CATALOGUE 2020/2021

ZOTUP®

INNOVATIVE SURGE PROTECTION

MADE IN ITALY

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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.

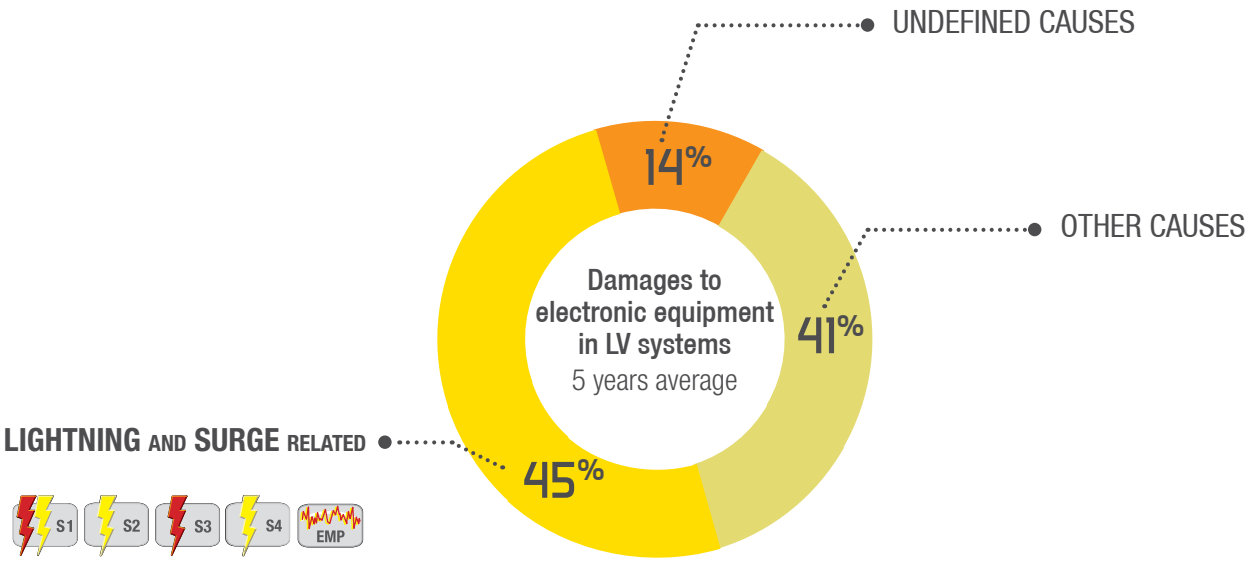
INNOVATION Continuous further development is the heartbeat of **ZOTUP**. Cutting -edge products are the answer to our customers needs.

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

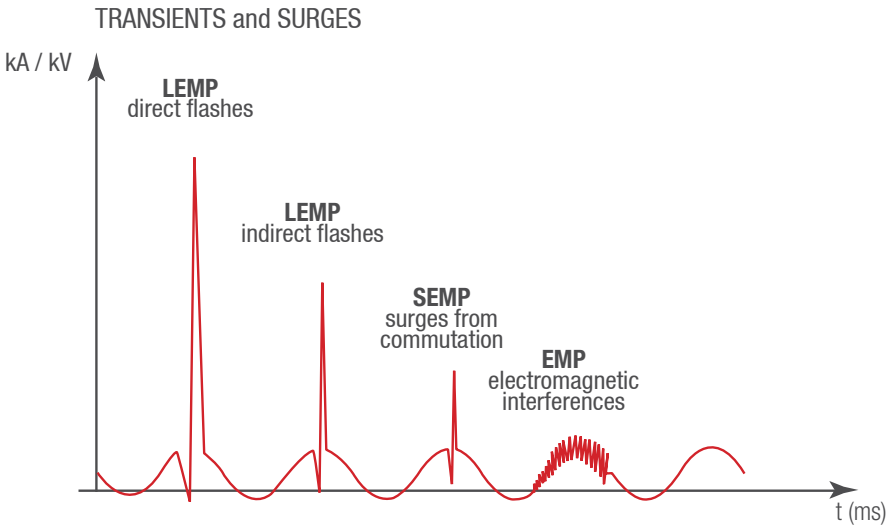
SURGE PROTECTIVE DEVICES - WHY?

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

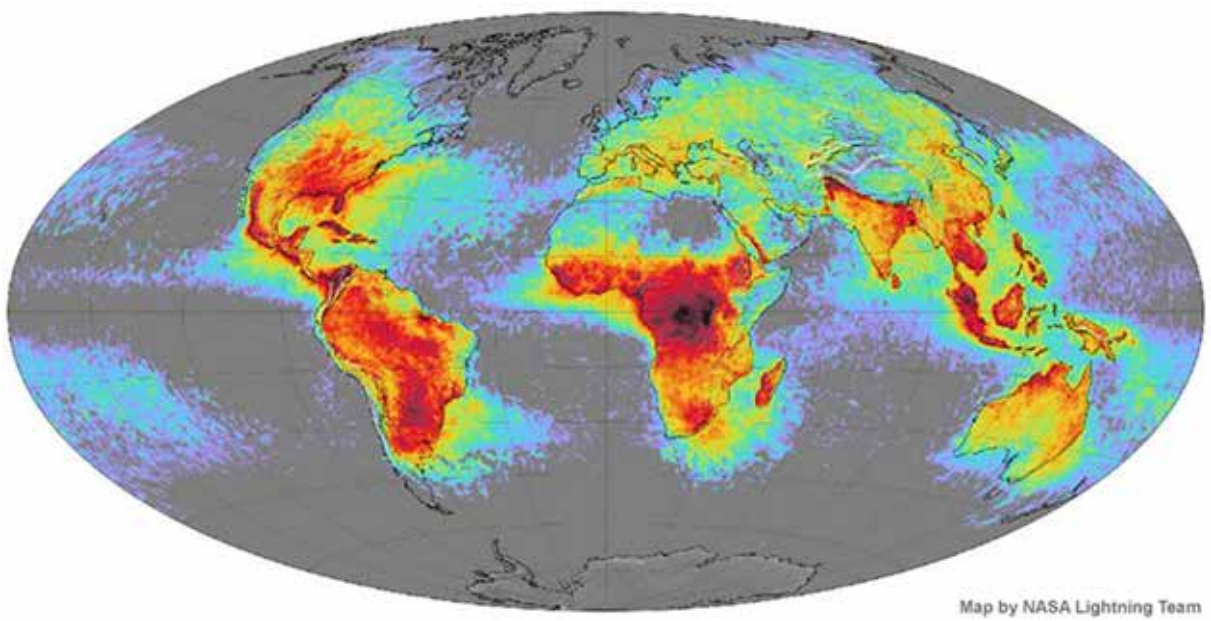
In the Internet era and with the exponentially increasing use of electrical and electronic equipment containing sensitive integrated circuits and semi-conductors with high cost implication in case of damage, increasing attention to transient phenomena of atmospheric origin and to the resulting surges 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



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 appearance 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 parts of the Earth, but only rarely in other areas of it. 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 localization 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 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 database where available. Where no such database exists, the standard IEC 62858 Ed.2 (2019-10) defines to get the N_G to devide the Flash NASA Data by 2,5.

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 61643-11 Ed. 1 (2011-03)
EN 61643-11 (2012-10)

Low-voltage surge protective devices:

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

Requirements and test methods.

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

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

IEC 61643-21 Ed. 1.2 (2012-07)
EN 61643-21 +A1 +A2 (2001/2009/2013)

Low-voltage surge protective devices.

Part 21: Surge protective devices connected to telecommunications and signalling networks. Performance requirements and testing methods.

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

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)

Low-voltage surge protective devices.

Part 31: Requirements and tests methods for SPDs for photovoltaic applications.

IEC 61643-32 (2017-09)
CLC/TS 51543-32 (2020)

Surge protective devices connected to the d.c. side of photovoltaic installations. Selection and application principles.

IEC 62305 series Ed. 2 (2010-12)
EN 62305 series (2011/2012)

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 60364-5-534 (2015-09)
HD 60364-5-534 (2016-02)

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 (2014-05)
EN 61000-4-5 (2014)

Electromagnetic compatibility (EMC).

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

IEC 61439 series
EN 61439 series

Low-voltage switchgear and controlgear assemblies.

IEC 61439-1(2020) / EN 61439-1 (2011)
Part 1: General rules.

IEC 61439-2 (2011) / EN 62439-2 (2011)
Part 2: Power switchgear and controlgear assemblies.

IEC 61439-3 (2012) / EN 62439-3 (2012)+AC (2019)
Part 3: Distribution boards intended to be operated by ordinary persons (DBO).

IEC 61439-4 (2012) / EN 62439-4 (2013)
Part 4: Particular requirements for assemblies for construction sites (ACS).

IEC 61439-7 (2018) / EN IEC 61439-7 (2020)
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

Low-voltage surge protective devices –
Part 31: Requirements and test methods for SPDs for photovoltaic installations

Parafoudres basse tension
pécifique y compris en courant continu –
parafoudres pour 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

Installations électriques basse tension - Partie 5-
et mise en œuvre des matériels électriques - A

Errichten von Niederspannungsanlagen - Teil 5-53:
Errichtung elektrischer Betriebsmittel - Schalt-
Steuergeräte

This Harmonization Document was approve
CEN/CENELEC Internal Regulations which

Up-to-date lists and bibliographical refere
CENELEC Management Centre or to an

This Harmonization Document exists i

CENELEC members are the nationa
Denmark, Estonia, Finland, Former
Lithuania, Luxembourg, Malta, the
Turkey and the United Kingdom.

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IEC 61643-11

Edition 1.0 2011-03

INTERNATIONAL STANDARD

NORME INTERNATIONALE

Low-voltage surge protective devices –
Part 11: Surge protective devices connected to low-voltage power systems –
Requirements and test methods

Parafoudres basse tension –
Partie 11: Parafoudres connectés aux systèmes basse tension – Exigences et méthodes d'essai

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

Technic 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).

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

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

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

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

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

SPD tested with combination wave.

Voltage switching type 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 type 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 type 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 current path, between terminals that contains 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 an SPD as test class I or type 1. 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 an SPD as test class II or type 2.

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 Uoc.
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 fail 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 e.g. for preventive maintenance, before it has reached its end of life.

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 behaviour of failure mode in caso 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 IEC 61643-11:

Application	Test parameters of the TOV		
SPDs connected to:	For t_T = 5 s (Faults within the LV-system in the consumer installation) (requirements in 7.2.8.1 and test in 8.3.8.1)	For t_T = 120 min (Faults within the LV-system in the distribution system) (requirements in 7.2.8.1 and test in 8.3.8.1)	For t_T = 200 ms (Faults within the HV system) (requirements in 7.2.8.2 and test in 8.3.8.2)
	Withstand* mode required	**Withstand*** mode or **safe**** failure mode	**Withstand*** mode or **safe**** failure mode
	Test values of the TOV U_T (V)		
TN Systems			
Connected L-(PE)N o L-N	1,32 x U_{REF}	√ 3 x U_{REF}	-
Connected N-PE	-	-	-
Connected L-L	-	-	-
TT Systems			
Connected L-PE	√ 3 x U_{REF}	1,32 x U_{REF}	1200 + U_{REF}
Connected L-N	1,32 x U_{REF}	√ 3 x U_{REF}	-
Connected N-PE	-	-	1200
Connected L-L	-	-	-
IT Systems			
Connected L-PE	-	-	1200 + U_{REF}
Connected L-N	1,32 x U_{REF}	√ 3 x U_{REF}	-
Connected N-PE	-	-	1200 + U_{REF}
Connected L-L	-	-	-

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

**** Safe failure 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.

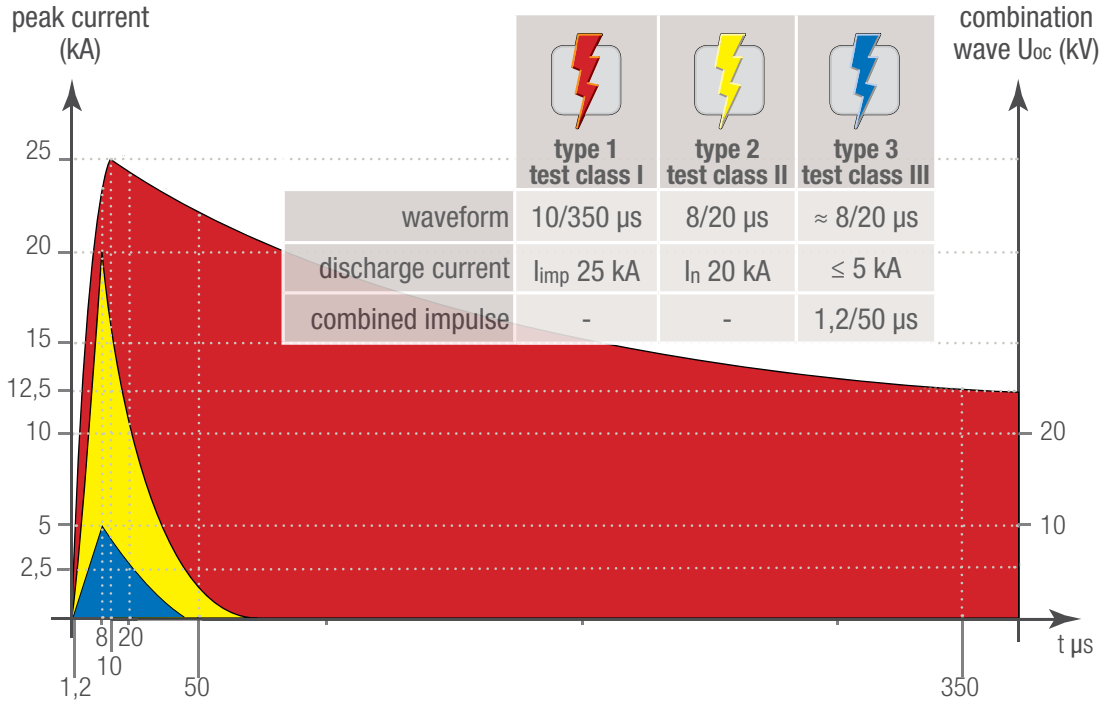
SPD test class I, II, III / Type T1 T2 T3

Surge protective devices are tested in accordance with the classification and parameters provided by the manufacturer. Depending on the intended application, according to HD 60364-5-534 or the EN 62305 series, there are three different test classes corresponding to three types of SPDs:

Type of SPD	IEC 61643-11 (2011-03)	EN 61643-11 (2012-10)	SPD icon
SPD for lightning equipotential bonding	SPD test class I	SPD type 1 T1	
SPDs for protection against transient overvoltages	SPD test class II	SPD type 2 T2	
SPDs for protection against transient overvoltages and for equipment protection	SPD test class III	SPD type 3 T3	
SPDs with filter for enhanced equipment protection	IEC 61000-4-5	EN 61000-4-5	

- SPD type 1: tested with the impulse discharge current I_{imp} (typically 10/350 µs) and with 8/20 µs current impulses;
- SPD type 2: 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 SPDs type 1 and type 2 are additionally tested with 1,2/50 µs voltage impulses;
- SPD type 3: tested with a combination wave 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 type 1, type 2 and type 3 SPDs in accordance with EN 61643-11



Short circuit withstand capability (short circuit current rating I_{sccr}):
During the normal operation of overvoltage protectiove 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 type 1 SPDs are required and partial lightning currents are to be expected.
If other kinds overcurrent protective devices than the ones recommended by the SPD manufacturer are used, this is under the full responsibility of the installer. Furthermore the higher internal impedance of such other devices compared to a fuse may add to the voltage drop under surge conditions and may therefore worsen 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 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 allows this follow current interrupt rating I_{fi} to be lower than the short-circuit current rating I_{sccr}, EN 61643-11requires this rating to be equal to the short-circuit current rating I_{sccr}. But both installation rules, IEC 60364-5-534 as well as HD 60364-5-534, 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.

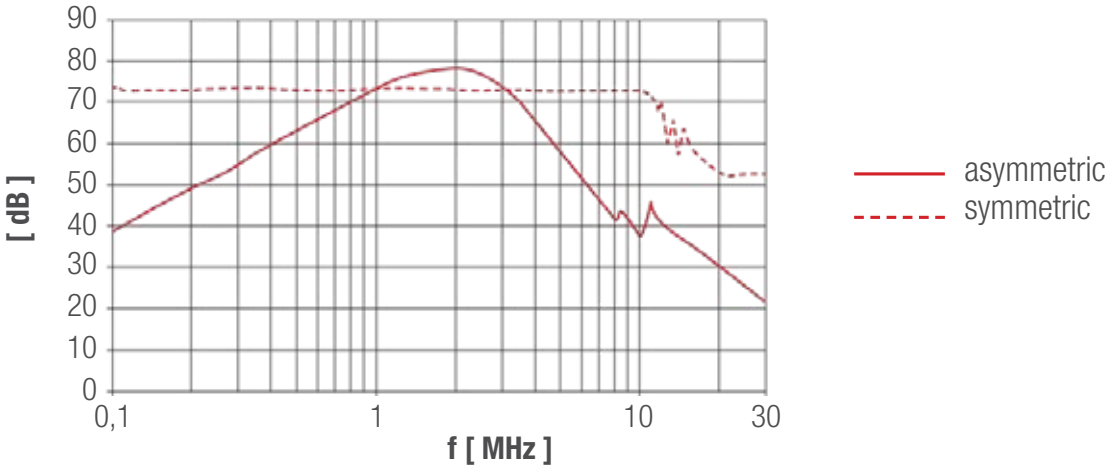
Response time t_a:
In EN 61643-11 the response time of SPDs is not directly addressed, but only an implicit factor when testing for the limiting voltage of voltage switching or combination SPDs. However, for semiconductors even very short peaks can be harmfull and therefore the response time of SPDs 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 all other tests are performed on single modes of protection, only I_{total} is particularly important for SPDs of type 1 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 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 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 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

- SPD Type 1 and 2 T1 T2
- SPD Type 2 T2
- SPD Type 3 T3
- SPD with additional filter

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

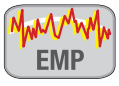
Lightning flash to a service - direct flash (Source of damage S3):

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**.

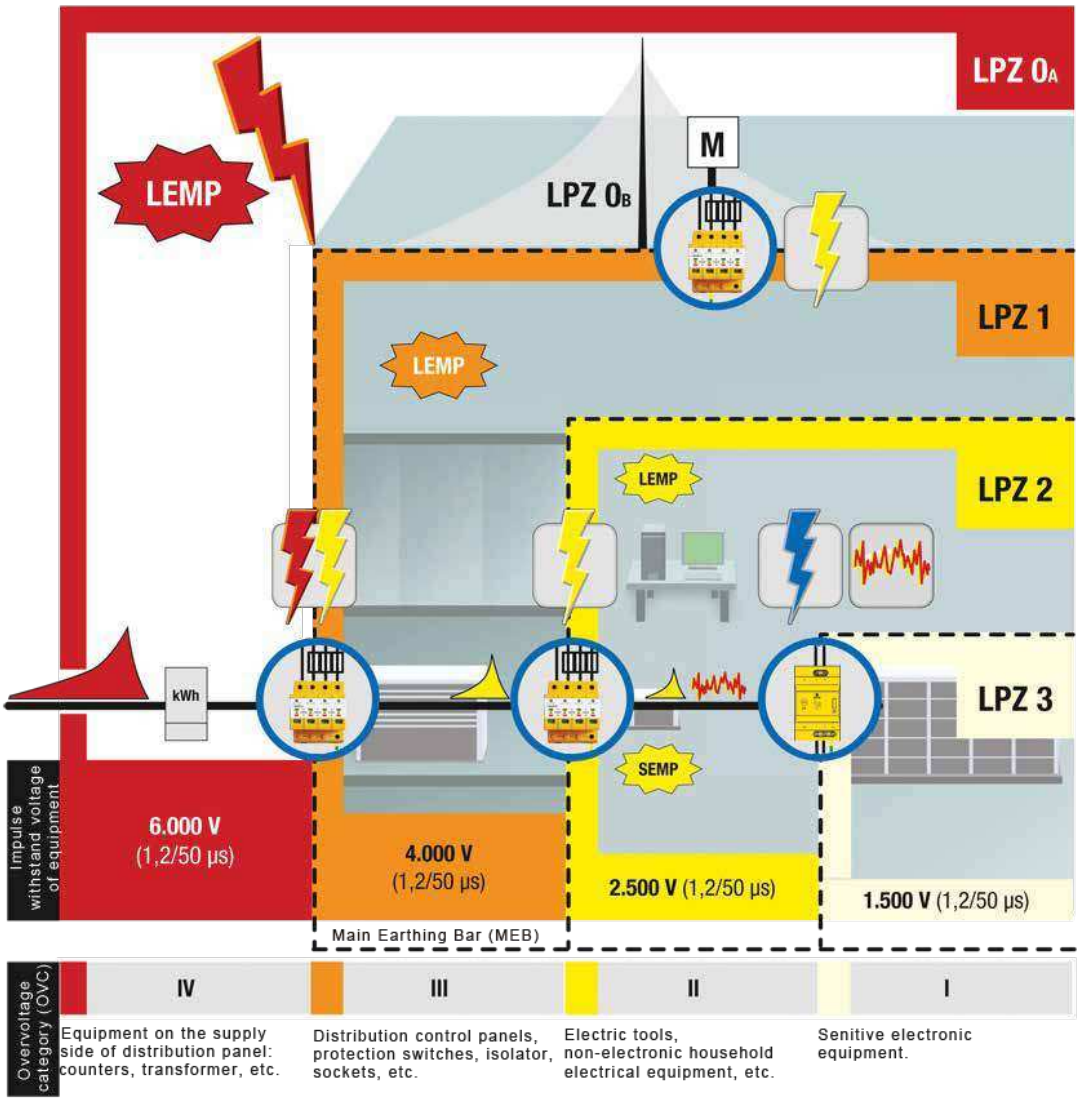
Electromagnetic interferences conducted by the service:



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 (S3 to 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 62305 series of standards respectively, and the HD 60364-5-534. 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 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 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 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 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 60364-5-534

The standard HD 60364-5-534 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 62305-2. Depending on the mode of protection, these minimum requirements are:

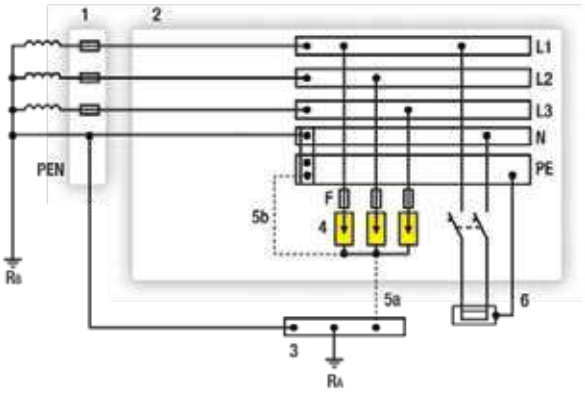
- For indirect lightning a nominal discharge current $I_n \geq 5$ kA 8/20 µs, and, when connection type CT2 is applied (3+1 or 1+1 connection), a nominal discharge current $I_n \geq 20$ kA 8/20 µs for the SPD mode connected N to PE in three-phase systems, and 10 kA 8/20 µs in single-phase systems. Nevertheless 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 60364-5-534

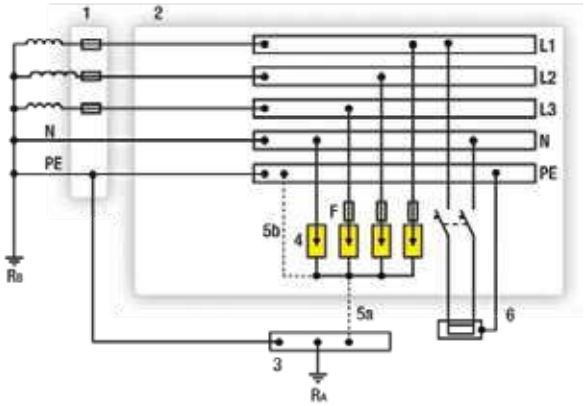
The installation of SPDs in a specific power distribution system must be coordinated with the protective measures against indirect contact (fault protection) and with the corresponding protective devices and their capability to withstand impulse currents.
This coordination depends on the type and earthing 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.



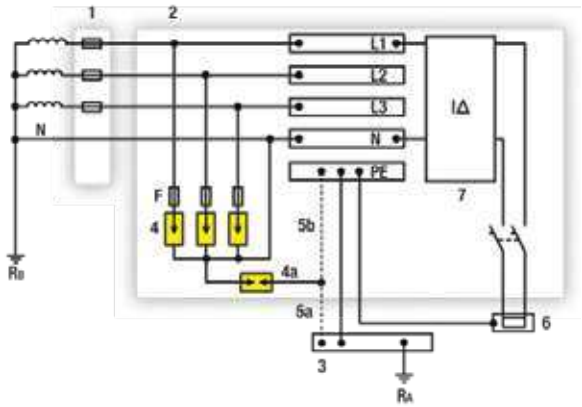
Installation of SPDs in a TN-C-system

Connection type CT1 (3+0 connection)



Installation of SPDs in a TN-S-system

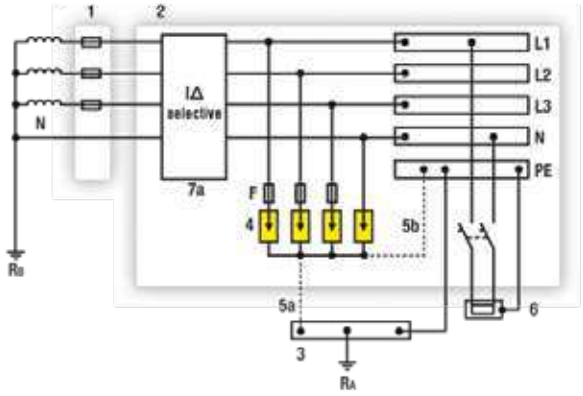
Connection type CT1 (4+0 connection)



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

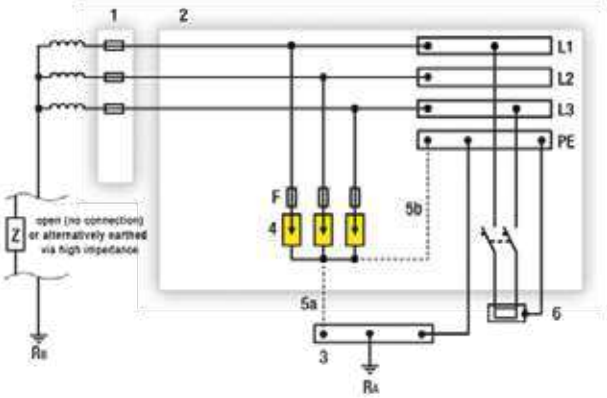
Connection type CT2 (3+1 connection)

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



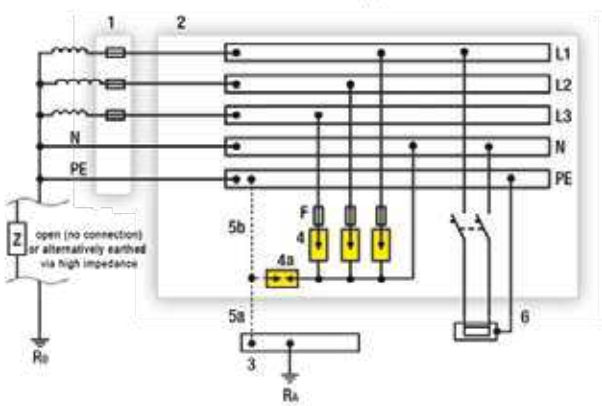
Installation of SPDs in a TT-system downstream the main residual current device

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 Type 1 and 2)

Protection against indirect lightning effects (Type 2)

Protection against induced overvoltages (Type 3)

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

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 60364-5-534);
  - high impulse current rating (I_{imp}) and (I_{max}) up to 100 kA, 10/350 µs.

- **Type G - Isolating Spark Gap ISG SPDs:**

These devices are used to indirectly connect an LPS to nearby metal structures which cannot be directly connect for functional reasons.

- Monolithic explosion proof protection;
- High protection of the insulation resistance versus the injected current;
- High discharge capability (I_{imp}).

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 Light 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, on linea, in series with low resistivity electronic equipments, like analog interfaces and data networks.

C - ZOTUPCOAX

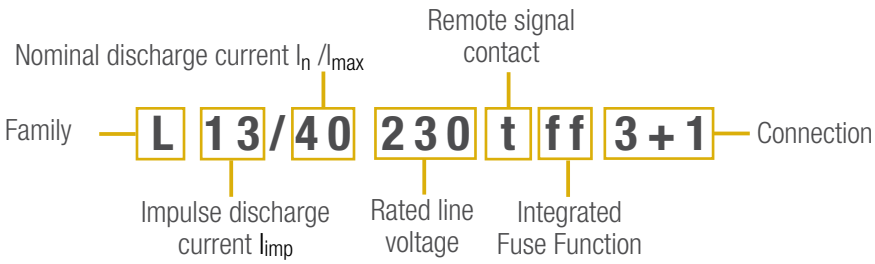
Specific SPDs with coaxial connectors, for protecting TV switchboards, satellite antenna or wideband transmission equipment and remote systems.
Particularly suitable for applications with long coaxial cables which are exposed to electromagnetic interference.

ZU - 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 mechanisc and stable characteristic even over long time.
- Additional impulse counter and impulse counter + measurement for indication of total leakage current (internal and external dispersion).
- Surge Arresters with a higher thermal energy rating than 4,5 kJ/kV are available upon request.

Ordering code Example for Low Voltage SPDs:



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 DIRECT CURRENT (DC) AND PHOTOVOLTAIC APPLICATIONS

- L 7/30 DC … ff – ZOTUPLIMITER
- L 13/60 PVY … ff – ZOTUPLIMITER
- L 3/40 PVY … ff – ZOTUPLIMITER

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 ISOLATING SPARK GAPS

ISOLATING SPARK GAPS

- G ... – ZOTUPGAP

ZOTUP SURGE ARRESTERS FOR HIGH VOLTAGE SYSTEMS (HV)

SURGE ARRESTERS FOR HIGH VOLTAGE SYSTEMS

- ZU ... – ZOTUPHV

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 standard **HD 60364-5-534**, 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.

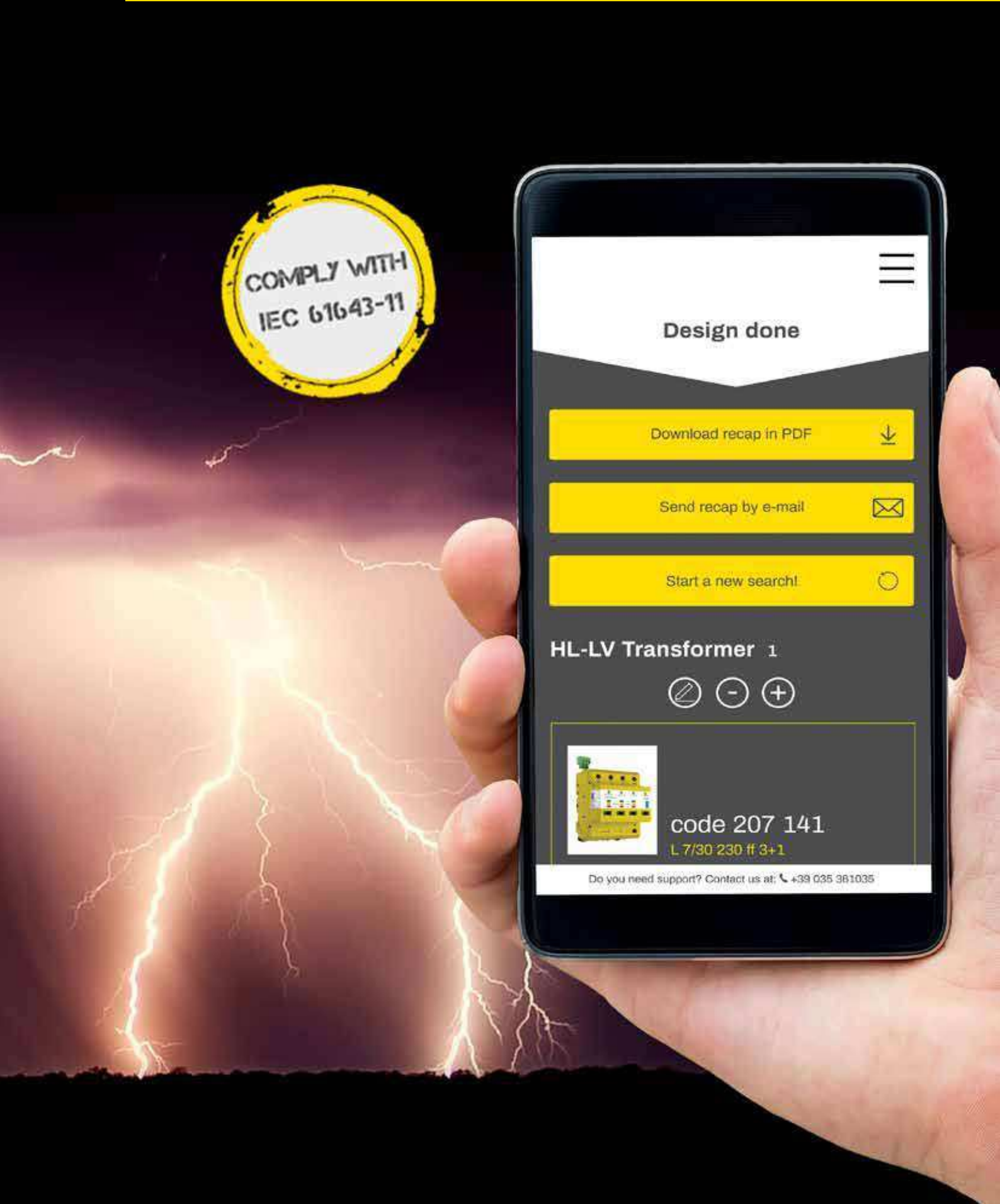
RESULTS

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 searches 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.

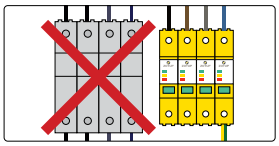


THE INNOVATIVE FEATURES OF OUR NEW PRODUCTS

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. The **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:



- **Integrated Fuse Function (ff)**

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

- OCFM (Open Circuit Failure Mode);
- SCFM (Short Circuit Failure Mode).

An SPD with OCFM 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:

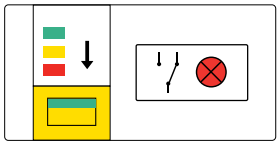
a) **a "slow" process** that depends on the degradation of voltage limiting components, e.g. in MOV-based SPDs, leading to thermal runaway. In such case the disconnection is generally ensured by an internal thermal operated disconnector.

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

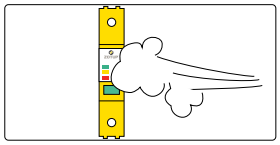


• Progressive performance indication

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 and clearance distances.
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.

ZOTUP SPDs FOR LOW VOLTAGE SYSTEMS

SPDs FOR LOW VOLTAGE ALTERNATING CURRENT (AC) APPLICATIONS

SPDs FOR LOW VOLTAGE ALTERNATING CURRENT (AC) APPLICATIONS

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

SPD	Model	Application icon	Test class/ Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	Prot. Box TN 40 ff		I and II / T1 and T2	4	10 kA	40 kA	55
	Prot. Box TT 40 ff			4			
	L 7/30 230 ff		I and II / T1 and T2	1	8 kA	30 kA	56
	L 7/30 400 ff		I and II / T1 and T2	1	7 kA	30 kA	56
	L 7/30 600 ff		I and II / T1 and T2	1	5 kA	25 kA	56
	L 7/30 750 ff		I and II / T1 and T2	1	5 kA	20 kA	56
	L 7/30 1000 ff		I and II / T1 and T2	1	2 kA	20 kA	56
	L 7/30 230 ff 2		I and II / T1 and T2	2	8 kA	30 kA	57
	L 7/30 230 ff 3		I and II / T1 and T2	3	8 kA	30 kA	58
	L 7/30 750 ff 3		I and II / T1 and T2	3	5 kA	20 kA	58
	L 7/30 230 ff 4		I and II / T1 and T2	4	8 kA	30 kA	59
	L 7/30 230 ff 1+1		I and II / T1 and T2	2	8 kA	30 kA	60
	L 7/30 230 ff 3+1		I and II / T1 and T2	4	8 kA	30 kA	61
	L 3/30 60 ff		II /T2	1	-	20 kA	62
	L 3/30 120 ff		II /T2	1	-	20 kA	62
	L 3/30 230 ff		II /T2	1	-	30 kA	62
	L 3/30 400 ff		II /T2	1	-	30 kA	62
	L 3/30 230 ff 2		II /T2	2	-	30 kA	63
	L 3/30 230 ff 3		II /T2	3	-	30 kA	64
	L 3/30 230 ff 4		II /T2	4	-	30 kA	65
	L 3/30 230 ff 1+1		II /T2	2	-	30 kA	66

SPD	Model	Application icon	Test class/ Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 3/30 230 ff 3+1		II /T2	4	-	30 kA	67
	L 2/10 230 ff		II /T2	1	-	10 kA	68
	L 2/10 230 ff 2		II /T2	2	-	10 kA	69
	L 2/10 230 ff 4		II /T2	4	-	10 kA	70
	L 2/10 230 ff 1+1		II /T2	2	-	10 kA	71
	L 2/10 230 ff 3+1		II /T2	4	-	10 kA	72
	L 2/10 230 ff 2 TT		II /T2	2	-	10 kA	73
	L 2/10 230 ff 4 TT		II /T2	4	-	10 kA	74
	I 12 N-PE		I and II / T1 and T2	1	12,5 kA	40 kA	75

FOR BASIC AC APPLICATIONS

SPD	Model	Application icon	Test class/ Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	IL 1/10 2P		II / T2	3	-	10 kA	76
	L 2/20 230 e		II / T2	1	-	20 kA	77
	L 2/20 230 1+1		II / T2	2	-	20 kA	78
	L 2/20 230 3+1		II / T2	4	-	20 kA	79
	IL 1/3 2P		III / T3	3	-	3 kA	80
	IL 1/10 2P M		II / T2	3	-	10 kA	80

FOR WIND TURBINE APPLICATIONS IN AC

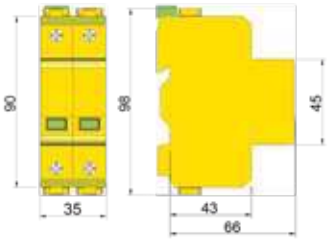
SPD	Model	Application icon	Test class/ Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	L 7/30 600 ff		I and II / T1 and T2	1	5 kA	25 kA	56
	L 7/30 750 ff		I and II / T1 and T2	1	5 kA	20 kA	56
	L 7/30 750 ff 3		I and II / T1 and T2	3	5 kA	20 kA	58

ACCESSORIES

SPD	Model	Application icon	Test class/ Type	Modes of protection	Impulse discharge current I_{imp}	Nominal discharge current I_n	Page
	CP 1	-	-	-	-	-	81
	CP 2	-	-	-	-	-	81
	CP 3	-	-	-	-	-	81
	CP 4	-	-	-	-	-	81
	CP 5	-	-	-	-	-	81
	CP 6	-	-	-	-	-	81
	CP 7	-	-	-	-	-	81
	CP 8	-	-	-	-	-	81

TN

TT



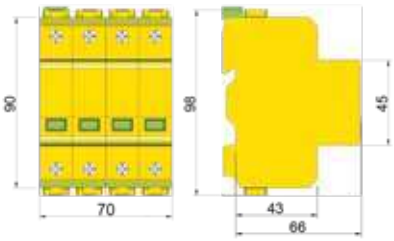
L 25/100 230 t ff

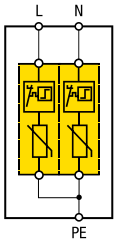
L 25/100 230 t ff is a voltage limiting SPD providing a single mode of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 100, I 52 and with connection type CT2 (3+1 or 1+1).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

- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- 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.**

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 (number of poles)			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 EN 61643-11 (2012-10)			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	≤ 0,70 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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV): L-(PE)N or L-N		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
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			305 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
GTIN (EAN)			8054890321365

* 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





L 25/100 230 t ff 2

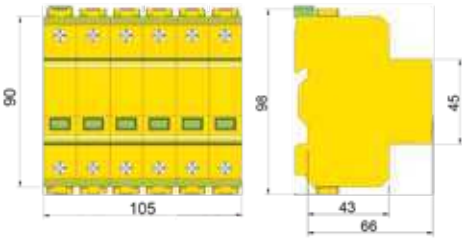
L 25/100 230 t ff 2 is a ready to install assembly of two voltage limiting SPDs providing two modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for single-phase 230 V TN-systems, with the following features and benefits:

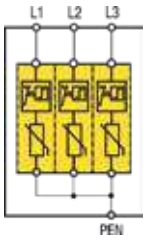
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- L 25/100 230 t ff 2 is a voltage limiting SPD for the protection of low voltage installations and equipment against direct and indirect lightning 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 (number of poles)			2
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 EN 61643-11 (2012-10)			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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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			630 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
GTIN (EAN)			8054890321372

* 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





L 25/100 230 t ff 3

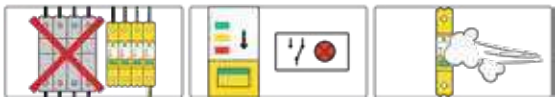
L 25/100 230 t ff 3 is a ready to install assembly of three voltage limiting SPDs providing three modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase 230/400 V TN-systems, with the following features and benefits:

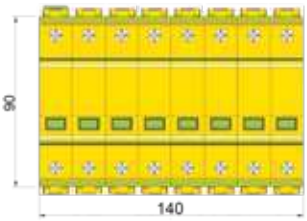
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- L 25/100 230 t ff 3 is a voltage limiting SPD for the protection of low voltage installations and equipment against direct and indirect lightning 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.**

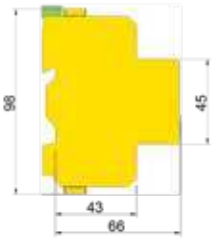
TECHNICAL DATA

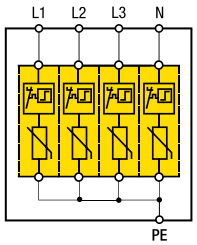
Model L 25/100 ... with remote signal contact			230 t ff 3
CODE			**215 130**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection (number of poles)			3
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to EN 61643-11 (2012-10)			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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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). 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			915 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
GTIN (EAN)			8054890321396

* 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









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 four 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:

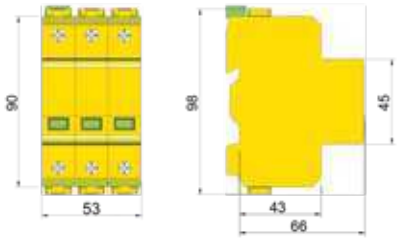
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- L 25/100 230 t ff 4 s a voltage limiting SPD for the protection of low voltage installations and equipment against direct and indirect lightning 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.**

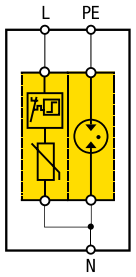
TECHNICAL DATA

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 (number of poles)			4
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 EN 61643-11 (2012-10)			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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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			1260 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
GTIN (EAN)			8054890321402

* 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

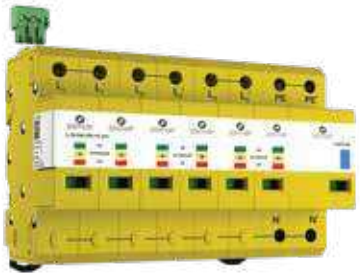
L 25/100 230 t ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing two modes of protection, typically installed in single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

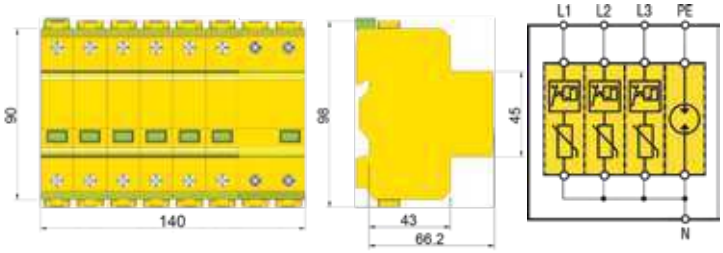
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

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 (number of poles)		1+1 (L-N + N-PE)	
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 EN 61643-11 (2012-10)		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)		OCFM (Open Circuit Failure Mode)	
Behaviour of failure mode 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* (> 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 (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		435 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	
GTIN (EAN)		8054890321389	

* 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 four 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 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

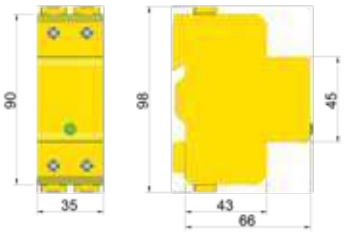
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

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 (number of poles)			3+1 (L1/L2/L3-N + N-PE)	
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 EN 61643-11 (2012-10)			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)			OCFM (Open Circuit Failure Mode)	
Behaviour of failure mode in case of Temporary Voltage (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* (> 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 (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			1260 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	
GTIN (EAN)			8054890321419	

* 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

TT



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:

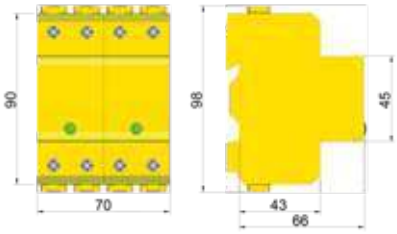
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- IA 25 230 is a self extinguishing spark gap based switching SPD, for the protection of low voltage installations against direct and indirect 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".

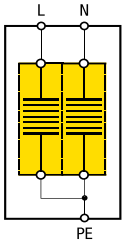
TECHNICAL DATA

Model IA 25 ...		230
CODE		**203 100**
Nominal ac system voltage	U_N	230/400 V ac
Modes of protection (number of poles)		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 EN 61643-11 (2012-10)		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 of failure mode in case of Temporary OverVoltage (TOV): L-(PE)N or L-N	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 in distribution systems with a short circuit current higher than 16 kA rms		
Short circuit withstand current > I_{fi} up to		50 kA rms (tested by CTI)
External backup fuse required		315 A gG
GTIN (EAN)		8054890320566

* 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 2

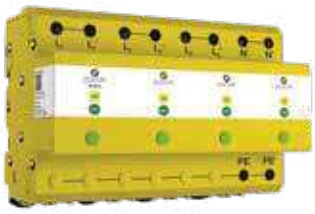
IA 25 230 2 is a ready to install assembly of two voltage switching SPDs providing two modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for single-phase 230 V TN-systems with the following features and benefits:

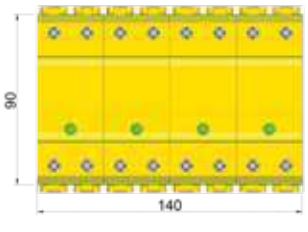
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- IA 25 230 2 is a self extinguishing spark gap based switching SPD, for the protection of low voltage installations against direct and indirect lightning effects;
- Impulse discharge current of (L-N) 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".

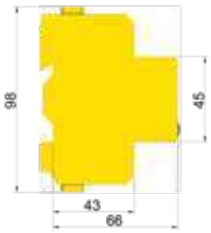
Model IA 25 ...		230 2
CODE		**203 120**
Nominal ac system voltage	U_N	230 V ac
Modes of protection (number of poles)		2
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to EN 61643-11 (2012-10)		T1 and T2
Impulse discharge current (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 (L / N-PE)	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 of failure mode in case of Temporary OverVoltage (TOV): L/N-PE	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 in distribution systems with a short circuit current higher than 16 kA rms		
Short circuit withstand current > I_{fi} up to		50 kA rms (tested by CTI)
External backup fuse required		315 A gG
GTIN (EAN)		8054890320573

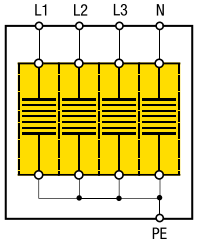
* with fuse 125 A gG I_{imp}= 10 kA and I_{max}= 40 kA; with fuse 100 A gG I_{imp}=9 kA and I_{max}= 30 kA

TN









IA 25 230 4

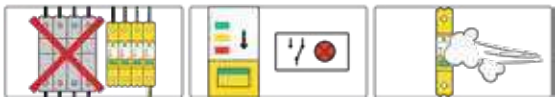
IA 25 230 4 is a ready to install assembly of four voltage switching SPDs providing four modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase plus neutral 230/400 V TN-S systems with the following features and benefits:

- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- 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**;
- 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 (number of poles)		4
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 EN 61643-11 (2012-10)		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 (L / N-PE)	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 of failure mode in case of Temporary OverVoltage (TOV): L/N-PE	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 in distribution systems with a short circuit current higher than 16 kA rms		
Short circuit withstand current > I_{fi} up to		50 kA rms (tested by CTI)
External backup fuse required		315 A gG
GTIN (EAN)		8054890320597

* 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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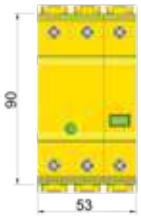
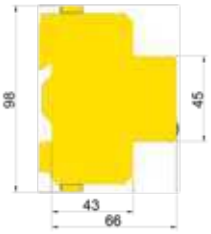
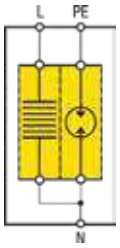






IA 25 230 1+1

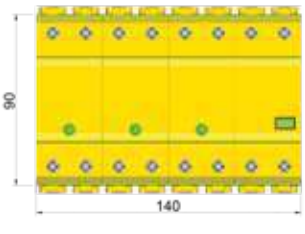
IA 25 230 1+1 is a ready to install assembly of two voltage switching SPDs providing two modes of protection, typically installed at the origin of the installation, e.g. in the main distribution board MDB, in single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

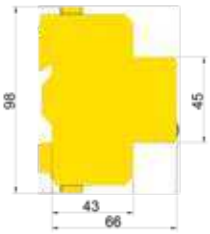
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- IA 25 230 1+1 is a self extinguishing spark gap and GDT based switching SPD, for the protection of low voltage installations against direct 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".

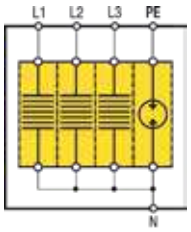
Model IA 25 ...		230 1+1		
CODE		**203 121**		
Nominal ac system voltage	U_N	230 V ac		
Modes of protection (number of poles)		1+1 (L-N + N-PE)		
Max Continuous Operating Voltage	U_c	255 V ac		
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II		
Type according to EN 61643-11 (2012-10)		T1 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 of failure mode 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 coloured levels (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		395 g		
Dimensions: width		53 mm (3 modules)		
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR		
Additional Technical Information: for application in distribution systems with a short circuit current higher than 16 kA rms				
Short circuit withstand current > I_{fi} up to		50 kA rms (tested by CTI)		
External backup fuse required		315 A gG		
GTIN (EAN)		8054890320580		

* 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







IA 25 230 3+1

IA 25 230 3+1 is a ready to install assembly of four voltage switching SPDs providing four 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 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

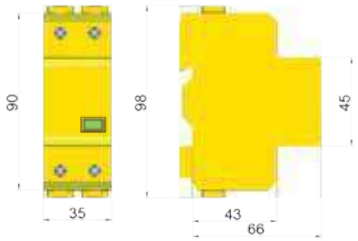
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- IA 25 230 3+1 is a self extinguishing spark gap and GDT based switching SPD, for the protection of low voltage installations against direct 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 (number of poles)			3+1 (L1/L2/L3-N + 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 EN 61643-11 (2012-10)			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 of failure mode 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 coloured levels (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 in distribution systems with a short circuit current higher than 16 kA rms					
Short circuit withstand current > I_{fi} up to			50 kA rms (tested by CTI)		
External backup fuse required			315 A gG		
GTIN (EAN)			8054890320603		

* 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



I 100 N-PE

I 100 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 60364-5-534, with the following features and benefits:

- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- 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.

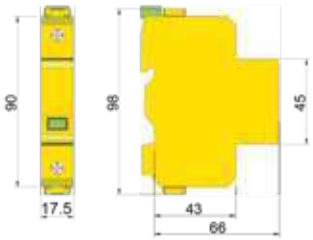
Model I 100 N-PE

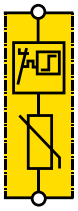
CODE		208 300
Nominal ac system voltage	U_N	230 V ac
Modes of protection (number of poles)		1 (N-PE)
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to EN 61643-11 (2012-10)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	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 of failure mode in case of Temporary OverVoltage (TOV): N-PE	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
GTIN (EAN)		8054890320870

* 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:

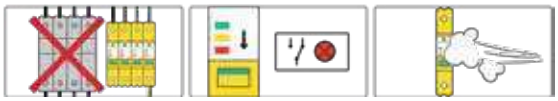
- L 13/40 230 ff is a voltage limiting SPD, for the protection of low voltage installations and equipment against direct and indirect lightning effects;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- Short circuit current withstand with max. back-up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

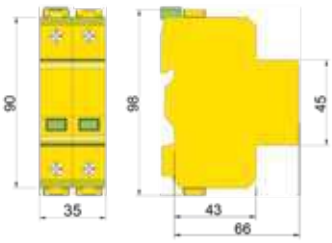
TECHNICAL DATA

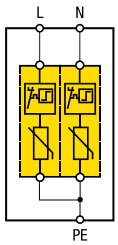
Model L 13/40 ...			230 ff
CODE			**204 100**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection (number of poles)			1
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to EN 61643-11 (2012-10)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	13 kA
Charge		Q	7 As
Nominal discharge current (8/20 µs)		I_n	35 kA
Max. discharge current (8/20 µs)		I_{max}	70 kA
Voltage protection level (L/N-PE) at a discharge current of:	1 kA	U_p	≤ 0,79 kV
	5 kA	U_p	≤ 0,90 kV
	13 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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L-(PE)N or L-N	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			140 g
Dimensions: width			17,5 mm (1 module)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320658

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
GTIN (EAN)		8054890321235

*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 two 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:

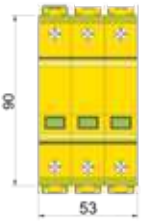
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- L 13/40 230 ff 2 is a voltage limiting SPD, for the protection of low voltage installations and equipment against direct and indirect lightning 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.**

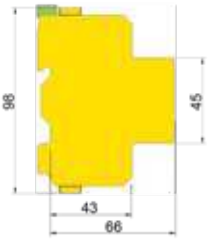
Model L 13/40 ...			230 ff 2
CODE			**204 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection (number of poles)			2
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to EN 61643-11 (2012-10)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	13 kA
Charge		Q	7 As
Nominal discharge current (8/20 µs)		I_n	35 kA
Max. discharge current (8/20 µs)		I_{max}	70 kA
Voltage protection level (L/N-PE) at a discharge current of:	1 kA	U_p	≤ 0,80 kV
	5 kA	U_p	≤ 0,93 kV
	13 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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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}	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			280 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320665

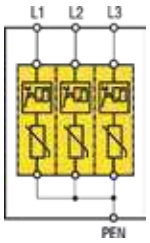
Model L 13/40 ... with remote signal contact		230 t ff 2
CODE		**214 120**
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm^2 flexible
Switching capacity remote signal contact		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A
GTIN (EAN)		8054890321280

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

TN







L 13/40 230 ff 3

L 13/40 230 ff 3 is a ready to install assembly of three 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 three-phase 230/400 V TN-systems, with the following features and benefits:

- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- 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.**

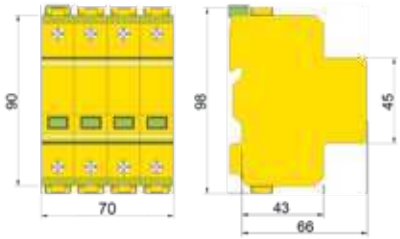
TECHNICAL DATA

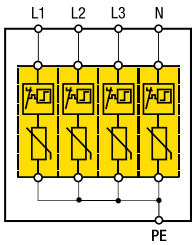
Model L 13/40 ...			230 ff 3
CODE			**204 130**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection (number of poles)			3
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to EN 61643-11 (2012-10)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	13 kA
Charge		Q	7 As
Nominal discharge current (8/20 µs)		I_n	35 kA
Max. discharge current (8/20 µs)		I_{max}	70 kA
Voltage protection level (L-PEN) at a discharge current of:	1 kA	U_p	≤ 0,80 kV
	5 kA	U_p	≤ 0,93 kV
	13 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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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}	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			420 g
Dimensions: width			53 mm (3 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320689

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
GTIN (EAN)		8054890321310

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

TN





L 13/40 230 ff 4

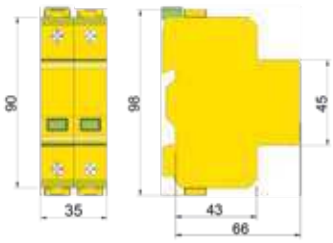
L 13/40 230 ff 4 is a ready to install assembly of four voltage limiting SPDs providing four modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase plus neutral 230/400 V TN-systems, with the following features and benefits:

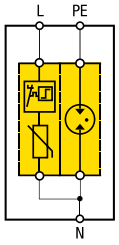
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- L 13/40 230 ff 4 is a voltage limiting SPD, for the protection of low voltage installations and equipment against direct and indirect lightning 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.**

Model L 13/40 ...			230 ff 4
CODE			**204 140**
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)			I and II
Type according to EN 61643-11 (2012-10)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	13 kA
Charge		Q	7 As
Nominal discharge current (8/20 µs)		I_n	35 kA
Max. discharge current (8/20 µs)		I_{max}	70 kA
Voltage protection level (L/N-PE) at a discharge current of:	1 kA	U_p	≤ 0,80 kV
	5 kA	U_p	≤ 0,93 kV
	13 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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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}	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			560 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320696

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
GTIN (EAN)		8054890321334

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





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 two modes of protection, typically installed in single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

- **IBackup 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.**

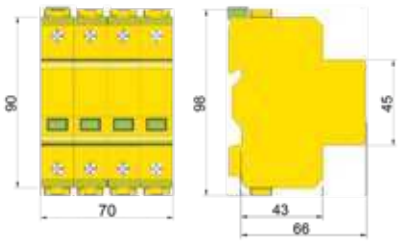
TECHNICAL DATA

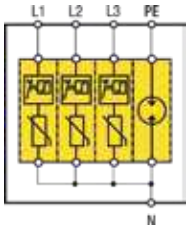
Model L 13/40 ...			230 ff 1+1	
CODE			**204 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection (number of poles)			1+1 (L-N + N-PE)	
Max Continuous Operating Voltage (L-N)		U_c	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_c	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II	
Type according to EN 61643-11 (2012-10)			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	7 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
	13 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)			OCFM (Open Circuit Failure Mode)	
Behaviour of failure mode 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			280 g	
Dimensions: width			35 mm (2 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)			8054890320672	

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
GTIN (EAN)		8054890321297

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

TT





L 13/40 230 ff 3+1

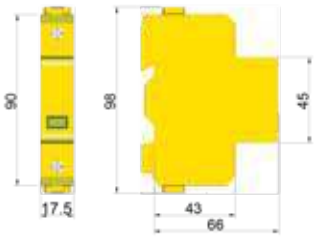
L 13/40 230 ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing four modes of protection, typically installed in three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-534, e.g. in the service 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 ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

Model L 13/40 ...			230 ff 3+1	
CODE			**204 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection (number of poles)			3+1 (L1/L2/L3-N + N-PE)	
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 EN 61643-11 (2012-10)			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	7 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
	13 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)			OCFM (Open Circuit Failure Mode)	
Behaviour of failure mode 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			560 g	
Dimensions: width			70 mm (4 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)			8054890320702	

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
GTIN (EAN)		8054890321341

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



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 60364-5-534, with the following features and benefits:

- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- 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 t ff, IA 25 230 when in single-phase and L 13/40 or L 7/30 when in single-phase and three-phase plus neutral 230/400 V TT-systems.

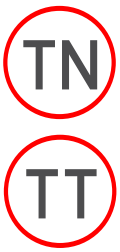
TECHNICAL DATA

Model I 52 N-PE

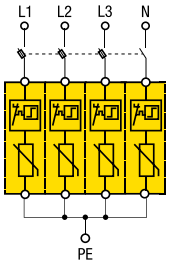
CODE		206 300
Nominal ac system voltage	U_N	230 V ac
Modes of protection (number of poles)		1 (N-PE)
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to EN 61643-11 (2012-10)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	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 of failure mode in case of Temporary OverVoltage (TOV): N-PE	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
GTIN (EAN)		8054890320726

Model I 52 N-PE t with remote signal contact

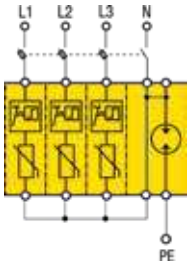
CODE		216 300
Remote signal contact		potential-free changeover contact
Terminal - conductor size for remote signal contact		max. 1,5 mm² flexible
Switching capacity		ac: 250 V / 0,5 A – dc: 125 V / 0,2 A; 75 V / 0,5 A
GTIN (EAN)		8054890321488



TN 40 ff



TT 40 ff



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 60364-5-534.**

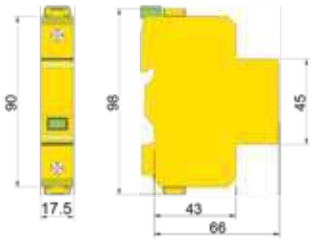
They provide the following features and benefits:

- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- They are suitable for installation at zone boundaries up to 0_A – 2 according to the lightning protection zones concept as defined in 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		
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 EN 61643-11 (2012-10)			T1 and T2		
Impulse discharge current (10/350 µs) (L-N, L-PE)		I_{imp}	10 kA	10 kA	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	10 kA	100 kA	
Charge (L-N, L-PE)		Q	12,5 As	12,5 As	
Charge (N-PE)		Q	12,5 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 discharge current:			(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	
Response time (L-N , L-PE / N-PE)		t_a	≤ 25 ns	≤ 25 ns / ≤ 100 ns	
End of Life			OCFM (Open Circuit Failure Mode)		
Behaviour of failure mode 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	-	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		
GTIN (EAN)			8054890321846	8054890321860	

TN

TT



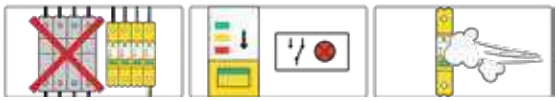
L 7/30 ... ff

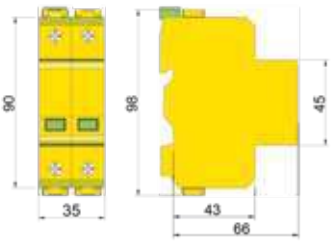
L 7/30 ... ff is a voltage limiting SPD providing a single mode of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 100, I 52 and with connection type CT2 (3+1 or 1+1). It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

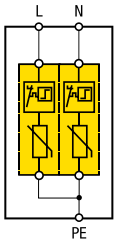
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms (for U_N 230/400 V)**;
- **Three colour Status Indicator with progressive indication of remaining performance.**

				Mini Wind Turbines	Wind Turbines	
Model L 7/30 ...		230 ff	400 ff	600 ff	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 (number of poles)		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 EN 61643-11 (2012-10)		T1 and T2				
Impulse discharge current (10/350 µs)	I_{imp}	8 kA	7 kA	5 kA		2 kA
Charge	Q	4,0 As	3,6 As	2,9 As		1,21 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 (L/N-PE) 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		OCFM (Open Circuit Failure Mode)				
Behaviour of failure mode in case of Temporary OverVoltage (TOV) 5 s	U_T	335 V, (W)	581 V, (W)	697 V, (W)	805 V, (W)	1452 V, (W)
L-(PE)N o L-N 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.4,50x10^5 A^{2}s)	160 A (max.4,50x10^5 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 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)		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
GTIN (EAN)		8054890320733	8054890320740	8054890320757	8054890320764	8054890321778

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 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				
GTIN (EAN)		8054890321495	8054890321501	8054890321518	8054890321525	8054890321785







L 7/30 230 ff 2

L 7/30 230 ff 2 is a ready to install assembly of two voltage limiting SPDs providing two 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:

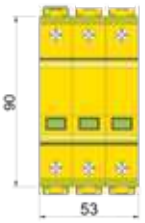
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

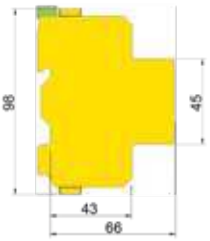
TECHNICAL DATA

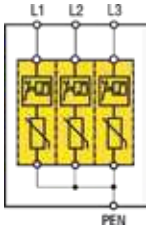
Model L 7/30 ...			230 ff 2
CODE			**207 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection (number of poles)			2
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			I and II
Type according to EN 61643-11 (2012-10)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	8 kA
Charge		Q	3,6 As
Nominal discharge current (8/20 µs)		I_n	30 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	≤ 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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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}	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		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			260 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320771

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
GTIN (EAN)		8054890321532

TN







L 7/30 ... ff 3

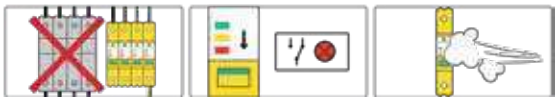
L 7/30...ff 3 is a ready to install assembly of three voltage limiting SPDs providing three modes of protection, typically installed at the origin of the installation, e.g. in the Main Distribution Board (MDB), for three-phase TN systems, with the following features and benefits:

- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- **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.**

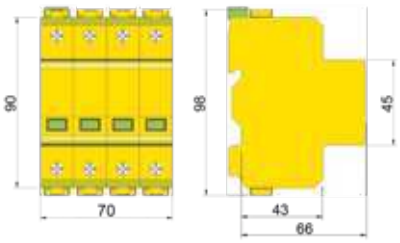
TECHNICAL DATA

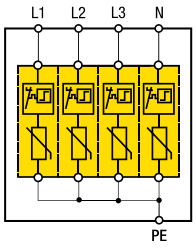
			Wind Turbines
Model L 7/30 ...		230 ff 3	750 ff 3
CODE		**207 130**	**207 137**
Nominal ac system voltage	U_N	230/400 V ac	554/960 V ac
Modes of protection (number of poles)		3	
Max Continuous Operating Voltage	U_c	335 V ac	750 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II	
Type according to EN 61643-11 (2012-10)		T1 and T2	
Impulse discharge current (10/350 µs)	I_{imp}	8 kA	5 kA
Charge	Q	3,6 As	2,9 As
Nominal discharge current (8/20 µs)	I_n	30 kA	20 kA
Max. discharge current (8/20 µs)	I_{max}	40 kA	
Voltage protection level (L-PEN) at a discharge current of: 1 kA	U_p	≤ 0,81 kV	≤ 1,90 kV
5 kA	U_p	≤ 0,98 kV	≤ 2,30 kV
20 kA	U_p	≤ 1,35 kV	≤ 2,75 kV
25 kA	U_p	≤ 1,45 kV	-
30 kA	U_p	≤ 1,60 kV	-
Response time	t_a	≤ 25 ns	
End of Life		OCFM (Open Circuit Failure Mode)	
Behaviour of failure mode in case of Temporary OverVoltage (TOV) L-PEN	U_T	335 V / 5 s, (W)	805 V / 5 s, (W)
withstand (W) / safe (S):	U_T	440 V / 120 min, (W)	1056 V / 120 min, (S)
Short Circuit Current rating without backup protection (internal disconnector)	I_{sccr}	5 kA rms	2 kA rms
Short Circuit Current rating with max. backup protection fuse	I_{sccr}	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.4,50x10^5 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 (> 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)	2 / 20 (built-in)
Approximate weight		491 g	582 g
Dimensions: width		53 mm (3 modules)	
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)		8054890320795	8054890320801

Model L 7/30 ... with remote signal contact		230 t ff 3	750 t ff 3
CODE		**217 130**	**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	
GTIN (EAN)		8054890321556	8054890321563



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 four 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:

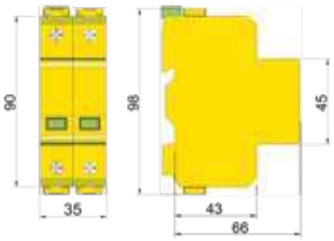
- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

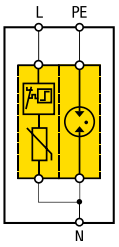
TECHNICAL DATA

Model L 7/30 ...			230 ff 4
CODE			**207 140**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection (number of poles)			4
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 EN 61643-11 (2012-10)			T1 and T2
Impulse discharge current (10/350 µs)		I_{imp}	8 kA
Charge		Q	3,6 As
Nominal discharge current (8/20 µs)		I_n	30 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	≤ 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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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}	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		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			520 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320818

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
GTIN (EAN)		8054890321570

TT





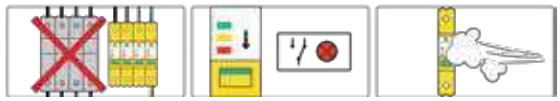
L 7/30 230 ff 1+1

L 7/30 230 ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing two modes of protection, typically installed in single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-534, 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 ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

Model L 7/30 ...			230 ff 1+1	
CODE			**207 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection (number of poles)			1+1 (L-N + N-PE)	
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 EN 61643-11 (2012-10)			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	≤ 0,81 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)			OCFM (Open Circuit Failure Mode)	
Behaviour of failure mode 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			260 g	
Dimensions: width			35 mm (2 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)			8054890320788	

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
GTIN (EAN)		8054890321549



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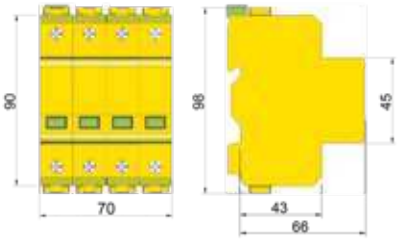
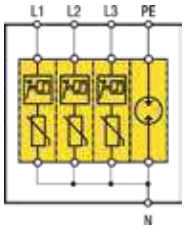




L 7/30 230 ff 3+1

L 7/30 230 ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing four 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 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

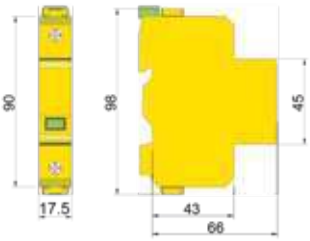
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

Model L 7/30 ...			230 ff 3+1	
CODE			**207 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection (number of poles)			3+1 (L1/L2/L3-N + N-PE)	
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 EN 61643-11 (2012-10)			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	≤ 0,81 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)			OCFM (Open Circuit Failure Mode)	
Behaviour of failure mode 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			520 g	
Dimensions: width			70 mm (4 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)			8054890320825	

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
GTIN (EAN)		8054890321587

TN

TT



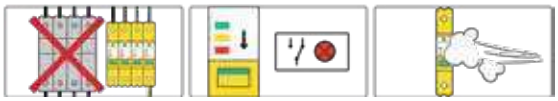
L 3/30 ... ff

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:

- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- 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 (number of poles)		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 EN 61643-11 (2012-10)		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 (L/N-PE) 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		OCFM (Open Circuit Failure Mode)			
Behaviour of failure mode in case of Temp. OverVoltage (TOV) L-(PE)N o L-N withstand (W)/safe (S):	U_T	87 V / 5 s, (W)	174 V / 5 s, (W)	335 V / 5 s, (W)	607 V / 5 s, (W)
	U_T	115 V / 120 min, (W)	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 (max. prospective short circuit current depends on CB breaking capability)		160 A (max.4,80x10^5 A^{2}s)	160 A (max.4,80x10^5 A^{2}s)	160 A (max.4,50x10^5 A^{2}s)	160 A (max.4,50x10^5 A^{2}s)
Max. back-up protection with FUSE at prospective short circuit current of		125 A gG at (> 5 ÷ 50 kA rms)	125 A gG at (> 5 ÷ 50 kA rms)	125 A gG at (> 5 ÷ 50 kA rms)	125 A gG at (> 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 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		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			
GTIN (EAN)		8054890320405	8054890320412	8054890320399	8054890320429

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 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			
GTIN (EAN)		8054890320993	8054890321006	8054890320986	8054890321013



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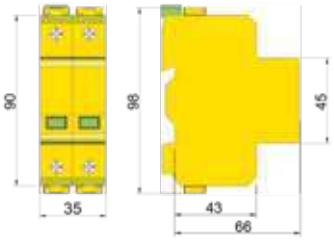

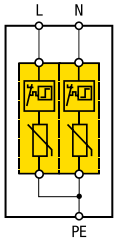

L 3/30 230 ff 2

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

- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- 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.**

Model L 3/30 ...			230 ff 2
CODE			**200 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection (number of poles)			2
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to EN 61643-11 (2012-10)			T2
Nominal discharge current (8/20 µs)		I_n	30 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	≤ 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			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode 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			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			240 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320436

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
GTIN (EAN)			8054890321068

L 3/30 230 ff 3

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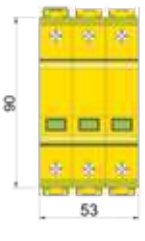
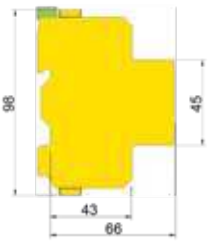
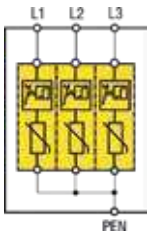






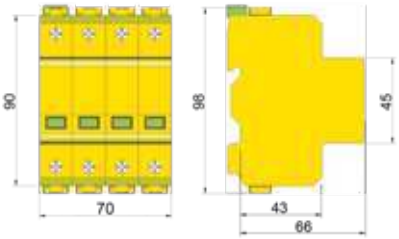
L 3/30 230 ff 3 is a ready to install assembly of three voltage limiting SPDs providing three modes of protection, typically installed in Sub Distribution Boards (SDB) for three-phase 230/400 V TN-systems, with the following features and benefits:

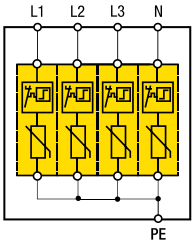
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- L 3/30 230 ff 3 is a voltage limiting SPD, for the protection of low voltage installations and equipment against indirect lightning effects;
- **Backup 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 (number of poles)			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 EN 61643-11 (2012-10)			T2
Nominal discharge current (8/20 µs)		I_n	30 kA
Max. discharge current (8/20 µs)		I_{max}	40 kA
Voltage protection level (L-PEN) 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			OCFM (open circuit failure mode)
Behaviour of failure mode 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			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			350 g
Dimensions: width			53 mm (3 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320450

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 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
GTIN (EAN)	8054890321099





L 3/30 230 ff 4

L 3/30 230 ff 4 is a ready to install assembly of four voltage limiting SPDs providing four 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:

- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- 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.**

Model L 3/30 ...			230 ff 4
CODE			**200 140**
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 EN 61643-11 (2012-10)			T2
Nominal discharge current (8/20 µs)		I_n	30 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	≤ 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			OCFM (open circuit failure mode)
Behaviour of failure mode 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			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			480 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320467

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
GTIN (EAN)			8054890321112

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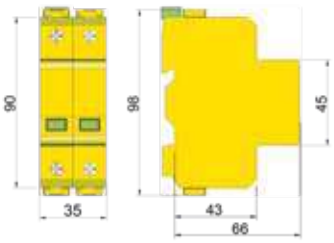
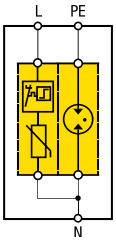




L 3/30 230 ff 1+1

L 3/30 230 ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing two 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 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

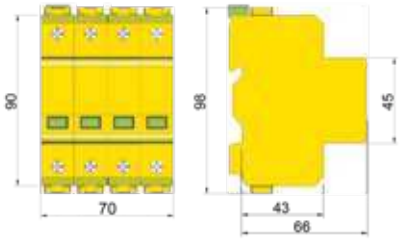
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

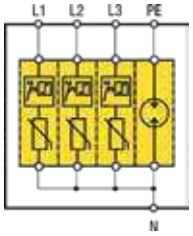
TECHNICAL DATA

Model L 3/30 ...			230 ff 1+1	
CODE			**200 121**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection (number of poles)			1+1 (L-N + N-PE)	
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 EN 61643-11 (2012-10)			T2	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	12,5 kA	
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)			OCFM (open circuit failure mode)	
Behaviour of failure mode 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			240 g	
Dimensions: width			35 mm (2 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)			8054890320443	

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
GTIN (EAN)	8054890321075

TT





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 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- **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.**

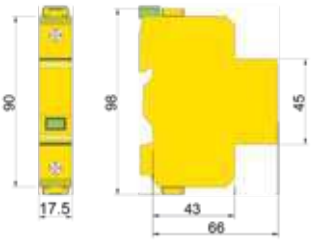
Model L3/30 ...			230 ff 3+1	
CODE			**200 141**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection (number of poles)			3+1 (L1/L2/L3-N + N-PE)	
Max Continuous Operating Voltage (L-N)		U_C	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_C	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to EN 61643-11 (2012-10)			T2	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	12,5 kA	
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)			OCFM (open circuit failure mode)	
Behaviour of failure mode 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			480 g	
Dimensions: width			70 mm (4 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)			8054890320474	

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
GTIN (EAN)	8054890321129

L 2/10 230 ff

TN

TT



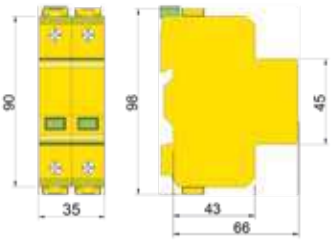
L 2/10 230 ff is a voltage limiting SPD providing a single mode of protection, typically installed in Sub Distribution Boards (SDB), in TN-systems or in TT-systems in combination with N-PE SPD model I 52 or I 12 and where connection type CT2 (3+1 or 1+1) is required according to HD 60364-5-534. It provides the following features and benefits:

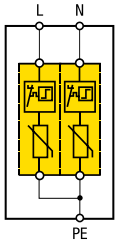
- L 2/10 230 ff is a voltage limiting SPD for the protection of low voltage installations and equipment against indirect lightning effects;
- Nominal discharge current of 10 kA 8/20 µs;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- Short circuit current withstand up to 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 (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 EN 61643-11 (2012-10)		T2
Nominal discharge current (8/20 µs)	I_n	10 kA
Max. discharge current (8/20 µs)	I_{max}	20 kA
Voltage protection level (L/N-PE) 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		OCFM (open circuit failure mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV): L-(PE)N o L-N	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
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		110 g
Dimensions: width		17,5 mm (1 module)
Certifications / Quality Mark		CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)		8054890320504

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
GTIN (EAN)		8054890321143





L 2/10 230 ff 2

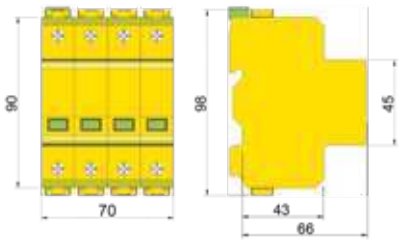
L 2/10 230 ff 2 is a ready to install assembly of two voltage limiting SPDs providing two modes of protection, typically installed in Sub Distribution Boards (SDB) for single-phase 230 V TN-systems, with the following features and benefits:

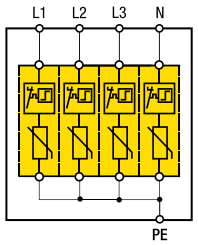
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- L 2/10 230 ff 2 is a voltage limiting SPD for the protection of low voltage installations and equipment against indirect lightning effects;
- **Backup 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.**

Model L 2/10 ...			230 ff 2
CODE			**202 120**
Nominal ac system voltage		U_N	230 V ac
Modes of protection (number of poles)			2
Max Continuous Operating Voltage		U_C	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to EN 61643-11 (2012-10)			T2
Nominal discharge current (8/20 µs)		I_n	10 kA
Max. discharge current (8/20 µs)		I_{max}	20 kA
Voltage protection level (L/N-PE) 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			OCFM (open circuit failure mode)
Behaviour of failure mode 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			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			220 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320511

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
GTIN (EAN)		8054890321150

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 four 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:

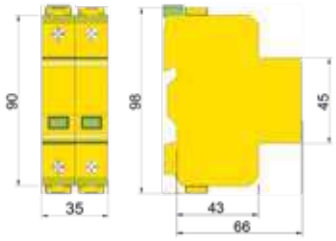
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- L 2/10 230 ff 4 is a voltage limiting SPD for the protection of low voltage installations and equipment against indirect lightning effects;
- **Backup 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.**

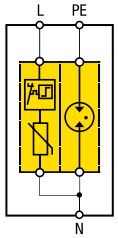
TECHNICAL DATA

Model L 2/10 ...			230 ff 4
CODE			**202 140**
Nominal ac system voltage		U_N	230/400 V ac
Modes of protection (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 EN 61643-11 (2012-10)			T2
Nominal discharge current (8/20 µs)		I_n	10 kA
Max. discharge current (8/20 µs)		I_{max}	20 kA
Voltage protection level (L/N-PE) 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			OCFM (open circuit failure mode)
Behaviour of failure mode 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			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			440 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890320535

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
GTIN (EAN)		8054890321174

TT





L 2/10 230 ff 1+1

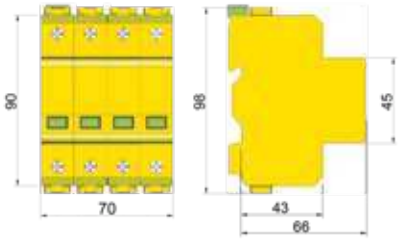
L 2/10 230 ff 1+1 is a ready to install assembly of a voltage limiting and a voltage switching SPD providing two modes of protection, typically installed in Sub Distribution Boards (SDBs) for single-phase 230 V TT-systems where connection type CT2 (1+1) is required according to HD 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

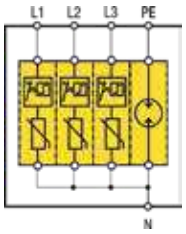
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **NFC No Follow Current®** technology, there are no 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 (number of poles)			1+1 (L-N + N-PE)	
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 EN 61643-11 (2012-10)			T2	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	12,5 kA	
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)			OCFM (open circuit failure mode)	
Behaviour of failure mode 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			220 g	
Dimensions: width			35 mm (2 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)			8054890320528	

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
GTIN (EAN)		8054890321167





L 2/10 230 ff 3+1

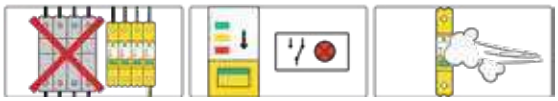
L 2/10 230 ff 3+1 is a ready to install assembly of three voltage limiting and a voltage switching SPD providing four modes of protection, typically installed in Sub Distribution Boards (SDBs) for three-phase plus neutral 230/400 V TT-systems where connection type CT2 (3+1) is required according to HD 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- **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 (number of poles)			3+1 (L1/L2/L3-N + N-PE)	
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 EN 61643-11 (2012-10)			T2	
Impulse discharge current (10/350 µs) (N-PE)		I_{imp}	12,5 kA	
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)			OCFM (open circuit failure mode)	
Behaviour of failure mode 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			440 g	
Dimensions: width			70 mm (4 modules)	
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR	
GTIN (EAN)			8054890320542	

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
GTIN (EAN)	8054890321181



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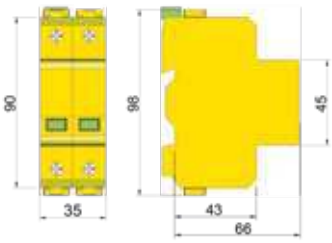
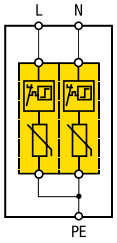




L 2/10 230 ff 2 TT

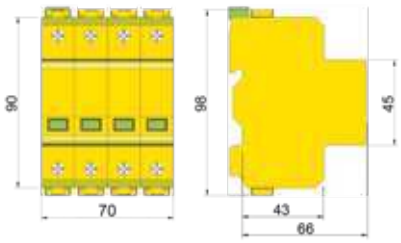
L 2/10 230 ff 2 TT is a ready to install assembly of voltage limiting SPDs providing two modes of protection, typically installed in Sub Distribution Boards (SDBs) for single-phase 230 V TT-systems downstream a RCD where connection type CT1 (2) is required according to HD 60364-5-534. This SPD is suitable for single-phase 230 V TN-systems too, when high performances against TOV are required. It provides the following features and benefits:

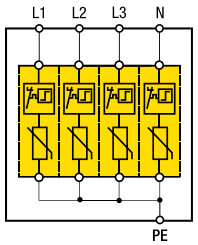
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication of remaining performance.**

Model L2/10 ...			230 ff 2 TT
CODE			**202 220**
Nominal ac system voltage		U_N	230 V ac
Modes of protection (number of poles)			2
Max Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to EN 61643-11 (2012-10)			T2
Nominal discharge current (8/20 µs) (the nominal discharge current depends on RCD)		I_n	10 kA
Max. discharge current (8/20 µs) (the max. discharge current depends on RCD)		I_{max}	20 kA
Voltage protection (L/N-PE) level at a discharge current of:	1 kA 5 kA 10 kA	U_p U_p U_p	≤ 0,83 kV ≤ 1,00 kV ≤ 1,25 kV
Response time		t_a	≤ 25 ns
End of Life			OCFM (Open Circuit Failure Mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L-PE N-PE	U_T U_T	440 V / 120 min, withstand (W); 1.455 V / 200 ms, safe (S) 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			240 g
Dimensions: width			35 mm (2 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890321723

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
GTIN (EAN)		8054890321754

TT





L 2/10 230 ff 4 TT

L 2/10 230 230 ff 4 TT is a ready to install assembly of 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 (4) is required according to HD 60364-5-534. This SPD is suitable for three-phase plus neutral 230/400 V TN-systems too, when high performances against TOV are required.
It provides the following features and benefits:

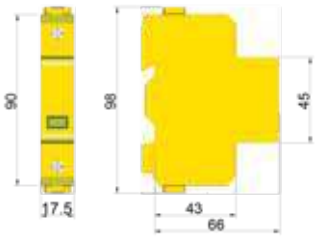
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- **Backup protection is not required with an upstream CB ≤ 160 A or up to an Isccr ≤ 5 kA rms;**
- **Three colour Status Indicator with progressive indication 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 EN 61643-11 (2012-10)			T2
Nominal discharge current (8/20 µs) (the nominal discharge current depends on RCD)		I_n	10 kA
Max. discharge current (8/20 µs) (the max. discharge current depends on RCD)		I_{max}	20 kA
Voltage protection level (L/N-PE) at a discharge current of:	1 kA 5 kA 10 kA	U_p U_p U_p	≤ 0,83 kV ≤ 1,00 kV ≤ 1,25 kV
Response time		t_a	≤ 25 ns
End of Life			OCFM (open circuit failure mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV) withstand (W) / safe (S):	L-PE N-PE	U_T U_T	440 V / 120 min, (W); 1.455 V / 200 ms, (S) 1200 V / 200 ms, (W)
Short Circuit Current rating without backup protection (internal disconnector) Short Circuit Current rating with max. backup protection fuse		I_{sccr} I_{sccr}	5 kA rms 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			480 g
Dimensions: width			70 mm (4 modules)
Certifications / Quality Mark			CB, STC issued by OVE / KEMA-KEUR
GTIN (EAN)			8054890321730

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
GTIN (EAN)			8054890321761

TT



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 60364-5-534, with the following features and benefits:

- **Impulse test classification: Test class I and II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 1 and 2** according to **EN 61643-11 (2012-10)**;
- 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 and L 2/10.

Model I 12 N-PE

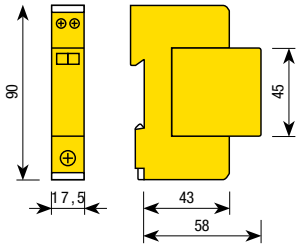
CODE		207 300
Nominal ac system voltage	U_N	230 V ac
Modes of protection (number of poles)		1 (N-PE)
Max Continuous Operating Voltage	U_c	255 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)		I and II
Type according to EN 61643-11 (2012-10)		T1 and T2
Impulse discharge current (10/350 µs)	I_{imp}	12,5 kA
Charge	Q	6,5 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 of failure mode in case of Temporary OverVoltage (TOV): N-PE	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
GTIN (EAN)		8054890320849

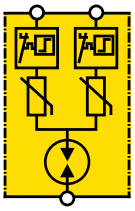
Model I 12 N-PE t with remote signal contact

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
GTIN (EAN)		8054890321594

IL 1/10 2P 230

TT





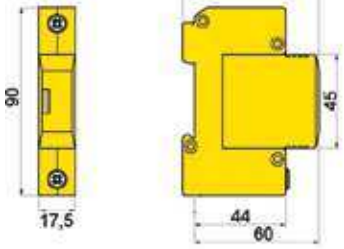
IL 1/10 2P is a combined voltage limiting and voltage switching SPD providing three modes of protection, typically installed in Sub Distribution Boards (SDBs) or control boards for single-phase 230 V TT-systems, with the following features and benefits:

- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- IL 1/10 2P is a varistor and GDT based combination SPD for the protection of low voltage installations against indirect lightning effects;
- **NFC No Follow Current®** technology, there are no follow currents drawn from the power supply system after operation;
- Two colour Status Indicator (green / red);
- Provides three modes of protection in a one module housing (L-N, L-PE, N-PE);
- Leakage current free and galvanic insulation from earth due to the Gas Discharge Tube (GDT);
- Suitable for installation at zone boundaries up to 0_B – 1 according to the lightning protection zones concept as defined in IEC 62305.

TECHNICAL DATA

Model IL 1/10 2P ...			230
CODE (pluggable execution)			**222 100**
Nominal ac system voltage		U_N	230 V ac
Maximum Continuous Operating Voltage		U_c	335 V ac
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II
Type according to EN 61643-11 (2012-10)			T2
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
Impulse discharge current (10/350 µs) for (L / N-PE)		I_{imp}	1 kA
Voltage protection level at I_n		U_p U_p	≤ 1,50 kV (L + N /PE) ≤ 1,50 kV (L / N)
Response time		t_a	≤ 25 ns (L / N) - ≤ 100 ns (N / PE)
End of Life			OCFM (open circuit failure mode)
Behaviour of failure mode in case of Temporary OverVoltage (TOV):	L-N L-PE N-PE	U_T U_T U_T	335 V / 5 s, withstand (W); 440 V / 120 min, withstand (W) 1455 V / 200 ms, safe (S) 1200 V / 200 ms, withstand (W)
Insulation resistance		R_{isol}	≥ 1 GΩ
Max. back-up protection with FUSE			32 A gG
Short Circuit Current rating with max. backup protection with fuse		I_{sccr}	20 kA rms
Follow current interrupt rating			NFC No Follow Current®
Operating temperature range			- 40 ... + 70 °C
Terminal-Conductor size			L / N 1,5-4 mm² flexible PE 2,5-16 mm² flexible
Busbar connection			fork-type busbar 16 mm² (only PE)
Mounting			indoor, 35 x 7,5 mm top hat DIN rail IEC/EN 60715
Enclosure material			thermoplastic
Pollution degree / Degree of protection		PD / IP	2 / 20 (built-in)
Approximate weight			100 g
Dimension: width			17,5 mm (1 module)
GTIN (EAN)			8054890321747

TN



L 2/20 230 e

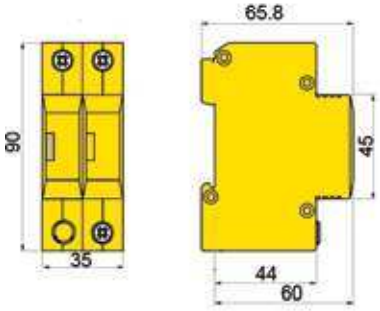
L 2/20 230 e is a pluggable execution, voltage limiting SPD, providing a single mode of protection, typically installed in Sub Distribution Boards (SDB), in TN-systems. It provides the following features and benefits:

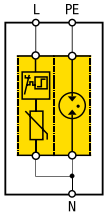
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- L 2/20 230 e is a voltage limiting varistor based SPD, for the protection of low voltage installations and equipment against indirect lightning effects;
- 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 EN 61643-11 (2012-10)			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			OCFM (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 at prospective short circuit currents of			125 A gG (50 kA rms)
Short Circuit Current withstand with max. overcurrent protection 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
GTIN (EAN)			8054890322324

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 two 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 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

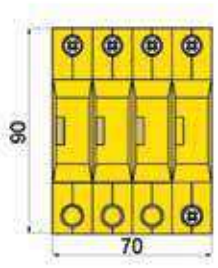
- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- Short circuit current withstand of 50 kA rms with max. back-up fuse;
- **NFC No Follow Current®** technology, there are no follow currents drawn from the power supply system after operation.

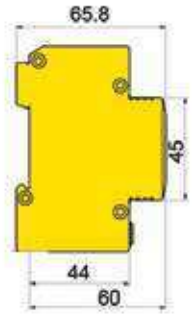
TECHNICAL DATA

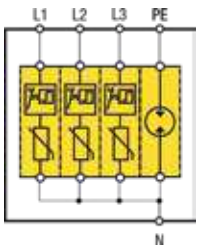
Model L 2/20 ...			230 1+1	
CODE			**200 023**	
Nominal ac system voltage		U_N	230 V ac	
Modes of protection (number of poles)			1+1 (L-N + N-PE)	
Max Continuous Operating Voltage (L-N)		U_C	335 V ac	
Max Continuous Operating Voltage (N-PE)		U_C	255 V ac	
Test Class according to IEC 61643-11 Ed.1 (2011-03)			II	
Type according to EN 61643-11 (2012-10)			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)			OCFM (open circuit failure mode)	
Behaviour of failure mode 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 (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)			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	
GTIN (EAN)			8054890322331	

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
GTIN (EAN)		8054890321266

TT







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 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 60364-5-534, e.g. in the service entrance board (SEB), with the following features and benefits:

- **Impulse test classification: Test class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- 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 3+1	
CODE			**200 025**	
Nominal ac system voltage		U_N	230/400 V ac	
Modes of protection (number of poles)			3+1 (L1/L2/L3-N + N-PE)	
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 EN 61643-11 (2012-10)			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)			OCFM (open circuit failure mode)	
Behaviour of failure mode 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 (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)			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	
GTIN (EAN)			8054890322348	

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
GTIN (EAN)		8054890320856

TN

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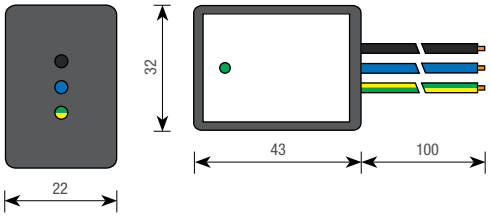
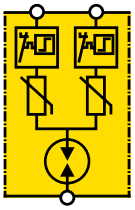
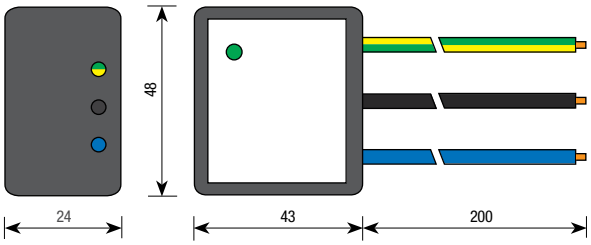
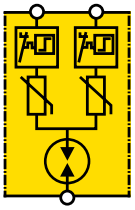




IL 1/3 2P





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:

- **Impulse test classification IL 1/3 2P: Test Class III** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 3** according to **EN 61643-11 (2012-10)**;
- **Impulse test classification IL 1/10 2P M: Test Class II** according to **IEC 61643-11 Ed. 1 (2011-03)** and **Type 2** according to **EN 61643-11 (2012-10)**;
- 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.

Model IL ...			1/3 2P	1/10 2P M
CODE			**241 001**	**241 002**
Nominal ac system Voltage		U_N	230 V ac	
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 EN 61643-11 (2012-10)			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 at In		U_p	≤ 1,5 kV (L-N; L / N-PE)	
Response time		t_a	≤ 25 ns (L-N); ≤ 100 ns (L / N-PE)	
End of Life			OCFM (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 of failure mode 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
GTIN (EAN)			8054890320375	8054890320382

CP 1

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.

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
GTIN (EAN)	8054890321105

TECHNICAL DATA

CP 2

CP 3

CP 4

CP 5

CP 6

CP 7

CP 8

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.

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						
GTIN (EAN)	8054890321136	8054890321198	8054890321204	8054890321211	8054890321228	8054890320719	8054890320832

TECHNICAL DATA