. No. 45047 page 3.1.26

Multiple socket outlet CS Art. No. 44990 Art. No. 44991

page 3.1.27

Combined lightning current arresters Art. No. 44994 Art. No. 44995 page 3.1.28

Indoor Protector for interface RS232 Art. No. 45080

page 3.1.29

Protective device for 4 conductors Art. No. 45021

page 3.1.30

Protective element for ISDN applications Art. No. 45098

page 3.1.31

Surge protection devices for telephone lines Art. No. 45095, 45096

page 3.1.32

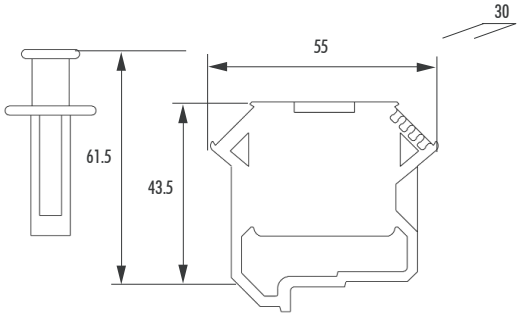
Current supply

Surge arrester terminal

4 mm², for ABB arrester MR 0.50 ZS

Art. No. 9105+ Art. No. 9109

Art. No. 9109



Art. No. 9109 Art. No. 9105

Article numbers

Article No.	9105	Terminal without ABB surge arrester

General information

Terminal without ABB arrester

- for each pole or neutral conductor, 1 terminal with surge arrester is needed
- insulating body of fiber glass reinforced polyamide 66
- to be mounted on grounding mounting rail according to EN 60715 TH 32 (also available in copper Art. No. 3744)
- 4-figure marking facilities on both sides
- bronze spring that presses ABB arrester, which is plugged in, against the discharge conductor
- discharge conductor and terminal base of brass
- BZS type: ALN 5920-256-6038

Application

To protect electrical appliances and components of installations against overvoltages.
Terminals with surge arresters are used where brief overvoltages on main leads may damage connected appliances, installations or personnel. The fast acting arresters limit both low-energy spikes, such as mains transients, and high-energy overvoltages due to atmospheric discharges. Their extremely short response time and their high discharge capacity also provide additional protection in extreme cases, such as NEMP (nuclear electromagnetic pulse).

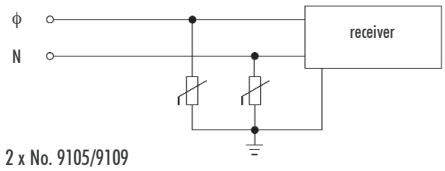
Installation

The leads to be connected to the surge arrester terminal should be straight and as short as possible. For certain protective conditions, the leads have to be screened.

Schemes

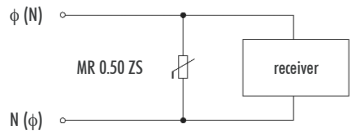
1 - Protective circuit for single-phase receivers, nominal voltage of 230V (fixed installation)
2 - Protective concept for ungrounded receivers (plug-in installation)
May be used for appliances with double insulation.
3 - Protective circuit for three-phase receivers (fixed installation)

Schema 1



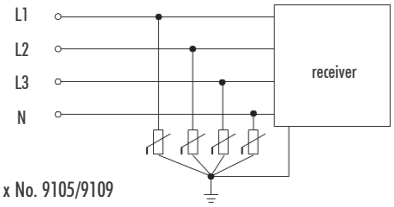
2 x No. 9105/9109

Schema 2



1 x No. 9105/9109

Schema 3



4 x No. 9105/9109

Accessories

Article No.	9109	ABB surge arrester with varistor MR 0.50 ZS

Electrical features of the ABB surge arresters

Type	MR 0.50 ZS	Max. discharge current (single surge current, wave 8/20 µs) ....kA	10
Continuous service voltage ....V~	500	Typical power loss under continuous service voltage (50Hz) ....mW	4
Max. service voltage (1s) V	625	Max. power loss under continuous service voltage (50Hz) ....mW	10
Max. continuous d.c. voltage ....V-	610	Response time ....ns	<25
Operating frequency ....Hz	50/60	Typical capacitance (1 kHz) ....nF	0.5
Nominal surge current, I_N (8/20 µs) ..kA	1	Temperature range ....°C	45
Max. surge current, I (4/10 µs) ....kA	5		
Square wave (t=2ms) ....A	45		
Residual voltage (with 1kA) ....kV	1.7		

Abbreviations
ZS Civil Defense
BZS Federal Office for Civil Defense
ALN Army Stock Number

- Single-phase arresters L, N, PE or three-phase arresters L1, L2, L3, N, PE
- Within housing: can easily be clipped on mounting rails according to EN 60715 TH 35 via integrated spring (also available in copper Art. No. 80290)
- Easy to replace by snapping from rail
- Compact – for saving space in the switchboard
- Available with cover for protection against accidental contact
- The arresters may be directly inserted in the main conductor or connected in parallel with their own delayed-action fuse

Art. No. 45050

Art. No. 45051

Article numbers

Article No.	45050	45051
Phases / Type	L, N, PE / OVP 260/5	L1, L2, L3, N, PE / OVP 260/20-4
To mounting rails acc. to EN 60715TH35		

General information

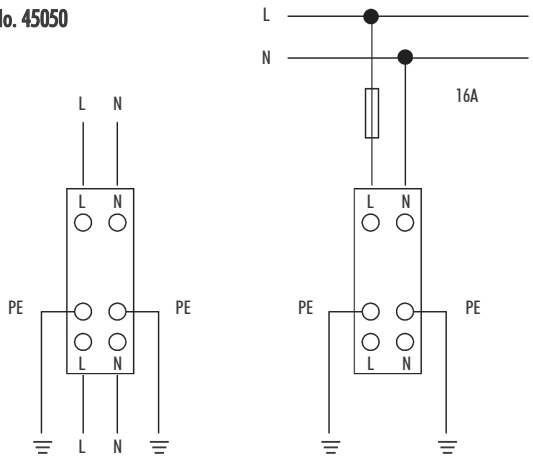
The surge arresters "Supersafe" with indicator work like usual elements for overvoltage protection. They are used for limiting overvoltages or spikes which may endanger personnel, connected appliances or installations. The surge arrester "Supersafe", type OVP 260/20-4, with rated current up to 63 A, is meant for three-phase networks 3 x 400 V / 230 V AC; the surge arrester "Supersafe" type OVP 260/5, with rated current up to 16 A, is suitable for one-phase networks 230 V. The protective capacity of the surge arrester may be increased with potential compensation and correct grounding of the "Supersafe".

The protective elements of the surge arresters "Supersafe" are provided with an operating indicator. The indicator lights up during normal working cycles; in case of overload it blows out thus providing a fast check of operation. If it has been damaged while conducting surge current, it will be disconnected; in the case of the "Supersafe" 63 A, the dry signal contact opens simultaneously. In case of malfunction, this signal contact opens, i.e. in the normal case, it is closed. At the receiver, current supply is not broken even if the protective element of the "Supersafe" is switched off or out of order.

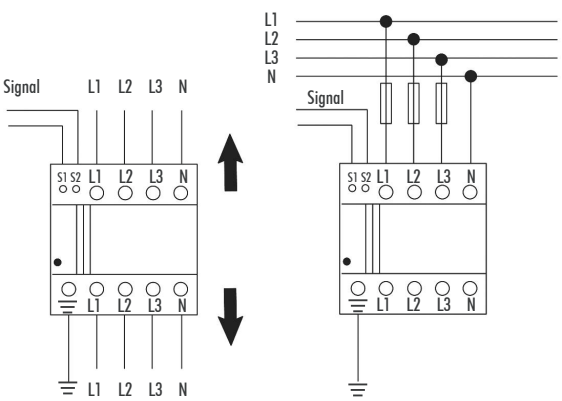
Technical data

Rated voltage $U_{nom.}$	230 V, 50 Hz	3 x 230 V, 50 Hz
Extinction voltage $U_{max.}$	260 V	260 V
Rated current $I_{nom.}$	16 A (delayed-action fuse max. 16 A)	63 A (delayed-action fuse max. 63 A)
Rated discharge current $I_{s\ nom.}$	5 kA	10 kA
Maximum discharge current $I_{s\ max.}$	10 kA	20 kA
Maximum leakage current $I_{leck.}$	0.5 A max. (in case of malfunction)	0.5 A max. (in case of malfunction)
Residual voltage for 1 kA	490 V	
Residual voltage for 5 kA	600 V	590 V
Residual voltage for 10 kA	750 V	700 V
Residual voltage for 20 kA		825 V
Temperature range	-10°C to +80°C	-10°C to +80°C

Art. No. 45050



Art. No. 45051



woertz

Surge arrester terminals

16 mm², with ABB varistor MVR...ZS

Art. No. 45041

Art. No. 45040

Article numbers

Article No.	45041	45040
to mounting rails	35mm according to EN 60715 TH 35	32mm according to EN 60715 TH 32
	also available in copper Art. No. 80290	also available in copper Art. No. 3744

General information

For mounting on standard DIN mounting rails for appliances and terminals.
- Rated voltage AC 440V
- Housing of fiber glass reinforced polyamide 6.6
- 4-figure marking facilities on both sides
- Discharge conductor and terminal base of brass

The surge arrester terminals with ABB varistor type MVR...ZS may be used in a.c. networks with frequencies up to 1 kHz.

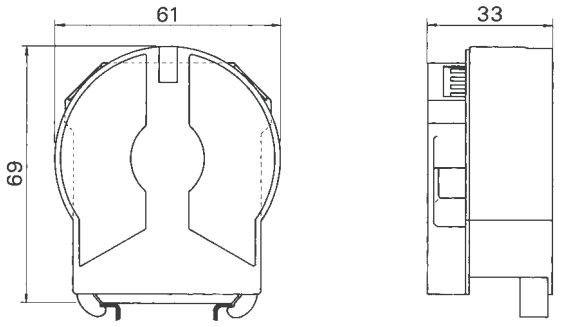
Rated discharge current (peak value) 5 kA, wave 8/20 µs
Max. discharge current (peak value) 30 kA, wave 4/10 µs
Long-wave resistance (peak value) 250 A, 1000 µs
According to IEC recommendation 99-1

Technical data: guaranteed values

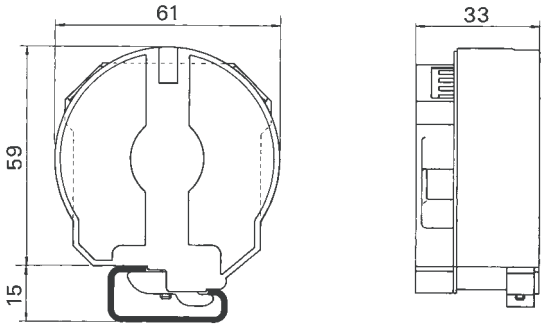
Type	Continuous service voltage U_c		service voltage 10 s U_{10s}	residual voltage U_p, square wave 250A, 1000µs	residual voltage U_p, 8/20µs wave at a discharge current of:			Max. permissible energy to be discharged within 2 minutes
	r.m.s	peak	r.m.s	peak	2.5 kV peak	5 kA peak	10 kA peak	
	kV	kV	kV	kV	kV	kV	kV	kWs
MVR 0.44 ZS	0.44	0.62	0.56	1.2	1.4	1.5	1.6	1.3

Detailed information about the surge arresters can be found in the ABB data sheet about arresters type MVR...ZS
Aluminium junction boxes type ZS designed for these surge arrester terminals see Art.No. 30188M page 4.2.10 and 30183 page 4.2.11.

Art. No. 45041



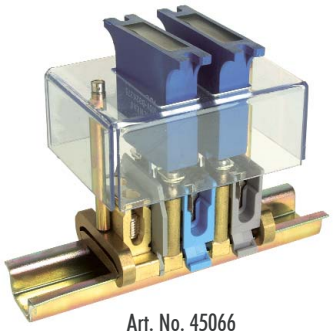
Art. No. 45040



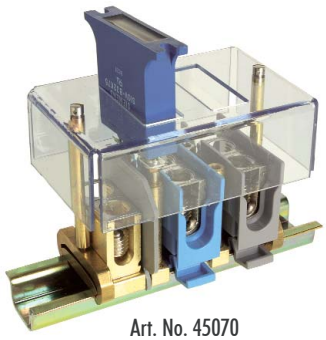
Sets of surge arresters

2.5-35 mm², P+N+PE, for Siemens arrester SIOV

The varistors have to be ordered separately



Art. No. 45066



Art. No. 45070

Article numbers

Article No.	45066	45070
Cross-section mm² to mounting rails 35mm according to EN 60715 TH 35	2.5-10	16-35

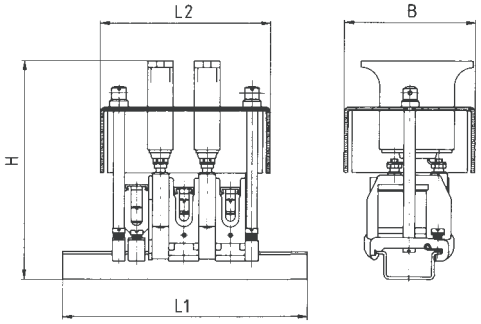
General data

For installations with up to ≤ 750 V service voltage

Set of arresters P+N+PE, ≤ 750 V **without varistors**

Complete set of arresters comprising:
1 terminal for pole conductor, grey
1 neutral conducting terminal, blue
2 sockets
1 bare earthing terminal
1 Cu rail according to EN 60715 TH 35 x 15
2 supporting studs and 1 transparent cover for protection against accidental contact

The arrester terminals, sockets, earthing terminals, varistors etc. can be supplied separately, so that the users can assemble them in junction boxes according to their own needs.



	W mm	L1 mm	L2 mm	H mm
45066	70	130	92	115
45070	70	145	106	127

Electrical features of Siemens varistors

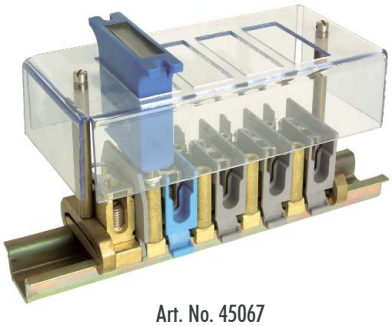
Varistor Siemens with plug pins Woertz Art. No.	Siemens type	Maximum service voltage permitted		Voltage at 1 mA K=±10%	Surge current max. wave 8/20 µs	Continuous capacity max.
		Ueff V	U- V	V	applied once only kA	W
45062/75	SIOV-B32K75	75	100	120	25	1.2
45062/130	SIOV-B32K130	130	170	205	25	1.2
45062/275*	SIOV-B32K275	275	350	430	25	1.2
45062/680	SIOV-B32K680	680	895	1100	25	1.2
45062/750	SIOV-B32K750	750	1060	1200	25	1.2
45063/275*	SIOV-B40K275	275	350	430	40	1.4
45063/680	SIOV-B40K680	680	895	1100	40	1.4
45063/750	SIOV-B40K750	750	1060	1200	40	1.4

* Standard for installations according to diagrams TN-S and TN-C-S with standard voltage 230V.
Other voltages available on request.

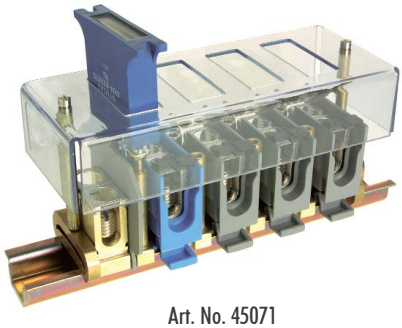
Sets of surge arresters

2.5-35 mm², 3P+N+PE, for Siemens arrester SIOV

The varistors have to be ordered separately



Art. No. 45067



Art. No. 45071

Article numbers

Artide No.		45067	45071
Cross-section to mounting rails 35mm according to EN 60715 TH 35	mm²	2.5-10	16-35

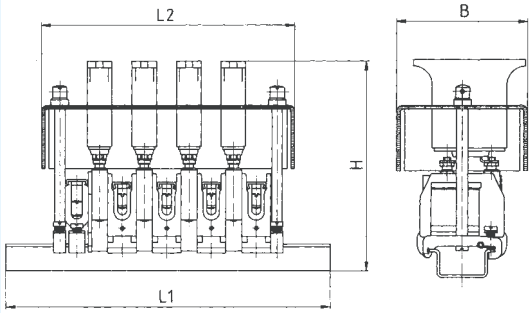
General data

For installations with up to ≤ 750 V service voltage

Set of arresters 3P+N+PE, ≤ 750 V **without varistor**

Complete set of arresters comprising:
3 terminals for pole conductors, grey
1 neutral conducting terminal, blue
4 sockets
1 bare earthing terminal
1 Cu rail according to EN 60715 TH 35 x 15
2 supporting studs and 1 transparent cover for protection against accidental contact

The arrester terminals, sockets, earthing terminals, varistors etc. can be supplied separately so that the users can assemble them according to their own needs.



	W mm	L1 mm	L2 mm	H mm
45067	70	177	139	115
45071	70	206	167	127

Electrical features of Siemens varistors see page 3.1.20

Varistor Siemens **Type SIOV-B32K**..., with plug pins
No. 45062/75
No. 45062/275*
No. 45062/...

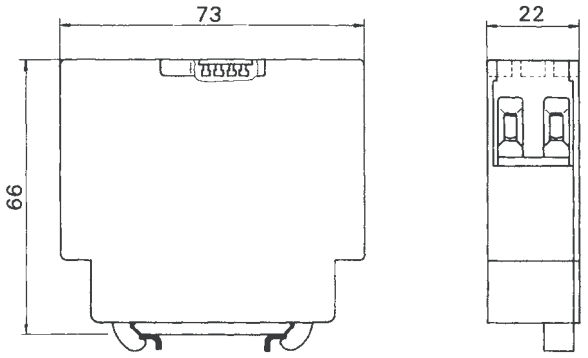
Varistor Siemens **Type SIOV-B40K**..., with plug pins
No. 45063/275*
No. 45063/...
* Standard for installations according to diagrams TN-S and TN-C-S with standard voltage 230V.
Other voltages available on request.

Note:
Mounting of varistors
Varistors mounted in supply mains may be prevented from working properly by overloads due to direct or close lightning strikes and may thus prove dangerous to the environment. To limit these detrimental effects, the varistors should be mounted either in heat-proof, non-combustible boxes or covered. Boxes are available on request.

Surge arrester terminals

4 mm², 10A, for Siemens arrester SIOV

Art. No. 45030/50



Article numbers

Article No.		45030/50	45030/220
Rated voltage to mounting rails 35mm according to EN 60715 TH 35	V	50	230

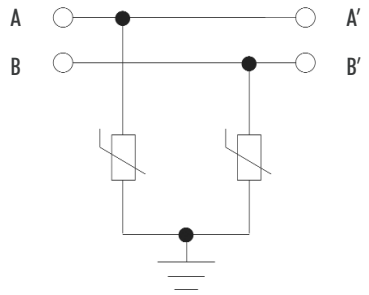
General data

- protection against overvoltages in the network
- for mounting rails according to EN 60715 TH 35
- equipped with 2 varistors SIOV-S20K..., each used to protect one conductor
- minimize discharge distance in order not to compromize low response time of varistors
- both on the incoming and on the outgoing side, one socket ø 2,3 mm for measurements
- **Use copper mounting rail, Art. No. 80290!**

Art. No. 45030/50 Version for civil defense ALN 256-6138, equipped with 2 varistors SIOV-S20K60

Art. No. 45030/220 equipped with 2 varistors SIOV-S20K275

Art. No. 45030/220 open



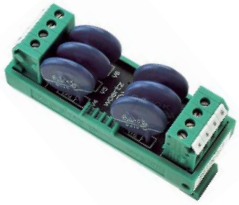
U_c	75V~ / 100V-
I_n	1 kA
$I_{max.}$	6.5kA 8/20µs

Electrical features of Siemens varistors

Siemens type	maximum service voltage permitted		voltage at 1 mA K=+10%	surge current max. wave 8/20 µs	continuous capacity max.
	Ueff V	U- V	V	applied once only kA	W
SIOV-S20K60	60	85	100	6.5	1.0
SIOV-S20K275	275	350	430	6.5	1.0

Different varistors available on request.

Surge arresters mounted on modules: see catalog volume 3, page 23.15



Suppressor terminals

4 mm², for rated current 6.3A and 10A

Art. No. 45025

Art. No. 45015

Art. No. 45047

General information

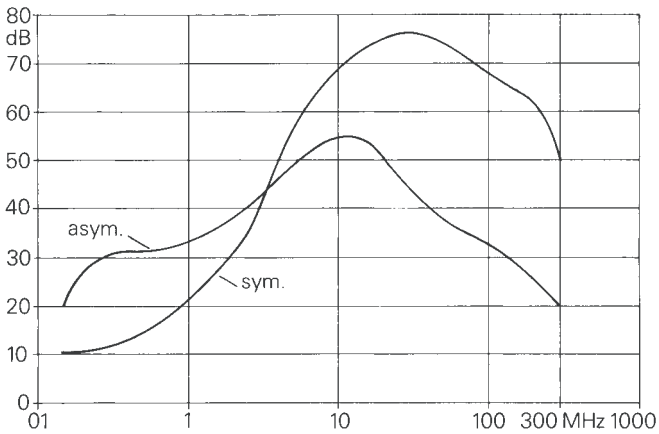
To protect electronic devices and circuits (TTL, CMOS, microprocessors etc.) against quick normal mode and common mode noise from the mains cables, in a frequency band from 150 kHz to 300 MHz.
For use in switchboards, in 19" racks, under-window ducts etc. to obtain a "clean" electricity network. For mounting on standard rails for devices and terminals.

The built-in protective elements of the terminals consist of a current-compensating choke and of self-healing metallized paper capacitors complying with SEV and VDE regulations. The filters damp mains disturbances in a wide frequency range, thus preventing malfunction of electronic circuits.

- 2-part terminal
- base part of terminal of brass
- insulating body of fiber glass reinforced polyamide 66
- 4-figure marking facilities on the central part

Developed in collaboration with the firm H. Schaffner AG, Electronic components, CH-4708 Luterbach.
Filter terminals and special filters, e.g. additionally equipped with metal oxide surge arrester, available on request.

Insertion loss for a rated current of 6.3A and 10A



Art. No. 45025
Art. No. 45015
Art. No. 45047

Technical data

Filters to suppress high-frequency noise voltages

Including	Choke coil, 1 X capacitor and 2 Y capacitors according to SEV 1055. 1978, VDE 565-1/IEC 161, earthing terminal
Voltage range	up to 250 V 50/60 Hz/~
Rated current	6.3A, 10 A*, according to type
Leakage current	below 0.5 mA
Temperature range	-25 to +85°C
Test voltage P, N→E	2 kV, 50 Hz, 1 min.
Test voltage P→N	750 V, 50 Hz , 1 min.
Test symbol	SEV

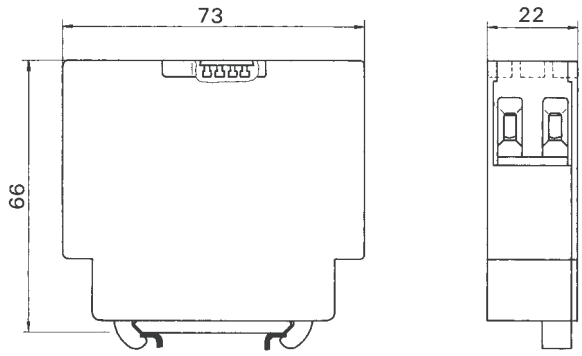
* The data about rated current refer to an environment temperature of 45°C. With higher temperatures, I^2 nom. decreases linearly; at 85°C: I=0

Article description see next page

Suppressor terminals

4 mm², for rated current 6.3A and 10A

Art. No. 45025



Article numbers

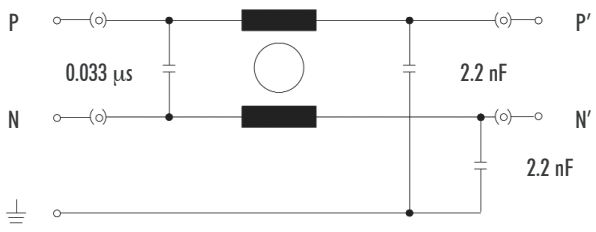
Article No.	45025	45015
	for rated current 6.3A	for rated current 10A
to mounting rails (also available in copper Art. No. 80290)	35mm according to EN 60715 TH 35	35mm according to EN 60715 TH 35

General data

on the incoming side	one socket ∅ 2.3mm for connecting measuring devices	one socket ∅ 2.3mm for connecting measuring devices
on the outgoing side	one socket ∅ 2.3mm for connecting measuring devices	one socket ∅ 2.3mm for connecting measuring devices

Technical data

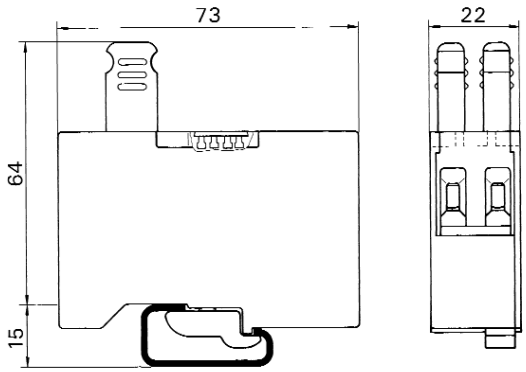
Connection:
2 x 0.8 mH rated current 6.3 A 45025
2 x 0.7 mH rated current 10 A 45015



Suppressor terminal

4 mm², for rated current 6.3A

Art. No. 45003/1



Article numbers

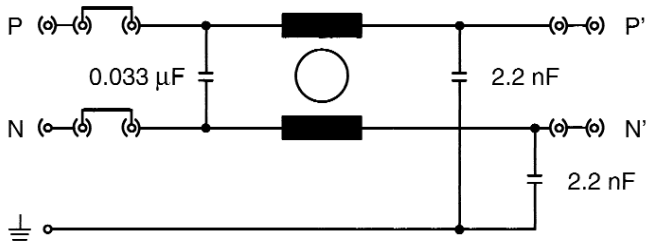
Article No.	**45003/1**
	for rated current 6.3A
for mounting rails (also available in copper Art. No. 3744)	32mm according to EN 60715 TH 32

General information

on the incoming side	one disconnecting unit with one disconnecting plug with 2 pins ∅ 2.3mm No. 45001, which is removed for measurement
on the outgoing side	one socket ∅ 2.3mm for connecting measuring devices

Technical data

Connection:
2 x 0.8 mH rated current 6.3 A

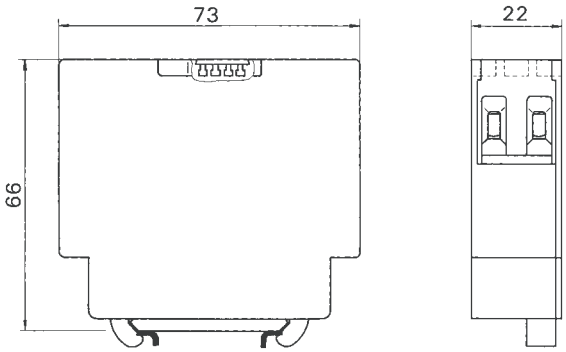


Suppressor terminal 45003/1 open

Suppressor terminal with overvoltage protection

4 mm², for rated current 6.3A

Art. No. 45047



Article numbers

Article No.	**45047**
	for rated current 6.3A
for mounting rails (also available in copper Art. No. 80290)	35mm according to EN 60715 TH 35

General information

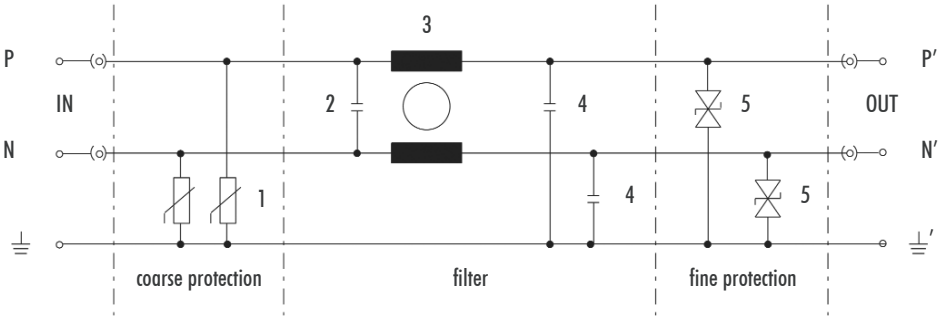
on the incoming side	one socket ∅ 2.3mm for connecting measuring devices
on the outgoing side	one socket ∅ 2.3mm for connecting measuring devices

see page 3.1.23

Technical data

Connection:
2 x 0.6 mH rated current 6.3 A

Legend:
1 varistor
2 X capacitor
3 choke
4 Y capacitor
5 protective diodes

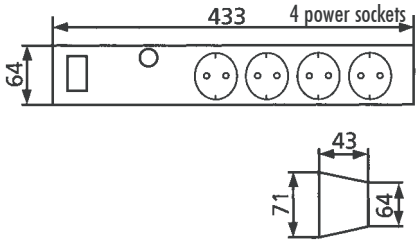


Discharge current 8/20 µs	2-4.5 kA
Protection level	550 V
Max. frequency	150 kHz-20MHz

General and electrical features of the filters see page 3.1.23

Multiple socket outlet CITEL CS

with fine protection (D arrester)



Article numbers

Article No.	44990	44991
	without high frequency suppressor	with high frequency suppressor

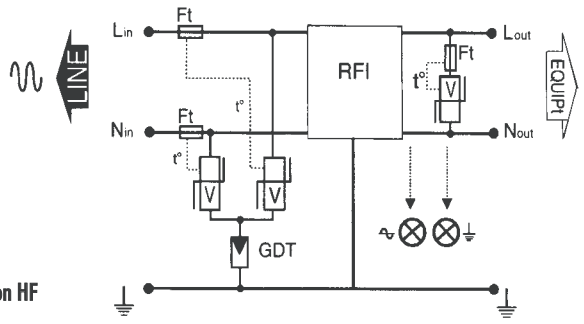
General data

- 4 power sockets 16A, 230V type 13, protected

Y circuit with thermally protected varistors and surge arresters. Also available with additional high frequency suppressor, which removes low-energy noise from the grid. With both versions (with or without high frequency suppressor) in case of overload (malfunction), the varistors are cut off and the green light goes out. The supply voltage remains.

Technical data

	D	D
Arrester class	D	D
Arrester technology	varistor and gas-discharge valve	varistor and gas-discharge valve
Rated voltage U_N	~ 230 V AC	~ 230 V AC
Low-pass filter		0.1-30 MHz
Rated discharge current (8/20) i_{sn}	3 kA	3 kA
Maximum discharge current (8/20)	10 kA	10 kA
Response time t_A	≤ 20 ns	≤ 20 ns
Residual voltage U_p	0.9 kV	0.9 kV
Temperature range	-20°C to +80°C	-20°C to +80°C
Mounting	pluggable	pluggable
Indicator	optical	optical



Version HF

Combined CITEL lightning current arresters

Coarse, medium and fine protection (B, C, D arresters)

Art. No. 44994

Article numbers

Article No.	44994	44995
	4pole	1pole

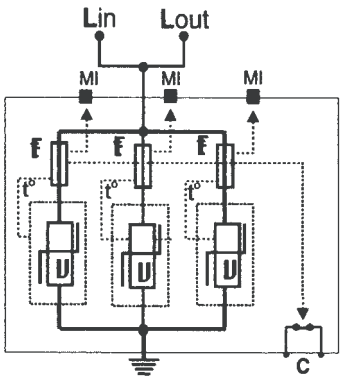
General data

The 4pole surge arrester Art. No. 44994, which is pre-assembled with a neutral bar, is meant for TNS installations. The lightning current arrester Art. No. 44995 has been developed for protecting central current supply systems. Both types combine the three arrester classes B, C and D in one component. They offer protection both in cases of direct lightning strikes and in cases of industrial overvoltages. They can be mounted in any current distribution board in a space-saving way.

Technical data

Arrester class	B/C/D	B/C/D
Arrester technology	varistor	varistor
Rated voltage U_N	~ 230 VAC	~ 300 VAC
Lightning surge current (10/350) i_{imp}	25 kA/POL	15 kA/POL
Rated discharge current (8/20) i_{sn}	70 kA	70 kA
Max. discharge current (8/20) I_{max}	140 kA	140 kA
Response time t_A	≤ 20 ns	≤ 20 ns
Residual voltage U_p	≤ 1200 V	≤ 900 V
Connection cross-section	2.5-50 mm²	2.5-50 mm²
Temperature range	-40°C to +85°C	-40°C to +85°C
L x H x W	114 x 90 x 67 mm	36 x 90 x 67 mm
Max. delayed-action fuse	100 AgL	100 AgL
Mounting	standard profile bar 35 mm	standard profile bar 35 mm
Indicator	optical	optical
Remote indicator contact	standard	standard
Contact form	N/C	N/C
Breaking capacity U_N/I_N	0.5 A/~ 230 V AC	U_N/I_N
Max. connection cross-section	1.5 mm²	1.5 mm²

Circuit



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CFW Indoor Protector
for interface RS232

Art. No. 45080

Article numbers

Article No.	**45080**
	9pole
Type	IDP09/RS232

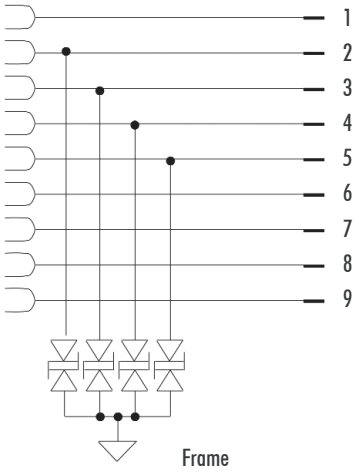
General information

In electrical and electronic installations, data links and signal lines behave like sensitive aerials receiving electric perturbations and overvoltages (caused by switching operations, electrostatic discharges, lightning strokes etc.) and transmitting them immediately to computers, peripherals or printers connected to them. Even the most insignificant and seemingly harmless interfering signal might lead to the destruction of highly sensitive semiconductor components nearby.
With the rapid and complex developments in the fields of electronics and microelectronics, measures against overvoltages, data loss and misoperation in case of malfunction have clearly become indispensable.
The indoor protectors, which are to be mounted as interference suppressors at the input ports of the electrical appliances, permit an effective elimination of such external disturbances. With a very low response time, they limit incoming overvoltages, i.e. they reduce them to values that are harmless for electronic appliances. Parasitic currents are thus deviated through the metal housing of the indoor protectors on to the grounded chassis of the protected electronic device or peripheral unit.

- with D subminiature plug (for blade or socket)
- different pin assignment on request
- Indoor protectors absolutely have to be screwed **directly**, i.e. without intermediate piece, on to the interfaces of the protected appliances.
- If the protected device is provided with an ungrounded plug, the indoor protector has to be connected to the nearest grounding screw with a grounding strip.

Technical data

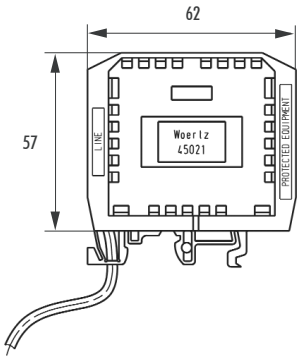
Protective element	TVS diode, bipolar
Breakdown voltage	13.5V/1mA
Withstand voltage	18.5V/35A (10x1000 µs)
Protected contacts	according to schema
Wiring	according to schema
Max. power loss	15kW/µs
	600W/ms
	5W Steady State
Response time	< 1 ns
Leakage current	< 5 µA
W x L x H	15 x 44 x 32 mm



CITEL protective device

for 4 conductors

Art. No. 45021



Article numbers

Article No.	**45021**
	24 V direct-current voltage

General information

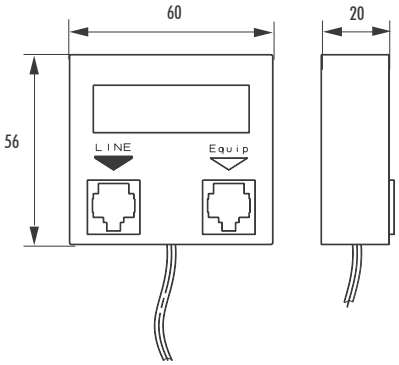
These protective devices can be clipped directly on the mounting rail. They offer a complete two-step protective circuit for 4 conductors. They are available for a nominal voltage of 24V. The devices consist of gas-discharge valves with downstream diode networks. High-quality wire resistors are used as transfer impedances.

Technical data

Service voltage	24 V
Rated discharge current (8/20 µs)	5 kA
Transfer impedance	10 Ohm / DC coil
Connection type	screw terminal
Number of conductors	4
Mounting	mounting rail according to EN 60715 TH 35
Temperature range	-20°C to +60°C

CITEL protective element for ISDN applications

Art. No. 45098



Article numbers

Article No.	**45098**

General information

Protective element for ISDN interface with modular jack connection technology. The two-step surge protection is specially adapted to the ISDN interface and protects reliably against voltage peaks that cause damages and malfunctions in ISDN components. The protective device is connected simply by plugging in the modular jack connector. The grounding cable is laid separately.

Technical data

Type of application	ISDN
Rated discharge current (8/20 µs)	5 kA
Transfer impedance	10 Ohm
Plug type	modular jack
Temperature range	-20°C to +60°C

Surge protection devices for telephone lines

Art. No. 45095

Art. No. 45096

Article numbers

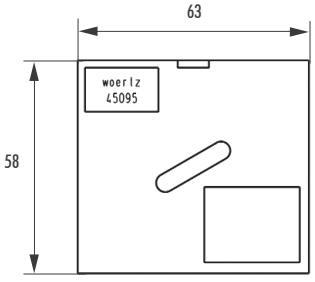
Article No.	for 2 conductors 45095	for 4 conductors 45096

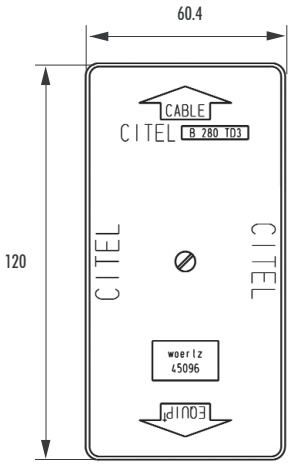
General data

Universal surge protection devices for communication lines with complete two-step protective circuit. The first step consists of 5 kA surge arresters, the second step of diodes with short response time. Standard connection elements are screw terminals.
For mounting, the cable that should be protected is just laid on the device 1:1. That way, the plug type and the pin assignment do not have any effect on the installation possibilities. On request, the protective device can be equipped with different connectors (wire-wrap, insulation displacement termination). The protective devices can also be delivered with suitable pre-assembled cables and plugs. The devices 45095 and 45096 differ in the number of conductors they can protect. Device 45095 can protect two conductors, device 45096 four. The housings are suitable for mounting in floors and walls.

Technical data

Rated voltages	6-170V (according to type)	6-170V (according to type)
Rated discharge current (8/20 µs)	5 kA	5 kA
Transfer impedance	10 Ohm	10 Ohm
max. transfer rate	1 MBit/sec	1 MBit/sec
Response time	< 1 ns	< 1 ns
Temperature range	-20°C to +60°C	-20°C to +60°C





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Notes

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