CATALOGUE 2025

INNOVATIVE SURGE PROTECTION

ZOTUP®

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THE COMPANY

ZOTUP is our company. Since 1986 we focus our efforts on the development of solutions for surge protection and on the production of Surge Protective Devices. We strive to serve our customers with highest quality products and services.

ZOTUP's values are pure and simple.

SAFETY Our ambition and goal is to provide products that **protect people, their property and their working environment.**

QUALITY Only through the **quality of our products** we can meet our promise.

INNOVATION Continuous further development is the heartbeat of **ZOTUP**. Cutting -edge products are the answer to our customers needs.

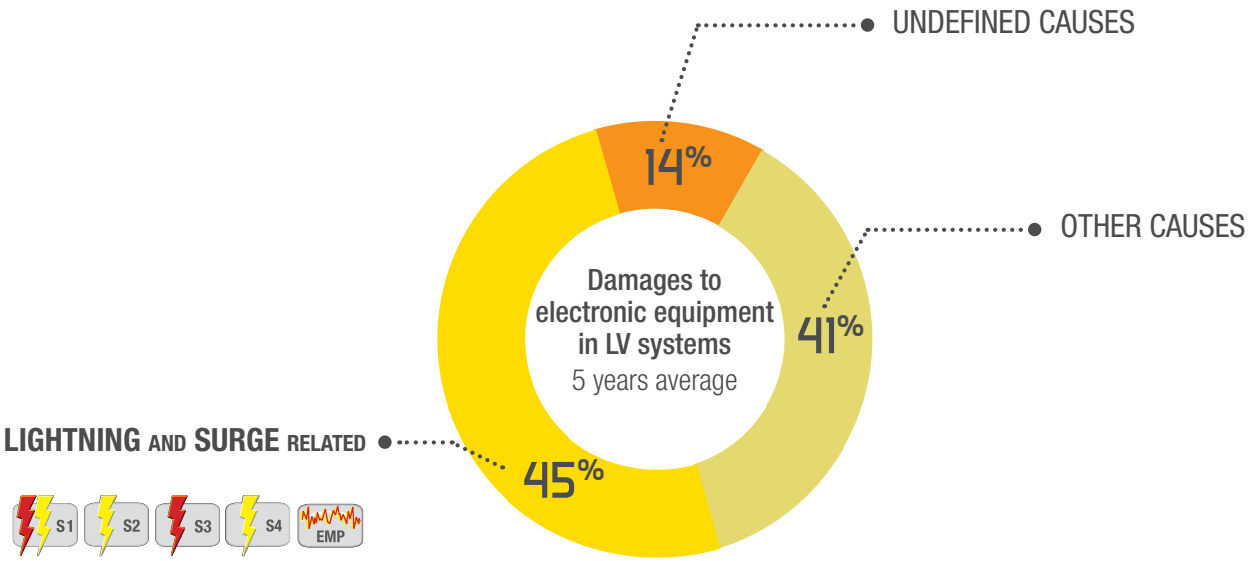
By means of these values, we at **ZOTUP** want to keep track with the market, today and tomorrow.

YOUR SAFETY, OUR GOAL

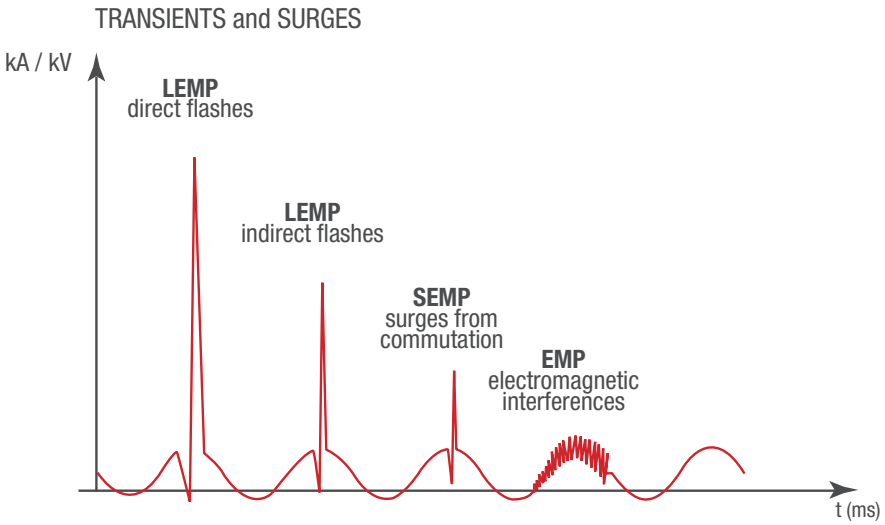
SURGE PROTECTIVE DEVICES - WHY?

REQUIRED BY HD 60364-4-443 AND BY THE EN IEC 62305 SERIES OF STANDARDS FOR PROTECTION AGAINST TRANSIENT OVERVOLTAGES OF ATMOSPHERIC ORIGIN.

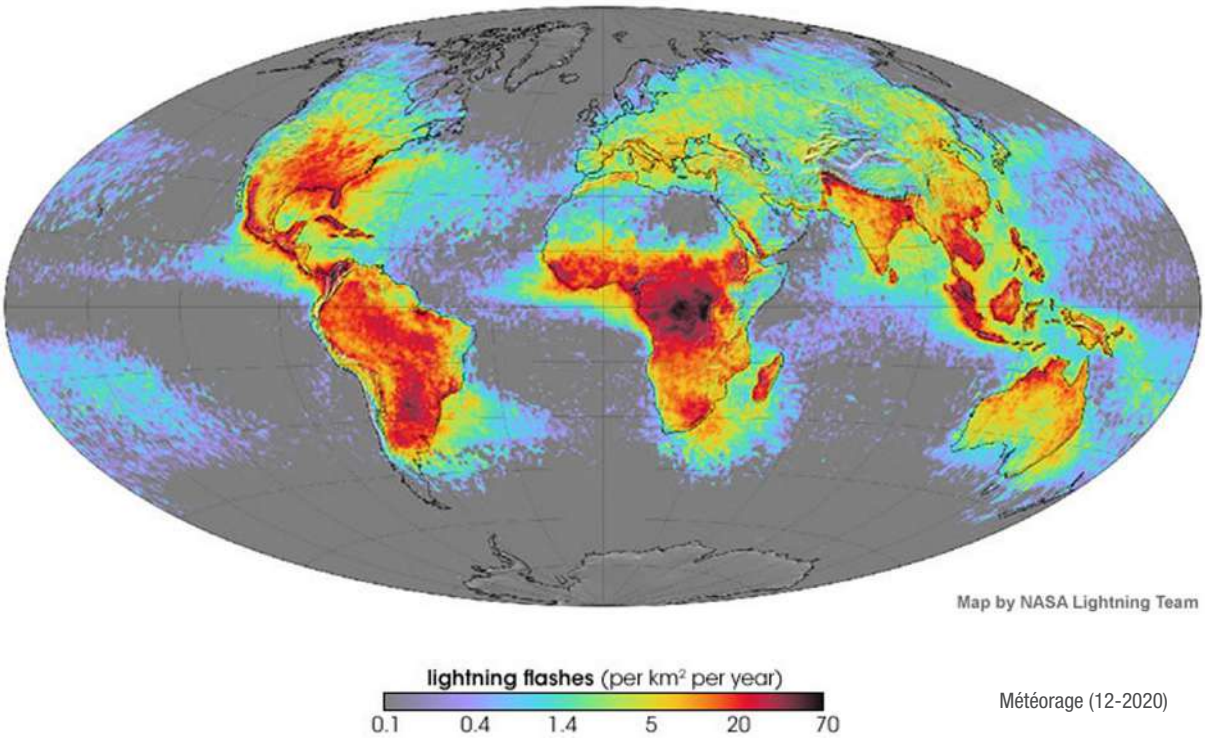
In the Internet era and with the exponentially increasing use of electrical and electronic equipment containing sensitive integrated circuits and semi-conductors with high cost implication in case of damage, increasing attention to transient phenomena of atmospheric origin and to the resulting surges within the electric distribution systems and installations is required. The statistical analysis of damages published by insurance companies irrefutably demonstrates the dimension of the problem. The costs of damage and downtime due to these transient effects has the same order of magnitude as the costs of civil crime.
To prevent damages to people and equipment, to ensure continuity of the electrical supply and of communication services and to avoid the corresponding economic loss due to presence of such interferences, the realisation of highly effective protection measures for structures and buildings in the public, industrial and tertiary care infrastructure as well as for private premises is essential.



source: German Insurance Association (GDV); Berlin - 2009.



LIGHTNING GROUND FLASH DENSITY



Météorage (12-2020)

Source: Article by Hobart M. King.

NASA has satellites orbiting the Earth with sensors designed to detect lightning and collect data, which is transmitted to Earth, plotted geographically and used to construct a geographic record of lightning activity over time. The map above shows the average yearly counts of lightning per square kilometer based on data collected by NASA's Lightning Imaging Sensor on the Tropical Rainfall Measuring Mission satellite between 1995 and 2002. Places where less than one lightning occurred (on average) each year are gray or light purple; places with the largest number of lightning flash are deep red, grading to black.
Globally, there are about 40 to 50 lightning every second, or nearly 1.4 billion of lightning per year. These electrical discharges are powerful and deadly. Each year, lightning not only kill people and wildlife but are also responsible for billions of dollars in damage to buildings, communication systems, power lines, electrical equipment and billions of dollars per year in flight rerouting and delays. Thus, maps showing the distribution of lightning across the Earth – which is far from uniform - are important for economic, environmental and safety reasons. The ideal conditions for the appearance of lightning and associated thunderstorms occur where warm, moist air rises and mixes with cold air above: the heated land surface warms the air above it, and that warm air rises to encounter cold air aloft. The interaction between air masses of different temperature stimulates thunderstorms and lightning. These conditions occur almost daily in many regions on Earth, but only rarely in other regions. Moreover, much more lightning occurs over land than over the ocean because daily sunshine heats the land surface faster than the ocean. More lightning occurs near the equator than at the poles because not only the latter's frozen surfaces are not effectively warmed by the sun to produce convection but also there is very little moisture in polar air.

DENSITY OF LIGHTNING FLASHES TO THE GROUND N_G

The ground flash density N_G is the number of lightning flashes per km^2 per year. These values are provided by recording of all the flashes detected by the corrresponding lightning location system (LLS) that covers the territory. The detection data registered by the LLS must be collected and processed, in order to calculate the annual number of dangerous events N_x according to EN IEC 62305-2. It is sufficient to provide the geographical coordinates (latitude/longitude) to retrieve the corresponding value of N_G. The ground flash density values are drawn from National databases where available. Where no such database is available, the standard EN IEC 62858 :2019 recommends to obtain the N_G by multiplying the N_t (total density of optical recorded flashes per km^2 per year from NASA website) by 0,25.

REFERENCE STANDARDS

Awareness, that transient surges are the main influencing factor of the MTBF (Mean Time Between Failures) of systems and equipment, is driving all manufacturers in the area of surge protection to continuously develop new overvoltage protective devices with increasing features and in compliance with the actual national and International standards.
The following is a list of the key standards involved:

IEC 61643-01 Ed. 1 (2024-12)
EN IEC 61643-01 +A11 (2025-04)

Low-voltage surge protective devices:

Part 01: General Requirements and test methods

IEC 61643-11 Ed. 2 (2025-06)
EN IEC 61643-11 +A11 (2025-11)

Low-voltage surge protective devices:

Part 11: Surge protective devices connected to AC low-voltage power systems

Requirements and test methods.

IEC 61643-12 Ed. 3 (2020-05)
CLC/TS 61643-12 (2009-12)

Surge protective devices connected to low-voltage power systems. Selection and application principles.

IEC 61643-21 Ed. 2 (2025-xx)
EN IEC 61643-21 +A11 (2025-xx)

Low-voltage surge protective devices.

Part 21: Surge protective devices connected to telecommunications and signalling networks

Requirements and test methods

IEC 61643-22 Ed. 2 (2015-06)
CLC/TS 61643-22 (2016-03)

Surge protective devices connected to telecommunications and signalling networks. Selection and application principles.

IEC 61643-31 Ed. 1 (2018-01)
EN 61643-31 (2019-10)

Surge protective devices.

Part 31: SPDs connected to the c.c. side of photovoltaic applications. Requirements and tests methods.

IEC 61643-32 (2017-09)
CLC/TS 51643-32 (2020-07)

Low-voltage surge protective devices connected to the c.c. side of photovoltaic installations. Selection and application principles.

IEC 61643-41 Ed. 1 (2025-05)
EN IEC 61643-41 +A11 (2025-08)

Low-voltage surge protective devices:

Part 41: Surge protective devices connected to DC low-voltage power systems

Requirements and test methods.

IEC 62305 series Ed. 3 (2024-09)
EN IEC 62305 series (2024-10)

Protection against lightning.

Part 1: General principles;
Part 2: Risk management;
Part 3: Physical damage to structures and life hazard;
Part 4: Electrical and electronic systems within structures.

IEC 60364-5-53 Ed. 4.2 (2024-12)
HD 60364-5-53 (2022-05)

Low-voltage electrical installations.

Part 5-53: Selection and erection of electrical equipment. Isolation, switching and control. Clause 534: Devices for protection against transient overvoltages.

IEC 61000-4-5 Ed. 3.1 (2017-08)
EN 61000-4-5 (2014-08) +A1 (2017-11)

Electromagnetic compatibility (EMC).

Part 4-5: Testing and measurement techniques. Surge immunity test.

IEC 61439 series
EN (IEC) 61439 series

Low-voltage switchgear and controlgear assemblies

IEC 61439-1(2020) / EN IEC 61439-1 (2021)
Part 1: General rules

IEC 61439-2 (2020) / EN IEC 61439-2 (2021)
Part 2: Power switchgear and controlgear assemblies

IEC 61439-3 (2024) / EN IEC 61439-3 (2024)
Part 3: Distribution boards intended to be operated by ordinary persons (DBO)

IEC 61439-4 (2023) / EN 61439-4 (2013)
Part 4: Particular requirements for assemblies for construction sites (ACS)

IEC 61439-7 (2022) / EN IEC 61439-7 (2023)
Part 7: Assemblies for specific applications such as marinas, camping sites, market squares, electric vehicle charging stations.


IEC 61643-31
Edition 1.0 2018-01
INTERNATIONAL STANDARD
NORME INTERNATIONALE
colour inside
Low-voltage surge protective devices –
Part 31: Requirements and test methods for SPDs for photovoltaic installations
HARMONIZATION DOCUMENT
DOCUMENT D'HARMONISATION
HARMONISIERUNGSDOKUMENT
HD 60364-5-53
November 2015
ICS 91.140.50, 29.120.50
Supersedes HD 50573-5-57:2014, HD 60364-5-53:2015
English Version
Low-voltage electrical installations - Part 5-53: Selection and erection of electrical equipment - Switchgear and controlgear
IEC 61643-11
Edition 1.0 2011-03
INTERNATIONAL STANDARD
NORME INTERNATIONALE
colour inside
Low-voltage surge protective devices –
Part 11: Surge protective devices connected to low-voltage power systems –
Requirements and test methods

TERMINOLOGY

Knowledge of some basic technical terms and definitions associated with SPDs will facilitate an understanding of the contents of this catalogue.
Please find below a selection of the most important.

TT System

Technique for the protection of persons: the exposed conductive parts are earthed and residual current devices (RCDs) are used.

TN System

Technique for the protection of persons: interconnection and earthing of exposed conductive parts and the neutral are mandatory.

IT System

Technique for the protection of persons:

- Interconnection and earthing of exposed conductive parts;
- Indication of the first fault by an insulation monitoring device (IMD);
- Interruption for the second fault using overcurrent protection (circuit-breakers or fuses).

T1 SPD or Type 1 (EN) / test class I (IEC)

SPD tested with nominal discharge current I_n and with impulse current I_{imp}.

T2 SPD or Type 2 (EN) / test class II (IEC)

SPD tested with nominal discharge current I_n and with max. discharge current I_{max} (optional).

T3 SPD or Type 3 (EN) / test class III (IEC)

SPD tested with combination wave.

Voltage switching SPD (GAP)

SPD that has a high impedance when no surge is present, but can have a sudden change in impedance to a low value in response to a voltage surge. Common examples of components used in such SPDs are spark gaps, gas tubes and thyristors.

Voltage limiting SPD

SPD that has a high impedance when no surge is present, but will reduce it continuously with increased surge current and voltage.
Common examples of components used in such SPDs are varistors and avalanche diodes.

Combination SPD

SPD that incorporates both, voltage switching components and voltage limiting components.
The SPD may exhibit voltage switching, limiting or both.

N-PE SPD

SPD intended exclusively for application between N and PE conductors in an installation.

Mode of protection (of a SPD)

An intended circuitry between two connections, that contains one or more protective components, e.g. line-to line, line-to-earth, line-to-neutral, neutral-to-earth.

Multipole SPD

SPD with more than one mode of protection, or a combination of electrically interconnected SPDs offered as a unit.

Maximum Continuous Operating Voltage (U_c)

Maximum r.m.s. voltage, which may be continuously applied to the SPD's mode of protection. This is comparable to the nominal voltage of other installation devices.

Impulse discharge current (I_{imp})

Crest value of a discharge current through the SPD with specified charge transfer Q and specified energy W/R in the specified time.
This characterises a T1 SPD. The characteristic waveform is 10/350 µs.

Nominal discharge current (I_n)

Crest value of the current through the SPD with a current waveshape of 8/20 µs.This characterises a T2 SPD.

Maximum discharge current (I_{max})

Crest value of a current through the SPD having an 8/20 µs waveshape and magnitude according to the manufacturers specification.
Imax is an optional parameter.
This parameter should not be considered for the selection of SPDs.

Discharge current (I_d)

Presumed maximum crest value of the current through the SPD when subjected to a combination wave with an open circuit voltage equal to U_{oc}.
The real current through the SPD will always be lower than I_{SC}.

Total discharge current (I_{Total})

Current which flows through the PE or PEN terminal of a multipole SPD during the total discharge current test.

Short-circuit current rating (I_{sccr})

Maximum prospective short-circuit current from the power system for which the SPD, in conjunction with the disconnector specified, is rated.

Follow current (I_f)

Peak current supplied by the electrical power system and flowing through the SPD after a discharge current impulse.

Follow current interrupt rating (I_{fi})

Prospective short-circuit current that an SPD is able to interrupt without operation of a disconnector.

No Follow Current® (NFC)

An SPD design not causing any follow current.
SPDs with NFC-technology avoid any undesired current stress to disconnectors and protective devices upstream the SPD.

Open circuit voltage (U_{oc})

Open circuit voltage of the combination wave generator at the point of connection of the device under test.

(Voltage) protection Level (U_p)

Maximum voltage to be expected at the SPD terminals due to an impulse stress with defined voltage steepness and an impulse stress with a discharge current with given amplitude and waveshape.

Noise level attenuation (dB)

Reduction of the noise caused by electromagnetic interferences, both in common and differential mode.

Temporary Overvoltage (TOV)

Power frequency overvoltage of relatively long duration. A temporary overvoltage is undamped or weakly damped.

SPD behaviour in case of Temporary Overvoltages TOV (U_T)

- Withstand without damage: withstand (W);
- or reach end of life in a safe way, maintaining its IP degree: safe (S).

Status Indicator

Device that indicates the operational status of an SPD or a part of an SPD. Such indicator may be local visual and may have remote signalling and output contact capability. Intermediate stages of the status indicator may also be provided before it has reached its end of life, e.g. for preventive maintenance.

Pollution Degree (PD)

Numeral characterizing the expected pollution of the relevant environment.

P.D. 1: No pollution or only dry, non-conductive pollution.

P.D. 2: Only non-conductive pollution, except an occasionally temporary conductivity caused by condensation.

P.D. 3: Conductive pollution or dry non-conductive pollution which becomes conductive due to expected condensation.

PARAMETERS FOR SPD SELECTION

The parameters to be considered for SPD selection are many. The main ones are:

- Suitability for the power distribution system (TN, TT, IT);
- Maximum Continuous Operating Voltage (U_C);
- Behaviour in case of TOV (U_T);
- SPD Type (and impulse current / voltage) T1 T2 T3;
- Short circuit current rating (I_{sccr});
- Back-up protection OCPD (fuse);
- Follow current interrupt rating (I_{fi});
- Voltage protection level (U_p);
- Pollution Degree;
- Response time (t_a).

Maximum Continuous Operating Voltage U_c:

This is the maximum r.m.s. voltage, which may be continuously applied to the SPD's mode of protection.
It is selected depending on:

- the nominal voltage of the circuit to be protected;
- the low voltage distribution system (TN, TT, IT);
- the required modes of protection (phase to earth; phase to neutral; neutral to earth).

Recommended U_c values for 230/400 V plants in the different power distribution systems.

By respecting these values, the withstand behaviour in case of TOV improves.

SPD	TN-system	TT-system	IT-systems
phase to neutral	Uc ≥ 335 V	Uc ≥ 335 V	Uc ≥ 335 V (1)
phase to earth	Uc ≥ 335 V	Uc ≥ 400 V	Uc ≥ 400 V
neutral to earth	-	Uc 255 V (2)	Uc 255 V (2)

(1) only for systems with distribuited neutral - (2) tested for a TOV of 1200 V for 200 ms

Behaviour in case of Temporary Overvoltage TOV (U_T), in accordance with EN IEC 61643-11:

Application	Test parameters of the TOV		
SPDs connected to:	For t_T = 5 s (LV-system faults in the consumer installation) (requirements in 8.3.9 and test 9.3.9.100)	For t_T = 120 min (LV-system - loss of neutral) (requirements in 8.3.9 and test 9.3.9.100)	For t_T = 200 ms (HV system faults) (requirements in 8.3.9 and test in 9.3.9.101)
	Withstand* mode required	**Withstand*** or **safe end of life**** acceptable	**Withstand*** or **safe end of life**** acceptable
	Test values of the TOV U_T (V)		
TN Systems			
Connected L-(PE)N o L-N	1,32 x U_{test}	√ 3 x U_{test}	-
Connected N-PE	-	-	-
Connected L-L	-	-	-
TT Systems			
Connected L-PE	√ 3 x U_{test}	1,32 x U_{test}	1200 + U_{test}
Connected L-N	1,32 x U_{test}	√ 3 x U_{test}	-
Connected N-PE	-	-	1200
Connected L-L	-	-	-
IT Systems			
Connected L-PE	-	-	1200 + U_{test}
Connected L-N	1,32 x U_{test}	√ 3 x U_{test}	-
Connected N-PE	-	-	1200 + U_{test}
Connected L-L	-	-	-

*** Withstand mode (W):** the SPD withstands without being damaged! This is the optimal condition.

**** Safe end of life mode (S):** the SPD is damaged and behaves in a safe way, without burning and maintaining its IP degree. This is the minimum acceptable condition, which involves the loss of the protection.

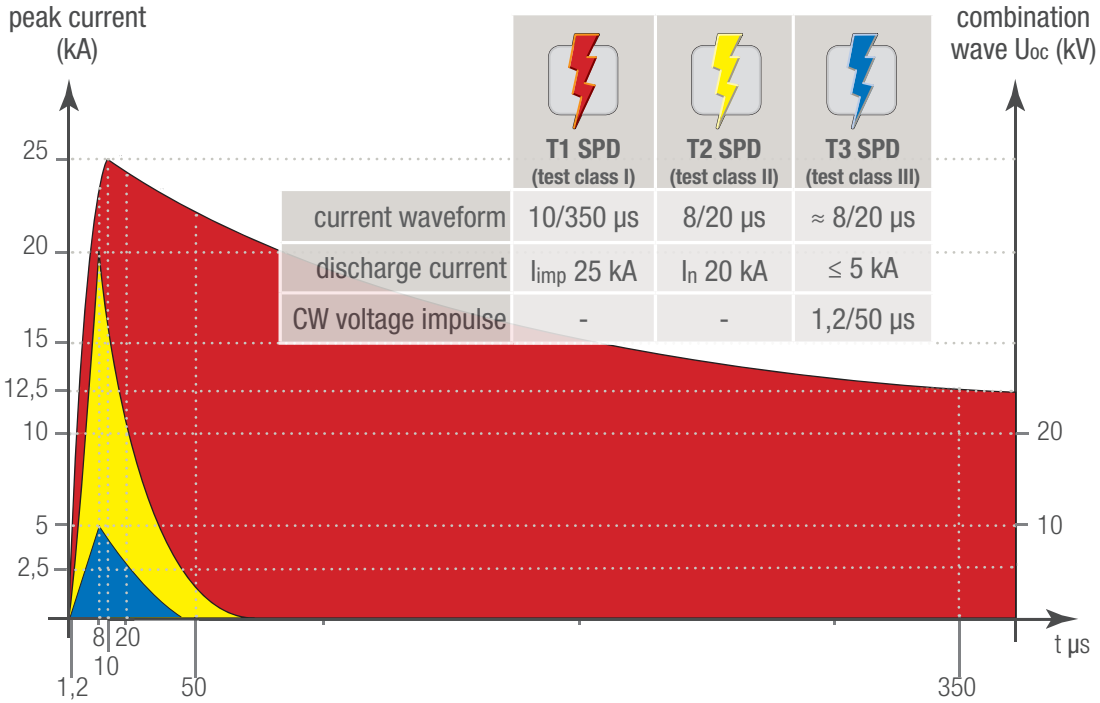
SPD classification and test classes

Surge protective devices are tested in accordance with the classification and parameters provided by the manufacturer. Depending on the intended application, according to HD 60364-5-53 or the EN IEC 62305 series, there are three different types of SPDs:

Type of SPD	IEC 61643-11 (2011)	EN IEC 61643-11 (2025)	SPD icon
SPD for lightning equipotential bonding	test class I	Type 1 / T1 SPD / T1	
SPDs for protection against transient overvoltages	test class II	Type 2 / T2 SPD / T2	
SPDs for protection against transient overvoltages and for equipment protection	test class III	Type 3 / T3 SPD / T3	
SPDs with filter for enhanced equipment protection	IEC 61000-4-5	EN 61000-4-5	

- T1 SPD: tested with the impulse discharge current I_{imp} (typically 10/350 µs) and with 8/20 µs current impulses;
- T2 SPD: tested with the nominal discharge current I_n (8/20 µs) and optional with the maximum discharge current I_{max} (8/20 µs). *Imax should not be considered for choosing an SPD.* When containing any voltage switching components T1 SPDs and T2 SPDs are additionally tested with 1,2/50 µs voltage impulses;
- T3 SPD: tested with a combination wave (CW) generator providing an open circuit voltage U_{oc} (1,2/50 µs) and a defined short circuit current I_{cw} (8/20 µs) with a fictive nominal output impedance of 2 Ω.

Maximum preferred discharge current values for T1, T2 and T3 SPDs in accordance with EN IEC 61643-11



Short circuit withstand capability (short circuit current rating I_{sccr}):
During the normal operation of overvoltage protective devices, the SPD provides a high impedance at nominal system voltage and rated frequency. In case an SPD reaches its end-of-life in a low impedance state, the resulting short-circuit current must be interrupted. This interruption may be provided by an SPD internal disconnector or in conjunction with an external disconnector, e.g. a fuse.
When the SPD manufacturer provides information about a maximum allowed backup fuse rating, any alternative overcurrent protective device, like e.g. MCBs or circuit breakers, must be considered very carefully, because such devices may not provide the required impulse withstand, specifically in applications where T1 SPDs are required and partial lightning currents are to be expected.
If overcurrent protective devices other than those recommended by the SPD manufacturer are used, their selection is under the sole responsability of the installer. Furthermore, the higher internal impedance of such altrernative devices compared to a fuse may increase the voltage drop under surge conditions, thereby worsening the effective voltage protection level for the installation and equipment.

Follow current interrupt rating I_{fi}:
This rating only exists in the IEC 61643-11 (2011) and relates to SPD constructions, which generally cause a follow current from the power supply after discharge current flow, and describes the ability of such SPDs to self-extinguish such follow current without operation or alteration of any disconnector. Important for correct understanding is, that this parameter does not provide a real current value that gets interrupted by the SPD, but the maximum prospective short circuit current that may be available at the SPD's point of installation, at which any expected follow current will be self-extinguished by the SPD.
While IEC 61643-11 (2011) allows this follow current interrupt rating I_{fi} to be lower than the short-circuit current rating I_{sccr}, EN 61643-11(2012) and IEC / EN IEC 61643-11 (2025) require this rating to be equal to the short-circuit current rating I_{sccr}. But both installation rules, IEC 60364-5-53 as well as HD 60364-5-53, require that the follow current interrupt rating must be equal or higher than the maximum available short circuit current from the power system at the SPD's point of installation.

NFC No Follow Current®:
Thanks to their design characteristics, SPDs with **No Follow Current®** technology **(NFC)**, completely avoid the flow of follow currents from the power system at all, and therefore also limit the impulse stress to disconnectors (e.g. fuses) and upstream protective devices in the installation to a minimum. Thus resulting in a lower risk of supply outages.

Voltage Protection level U_p:
This parameter is defined as the maximum instantaneous voltage value at the SPD's terminals during its intended operation under defined impulse stress conditions. Depending on the construction and the type of components used in the SPD this protection level corresponds to:

- for voltage Limiting SPDs: the residual voltage at nominal discharge current (8/20 µs) for type 2 SPDs or the residual voltage at a discharge current (8/20 µs), with a crest value of I_{imp} for type 1 SPDs;
- for voltage switching and combination SPDs: the limiting voltage at 1,2/50 µs voltage impulses and the residual voltage as above, whatever is higher, or the limiting voltage at hybrid generator impulses.

The protection level provided by SPDs must be compared to the impulse voltage withstand of the equipment to be protected, also taking into consideration the distances between these SPDs and the equipment.

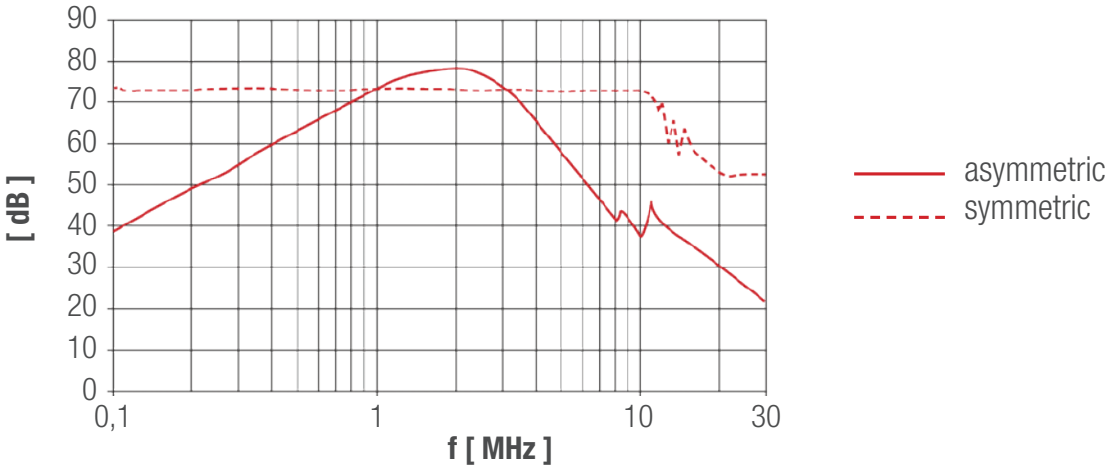
Response time t_a:
In EN IEC 61643-11 the response time of SPDs is not directly addressed, but only an implicit factor when testing for the limiting voltage of voltage switching or combination SPDs. However, for semiconductors even very short peaks can be harmfull and therefore the response time of SPDs is not of secondary importance. The phenomena of transient overvoltages in equipment is usually in the order of some ten **µs**, the response time of voltage limiting SPDs is in the order of some to some ten **ns**, but the time before damage may occur to some categories of semiconductors is in the order of **ps**.
This leads to the simple statement: the shorter the SPDs response time is, the better is the overall protection function the SPD provides.

Coordination of SPDs:
The best effectiveness of SPDs can only be ensured through appropriate coordination of all SPDs with regard to the voltage protection level and the energy absorption. The necessary information to enable such coordination of SPDs can only be provided by the manufacturer, because the specific SPD design and construction may have a significant influence here. The larger an electrical system is, the more difficult and complex it is to achieve proper coordination because of the increasing distances, and therefore increasing conductor length and impedances, between the SPDs and the parts of the installation and the equipment to be protected, which may cause the various SPDs installed to operate independently from each other.

Total discharge current (I_{total} 10/350 and I_{total} 8/20):
This parameter is intended to specify and test for the maximum surge current stress in the terminal and related components of a multipole SPD, which are connected to PE. This is necessary to check for the accumulating effects and stress factors when several or even all modes of protection of an SPD are operated, because most other tests are performed on single modes of protection, but I_{total} is particularly important for T1 SPDs as the stresses expected in a lightning equipotential bonding system are common mode, meaning impulse currents flowing simultaneously in all active conductors, as indicated in EN IEC 62305-1 and -4.

Noise level attenuation:
This is realised by filters for limiting the electromagnetic interferences in the range of 150 kHz – 30 MHz, both in common and line to line mode, which show a specific characteristic to reach that protective behaviour. Such filters are added as an additional feature to advanced SPD designs for providing extensive protection against transients and all kinds of conducted interferences, with the aim of reaching electromagnetic compatibility (EMC) in a wide frequency range.

Filter characteristics showing the asymmetric and the symmetric attenuation curve



Pollution Degree:
The basic safety publication EN IEC 60664-1 for insulation coordination for equipment within low voltage systems specifies and classifies four pollution degrees, whereby the micro-environmental conditions of the insulation must be taken into account for construction. Micro environment in this context means the immediate environment of the insulation, as compared to the macro environment, which describes the environment of the room or location where the equipment is installed. The micro environment often depends primarily on the macro environment and they are essentially identical.
Classification of pollution degrees (PDs):
PD 1: No pollution or only dry, non-conductive pollution.
PD 2: Only non-conductive pollution, except an occasionally temporary conductivity caused by condensation.
PD 3: Conductive pollution or dry non-conductive pollution which becomes conductive due to expected condensation.
This design parameter of an SPD should be thoroughly checked to determine its suitability for a specific application. As a general guideline for domestic applications pollution degree 2 applies and for industrial applications pollution degree 3 applies. It may require particular attention in outdoor locations or under severe environmental conditions. e.g. for photovoltaic installations, public lighting and wind farms, industrial environments such as steel mills, cement factories.

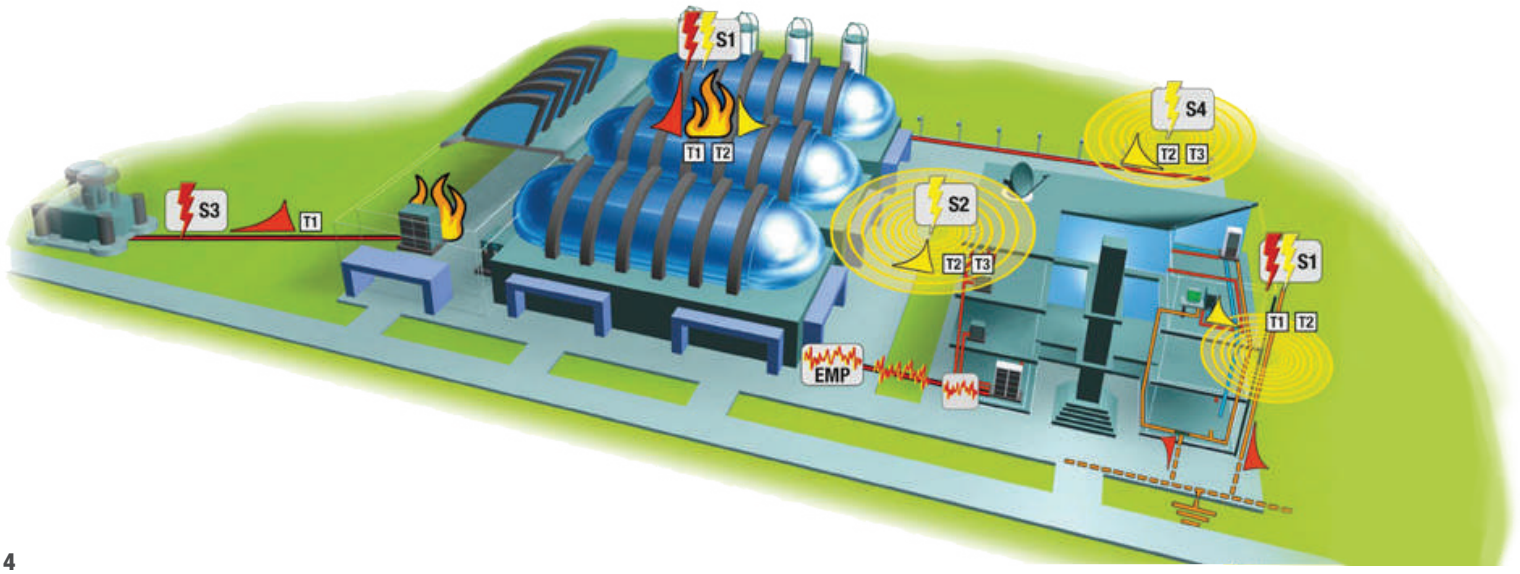
SELECTION OF SPDs ACCORDING TO THE EXPECTED IMPACT

The standard series IEC and EN IEC 62305 defines lightning flashes to various points as so called sources of damage. Such damage may e.g. be to a structures, to services, to installations or equipment. The installation of SPDs within the electric distribution system can significantly reduce the risk of such damages to services, to installations or equipment. Electromagnetic interferences are also a potential source of damage, the risk of which can be reduced by the installation of SPDs with additional filter.

Source of damage	Source of damage	Effect Icon	Selection of SPD
Flash to the structure	S1		T1 and T2
Flash near the structure	S2		T2 and/or T3
Direct flash to the service	S3		T1 and T2
Indirect flash to the service	S4		T2 and/or T3
Interference on the service	EMP		T1 and/or T2 and/or T3 +FILTER

SPD type

- T1+T2 SPD T1 T2
- T2 SPD T2
- T3 SPD T3
- SPD with additional filter



SELECTION OF SPDs ACCORDING TO THE EXPECTED IMPACT IN ACCORDANCE WITH IEC AND EN IEC 62305-2

Lightning flash to the structure - direct flash (source of damage S1):

The lightning current flowing to earth is subdivided directly and via SPDs between the earthing system and all metal structures entering, including any electric services. A representative current waveform is a unipolar 10/350 µs impulse (I_{imp}). In the event of a direct lightning flash to a structure there will also be induced currents represented by an 8/20 µs impulse (I_n). Required SPDs are **T1** and **T2**.

Lightning flash near the structure - indirect flash (Source of damage S2):

The impulses caused by induction effects from magnetic fields generated by the lighting current are represented by an 8/20 µs impulse (I_n).
Required SPDs are **T2** and/or **T3**.

Lightning flash to a service - direct flash (Source of damage S3):

The lightning current is subdivided to both directions of the service and insulation breakdown needs to be considered. A representative current waveform is a unipolar 10/350 µs impulse (I_{imp}). Required SPDs are **T1** and **T2**.

Lightning flash close to a service - indirect flash (Source of damage S4):

The impulses caused by induction effects from magnetic fields generated by the lightning current are represented by an 8/20 µs impulse (I_n).
Required SPDs are **T2** and/or **T3**.

SELECTION OF SPDs ACCORDING TO THE EXPECTED IMPACT IN ACCORDANCE WITH HD 60364-4-443

Lightning flash to a service - direct flash (Source of damage S3):

The lightning current is subdivided to both directions of the service and insulation breakdown needs to be considered. A representative current waveform is a unipolar 10/350 µs impulse (I_{imp}). Required SPDs are **T1** and **T2**.

Lightning flash close to a service - indirect flash (Source of damage S4):

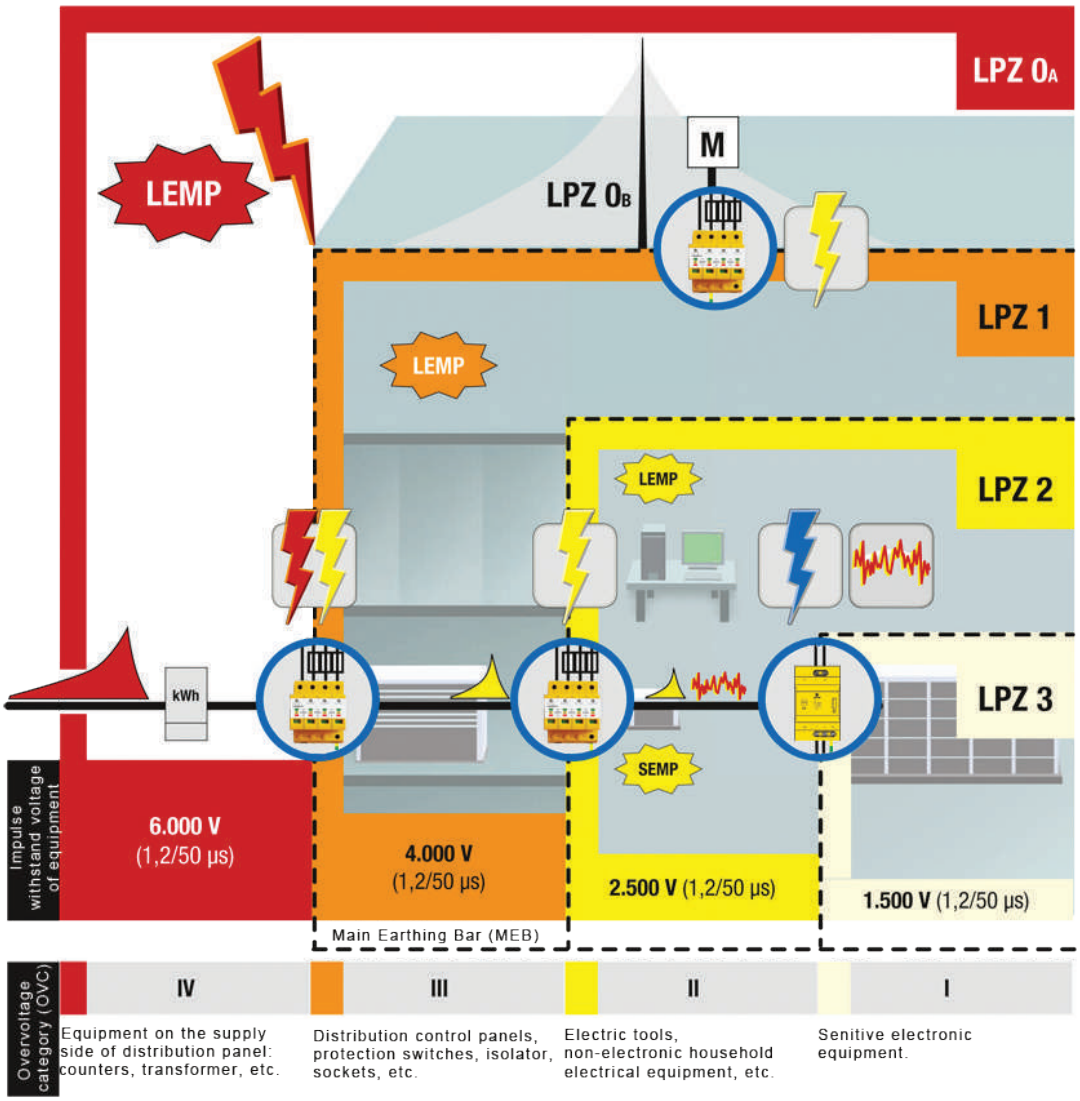
The impulses caused by induction effects from magnetic fields generated by the lightning current are represented by an 8/20 µs impulse (I_n).
Required SPDs are **T2** and/or **T3**.

Electromagnetic interferences conducted by the service:

Conducted electromagnetic interferences may appear in common mode (all active conductors versus earth) or in differential mode (between active conductors) and are mostly in the range of 150 kHz to 30 MHz.
Such interferences can cause damage to equipment and service outage.
It is recommended to apply SPDs with interference filter. The required discharge capability is determined depending on the source of damage to be expected (S2 and S4) and the filter characteristic and mitigation level is determined by the expected interference level.

SELECTION OF SPDs ACCORDING TO THE LIGHTNING PROTECTION ZONE (LPZ) CONCEPT

SPDs shall be selected and installed in accordance with the requirements of the HD 60364-4-443 and the IEC and EN IEC 62305 series of standards respectively, and the HD 60364-5-53. The primary SPDs shall be located as close as possible to the origin of the installation. In many cases this will be the Main Distribution Board (MDB). Further SPDs will most likely be located in Sub Distribution Boards (SDBs).
Following the philosophy of the lightning protection zone concept right from the planning phase of an installation, it is first necessary to define and separate into areas (so called zones) within a structure, which require a certain level of protection, depending on the resistivity and immunity of the equipment installed and used there. The higher the protection requirements are, the higher is the corresponding Zone number.
Based on that the progressive attenuation of transients and electromagnetic inteferences is achieved through the installation of coordinated SPDs at the boundaries of the zones defined.
The objective is to reach a fully compatible system, where all electric and electronic equipment is sufficiently protected not to face any transients or interference it is not able to withstand. By doing this service continuity and the integrity of equipment should be guaranteed.



Classification of LPZs:

LPZ O_A Zone where the threat is due to the direct lightning flash and the full lightning electromagnetic field. The internal system may be subjected to full or partial lightning surge current;

LPZ O_B Zone protected against direct lightning flashes but where the threat is the full lightning electromagnetic field. The internal system may be subjected to partial lightning surge current;

LPZ 1 Zone where the surge current is limited by current sharing and by isolating interfaces and/or SPDs at the boundary. Spatial shielding may attenuate the lightning electromagnetic field;

LPZ 2, ..., n Zone where the surge current may be further limited by current sharing and by isolating interfaces and/or additional SPDs at the boundary. Additional spatial shielding may be used to further attenuate the lightning electromagnetic field.

LIGHTNING PROTECTION LEVELS (LPLs) AND SPD DISCHARGE CAPABILITY

The Standard series EN IEC 62305 classifies a set of four Lightning Protection Levels with decreasing efficiency. The table below briefly outlines the details and threat parameters for these levels.

Lightning protection level LPL	Total efficiency	Capture efficiency	Dimensioning efficiency	Values of protection parameters chosen for LPS dimensioning					
				I_{max} (kA)	I_{min} (kA)	$\Delta i/\Delta t$ (kA/µs)	Q_{tot} (C)	Q_{imp} (C)	E_{sp} (kJ/Ω)
I	98%	99%	**99%**	**200**	3	200	300	100	10.000
II	95%	97%	**98%**	**150**	5	150	225	75	5.600
III	90%	95%	**95%**	**100**	7	100	150	50	2.500
IV	80%	85%	**95%**	**100**	16	100	150	50	2.500

• Discharge capability requirements according to IEC and EN IEC 62305

In order to choose the correct value for the SPD discharge capability, it is necessary to determine the expected impulse current at the SPDs point of installation. This value depends on the strike point of the lightning flash and on the current sharing and distribution within the structure and the electric system and wiring.

The EN IEC 62305 series of standards provides the information necessary to calculate these parameters for source of damage S1. For sources of damage S2, S3 and S4, the standard provides the values to be applied. The standard also provides appropriate information for telecommunication systems, because discharge parameters are an important factor there as well.

According to EN IEC 62305-2 (Risk Analysis) the SPDs discharge capability is quite important and provides an indication for the overall protection level of the SPD system installed (see table beside).

In some cases, the standard recommends the choice of SPDs with very high capabilities in order to reduce the risk of explosion (increase of I_{imp}, I_n capabilities corresponding to LPL I requirements).

Choosing SPDs with a high discharge capability (I_{imp}) is important, but it should be considered that other SPD parameters, like the protection level (U_p), must be superior too then.

LPL + SPD Rating	P_{SPD} 1)
none / no coordinated SPD	1
III-IV + SPD with I_n/I_{imp}	0,05
II + SPD with I_n/I_{imp}	0,02
I + SPD with I_n/I_{imp}	0,01
I + SPD with 1,5 x I_n/I_{imp}	0,005
I + SPD with 2 x I_n/I_{imp}	0,002
I + SPD with 3 x I_n/I_{imp}	0,001

1) probability that an overvoltage damages an apparatus protected by an SPD system, expressed in %

• Discharge capability requirements according to HD 60364-5-53

The standard HD 60364-5-53 provides some minimum requirements regarding the discharge capability of SPDs in case of indirect lightning, but also in case of direct lightning when there is not sufficient data available to calculate the parameters based on IEC and EN IEC 62305-2. Depending on the mode of protection, these minimum requirements are:

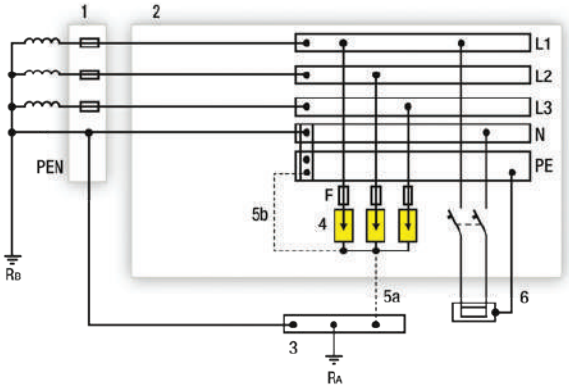
- For indirect lightning a nominal discharge current $I_n \geq 5$ kA 8/20 µs, and, when connection type CT2 is applied (3+1 or 1+1 connection), a nominal discharge current $I_n \geq 20$ kA 8/20 µs for the SPD mode connected N to PE in three-phase systems, and 10 kA 8/20 µs in single-phase systems. Nevertheless we recommend to use SPDs with a nominal discharge current of at least 10 kA 8/20 µs.

- For direct lightning an impulse current $I_{imp} \geq 12,5$ kA 10/350 µs for LPL III and IV, and, when connection type CT2 is applied (3+1 or 1+1 connection), an impulse current $I_{imp} \geq 50$ kA 10/350 µs for the SPD mode connected N to PE in three-phase systems, and 25 kA 10/350 µs in single-phase systems.

INSTALLATION OF SPDs IN TN-, TT-, AND IT-SYSTEMS ACCORDING TO HD 60364-5-53

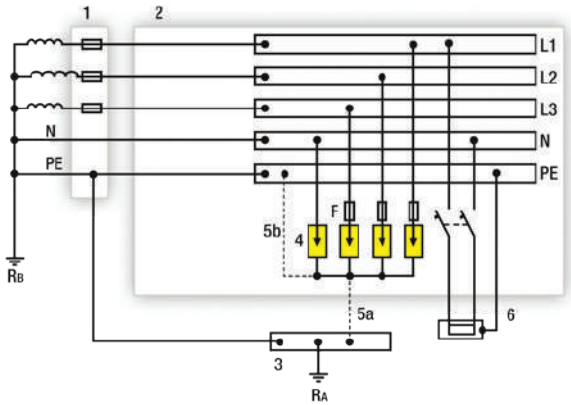
The installation of SPDs in a specific power distribution system must be coordinated with the protective measures against indirect contact (fault protection) and with the corresponding protective devices and their capability to withstand impulse currents.
This coordination depends on the type and earthing arrangement of the power system, as there are TN-, TT- and IT-systems according to HD 60364-1 and the corresponding protective devices may be:

- overcurrent protective devices;
- residual current protective devices;
- insulation monitoring devices.



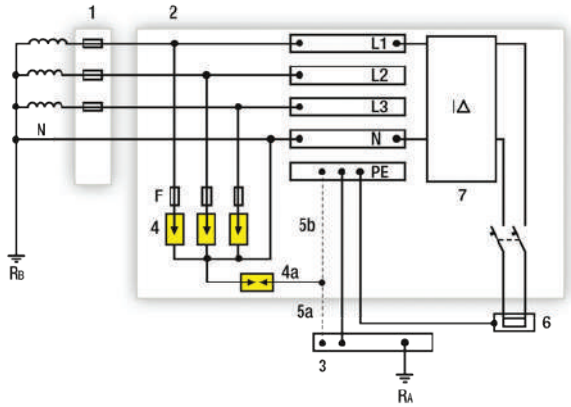
Installation of SPDs in a TN-C-system

Connection type CT1 (3+0 connection)



Installation of SPDs in a TN-S-system

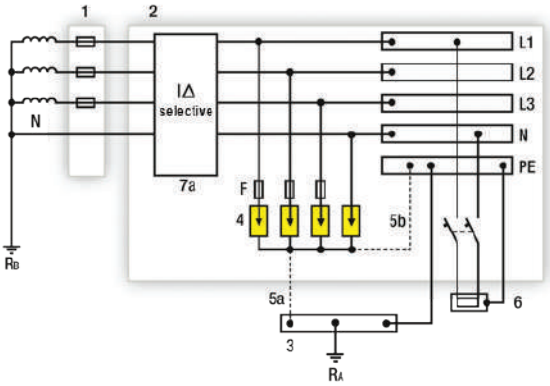
Connection type CT1 (4+0 connection)



Installation of SPDs in a TT-system upstream the main residual current device

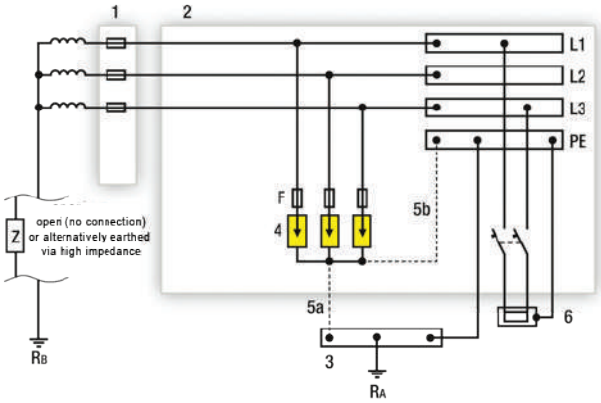
Connection type CT2 (3+1 connection)

1: OCPD 1 OverCurrent Protective Device at the origin of the installation (e.g. in the main distribution board)
2: Main Distribution Board (MDB)
3: Main Earthing Terminal
4: Surge Protective Device(s) (SPDs)
4a: Surge Protective Device connected N to PE (N-PE SPD) when connection type CT2 (3+1 connection) is applied
5a/5b: Alternative connections to PE (preferably the shortest route, or even both connections as required in some countries)
6: Equipment to be protected
7: Residual Current Device (RCD) (in most cases this will be a RCCB or a RCBO)
7a: Selective Residual Current Device (e.g. type S RCD)
F: OCPD 2 OverCurrent Protective Device required by the SPD manufacturer
RA: Earthing resistance of the (consumers) installation
RB: Earthing resistance of the power supply system



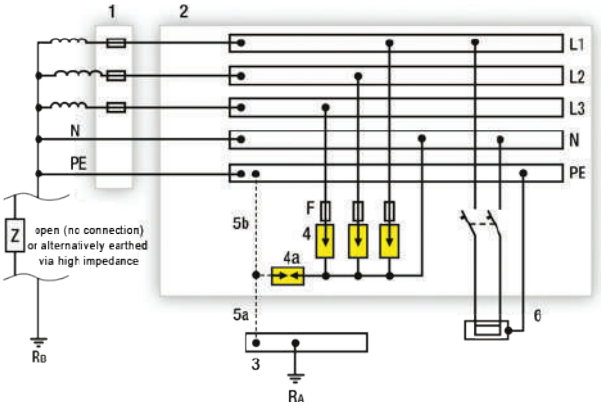
Installation of SPDs in a TT-system downstream the main residual current device

Connection type CT1 (4+0 connection)



Installation of SPDs in an IT-system without distributed neutral

Connection type CT1 (3+0 connection)



Installation of SPDs in an IT-system with distributed neutral

Connection type CT2 (3+1 connection)

ICONS FOR A QUICK SPD SELECTION

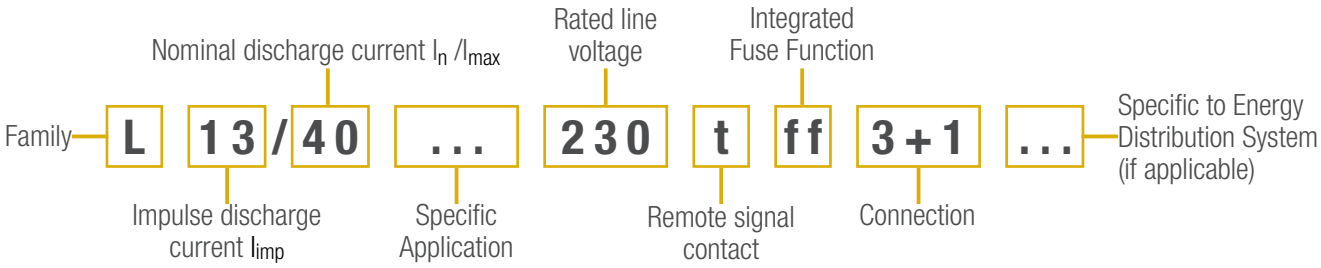
Protection against direct and indirect lightning effects (combined T1 and T2 SPD)

Protection against indirect lightning effects (T2 SPD)

Protection against induced overvoltages (T3 SPD)

Protection against electro-magnetic interferences on the line including transient surge suppression

ORDERING CODE EXAMPLE FOR LOW VOLTAGE SPDS:



ZOTUP SPD TAXONOMY

L - ZOTUPLIMITER

Varistor based SPDs:

- **NFC No Follow Current®**
- very short response time (t_a): ≤ 25 ns;
- very good voltage protection level even at certain impulse overcurrent;
- high impulse current rating: (I_{imp}) up to 25 kA/pole, 10/350 µs; (I_{max}) up to 100 kA/pole 8/20 µs.

The wide range of **limiting SPDs** with **NFC No Follow Current®** technology allows optimum protection in most applications, also in large installations, where SPDs often operate independent from each other, and where reliable protection and high performance are required.

IL - ZOTUPCOMB

Combined Voltage Limiting and Switching SPD with varistor and GDT connected in series:

- NFC No Follow Current® as a result of the combination;
- short response time (t_a): ≤ 100 ns;
- good voltage protection level;
- no leakage currents.

Combined SPDs make use of GDT and varistor elements, with voltage switching and with voltage limiting function. In our production range, these SPDs have been optimized for those applications where no really high discharge capability is required, as for example residential applications.

IA - I - G - ZOTUPGAP

- **Type IA - Voltage Switching Spark gap based SPDs with trigger technology:**
  - high impulse current rating: (I_{imp}) 25 kA/pole 10/350 µs; 100 kA/4 poles 10/350 µs);
  - short response time (t_a): ≤ 100 ns;
  - good voltage protection level;
  - no leakage currents.

SPDs with spark gap and trigger technology are intended for primary protection applications where the prospective short circuit current of the power distribution system at the installation point of the SPDs is lower than or equal to I_{fi} and for installations where coordinated SPDs with very short response time are provided for secondary protection. A typical application is e.g. in a TT system of a medium plant size comprising a main distribution board feeding first and second level subdistribution boards.

- **Type I - Voltage Switching GDT based SPDs:**
  - the typical application for this device is in the N-PE mode of protection in TT distribution systems (1+1 or 3 + 1 construction, connection type CT 2 according to HD 60364-5-53);
  - high impulse current rating (I_{imp}) and (I_{max}) up to 100 kA, 10/350 µs.

ILF - ZOTUPFILTER

Combined Voltage Limiting and Switching SPD plus Filter with varistor and GDT comprising an additional filter:

- effective noise level attenuation by use of additional high frequency bandpass filters;
- high level interference protection for sensitive equipment with limited resistivity and immunity characteristics;
- high discharge capabilty (combination wave test at U_{oc} 10 kV 1,2/50 µs, I_{cw} 5 kA 8/20 µs).

Combined SPDs with additional filter are used where high continuity of service is required like data centers, DCS (distributed control systems), etc.. These SPDs do not only protect against transients due to lightning, but also against high frequency conducted interferences. They are applied where Electromagnetic Compatibility (EMC) is an issue and requires improvement of the system immunity.

ZOTUPBOX

Protection boxes with an IP65 enclosure which provide a compact and preinstalled solution for applications in Power Centers.

ZOTUPACCESSORIES

CPs are fork-type busbars with 2 up to 8 connection points. Typical application: to provide a common PE connection for several SPDs.

LLP - ZOTUPLED

SPD LED Lighting Protection Systems
A ready to install assembly of a voltage limiting and a voltage switching SPD providing two modes of protection.

S - ZOTUPSIGNAL

SPDs for Signalling, telecommunication and data transmission.
These SPDs are connected in series with low resistivity electronic equipments, like analog interfaces and data networks.

C - ZOTUPCOAX

Specific SPDs with coaxial connectors for protecting TV switchboards, satellite antenna or wideband transmission equipment and remote systems.
Particularly suitable for applications with long coaxial cables which are exposed to electromagnetic interference.

HV - ZOTUPHV

Surge Arresters for high voltage systems (HV) with typical applications: protection of transformers, switchgears and transmission lines in HV systems.

- Surge Arresters with silicone rubber housing providing big internal and external creepage distances suitable for all applications with high level of pollution.
- Surge Arresters available with disconnector device, which is activated by and increase in internal preassure with a reliable operating mechanism and stable characteristic even over long time.
- Additional lightning strike counters and lightning strike counters with measurement for indication of the total leakage current (internal and external dispersion) are also available.
- Surge Arresters with a higher thermal energy rating than 4,5 kJ/kV are available upon request.

ZOTUP SPDs FOR LOW VOLTAGE SYSTEMS

SPDs FOR LOW VOLTAGE ALTERNATING CURRENT (AC) APPLICATIONS

- L ... – ZOTUPLIMITER
- IA ... – ZOTUPGAP (SPARK GAPS WITH TRIGGER TECHNOLOGY)
- I ... – ZOTUPGAP (SPARK GAPS N-PE)
- IL ... – ZOTUPCOMB
- PB ... – ZOTUPBOX
- CP ... – ZOTUPACCESSORIES

SPDs FOR ALTERNATING CURRENT (AC) WITH ADDITIONAL FILTER

- ILF ... – ZOTUPFILTER

SPDs FOR PHOTOVOLTAIC APPLICATIONS

- L 13/60 PV Y … ff – ZOTUPLIMITER PV
- L 3/40 PV Y … ff – ZOTUPLIMITER PV

SPDs FOR DIRECT CURRENT (DC)

- L 7/30 DC … ff – ZOTUPLIMITER DC

SPDs FOR LED LIGHTING

- LLP ... – ZOTUPLED
- IL 1/10 2P LED – ZOTUPCOMB

ZOTUP SPDs FOR SIGNALLING, TELECOMMUNICATION AND DATA TRANSMISSION

SPDs FOR SIGNALLING AND TELECOMMUNICATION NETWORKS

- S (S-ASI L/R; S-AS2; S-N) – ZOTUPSIGNAL
- C ... – ZOTUPCOAX

SPDs FOR DATA TRANSMISSION

- S (S-ASI B/G; S-F; S ADSL) – ZOTUPSIGNAL

ZOTUP SURGE ARRESTERS FOR HIGH VOLTAGE SYSTEMS (HV) IN CA, CC AND SURGES COUNTER

SURGE ARRESTERS FOR HIGH VOLTAGE SYSTEMS

- HV ... – ZOTUPHV SL
- HV ... – ZOTUPHV SC
- HV ... – ZOTUPHV DC

THE WEBAPP

Choosing the right SPD is essential as well as demanding: there are many parameters to take into account. On the occasion of the latest publication of the new standards **HD 60364-4-443** and **HD 60364-5-53 chapter 534**, ZOTUP presents the new WEBAPP, a new digital tool totally free of charge and designed to help the user choosing the right SPD.

HOW TO INSTALL IT

Totally free of charge, by clicking this link: **webapp.zotup.it.**
It is required to register only when accessing the first time.

HOW IT WORKS

Easy multiple-choice questions will guide the user to select the right SPD.

RESULTS

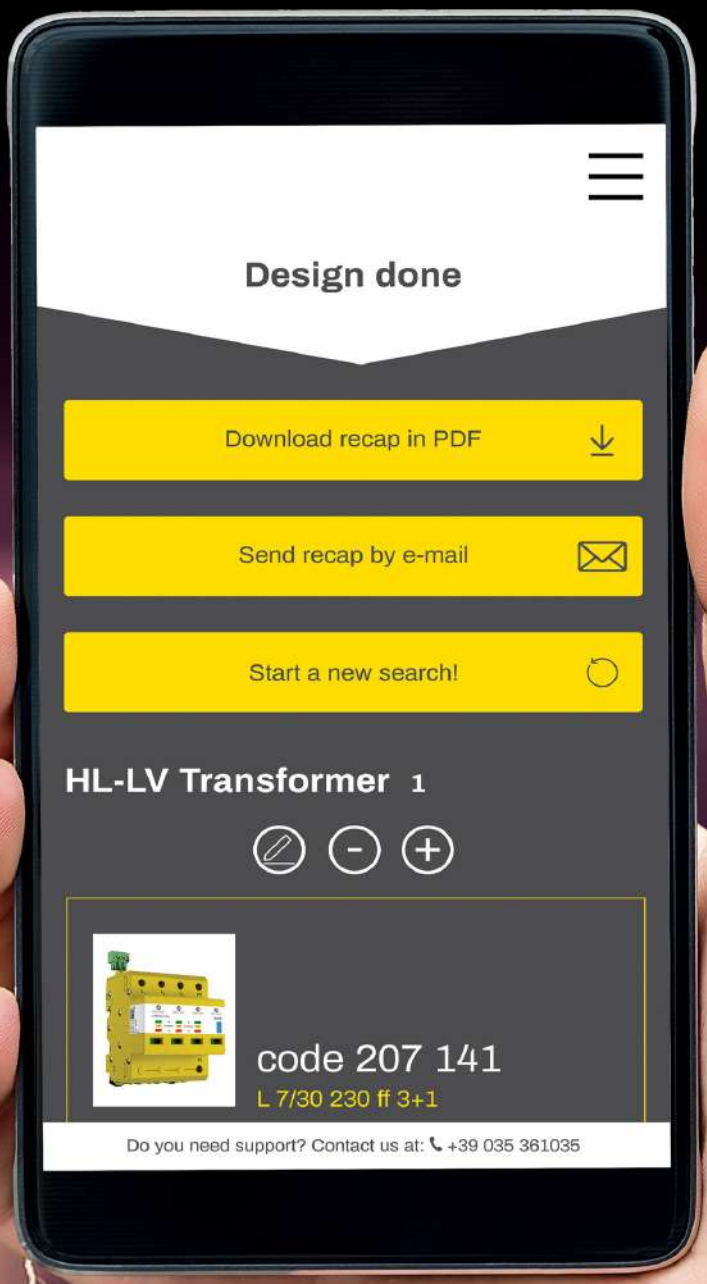
The most suitable SPD for the protection needs will be identified together with all the technical info. Moreover, there is also the possibility of saving search results and/or downloading them.

ONGOING SUPPORT

The ZOTUP team is available for an ongoing support when using the app and for choosing the right SPD.

Design your plant for free with ZOTUP WEBAPP. Install it on your smartphone or on your pc desktop.

COMPLY WITH
HD 60364-4-443
HD 60364-5-53
CHAPTER 534

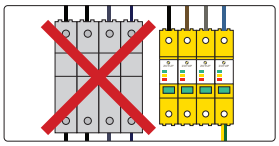


THE INNOVATIVE FEATURES OF OUR NEW PRODUCTS

MAIN FEATURES

ZOTUP brings to the market a new technology after 4,5 years of intensive research and development activities. These new products are supported by more than 330 laboratory tests and the technology behind is protected by four international patents. Herewith **ZOTUP** is standing for new state of the art surge protection for low voltage power systems. **ZOTUP** products represent an outstanding innovation on the market of surge protection with regard to performance, safety, easiness of installation and reliability. All these quality attributes are now available in a single product.

The unique technical features putting our products to the top are:



- **Fuse Function (ff)**

in case the SPD reaches its end of life in a short circuit state.
According to the product standard EN IEC 61643-11 SPDs are classified according to their behavior when reaching end of life.
There are two end o life modes:

- OCM (Open-Circuit Mode);
- SCM (Short-Circuit Mode).

An SPD with OCM must disconnect from the power supply when reaching end of life. The disconnection operation can be performed by an internal or an external disconnector, or by a combination of these two.

The standard differentiates between two distinct processes:

a) **a "slow" process** that depends on the degradation of voltage limiting components, e.g. in MOV-based SPDs, leading to thermal runaway. In such case the disconnection is generally ensured by an internal thermal operated disconnector.

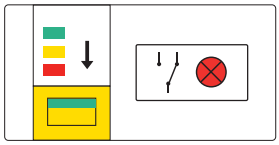
b) **a "quick" or even "instant" process** that depends on the overcurrent caused by a very low remaining impedance of the SPD, which causes a short circuit on the supply. The interruption of such short-circuit current is managed by an internal or external disconnector with appropriate breaking capability, preferrably a fuse.

The innovative feature from **ZOTUP** is a patented combined internal disconnector, which is able to disconnect in both of the above mentioned cases, the "slow" and the "quick" or "instant" process. This means that the disconnector used in **ZOTUP** products provides an Integrated Fuse Function (ff). Therefore, as long as certain short circuit current values are not exceeded, our products do not require any additional external disconnector.

Advantages:

- Maintaining the full discharge capability of the SPD. An external fuse or disconnector may influence/limit this capability;
- The overall voltage drop across the SPD branch circuit and therefore the effective voltage protection level for the installation and equipment is kept to a minimum, as there are no additional devices and the wiring can be kept very short;
- No additional costs for external disconnectors, less time for cabling and a smaller ecologic footprint.

If the short circuit current at the point of installation exceeds the breaking capability of that internal disconnector an additional external fuse is required. In such case the fuse is intrinsically selective with the internal disconnector, safeguarding the integrity of the SPD in case of a very low impedance or even short circuit state.

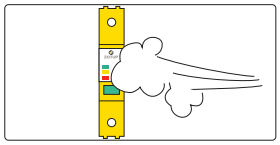


• Progressive performance indication

The new design of ZOTUP makes regular checks of the SPDs status and system verification very easy. Periodic verification is generally required by regulations on national level. The new **ZOTUP** SPD range displays its performance status by a change of color in the Status Indicator window. The transition from the initial green color (full performance) to the totally yellow (minimum performance) is **progressive/analog**. The colour in the window indicates the actual remaining performance of the SPD, thus providing comprehensive information rather than a simple good versus out of order message for attention.
After that a red indication follows, showing the SPD has reached its end of life.

Advantages:

- **Progressive indication** of the reduction in performance of the SPD allows preventive maintenance and optimization of replacement decisions;
- **Remote indication** for SPDs incorporating a changeover contact is activated when the performance reaches its minimum state (totally yellow). Therefore the remote alarm is preventive, because the SPD is still operational and still able to protect at minimum performance level.



• For applications with high pollution (PD 3) and for extended temperature range (-40°/+80°C)

The increasing application of SPDs under "heavy" environmental conditions (such as traffic light controls, cellular radio and mobile phone stations, outdoor public lighting and street lighting systems) has highlighted the need for more stringent requirements on resistivity to pollution.

Installation of SPDs in costal areas with a high rate of salinity and/or in locations with increased condensation effects due to rapid changes in temperature, e.g. in photovoltaic (PV) installations and power plants or in Wind Turbines, has shown that increased distances are necessary to sufficiently prevent from electric tracking on insulating materials on a long term view.

ZOTUP deals with the issue of pollution and uses firm materials and applies adequate design features to achieve Pollution Degree 3 for all internal and external creepage distances and clearances.
Keeping an emphasis on environmental aspects our products are designed and classified for the highest level of temperature range, which goes even beyond the so called extended range in the product standard.

Advantages:

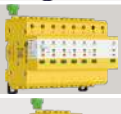
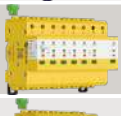
- Improved reliability when installed in "heavy" environments;
- Enabling applications that cannot be covered with a lower pollution degree or normal temperature range.

SPDs FOR LOW VOLTAGE ALTERNATING CURRENT (AC) APPLICATIONS

SPDs FOR LOW VOLTAGE ALTERNATING CURRENT (AC) APPLICATIONS

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 50/100 230 t ff 1+1		T1 and T2	3	50 kA	60 kA	36
	L 50/100 230 t ff 3+1		T1 and T2	10	50 kA	60 kA	37
	L 25/100 230 t ff		T1 and T2	1	25 kA	60 kA	38
	L 25/100 230 t ff 2		T1 and T2	3	25 kA	60 kA	39
	L 25/100 230 t ff 3		T1 and T2	6	25 kA	60 kA	40
	L 25/100 230 t ff 4		T1 and T2	10	25 kA	60 kA	41
	L 25/100 230 t ff 1+1		T1 and T2	3	25 kA	60 kA	42
	L 25/100 230 t ff 3+1		T1 and T2	10	25 kA	60 kA	43
	IA 25 230		T1 and T2	1	25 kA	25 kA	44
	IA 25 230 2		T1 and T2	3	25 kA	25 kA	45
	IA 25 230 4		T1 and T2	10	25 kA	25 kA	46
	IA 25 230 1+1		T1 and T2	3	25 kA	25 kA	47
	IA 25 230 3+1		T1 and T2	10	25 kA	25 kA	48
	I 100 N-PE		T1 and T2	1	100 kA	100 kA	49
	L 13/40 230 t ff		T1 and T2	1	13 kA	35 kA	50
	L 13/40 230 t ff 2		T1 and T2	3	13 kA	35 kA	51
	L 13/40 230 t ff 3		T1 and T2	6	13 kA	35 kA	52
	L 13/40 230 t ff 4		T1 and T2	10	13 kA	35 kA	53
	L 13/40 230 t ff 1+1		T1 and T2	3	13 kA	35 kA	54

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 13/40 230 t ff 3+1		T1 and T2	10	13 kA	35 kA	55
	I 52 N-PE		T1 and T2	1	52 kA	52 kA	56
	Prot. Box TN 40 ff		T1 and T2	10	10 kA	40 kA	57
	Prot. Box TT 40 ff		T1 and T2	10	10 kA	40 kA	57
	L 7/30 230 t ff		T1 and T2	1	8 kA	30 kA	58
	L 7/30 400 t ff		T1 and T2	1	7 kA	30 kA	58
	L 7/30 600 t ff		T1 and T2	1	5 kA	25 kA	58
	L 7/30 750 t ff		T1 and T2	1	5 kA	20 kA	58
	L 7/30 1000 t ff		T1 and T2	1	2 kA	20 kA	58
	L 7/30 230 t ff 2		T1 and T2	3	8 kA	30 kA	59
	L 7/30 230 t ff 3		T1 and T2	6	8 kA	30 kA	60
	L 7/30 400 t ff 3		T1 and T2	6	7 kA	30 kA	60
	L 7/30 750 t ff 3		T1 and T2	6	5 kA	20 kA	60
	L 7/30 230 t ff 4		T1 and T2	10	8 kA	30 kA	61
	L 7/30 230 t ff 1+1		T1 and T2	3	8 kA	30 kA	62
	L 7/30 230 t ff 3+1		T1 and T2	10	8 kA	30 kA	63
	L 3/30 60 t ff		T2	1	-	20 kA	64
	L 3/30 120 t ff		T2	1	-	20 kA	64
	L 3/30 230 t ff		T2	1	-	30 kA	64

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 3/30 400 t ff		T2	1	-	30 kA	64
	L 3/30 230 t ff 2		T2	3	-	30 kA	65
	L 3/30 230 t ff 3		T2	6	-	30 kA	66
	L 3/30 230 t ff 4		T2	10	-	30 kA	67
	L 3/30 230 t ff 1+1		T2	3	-	30 kA	68
	L 3/30 230 t ff 3+1		T2	10	-	30 kA	69
	L 2/10 230 t ff		T2	1	-	10 kA	70
	L 2/10 230 t ff 2		T2	3	-	10 kA	71
	L 2/10 230 t ff 4		T2	10	-	10 kA	72
	L 2/10 230 t ff 1+1		T2	3	-	10 kA	73
	L 2/10 230 t ff 3+1		T2	10	-	10 kA	74
	L 2/10 230 t ff 2 TT		T2	3	-	10 kA	75
	L 2/10 230 t ff 4 TT		T2	10	-	10 kA	76
	I 12 N-PE		T1 and T2	1	12,5 kA	40 kA	77
	IL 4/20 400 t ff 2 IT		T1 and T2	3	5 kA	20 kA	78
	IL 4/20 400 t ff 3 IT		T1 and T2	6	10 kA	20 kA	79
	IL 4/20 690 t ff 2 IT		T1 and T2	3	2 kA	20 kA	80
	IL 4/20 690 t ff 3 IT		T1 and T2	6	4 kA	20 kA	81
	IL 4/20 830 t ff 2 IT		T1 and T2	3	4 kA	20 kA	82

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	IL 4/20 830 t ff 3 IT		T1 and T2	6	4 kA	20 kA	83

FOR BASIC AC APPLICATIONS

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 2/20 230 e		T2	1	-	20 kA	85
	L 2/20 230 t 1+1		T2	3	-	20 kA	86
	L 2/20 230 t 3+1		T2	10	-	20 kA	87
	IL 1/3 2P		T3	3	-	-	84
	IL 1/10 2P M		T2	3	-	10 kA	84

FOR WIND TURBINE APPLICATIONS IN AC

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 7/30 600 t ff		T1 and T2	1	5 kA	25 kA	58
	L 7/30 750 t ff		T1 and T2	1	5 kA	20 kA	58
	L 7/30 400 t ff 3		T1 and T2	6	7 kA	30 kA	60
	L 7/30 750 t ff 3		T1 and T2	6	5 kA	20 kA	60

ACCESSORIES

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	CP 1	-	-	-	-	-	88
	CP 2	-	-	-	-	-	88
	CP 3	-	-	-	-	-	88
	CP 4	-	-	-	-	-	88
	CP 5	-	-	-	-	-	88
	CP 6	-	-	-	-	-	88
	CP 7	-	-	-	-	-	88
	CP 8	-	-	-	-	-	88

TN

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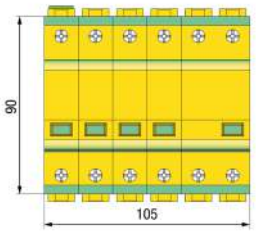
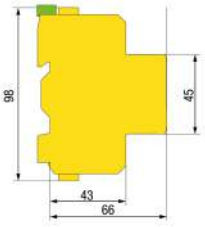
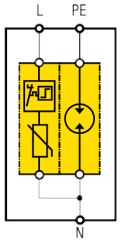






L 50/100 230 t ff 1+1

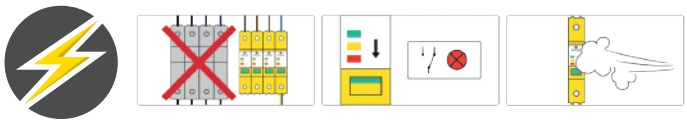
L 50/100 230 t ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection, typically installed in single-phase 230 V TT systems, where connection type CT2 (1+1) is required, and in TN systems according to HD 60364-53, with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.
- Remote signal contact for indication of reduced performance

TECHNICAL DATA

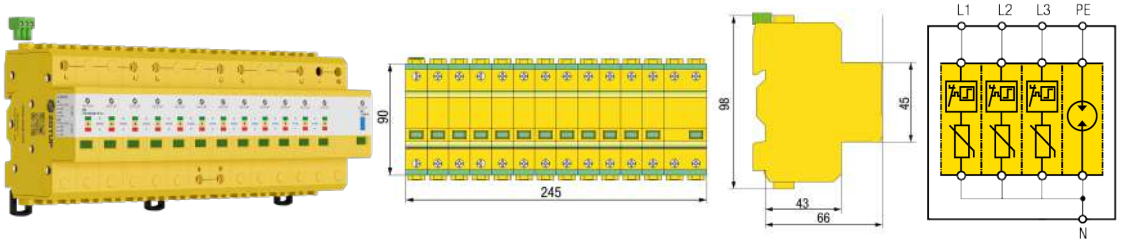
Model L 50/100 ... with remote signal contact			230 t ff 1+1	
CODE			**218 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection			3	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	50 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	100 kA	
Charge (L-N)		Q	25 As	
Charge (N-PE)		Q	50 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	60 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	100 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	100 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	150 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,75 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,85 kV	≤ 1,50 kV
	13 kA	U_p	≤ 1,10 kV	≤ 1,50 kV
	25 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
	60 kA	U_p	≤ 1,70 kV	≤ 1,70 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (Open Circuit Failure Mode)	
Behaviour in case of Temporary Overvoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	25 kA rms	
Max. back-up protection with up-stream CB having a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			400 A gG (> 5 ÷ 25 kA rms) / 250 A gG (>5 ÷ 50 kA rms 160/125/100 A gG* (> 5 ÷ 100 kA rms)	
Max. overcurrent protection for through-wiring (V-connection)			125 A gG	
Rated Load Current (for V-connection)		I_L	125 A	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size (double clamps for V-connection on L-terminals)			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			1100 g	
Dimensions: width			105 mm (6 modules)	
Remote signal contact			potential-free changeover contact	
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible	
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A	
Certifications / Quality Mark			CTI pending	

* with fuse 400 A gG I_{imp}=35 kA and I_{max}= 70 kA; with fuse 250 A gG I_{imp}=25 kA and I_{max}= 70 kA; with fuse 160 A gG I_{imp}=13 kA and I_{max}= 60 kA; with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA



TN

TT



L 50/100 230 t ff 3+1

L 50/100 230 t ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing ten modes of protection, typically installed in three-phase plus neutral 230/400 V TT systems, where connection type CT2 (3+1) is required, and in TN systems according to HD 60364-53, with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.
- Remote signal contact for indication of reduced performance

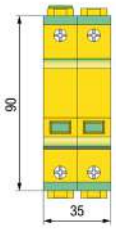
TECHNICAL DATA

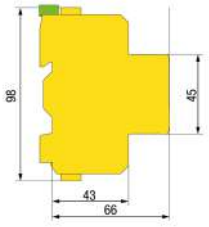
Model L 50/100 ... with remote signal contact			230 t ff 3+1	
CODE			**218 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection			10	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 andT2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	50 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	100 kA	
Charge (L-N)		Q	25 As	
Charge (N-PE)		Q	50 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	60 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	100 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	100 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	150 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,75 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,85 kV	≤ 1,50 kV
	13 kA	U_p	≤ 1,10 kV	≤ 1,50 kV
	25 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
	60 kA	U_p	≤ 1,70 kV	≤ 1,70 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (Open Circuit Failure Mode)	
Behaviour in case of Temporary Overvoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms	
Max. back-up protection with up-stream CB having a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			400 A gG (> 5 ÷ 25 kA rms) / 250 A gG (>5 ÷ 50 kA rms) 160/125/100 A gG* (> 5 ÷ 100 kA rms)	
Max. overcurrent protection for through-wiring (V-connection)			125 A gG	
Rated Load Current (for V-connection)		I_L	125 A	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A eff	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size (double clamps for V-connection on L-terminals)			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			2110 g	
Dimensions: width			245 mm (14 modules)	
Remote signal contact			potential-free changeover contact	
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible	
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A	
Certifications / Quality Mark			CTI pending	

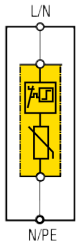
* with fuse 250 A gG I_{imp}=25 kA and I_{max}= 70 kA; with fuse 160 A gG I_{imp}=13 kA and I_{max}= 60 kA; with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA

TN

TT







L 25/100 230 t ff

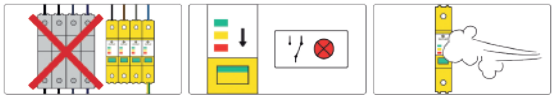
L 25/100 230 t ff is a voltage limiting SPD providing a single mode of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 100, I 52 and with connection type CT2 (3+1 or 1+1). It provides the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 25/100 230 t ff is a voltage limiting SPD for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- The impulse current is divided into two independent branch circuits, each branch providing its own disconnector and Status Indicator;
- Three colour Status Indicator with progressive indication of remaining performance.

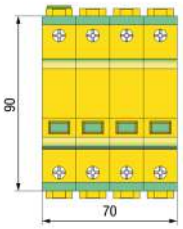
TECHNICAL DATA

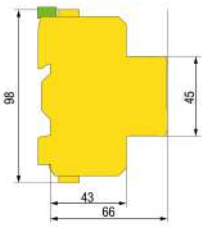
Model L 25/100 ... with remote signal contact			230 t ff
CODE			**215 100**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			1
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	25 kA
Charge		Q	12,5 As
Nominal discharge current (8/20 µs)		I_n	60 kA
Max. discharge current (8/20 µs)		I_{max}	100 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,70 kV
	5 kA	U_p	≤ 0,82 kV
	13 kA	U_p	≤ 0,95 kV
	25 kA	U_p	≤ 1,05 kV
	60 kA	U_p	≤ 1,40 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary Overvoltage (TOV):		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			250 A gG (> 5 ÷ 50 kA rms) 160/125/100 A gG* (> 50 ÷ 100 kA rms)
Max. overcurrent protection for through-wiring (V-connection)			125 A gG
Rated Load Current (for V-connection)		I_L	125 A
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size (double clamps for V-connection)			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Busbar connections			fork-type busbar 16 mm^2
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			395 g
Dimensions: width			35 mm (2 modules)
Remote signal contact			potential-free changeover contact
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

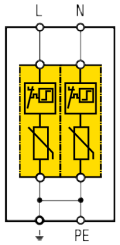
* with fuse 160 A gG I_{imp}=13 kA and I_{max}= 70 kA; with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA



TN







L 25/100 230 t ff 2

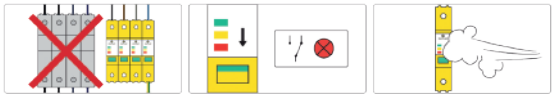
L 25/100 230 t ff 2 is a ready to install assembly of two voltage limiting SPDs providing three modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for single-phase 230 V TN-systems, with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 25/100 230 t ff 2 is a voltage limiting SPD for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- The impulse current is divided into two independent branch circuits, each branch providing its own disconnector and Status Indicator;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 25/100 ... with remote signal contact			230 t ff 2
CODE			**215 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection			3
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	25 kA
Charge		Q	12,5 As
Nominal discharge current (8/20 µs)		I_n	60 kA
Max. discharge current (8/20 µs)		I_{max}	100 kA
Voltage protection level (L/N-PE) at a discharge current of:	1 kA	U_p	≤ 0,75 kV
	5 kA	U_p	≤ 0,85 kV
	13 kA	U_p	≤ 1,10 kV
	25 kA	U_p	≤ 1,25 kV
	60 kA	U_p	≤ 1,70 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV):	L/N-PE	U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability). Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 250 A gG (> 5 ÷ 50 kA rms) 160/125/100 A gG* (> 50 ÷ 100 kA rms)
Max. overcurrent protection for through-wiring (V-connection)			125 A gG
Rated Load Current (for V-connection)		I_L	125 A
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size (double clamps for V-connection)			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			785 g
Dimensions: width			70 mm (4 modules)
Remote signal contact			potential-free changeover contact
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

* with fuse 160 A gG I_{imp}=13 kA and I_{max}= 70 kA; with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA



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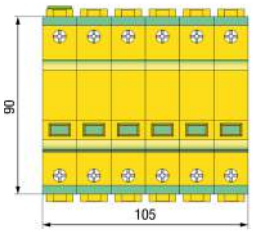
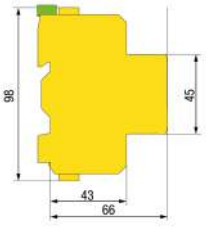
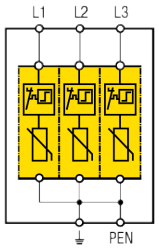






L 25/100 230 t ff 3

L 25/100 230 t ff 3 is a ready to install assembly of three voltage limiting SPDs providing six modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase 230/400 V TN-systems, with the following features and benefits:

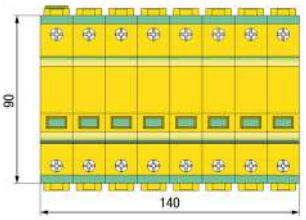
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 25/100 230 t ff 3 is a voltage limiting SPD for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- The impulse current is divided into two independent branch circuits, each branch providing its own disconnector and Status Indicator;
- Three colour Status Indicator with progressive indication of remaining performance.

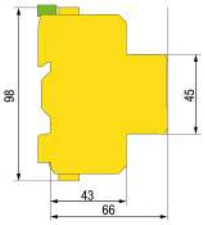
TECHNICAL DATA

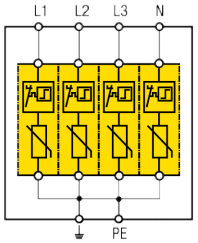
Model L 25/100 ... with remote signal contact		230 t ff 3
CODE		**215 130**
Nominal ac system voltage	U_N	230/400 V ac
Modes of protection		6
Max Continuous Operating Voltage	U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	25 kA
Charge	Q	12,5 As
Nominal discharge current (8/20 µs)	I_n	60 kA
Max. discharge current (8/20 µs)	I_{max}	100 kA
Voltage protection level (L-PEN) at a discharge current of: 1 kA	U_p	≤ 0,75 kV
5 kA	U_p	≤ 0,85 kV
13 kA	U_p	≤ 1,10 kV
25 kA	U_p	≤ 1,25 kV
60 kA	U_p	≤ 1,70 kV
Response time	t_a	≤ 25 ns
End of Life		OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV): L-PEN	U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)	I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse	I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).		160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of		250 A gG (> 5 ÷ 50 kA rms) 160/125/100 A gG* (> 50 ÷ 100 kA rms)
Max. overcurrent protection for through-wiring (V-connection)		125 A gG
Rated Load Current (for V-connection)	I_L	125 A
Follow current interrupt rating	I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)		3 colours with progressive performance indication
Operating temperature range / Humidity		-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size (double clamps for V-connection)		4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade		BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection	PD / IP	3 / 20 (built-in)
Approximate weight		1180 g
Dimensions: width		105 mm (6 modules)
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR

* with fuse 160 A gG I_{imp}=13 kA and I_{max}= 70 kA; with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA

TN







L 25/100 230 t ff 4

L 25/100 230 t ff 4 is a ready to install assembly of four voltage limiting SPDs providing ten modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase plus neutral 230/400 V TN-systems, with the following features and benefits:

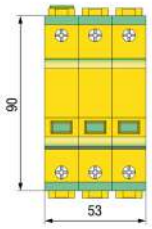
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 25/100 230 t ff 4 s a voltage limiting SPD for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- The impulse current is divided into two independent branch circuits, each branch providing its own disconnector and Status Indicator;
- Three colour Status Indicator with progressive indication of remaining performance.

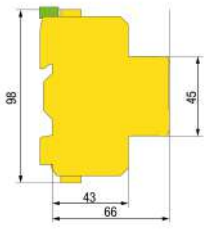
TECHNICAL DATA

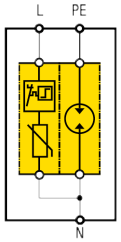
Model L 25/100 ... with remote signal contact			230 t ff 4
CODE			**215 140**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			10
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	25 kA
Charge		Q	12,5 As
Nominal discharge current (8/20 µs)		I_n	60 kA
Max. discharge current (8/20 µs)		I_{max}	100 kA
Voltage protection level (L/N-PE) at a discharge current of:	1 kA	U_p	≤ 0,75 kV
	5 kA	U_p	≤ 0,85 kV
	13 kA	U_p	≤ 1,10 kV
	25 kA	U_p	≤ 1,25 kV
	60 kA	U_p	≤ 1,70 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV):	L/N-PE	U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			250 A gG (> 5 ÷ 50 kA rms) 160/125/100 A gG* (> 50 ÷ 100 kA rms)
Max. overcurrent protection for through-wiring (V-connection)			125 A gG
Rated Load Current (for V-connection)		I_L	125 A
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size (double clamps for V-connection)			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			1368 g
Dimensions: width			140 mm (8 modules)
Remote signal contact			potential-free changeover contact
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

* with fuse 160 A gG I_{imp}=13 kA and I_{max}= 70 kA; with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA

TT







L 25/100 230 t ff 1+1

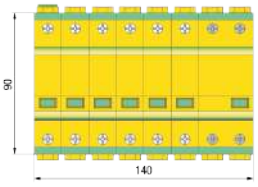
L 25/100 230 t ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection, typically installed in single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-53, e.g. in the service entrance board (SEB), with the following features and benefits:

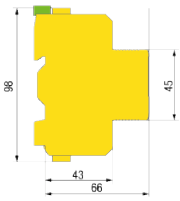
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

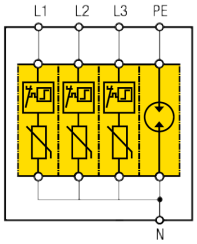
Model L 25/100 ... with remote signal contact			230 t ff 1+1	
CODE			**215 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection			3	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	25 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	52 kA	
Charge (L-N)		Q	12,5 As	
Charge (N-PE)		Q	26 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	60 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	52 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	100 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	70 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,75 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,85 kV	≤ 1,50 kV
	13 kA	U_p	≤ 1,10 kV	≤ 1,50 kV
	25 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
	60 kA	U_p	≤ 1,70 kV	≤ 1,70 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (Open Circuit Failure Mode)	
Behaviour in case of Temporary Overvoltage (TOV)	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms	
Max. back-up protection with up-stream CB having a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			250 A gG (> 5 ÷ 50 kA rms)	
			160/125/100 A gG* (> 5 ÷ 100 kA rms)	
Max. overcurrent protection for through-wiring (V-connection)			125 A gG	
Rated Load Current (for V-connection)		I_L	125 A	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size (double clamps for V-connection on L-terminals)			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			550 g	
Dimensions: width			53 mm (3 modules)	
Remote signal contact			potential-free changeover contact	
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible	
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

* with fuse 160 A gG I_{imp}=13 kA and I_{max}= 70 kA; with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA

TT







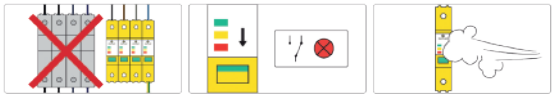
L 25/100 230 t ff 3+1

L 25/100 230 t ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing ten modes of protection, typically installed in three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-53, e.g. in the service entrance board (SEB), with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

Model L 25/100 ... with remote signal contact			230 t ff 3+1	
CODE			**215 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection			10	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	25 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	100 kA	
Charge (L-N)		Q	12,5 As	
Charge (N-PE)		Q	50 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	60 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	100 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	100 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	150 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,75 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,85 kV	≤ 1,50 kV
	13 kA	U_p	≤ 1,10 kV	≤ 1,50 kV
	25 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
	60 kA	U_p	≤ 1,70 kV	≤ 1,70 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (Open Circuit Failure Mode)	
Behaviour in case of Temporary Overvoltage (TOV)	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms	
Max. back-up protection with up-stream CB having a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			250 A gG (> 5 ÷ 50 kA rms) 160/125/100 A gG* (> 5 ÷ 100 kA rms)	
Max. overcurrent protection for through-wiring (V-connection)			125 A gG	
Rated Load Current (for V-connection)		I_L	125 A	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size (double clamps for V-connection)			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			1495 g	
Dimensions: width			140 mm (8 modules)	
Remote signal contact			potential-free changeover contact	
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible	
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

* with fuse 160 A gG I_{imp}=13 kA and I_{max}= 70 kA; with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA



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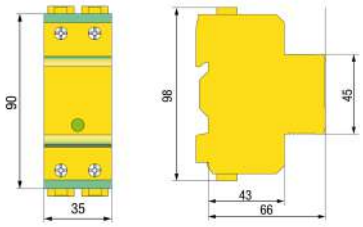


IA 25 230

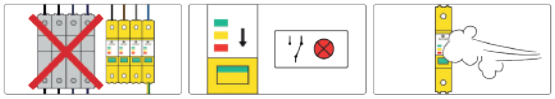
IA 25 230 is a voltage switching SPD with a single mode of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 100, I 52 and with connection type CT2 (3+1 or 1+1), providing the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- IA 25 230 is a self extinguishing spark gap based switching SPD, for the protection of low voltage installations against direct and indirect lightning effects;
- Impulse discharge current of 25 kA 10/350 µs;
- Nominal discharge current of 25 kA 8/20 µs;
- High self extinguishing capability of 16 kA rms (follow current interrupt rating);
- Green LED Status Indicator;
- The special housing is designed for "Pollution Degree 3".

TECHNICAL DATA

Model IA 25 ...		230
CODE		**203 100**
Nominal ac system voltage	U_N	230/400 V ac
Modes of protection		1
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	25 kA
Charge	Q	12,5 As
Nominal discharge current (8/20 µs)	I_n	25 kA
Short Circuit Current rating with max. backup protection	I_{sccr}	16 kA rms
Follow current interrupt rating	I_{fi}	16 kA rms
Voltage protection level	U_p	≤ 2,00 kV
Max. backup protection with fuse		315 A gG*
Max. overcurrent protection for through-wiring (V-connection)		125 A gG*
Rated Load Current (for V-connection)	I_L	125 A
Behaviour in case of Temporary OverVoltage (TOV)	U_T	440 V / 120 min, withstand (W)
Response time	t_a	≤ 100 ns
Insulation resistance	R_{ins}	≥ 1 G Ω
Status Indicator		Green LED
Operating temperature range / Humidity		-40 … +80 °C (extended) / 5% ... 95%
Terminal-Conductor size (double clamps for V-connection)		4-35 mm² flexible / 4-50 mm² semi rigid
Busbar connections		fork-type busbar 16 mm²
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade		BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection	PD / IP	3 / 20 (built-in)
Approximate weight		265 g
Dimensions: width		35 mm (2 modules)
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR
Additional Technical Information: for application at locations with a prospective short circuit current higher than the follow current interrupt rating Ifi		
Max. prospective short circuit current at the SPD's point of installation		50 kA rms (tested by CTI)
External backup fuse required		315 A gG

* with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA



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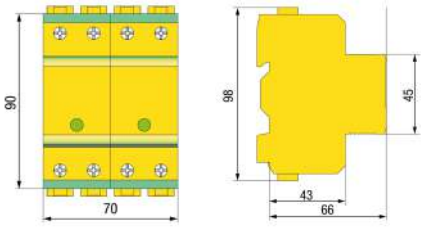
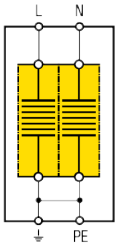




IA 25 230 2

IA 25 230 2 is a ready to install assembly of two voltage switching SPDs providing three modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for single-phase 230 V TN-systems with the following features and benefits:

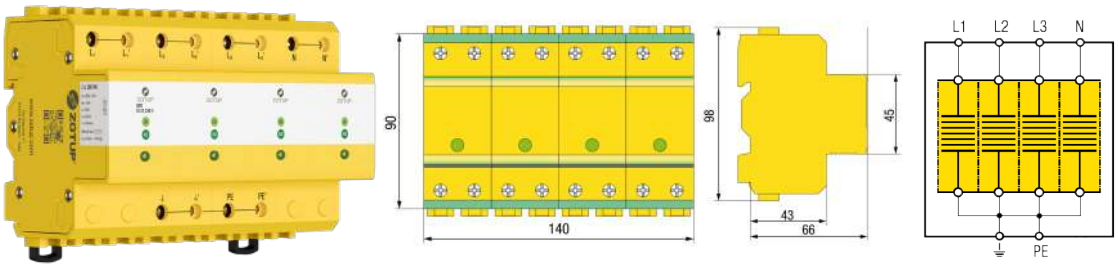
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- IA 25 230 2 is a self extinguishing spark gap based switching SPD, for the protection of low voltage installations against direct and indirect lightning effects;
- Impulse discharge current of 25 kA 10/350 µs;
- Nominal discharge current of 25 kA 8/20 µs;
- High self extinguishing capability of 16 kA rms (follow current interrupt rating);
- Green LED Status Indicator;
- The special housing is designed for "Pollution Degree 3".

TECHNICAL DATA

Model IA 25 ...		230 2
CODE		**203 120**
Nominal ac system voltage	U_N	230 V ac
Modes of protection		3
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	25 kA
Charge	Q	12,5 As
Nominal discharge current (8/20 µs)	I_n	25 kA
Short Circuit Current rating with max. backup protection	I_{sccr}	16 kA rms
Follow current interrupt rating	I_{fi}	16 kA rms
Voltage protection level	U_p	≤ 2,00 kV
Max. back-up protection with fuse (L)		315 A gG*
Max. overcurrent protection for through-wiring (V-connection)		125 A gG*
Rated Load Current (for V-connection)	I_L	125 A
Behaviour in case of Temporary OverVoltage (TOV)	U_T	440 V / 120 min, withstand (W)
Response time	t_a	≤ 100 ns
Insulation resistance	R_{ins}	≥ 1 G Ω
Status Indicator		Green LED (L-N)
Operating temperature range / Humidity		-40 … +80 °C (extended) / 5% ... 95%
Terminal-Conductor size (double clamps for V-connection)		4-35 mm² flexible / 4-50 mm² semi rigid
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade		BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection	PD / IP	3 / 20 (built-in)
Approximate weight		530 g
Dimensions: width		70 mm (4 modules)
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR
Additional Technical Information: for application at locations with a prospective short circuit current higher than the follow current interrupt rating Ifi		
Max. prospective short circuit current at the SPD's point of installation		50 kA rms (tested by CTI)
External backup fuse required		315 A gG

* with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA

TN



IA 25 230 4

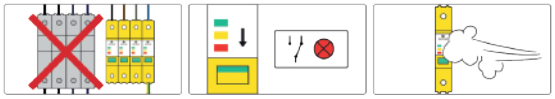
IA 25 230 4 is a ready to install assembly of four voltage switching SPDs providing ten modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase plus neutral 230/400 V TN-S systems with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- IA 25 230 4 is a self extinguishing spark gap based switching SPD, for the protection of low voltage installations against direct and indirect lightning effects;
- Impulse discharge current of 25 kA 10/350 µs;
- Nominal discharge current of 25 kA 8/20 µs;
- High self extinguishing capability of 16 kA rms (follow current interrupt rating);
- Green LED Status Indicator;z
- The special housing is designed for "Pollution Degree 3".

TECHNICAL DATA

Model IA 25 ...		230 4
CODE		**203 140**
Nominal ac system voltage	U_N	230/400 V ac
Modes of protection		10
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	25 kA
Charge	Q	12,5 As
Nominal discharge current (8/20 µs)	I_n	25 kA
Short Circuit Current rating with max. backup protection	I_{sccr}	16 kA rms
Follow current interrupt rating	I_{fi}	16 kA rms
Voltage protection level	U_p	≤ 2,00 kV
Max. back-up protection with fuse (L)		315 A gG*
Max. overcurrent protection for through-wiring (V-connection)		125 A gG*
Rated Load Current (for V-connection)	I_L	125 A
Behaviour in case of Temporary OverVoltage (TOV)	U_T	440 V / 120 min, withstand (W)
Response time	t_a	≤ 100 ns
Insulation resistance	R_{ins}	≥ 1 G Ω
Status Indicator		Green LED (L-N)
Operating temperature range / Humidity		-40 … +80 °C (extended) / 5% ... 95%
Terminal-Conductor size (double clamps for V-connection)		4-35 mm² flexible / 4-50 mm² semi rigid
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade		BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection	PD / IP	3 / 20 (built-in)
Approximate weight		1060 g
Dimensions: width		140 mm (8 modules)
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR
Additional Technical Information: for application at locations with a prospective short circuit current higher than the follow current interrupt rating Ifi		
Max. prospective short circuit current at the SPD's point of installation		50 kA rms (tested by CTI)
External backup fuse required		315 A gG

* with fuse 125 A gG Iimp= 10 kA and Imax= 40 kA; with fuse 100 A gG Iimp=9 kA and Imax= 30 kA



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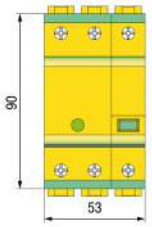

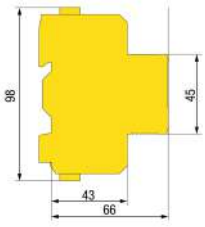

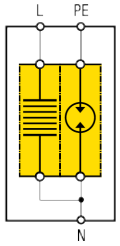

IA 25 230 1+1

IA 25 230 1+1 is a ready to install assembly of two voltage switching SPDs providing three modes of protection, typically installed at the origin of the installation, e.g. in the main distribution board (MDB), in single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-53, with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- IA 25 230 1+1 is a self extinguishing spark gap and GDT based switching SPD, for the protection of low voltage installations against direct and indirect lightning effects;
- Impulse discharge current (L-N) of 25 kA 10/350 µs;
- Impulse discharge current (N-PE) of 52 kA 10/350 µs;
- High self extinguishing capability of 16 kA rms (follow current interrupt rating L-N);
- Green LED Status Indicator;
- The special housing is designed for "Pollution Degree 3".

TECHNICAL DATA

Model IA 25 ...			230 1+1		
CODE			**203 121**		
Nominal ac system voltage		U_N	230 V ac		
Modes of protection			3		
Max Continuous Operating Voltage		U_c	255 V ac		
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II		
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2		
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	25 kA		
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	52 kA		
Charge (L-N)		Q	12,5 As		
Charge (N-PE)		Q	26 As		
Nominal discharge current (8/20 µs) (L-N)		I_n	25 kA		
Nominal discharge current (8/20 µs) (N-PE)		I_n	52 kA		
Short Circuit Current rating with max. backup protection		I_{sccr}	16 kA rms		
Follow current interrupt rating (L-N)		I_{fi}	16 kA rms		
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms		
Voltage protection level (L-N, N-PE, L-PE)		U_p	≤ 2,00 kV	≤ 1,50 kV	≤ 2,00 kV
Max. overcurrent protection fuse			315 A gG*		
Max. overcurrent protection for through-wiring (V-connection)			125 A gG*		
Rated Load Current (for V-connection)		I_L	125 A		
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)		
	N-PE	U_T	1200 V / 200 ms, withstand (W)		
Response time		t_a	≤ 100 ns		
Insulation resistance		R_{ins}	≥ 1 G Ω		
Status Indicator / N-PE (no disconnector)			Green LED / 2 colour indication (green/red) for N-PE		
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%		
Terminal-Conductor size (double clamps for V-connection on L-terminal)			4-35 mm² flexible / 4-50 mm² semi rigid		
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715		
Case material / Flammability grade			BMC / V-0 in accordance with UL 94		
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)		
Approximate weight			420 g		
Dimensions: width			53 mm (3 modules)		
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR		
Additional Technical Information: for application at locations with a prospective short circuit current higher than the follow current interrupt rating Ifi					
Max. prospective short circuit current at the SPD's point of installation			50 kA rms (tested by CTI)		
External backup fuse required			315 A gG		

* with fuse 125 A gG Iimp= 10 kA and Imax=40 kA, with fuse 100 A gG Iimp=9 kA and Imax= 30 kA

Surge Protective Devices: ZOTUPGAP

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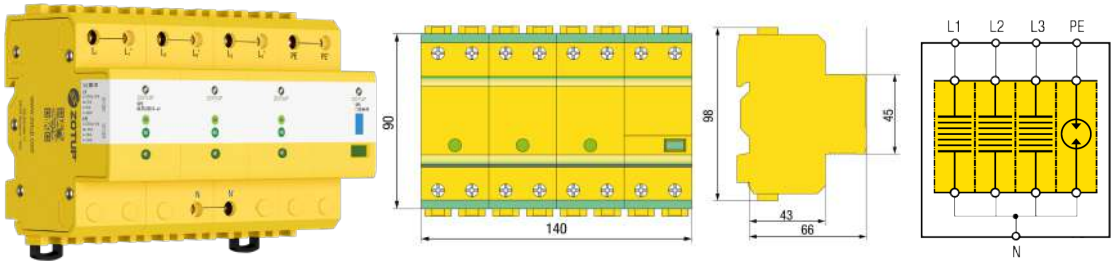


IA 25 230 3+1

IA 25 230 3+1 is a ready to install assembly of four voltage switching SPDs providing ten modes of protection, typically installed in three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-53, e.g. in the service entrance board (SEB), with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- IA 25 230 3+1 is a self extinguishing spark gap and GDT based switching SPD, for the protection of low voltage installations against direct and indirect lightning effects;
- Impulse discharge current (L-N) of 25 kA 10/350 µs;
- Impulse discharge current (N-PE) of 100 kA 10/350 µs;
- High self extinguishing capability of 16 kA rms (follow current interrupt rating L-N);
- Green LED Status Indicator;
- The special housing is designed for "Pollution Degree 3".

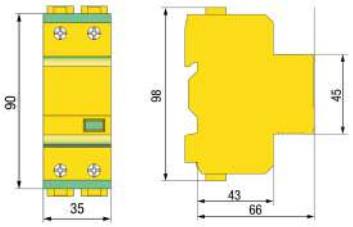
TECHNICAL DATA

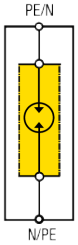
Model IA 25 ...			230 3+1		
CODE			**203 141**		
Nominal ac system voltage		U_N	230/400 V ac		
Modes of protection			10		
Max Continuous Operating Voltage		U_c	255 V ac		
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II		
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2		
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	25 kA		
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	52 kA		
Charge (L-N)		Q	12,5 As		
Charge (N-PE)		Q	26 As		
Nominal discharge current (8/20 µs) (L-N)		I_n	25 kA		
Nominal discharge current (8/20 µs) (N-PE)		I_n	52 kA		
Short Circuit Current rating with max. backup protection		I_{sccr}	16 kA rms		
Follow current interrupt rating (L-N)		I_{fi}	16 kA rms		
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms		
Voltage protection level (L-N, N-PE, L-PE)		U_p	≤ 2,00 kV	≤ 1,50 kV	≤ 2,00 kV
Max. back-up protection with fuse			315 A gG*		
Max. overcurrent protection for through-wiring (V-connection)			125 A gG*		
Rated Load Current (for V-connection)		I_L	125 A		
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)		
	N-PE	U_T	1200 V / 200 ms, withstand (W)		
Response time		t_a	≤ 100 ns		
Insulation resistance		R_{ins}	≥ 1 G Ω		
Status Indicator / N-PE (no disconnector)			Green LED / 2 colour indication (green/red) for N-PE		
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%		
Terminal-Conductor size (double clamps for V-connection)			4-35 mm² flexible / 4-50 mm² semi rigid		
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715		
Case material / Flammability grade			BMC / V-0 in accordance with UL 94		
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)		
Approximate weight			1060 g		
Dimensions: width			140 mm (8 modules)		
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR		
Additional Technical Information: for application at locations with a prospective short circuit current higher than the follow current interrupt rating Ifi					
Max. prospective short circuit current at the SPD's point of installation			50 kA rms (tested by CTI)		
External backup fuse required			315 A gG		

* with fuse 125 A gG Iimp= 10 kA and Imax=40 kA; with fuse 100 A gG Iimp=9 kA and Imax= 30 kA

I 100 N-PE

TT





I 100 N-PE is a voltage switching SPD providing three modes of protection, typically installed in TT-systems between neutral conductor N and protective earth PE, where connection type CT2 (1+1 or 3+1) is required according to HD 60364-5-53, e.g. in the main distribution board (MDB), with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- I 100 N-PE is a Gas Discharge Tube (GDT) based SPD, for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Impulse discharge current of 100 kA 10/350 µs;
- Nominal discharge current of 100 kA 8/20 µs;
- The special housing is designed for "Pollution Degree 3";
- To be combined with IA 25 or L 25/100 230 ff.

TECHNICAL DATA

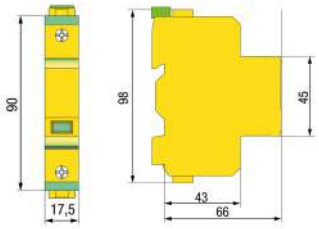
Model I 100 N-PE

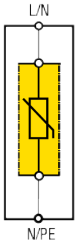
CODE		208 300
Nominal ac system voltage	U_N	230 V ac
Modes of protection		3
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	100 kA
Charge	Q	50 As
Nominal discharge current (8/20 µs)	I_n	100 kA
Max. discharge current (8/20 µs)	I_{max}	150 kA
Follow current interrupt rating	I_{fi}	100 A rms
Voltage protection level	U_p	≤ 1,50 kV
Max. overcurrent protection for through-wiring (V-connection)		125 A gG*
Rated Load Current (for V-connection)	I_L	125 A
Response Time	t_a	≤ 100 ns
Behaviour in case of Temporary OverVoltage (TOV):	U_T	1200 V / 200 ms, withstand (W)
Status indicator (no disconnector)		2 colour indication (green/red)
Operating temperature range / Humidity		-40 … +80 °C (extended) / 5% ... 95%
Terminal-Conductor size		4-35 mm² flexible / 4-50 mm² semi rigid
Busbar connections		fork-type busbar 16 mm²
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade		BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection	PD / IP	3 / 20 (built-in)
Approximate weight		240 g
Dimensions: width		35 mm (2 modules)
To be combined with		IA 25 or L 25/100 230 ff
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR

* with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA

TN

TT





L 13/40 230 ff

L 13/40 230 ff is a voltage limiting SPD providing a single mode of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 100, I 52 and with connection type CT2 (1+1 or 3+1). It provides the following features and benefits:

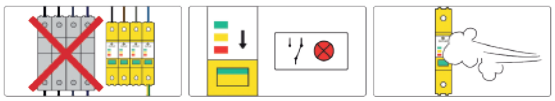
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 13/40 230 ff is a voltage limiting SPD, for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Short circuit current withstand of 100 kA rms with max. back-up fuse;
- Three colour Status Indicator with progressive indication of remaining performance.

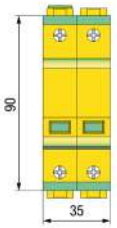
TECHNICAL DATA

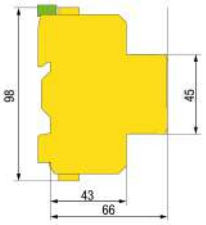
Model L 13/40 ...			230 ff
CODE			**204 100**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			1
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	13 kA
Charge		Q	6,5 As
Nominal discharge current (8/20 µs)		I_n	35 kA
Max. discharge current (8/20 µs)		I_{max}	70 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,79 kV
	5 kA	U_p	≤ 0,90 kV
	15 kA	U_p	≤ 1,10 kV
	20 kA	U_p	≤ 1,20 kV
	35 kA	U_p	≤ 1,50 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			160/125 A gG* (> 5 ÷ 100 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Busbar connections			fork-type busbar 16 mm^2
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			195 g
Dimensions: width			17,5 mm (1 module)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

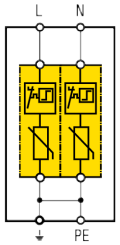
Model L 13/40 ... with remote signal contact	230 t ff
CODE	**214 100**
Remote signal contact	potential-free changeover contact
Terminal - conductor size for remote signal contact	max. 1,5 mm^2 flexible
Switching capacity remote signal contact	ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

*with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA









L 13/40 230 ff 2

L 13/40 230 ff 2 is a ready to install assembly of two voltage limiting SPDs providing three modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for single-phase 230 V TN-systems, with the following features and benefits:

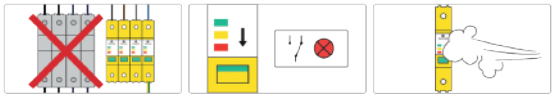
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 13/40 230 ff 2 is a voltage limiting SPD, for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 13/40 ...			230 ff 2
CODE			**204 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection			3
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	13 kA
Charge		Q	6,5 As
Nominal discharge current (8/20 µs)		I_n	35 kA
Max. discharge current (8/20 µs)		I_{max}	70 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,80 kV
	5 kA	U_p	≤ 0,93 kV
	15 kA	U_p	≤ 1,15 kV
	20 kA	U_p	≤ 1,25 kV
	35 kA	U_p	≤ 1,50 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			160/125 A gG* (> 5 ÷ 100 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			385 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 13/40 ... with remote signal contact		230 t ff 2
CODE		**214 120**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

*with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA



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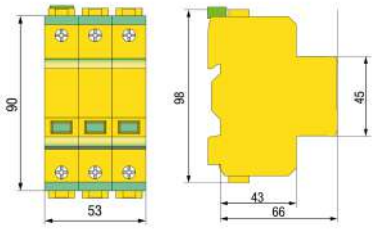
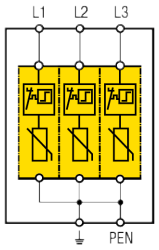




L 13/40 230 ff 3

L 13/40 230 ff 3 is a ready to install assembly of three voltage limiting SPDs providing six modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase 230/400 V TN-systems, with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 13/40 230 ff 3 is a voltage limiting SPD, for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

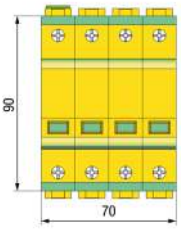
TECHNICAL DATA

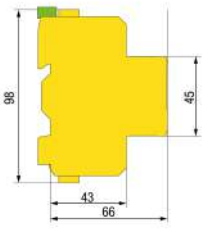
Model L 13/40 ...			230 ff 3
CODE			**204 130**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			6
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	13 kA
Charge		Q	6,5 As
Nominal discharge current (8/20 µs)		I_n	35 kA
Max. discharge current (8/20 µs)		I_{max}	70 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,80 kV
	5 kA	U_p	≤ 0,93 kV
	15 kA	U_p	≤ 1,15 kV
	20 kA	U_p	≤ 1,25 kV
	35 kA	U_p	≤ 1,50 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability) Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 160/125 A gG* (> 5 ÷ 100 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			590 g
Dimensions: width			53 mm (3 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

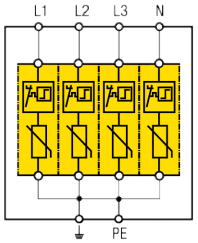
Model L 13/40 ... with remote signal contact		230 t ff 3
CODE		**214 130**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

*with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA

TN







L 13/40 230 ff 4

L 13/40 230 ff 4 is a ready to install assembly of four voltage limiting SPDs providing ten modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase plus neutral 230/400 V TN-systems, with the following features and benefits:

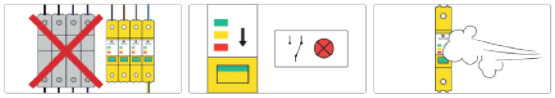
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 13/40 230 ff 4 is a voltage limiting SPD, for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 13/40 ...			230 ff 4
CODE			**204 140**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			10
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	13 kA
Charge		Q	6,5 As
Nominal discharge current (8/20 µs)		I_n	35 kA
Max. discharge current (8/20 µs)		I_{max}	70 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,80 kV
	5 kA	U_p	≤ 0,93 kV
	15 kA	U_p	≤ 1,15 kV
	20 kA	U_p	≤ 1,25 kV
	35 kA	U_p	≤ 1,50 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			160/125 A gG* (> 5 ÷ 100 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			780 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 13/40 ... with remote signal contact		230 t ff 4
CODE		**214 140**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

*with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA



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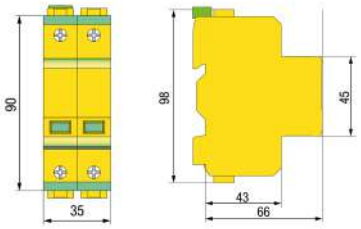
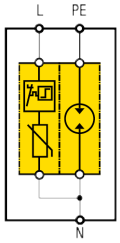




L 13/40 230 ff 1+1

L 13/40 230 ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection, typically installed in single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-53, e.g. in the service entrance board (SEB), with the following features and benefits:

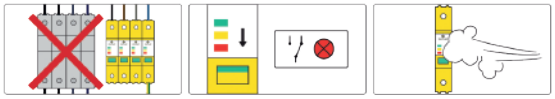
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 13/40 ...			230 ff 1+1	
CODE			**204 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection			3	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	13 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	52 kA	
Charge (L-N)		Q	6,5 As	
Charge (N-PE)		Q	26 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	35 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	52 kA	
Max. discharge current (8/20 µs) (L-N) and (N-PE)		I_{max}	70 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,80 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,93 kV	≤ 1,50 kV
	15 kA	U_p	≤ 1,15 kV	≤ 1,50 kV
	20 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
	35 kA	U_p	≤ 1,50 kV	≤ 1,50 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (Open Circuit Failure Mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms	
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			160/125 A gG* (> 5 ÷ 100 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			350 g	
Dimensions: width			35 mm (2 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

Model L 13/40 ... with remote signal contact		230 t ff 1+1
CODE		**214 121**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

*with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA



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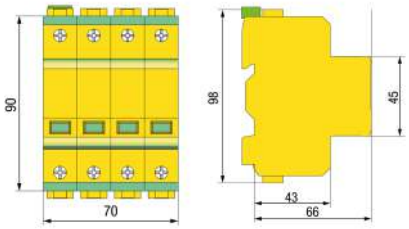
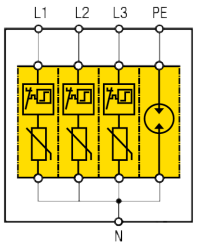




L 13/40 230 ff 3+1

L 13/40 230 ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing ten modes of protection, typically installed in three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-53, e.g. in the service entrance board (SEB), with the following features and benefits:

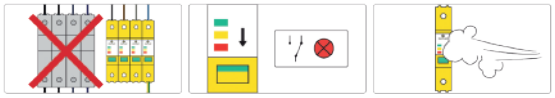
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

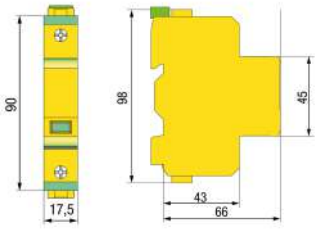
Model L 13/40 ...			230 ff 3+1	
CODE			**204 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection			10	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	13 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	52 kA	
Charge (L-N)		Q	6,5 As	
Charge (N-PE)		Q	26 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	35 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	52 kA	
Max. discharge current (8/20 µs) (L-N) and (N-PE)		I_{max}	70 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,80 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,93 kV	≤ 1,50 kV
	15 kA	U_p	≤ 1,15 kV	≤ 1,50 kV
	20 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
	35 kA	U_p	≤ 1,50 kV	≤ 1,50 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (Open Circuit Failure Mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms	
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			125 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			160/125 A gG* (> 5 ÷ 100 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			735 g	
Dimensions: width			70 mm (4 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

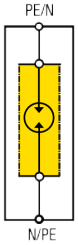
Model L 13/40 ... with remote signal contact		230 t ff 3+1
CODE		**214 141**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

*with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA



TT





I 52 N-PE

I 52 N-PE is a voltage switching SPD providing a single mode of protection, typically installed in TT-systems between neutral conductor N and protective earth PE, where connection type CT2 (1+1 or 3+1) is required according to HD 60364-5-53, with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- I 52 N-PE is a Gas Discharge Tube (GDT) based SPD, for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- Impulse discharge current of 52 kA 10/350 µs;
- Nominal discharge current of 52 kA 8/20 µs;
- The special housing is designed for "Pollution Degree 3";
- To be combined with L 25/100 230 ff or IA 25 230 for single-phase 230 V TT-systems and with L 13/40 230 ff or L 7/30 230 ff for single-phase and three-phase plus neutral 230/400 V TT-systems.

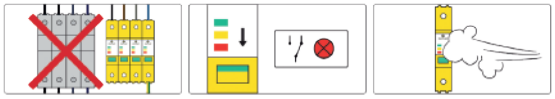
TECHNICAL DATA

Model I 52 N-PE

CODE		206 300
Nominal ac system voltage	U_N	230 V ac
Modes of protection		1
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	52 kA
Charge	Q	26 As
Nominal discharge current (8/20 µs)	I_n	52 kA
Max. discharge curret (8/20 µs)	I_{max}	70 kA
Follow current interrupt rating	I_{fi}	100 A rms
Voltage protection level	U_p	≤ 1,50 kV
Response time	t_a	≤ 100 ns
Behaviour in case of Temporary Overvoltage (TOV)	U_T	1200 V / 200 ms, withstand (W)
Operating temperature range / Humidity		-40 … +80 °C (extended) / 5% ... 95%
Terminal-Conductor size		4-35 mm² flexible / 4-50 mm² semi rigid
Busbar connections		fork-type busbar 16 mm²
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade		BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection	PD / IP	3 / 20 (built-in)
Approximate weight		130 g
Dimensions: width		17,5 mm (1 module)
In bundle with		L 13/40 230 ff and L 7/30 230 ff
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR

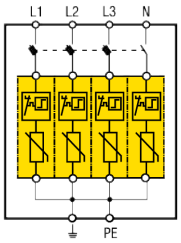
Model I 52 N-PE t with remote signal contact

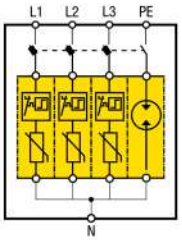
CODE		216 300
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible
Switching capacity		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



TN

TT





Protection Box ...

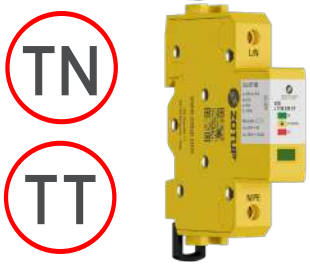
These Protection Boxes with an IP65 enclosure provide a compact and preinstalled solution for applications in Power Centers, when there is no remaining space in existing distribution boards, for outdoor applications as well as for line termination at or close to the origin of the installation where the lines may be subject to direct lightning strikes.
They are available as:

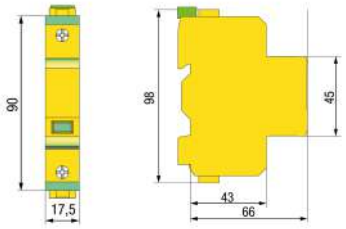
- TN 40 ff with four voltage limiting SPDs (four modes of protection), for three-phase plus neutral 230/400 V TN-systems;
- TT 40 ff with three voltage limiting and a voltage switching SPD (four modes of protection), for three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-53.

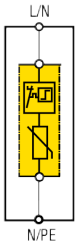
They provide the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- They are suitable for installation at zone boundaries up to 0_A – 2 according to the lightning protection zones concept as defined in EN IEC 62305.

Model Protection Box ...			TN 40 ff	TT 40 ff	
CODE			**244 100**	**245 100**	
Nominal ac system voltage		U_N	230/400 V ac		
Modes of protection			10		
Max Continuous Operating Voltage		U_c	335 V ac	-	
Max Continuous Operating Voltage (L-N, L-PE)		U_c	-	335 V ac	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II		
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2		
Impulse discharge current (10/350 µs) (L-N, L-PE)		I_{imp}	5 kA	10 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	5 kA	100 kA	
Charge (L-N, L-PE)		Q	10 As	5 As	
Charge (N-PE)		Q	10 As	50 As	
Nominal discharge current (8/20 µs) (L-N, L-PE)		I_n	40 kA	40 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	40 kA	100 kA	
Max. discharge current (8/20 µs) (L-N, L-PE)		I_{max}	40 kA	40 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	40 kA	100 kA	
Voltage protection level at a discharge current of:			(L-PE)	(L-N)	(L-PE)
	1 kA	U_p	≤ 0,75 kV	≤ 0,75 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,85 kV	≤ 0,85 kV	≤ 1,50 kV
	10 kA	U_p	≤ 1,00 kV	≤ 1,00 kV	≤ 1,50 kV
	20 kA	U_p	≤ 1,15 kV	≤ 1,15 kV	≤ 1,50 kV
	40 kA	U_p	≤ 1,50 kV	≤ 1,50 kV	≤ 1,50 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	≤ 1,50 kV	
Response time (L-N , L-PE / N-PE)		t_a	≤ 25 ns	≤ 25 ns / ≤ 100 ns	
End of Life			OCM (Open Circuit Failure Mode)		
Behaviour in case of Temporary Overvoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	440 V / 120 min, withstand (W)	
	N-PE	U_T	440 V / 120 min, withstand (W)	1200 V / 200 ms, withstand (W)	
Max. back-up protection with fuse (L)			125 A gG (incorporated)		
Short circuit current rating with max. back-up protection		I_{sccr}	50 kA rms		
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	NFC No Follow Current®	100 A rms	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%		
Terminal-Conductor size			16 mm² flexible		
Approximate weight			2460 g		
Size			l 300 x h 400 x d 140 mm		
Degree of protection		IP	65 (enclosure)		
Remote signal contact			changeover contact		
Terminal - conductor size for remote signal contact			max. 1,5 mm² flexible		
Switching capacity remote signal contact			ac: 250 V / 0,5 A - dc: 125 V / 0,2 A; 75 V / 0,5 A		







L 7/30 ... ff

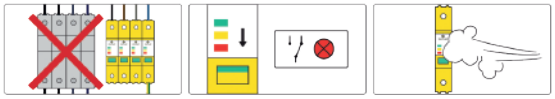
L 7/30 ... ff is a voltage limiting SPD providing a single mode of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 100, I 52 and with connection type CT2 (3+1 or 1+1). Additional models are also available for the protection of wind turbines.
It provides the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms (for U_N 230/400 V);
- Three colour Status Indicator with progressive indication of remaining performance.

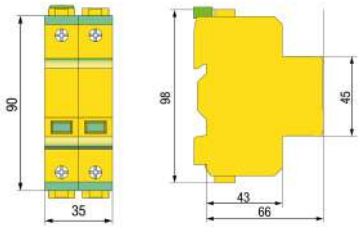
TECHNICAL DATA

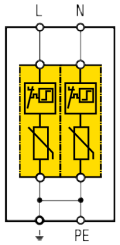
Model L 7/30 ...			230 ff	400 ff	Mini Wind Turbines 600 ff	Wind Turbines 750 ff	1000 ff
CODE			**207 100**	**207 104**	**207 106**	**207 107**	**207 110**
Nominal ac system voltage		U_N	230/400 V ac	400/690 V ac	480/830 V ac	554/960 V ac	554/960 V ac
Modes of protection			1				
Max Continuous Operating Voltage		U_c	335 V ac	460 V ac	690 V ac	750 V ac	1000 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II				
Type according to IEC 61643-11 Ed.2 and EN IEC 61643-11 (2025)			T1 and T2				
Impulse discharge current (10/350 µs)		I_{imp}	8 kA	7 kA	5 kA		2 kA
Charge		Q	4,0 As	3,5 As	2,5 As		1 As
Nominal discharge current (8/20 µs)		I_n	30 kA		25 kA	20 kA	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA				
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,80 kV	≤ 1,20 kV	≤ 1,75 kV	≤ 1,85 kV	≤ 3,00 kV
	5 kA	U_p	≤ 0,96 kV	≤ 1,46 kV	≤ 2,15 kV	≤ 2,25 kV	≤ 3,50 kV
	15 kA	U_p	≤ 1,30 kV	≤ 1,90 kV	≤ 2,72 kV	≤ 2,75 kV	≤ 4,20 kV
	20 kA	U_p	≤ 1,35 kV	≤ 1,95 kV	≤ 2,80 kV	≤ 2,85 kV	≤ 4,40 kV
	25 kA	U_p	≤ 1,40 kV	≤ 2,03 kV	≤ 2,90 kV	-	-
	30 kA	U_p	≤ 1,50 kV	≤ 2,15 kV	-	-	-
Response time		t_a	≤ 25 ns				
End of Life			OCM (Open Circuit Failure Mode)				
Behaviour in case of Temporary OverVoltage (TOV)	5 s	U_T	440 V, (W)	581 V, (W)	697 V, (W)	805 V, (W)	1452 V, (W)
withstand (W) / safe (S):	120 min	U_T	440 V, (W)	797 V, (S)	915 V, (S)	1056 V, (S)	1930 V, (S)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	3 kA rms	2 kA rms	2 kA rms	2 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms	100 kA rms	100 kA rms	100 kA rms	100 kA rms
Max. back-up protection with up-stream CB with max. let-through energy of (max. prospective short circuit current depends on CB breaking capability)			160 A (max.4,5x10^5 A^{2}s)	160 A (max.4,5x10^5 A^{2}s)	-	-	-
Max. back-up protection with FUSE at prospective short circuit current of			125 A gG at (>5÷100 kA rms)	125 A gG at (>3÷100 kA rms)	125 A gG at (>2÷100 kA rms)	125 A gG at (>2÷100 kA rms)	100 A aM (>2÷100 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®				
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication				
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%				
Terminal - Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid				
Busbar connections			fork-type busbar 16 mm²				
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715				
Case material / Flammability grade			BMC / V-0 in accordance with UL 94				
Pollution degree / Degree of protection		PD/IP	3 / 20 (built-in)		2 / 20 (built-in)		
Approximate weight			130 g	175 g	180 g	190 g	190 g
Dimensions: width			17,5 mm (1 module)				
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR				CTI Test Report

Model L 7/30 ... with remote signal contact		230 t ff	400 t ff	600 t ff	750 t ff	1000 t ff
CODE		**217 100**	**217 104**	**217 106**	**217 107**	**217 110**
Remote signal contact		potential-free changeover contact				
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible				
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A				



TN





L 7/30 230 ff 2

L 7/30 230 ff 2 is a ready to install assembly of two voltage limiting SPDs providing three modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for single-phase 230 V TN-systems, with the following features and benefits:

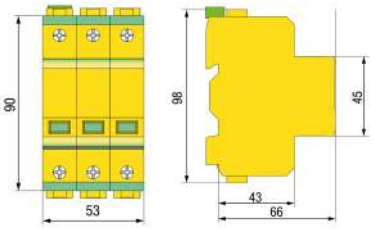
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

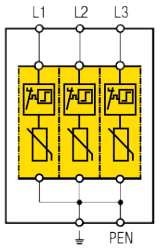
TECHNICAL DATA

Model L 7/30 ...			230 ff 2
CODE			**207 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection			3
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	8 kA
Charge		Q	4 As
Nominal discharge current (8/20 µs)		I_n	30 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,81 kV
	5 kA	U_p	≤ 0,98 kV
	20 kA	U_p	≤ 1,35 kV
	25 kA	U_p	≤ 1,45 kV
	30 kA	U_p	≤ 1,60 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability) Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 100 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			310 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 7/30 ... with remote signal contact		230 t ff 2
CODE		**217 120**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

TN





L 7/30 ... ff 3

L 7/30...ff 3 is a ready to install assembly of three voltage limiting SPDs providing six modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase TN systems, with the following features and benefits:

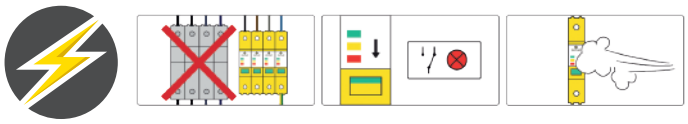
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms (for U_N 230/400 V);
- Three colour Status Indicator with progressive indication of remaining performance.

Wind Turbines

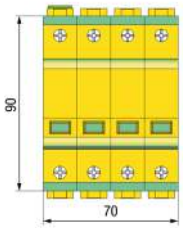
TECHNICAL DATA

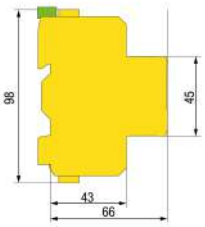
Model L 7/30 ...			230 ff 3	400 ff 3	750 ff 3
CODE			**207 130**	**207 134**	**207 137**
Nominal ac system voltage		U_N	230/400 V ac	400/690 V ac	554/960 V ac
Modes of protection			6		
Max Continuous Operating Voltage		U_c	335 V ac	460 V	750 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II		
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2		
Impulse discharge current (10/350 µs)		I_{imp}	8 kA	7 kA	5 kA
Charge		Q	4 As	3,5 As	2,5 As
Nominal discharge current (8/20 µs)		I_n	30 kA	30 kA	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA		
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,81 kV	≤ 1,20 kV	≤ 1,90 kV
	5 kA	U_p	≤ 0,98 kV	≤ 1,46 kV	≤ 2,30 kV
	20 kA	U_p	≤ 1,35 kV	≤ 1,95 kV	≤ 2,75 kV
	25 kA	U_p	≤ 1,45 kV	≤ 2,03 kV	-
	30 kA	U_p	≤ 1,60 kV	≤ 2,15 kV	-
Response time		t_a	≤ 25 ns		
End of Life			OCM (Open Circuit Failure Mode)		
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 5 s, (W)	581 V / 5 s, (W)	805 V / 5 s, (W)
withstand (W) / safe (S):		U_T	440 V / 120 min, (W)	797 V / 120 min, (W)	1056 V / 120 min, (S)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	3 kA rms	2 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms	100 kA rms	100 kA rms
Max. back-up protection with up-stream CB with max. let-through energy of			160 A (max.4,50x10^5 A^{2}s)	160 A (max.4,50x10^5 A^{2}s)	-
(max. prospective short circuit current depends on CB breaking capability)					
Max. back-up protection with FUSE at prospective short circuit current of			125 A gG at (> 5 ÷ 100 kA rms)	125 A gG at (> 3 ÷ 100 kA rms)	125 A gG at (> 2 ÷ 100 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®		
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication		
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%		
Terminal - Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid		
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715		
Case material / Flammability grade			BMC / V-0 in accordance with UL 94		
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	3 / 20 (built-in)	2 / 20 (built-in)
Approximate weight			491 g	491 g	582 g
Dimensions: width			53 mm (3 modules)		
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR		

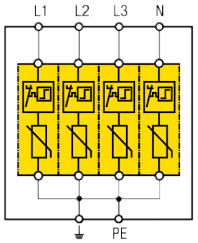
Model L 7/30 ... with remote signal contact		230 t ff 3	400 t ff 3	750 t ff 3
CODE		**217 130**	**217 134**	**217 137**
Remote signal contact		potential-free changeover contact		
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible		
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A		



TN







L 7/30 230 ff 4

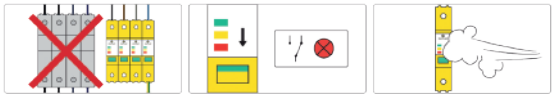
L 7/30 230 ff 4 is a ready to install assembly of four voltage limiting SPDs providing ten modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase plus neutral 230/400 V TN-systems, with the following features and benefits:

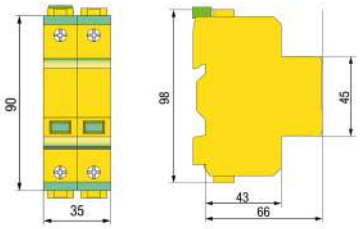
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

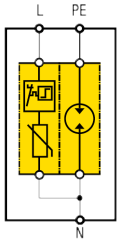
TECHNICAL DATA

Model L 7/30 ...			230 ff 4
CODE			**207 140**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			10
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	8 kA
Charge		Q	4,0 As
Nominal discharge current (8/20 µs)		I_n	30 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,81 kV
	5 kA	U_p	≤ 0,98 kV
	20 kA	U_p	≤ 1,35 kV
	25 kA	U_p	≤ 1,45 kV
	30 kA	U_p	≤ 1,60 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability) Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 100 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			620 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 7/30 ... with remote signal contact		230 t ff 4
CODE		**217 140**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A







L 7/30 230 ff 1+1

L 7/30 230 ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection, typically installed in single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-53, e.g. in the service entrance board (SEB), with the following features and benefits:

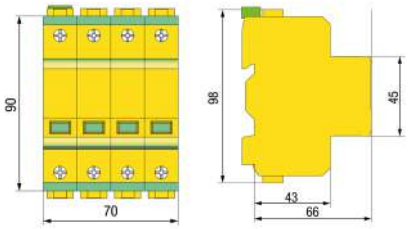
- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

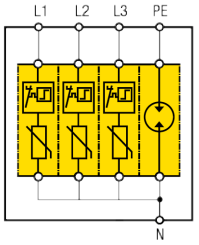
TECHNICAL DATA

Model L 7/30 ...			230 ff 1+1	
CODE			**207 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection			3	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	8 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	52 kA	
Charge (L-N)		Q	4 As	
Charge (N-PE)		Q	26 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	30 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	52 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	40 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	70 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,81 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,98 kV	≤ 1,50 kV
	20 kA	U_p	≤ 1,35 kV	≤ 1,50 kV
	25 kA	U_p	≤ 1,45 kV	≤ 1,50 kV
	30 kA	U_p	≤ 1,60 kV	≤ 1,60 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (Open Circuit Failure Mode)	
Behaviour in case of Temporary OverVoltage (TOV)	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms	
Max. back-up protection with up-stream CB having a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 5 ÷ 100 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			310 g	
Dimensions: width			35 mm (2 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

Model L 7/30 ... with remote signal contact		230 t ff 1+1
CODE		**217 121**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

TT





L 7/30 230 ff 3+1

L 7/30 230 ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing ten modes of protection, typically installed in three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-53, e.g. in the service entrance board (SEB), with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

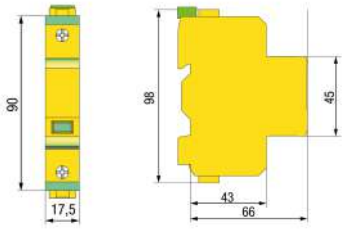
TECHNICAL DATA

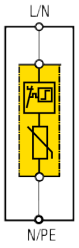
Model L 7/30 ...			230 ff 3+1	
CODE			**207 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection			10	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	8 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	52 kA	
Charge (L-N)		Q	4 As	
Charge (N-PE)		Q	26 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	30 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	52 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	40 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	70 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,81 kV	≤ 1,50 kV
	5 kA	U_p	≤ 0,98 kV	≤ 1,50 kV
	20 kA	U_p	≤ 1,35 kV	≤ 1,50 kV
	25 kA	U_p	≤ 1,45 kV	≤ 1,50 kV
	30 kA	U_p	≤ 1,60 kV	≤ 1,60 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (Open Circuit Failure Mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	100 kA rms	
Max. back-up protection with up-stream CB having a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 5 ÷ 100 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			620 g	
Dimensions: width			70 mm (4 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

Model L 7/30 ... with remote signal contact		230 t ff 3+1
CODE		**217 141**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

TN

TT





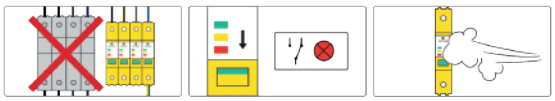
L 3/30 ... ff

L 3/30 ... ff is a voltage limiting SPD providing a single mode of protection, typically installed in Sub Distribution Boards (SDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 100, I 52 or I 12 and with connection type CT2 (1+1 or 3+1). It provides the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 3/30 ... ff is a voltage limiting SPD, for the protection of low voltage installations and equipment against indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms (for U_N 230/400 V);
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- Three colour Status Indicator with progressive indication of remaining performance.

Model L 3/30 ...			60 ff	120 ff	230 ff	400 ff
CODE			**200 102**	**200 103**	**200 100**	**200 104**
Nominal ac system voltage		U_N	60/104 V ac	120/208 V ac	230/400 V ac	400/690 V ac
Modes of protection			1			
Max Continuous Operating Voltage		U_c	75 V ac	150 V ac	335 V ac	460 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II			
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2			
Nominal discharge current (8/20 µs)		I_n	20 kA	20 kA	30 kA	30 kA
Max. discharge current (8/20 µs)		I_{max}	30 kA	30 kA	40 kA	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,22 kV	≤ 0,42 kV	≤ 0,81 kV	≤ 1,20 kV
	5 kA	U_p	≤ 0,28 kV	≤ 0,50 kV	≤ 1,00 kV	≤ 1,45 kV
	10 kA	U_p	≤ 0,36 kV	≤ 0,60 kV	≤ 1,20 kV	≤ 1,58 kV
	20 kA	U_p	≤ 0,50 kV	≤ 0,80 kV	≤ 1,35 kV	≤ 1,90 kV
	30 kA	U_p	-	-	≤ 1,50 kV	≤ 2,15 kV
Response time		t_a	≤ 25 ns			
End of Life			OCM (Open Circuit Failure Mode)			
Behaviour in case of Temp. OverVoltage (TOV)		U_T	87 V / 5 s, (W)	174 V / 5 s, (W)	440 V / 5 s, (W)	607 V / 5 s, (W)
withstand (W)/safe (S):		U_T	115 V / 120 min, (S)	230 V / 120 min, (S)	440 V / 120min, (W)	760 V / 120 min, (S)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms			3 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms			
Max. back-up protection with up-stream CB with max. let-through energy of			160 A	160 A	160 A	160 A
(max. prospective short circuit current depends on CB breaking capability)			(max.4,80x10^5 A^{2}s)	(max.4,80x10^5 A^{2}s)	(max.4,50x10^5 A^{2}s)	(max.4,50x10^5 A^{2}s)
Max. back-up protection with FUSE at prospective short circuit current of			125 A gG at	125 A gG at	125 A gG at	125 A gG at
			(> 5 ÷ 50 kA rms)	(> 5 ÷ 50 kA rms)	(> 5 ÷ 50 kA rms)	(> 3 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®			
Status indicator (indication of disconnector operation)			3 colors with progressive performance indication			
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%			
Terminal - Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid			
Busbar connections			fork-type busbar 16 mm²			
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715			
Case material / Flammability grade			BMC / V-0 in accordance with UL 94			
Pollution degree / Degree of protection		PD/IP	3 / 20 (built-in)			
Approximate weight			120 g	140 g	160 g	175 g
Dimensions: width			17,5 mm (1 module)			
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR			

Model L 3/30 ... with remote signal contact		60 t ff	120 t ff	230 t ff	400 t ff
CODE		**210 102**	**210 103**	**210 100**	**210 104**
Remote signal contact		potential-free changeover contact			
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible			
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A			



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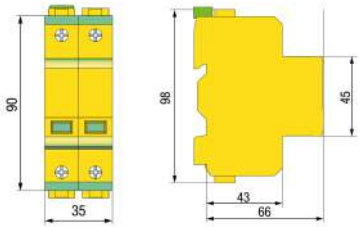
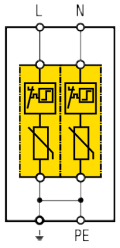




L 3/30 230 ff 2

L 3/30 230 ff 2 is a ready to install assembly of two voltage limiting SPDs, providing three modes of protection, typically installed in Sub Distribution Boards (SDB) for single-phase 230 V TN-systems, with the following features and benefits:

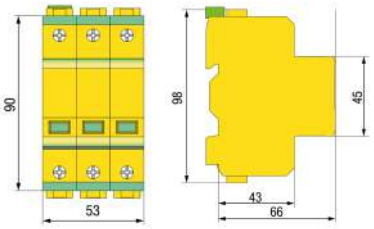
- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 3/30 230 ff 2 is a voltage limiting SPD, for the protection of low voltage installations and equipment against indirect lightning effects;
- Nominal discharge current of 30 kA 8/20 µs;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- Three colour Status Indicator with progressive indication of remaining performance.

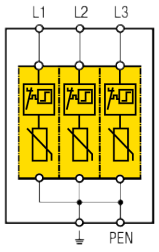
TECHNICAL DATA

Model L 3/30 ...			230 ff 2
CODE			**200 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection			3
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs)		I_n	30 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,82 kV
	5 kA	U_p	≤ 1,00 kV
	10 kA	U_p	≤ 1,25 kV
	20 kA	U_p	≤ 1,40 kV
	30 kA	U_p	≤ 1,60 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability) Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			315 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 3/30 ... with remote signal contact		230 t ff 2
CODE		**210 120**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

TN





L 3/30 230 ff 3

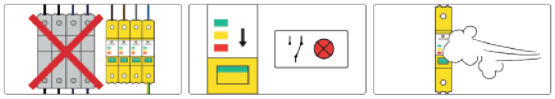
L 3/30 230 ff 3 is a ready to install assembly of three voltage limiting SPDs providing six modes of protection, typically installed in Sub Distribution Boards (SDB) for three-phase 230/400 V TN-systems, with the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 3/30 230 ff 3 is a voltage limiting SPD, for the protection of low voltage installations and equipment against indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 3/30 ...			230 ff 3
CODE			**200 130**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			6
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs)		I_n	30 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,82 kV
	5 kA	U_p	≤ 1,00 kV
	10 kA	U_p	≤ 1,25 kV
	20 kA	U_p	≤ 1,40 kV
	30 kA	U_p	≤ 1,60 kV
Reaction time		t_a	≤ 25 ns
End of Life			OCM (open circuit failure mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability) Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			465 g
Dimensions: width			53 mm (3 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 3/30 ... with remote signal contact		230 t ff 3
CODE		**210 130**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



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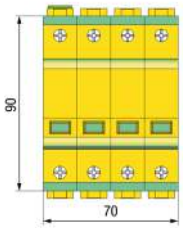
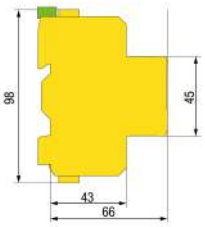
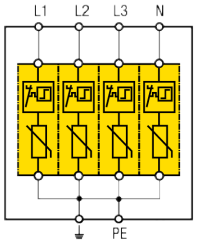






L 3/30 230 ff 4

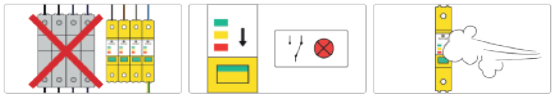
L 3/30 230 ff 4 is a ready to install assembly of four voltage limiting SPDs providing ten modes of protection, typically installed in Sub Distribution Boards (SDB) for three-phase plus neutral 230/400 V TN-systems, with the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 3/30 230 ff 4 is a voltage limiting SPD, for the protection of low voltage installations and equipment against indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Short circuit current of 50 kA rms with max. back-up fuse;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 3/30 ...			230 ff 4
CODE			**200 140**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			10
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs)		I_n	30 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,82 kV
	5 kA	U_p	≤ 1,00 kV
	10 kA	U_p	≤ 1,25 kV
	20 kA	U_p	≤ 1,40 kV
	30 kA	U_p	≤ 1,60 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (open circuit failure mode)
Behaviour in case of Temporary OverVoltage (TOV):		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 5 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			620 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 3/30 ... with remote signal contact		230 t ff 4
CODE		**210 140**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



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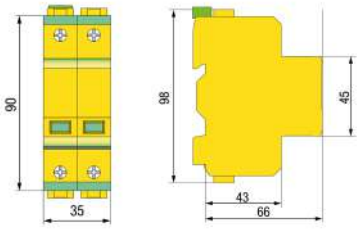
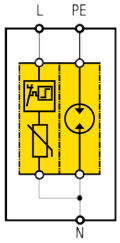




L 3/30 230 ff 1+1

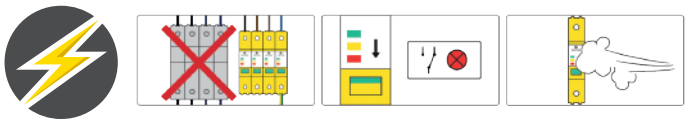
L 3/30 230 ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection, typically installed in Sub Distribution Boards (SDBs) for single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-53, with the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 3/30 ...			230 ff 1+1	
CODE			**200 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection			3	
Max Continuous Operating Voltage (L-N)		U_C	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_C	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2	
Nominal discharge current (8/20 µs) (L-N)		I_n	30 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	40 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	40 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	65 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,82 kV	≤ 1,50 kV
	5 kA	U_p	≤ 1,00 kV	≤ 1,50 kV
	10 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
	20 kA	U_p	≤ 1,40 kV	≤ 1,50 kV
	30 kA	U_p	≤ 1,60 kV	≤ 1,60 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms	
Max. back-up protection with up-stream CB having a max. let-through energy of			160 A (max. 4,50 x 10^5 A^2s)	
(max. prospective short circuit current depends on the CB breaking capability)				
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 5 ÷ 50 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			280 g	
Dimensions: width			35 mm (2 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

Model L 3/30 ... with remote signal contact		230 t ff 1+1
CODE		**210 121**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



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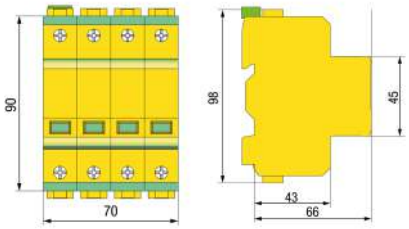
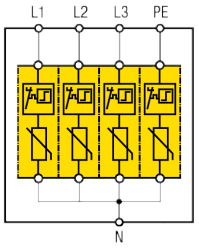




L 3/30 230 ff 3+1

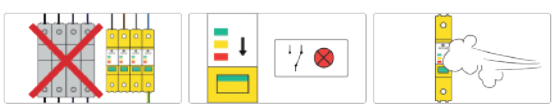
L 3/30 230 ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing four modes of protection, typically installed in Sub Distribution Boards (SDBs) for three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-53, with the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L3/30 ...			230 ff 3+1	
CODE			**200 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection			10	
Max Continuous Operating Voltage (L-N)		U_C	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_C	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2	
Nominal discharge current (8/20 µs) (L-N)		I_n	30 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	40 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	40 kA	
Max. discarge current (8/20 µs) (N-PE)		I_{max}	65 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,82 kV	≤ 1,50 kV
	5 kA	U_p	≤ 1,00 kV	≤ 1,50 kV
	10 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
	20 kA	U_p	≤ 1,40 kV	≤ 1,50 kV
	30 kA	U_p	≤ 1,60 kV	≤ 1,60 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms	
Max. back-up protection with CB having a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability) Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 50 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			590 g	
Dimensions: width			70 mm (4 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

Model L 3/30 ... with remote signal contact	230 t ff 3+1
CODE	210 141
Remote signal contact	potential-free changeover contact
Terminal - conductor size for remote signal contact	max. 1,5 mm^2 flexible
Switching capacity remote signal contact	ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



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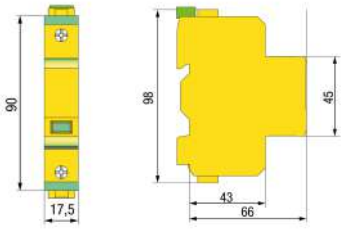
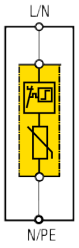




L 2/10 230 ff

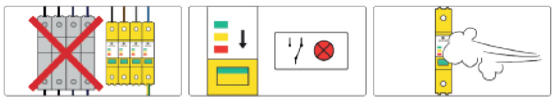
L 2/10 230 ff is a voltage limiting SPD providing a single mode of protection, typically installed in Sub Distribution Boards (SDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 52 or I 12 and where connection type CT2 (3+1 or 1+1) is required according to HD 60364-5-53. It provides the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 2/10 230 ff is a voltage limiting SPD for the protection of low voltage installations and equipment against indirect lightning effects;
- Nominal discharge current of 10 kA 8/20 µs;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- NFC No Follow Current® technology, there are no follow currents drawn from the power supply system after operation;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 2/10 ...			230 ff
CODE			**202 100**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			1
Max Continuous Operating Voltage		U_C	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs)		I_n	10 kA
Max. discharge current (8/20 µs)		I_{max}	20 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,82 kV
	5 kA	U_p	≤ 1,00 kV
	10 kA	U_p	≤ 1,25 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (open circuit failure mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability). Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Busbar connections			fork-type busbar 16 mm^2
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			155 g
Dimensions: width			17,5 mm (1 module)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 2/10 ... with remote signal contact		230 t ff
CODE		**212 100**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



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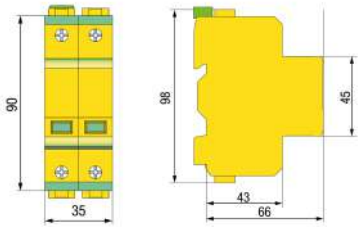
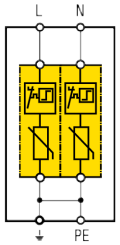




L 2/10 230 ff 2

L 2/10 230 ff 2 is a ready to install assembly of two voltage limiting SPDs providing three modes of protection, typically installed in Sub Distribution Boards (SDB) for single-phase 230 V TN-systems, with the following features and benefits:

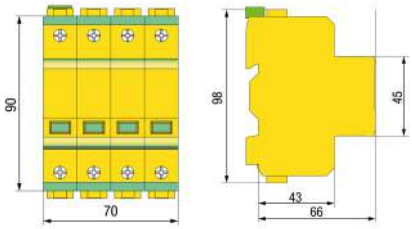
- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 2/10 230 ff 2 is a voltage limiting SPD for the protection of low voltage installations and equipment against indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- NFC No Follow Current® technology, there are no follow currents drawn from the power supply system after operation;
- Three colour Status Indicator with progressive indication of remaining performance.

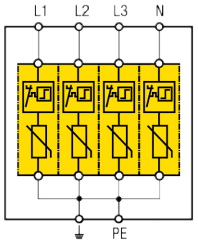
TECHNICAL DATA

Model L 2/10 ...			230 ff 2
CODE			**202 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection			3
Max Continuous Operating Voltage		U_C	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs)		I_n	10 kA
Max. discharge current (8/20 µs)		I_{max}	20 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,83 kV
	5 kA	U_p	≤ 1,00 kV
	10 kA	U_p	≤ 1,25 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (open circuit failure mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability) Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			310 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 2/10 ... with remote signal contact		230 t ff 2
CODE		**212 120**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

TN





L 2/10 230 ff 4

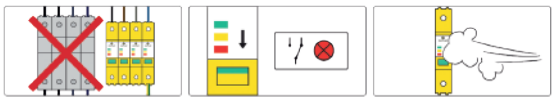
L 2/10 230 ff 4 is a ready to install assembly of four voltage limiting SPDs providing ten modes of protection, typically installed in Sub Distribution Boards (SDB) for three-phase plus neutral 230/400 V TN-systems, with the following features and benefits:

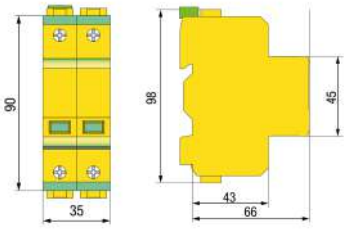
- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 2/10 230 ff 4 is a voltage limiting SPD for the protection of low voltage installations and equipment against indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- NFC No Follow Current® technology, there are no follow currents drawn from the power supply system after operation;
- Three colour Status Indicator with progressive indication of remaining performance.

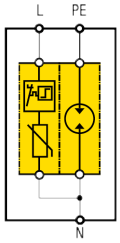
TECHNICAL DATA

Model L 2/10 ...			230 ff 4
CODE			**202 140**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection			10
Max Continuous Operating Voltage		U_C	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs)		I_n	10 kA
Max. discharge current (8/20 µs)		I_{max}	20 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,83 kV
	5 kA	U_p	≤ 1,00 kV
	10 kA	U_p	≤ 1,25 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (open circuit failure mode)
Behaviour in case of Temporary OverVoltage (TOV)		U_T	440 V / 120 min, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 5 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			620 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 2/10 ... with remote signal contact		230 t ff 4
CODE		**212 140**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A







L 2/10 230 ff 1+1

L 2/10 230 ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection, typically installed in Sub Distribution Boards (SDBs) for single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-53, with the following features and benefits:

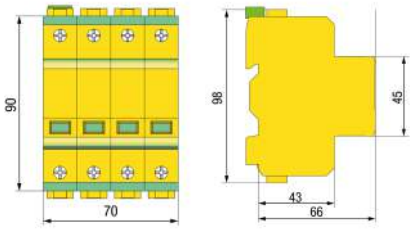
- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- NFC No Follow Current® technology, there are no follow currents drawn from the power supply system after operation;
- Three colour Status Indicator with progressive indication of remaining performance.

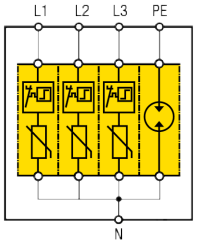
TECHNICAL DATA

Model L 2/10 ...			230 ff 1+1	
CODE			**202 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection			3	
Max Continuous Operating Voltage (L-N)		U_C	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_C	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2	
Nominal discharge current (8/20 µs) (L-N)		I_n	10 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	40 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	20 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	65 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,83 kV	≤ 1,50 kV
	5 kA	U_p	≤ 1,00 kV	≤ 1,50 kV
	10 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms	
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 5 ÷ 50 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			280 g	
Dimensions: width			35 mm (2 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

Model L 2/10 ... with remote signal contact		230 t ff 1+1
CODE		**212 121**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

TT





L 2/10 230 ff 3+1

L 2/10 230 ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing ten modes of protection, typically installed in Sub Distribution Boards (SDBs) for three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-53, with the following features and benefits:

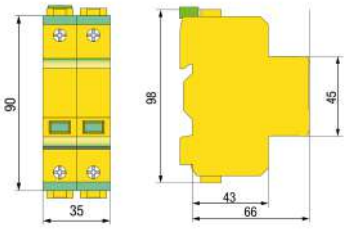
- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- NFC No Follow Current® technology, there are no follow currents drawn from the power supply system after operation;
- Three colour Status Indicator with progressive indication of remaining performance.

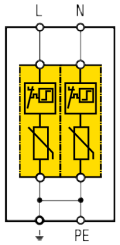
TECHNICAL DATA

Model L 2/10 ...			230 ff 3+1	
CODE			**202 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection			10	
Max Continuous Operating Voltage (L-N)		U_C	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_C	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2	
Nominal discharge current (8/20 µs) (L-N)		I_n	10 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	40 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	20 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	65 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 0,83 kV	≤ 1,50 kV
	5 kA	U_p	≤ 1,00 kV	≤ 1,50 kV
	10 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms	
Max. back-up protection with up-stream CB having a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 5 ÷ 50 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for N-PE	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)	
Approximate weight			590 g	
Dimensions: width			70 mm (4 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

Model L 2/10 ... with remote signal contact		230 t ff 3+1
CODE		**212 141**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

TT





L 2/10 230 ff 2 TT

L 2/10 230 ff 2 TT is a ready to install assembly of two voltage limiting SPDs providing three modes of protection, typically installed in Sub Distribution Boards (SDBs) for single-phase 230 V TT-systems downstream a RCD where connection type CT1 is applied according to HD 60364-5-53. This SPD is also suitable for single-phase 230 V TN-systems, when high resistability against TOVs is required. It provides the following features and benefits:

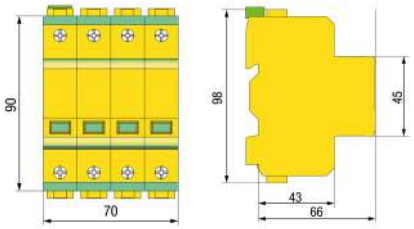
- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

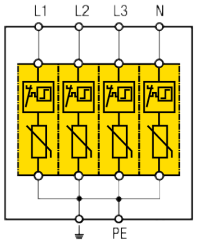
TECHNICAL DATA

Model L2/10 ...			230 ff 2 TT
CODE			**202 220**
Nominal ac system voltage		U_N	230 V ac
Modes of protection			3
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs) (the upstream RCD may trip when discharge currents exceed 3 kA 8/20 µs)		I_n	10 kA
Max. discharge current (8/20 µs) (the upstream RCD may trip when discharge currents exceed 3 kA 8/20 µs)		I_{max}	20 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,83 kV
	5 kA	U_p	≤ 1,00 kV
	10 kA	U_p	≤ 1,25 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (Open Circuit Failure Mode)
Behaviour in case of Temporary OverVoltage (TOV):	L-PE	U_T	440 V / 120 min, withstand (W); 1.455 V / 200 ms, safe (S)
	N-PE	U_T	1.200 V / 200 ms, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability). Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			310 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 2/10 ... with remote signal contact	230 t ff 2 TT
CODE	**212 220**
Remote signal contact	potential-free changeover contact
Terminal - conductor size for remote signal contact	max. 1,5 mm^2 flexible
Switching capacity remote signal contact	ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

TT





L 2/10 230 ff 4 TT

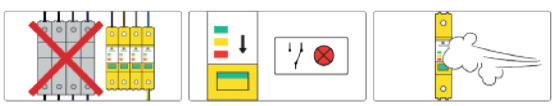
L 2/10 230 ff 4 TT is a ready to install assembly of four voltage limiting SPDs providing four modes of protection, typically installed in Sub Distribution Boards (SDBs) for three-phase plus neutral 230/400 V TT-systems downstream a RCD where connection type CT1 is applied according to HD 60364-5-53. This SPD is also suitable for three-phase plus neutral 230/400 V TN-systems, when high resistability against TOVs is required.
It provides the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Three colour Status Indicator with progressive indication of remaining performance.

TECHNICAL DATA

Model L 2/10 ...			230 ff 4 TT
CODE			**202 240**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection (number of poles)			4
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs) (the upstream RCD may trip when discharge currents exceed 3 kA 8/20 µs)		I_n	10 kA
Max. discharge current (8/20 µs) (the upstream RCD may trip when discharge currents exceed 3 kA 8/20 µs)		I_{max}	20 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,83 kV
	5 kA	U_p	≤ 1,00 kV
	10 kA	U_p	≤ 1,25 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (open circuit failure mode)
Behaviour in case of Temporary OverVoltage (TOV)	L-PE	U_T	440 V / 120 min, (W); 1.455 V / 200 ms, (S)
withstand (W) / safe (S):	N-PE	U_T	1200 V / 200 ms, (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	50 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability). Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG (> 5 ÷ 50 kA rms)
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	3 / 20 (built-in)
Approximate weight			620 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR

Model L 2/10 ... with remote signal contact			230 t ff 4 TT
CODE			**212 240**
Remote signal contact			potential-free changeover contact
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



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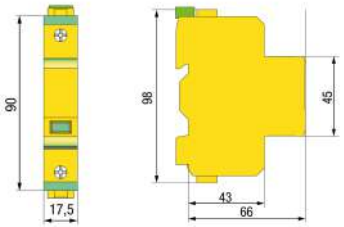
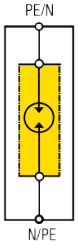




I 12 N-PE

I 12 N-PE is a voltage switching SPD providing a single mode of protection, typically installed in TT-systems between neutral conductor N and protective earth PE, where connection type CT2 (3+1 or 1+1) is required according to HD 60364-5-53, with the following features and benefits:

- T1 SPD and T2 SPD (Type 1 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- I 12 N-PE is a Gas Discharge Tube (GDT) based SPD for protection of low voltage installations and equipment against direct and indirect lightning effects;
- Impulse discharge current of 12,5 kA 10/350 µs;
- Nominal discharge current of 40 kA 8/20 µs;
- The special housing is designed for "Pollution Degree 3";
- To be combined with L 3/30 230 ff or L 2/10 230 ff.

TECHNICAL DATA

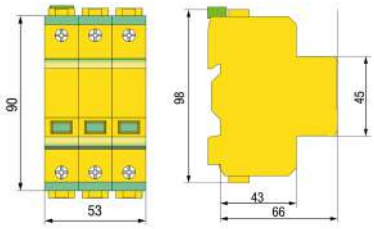
Model I 12 N-PE

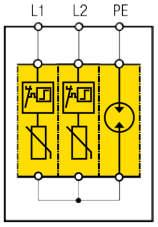
CODE		207 300
Nominal ac system voltage	U_N	230 V ac
Modes of protection (number of poles)		1 (N-PE)
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	12,5 kA
Charge	Q	6,25 As
Nominal discharge current (8/20 µs)	I_n	40 kA
Max. discharge current (8/20 µs)	I_{max}	65 kA
Follow current interrupt rating	I_{fi}	100 A rms
Voltage protection level	U_p	≤ 1,50 kV
Response time	t_a	≤ 100 ns
Behaviour in case of Temporary OverVoltage (TOV)	U_T	1200 V / 200 ms, withstand (W)
Operating temperature range / Humidity		-40 … +80 °C (extended) / 5% ... 95%
Terminal-Conductor size		4-35 mm² flexible / 4-50 mm² semi rigid
Busbar connections		fork-type busbar 16 mm²
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade		BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection	PD / IP	3 / 20 (built-in)
Approximate weight		120 g
Dimensions: width		17,5 mm (1 module)
In bundle with		L 3/30 230 ff and L 2/10 230 ff
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR

Model I 12 N-PE t with remote signal contact

CODE		217 300
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

IT





IL 4/20 400 ff 2 IT

IL 4/20 400 ff 2 IT is a ready to install assembly of two voltage limiting and a voltage switching SPD-module, providing three modes of protection, typically installed in IT systems according to HD 60364-5-53 (e.g. in the service entrance board SEB), with the following features and benefits:

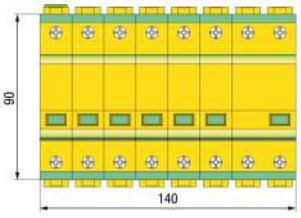
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 2 kA rms;
- No leakage current to PE;
- Three colour Status Indicator with progressive indication of remaining performance / two colours for GDT.

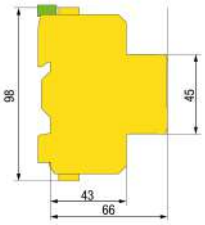
TECHNICAL DATA

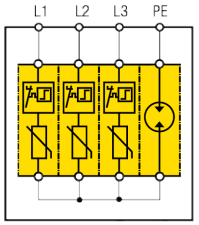
Model IL 4/20 ...			400 ff 2 IT
CODE			**207 220**
Nominal ac system voltage		U_N	230 / 400 V ac
Modes of protection			3
Max Continuous Operating Voltage (L/N-PE)		U_c	440 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	2 kA
Charge		Q	2,5 As
Nominal discharge current (8/20 µs)		I_n	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level (L/N-PE) at a discharge current of:	1 kA	U_p	≤ 2,10 kV
	5 kA	U_p	≤ 2,40 kV
	10 kA	U_p	≤ 2,70 kV
	15 kA	U_p	≤ 3,00 kV
	20 kA	U_p	≤ 3,30 kV
Voltage protection level (L-PE) at 6 kV (1,2/50 µs)		U_p	≤ 4,00 kV
Response time L-PE		t_a	≤ 100 ns
End of Life (L-PE)			OCM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L-PE	U_T	1640 V / 200 ms, safe (S)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	2 kA rms
Short Circuit Current rating with max. backup protection fuse			100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability) Max. back-up protection with FUSE at prospective short circuit currents of			160 A (max. 4,50 x 10^5 A^2s) 125 A gG* (> 5 ÷ 100 kA rms)
Follow current interrupt rating (L-PE)		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication + 2 colours for GDT
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)
Approximate weight			280 g
Dimensions: width			53 mm (3 modules)

Model IL 2/20 ... with remote signal contact		400 t ff 2 IT
CODE		**217 220**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

IT







IL 4/20 400 ff 3 IT

IL 4/20 400 ff 3 IT is a ready to install assembly of three voltage limiting and a voltage switching SPD-module, providing six modes of protection, typically installed in IT systems according to HD 60364-5-53 (e.g. in the service entrance board SEB), with the following features and benefits:

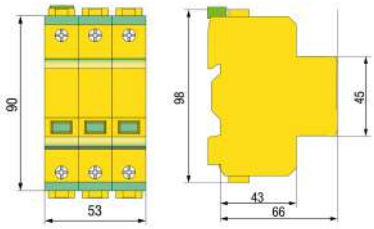
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 2 kA rms;
- No leakage current to PE;
- Three colour Status Indicator with progressive indication of remaining performance / two colours for GDT.

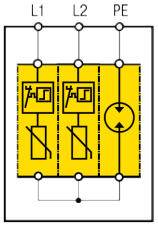
TECHNICAL DATA

Model IL 4/20 ...			400 ff 3 IT
CODE			**207 230**
Nominal ac system voltage		U_N	230 / 400 V ac
Mode of protection			6
Max Continuous Operating Voltage (L-PE)		U_c	440 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	10 kA
Charge		Q	5 As
Nominal discharge current (8/20 µs)		I_n	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level (L-PE) at a discharge current of:	1 kA	U_p	≤ 2,00 kV
	5 kA	U_p	≤ 2,30 kV
	10 kA	U_p	≤ 2,50 kV
	15 kA	U_p	≤ 2,70 kV
	20 kA	U_p	≤ 2,90 kV
Voltage protection level (L-PE) at 6 kV (1,2/50 µs)		U_p	≤ 4,00 kV
Response time L-PE		t_a	≤ 100 ns
End of Life (L-PE)			OCM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L-PE	U_T	1960 V / 200 ms, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	2 kA rms
Short Circuit Current rating with max. backup protection fuse			100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 2 ÷ 100 kA rms)
Follow current interrupt rating (L-PE)		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication + 2 colours for GDT
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)
Approximate weight			1.260 g
Dimensions: width			140 mm (8 modules)

Model IL 2/20 ... with remote signal contact		400 t ff 3 IT
CODE		**217 230**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

IT





IL 4/20 690 ff 2 IT

IL 4/20 690 ff 2 IT is a ready to install assembly of two voltage limiting and a voltage switching SPD-module, providing three modes of protection, typically installed in IT systems according to HD 60364-5-53 (e.g. in the service entrance board SEB), with the following features and benefits:

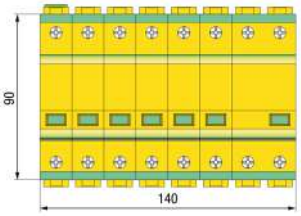
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 2 kA rms;
- No leakage current to PE;
- Three colour Status Indicator with progressive indication of remaining performance / 2 colours for GDT.

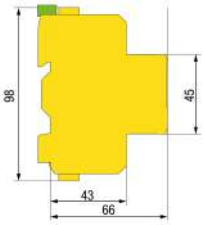
TECHNICAL DATA

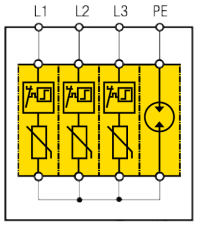
Model IL 4/20 ...			690 ff 2 IT
CODE			**207 224**
Nominal ac system voltage		U_N	400 / 690 V ac
Modes of protection			3
Max Continuous Operating Voltage (L-PE)		U_c	760 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	2 kA
Charge		Q	1 As
Nominal discharge current (8/20 µs)		I_n	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level (L-PE) at a discharge current of:	1 kA	U_p	≤ 2,90 kV
	5 kA	U_p	≤ 3,10 kV
	10 kA	U_p	≤ 3,50 kV
	15 kA	U_p	≤ 3,80 kV
	20 kA	U_p	≤ 4,00 kV
Voltage protection level (L-PE) at 6 kV (1,2/50 µs)		U_p	≤ 4,00 kV
Response time L-PE		t_a	≤ 100 ns
End of Life (L-PE)			OCM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L-PE	U_T	1960 V / 200 ms, safe (S)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	2 kA rms
Short Circuit Current rating with max. backup protection fuse			100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			80 A gG (> 2 ÷ 100 kA rms)
Follow current interrupt rating (L-PE)		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for GDT
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)
Approximate weight			550 g
Dimensions: width			53 mm (3 modules)

Model IL 2/20 ... with remote signal contact			690 t ff 2 IT
CODE			**217 224**
Remote signal contact			potential-free changeover contact
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

IT







IL 4/20 690 ff 3 IT

IL 4/20 690 ff 3 IT s a ready to install assembly of three voltage limiting and a voltage switching SPD-module, providing six modes of protection, typically installed in IT systems according to HD 60364-5-53 (e.g. in the service entrance board SEB), with the following features and benefits:

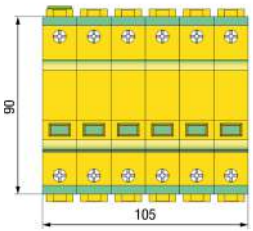
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 2 kA rms;
- No leakage current to PE;
- Three colour Status Indicator with progressive indication of remaining performance / two colours for GDT.

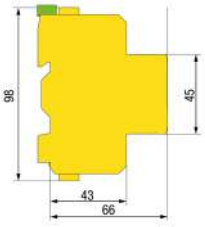
TECHNICAL DATA

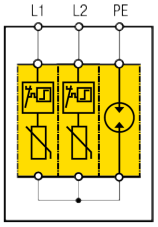
Model IL 4/20 ...			690 ff 3 IT
CODE			**207 234**
Nominal ac system voltage		U_N	400 / 690 V ac
Mode of protection			6
Max Continuous Operating Voltage (L-PE)		U_c	760 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	4 kA
Charge		Q	2 As
Nominal discharge current (8/20 µs)		I_n	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level (L-PE) at a discharge current of:	1 kA	U_p	≤ 2,80 kV
	5 kA	U_p	≤ 3,00 kV
	10 kA	U_p	≤ 3,40 kV
	15 kA	U_p	≤ 3,70 kV
	20 kA	U_p	≤ 3,90 kV
Voltage protection level (L-PE) at 6 kV (1,2/50 µs)		U_p	≤ 4,00 kV
Response time L-PE		t_a	≤ 100 ns
End of Life (L-PE)			OCM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L-PE	U_T	1960 V / 200 ms, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	2 kA rms
Short Circuit Current rating with max. backup protection fuse			100 kA rms
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability)			160 A (max. 4,50 x 10^5 A^2s)
Max. back-up protection with FUSE at prospective short circuit currents of			100 A gG (> 2 ÷ 100 kA rms)
Follow current interrupt rating (L-PE)		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication + 2 colours for GDT
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)
Approximate weight			1.260 g
Dimensions: width			140 mm (8 modules)

Model IL 2/20 ... with remote signal contact			690 t ff 3 IT
CODE			**217 234**
Remote signal contact			potential-free changeover contact
Terminal - conductor size for remote signal contact			max. 1,5 mm^2 flexible
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

IT







IL 4/20 830 ff 2 IT

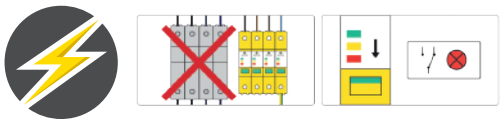
IL 4/20 830 ff 2 IT is a ready to install assembly of two voltage limiting and a voltage switching SPD-module, providing three modes of protection, typically installed in IT systems according to HD 60364-5-53 (e.g. in the service entrance board SEB), with the following features and benefits:

- Backup protection is not required up to an Isccr ≤ 2 kA rms;
- No leackage current to PE;
- Three colour Status Indicator with progressive indication of remaining performance / two colours for GDT.

TECHNICAL DATA

Model IL 4/20 ...			830 ff 2 IT
CODE			**207 226**
Nominal ac system voltage		U_N	480 / 830 V ac
Modes of protection			3
Max Continuous Operating Voltage (L/N-PE)		U_c	915 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	4 kA
Charge		Q	2 As
Nominal discharge current (8/20 µs)		I_n	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level (L/N-PE) at a discharge current of:	1 kA	U_p	≤ 2,90 kV
	5 kA	U_p	≤ 3,10 kV
	10 kA	U_p	≤ 3,50 kV
	15 kA	U_p	≤ 3,80 kV
	20 kA	U_p	≤ 4,00 kV
Voltage protection level (L/N-PE) at 6 kv (1,2/50 µs)		U_p	≤ 4,00 kV
Response time L/N-PE		t_a	≤ 100 ns
End of Life (L-N)			OCM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L/N-PE	U_T	2115 V / 200 ms, safe (S)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	2 kA rms
Short Circuit Current rating with max. backup protection fuse			100 kA rms
Max. back-up protection with FUSE at prospective short circuit currents of			80 A gG (> 5 ÷ 100 kA rms)
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation) / N-PE (no disconnector)			3 colours with progressive performance indication / 2 colours for GDT
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)
Approximate weight			280 g
Dimensions: width			53 mm (3 modules)

Model IL 2/20 ... with remote signal contact			830 t ff 2 IT
CODE			**217 226**
Remote signal contact			potential-free changeover contact
Terminal - conductor size for remote signal contact			max. 1,5 mm² flexible
Switching capacity remote signal contact			ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



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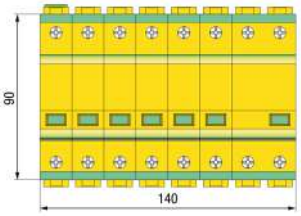
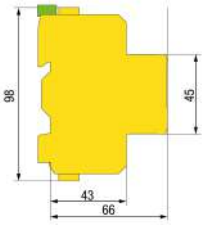
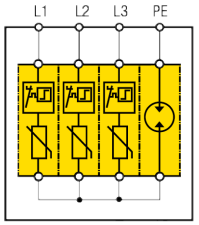






IL 4/20 830 ff 3 IT

IL 4/20 830 ff 3 IT s a ready to install assembly of three voltage limiting and a voltage switching SPD-module, providing six modes of protection, typically installed in IT systems according to HD 60364-5-53 (e.g. in the service entrance board SEB), with the following features and benefits:

- Backup protection is not required up to an Isccr ≤ 2 kA rms;
- No leackage current to PE;
- Three colour Status Indicator with progressive indication of remaining performance / two colours for GDT.

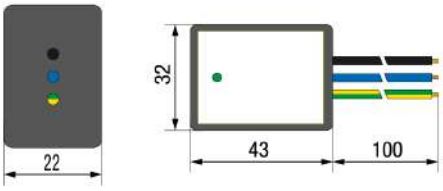
TECHNICAL DATA

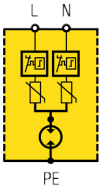
Model IL 4/20 ...			830 ff 3 IT
CODE			**207 236**
Nominal ac system voltage		U_N	480 / 830 V ac
Modes of protection			6
Max Continuous Operating Voltage (L-PE)		U_c	915 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	4 kA
Charge		Q	2 As
Nominal discharge current (8/20 µs)		I_n	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level (L-PE) at a discharge current of:	1 kA	U_p	≤ 2,90 kV
	5 kA	U_p	≤ 3,10 kV
	10 kA	U_p	≤ 3,50 kV
	15 kA	U_p	≤ 3,80 kV
	20 kA	U_p	≤ 4,00 kV
Voltage protection level (L-PE) at 6 kV (1,2/50 µs)		U_p	≤ 4,00 kV
Response time L-PE		t_a	≤ 100 ns
End of Life (L-PE)			OCM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L-PE	U_T	2115 V / 200 ms, withstand (W)
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	2 kA rms
Short Circuit Current rating with max. backup protection fuse			100 kA rms
Max. back-up protection with FUSE at prospective short circuit currents of			80 A gG (> 2 ÷ 100 kA rms)
Follow current interrupt rating (L-PE)		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication / 2 colours for GDT
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%
Terminal - Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			BMC / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)
Approximate weight			1.260 g
Dimensions: width			140 mm (8 modules)

Model IL 2/20 ... with remote signal contact	830 t ff 3 IT
CODE	**217 236**
Remote signal contact	potential-free changeover contact
Terminal - conductor size for remote signal contact	max. 1,5 mm² flexible
Switching capacity remote signal contact	ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

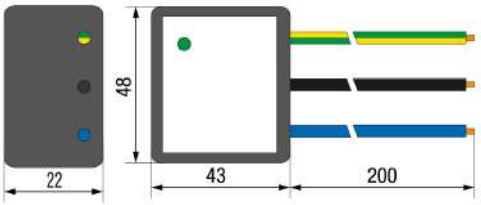
TN

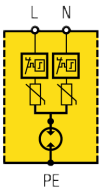
TT





IL 1/3 2P





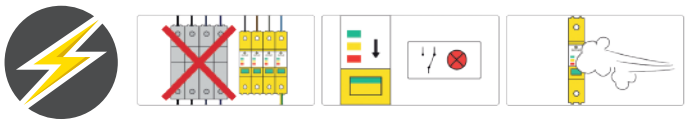
IL 1/10 2P M

IL 1/3 2P and IL 1/10 2P M are combined voltage limiting and voltage switching SPDs providing three modes of protection, typically installed in single-phase 230 V socket outlets or within equipment with the following features and benefits:

- IL 1/3 2P: T3 SPD (Type 3) according to IEC 61643-11 Ed. 2 (2025) and EN IEC 61643-11 (2025);
- IL 1/10 2P M: T2 SPD (Type 2) according to IEC 61643-11 Ed. 2 (2025) and EN IEC 61643-11 (2025);
- Equipped with a thermal disconnector, which interrupts the phase or neutral to ground path in case of an SPD failure, and with a green LED operating state indicator;
- Provided with pigtail connections to enable the IL 1/3 2P to be installed at equipment terminals or e.g. socket outlets, LED power supplies, CCTVs, intruder alarms;
- Suitable for installation at LPZ boundaries 2 – 3 or higher according to the lightning protection zones concept and in coordination with other SPDs.

TECHNICAL DATA

Model IL ...			1/3 2P	1/10 2P M
CODE			**241 001**	**241 002**
Nominal ac system Voltage		U_N	230 V ac	
Modes of protection			3	
Maximum Continuous Operating Voltage		U_c	275 V ac	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			III	II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T3	T2
Max. backup protection with fuse, if not already installed			16 A gG	
Combination wave impulse (1,2/50 µs, 8/20 µs)			6 kV / 3 kA	-
Nominal discharge current (8/20 µs) (L / N- PE)		I_n	-	10 kA
Maximum discharge current (8/20 µs) (L / N-PE)		I_{max}	-	20 kA
Total discharge current (8/20 µs) (L + N-PE)		I_{Total}	-	20 kA
Voltage protection level (L-N; L / N-PE)		U_p	≤ 1,5 kV	
Response time		t_a	≤ 25 ns (L-N); ≤ 100 ns (L / N-PE)	
End of Life			OCM (open circuit failure mode)	
Short circuit current rating with max. backup protection with fuse		I_{sccr}	6 kA rms	
Follow current interrupt rating			NFC No Follow Current®	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	335 V / 5 s, withstand (W); 440 V / 120 min, withstand (W)	
	L-PE	U_T	1455 V / 200 ms, safe (S)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Operating temperature range			- 40 ... + 70 °C	
Operating state indicator			green LED	
Connecting wires			1,5 mm²; l=100 mm	
Enclosure material			thermoplastic	
Dimensions			l 43 x h 32 x d 22 mm	l 48 x h 43 x d 24 mm
Pollution Degree / Degree of protection		PD / IP	2 / 20	
Approximate weight			30 g	50 g



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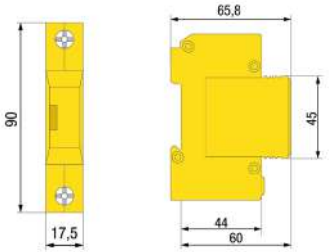


L 2/20 230 e

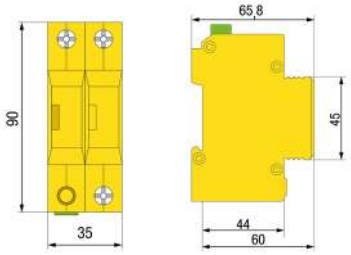
L 2/20 230 e is a pluggable execution of a voltage limiting SPD, providing a single mode of protection, typically installed in Sub Distribution Boards (SDB) in TN-systems. It provides the following features and benefits:

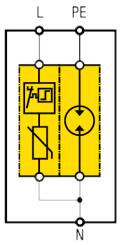
- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- L 2/20 230 e is a voltage limiting varistor based SPD, for the protection of low voltage installations and equipment against indirect lightning effects;
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- NFC No Follow Current® technology, there are no follow currents drawn from the power supply system after operation.

TECHNICAL DATA

Model L 2/20 ...			230 e
CODE			**220 001**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection (number of poles)			1
Max Continuous Operating Voltage		U_C	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2
Nominal discharge current (8/20 µs)		I_n	20 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,90 kV
	5 kA	U_p	≤ 1,05 kV
	10 kA	U_p	≤ 1,25 kV
	20 kA	U_p	≤ 1,40 kV
Response time		t_a	≤ 25 ns
End of Life			OCM (open circuit failure mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV)	L-(PE)N o L-N	U_T	335 V / 5 s, withstand (W); 440 V / 120 min, safe (S)
Max. back-up protection with FUSE			125 A gG
Short Circuit Current rating with max. backup protection with fuse		I_{sccr}	50 kA rms
Follow current interrupt rating		I_{fi}	NFC No Follow Current®
Status indicator (indication of disconnector operation)			2 colours: transparent - OK / red - replace
Operating temperature range / Humidity			-40 … +70 °C / 5% ... 95%
Terminal - Conductor size			4-25 mm² flexible / 4-25 mm² semi rigid
Busbar connections			fork-type busbar 16 mm²
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Case material / Flammability grade			Polyamide PA6 / V-0 in accordance with UL 94
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)
Approximate weight			100 g
Dimensions: width			17,5 mm (1 module)
Certifications			CB, STC issued by OVE

TT





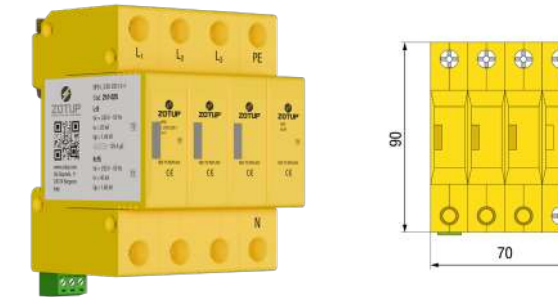
L 2/20 230 1+1

L 2/20 230 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection, typically installed in Sub Distribution Boards (SDBs) for single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-53, with the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- NFC No Follow Current® technology, there are no follow currents drawn from the power supply system after operation.

Model L 2/20 ...			230 1+1	
CODE			**200 023**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection			3	
Max Continuous Operating Voltage (L-N)		U_C	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_C	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2	
Nominal discharge current (8/20 µs) (L-N)		I_n	20 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	40 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	40 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	60 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 1,00 kV	≤ 1,60 kV
	5 kA	U_p	≤ 1,10 kV	≤ 1,60 kV
	10 kA	U_p	≤ 1,30 kV	≤ 1,60 kV
	20 kA	U_p	≤ 1,45 kV	≤ 1,60 kV
Voltage protection level (N-PE)		U_p	≤ 1,60 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	335 V / 5 s, withstand (W); 440 V / 120 min, safe (S)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating with max. backup protection with fuse		I_{sccr}	50 kA rms	
Max. back-up protection with FUSE			125 A gG	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation)			2 colours: transparent - OK / red - replace	
Operating temperature range / Humidity			-40 … +70 °C / 5% ... 95%	
Terminal - Conductor size			4-25 mm² flexible / 4-40 mm² semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			Polyamide PA6 / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)	
Approximate weight			170 g	
Dimensions: width			35 mm (2 modules)	
Certifications			CB, STC issued by OVE	

Model L 2/20 ... with remote signal contact		230 t 1+1
CODE		**210 023**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A



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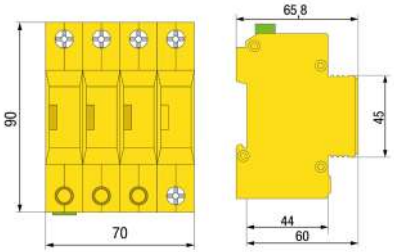
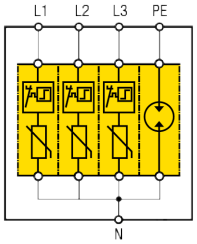




L 2/20 230 3+1

L 2/20 230 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing ten modes of protection. Typically installed in Sub Distribution Boards (SDBs) for three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-53, with the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025);
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- NFC No Follow Current® technology, there are no follow currents drawn from the power supply system after operation.

TECHNICAL DATA

Model L 2/20 ...			230 3+1	
CODE			**200 025**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection			10	
Max Continuous Operating Voltage (L-N)		U_C	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_C	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2	
Nominal discharge current (8/20 µs) (L-N)		I_n	20 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	40 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	40 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	60 kA	
Voltage protection level (L-N, L-PE) at a discharge current of:	1 kA	U_p	≤ 1,00 kV	≤ 1,60 kV
	5 kA	U_p	≤ 1,10 kV	≤ 1,60 kV
	10 kA	U_p	≤ 1,30 kV	≤ 1,60 kV
	20 kA	U_p	≤ 1,45 kV	≤ 1,60 kV
Voltage protection level (N-PE)		U_p	≤ 1,60 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of Life (L-N)			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	335 V / 5 s, withstand (W); 440 V / 120 min, safe (S)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating with max. backup protection with fuse		I_{sccr}	50 kA rms	
Max. back-up protection with FUSE			125 A gG	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation)			2 colours: transparent - OK / red - replace	
Operating temperature range / Humidity			-40 … +70 °C / 5% ... 95%	
Terminal - Conductor size			4-25 mm² flexible / / 4-40 mm² semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			Polyamide PA6 / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)	
Approximate weight			360 g	
Dimensions: width			70 mm (4 modules)	
Certifications			CB, STC issued by OVE	

Model L 2/20 ... with remote signal contact		230 t 3+1
CODE		**210 025**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A

CP1

CP 1 is an insulated extension clamp with 3 wire terminations and enables a V-connection even if the SPD is not equipped with double clamps. CP1 can be assembled on the SPD's PE terminal as well as on phase or neutral terminals.

TECHNICAL DATA

Model CP 1	
CODE	**249 591**
Wire terminations per unit	1 ~ 3
Nominal current	125 A
Material	copper
max. conductor size	3 x 16 mm2

CP2

CP3

CP4

CP5

CP6

CP7

CP8

CP2 to CP8 are fork-type busbars with 2 up to 8 connection points. Typical application: to provide a common PE connection for several SPDs. In TT system applications these busbars can also be used to provide a common neutral point connection to N-PE SPDs type I 12, I 52 and I 100.

TECHNICAL DATA

Model CP ...	2	3	4	5	6	7	8
CODE	**249 592**	**249 593**	**249 594**	**249 595**	**249 596**	**249 597**	**249 598**
Number of connection points	2	3	4	5	6	7	8
Nominal current	125 A						
Material	copper						
Cross section	16 mm2						

SPDs FOR ALTERNATING CURRENT (AC) WITH ADDITIONAL FILTER

SURGE PROTECTION FROM DIRECT AND INDIRECT LIGHTNING EFFECTS WITH ADDITIONAL FILTER FOR REDUCTION OF HIGH FREQUENCY ELECTROMAGNETIC INTERFERENCES. IDEAL FOR DATA CENTER, CED AND DCS PROTECTION.

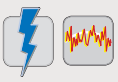
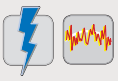
The impact of data center outages or even damages demands to adopt comprehensive protection measures. Atmospheric overvoltages and high frequence electromagnetic interference can cause "catastrophic" incidences, thus good and effective protection is essential. The tremendous costs caused by data center blackouts have made it necessary to carry out specific studies towards this issue. Statistical reporting of the costs, which are generally expressed in Amount Lost for Record (Setting), has been ongoing for several years in the USA and in UK.
In 2019 the Ponemon Institute of Michigan estimated a loss of € 240- Amount Lost for Record. On the occurrence of the worst event, the total loss was estimated at € 8.200.000,- in USA and at € 4.490.000,- in UK. The same Institute, based on an item by item analysis of 51 cases of blackouts in medium to large size data centers that are operating in 15 different industrial and service sectors, has found that the average downtime is about 130 minutes and costs businesses up to € 540.000- each, equal to a loss of € 4.150 per minute. For businesses operating in the area of telecommunications and E-commerce, losses can be even higher. These numbers speak for themselves and clearly explain why protection must be achieved at the maximum level possible and needs to be considered right from the planning phase.

Data Center Protection realised with 4 parallel connected ILF 4P 400 SPDs.

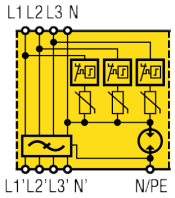
Data Center Protection realised with an ILF 4P 250, installed in the course of refurbishment.

Direct Lightning phenomena are the main cause of disastrous events, while indirect lightning effects and electrical high frequency interferences are also a source of damage whose origin is often not easy to identify, but their destructive effects are terrible for facilities where availability and reliability is crucial.
All these phenomena need to be identified in order to properly protect facilities connected to the power system and to ensure integrity and continuty of operation. This aspect is particularly relevant in the protection of servers located in Data Centers, CED, TLC or DCS plants and for the control of industrial processes.
Due to all these aspects, it is necessary to use protective devices in such facilities and plants, which are not only designed to protect against direct or indirect lightning effects (high performance SPDs), but which also provide additional filtering that is able to significantly reduce electromagnetic interference. Based on conservative consideration such filters are required to cover a frequecy range from 150 kHz up to 30 MHz.

SPDs FOR ALTERNATING CURRENT (AC) WITH ADDITIONAL FILTER

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	ILF 4P 250		T1, T2 and T3	10	12,5 kA	25 kA	92
	ILF 4P 400		T1, T2 and T3	10	12,5 kA	25 kA	92
	ILF 4P 40		T3	10	-	3 kA	94
	ILF 4P 63		T3	10	-	3 kA	94
	ILF 4P 80		T3	10	-	3 kA	94
	ILF 4P 125		T3	10	-	3 kA	94
	ILF 2P 40		T3	3	-	3 kA	96
	ILF 2P 63		T3	3	-	3 kA	96
	ILF 2P 80		T3	3	-	3 kA	96
	ILF 2P 10 t DIN		T3	3	-	3 kA	98
	ILF 2P 16 t DIN		T3	3	-	3 kA	98
	ILF 2P 25 t DIN		T3	3	-	3 kA	98

TN



ILF 4P...

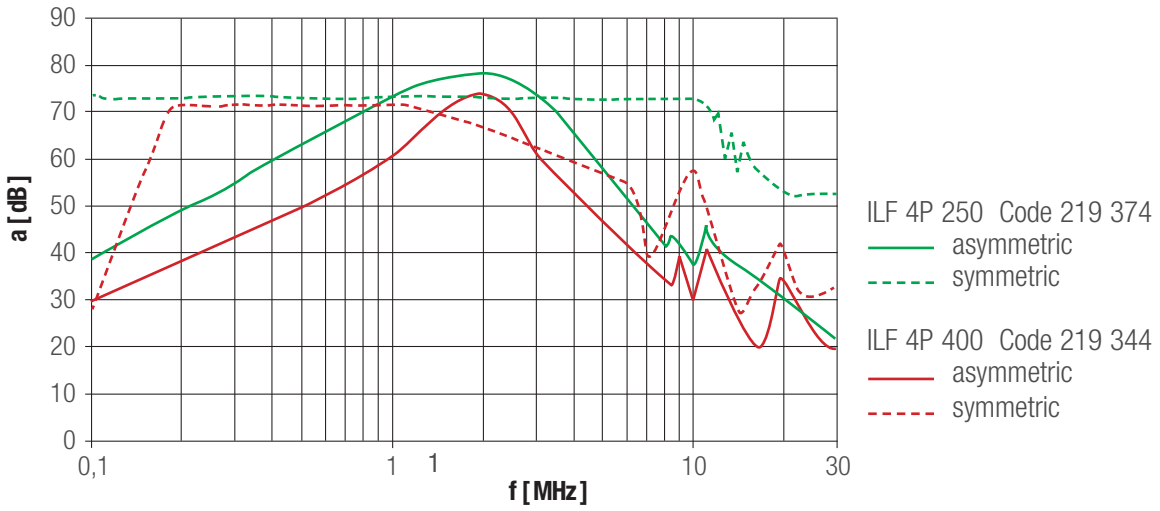
ILF 4P 250/400 is a multimode SPD against direct and indirect lightning effects with integrated interference filter for high frequency disturbances, typically installed in in three phase plus neutral TN systems for the protection of Control Rooms, Data Centers or EDPs, with the following features and benefits:

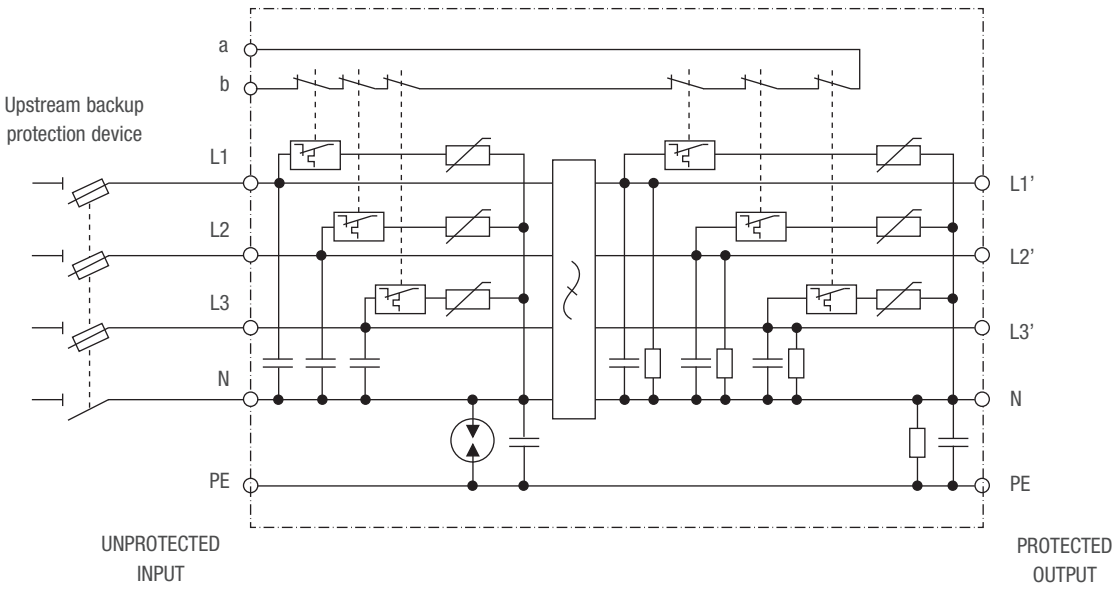
- T1, T2 and T3 SPD (Type 1, Type 2 and Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11(2025);
- Although a special inductor ensures an effective attenuation of high frequency interferences, it has an insignificant energy insertion loss as compared to the no-load losses and the efficiency of an insulation transformer.

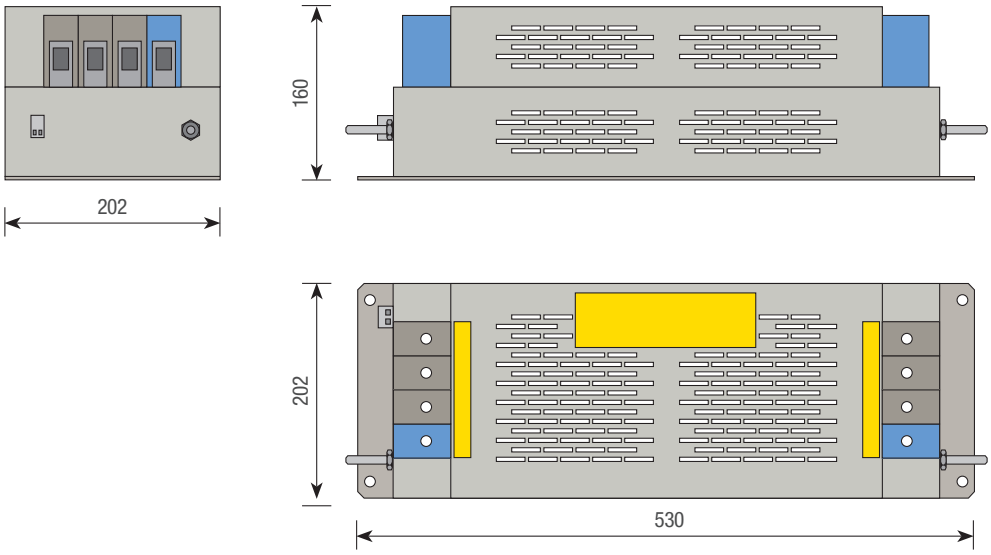
TECHNICAL DATA

Model ILF 4P ...			250	400
CODE			**219 374**	**219 344**
Nominal ac system Voltage		U_N	230/400 V - 50 Hz	
Maximum Continuous operating voltage		U_c	335/570 V - 50 Hz	
Modes of protection			10	
Rated load current		I_L	250 A	400 A
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I, II and III	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1,T2 and T3	
Total discharge current (10/350 µs) (L1+L2+L3+N-PE)		$I_{Total\ 10/350}$	50 kA	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	12,5 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	50 kA	
Total discharge current (8/20 µs) (L1+L2+L3+N-PE)		$I_{Total\ 8/20}$	100 kA	
Nominal discharge current (8/20 µs)		I_n	25 kA	
Combination wave impulse (L/N-PE)		U_{cc}	6 kV / 3 kA	
Combination wave impulse (L-N)		U_{cc}	6 kV / 3 kA	
Voltage protection level at a discharge current of (8/20 µs)	1kA	U_p	≤ 800 V	≤ 825 V
	5 kA	U_p	≤ 825 V	≤ 850 V
	12,5 kA	U_p	≤ 875 V	≤ 900 V
	20 kA	U_p	≤ 925V	≤ 950 V
	25 kA	U_p	≤ 975V	≤ 1000 V
Voltage protection level at combination wave impulse	(L-N)	U_p	≤ 850 V	≤ 900 V
	(N-PE)	U_p	≤ 1250V	≤ 1500V
Response time (L-N)		t_a	≤ 25 ns	
Response time (N-PE)		t_a	≤ 100 ns	
End of Life (L-N)			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV) : L/N-PE		U_T	335 V / 5 s, withstand (W); 440 V / 120 min, safe (S)	
Short Circuit Current rating with max. backup protection		I_{sccr}	50 kA rms	
Follow current interrupt rating			NFC No Follow Current®	
Asymmetric attenuation 50 Ω / 50 Ω		f	at 2 MHz: ≥ 78 dB	at 2 MHz: ≥ 73 dB
Symmetric attenuation 50 Ω / 50 Ω		f	at 0,2 MHz: ≥ 73 dB	at 0,2 MHz: ≥ 71 dB
Filter components		C_{X1}, C_{X2}	2,2 µF	2,2 µF
		C_Y	2 x 50 nF	2 x 50 nF
		R_X , R_Y	1 MΩ	1 MΩ
		L_{SYM}	4,3 µH	2,4 µH
		L_{ASYM}	2,3 mH	1,1 mH
Power dissipation at 20°C (ventilated)			≤ 160 W	≤ 380 W
Max. back-up protection with fuse, if not already provided in the upstream installation			250 A gG	400 A gG
Operating temperature range			- 40 … + 55 °C	
Terminal - Conductor size			35-240 mm² (35-120 mm² / 26 Nm; 150-240 mm / 55 Nm)	5-240 mm² (35-120 mm² / 26 Nm; 150-240 mm / 55 Nm)
Mounting			vertical on a panel / wall (natural convection required)	
Enclosure material			metal	
Pollution Degree / Degree of protection		PD / IP	2 / 10	
Remote signal contact			NC (max. 1,5 mm² flexible; ac: 250 V/0,5 A; dc: 125 V/0,2 A; 75 V/0,5 A)	
Approximate weight			9,6 kg	11 kg
Dimensions			l 530 x h 202 x d 160 mm	

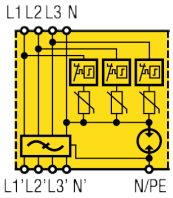
Asymmetric and symmetric attenuation characteristics







TN



ILF 4P...

ILF 4P is a multimode SPD against indirect lightning effects with integrated interference filter for high frequency disturbancies, typically installed in three phase plus neutral TN-systems close to equipment or machinery, particularly in industrial automation environment, with the following features and benefits:

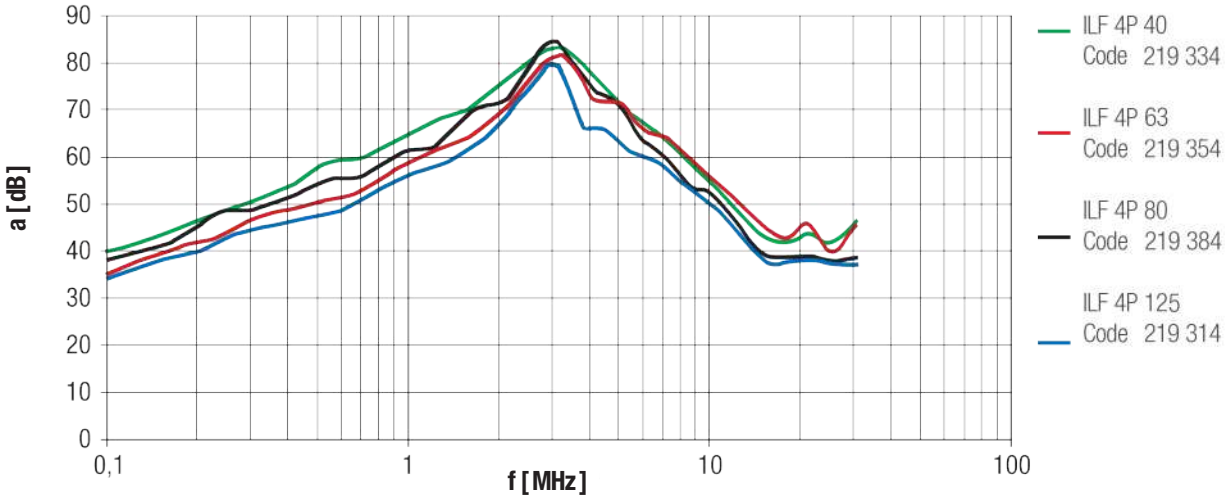
- T3 SPD (Type 3) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11(2025);
- Protects electronic equipment (PLC or computers, etc.) from overvoltages due to indirect lightning effects and from other interferences;
- In case of an SPD reaching its end of life the protection is disconnected without interrupting the downstream supply. This is indicated locally by an optical indicator and via a remote signal contact;
- It is suitable for installation at LPZ boundaries 2 -3 and higher, in accordance with the lightning protection zones concept and in coordination with other SPDs.

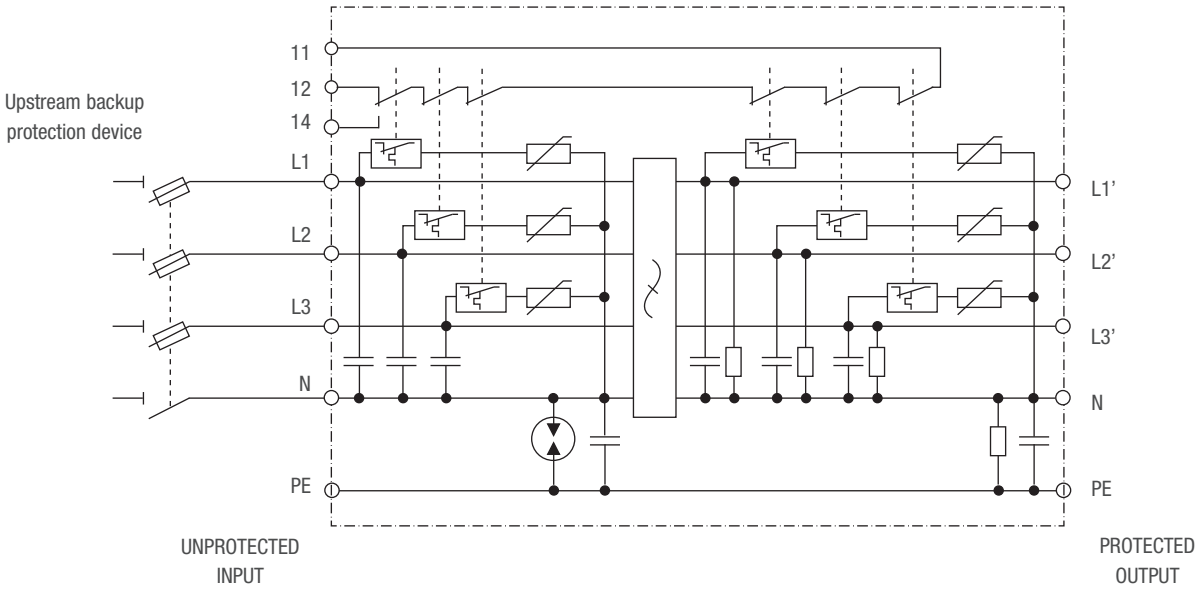
TECHNICAL DATA

Model ILF 4P ...		40	63	80	125
CODE		**219 334**	**219 354**	**219 384**	**219 314**
Nominal ac system Voltage	U_N	230/400 V - 50 Hz			
Maximum Continuous Operating Voltage	U_c	275/480 V - 50 Hz			
Modes of protection		10			
Rated load current	I_L	40 A	63 A	80 A	125 A
Test Class according to IEC 61643-11 Ed.1 (2011-03)		III			
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T3			
Combination wave impulse (L/N-PE)	U_{OC}	6 kV / 3 kA			
Voltage protection level (L/N-PE)	U_p	≤ 1,5 kV			
Response time (L-N)	t_a	≤ 25 ns			
Response time (N-PE)	t_a	≤ 100 ns			
End of Life (L-N)		OCM (open circuit failure mode)			
Behaviour in case of Temporary OverVoltage (TOV): L/N-PE	U_T	335 V / 5 s, withstand (W); 440 V / 120 min, safe (S)			
Asymmetric attenuation		range 0,4 - 10 MHz: ≥ 40 dB / at 3 MHz: ≥ 80 dB			
Filter components	C_{X1}	150 nF	150 nF	150 nF	150 nF
	C_{X2}	680 nF	680 nF	680 nF	680 nF
	C_Y	2 x 47 nF	2 x 47 nF	2 x 47 nF	2 x 47 nF
	L	8 µH	6 µH	1,4 mH	1,0 mH
Power dissipation		≤ 8 W	≤ 12 W	≤ 15 W	≤ 20 W
Max. back-up protection with fuse, if not already provided in the upstream installation		40 A gG	63 A gG	80 A gG	125 A gG
Status indicator (indication of disconnector operation)		LED off - OK; Red LED - replace			
Operating temperature range		- 40 … + 55 °C			
Terminal - Conductor size		10 mm²	10 mm²	25 mm²	35 mm²
Mounting		vertical on a panel / wall			
Enclosure material		metallic			
Pollution Degree / Degree of protection	PD/IP	2 / 10			
Remote signal contact		NC			
Terminal - Conductor size for remote signal contact		max. 1,5 mm² flexible			
Switching capacity remote signal contact		ac: 250 V / 0,5 A - dc: 125 V / 0,2 A; 75 V / 0,5 A			
Approximate weight		1590 g	1700 g	1950 g	2820 g
Dimensions		l 250 x h 150 x d 65 mm		l 290 x h 180 x d 75 mm	

Upon request the ILF 4P type SPD can be supplied with other impulse current and voltage ratings.

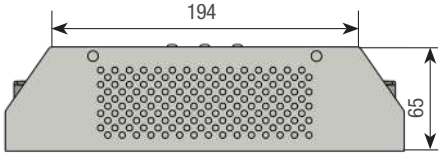
Asymmetric attenuation characteristics

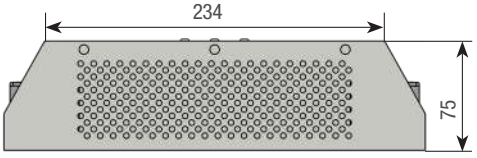




ILF 4P 40
Code 219 334

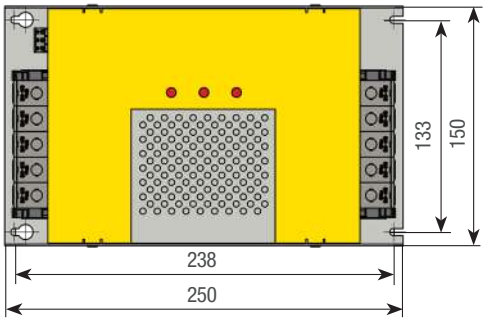
ILF 4P 63
Code 219 354

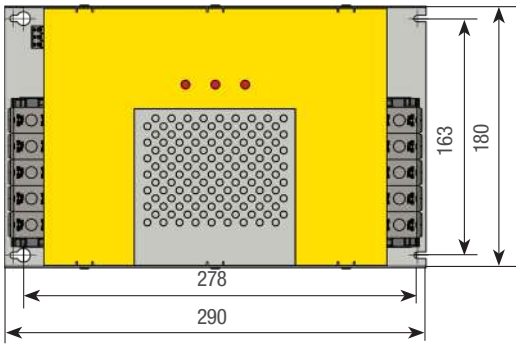




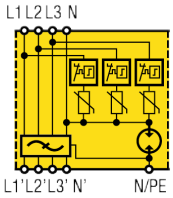
ILF 4P 80
Code 219 384

ILF 4P 125
Code 219 314





TN



ILF 2P...

ILF 2P is a multimode SPD against indirect lightning effects with integrated interference filter for high frequency disturbancies, typically installed in single phase TN-systems close to equipment or machinery, particularly in industrial automation environment, with the following features and benefits:

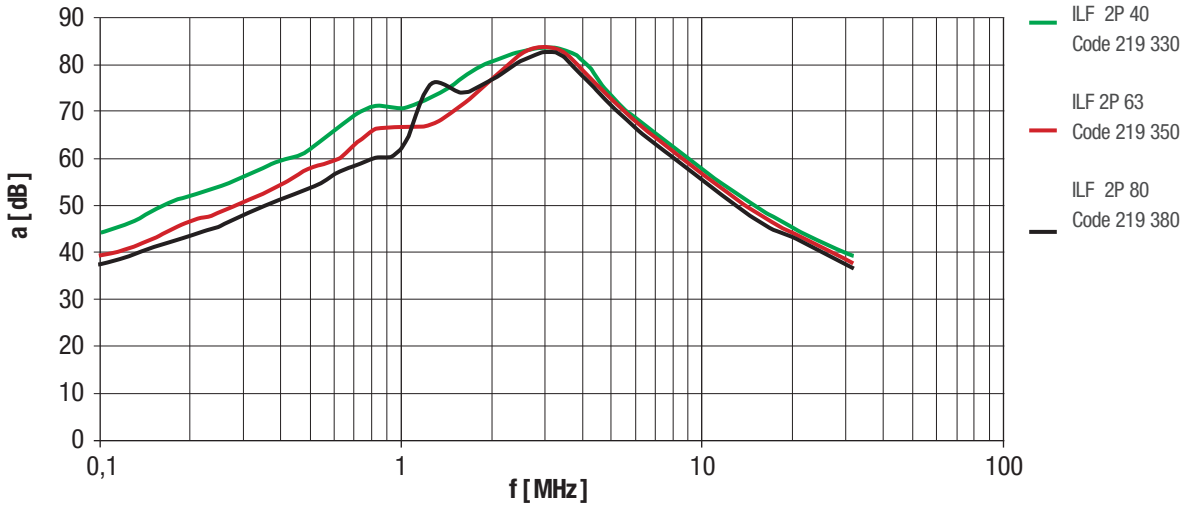
- T3 SPD (Type 3) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11(2025);
- Protects electronic equipment (PLC or computers, etc.) from overvoltages due to indirect lightning effects and from other interferences;
- In case of an SPD reaching its end of life the protection is disconnected without interrupting the downstream supply. This is indicated locally by an optical indicator and via a remote signal contact;
- It is suitable for installation at LPZ boundaries 2 -3 and higher, in accordance with the lightning protection zones concept and in coordination with other SPDs.

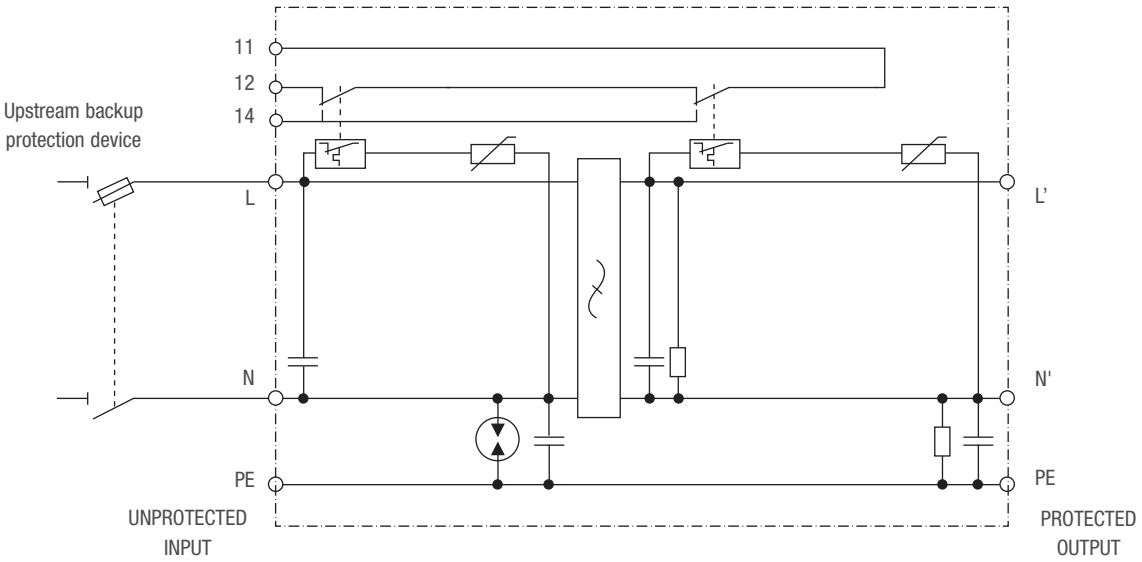
TECHNICAL DATA

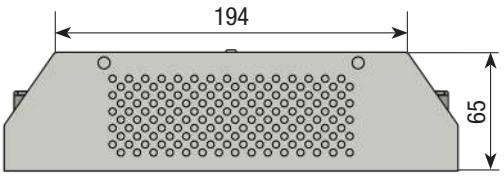
Model ILF 2P ...		40	63	80
CODE		**219 330**	**219 350**	**219 380**
Nominal ac system Voltage	U_N	230 V - 50 Hz		
Maximum Continuous Operating Voltage	U_c	275 V - 50 Hz		
Modes of protection		3		
Rated load current	I_L	40 A	63 A	80 A
Test Class according to IEC 61643-11 Ed.1 (2011-03)		III		
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)		T3		
Combination wave impulse (L/N-PE)	U_{oc}	6 kV / 3 kA		
Voltage protection level (L/N-PE)	U_p	≤ 1,5 kV		
Response time (L-N)	t_a	≤ 25 ns		
Response time (N-PE)	t_a	≤ 100 ns		
End of Life (L-N)		OCM (open circuit failure mode)		
Behaviour in case of Temporary OverVoltage (TOV): L/N-PE	U_T	335 V / 5 s, withstand (W); 440 V / 120 min, safe (S)		
Asymmetric attenuation		range 0,4 - 10 MHz: ≥ 50 dB / at 3 MHz: ≥ 80 dB		
Filter components	C_X	150 nF	220 nF	220 nF
	C_Y	22 nF	22 nF	22 nF
	L	2,2 mH	2,2 mH	1,4 mH
Power dissipation		≤ 4 W	≤ 9 W	≤ 12 W
Max. back-up protection with fuse, if not already provided in the upstream installation		40 A gG	63 A gG	80 A gG
Operating temperature range		- 40 … + 55 °C		
Terminal - Conductor size		10 mm²	10 mm²	25 mm²
Mounting		vertical on a panel / wall		
Enclosure material		metallic		
Pollution Degree / Degree of protection	PD / IP	2 / 10		
Remote signal contact		NC		
Terminal - Conductor size for remote signal contact		max. 1,5 mm² flexible		
Switching capacity remote signal contact		ac: 250 V / 0,5 A - dc: 125 V / 0,2 A; 75 V / 0,5 A		
Approximate weight		720 g	1450 g	1520 g
Dimensions		l 250 x h 150 x d 65 mm		

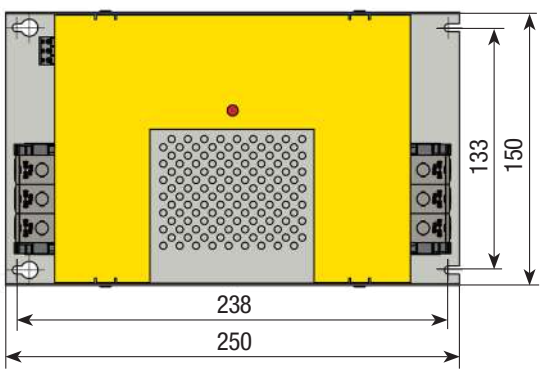
Upon request the ILF 2P type SPD can be supplied with other impulse current and voltage ratings.

Asymmetric attenuation characteristics





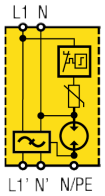




Surge Protective Devices:
ZOTUPFILTER

TN

TT



ILF 2P ... DIN

ILF 2P ... DIN is a multimode SPD against indirect lightning effects with integrated interference filter for high frequency disturbancies, typically installed in single phase TN and TT systems close to equipment or machinery, particularly in industrial automation environment, with the following features and benefits:

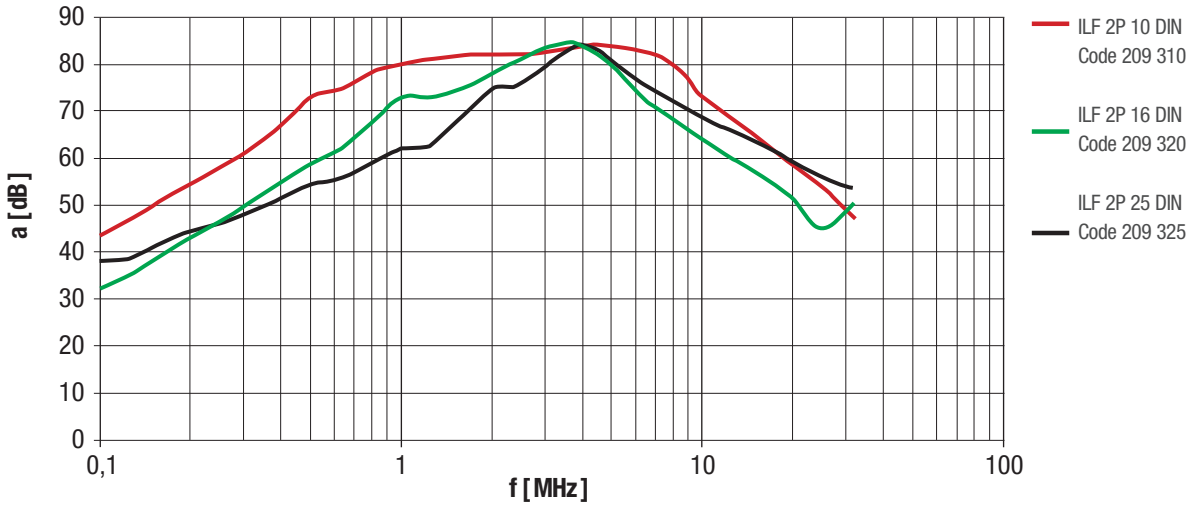
- T3 SPD (Type 3) according to IEC 61643-11 Ed. 2 (2025) and EN IEC 61643–11 (2025);
- Protects electronic equipment (PLC or computers, etc.) from overvoltages due to indirect lightning effects and from other interferences;
- In case of an SPD reaching its end of life the protection is disconnected without interrupting the downstream supply. This is indicated locally by two colours status indicator and via a remote signal contact;
- It is suitable for installation at LPZ boundaries 2 -3 and higher, in accordance with the lightning protection zones concept and in coordination with other SPDs;
- Upon request, ILF 2P ... DIN SPDs type can be supplied with other voltages and currents rating.

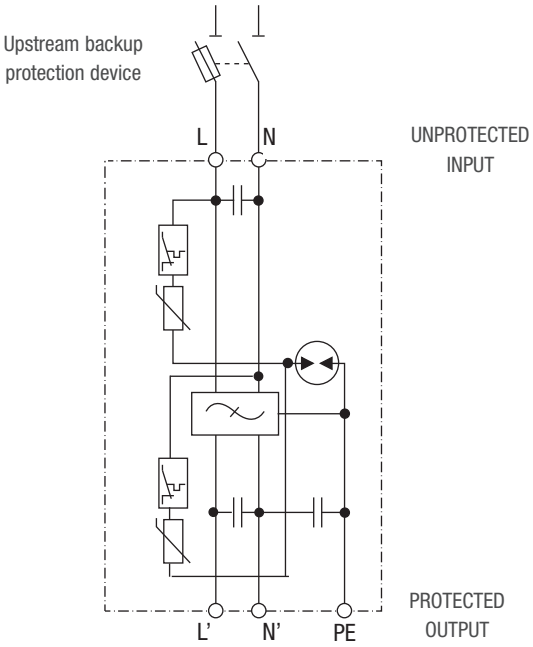
TECHNICAL DATA

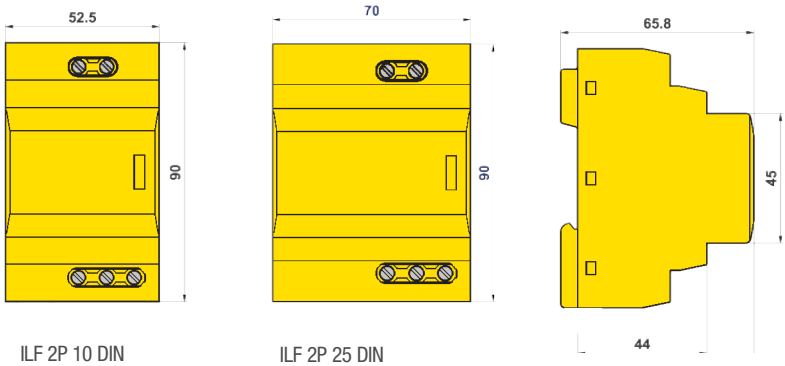
Model ILF 2P ...			10 DIN	16 DIN	25 DIN
CODE			**209 310**	**209 320**	**209 325**
Nominal ac system Voltage		U_N	230 V - 50 Hz		
Maximum Continuous Operating Voltage		U_c	275 V - 50 Hz		
Modes of protection			3		
Rated load current		I_L	10 A	16 A	25 A
Test Class according to IEC 61643-11 Ed.1 (2011-03)			III		
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T3		
Combination wave impulse (L/N-PE)		U_{OC}	6 kV / 3 kA		
Voltage protection level		U_p	≤ 800 V (L-N); ≤ 1,5 kV (L/N-PE)		
Response time (L-N)		t_a	≤ 25 ns		
Response time (L/N-PE)		t_a	≤ 100 ns		
End of life			OCM (open circuit failure mode)		
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	335 V / 5 s, withstand (W); 440 V / 120 min, safe (S)		
	N-PE	U_T	1200 V / 200 ms, withstand (W)		
Asymmetric attenuation			range 0,4 - 20 MHz: ≥ 50 dB / at 4 MHz: ≥ 80 dB		
Filter components		C_X	150 nF	220 nF	220 nF
		C_Y	22 nF	22 nF	22 nF
		L	36 µH	19 µH	7 µH
Power dissipation			≤ 2,5 W	≤ 3,5 W	≤ 4 W
Max. back-up protection with fuse, if not already provided in the upstream installation			10 A gG	16 A gG	25 A gG
Status indicator			2 colours: transparent - OK / red - to replace		
Operating temperature range			- 40 ... + 55 °C		
Terminal - Conductor size			2,5 - 4 mm²	2,5 - 4 mm²	6-16 mm²
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715		
Enclosure material			PA6 / V-0 Polyamide according to UL 94		
Pollution Degree / Degree of Protection		PD / IP	2 / 20 (built-in)		
Approximate weight			170 g	190 g	220 g
Dimensions: Width			52,5 mm (3 modules)	52,5 mm (3 modules)	70 mm (4 modules)

Model ILF 2P ... with remote signal contact		10 t DIN	16 t DIN	25 t DIN
CODE		**219 310**	**219 320**	**219 325**
Remote signal contact		potential-free changeover contact		
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible		
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A		

Asymmetric attenuation characteristics







ILF 2P 10 DIN
Code 209 310

ILF 2P 16 DIN
Code 209 320

ILF 2P 25 DIN
Code 209 325

SPDs FOR DIRECT CURRENT (DC) AND PHOTOVOLTAIC APPLICATIONS

SPDs FOR DIRECT CURRENT (DC) APPLICATIONS

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 7/30 DC 60 t ff		T2	1	-	20 kA	102
	L 7/30 DC 110 t ff		T2	1	-	20 kA	102
	L 7/30 DC 230 t ff		T1 and T2	1	8 kA	30 kA	102
	L 7/30 DC 600 t ff		T1 and T2	1	7 kA	30 kA	102
	L 7/30 DC 1000 t ff		T1 and T2	1	5 kA	20 kA	102
	L 7/30 DC 60 t ff 2		T2	3	-	20 kA	103
	L 7/30 DC 110 t ff 2		T2	3	-	20 kA	103
	L 7/30 DC 230 t ff 2		IT1 and T2	3	8 kA	30 kA	103
	L 7/30 DC 600 t ff 2		IT1 and T2	3	7 kA	30 kA	103
	L 7/30 DC 1000 ff 2		T1 and T2	3	5 kA	20 kA	103

SPDs FOR PHOTOVLTAIC APPLICATIONS

SPD	Model	Application Icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 13/60 PV Y 600 t ff		T1 and T2	3	7 kA	20 kA	104
	L 13/60 PV Y 1000 t ff		T1 and T2	3	5 kA	20 kA	104
	L 3/40 PV Y 600 t ff		T2	3	-	20 kA	105
	L 3/40 PV Y 1000 t ff		T2	3	-	20 kA	105

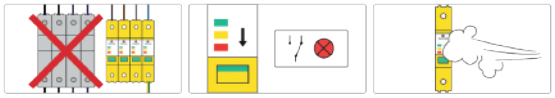
L 7/30 DC ...ff

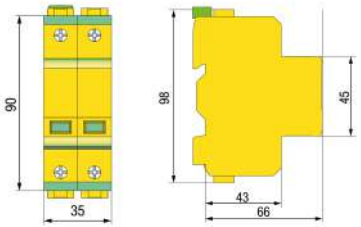
L 7/30 DC ... ff is a voltage limiting SPD providing a single mode of protection, typically installed in DC Distribution Boards (DB) with the following features and benefits:

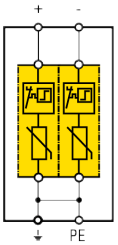
- T1 and T2 SPD (Type 1 and Type 2) for 230, 600 and 1000 V DC according to IEC 61643-41Ed.1 and EN IEC 61643–41 (2025);
- T2 SPD (Type 2) for 60 and 110 V DC according to IEC 61643-41Ed. 1 and EN IEC 61643–41 (2025);
- Backup protection is not required up to a prospective DC short circuit current of 1000 A (for U_N up to 230 V);
- Three colour Status Indicator with progressive indication of remaining performance;
- Pollution Degree 3 up to Un 230 V DC.

Model L 7/30 DC ...			60 ff	110 ff	230 ff	600 ff	1000 ff
CODE			**200 602**	**200 603**	**200 600**	**200 606**	**200 610**
Nominal dc system voltage		U_N	60 V DC	110 V DC	230 V DC	600 V DC	1000 V DC
Modes of protection			1				
Max Continuous Operating Voltage		U_c	100 V DC	200 V DC	420 V DC	895 V DC	1000 V DC
Type according to IEC 61643-41 Ed.1 (2025) and EN IEC 61643-41 (2025)			T2	T2	T1 and T2	T1 and T2	T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	-	-	8 kA	7 kA	5 kA
Charge		Q	-	-	4 As	3,6 As	2,9 As
Nominal discharge current (8/20 µs)		I_n	20 kA	20 kA	30 kA	30 kA	20 kA
Max. discharge current (8/20 µs)		I_{max}	30 kA	30 kA	40 kA	40 kA	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,22 kV	≤ 0,42 kV	≤ 0,81 kV	≤ 1,20 kV	≤ 1,85 kV
	5 kA	U_p	≤ 0,28 kV	≤ 0,50 kV	≤ 1,00 kV	≤ 1,46 kV	≤ 2,25 kV
	10 kA	U_p	≤ 0,36 kV	≤ 0,60 kV	≤ 1,20 kV	≤ 1,58 kV	≤ 2,60 kV
	20 kA	U_p	≤ 0,50 kV	≤ 0,80 kV	≤ 1,35 kV	≤ 1,95 kV	≤ 2,85 kV
	30 kA	U_p	-	-	≤ 1,50 kV	≤ 2,15 kV	-
Response time		t_a	≤ 25 ns				
End of Life			OCM (Open Circuit Failure Mode)				
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	1000 A	1000 A	1000 A	500 A	200 A
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	30 kA	30 kA	30 kA	30 kA	30 kA
Max. back-up protection with fuse (DC)			200 A gPV	200 A gPV	200 A gPV	200 A gPV	200 A gPV
Follow current interrupt rating		I_{fi}	NFC No Follow Current®				
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication				
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%				
Terminal - Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid				
Busbar connections			fork-type busbar 16 mm²				
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715				
Case material / Flammability grade			BMC / V-0 in accordance with UL 94				
Pollution degree / Degree of protection		PD	3	3	3	2	2
Degree of protection		IP	20 (built-in)				
Approximate weight			120 g	150 g	170 g	175 g	190 g
Dimensions: width			17,5 mm (1 module)				
3rd party testing			CTI test report				

Model L 7/30 DC ... with remote signal contact		60 t ff	110 t ff	230 t ff	600 t ff	1000 t ff
CODE		**210 602**	**210 603**	**210 600**	**210 606**	**210 610**
Remote signal contact		potential-free changeover contact				
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible				
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A				







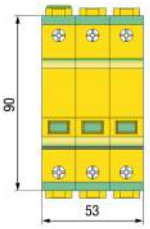
L 7/30 DC ...ff 2

L 7/30 DC ... ff is a voltage limiting SPD providing three modes of protection, typically installed in DC Distribution Boards (DB) with the following features and benefits:

- T1 and T2 SPD (Type 1 and Type 2) for 230, 600 and 1000 V DC according to IEC 61643-41Ed.1 and EN IEC 61643–41 (2025);
- T2 SPD (Type 2) for 60 and 110 V DC according to IEC 61643-41Ed.1 and EN IEC 61643–41 (2025);
- Backup protection is not required up to a prospective DC short circuit current of 1000 A (for U_N up to 230 V);
- Three colour Status Indicator with progressive indication of remaining performance;
- Pollution Degree 3 up to Un 230 V DC.

Model L 7/30 DC ...			60 ff 2	110 ff 2	230 ff 2	600 ff 2	1000 ff 2
CODE			**200 622**	**200 623**	**200 620**	**200 626**	**200 612**
Nominal dc system voltage		U_N	60 V dc	110 V dc	230 V dc	600 V dc	1000 V dc
Modes of protection			3				
Max Continuous Operating Voltage		U_c	100 V dc	200 V dc	420 V dc	895 V dc	1000 V dc
Type according to IEC 61643-41 Ed.1 (2025) and EN IEC 61643-41 (2025)			T2	T2	T1 and T2	T1 and T2	T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	-	-	8 kA	7 kA	5 kA
Charge		Q	-	-	3,5 As	3,5 As	2,5 As
Nominal discharge current (8/20 µs)		I_n	20 kA	20 kA	30 kA	30 kA	20 kA
Max. discharge current (8/20 µs)		I_{max}	30 kA	30 kA	40 kA	40 kA	40 kA
Voltage protection level at a discharge current of:	1 kA	U_p	≤ 0,22 kV	≤ 0,42 kV	≤ 0,81 kV	≤ 1,20 kV	≤ 1,85 kV
	5 kA	U_p	≤ 0,28 kV	≤ 0,50 kV	≤ 1,00 kV	≤ 1,46 kV	≤ 2,25 kV
	10 kA	U_p	≤ 0,36 kV	≤ 0,60 kV	≤ 1,20 kV	≤ 1,58 kV	≤ 2,60 kV
	20 kA	U_p	≤ 0,50 kV	≤ 0,80 kV	≤ 1,35 kV	≤ 1,95 kV	≤ 2,85 kV
	30 kA	U_p	-	-	≤ 1,50 kV	≤ 2,15 kV	-
Response time		t_a	≤ 25 ns				
End of Life			OCM (Open Circuit Failure Mode)				
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	1000 A	1000 A	1000 A	500 A	200 A
Short Circuit Current rating with max. backup protection fuse		I_{sccr}	30 kA	30 kA	30 kA	30 kA	30 kA
Max. back-up protection with fuse (DC)			100 A gPV	100 A gPV	100 A gPV	100 A gPV	100 A gPV
Follow current interrupt rating		I_{fi}	NFC No Follow Current®				
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication				
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%				
Terminal - Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid				
Busbar connections			fork-type busbar 16 mm²				
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715				
Case material / Flammability grade			BMC / V-0 in accordance with UL 94				
Pollution degree / Degree of protection		PD	3	3	3	2	2
Degree of protection		IP	20 (built-in)				
Approximate weight			270 g	310 g	330 g	390 g	410 g
Dimensions: width			35 mm (2 modules)				
3rd party testing			CTI test report				

Model L 7/30 DC ... with remote signal contact		60 t ff 2	110 t ff 2	230 t ff 2	600 t ff 2	1000 t ff 2
CODE		**210 622**	**210 623**	**210 620**	**210 626**	**210 612**
Remote signal contact		potential-free changeover contact				
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible				
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A				



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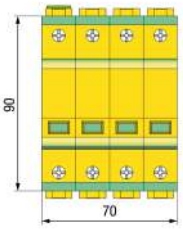

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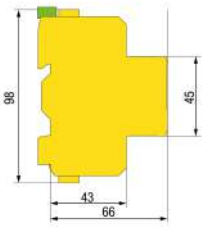
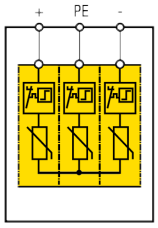




L 13/60 PV Y ... ff

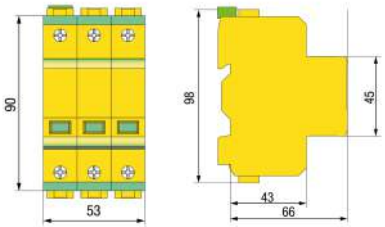
L 13/60 PV Y ... ff is a voltage limiting SPD for photovoltaic systems providing three modes of protection, typically installed close to the PV inverter, close to the PV generator and/or in the junction box, with the following features and benefits:

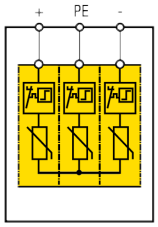
- Impulse test classification: Test Class I and II according to IEC 61643-31 Ed.1 (2018) and Type 2 according to EN 61643-31 (2019);
- High short circuit current rating without backup protection Iscpv = 1000 A according to IEC 61643-31;
- High short circuit current rating without backup protection, additionally tested based on IEC/EN 61643-11;
- Three colour Status Indicator with progressive indication of remaining performance;
- Upon request the L 13/60 PV Y ... ff type SPD can be supplied with other ratings for discharge current and Max. Continous Operating Voltage.

TECHNICAL DATA

Model L 13/60 PV Y ...			600 ff	1000 ff
CODE			**216 106**	**216 110**
Maximum Continous Operating DC Voltage for PV applications		U_{CPV}	600 V DC	1000 V DC
Modes of protection			3	
Type (acc. to IEC 61643-31 Ed.1 (2018) and EN 61643-31 (2019))			T1+T2	
Impulse discharge current (10/350 µs) (all modes)		I_{imp}	7 kA	5 kA
Nominal discharge current (8/20 µs) (all modes)		I_n	20,0 kA	
Total discharge current (10/350 µs) DC+ and DC- to PE		$I_{Total\ 10/350}$	13 kA	10 kA
Total discharge current (8/20 µs) DC+ and DC- to PE		$I_{Total\ 8/20}$	35,0 kA	40,0 kA
Max. discharge current (8/20 µs)		I_{max}	70,0 kA	
Voltage protection level at a discharge current of (all modes)	1 kA	U_p	≤ 1,60 kV	≤ 2,60 kV
	5 kA	U_p	≤ 1,90 kV	≤ 3,10 kV
	10 kA	U_p	≤ 2,10 kV	≤ 3,30 kV
	15 kA	U_p	≤ 2,40 kV	≤ 4,00 kV
	20 kA	U_p	≤ 2,50 kV	≤ 4,20 kV
Response time		t_a	≤ 25 ns	
End of life			OCM (open circuit failure mode)	
Short-circuit current rating (acc. to IEC 61643-31)		I_{SCPV}	1000 A	
Short-circuit current rating (based on IEC/EN 61643-11)		I_{SCCR}	500 A	200 A
Follow current interrupt rating			NFC No Follow Current®	
Status indicator			3 colours with progressive performance indication	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal-Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 according to UL 94	
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)	
Approximate weight			590 g	690 g
Dimensions: width			53 mm (3 modules)	70 mm (4 modules)

Model L 13/60 PV Y ... with remote signal contact	600 t ff	1000 t ff
CODE	**216 116**	**216 126**
Remote signal contact	potential-free changeover contact	
Terminal - conductor size for remote signal contact	max. 1,5 mm² flexible	
Switching capacity remote signal contact	ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A	





L 3/40 PV Y ... ff

L 3/40 PV Y ... ff is a voltage limiting SPD for photovoltaic systems providing three modes of protection, typically installed close to the PV inverter, close to the PV generator and/or in the junction box, with the following features and benefits:

- Impulse test classification: Test Class II according to IEC 61643-31 Ed.1 (2018) and Type 2 according to EN 61643-31 (2019);
- High short circuit current rating without backup protection Iscpv = 1000 A according to IEC 61643-31;
- High short circuit current rating without backup protection, additionally tested based on IEC/EN 61643-11;
- Three colour Status Indicator with progressive indication of remaining performance;
- Upon request the L 13/60 PV Y ... ff type SPD can be supplied with other ratings for discharge current and Max. Continous Operating Voltage.

TECHNICAL DATA

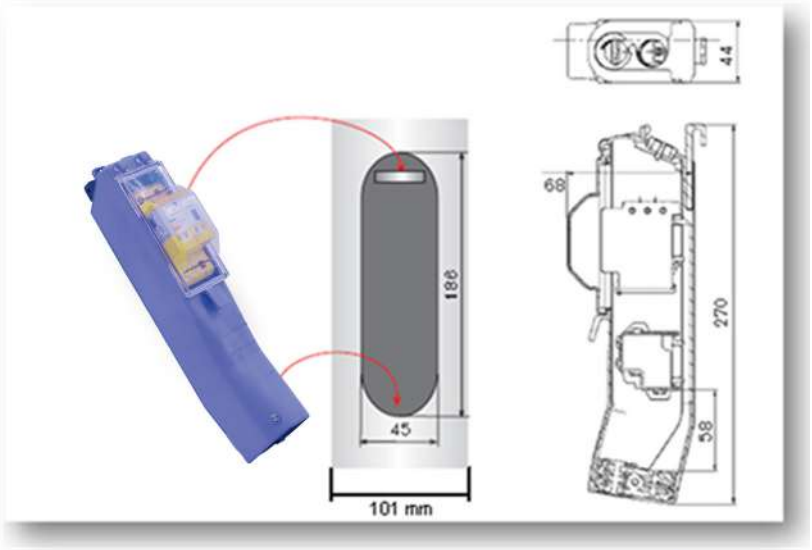
Model L 3/40 PV Y ...			600 ff	1000 ff
CODE			**210 106**	**210 110**
Maximum Continous Operating DC Voltage for PV applications		U_{CPV}	600 V DC	1000 V DC
Modes of protection			3	
Type (acc. to IEC 61643-31 Ed.1 (2018) and EN 61643-31 (2019))			T2	
Nominal discharge current (8/20 µs) (all modes)		I_n	20,0 kA	
Total discharge current (8/20 µs) DC+ and DC- to PE		$I_{Total\ 8/20}$	30,0 kA	
Max. discharge current (8/20 µs)		I_{max}	40,0 kA	
Voltage protection level at a discharge current of (all modes)	1 kA	U_p	≤ 1,70 kV	≤ 2,70 kV
	5 kA	U_p	≤ 2,10 kV	≤ 3,20 kV
	10 kA	U_p	≤ 2,50 kV	≤ 3,40 kV
	15 kA	U_p	≤ 2,70 kV	≤ 4,10 kV
	20 kA	U_p	≤ 2,80 kV	≤ 4,30 kV
Response time		ta	≤ 25 ns	
End of life			OCM (open circuit failure mode)	
Short-circuit current rating (acc. to IEC 61643-31)		I_{SCPV}	1000 A	
Short-circuit current rating (based on IEC/EN 61643-11)		I_{SCCR}	500 A	200 A
Follow current interrupt rating			NFC No Follow Current®	
Status indicator			3 colours with progressive performance indication	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal-Conductor size			4-35 mm² flexible / 4-50 mm² semi rigid	
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 according to UL 94	
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)	
Approximate weight			470 g	520 g
Dimensions: width			53 mm (3 modules)	

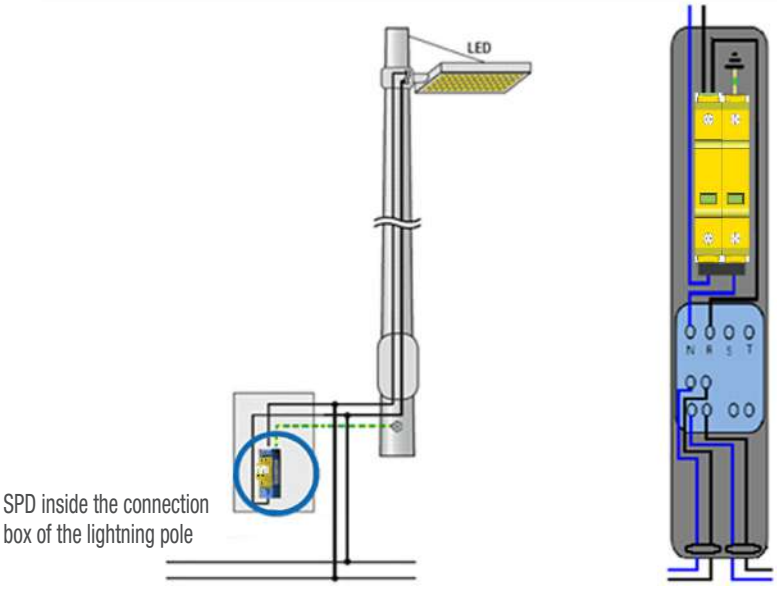
Model L 3/40 PV Y ... with remote signal contact		600 t ff	1000 t ff
CODE		**210 116**	**210 126**
Remote signal contact		potential-free changeover contact	
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible	
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A	

SPDs FOR LED LIGHTING

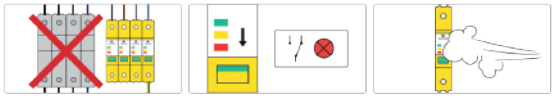
ZOTUP SPDs FOR LED LIGHTING IN LOW VOLTAGE SYSTEMS

SPD	Model	Application icon	Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	LLP 7/30 230 ff 1+1		T1 and T2	3	8 kA	30 kA	108
	LLP 2/10 230 ff 1+1		T2	3	-	10 kA	109





SPD inside the connection box of the lightning pole



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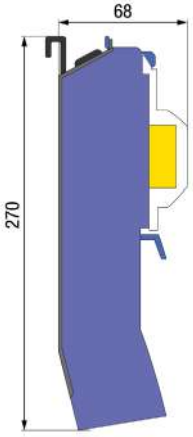

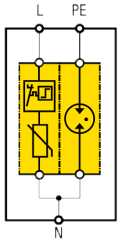

LLP 7/30 230 ff 1+1

LLP (LED Lighting Protection) systems is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection in a protective housing for mounting inside the opening at the pole base, with the following features and benefits:

- Combination SPD for the protection of street lighting luminaires against direct and indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Easy wiring inside of the openings at the pole base with a size of 186 x 45 mm (minimum diameter of the pole 101 mm);
- The special SPD case material allows to match with "Pollution Degree 3" requirements.

TECHNICAL DATA

Model LLP 7/30 ...			230 ff 1+1	
CODE			**242 191**	
Nominal AC system voltage		U_N	230/400 V AC	
Modes of protection			3	
Max Continuous Operating Voltage		U_c	335 V AC	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T1 and T2	
Impulse discharge current (10/350 µs) (L-N)		I_{imp}	8 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	52 kA	
Charge (L-N)		Q	3,6 As	
Charge (N-PE)		Q	26 As	
Nominal discharge current (8/20 µs) (L-N)		I_n	30 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	52 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	40 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	70 kA	
Voltage protection level (L-N, L-PE) at a discharge current of	1 kA	U_p	≤ 0,83 kV	≤ 1,50 kV
	5 kA	U_p	≤ 1,00 kV	≤ 1,50 kV
	20 kA	U_p	≤ 1,35 kV	≤ 1,50 kV
	25 kA	U_p	≤ 1,45 kV	≤ 1,50 kV
	30 kA	U_p	≤ 1,60 kV	≤ 1,60 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of life			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse (L)		I_{sccr}	100 kA rms	
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (5 ÷ 100 kA rms)	
Follow current interrupt rating			NFC No Follow Current®	
Status indicator (indication of disconnector operation)			3 colours with progressive performance indication	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal-Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 54 (built-in)	
Approximate weight			300 g	
Dimensions			l 68 x h 270 x d 44 mm	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

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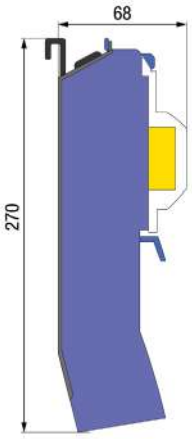
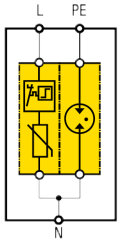




LLP 2/10 230 ff 1+1

LLP (LED Lighting Protection) systems is a ready to install assembly of a voltage limiting and a voltage switching SPD providing three modes of protection in a protective housing, with the following features and benefits:

- T2 SPD (Type 2) according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643–11 (2025);
- Combination SPD for the protection of street lighting luminaires against indirect lightning effects;
- Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;
- Easy wiring inside of the openings at the pole base with a size of 186 x 45 mm (minimum diameter of the pole 101 mm);
- The special SPD case material allows to match with "Pollution Degree 3" requirements.

TECHNICAL DATA

Model LLP 2/10 ...			230 ff 1+1	
CODE			**242 190**	
Nominal AC system voltage		U_N	230/400 V AC	
Modes of protection			3	
Max Continuous Operating Voltage (L-N)		U_C	335 V AC	
Max Continuous Operating Voltage (N-PE)		U_C	255 V AC	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to IEC 61643-11 Ed.2 (2025) and EN IEC 61643-11 (2025)			T2	
Nominal discharge current (8/20 µs) (L-N)		I_n	10 kA	
Nominal discharge current (8/20 µs) (N-PE)		I_n	40 kA	
Max. discharge current (8/20 µs) (L-N)		I_{max}	20 kA	
Max. discharge current (8/20 µs) (N-PE)		I_{max}	65 kA	
Voltage protection level (L-N, L-PE) at a discharge current of	1 kA	U_p	≤ 0,87 kV	≤ 1,50 kV
	5 kA	U_p	≤ 1,00 kV	≤ 1,50 kV
	10 kA	U_p	≤ 1,25 kV	≤ 1,50 kV
Voltage protection level (N-PE)		U_p	≤ 1,50 kV	
Response time (L-N / N-PE)		t_a	≤ 25 ns / ≤ 100 ns	
End of life			OCM (open circuit failure mode)	
Behaviour in case of Temporary OverVoltage (TOV):	L-N	U_T	440 V / 120 min, withstand (W)	
	N-PE	U_T	1200 V / 200 ms, withstand (W)	
Short Circuit Current rating without backup protection (internal disconnector)		I_{sccr}	5 kA rms	
Short Circuit Current rating with max. backup protection fuse (L)		I_{sccr}	100 kA rms	
Max. back-up protection with up-stream CB with a max. let-through energy of (max. prospective short circuit current depends on the CB breaking capability).			160 A (max. 4,50 x 10^5 A^2s)	
Max. back-up protection with FUSE at prospective short circuit currents of			125 A gG (> 5 ÷ 100 kA rms)	
Follow current interrupt rating (L-N)		I_{fi}	NFC No Follow Current®	
Follow current interrupt rating (N-PE)		I_{fi}	100 A rms	
Status indicator (indication of disconnector operation)			3 coloured levels with progressive performance indication	
Operating temperature range / Humidity			-40 … +80 °C (extended) / 5% ... 95%	
Terminal-Conductor size			4-35 mm^2 flexible / 4-50 mm^2 semi rigid	
Mounting			35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Case material / Flammability grade			BMC / V-0 in accordance with UL 94	
Pollution degree / Degree of protection		PD / IP	3 / 54 (built-in)	
Approximate weight			260 g	
Dimensions			l 68 x h 270 x d 44 mm	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	

ZOTUP SPDs FOR SIGNALLING, TELECOMMUNICATION AND DATA TRANSMISSION

SPDs FOR SIGNALLING AND TELECOMMUNICATION NETWORKS

SPDs FOR SIGNALLING AND TELECOMMUNICATION APPLICATIONS

Typical installation: in series with the signalling/telecommunication circuits for equipments with "low resistability" according Recommendation ITU-T K.45 / "low surge immunity" according IEC/EN 61000-4-5.

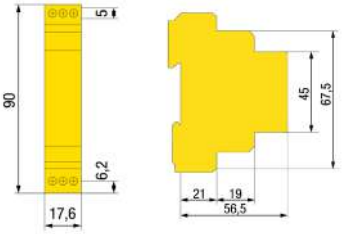
Features:

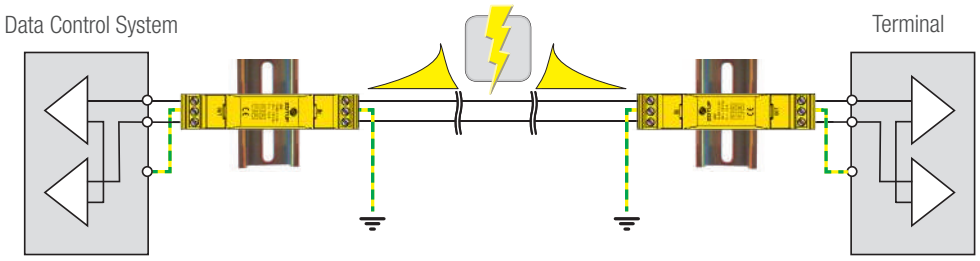
- SPDs with impulse ratings for categories C1, C2, C3 and D1 (according to IEC/EN 61643-21).
- SPDs with common mode and differential mode protection against symmetrical and/or asymmetrical disturbances.
- SPDs with disconnecting means in case of accidential contact between the signal/telecommunication circuit and a power line (e.g. 230/400V a.c.) due to insulation faults.
- SPDs with integrated earth/protective ground connection via the 35 x 7,5 mm top hat DIN rail according IEC/EN 60715 and by screwless spring type termination of the cable screen.
- SPDs with RJ and LSA connectors.

SPD	Model	Application Icon	Impulse rating / Category	Category D1 Impulse discharge current (10/350 µs) per wire	Category C2 Nominal discharge current (8/20 µs) per wire	Page
	S-AS 2 24/1		C2, C3	-	1 kA	115
	S-AS 2 48/1		C2,C3	-	1 kA	115
	S-ASI 1 L 6		C1, C2, C3, D1	2,5 kA	15 kA	116
	S-ASI 1 L 12		C1, C2, C3, D1	2,5 kA	15 kA	116
	S-ASI 1 L 24		C1, C2, C3, D1	2,5 kA	15 kA	116
	S-ASI 1 L 48		C1, C2, C3, D1	2,5 kA	15 kA	116
	S-ASI 2 L 6		C1, C2, C3, D1	2,5 kA	15 kA	117
	S-ASI 2 L 12		C1, C2, C3, D1	2,5 kA	15 kA	117
	S-ASI 2 L 24		C1, C2, C3, D1	2,5 kA	15 kA	117
	S-ASI 2 L 48		C1, C2, C3, D1	2,5 kA	15 kA	117
	S-ASI 1 R 6		C1, C2, C3, D1	2,5 kA	15 kA	118
	S-ASI 1 R 12		C1, C2, C3, D1	2,5 kA	15 kA	118
	S-ASI 1 R 24		C1, C2, C3, D1	2,5 kA	15 kA	118
	S-ASI 1 R 48		C1, C2, C3, D1	2,5 kA	15 kA	118
	S-ASI 2 R 6		C1, C2, C3, D1	2,5 kA	15 kA	119
	S-ASI 2 R 12		C1, C2, C3, D1	2,5 kA	15 kA	119
	S-ASI 2 R 24		C1, C2, C3, D1	2,5 kA	15 kA	119
	S-ASI 2 R 48		C1, C2, C3, D1	2,5 kA	15 kA	119

SPD	Model	Application Icon	Impulse rating / Category	Transmission category	Category D1 Impulse discharge current (10/350 µs) per wire	Category C2 Nominal discharge current (8/20 µs) per wire	Page
	S-ASI 1 G 48		C1, C2, C3, D1	-	2,5 kA	15 kA	120
	S-ASI 1 G 110		C1, C2, C3, D1	-	2,5 kA	15 kA	120
	S-ASI 2 G 48		C1, C2, C3, D1	-	2,5 kA	15 kA	121
	S-ASI 2 G 110		C1, C2, C3, D1	-	2,5 kA	15 kA	121

S-AS 2 ...





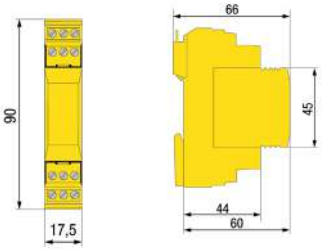
S-AS 2 is an SPD for installation in series with the telecommunication/signalling circuits to protect sensitive equipment with low resistability/immunity, providing the following features and benefits:

- Offers sensitive common and differential mode protection to connected devices;
- Very efficient protection providing a low voltage protection level U_p;
- Providing protection against indirect lightning effects;
- Suitable for installation at LPZ boundaries up to 0_B -2 in accordance with the lightning protection zones concept;
- The end of the life behaviour of the SPD is Short Circuit Mode (SCM);
- Earth/ground connection is made via screw type terminals.

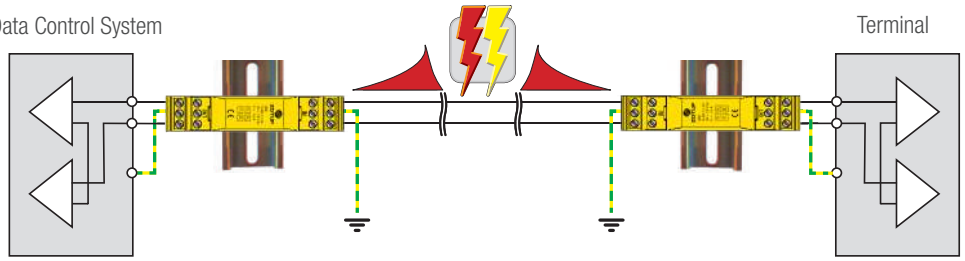
Note: Equipment protection at both ends of the telecommunication/signal line is essential for an efficient protection system (see above schematics).

Modello S-AS 2 ...		24/1	48/1
CODE		**302 524**	**302 548**
SPD impulse rating/Category		C2, C3	
Number of protected Lines		1	
Nominal voltage	U_N	24 V dc/18 V ac	48 V dc/34 V ac
Maximum Continuous Operating Voltage	U_C	29 V dc	58 V dc
Rated Current	I_L	5 A	5 A
Category C2 - Total Discharge Current (8/20 µs)	$I_{Total\ 8/20}$	2 kA	2 kA
Category C2 - Nominal Discharge Current (8/20 µs) per wire	I_n	1 kA	1 kA
Category C2 - Voltage Protection level at In (all modes)	U_p	≤ 90 V	≤ 170 V
Category C3 - Voltage Protection level at 1 kV/µs wire (all modes)	U_p	≤ 51 V	≤ 118 V
Response time	t_a	≤ 25 ns	
Parasitic Capacitance	C	10 nF	
Operating temperature range		- 40 ... + 80 °C	
Terminal - conductor size		max. 2,5 mm² flexible	
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Housing		thermoplastic	
Degree of protection	IP	20	
Approximate weight		45 g	
Dimension: width		17,5 mm (1 module)	

S-ASI ... L ...



DIN-rail socket + pluggable SPD-module

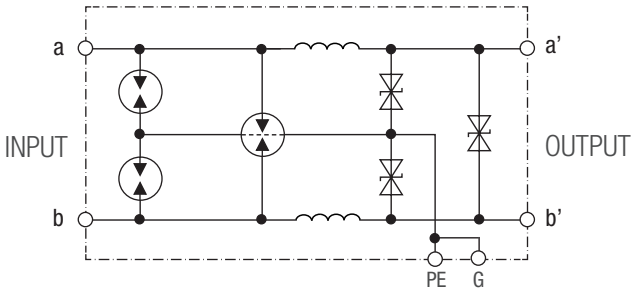


S-ASI ... L ... is an SPD for installations in series with the telecommunication/signalling circuits to protect sensitive equipment with low resistability/immunity, providing the following features and benefits:

- Classification for impulse test: categories C1, C2, C3, D1 (in accordance with IEC/EN 61643-21);
- S-ASI ... SPDs represent a pluggable execution and they provide continuity of the signal circuits. They do not interrupt when the plug in module is pulled out;
- Offers sensitive common and differential mode protection to connected devices;
- Providing protection against direct and indirect lightning effects;
- The end of the life behaviour of the SPD is Short Circuit Mode (SCM);
- The connection is made by screw type terminals providing best connection reliability;
- With integrated earth/protective ground connection via the top hat DIN rail and by screw type terminations PE and G.

				4-20 mA	Konnex
Model S-ASI 1 L ...		6	12	24	48
CODE		**341 006**	**341 012**	**341 024**	**341 048**
Number of protected Lines		1			
SPD impulse rating/Category		C1, C2, C3, D1			
Nominal Voltage	U_N	6 V dc/ 4,2 V ac	12 V dc/9 V ac	24 V dc/18 V ac	48 V dc/39 V ac
Maximum Continuous Operating Voltage	U_c	7,2 V dc	14,4 V dc	28,8 V dc	57,6 V dc
Rated Current	I_L	1,5 A			
Category C1 - Nominal discharge current (8/20 µs) per wire	I_n	1 kA			
Category C1 - Voltage protection level at In (all modes)	U_p	30 V dc	50 V dc	65 V dc	80 V dc
Category C2 - Nominal discharge current (8/20 µs) per wire	I_n	15 kA			
Category C2 - Voltage protection level at In (all modes)	I_n	40 V dc	55 V dc	70 V dc	120 V dc
Category C3 - Voltage protection level at 1 kV/µs (all modes)	U_p	≤ 15 V	≤ 28 V	≤ 64 V	≤ 85 V
Category D1 - impulse discharge current (10/350 µs) per wire	$I_{imp\ 10/350}$	2,5 kA			
Category D1 - Total discharge current (10/350 µs)	$I_{Total\ 10/350}$	5 kA			
Response time	t_a	≤ 1ns			
Longitudinal impedance/resistance		2,2 µH			
Parasitic capacitance	C	1,5 nF			
Operating temperature range		-25 ... +70 °C			
Terminal - conductor size		max. 1,5 mm^2 flexible			
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715			
Housing		thermoplastic			
Degree of protection	IP	20			
Approximate weight		50 g			
Dimension: width		17,5 mm (1 module)			

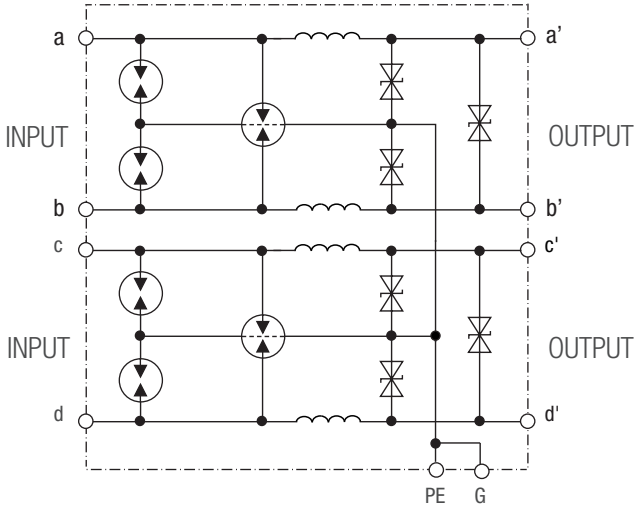
MODEL S-ASI 1 L ...



Typical protection scheme for applications using 6, 12, 24 or 48 V DC-, 4-20 mA or Konnex .

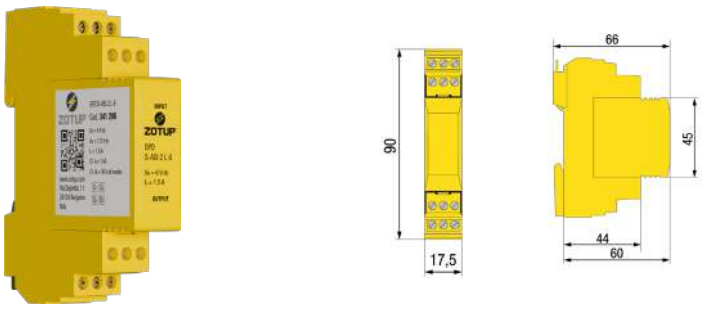
For applications where a high discharge capability and a significant rated load current are required.

MODEL S-ASI 2 L ...

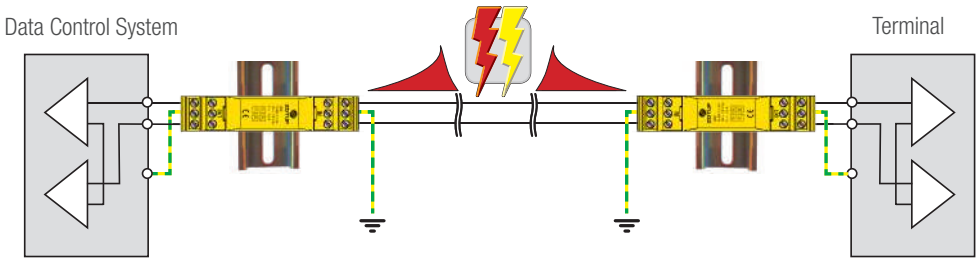


				4-20 mA	Konnex
Model S-ASI 2 L ...		6	12	24	48
CODE		**341 206**	**341 212**	**341 224**	**341 248**
Number of protected Lines		2			
SPD impulse rating/Category		C1, C2, C3, D1			
Nominal Voltage	U_N	6 V dc/ 4,2 V ac	12 V dc/9 V ac	24 V dc/18 V ac	48 V dc/39 V ac
Maximum Continuous Operating Voltage	U_c	7,2 V dc	14,4 V dc	28,8 V dc	57,6 V dc
Rated Current	I_L	1,5 A			
Category C1 - Nominal discharge current (8/20 µs) per wire	I_n	1 kA			
Category C1 - Voltage protection level at In (all modes)	U_p	30 V dc	50 V dc	65 V dc	80 V dc
Category C2 - Nominal discharge current (8/20 µs) per wire	I_n	15 kA			
Category C2 - Voltage protection level at In (all modes)	I_n	40 V dc	55 V dc	70 V dc	120 V dc
Category C3 - Voltage protection level at 1 kV/µs (all modes)	U_p	≤ 15 V	≤ 28 V	≤ 64 V	≤ 85 V
Category D1 - impulse discharge current (10/350 µs) per wire	$I_{imp\ 10/350}$	2,5 kA			
Category D1 - Total discharge current (10/350 µs) per line	$I_{Total\ 10/350}$	5 kA			
Response time	t_a	≤ 1ns			
Longitudinal impedance/resistance		2,2 µH			
Parasitic capacitance	C	1,5 nF			
Operating temperature range		-25 ... +70 °C			
Terminal - conductor size		max. 1,5 mm^2 flexible			
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715			
Housing		thermoplastic			
Degree of protection	IP	20			
Approximate weight		50 g			
Dimension: width		17,5 mm (1 module)			

S-ASI ... R ...



DIN-rail socket + pluggable SPD-module



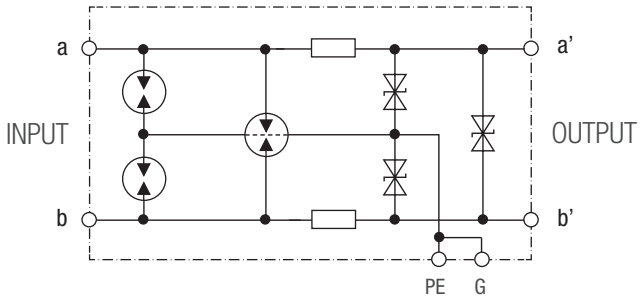
S-ASI ... R ... is an SPD for installation in series with the telecommunication/signalling circuits to protect sensitive equipment with low resistability/immunity, providing the following features and benefits:

- Classification for the impulse test: categories C1, C2, C3, D1 (in accordance with IEC/EN 61643-21);
- S-ASI ... SPDs represent a pluggable execution and they provide continuity of the signal circuits. They do not interrupt when the plug in module is pulled out;
- Offers sensitive common and differential mode protection to connected devices;
- Providing protection against direct and indirect lightning effects;
- The end of the life behaviour of the SPD is Short Circuit Mode (SCM);
- The connection is made by screw type terminals providing best connection reliability;
- With integrated earth/protective ground connection via the top hat DIN rail and by screw type terminations PE and G.

RS 485 / RS 422
CAN - Bus

Model S-ASI 1 R ...		6	12	24	48
CODE		**342 006**	**342 012**	**342 024**	**342 048**
Number of protected Lines		1			
SPD impulse rating/Category		C1, C2, C3, D1			
Nominal Voltage	U_N	6 V dc/ 4,2 V ac	12 V dc/9 V ac	24 V dc/18 V ac	48 V dc/39 V ac
Maximum Continuous Operating Voltage	U_c	7,2 V dc	14,4 V dc	28,8 V dc	57,6 V dc
Rated Current	I_L	0,5 A			
Category C1 - Nominal discharge current (8/20 µs) per wire	I_n	1 kA			
Category C1 - Voltage protection level at In (all modes)	U_p	30 V dc	50 V dc	65 V dc	80 V dc
Category C2 - Nominal discharge current (8/20 µs) per wire	I_n	15 kA			
Category C2 - Voltage protection level at In (all modes)	I_n	40 V dc	55 V dc	70 V dc	120 V dc
Category C3 - Voltage protection level at 1 kV/µs (all modes)	U_p	≤ 15 V	≤ 28 V	≤ 64 V	≤ 85 V
Category D1 - impulse discharge current (10/350 µs) per wire	$I_{imp\ 10/350}$	2,5 kA			
Category D1 - Total discharge current (10/350 µs)	$I_{Total\ 10/350}$	5 kA			
Response time	t_a	≤ 1ns			
Bandwidth		1 MHz			
Data Rate	C	1 Mbit/s			
Longitudinal impedance/resistance		1,8 Ω			
Parasitic capacitance		1,5 nF			
Operating temperature range		-25 ... +70 °C			
Terminal - conductor size		max. 1,5 mm² flexible			
Mounting	IP	indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715			
Housing		thermoplastic			
Degree of protection	IP	20			
Approximate weight		50 g			
Dimension: width		17,5 mm (1 module)			

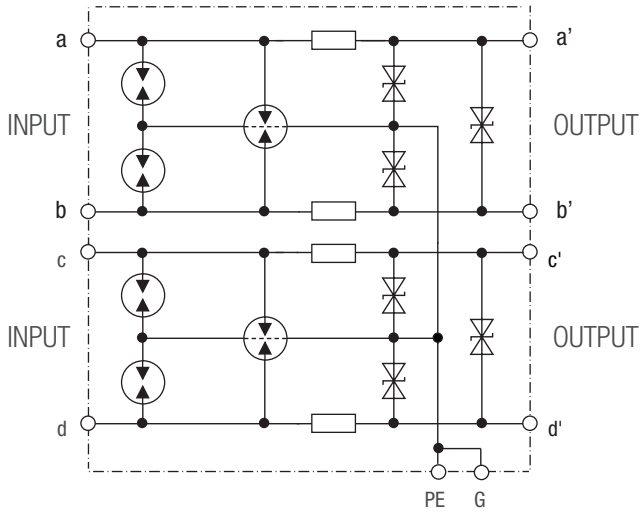
MODEL S-ASI 1 R ...



Typical protection scheme for applications according to the following standards:
RS 485, RS 422, CAN-Bus
and for 6, 12, 24 and 48 V DC.

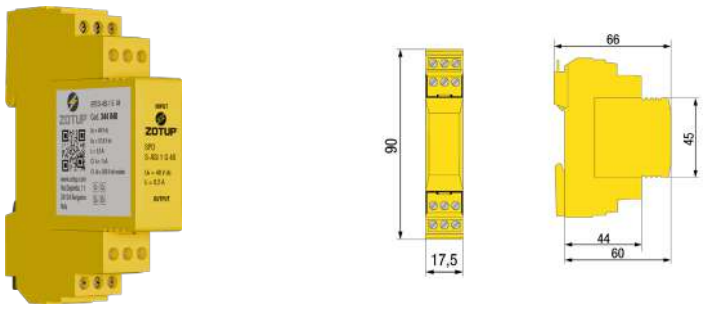
The protection allows a data transmission up to 1 Mbit/s.
The voltage protection level provided by these devices is not affected by the steepness of the transient.

MODEL S-ASI 2 R ...

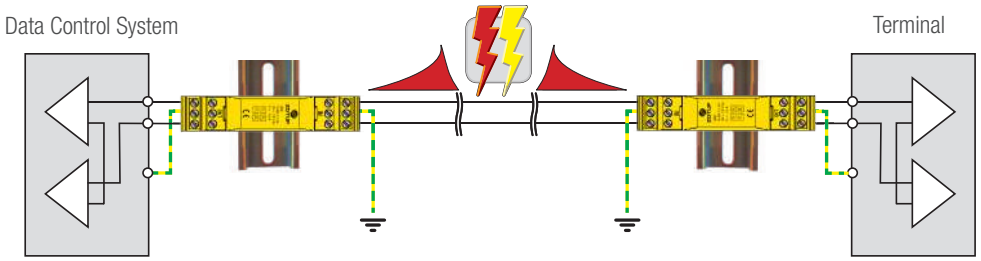


RS 485 / RS 422
CAN - Bus

Model S-ASI 2 R ...		6	12	24	48
CODE		**342 206**	**342 212**	**342 224**	**342 248**
Number of protected Lines		2			
SPD impulse rating/Category		C1, C2, C3, D1			
Nominal Voltage	U_N	6 V dc/ 4,2 V ac	12 V dc/9 V ac	24 V dc/18 V ac	48 V dc/39 V ac
Maximum Continuous Operating Voltage	U_c	7,2 V dc	14,4 V dc	28,8 V dc	57,6 V dc
Rated Current	I_L	0,5 A			
Category C1 - Nominal discharge current (8/20 µs) per wire	I_n	1 kA			
Category C1 - Voltage protection level at In (all modes)	U_p	30 V dc	50 V dc	65 V dc	80 V dc
Category C2 - Nominal discharge current (8/20 µs) per wire	I_n	15 kA			
Category C2 -Voltage protection level at In (all modes)	I_n	40 V dc	55 V dc	70 V dc	120 V dc
Category C3 - Voltage protection level at 1 kV/µs (all modes)	U_p	≤ 15 V	≤ 28 V	≤ 64 V	≤ 85 V
Category D1 - Impulse discharge current (10/350 µs) per wire	$I_{imp\ 10/350}$	2,5 kA			
Category D1 - Total discharge current (10/350 µs) per line	$I_{Total\ 10/350}$	5 kA			
Response time	t_a	≤ 1ns			
Bandwidth		1 MHz			
Data Rate	C	1 Mbit/s			
Longitudinal impedance/resistance		1,8 Ω			
Parasitic capacitance		1,5 nF			
Operating temperature range		-25 ... +70 °C			
Terminal - conductor size		max. 1,5 mm² flexible			
Mounting	IP	indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715			
Housing		thermoplastic			
Degree of protection	IP	20			
Approximate weight		50 g			
Dimension: width		17,5 mm (1 module)			



DIN-rail socket + pluggable SPD-module

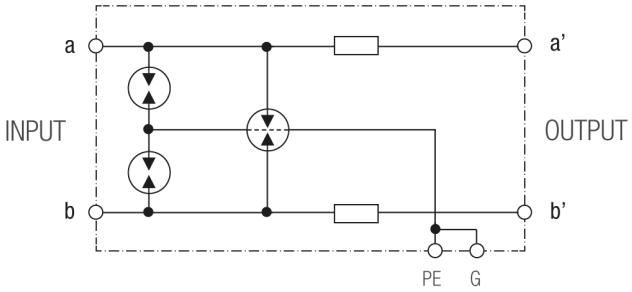


S-ASI ... G ... is an SPD for installation in series with the telecommunication/signalling circuits to protect sensitive equipment with low resistability/immunity, providing the following features and benefits:

- Classification for the impulse test: categories C1, C2, C3, D1 (in accordance with IEC/EN 61643-21);
- S-ASI ... SPDs represent a pluggable execution and they provide continuity of the signal circuits. They do not interrupt when the plug-in module is pulled out;
- Offers sensitive common and differential mode protection to connected devices;
- Providing protection against direct and indirect lightning effects;
- The connection is made by screw type terminals providing best connection reliability;
- With integrated earth/protective ground connection via the top hat DIN rail and by screw type terminations PE and G.

		CAMERAS	TELECOM analog
Model S-ASI 1 G ...		48	110
CODE		**344 048**	**344 011**
Number of protected Lines		1	
SPD impulse rating/Category		C1, C2, C3, D1	
Nominal Voltage	U_N	48 V dc/39 V ac	110 V dc/78 V ac
Maximum Continuous Operating Voltage	U_c	57,6 V dc	132 V dc
Rated Current	I_L	0,5 A	
Category C1 - Nominal discharge current (8/20 µs) per wire	I_n	1 kA	
Category C1 - Voltage protection level at In (all modes)	U_p	≤ 500 V	≤ 550 V
Category C2 - Nominal discharge current (8/20 µs) per wire	I_n	15 kA	
Category C2 - Voltage protection level at In (all modes)	U_p	≤ 600 V	≤ 650 V
Category C3 - Voltage protection level at 1 kV/µs (all modes)	U_p	≤ 550 V	≤ 600 V
Category D1 - Impulse discharge current (10/350 µs) per wire	$I_{imp\ 10/350}$	2,5 kA	
Category D1 - Total discharge current (10/350 µs) per line	$I_{Total\ 10/350}$	5 kA	
Response time	t_a	≤ 100 ns	
Bandwidth		100 MHz	
Data Rate		100 Mbit/s	
Longitudinal impedance/resistance		0,8 Ω	
Parasitic capacitance	C	1,5 nF	
Operating temperature range		-25 ... +70 °C	
Terminals - conductor size		max. 1,5 mm² flexible	
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Housing		thermoplastic	
Degree of protection	IP	20	
Approximate weight		50 g	
Dimension: width		17,5 mm (1 module)	

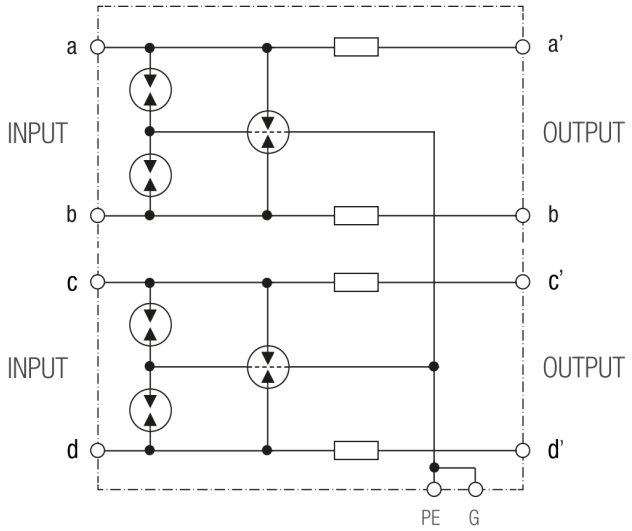
MODEL S-ASI 1 G ...



Typical protection scheme with high discharge capability for high frequency data transmission interfaces and for *applications in telecommunications.*

The protection allows a data transmission up to100 Mbit/s. The protection is equipped with decoupling resistances between the protection and the output circuit.

MODEL S-ASI 2 G ...



		CAMERAS	TELECOM analog
Model S-ASI 2 G ...		48	110
CODE		**344 248**	**344 211**
Number of protected Lines		2	
SPD impulse rating/Category		C1, C2, C3, D1	
Nominal Voltage	U_N	48 V dc/39 V ac	110 V dc/78 V ac
Maximum Continuous Operating Voltage	U_c	57,6 V dc	132 V dc
Rated Current	I_L	0,5 A	
Category C1 - Nominal discharge current (8/20 µs) per wire	I_n	1 kA	
Category C1 - Voltage protection level at In (all modes)	U_p	≤ 500 V	≤ 550 V
Category C2 - Nominal discharge current (8/20 µs) per wire	I_n	15 kA	
Category C2 - Voltage protection level at In (all modes)	U_p	≤ 600 V	≤ 650 V
Category C3 - Voltage protection level at 1 kV/µs (all modes)	U_p	≤ 550 V	≤ 600 V
Category D1 - Impulse discharge current (10/350 µs) per wire	$I_{imp\ 10/350}$	2,5 kA	
Category D1 - Total discharge current (10/350 µs) per line	$I_{Total\ 10/350}$	5 kA	
Response time	t_a	≤ 100 ns	
Bandwidth		100 MHz	
Data Rate		100 Mbit/s	
Longitudinal impedance/resistance		0,8 Ω	
Parasitic capacitance	C	1,5 nF	
Operating temperature range		-25 ... +70 °C	
Terminals - conductor size		max. 1,5 mm² flexible	
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	
Housing		thermoplastic	
Degree of protection	IP	20	
Approximate weight		70 g	
Dimension: width		17,5 mm (1 module)	

SPECIFIC SPDs WITH COAXIAL CONNECTORS

Specific SPDs with coaxial connectors

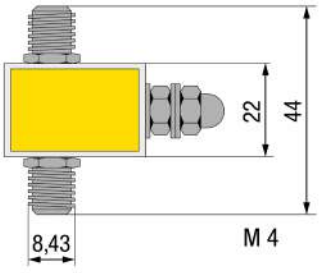
Typical installation: for the protection of TV switchboards, satellite antenna or wideband transmission equipment and remote systems. Particularly suitable for applications with long coaxial cables which are exposed to electromagnetic interference.

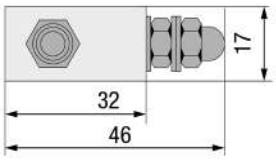
Features:

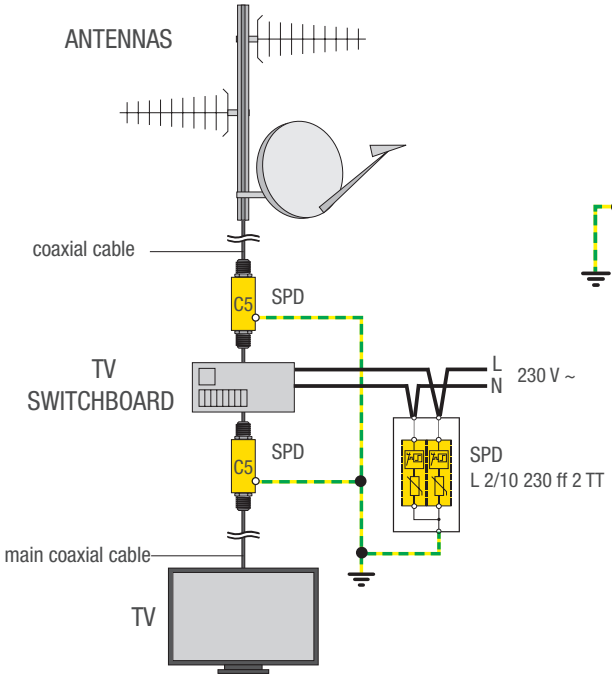
- SPDs with type F connectors for the protection of antenna circuits used in civil applications.
- SPDs with BCN type connectors for CCTV circuits.
- SPDs with 7/16 M/F type connection for coaxial cables of antenna circuits and telecommunication systems (4 and 3G).
- SPDs with special connectors/connection can be supplied upon request.

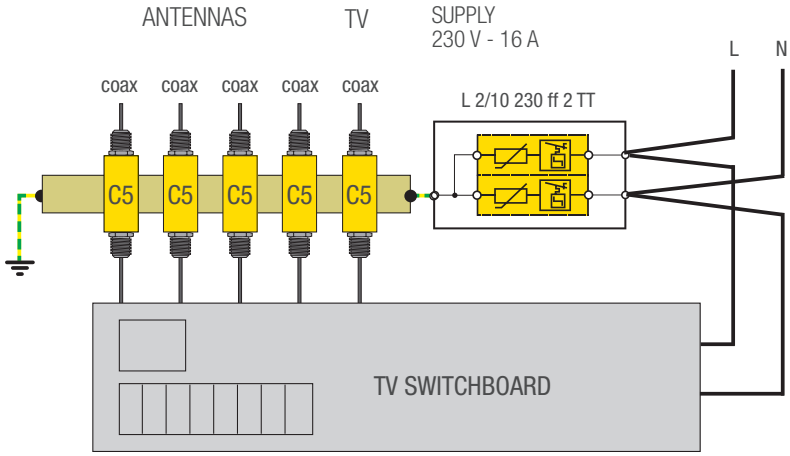
SPD	Model	Application icon	Impulse rating/ Category	Category D1 Impulse discharge current (10/350 µs) per wire	Category C2 Nominal discharge current (8/20 µs) per wire	Connection technique	Page
	C 5		C2, C3, D1	2 kA	5 kA	F	123
	C 6		C2, C3	-	1 kA	BNC	124

C5









C 5 is an SPD for the protection of TV switchboards with ground or satellite antennas.
It provides the following features and benefits:

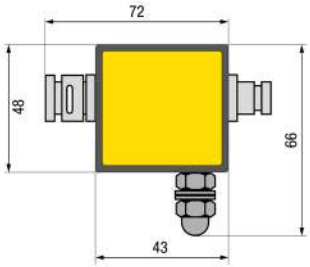
- Particularly suitable for applications with coaxial cables longer than 40 m. (cable from the antenna to the switchboard or main cable from the television to the switchboard);
- Easy to install by fixing and connecting the SPD to ground via an integrated M4 bolt (e.g. directly to the equipotential bonding bar);
- Suitable for installation at LPZ boundaries up to 0_B - 2 in accordance with the lightning protection zones concept.

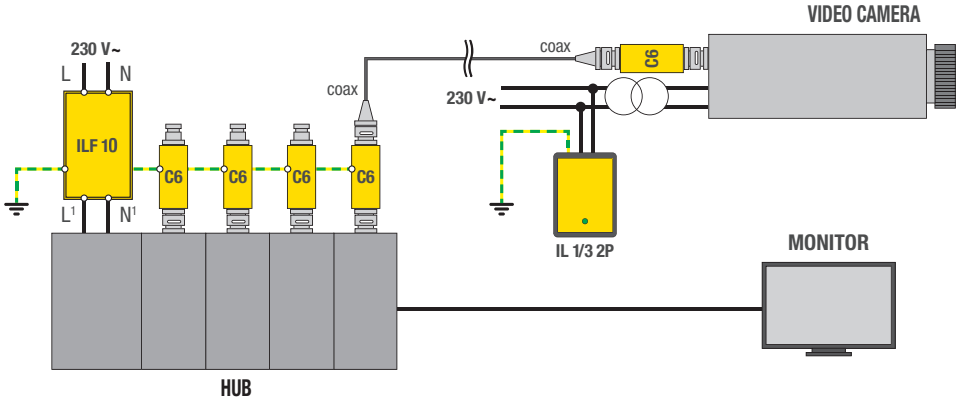
Note: To complete the protection of the TV switchboard an adequate protection should also be provided on the power supply circuit, for example by installation of the L 2/10 230 ff 2 TT type SPD, code 202 220.

TECHNICAL DATA

Model C 5

CODE		351 075
SPD impulse rating/Category		C2, C3, D1
Impedance		75 Ω
Frequency range	f	up to 2,15 GHz
Maximum Continuous Operating Voltage	U_C	90 V dc
Category C2 - Nominal Discharge Current (8/20 µs)	I_n	5 kA
Category C2 - Voltage Protection level at In	U_p	≤ 600 V
Category C3 - Voltage Protection level at 1 kV/µs	U_p	≤ 600 V
Category D1 - Impulse discharge current (10/350 µs)	$I_{imp\ 10/350}$	2 kA
Typical attenuation	at	0,5 dB
Maximum power transmission		50 W
Connector type		F
Housing		metal
PG/PE-terminal		M4 bolt
Operating temperature range		- 25 ... + 55°C
Approximate weight		25 g
Dimensions		l 32 x h 22 x d 17 mm





C 6 is an SPD for the protection of CCTV circuits, typilcally installed on each line close to the HUB and close to the video cameras, providing the following features and benefits:

- Particularly suitable for surveillance systems with connecting cables longer than 40 m.;
- Easy to install by fixing and connecting the SPD to ground via an integrated M5 bolt;
- Suitable for installation at LPZ boundaries up to 0_B - 2 in accordance with the lightning protection zones concept.

Note: To complete the protection of the HUB an adequate protection should also be provided on the power supply circuit, for example by installation of an ILF 2P type SPD (Code 209 310). Protection of the video camera power supply can be provided e.g. by a type IL 1/3 2P SPD (code 241 001) close to the input terminals of the camera power supply (see schematic above).

Model C 6

CODE		358 006
SPD impulse rating/Category		C2, C3
Video signal	U_o	1 V pp
Maximum Continuous Operating Voltage	U_c	6 V pp
Rated current	I_L	300 mA
Impedance		75 Ω
Category C2 - Nominal Discharge Current (8/20 µs)	I_n	1 kA
Category C2 - Voltage Protection level at In	U_p	≤ 22 V
Category C3 - Voltage Protection level at 1 kV/µs	U_p	≤ 22 V
Cross sectional area		≥ 1 mm² flexible
Housing		thermoplastic
Operating temperature range		- 25 ... + 55 °C
Connector type		BNC female (input not protected) BNC male (output protected)
PG/PE-terminal		M5 bolt
Approximate weight		50 g
Dimensions		l 43 x h 48 x d 22 mm

SPDs FOR DATA TRANSMISSION

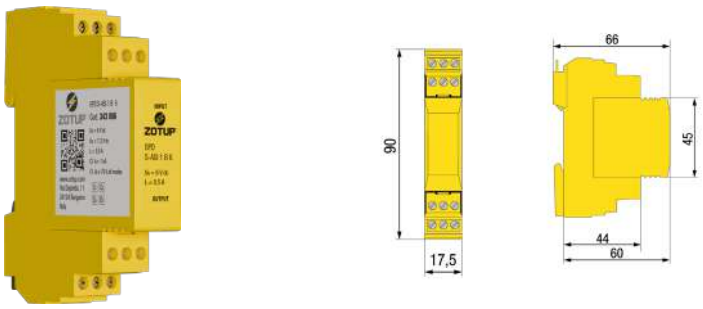
SPDs FOR DATA TRANSMISSION

SPDs for the protection of network equipment (HUBs/SWITCHES) in structured cabling systems in category 6.

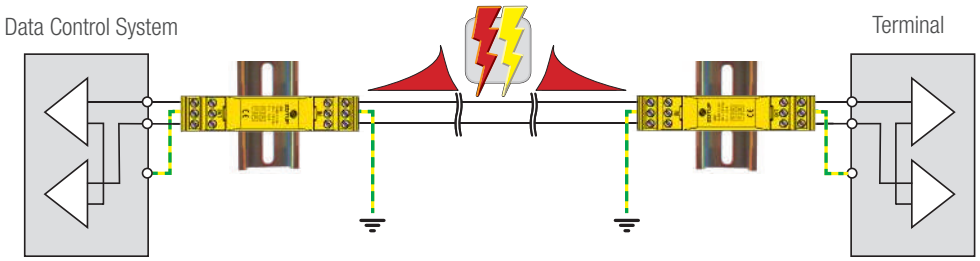
- SPDs with impulse ratings for categories C1, C2, C3 and D1 (according to IEC/EN 61643-21).
- SPDs for rack and/or rail mounting to enable easy installation, even in existing systems.

SPD	Model	Application icon	Impulse rating/ Category	Transmission category	Category D1 Impulse discharge current (10/350 µs) per wire	Category C2 Nominal discharge current (8/20 µs) per wire	Page
	S-ASI 1 B 6		C1, C2, C3, D1	-	2,5 kA	15 kA	128
	S-AS 1 B 12		C1, C2, C3, D1	-	2,5 kA	15 kA	128
	S-ASI 1 B 24		C1, C2, C3, D1	-	2,5 kA	15 kA	128
	S-ASI 1 B 48		C1, C2, C3, D1	-	2,5 kA	15 kA	128
	S-ASI 2 B 6		C1, C2, C3, D1	-	2,5 kA	15 kA	129
	S-ASI 2 B 12		C1, C2, C3, D1	-	2,5 kA	15 kA	129
	S-ASI 2 B 24		C1, C2, C3, D1	-	2,5 kA	15 kA	129
	S-ASI 2 B 48		C1, C2, C3, D1	-	2,5 kA	15 kA	129
	S-F 1/6		C2, C3	6	-	1kA	130
	S-F 1/48 PoE +		C2, C3	6 A	-	1kA	130
	S-F 1/48 PoE + b		C2, C3	6 A	-	1kA	130

S-ASI ... B ...



DIN-rail socket + pluggable SPD-module



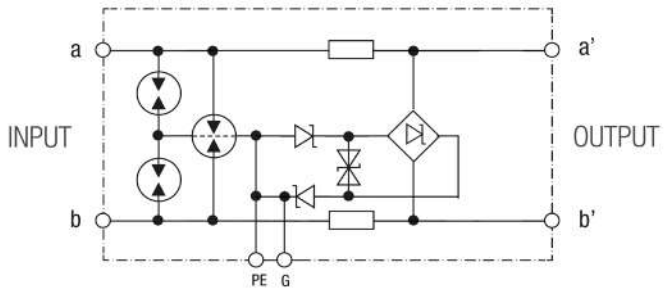
S-ASI ... B ... is an SPD for installation in series with the telecommunication/signalling circuits to protect sensitive equipment with low resistability/immunity, providing the following features and benefits:

- Classification for the impulse test: categories C1, C2, C3, D1 (in compliance with IEC/EN 61643-21);
- S-ASI ... SPDs represent a pluggable execution and they provide continuity of the signal circuits. They do not interrupt when the plug in module is pulled out;
- Offers sensitive common and differential mode protection to connected devices;
- Providing protection against direct and indirect lightning effects;
- The end of the life behaviour of the SPD is Short Circuit Mode (SCM);
- The connection is made by screw type terminals providing best connection reliability;
- With integrated earth/protective ground connection via the top hat DIN rail and by screw type terminations PE and G.

		PROFIBUS			
Model S-ASI 1 B ...		6	12	24	48
CODE		**343 006**	**343 012**	**343 024**	**343 048**
Number of protected Lines		1			
SPD impulse rating/Category		C1, C2, C3, D1			
Nominal Voltage	U_N	6 V dc/ 4,2 V ac	12 V dc/9 V ac	24 V dc/18 V ac	48 V dc/39 V ac
Maximum Continuous Operating Voltage	U_C	7,2 V dc	14,4 V dc	28,8 V dc	57,6 V dc
Rated Current	I_L	0,5 A			
Category C1 - Nominal discharge current (8/20 µs) per wire	I_n	1 kA			
Category C1 - Voltage protection level at In (all modes)	U_p	70 V dc	80 V dc	150 V dc	220 V dc
Category C2 - Nominal discharge current (8/20 µs) per wire	I_n	15 kA			
Category C2 - Voltage protection level at In (all modes)	U_p	110 V dc	130 V dc	180 V dc	260 V dc
Category C3 - Voltage protection level at 1 kV/µs (all modes)	U_p	≤ 45 V	≤ 50 V	≤ 50 V	≤ 70 V
Category D1 - Impulse discharge current (10/350 µs) per wire	$I_{imp\ 10/350}$	2,5 kA			
Category D1 - Total discharge current (10/350 µs)	$I_{Total\ 10/350}$	5 kA			
Response time	t_a	≤ 1ns			
Bandwidth		100 MHz			
Data Rate		100 Mbit/s			
Longitudinal impedance/resistance		1,8 Ω			
Parasitic capacitance	C	1,5 nF			
Operating temperature range		-25 ... +70 °C			
Terminals - conductor size		max. 1,5 mm² flexible			
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715			
Housing		thermoplastic			
Degree of protection	IP	20			
Approximate weight		50 g			
Dimension: width		17,5 mm (1 module)			

TECHNICAL DATA

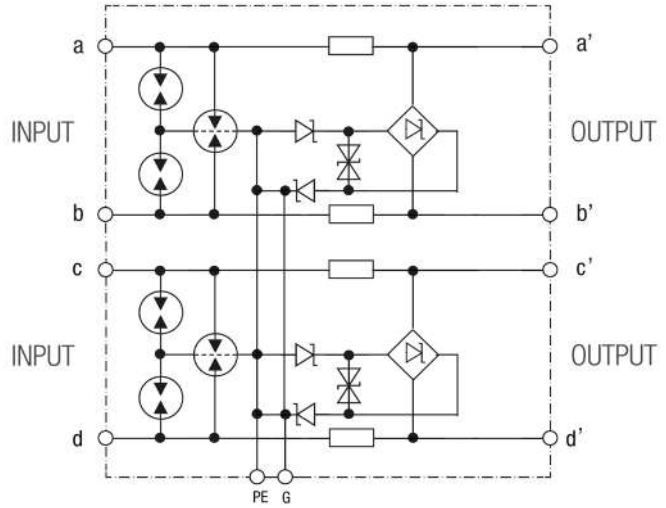
MODEL S-ASI 1 B ...



Typical protection scheme for high frequency data transmission interfaces. The protection allows data transmission up to 100 Mbit/s.

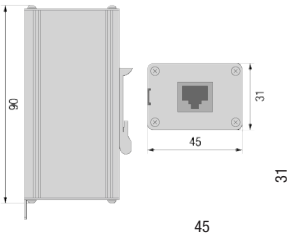
The voltage protection level provided by these devices is not affected by the steepness of the transient.

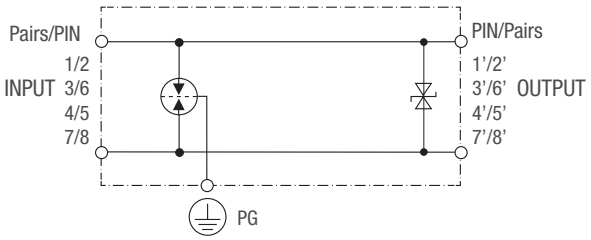
MODEL S-ASI 2 B ...



		PROFIBUS			
Model S-ASI 2 B ...		6	12	24	48
CODE		**343 206**	**343 212**	**343 224**	**343 248**
Number of protected Lines		2			
SPD impulse rating/Category		C1, C2, C3, D1			
Nominal Voltage	U_N	6 V dc/ 4,2 V ac	12 V dc/9 V ac	24 V dc/18 V ac	48 V dc/39 V ac
Maximum Continuous Operating Voltage	U_C	7,2 V dc	14,4 V dc	28,8 V dc	57,6 V dc
Rated Current	I_L	0,5 A			
Category C1 - Nominal discharge current (8/20 µs) per wire	I_n	1 kA			
Category C1 - Voltage protection level at In (all modes)	U_p	70 V dc	80 V dc	150 V dc	220 V dc
Category C2 - Nominal discharge current (8/20 µs) per wire	I_n	15 kA			
Category C2 - Voltage protection level at In (all modes)	U_p	110 V dc	130 V dc	180 V dc	260 V dc
Category C3 - Voltage protection level at 1 kV/µs (all modes)	U_p	≤ 45 V	≤ 50 V	≤ 50 V	≤ 70 V
Category D1 - Impulse discharge current (10/350 µs) per wire	$I_{imp\ 10/350}$	2,5 kA			
Category D1 - Total discharge current (10/350 µs) per line	$I_{Total\ 10/350}$	5 kA			
Response time	t_a	≤ 1ns			
Bandwidth		100 MHz			
Data Rate		100 Mbit/s			
Longitudinal impedance/resistance		1,8 Ω			
Parasitic capacitance	C	1,5 nF			
Operating temperature range		-25 ... +70 °C			
Terminals - conductor size		max. 1,5 mm² flexible			
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715			
Housing		thermoplastic			
Degree of protection	IP	20			
Approximate weight		50 g			
Dimension: width		17,5 mm (1 module)			

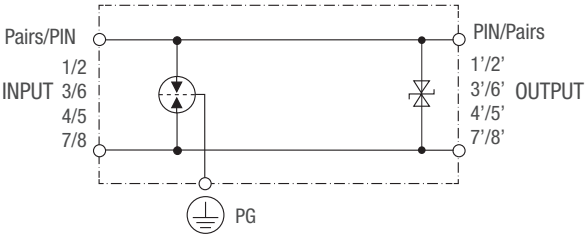
S-F 1/6



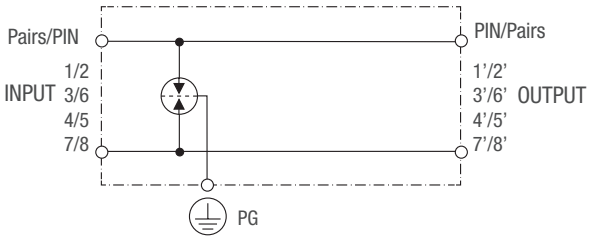


model S-F 1/6 Code 318 008
general layout for each of
the four wire pairs in the line

S-F 1/48 PoE+ ...



model S-F 1/48 PoE+ Code 318 009
general layout for each of
the four wire pairs in the line



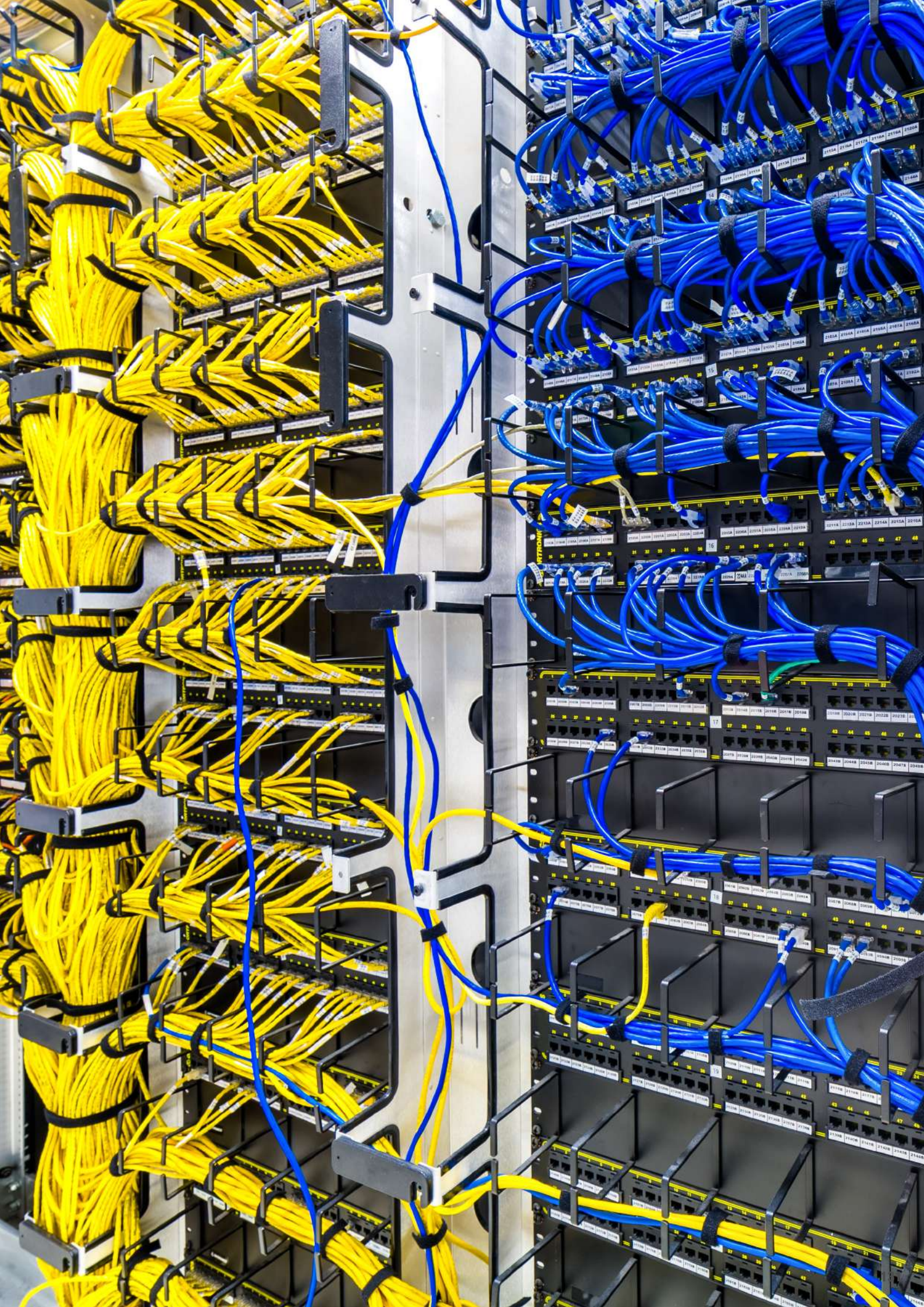
model S-F 1/48 PoE+ b Code 318 010
general layout for each of
the four wire pairs in the line

S-F 1/6 is an SPD for the protection of equipment connected to Category 6 A cable systems according to EN 50173-1.
S-F 1/48 PoE+ and S-F 1/48 PoE+ b are SPDs for the protection of equipment connected to Category 6 A cable systems according IEEE 802.3 at and ISO/IEC 11801 for 10 GB applications.
They are equipped with RJ 45 female connectors. Typical applications are for the protection of cameras or CCTV systems connected via Ethernet cables, providing the following features and benefits:

- Suitable for installation at boundaries 1 – 2 and higher, in accordance with the lightning protection zones concept;
- Protection of all four wire pairs in each line;
- In patch panel boards the S-F 1/6 or S-F 1/48 PoE is installed between the incoming lines and the hub/switch.

TECHNICAL DATA

Model S-F ...		1/6	1/48 PoE+	1/48 PoE+ b
CODE		**318 008**	**318 009**	**318 010**
SPD impulse rating / Category			C2, C3	
Number of protected lines	n		1 (four wire pairs)	
Nominal dc Voltage	U_N	6 V	48 V	48 V
Max. Continuous Operating Voltage (dc)	U_C	7,2 V	58 V	58 V
Rated Line Current	I_L	100 mA	1 A	1 A
Category C2 - Nominal Discharge Current (8/20 µs) per wire	I_n	1 kA	1 kA	1 kA
Category C2 - Voltage Protection level at In (all modes)	U_p	≤ 15 V	≤ 120 V	≤ 600 V
Category C3 - Voltage Protection level at 1 kV/µs (all modes)	U_p	≤ 9 V	≤ 120 V	≤ 600 V
Data rate		100 Mbit/s	250 Mbit/s	250 Mbit/s
Category (according IEEE 802.3 at)		6	6 A	6 A
Bandwidth	f	500 MHz	500 MHz	500 MHz
Typical attenuation at 500 MHz	a_E	2,7 dB	2,7 dB	2,7 dB
Maximum capacitance wire-wire	C	≤ 50 pF	≤ 50 pF	≤ 50 pF
Operating temperature range		-40 … +70 °C	-40 … +70 °C	-40 … +70 °C
Connectors (input and output)		RJ 45 female	RJ 45 female	RJ 45 female
Protected pairs		1/2, 3/6, 4/5, 7/8	1/2, 3/6, 4/5, 7/8	1/2, 3/6, 4/5, 7/8
Mounting		indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715	indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
PE/PG connection		6,3 mm flat quick connect male tab + 1,5 mm^2 cable	6,3 mm flat quick connect male tab + 1,5 mm^2 cable	6,3 mm flat quick connect male tab + 1,5 mm^2 cable
Approximate weight		105 g	105 g	105 g
Dimentions		l 45 x h 31 x w 90 mm	l 45 x h 31 x w 90 mm	l 45 x h 31 x w 90 mm

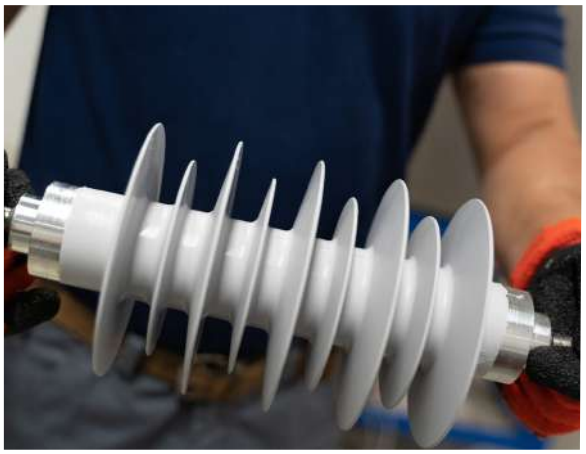


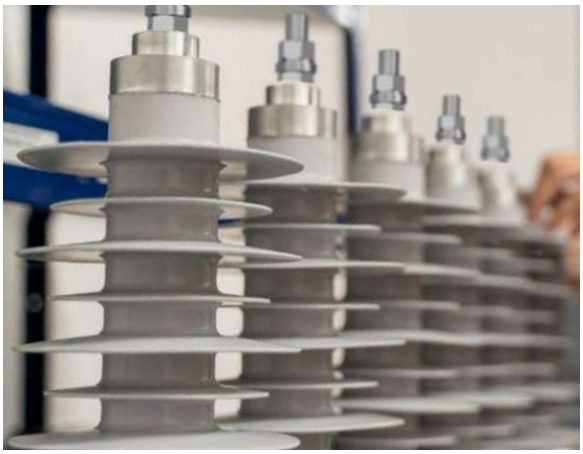
ZOTUP SURGE ARRESTERS FOR HIGH VOLTAGE SYSTEMS (HV)

SURGE ARRESTERS
FOR HIGH VOLTAGE SYSTEMS (HV)

Surge Arresters are in accordance with IEC/EN 60099-4:2014 and their typical application is in the high voiltage distribution system for the protection of transformers, switchgear and transmission lines.

- Surge Arresters with a higher thermal energy rating than 4,5 kJ/kV are available upon request.
- Surge Arresters with silicone rubber housing providing big internal and external creepage distances suitable for all applications even with a high level of pollution.
- Surge Arresters available with external disconnector device, which is activated by an increase in internal pressure with a reliable operating mechanism and providing a stable characteristic even over long time.
- Additional impulse counters and impulse counters with analog meter for indication of the total leakage current (internal and external dispersion) are available.





SURGE ARRESTERS
FOR HIGH VOLTAGE SYSTEMS (HV)

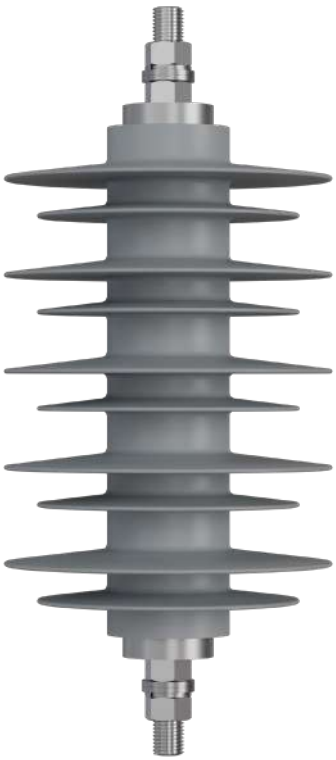
Alternating Current Systems (AC)

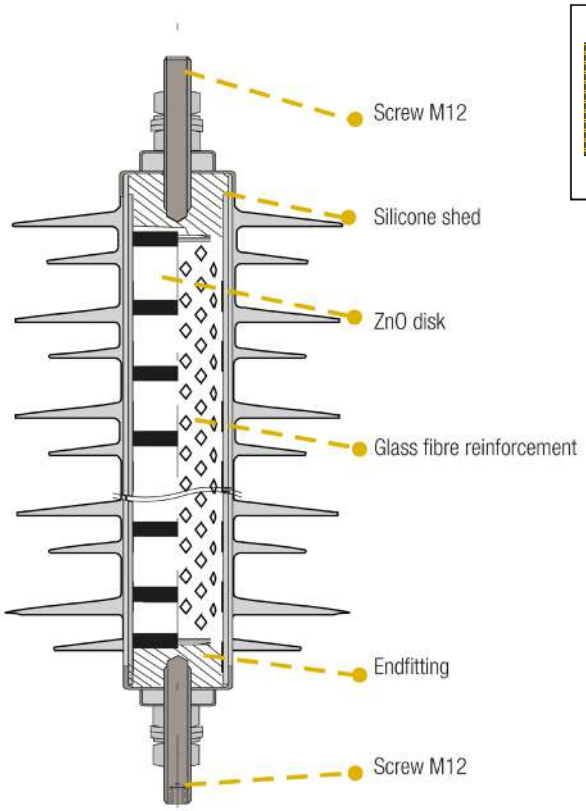
SPD	Modello	Application icon	System voltage kV	Rated voltage kV	Thermal energy rating kJ/kV of Ur (IEC 60099-4 Ed. 3.0; 2014)	Nominal discharge current I_n kA (8/20 µs)	Location	Page
	HV SL 12		10	12	4,5	10	indoor + outdoor	137
	HV SL 18		15	18	4,5	10	indoor + outdoor	137
	HV SL 24		20	24	4,5	10	indoor + outdoor	137
	HV SL 30		24	30	4,5	10	indoor + outdoor	137
	HV SL 36		30	36	4,5	10	indoor + outdoor	137

Direct Current Systems (DC)

SPD	Model	Application icon	System voltage V	Rated voltage kV	Line discharge class (IEC 60099-4 Ed. 2.2; 2009)	Thermal energy rating kJ/kV of Ur (IEC 60099-4 Ed. 3.0; 2014)	Nominal discharge current I_n kA (8/20 µs)	Location	Page
	HV DC 1/10		1000	1,0	DC-B	12	10	indoor + outdoor	141
	HV DC 1,5/10		1500	1,5	DC-B	12	10	indoor + outdoor	141
	HV DC 2/10		2000	2,0	DC-B	12	10	indoor + outdoor	141
	HV DC 3/10		3000	3,0	DC-B	12	10	indoor + outdoor	141
	HV DC 4/10		4000	4,0	DC-B	12	10	indoor + outdoor	141
	HV DC 4,5/10		4500	4,5	DC-B	12	10	indoor + outdoor	141

HV-SL





HV-SL is a medium/high voltage surge arrester for the protection of transformers, metalclad switchgear and transmission lines against atmospheric and switching overvoltages, ideal for indoor or outdoor applications and where a high level of pollution is expected, with the following features and benefits:

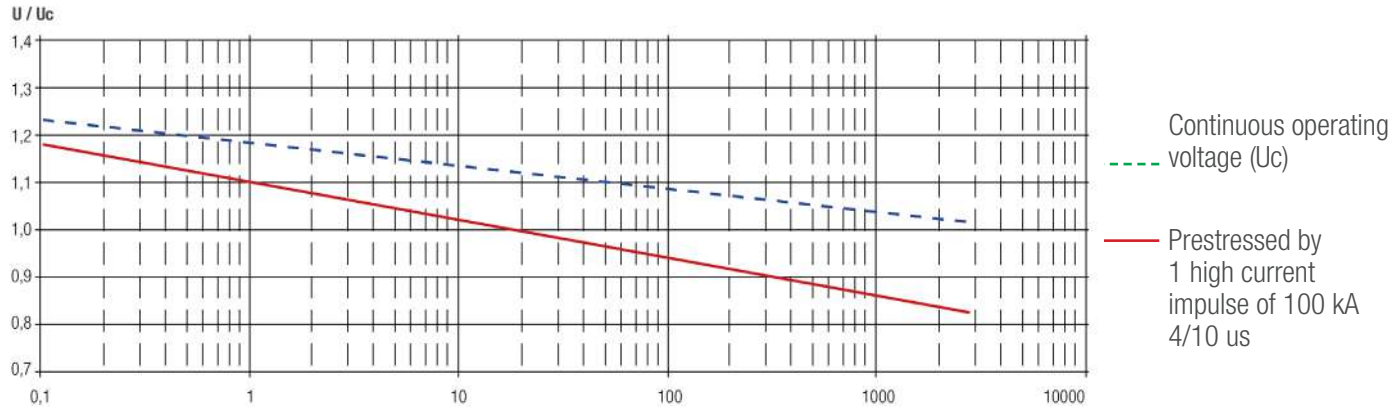
- Installation of these surge arresters on the HV -side simplifies the selection of the surge protective devices on the low voltage side (in TN or TT systems) which are intended to protect against transient phenomena coming from the line;
- Compliant with IEC/EN 60099-4;
- State of the art metal oxide surge arresters without a spark gap and with silicone rubber housing;
- Very high short-circuit current withstand;
- Size and volume of the surge arresters based on the practicable minimum for each nominal voltage;
- High tightening torque of the line terminals;
- The construction and manufacturing process prevent partial discharges;
- Sealed with aluminium fittings and terminated with stainless steel bolts, including nuts and washers.

Model HV-SL

Class (IEC 60099-4 Ed. 3.0; 2014)		Station Low SL
Thermal energy rating (IEC 60099-4 Ed. 3.0; 2014)	W_{th}	4,5 kJ/kV
Repetitive charge transfer rating	Q_{rs}	1,2 C
Thermal charge transfer rating	Q_{th}	1,1 C
Nominal discharge current	I_n	10 kA
Rated voltage	U_r	from 3 kV to 60 kV
Rated frequency		from 48 Hz to 62 Hz
High current impulse		100 kA (4/10 µs)
Short-circuit current capability		63 kA
Ambient temperature range		- 60 ... + 60 °C
Altitude		up to 1000 m above sea level
Torsional strength		100 Nm
Specified short-time tensile strength		500 Nm
Specified long-term tensile strength		350 N
Insulator		silicone rubber HTV
Insulator colour		grey RAL 7040

Rated voltage	Continuos operating voltage	Temporary over-voltage TOV		Max. residual voltage / Protection level					Switching impulse residual voltage			
Ur kV	Uc kV	1 sec. U1s kV	10 sec. U10s kV	10 kA (1/2 µs) STIPL kV	5 kA (8/20 µs) LIPL (U_{pl}) kV	10 kA (8/20 µs) LIPL (U_{pl}) kV	20 kA (8/20 µs) LIPL (U_{pl}) kV	40 kA (8/20 µs) LIPL (U_{pl}) kV	500 A (30/70 µs) SIPL (U_{ps}) kV	1.000 A (30/70 µs) SIPL (U_{ps}) kV	2.000 A (30/70 µs) SIPL (U_{ps}) kV	3.000 A (30/70 µs) SIPL (U_{ps}) kV
3	2,4	3,3	3,1	8,7	7,3	8,0	8,8	10,1	6,1	6,3	6,6	6,8
6	4,8	6,6	6,1	17,3	14,7	16,0	17,6	20,3	12,2	12,6	13,2	13,7
9	7,2	9,9	9,2	26,0	22,0	23,9	26,4	30,4	18,3	19,0	19,9	20,5
12	9,6	13,2	12,2	34,6	29,4	31,9	35,2	40,5	24,4	25,3	26,5	27,4
15	12,0	16,5	15,3	43,3	36,7	39,9	44,0	50,7	30,5	31,6	33,1	34,2
18	14,4	19,8	18,4	51,9	44,1	47,9	52,8	60,8	36,6	37,9	39,7	41,0
21	16,8	23,1	21,4	60,6	51,4	55,9	61,6	70,9	42,7	44,2	46,4	47,9
24	19,2	26,4	24,5	69,3	58,8	63,8	70,4	81,1	48,8	50,6	53,0	54,7
27	21,6	29,7	27,5	77,9	66,1	71,8	79,2	91,2	54,9	56,9	59,6	61,5
30	24,0	33,0	30,6	86,6	73,5	79,8	88,0	101,3	61,0	63,2	66,2	68,4
33	26,4	36,3	33,7	95,2	80,8	87,8	96,8	111,5	67,2	69,5	72,9	75,2
36	28,8	39,6	36,7	103,9	88,2	95,8	105,6	121,6	73,3	75,8	79,5	82,1
39	31,2	42,9	39,8	112,6	95,5	103,7	114,4	131,7	79,4	82,2	86,1	88,9
42	33,6	46,2	42,8	121,2	102,9	111,7	123,2	141,9	85,5	88,5	92,7	95,7
45	36,0	49,5	45,9	129,9	110,2	119,7	132,0	152,0	91,6	94,8	99,4	102,6
48	38,4	52,8	49,0	138,5	117,6	127,7	140,8	162,2	97,7	101,1	106,0	109,4
51	40,8	56,0	52,0	147,0	125,0	136,0	150,0	172,0	104,0	107,0	113,0	116,0
54	43,2	59,0	55,0	156,0	132,0	144,0	158,0	182,0	110,0	114,0	119,0	123,0
60	48,0	66,0	61,0	173,0	147,0	160,0	176,0	203,0	122,0	126,0	132,0	137,0

Power frequency voltage versus time characteristcs (TOV) (pre-heated to 60 °C)



Selection of surge arresters must be carried out in accordance with IEC/EN 60099-5

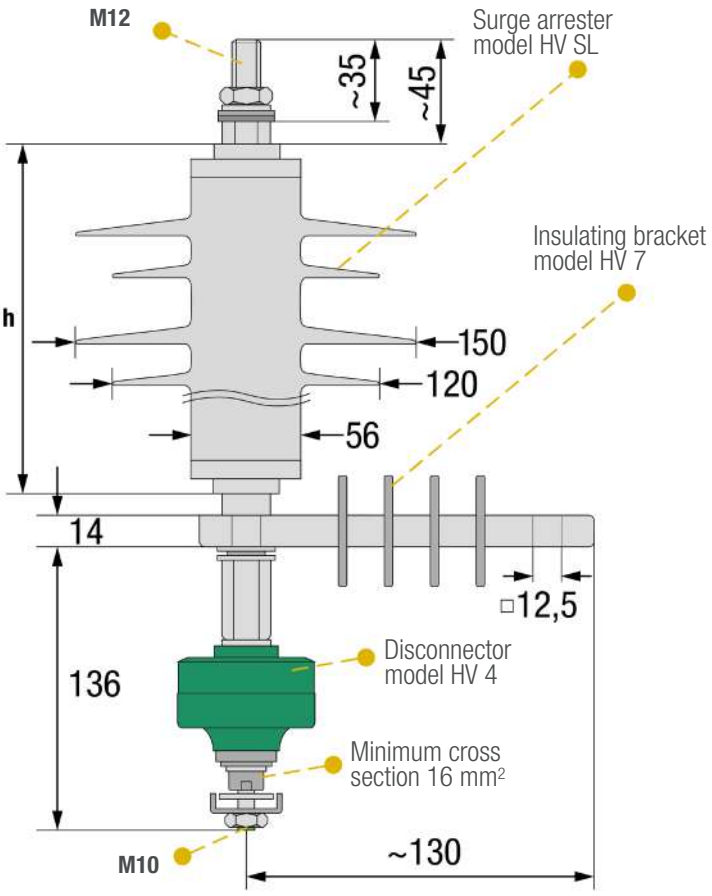
HV SL	• Surge arrester with silicone rubber housing
SL	• Arrester classification: Station SL
3…60	• Rated surge arrester voltage

NOTE:
All surge arresters HV SL have an increased creepage distance.

Rated voltage	Height	Creepage distance total	Weight	Surge arrester insulation			Surge arrester distance		Model	CODE
Ur kV	h mm	mm	kg	Withstand voltage (dry) Unstw kV	Withstand voltage (wet) Unstw kV	Lightning impulse withstand Unsts kV	Phase/ Phase LL mm	Phase/ Ground LE mm	HV SL	
3	120	387	1	34	22	50	156	108	3	**130 403**
6	164	574	1	42	26	60	156	128	6	**130 406**
9	164	574	1	48	32	70	181	148	9	**130 409**
12	208	762	2	56	39	82	201	168	12	**130 412**
15	208	762	2	60	40	86	221	183	15	**130 415**
18	208	762	2	64	42	92	246	203	18	**130 418**
21	252	950	3	70	46	104	266	223	21	**130 421**
24	252	950	3	78	52	114	291	243	24	**130 424**
27	296	1.137	3	82	54	120	311	258	27	**130 427**
30	296	1.137	3	94	62	136	331	278	30	**130 430**
33	340	1.325	4	100	66	146	356	298	33	**130 433**
36	340	1.325	4	126	84	184	381	318	36	**130 436**
39	340	1.325	4	134	88	194	396	333	39	**130 439**
42	384	1.513	4	142	94	206	421	353	42	**130 442**
45	384	1.513	4	152	100	222	446	373	45	**130 445**
48	428	1.700	5	156	104	226	471	393	48	**130 448**
51	428	1.700	5	168	112	246	486	408	51	**130 451**
54	428	1.700	5	266	176	386	511	428	54	**130 454**
60	470	1.886	6	266	176	386	561	468	60	**130 460**

In order to simplify selection and ordering, the most common configurations and system voltages on the European grid (impedance earthed neutral and protection relyas for the elimination of the earth faults) are indicated below. This recommended dimensioning is also suitable for system configurations as indicated in Italian CEI 0-16.

For systems with operating voltage 10 kV	(HV SL 12) (HV 7) (HV 4)	N.3 N.3 N.3	COD. 130 412 COD. 107 000 COD. 104 000
For systems with operating voltage 15 kV	(HV SL 18) (HV 7) (HV 4)	N.3 N.3 N.3	COD. 130 418 COD. 107 000 COD. 104 000
For systems with operating voltage 20 kV	(HV SL 24) (HV 7) (HV 4)	N.3 N.3 N.3	COD. 130 424 COD. 107 000 COD. 104 000
For systems with operating voltage 24 kV	(HV SL 30) (HV 7) (HV 4)	N.3 N.3 N.3	COD. 130 430 COD. 107 000 COD. 104 000
For systems with operating voltage 30 kV	(HV SL 36) (HV 7) (HV 4)	N.3 N.3 N.3	COD. 130 436 COD. 107 000 COD. 104 000



HV 7

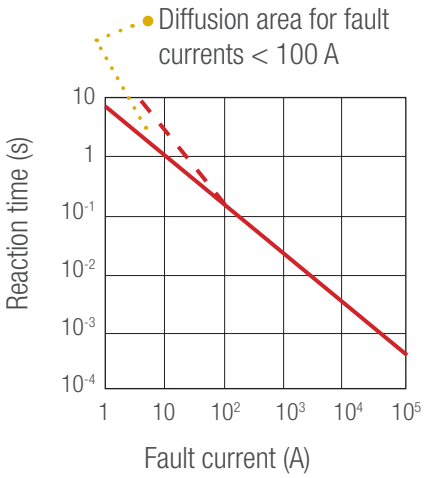
Insulating bracket model HV 7
This insulating support is necessary to support the lower arrester end, when the disconnector device model HV 4 is applied. This fixes the arrester and avoids leakage currents to ground.

Model HV 7

CODE	107 000
Max. applicable voltage	30 kV

HV 4

Disconnector characteristic



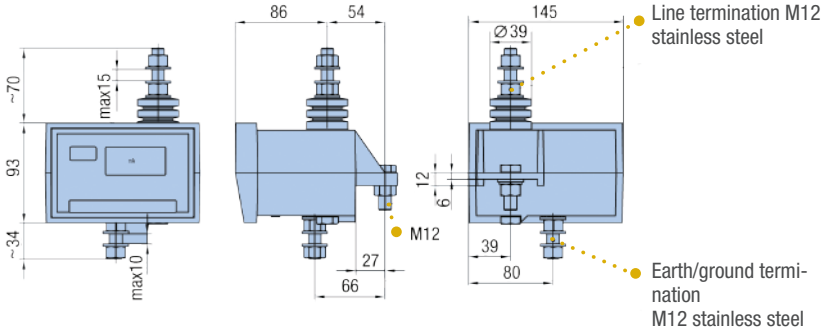
Disconnector device model HV 4
Surge arresters for high voltage systems are often equipped with a disconnector that permits the disconnection of the surge arrester in case of an internal fault. This disconnection prevents a persistent fault in the network and provides a visual indication that the surge arrester is defective. The disconnector is activated by an increase in internal pressure due to the electric arc caused by the sublimation of the internal connecting wire as a result of the fault current. The operating mechanism is very reliable and the characteristc remains constant even over long period of time.

NOTE: It is important to ensure that sufficient insulating distance is kept for parts remaining energised after the detachment of the lower part of the disconnector.

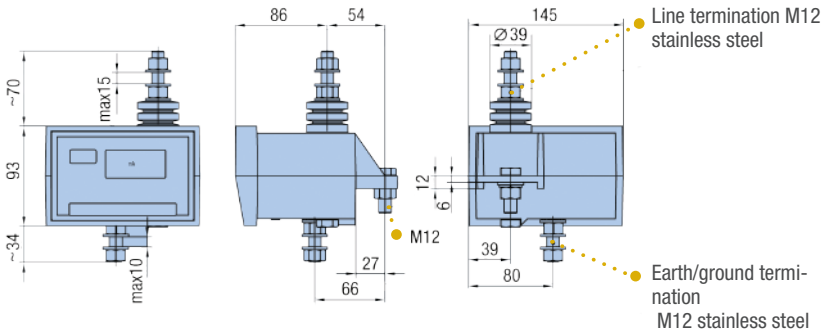
Model HV 4

CODE	104 000
Nominal discharge current (8/20 µs)	10 kA
Frequency	48 - 62 Hz
Altitude	Up to 3000 m above sea level
Housing	Polyethylene with a low pressure rating, stabilized against UV
Minimum cross section and lenght for connection	16 mm² flexible / 300 mm

HV SC



HV SC-M



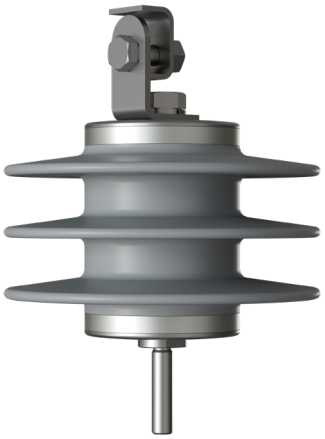
Lightning surge counter models HV SC and HV SC-M
In compliance with the standards IEC/EN 62561-6.
The installation of the lightning surge counter must be combined with a surge arrester mounted with an insulating support.
Lightning surge counters do not require a power supply, they are installed at the earth/ground terminal of a single surge arrester or at the common earth/ground connection of a group of arresters.
The HV SC model is capable of counting surges to ground.
The HV SC-M model counts surges to ground and provides an indication of the total leakage current via an analogue meter.
A significant change in the value of the indicated current after installation shows a deterioration of the surge arrester or an increased level of pollution on its outer insulator surface.
Both models can, upon request, be supplied with an auxiliary contact for remote monitoring of the counting.

TECHNICAL DATA

Model		HV SC	HV SC-M
CODE		**105 000**	**106 000**
Classification according to IEC/EN 62561-6		Type II	Type II
Minimum discharge current counted (8/20 µs)	$I_{n\,min}$	100 A	100 A
Maximum discharge current counted (8/20 µs)	$I_{n\,max}$	100 kA	100 kA
Residual voltage at 100 kA 4/10 µs		6 kV peak	6 kV peak
Surge counter		6 digit	6 digit
Maximum counting frequency		5/second	5/second
Analogue leakage current meter		-	0-30 mA Peak/√2

Model … with remote signal contact		HV SC t	HV SC-M t
CODE		**105 001**	**106 001**
Remote signal contact		Potential free normally open contact	
Terminal-conductor size for remote signal contact		max. 1,5 mm² flexible	
Switching capacity		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A	

HV DC



HV DC is a surge arrester for application in direct current systems and particularly for electric traction systems (railway, underground).

It provides the following features and benefits:

- varistor based surge arrester with limiting operation for protection of direct current systems against overvoltages, able to withstand lightning currents;
- This SPD is Installed in a vertical position, either hooked on overhead lines or mounted on electric motors;
- Its high mechanical resistance to bumps and vibrations complies with IEC/EN 60068 part 2-29;
- Its silicone rubber housing with long creepage distance allows indoor and outdoor mounting;
- Its nominal discharge capability I_n is 10 kA (8/20);
- It is available with continuous operating voltages from 1 to 4kV DC.;
- Size and volume of the surge arresters based on the practicable minimum for each rated voltage;
- The insulator of the surge arrester is characterized by the absence of junction lines;
- The construction and manufacturing process prevent partial discharges;
- Sealed with aluminium fittings and terminated with stainless steel clamps, screws and washers.

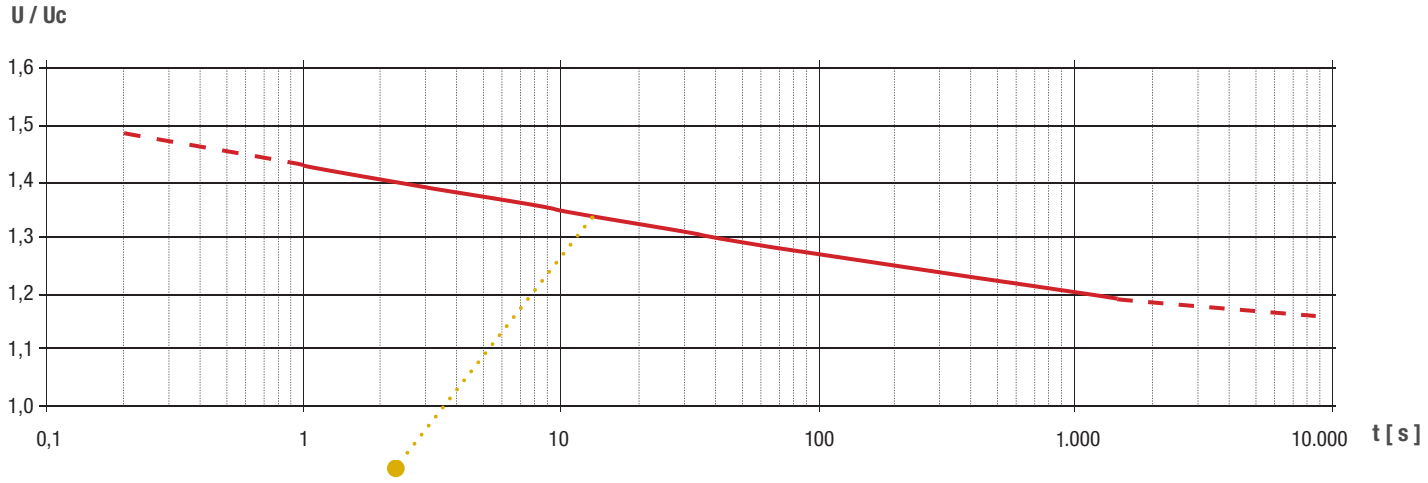
Model HV DC -/10

Nominal voltages	U_r	from 1 kV to 4.5 kV
Nominal discharge current	I_n	10 kA
Strong current pulse	I_{hc}	100 kA 4/10 µs
Class according to IEC 62848 (2016-06)		DC-B
Thermal energy performance kJ/kV (IEC 60099-4)		12 kJ/kV at Ur
Load		2.5 As
Rated short circuit current		40 kA / 0.2 s
Mechanical impact resistance IEC/EN 60068 part 2-29		15 g
Vibration resistance IEC/EN 60068 part 2-6		3 g (10 - 500 Hz)
Room temperature		- 60 ... + 60 °C
Short-term load (SSL)		1,100 Nm
Long Term Load (SSL)		450 Nm
Isolator		HTV silicone rubber
Insulator color		RAL 7040 grey

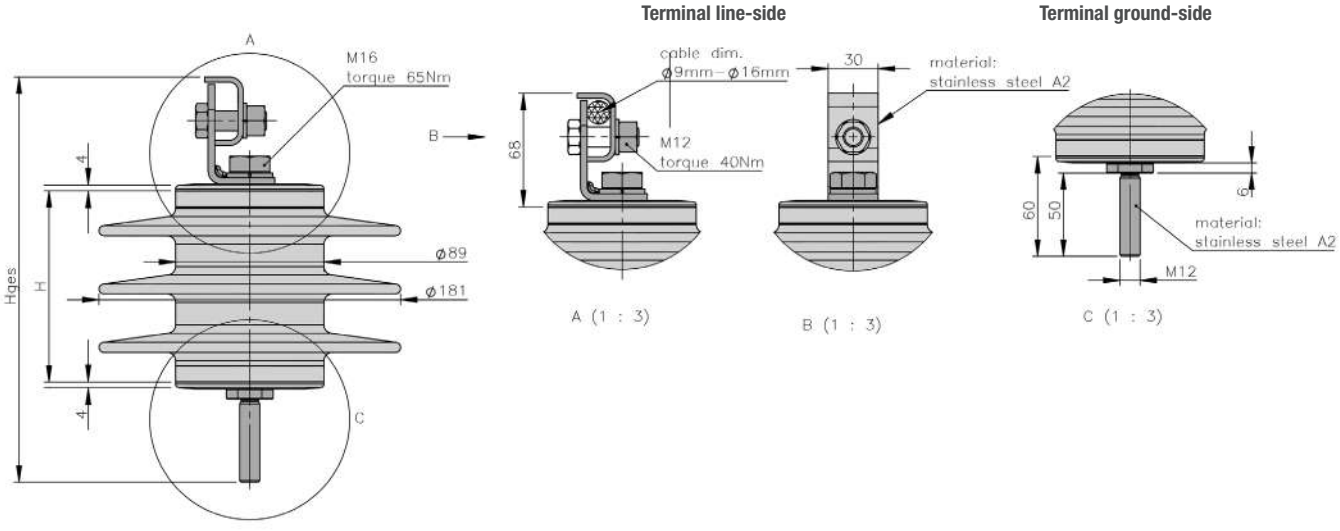
* for application at altitudes above 1000 m apply apply altitude correction factors according IEC

Rated voltage	Continuous operating voltage	Max. residual voltage / Protection level							Height	Total creepage distance	Weight	Surge arrester insulation		Model	CODE
Ur kV	Uc kV	10 kA 1/2 µs kV	5 kA 8/20 µs U_{pl} kV	10 kA 8/20 µs U_{pl} kV	20 kA 8/20 µs U_{pl} kV	250 A 30/70 µs U_{ps} kV	500 A 30/70 µs U_{ps} kV	1000 A 30/70 µs U_{ps} kV	h mm	mm	kg	Withstand voltage wet Unst kV	Lightning impulse withstand wet Unsch kV	HV DC	
1,0	1,0	2,7	2,5	2,6	2,8	2,0	2,1	2,1	115	320	3,1	≥ 35	≥ 123	1/10	111 001
1,5	1,5	3,7	3,5	3,7	3,9	2,8	2,9	3,0	115	320	3,2	≥ 35	≥ 123	1,5/10	111 005
2,0	2,0	5,1	4,8	5,0	5,4	3,9	4,0	4,1	115	320	3,3	≥ 35	≥ 123	2/10	111 002
3,0	3,0	7,5	6,9	7,3	7,9	5,7	5,8	6,0	115	320	3,4	≥ 35	≥ 123	3/10	111 003
4,0	4,0	10,2	9,5	10,0	10,8	7,8	8,0	8,2	115	320	3,1	≥ 35	≥ 123	4/10	111 004
4,5	4,5	11,5	10,7	11,3	12,2	8,8	9,0	9,2	115	320	3,4	≥ 35	≥ 123	4,5/10	111 006

Power frequency voltage versus time characteristic (TOV) (pre heated to 60 °C)



Pre stressed by 1 high current impulse of
100 kA 4/10 µs



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ZOTUP® S.r.l.

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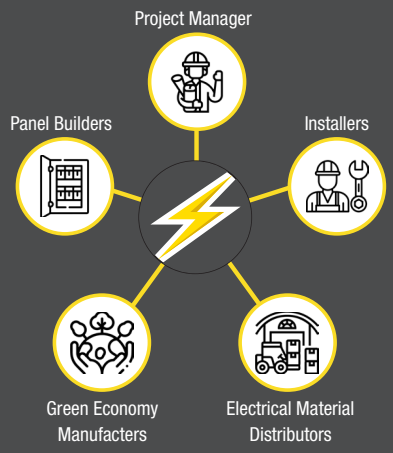

Our technical staff is able to:

- **Support you with systems sizing;**
- **Suggest you the nearest dealers;**
- **Provide you with technical support on field.**

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