Introducing Havells Range of Surge Protection Devices

EURO-II

Surge Protection Devices
Range Catalogue 2016

QRG GROUP

HAVELLS

About Havells

Havells India Ltd is a billion-dollar-plus organization, and is one of the largest & India's fastest growing electrical and power distribution equipment manufacturer with products ranging from Industrial & Domestic Circuit Protection Switchgear, Cables & Wires, Motors, Fans, Power Capacitors, LED luminaires, CFL Lamps, Luminaires for Domestic, Commercial & Industrial applications, Modular Switches, Water Heaters and Domestic Appliances covering the entire gamut of household, commercial and industrial electrical needs.

Havells owns some of the prestigious global brands like Crabtree, Sylvania, Concord, Luminance & Standard.

With 91 branches / representative offices and over 6500 professionals in over 50 countries across the globe, the group has achieved rapid success in the past few years. Its 11 state-of-the-art manufacturing units in India located at Haridwar, Baddi, Noida, Faridabad, Alwar, Neemrana, and 6 state-of-the-art manufacturing plants located across Europe, Latin America & Africa churn out globally acclaimed products. Havells is a name synonymous with excellence and expertise in the electrical industry. Its 20000 strong global distribution network is prompt to service customers.

The company has acquired a number of International certifications, like CSA, KEMA, CB, CE, ASTA, CPA, SEMKO, SIRIUM (Malaysia), SPRING (Singapore), TSE (Turkey), SNI (Indonesia) and EDD (Bahrain) for various products. Today, Havells and its brands have emerged as the preferred choice of electrical products for discerning individuals and industrial consumers both in India and abroad.

In an attempt to transform itself from an industrial product company to a consumer products company, Havells launched the consumer electrical products such as LED luminaires, CFLs, Fans, Modular Switches Luminaires, Water Heaters and Domestic Appliances. The company has been consistent in its brand promotion with sponsorship of Cricket events like T20 World Cup, India-Australia Series and IPL Season first, second, third and fourth.

The company has also taken the initiative to reach directly to the consumers through "Havells Galaxy" – a one stop shop for all electrical and lighting needs. Havells has more than 250 such Galaxies across the country.

Social and environmental responsibility has been at the forefront of Havells operating philosophy and as a result the company consistently contributes to socially responsible activities. For instance, the company is providing mid-day meal in government schools in Alwar district, covering 50000 students per day. Besides this company has acquired land for constructing a larger kitchen with all the modern facilities to serve freshly cooked food to 50000 students in the area. We also set up free medical check-up camps. In the past also, the company has generously contributed to the society during various national calamities like the Bihar Flood, Tsunami and Kargil National Relief Fund etc.

The essence of Havells success lies in the expertise of its fine team of professionals, strong relationships with associates and the ability to adapt quickly and efficiently, with the vision to always think ahead.


QRG TOWERS
HAVELLS
SYLVANIA
Crabtree
QRG Towers
2D, Sector -126, Noida-201 304


HAVELLS
PV Surge Arrester

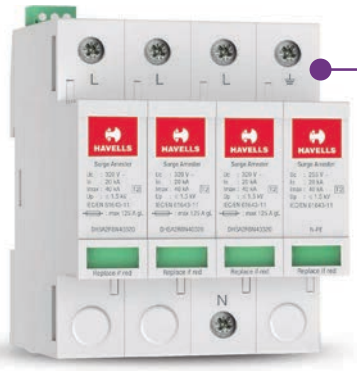
Content

Presenting a range of Euro II SPD

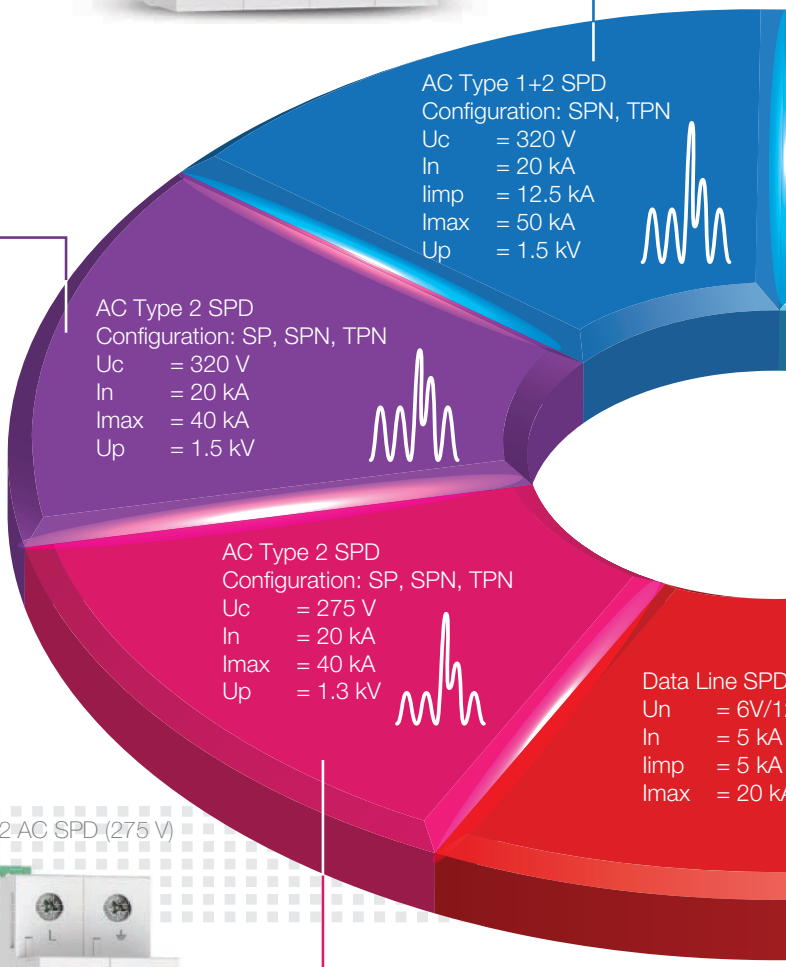
Type 1+2 AC SPD

They provide first level of protection in incoming power supply panels, in areas with risk of surge voltages due to direct lightning as well as indirect lightning strikes and switching surges.

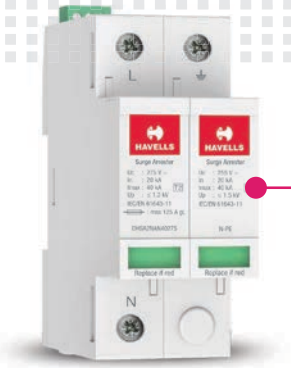
Type 2 AC SPD (320 V)



They are installed in supply distribution panels and protect installations from transient over voltages due to indirect lightning strikes and switching surges.



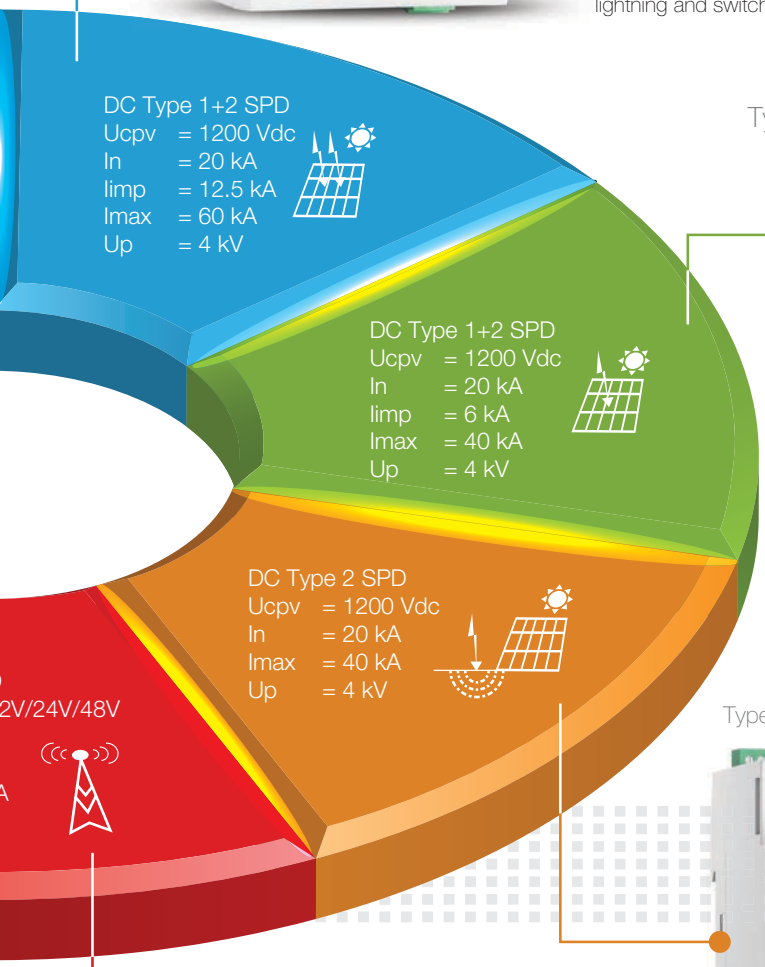
Type 2 AC SPD (275 V)



They provide fine protection of installations from transient over voltages due to indirect lightning strikes and switching surges (lower Up).

Type 1+2 Photovoltaic SPD (12.5 kA)

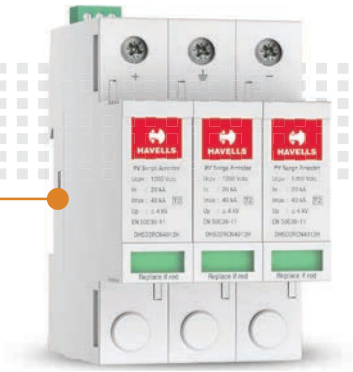
They are heavy duty surge protectors designed to protect photovoltaic power supply network against surge voltages due to direct lightning, indirect lightning and switching surges.



Type 1+2 Photovoltaic SPD (6 kA)

They are compact surge protectors designed to protect photovoltaic power supply network against surge voltages due to direct/ indirect lightning strikes and switching surges.

Type 2 Photovoltaic SPD



They protect photovoltaic system against surge voltages due to indirect lightning strikes and switching surges.

Data Line SPD

They are designed to protect, against surge voltages due to lightning & switching surges, terminal equipment connected to industrial buses, telecom lines or data lines.

World-Class Safety Features

1 Pluggable Cartridges

- Faulty cartridges can be replaced without changing the entire SPD.
- Cartridges can be replaced with mains voltage ON.
- All cartridges are marked with characteristics for ease of maintenance.

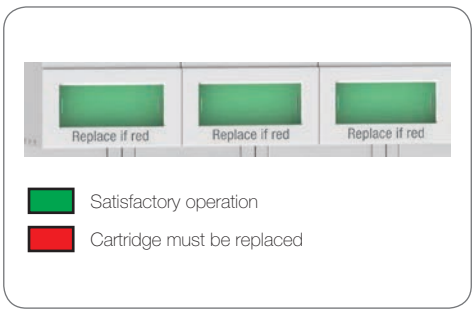
2 Dedicated Protection of the Neutral

- The 1P+N and 3P+N SPDs with dedicated protection of the neutral pole discharge the common and differential mode overvoltages that may occur in installations with TT and TNS systems, when there is a voltage surge.

3 Remote Signaling Contact

- Option to remotely monitor the status of the surge protector.
- Simplified cabling thanks to a single terminal for monitoring all poles.

4 End of Life Indicator



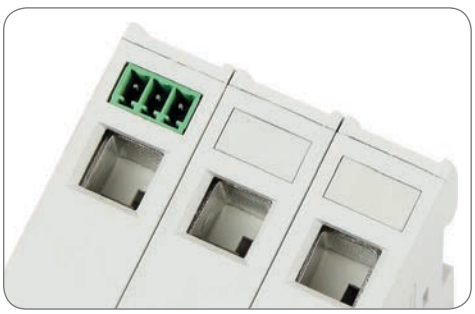
5 Finger Touch- Proof

- Terminal - IP 20

6 Simple, professional installation of arrester modules

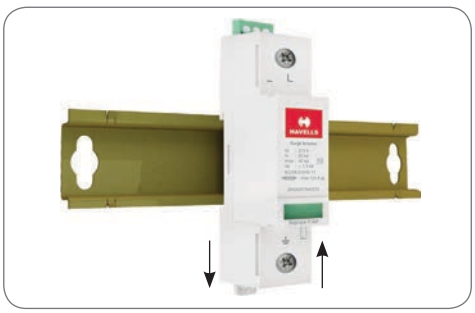
- Mechanically coded cartridges to avoid cartridge replacement errors.

7 High Terminal Capacity



- 35 sq. mm Terminals

8 Ease of Installation



- Dual position of Din-rail clip.

Surge Voltages – An Underestimated Danger

Machines face surges every day. In case of failure, is the right diagnostic always done?

Electronic systems now pervade almost every aspect of our lives. We invest thousands of rupees in state-of-the-art equipments such as computers, printers, flat screen televisions, fax machines, photocopiers, microwaves and washing machines. Highly-sensitive data processing, telecommunications and computer networks form the backbone of worldwide communications, structures without which no company or public body can survive. Machines and production lines are monitored and controlled by electronic programmers. And even many creative services are no longer conceivable without the aid of computers.

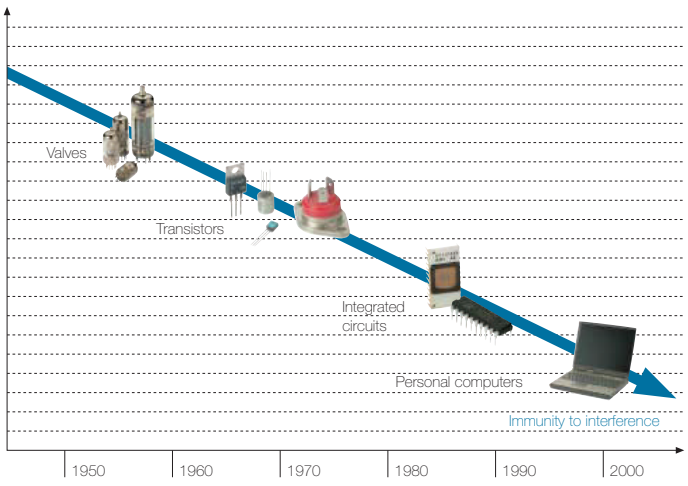
As a society, we are now heavily reliant on the continuous and efficient running of such systems. We wisely insure such equipment against theft and fire, but when it comes to protection against damage caused by overvoltage surges, we are sometimes unaware of the risk and its safeguarding methods.

Over-voltage surges are a major cause of electronic equipment failure and business disruption. Over-voltage surge caused by lightning, lasting only some millionths of a second, are responsible for 25% to 40% of all damage to equipment. If the transient over-voltage caused by other phenomena are added to this, close to 60% of all electrical damage could be avoided by installing surge protection devices (SPDs).

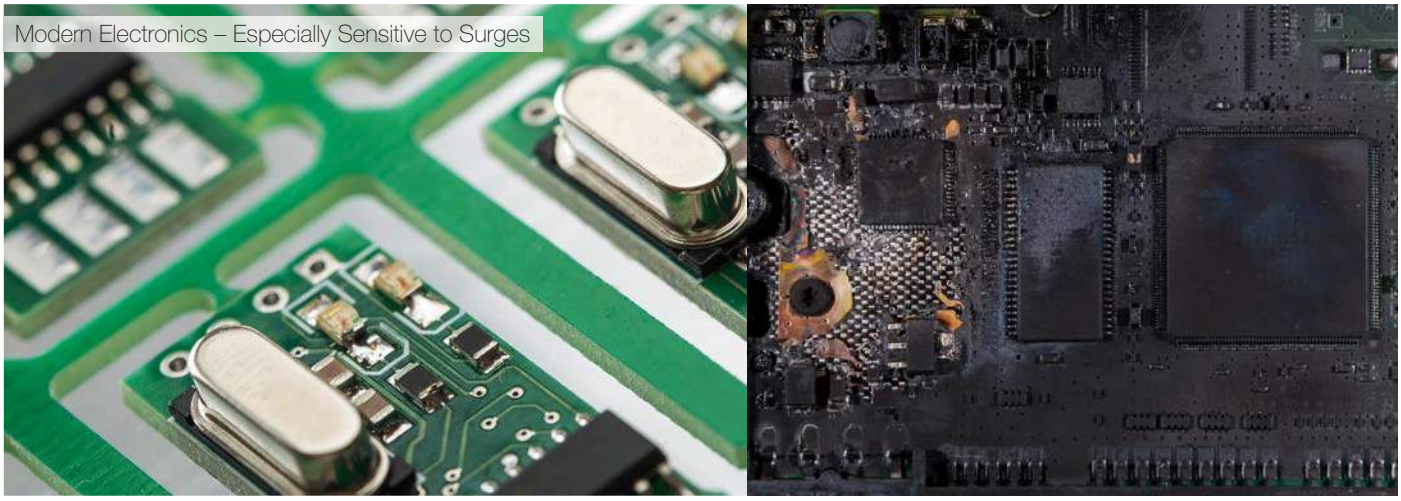
The incidence of damage caused by overvoltage surges, has increased markedly in recent years. Why is this?

The reason is not, as one might imagine, increased thunderstorm activity. There are two reasons here: one is the fact that nowadays our premises contain more sensitive electronic equipment than ever before. It is a long time since it was only the television set that was sensitive to surges. In the field of entertainment electronics, hi-fi installations, video recorders and DVD players, home PCs and peripherals are all vulnerable to overvoltage surges on the low-voltage network. In addition, there are electronically-controlled devices in almost every field of building technology, from the heating system and the telephone system to the alarm installation, as well as a broad range of domestic and kitchen appliances from the programmable washing machine to the sensor-controlled electric cooker. In industries, tools and equipment are becoming electronically based as factories become more automated and process intensive.

The other reason is the effect of technological progress. The electronic chips formerly used were more resistant to surges. Now the components have become much more sensitive to surges due to reduction in the spacing of conductors by a factor of ten. One result of this is that even relatively low voltage peaks of a few dozen volts on the data line are enough to destroy the interface card in an Internet PC. Overvoltage peaks lasting only some millionths of a second, can cause the failure of a semiconductor module and destroy the whole system.



Circuit breakers/fuses are not designed to provide overvoltage protection !



A charred, burnt circuit board from the hard drive that suffered a power surge. (Right)

Everyday Effects of electrical surges

Surges, though an invisible and transient phenomena, can cause significant malfunction:

Damage

- Logic failures and down time
- voltage breakdown of semiconductor junctions
- destruction of bonding of components
- destruction of tracks of PCBs or contacts
- destruction of triacs/thyristors by dV/dt.
- interference with operation such as abnormal operation of latches, thyristors, and triacs
- in some situations, distruction can degenerate into the equipment catching fire.

Disruption

Although no physical damage is caused, the logic or analogue levels of the systems' are upset, causing

- data and software corruption
- unexplained computer crashes
- lock-ups
- the unwanted tripping of Residual Current Devices (RCDs)
- stops of ventillation, elevator, lighting causes risk for people
- stops of other equipments causing over-heating, over-cooling etc with damage to installation

Degradation

This is somewhat more serious. Long term exposure to lower level transient overvoltages will, unknown to the user, degrade electronic components and circuitry reducing the equipment's expected life and increasing the likelihood of failures

Downtime

Unnecessary disruption, component degradation and damage all result in equipment and systems' downtime, which means :

- staff unable to work
- staff overtime
- senior managers and technical specialists unnecessarily tied-up in problem solving
- lost data which may result in lost productivity, delays to customers, lost business etc.

This means that minimizing the risk of damage from electrical surges is an absolute priority for companies of all types, all across the globe.

In the low-voltage system, the surge arrester is essential to

ensure complete protection.

Causes of Transient Overvoltage

Transient overvoltages are generally caused by lightning and/or electrical switching events.

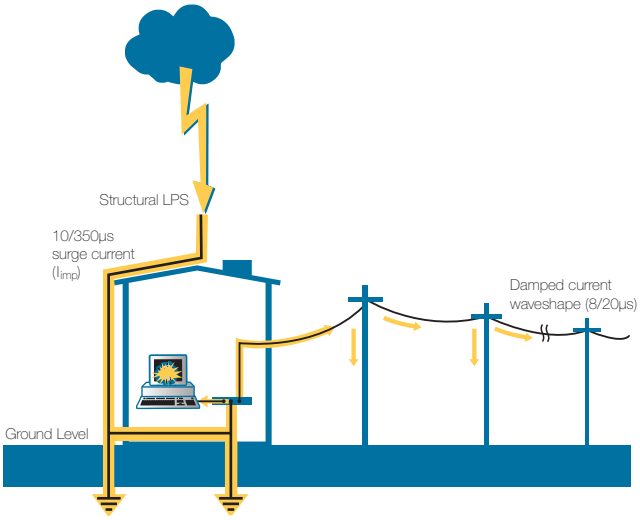
Overvoltages due to lightning strikes:

Each day over four million lightning strikes occur all over the world. Ten percent of these are cloud-to-ground lightning strikes with surge currents up to 200,000 amperes.

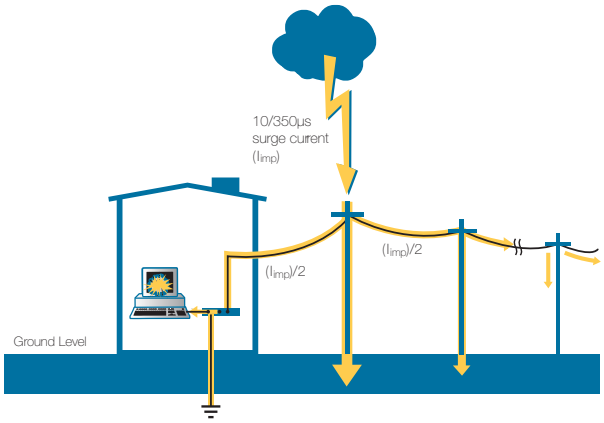
Direct Lightning strikes:

When lightning strikes a conductor or the roof of a building which is earthed, the lightning current is dissipated into the ground. This increases the ground potential which then propagates throughout the building via the cables, damaging equipments along the way.

When lightning strikes an overhead low voltage line, the latter conducts high currents which penetrate into the building creating large overvoltage surges. The damage caused by this type of overvoltage surges is usually spectacular (e.g. fire in the electrical switchboard causing the destruction of buildings and industrial equipment) and may result in explosions.



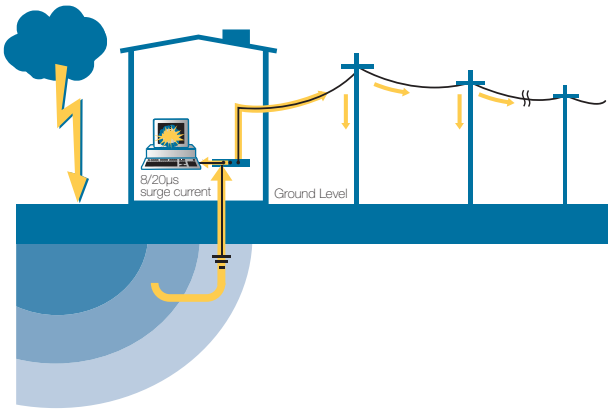
Direct strike to building.



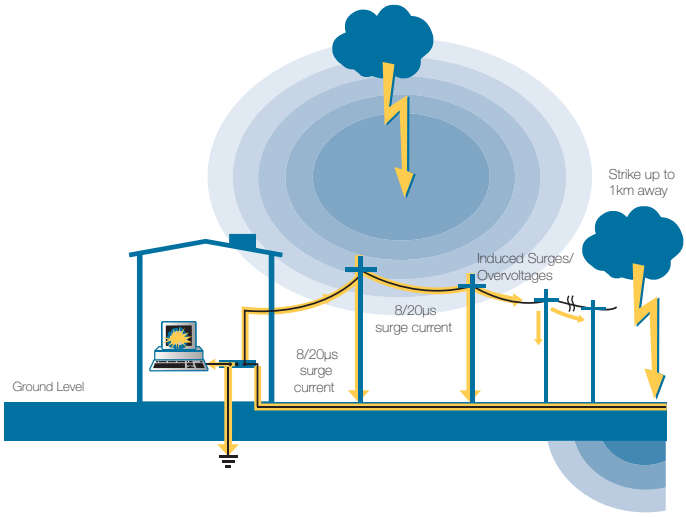
Direct strike to nearby overhead line.

Indirect Lightning strikes:

The over-voltage surges previously mentioned are also found when lightning strikes in the vicinity of a building, due to the increase in potential of the ground at the point of impact. Within a radius up to several kilometres, the electromagnetic fields created by the lightning current generate inductive and capacitive coupling, leading to other overvoltages.



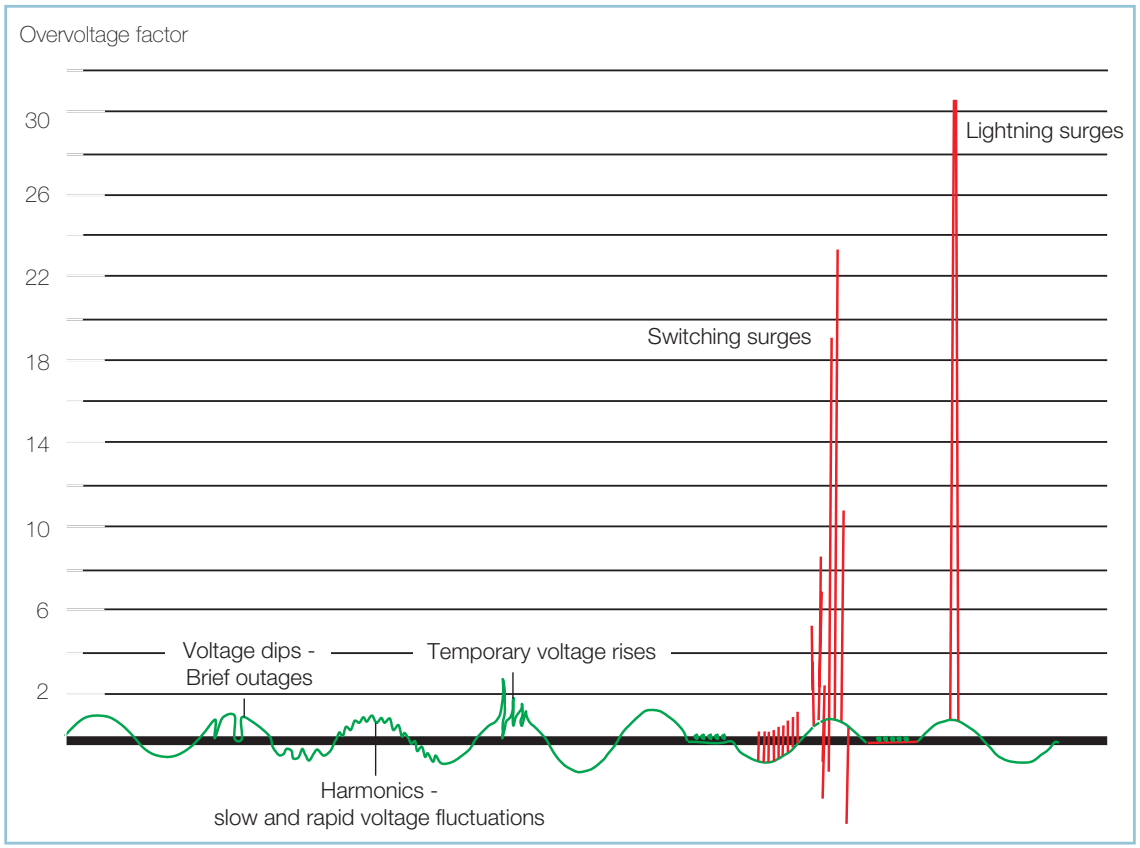
Indirect strike near the building.



Indirect strike near overhead line.

Over-voltage surges due to switching operations

Switching surges arise from on and off-switching operations, from the switching of inductive and capacitive loads and from the breaking of short-circuit currents. Compared to thunder strike over-voltage surge, these switching over-voltage surges have less energy but occur much more frequently.They are harmful as they are generated directly in the mains. Their short duration, their steep wave front and their peak value (that can reach several kilovolts) cause premature ageing of electronic equipment.



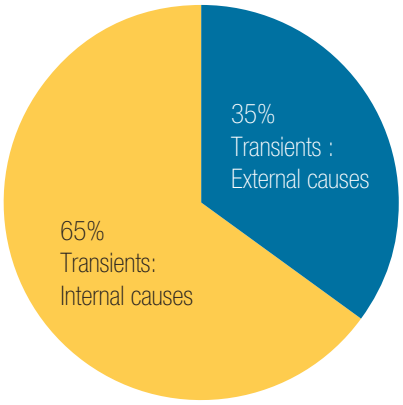
SPD… Not Just Protection Against The Effects Of Lightning

35% Transients : External causes

(lightning, utility grid switching, switching of large capacitor banks on the utility lines, electrical accidents, switching of heavy motors or loads from nearby industry)

65% Transients: Internal causes

(generated inside our homes and facilities and come from such unsuspected sources as microwave ovens, laser printers and copiers, electric motors, electrical appliances, X-ray generators, heavy load machines, welders, robotics, panel, pumps, AC chillers, switched-mode power supply units, circuit-breakers tripping and even lights being switched on or off)



Location variables that increase the risk of external transients:

- Regions of high lightning activity
- At the end of a utility line
- Installation equipped with external lightning conductors or with a metal structure higher than surrounding buildings
- Installation with overhead power supply
- On a transmission line downstream of industrial facilities
- At a higher elevation than surrounding structures
- In an open, rural location

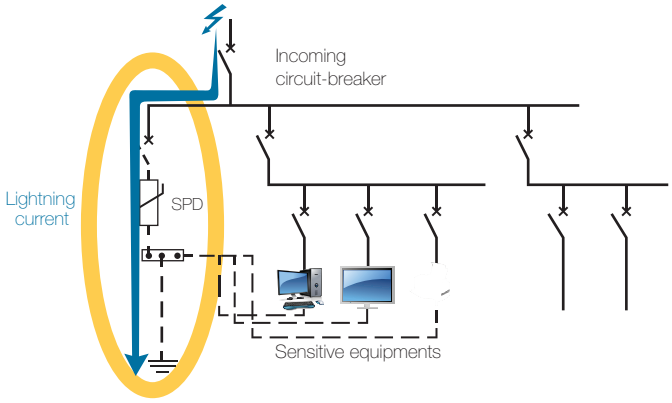
Thus, surge protection is of extreme importance, as it provides the first level of defence for all site equipment at the point of entry of power and data lines.

Surge Protection Devices

General operation of SPD

The Surge Protection Devices (SPD) / Surge Arrester/ Surge Protector/Limiters are generic names for any device to protect from voltage surges. They are designed to limit transitory overvoltage surges and to divert impulse currents away. They contain at least one non-linear component (such as varistor and/ or spark gaps).

They are installed in parallel to the load:
— during normal operation (in absence of surges), SPD shall have no influence on the system to which it is applied. SPD acts as an open circuit and maintains insulation between the line and earth.
— when surge occurs, the SPD lowers its impedance in some nanoseconds and diverts the surge current. SPD behaves as a closed circuit, the surge voltage is short circuited. The overvoltage is limited to an admissible value for the electrical equipment located downstream.
— after surge occurrence, the SPD recovers its high impedance and behaves as an open circuit.



Classification of SPD

IEC 61643-11 classifies SPD into different types:

Type 1 SPDs provide protection from over-voltage surges due to direct lightning strikes with the ability to divert a large quantity of energy. The test parameter is the discharge current represented by a 10/350 µs waveform (test class I). They are installed in areas with high risk of lightning, typically in main distribution boards. They allow only a small part of the impulse current into the system, which must be managed by finer (Type 2) protection devices.

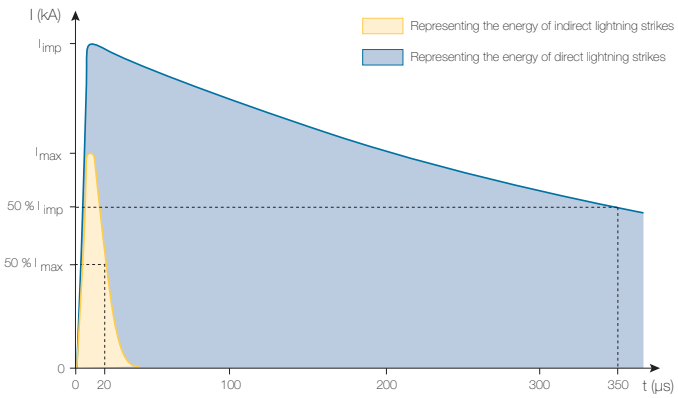
Type 2 SPDs provide protection from over-voltage surges due to indirect lightning strikes hitting the building or surrounding area and switching surges. The test parameter is the discharge current idem 8/20 µs waveform (test class II). They usually employ metal oxide varistor (MOV) technology. They are suitable for installation at the entrance of the installation, in intermediate distribution boards and by the terminal equipment. A Type 2 SPD must be installed downstream of the Type 1 SPDs to protect sensitive equipment.

Type 1+2 SPDs provide protection from over-voltage surges due to direct lightning strikes (having a waveform of 10/350 µs) as well as indirect lightning strikes and switching surges (having a waveform of 8/20 µs). They are increasingly being used at the supply end of installations, as they occupy less space and comply with the specifications of both types.

Discharge current waveforms

- Wave 8/20: Current impulse with a 8 µs rising edge (from 10-90% of maximum value) and a time to decrease to half value of 20 µs. It is used to represent indirect lightning strike.

- Wave 10/350: Current impulse with a 10 µs rising edge (from 10-90% of maximum value) and a time to decrease to half value of 350 µs. It is used to represent direct lightning strike.



Terminology of SPD electrical characteristics

Surge Protectors are defined by a series of electrical specifications which help the user select the right protection specific to their installation:

Rated Voltage (Un)- Rated voltage of the mains network between phase and neutral (RMS AC value).

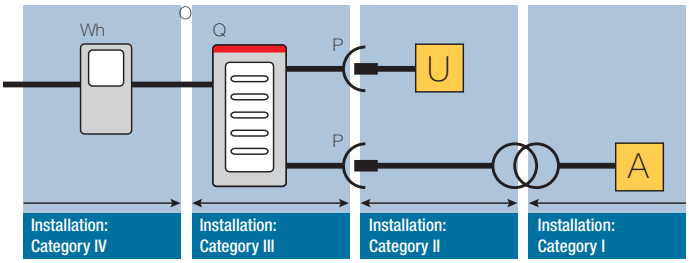
Maximum Continuous Operating Voltage (Uc/Ucpv)- The maximum continuous operating voltage Uc is the maximum r.m.s/ dc voltage which may be applied continuously to the SPD. It has to take into account the network nominal voltage Un plus the possible tolerances.

Nominal discharge current (In)- This is the discharge current with 8/20 µs waveform that the Class 2 SPD is able to divert (towards earth) at least 15 consecutive times, without deteriorating.
The higher it is, the longer the life of the SPD will be.

Impulse current (Iimp)- The impulse current (Iimp), used in Class I test is the maximum impulse 10/350 µs current a surge protector can withstand without destruction. This test simulates the effect, of a direct lightning strike on an installation.

Maximum Discharge current (Imax)- The maximum discharge current (Imax), applicable to Type 2 SPD, is the maximum impulse current 8/20 µs a surge protector can withstand without destruction.
The higher the Imax is, for the same In, the safer the SPD is working, far away from its performance limits.

Protection Level (Up)- The residual voltage that is measured across the terminal of the SPD when In is applied. Surge protection needs to be selected such that their voltage protection level (Up) is lower than the impulse withstand capability of the equipment to be protected.



O = origin of the installation; Wh = electricity meter, Q = main electrical switchboard;
P = electric socket; U = end-user electrical equipment, A = electronic equipment

Category	Impulse With-stand Voltage (Un 230-400 V)	Examples
I	1500 V	Equipment containing particularly sensitive electronic circuits: – Servers, computers, TVs, HiFis, videos, alarms etc. – Household appliances with electronic program etc.
II	2500 V	Non-electronic household appliances, devices etc.
III	4000 V	Distribution switchboards, switching devices (switches and circuit breakers, sockets, insulators etc.), conduits and accessories (wires, bars, junction boxes etc).
IV	6000 V	Industrial equipment and equipment such as, for example, fixed motors connected permanently to fixed systems, electricity meters, transformers etc.

Follow-through current (If)- Current supplied by the electrical supply grid, which flows through the SPD following an impulse current.

Follow current interrupting rating (Ifi): It is a parameter for spark-gaps and gas discharge tubes and does not concern varistors. Ifi is the rms-value of the follow current, which can be interrupted by the SPD under Uc.

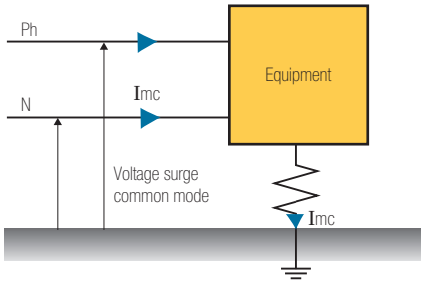
Residual current (Ipe)- Current measured at the PE terminals when the SPD is connected under nominal voltage.

Short circuit current rating (Isccr)- Maximum prospective short circuit-current from the power system for which the SPD is configurated in conjunction with the recommended back-up protection.

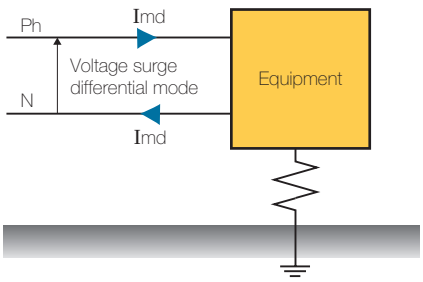
Temporary overvoltage (Ut)- The temporary overvoltage Ut is the maximum r.m.s. value the surge protector can withstand during 5 seconds, without failure.

Different propogation modes:

Common mode: Common mode voltage surges occur between the live parts and the earth: phase/earth or neutral/earth. They are especially dangerous for devices whose frame is earthed due to the risk of dielectric breakdown.



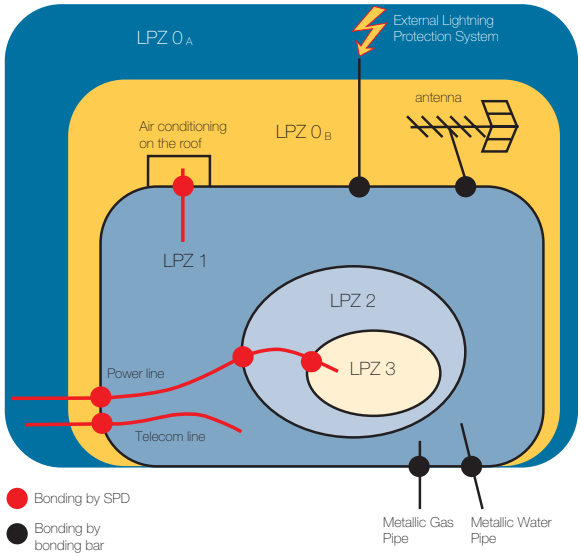
Differential mode: Differential mode voltage surges circulate between live conductors: Phase to phase or phase to neutral. They are especially dangerous for electronic equipment, sensitive computer equipment, etc.



Selection Principle

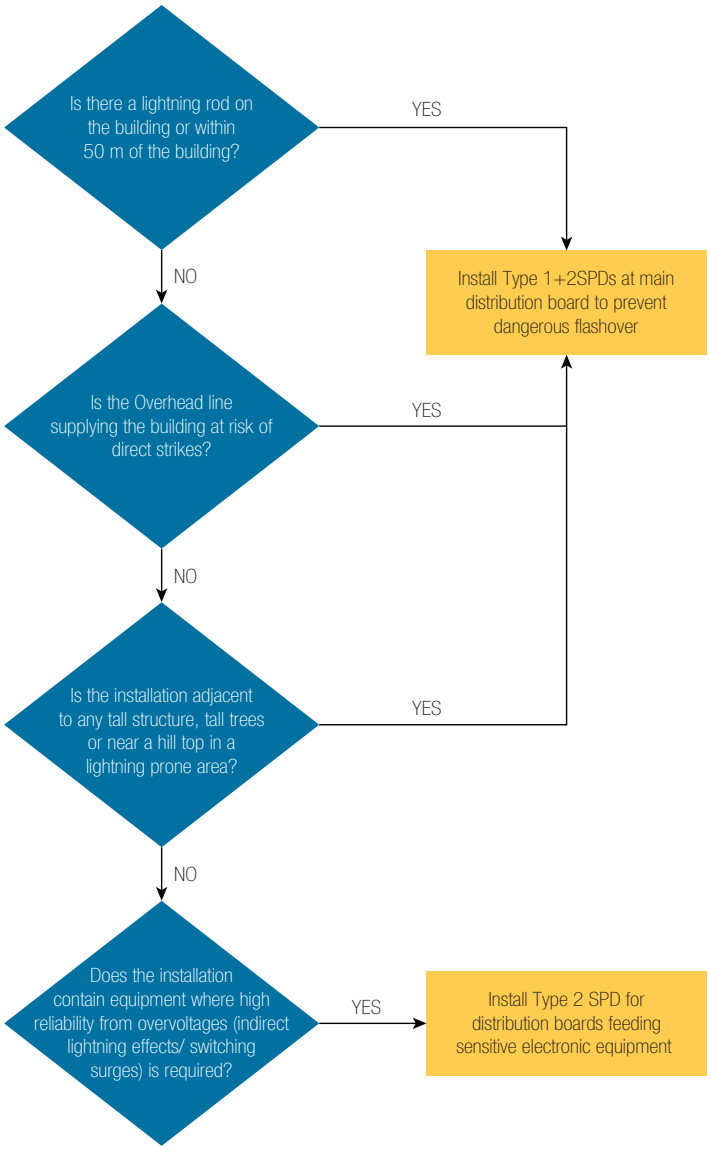
Lightning Protection Zones Concept (IEC 62305-4)

IEC introduced the concept of protection zones as a design tool which assist in the selection of the appropriate surge protection. This concept ensures the gradual reduction by stages of the energies and overvoltages caused by lightning or switching operations from the non protected environment to the very sensitive equipment. SPDs are installed at the boundaries of protection zones.



	LPZ0A	LPZ0B	LPZ1	LPZ2	LPZ3
Location	Zone outside the building and outside the protection area of the lightning protection system.	Zone outside the building and inside the protection area of the lightning protection system.	Zone inside the building. (This is typically the area where services enter the building or where main power switchboard is located).	Zone inside the building. (This is typically a screened room or the sub-distribution board area).	Zone inside the building for very sensitive equip-ment
Direct lightning strike possibility	YES	NO	NO	NO	NO
Electromagnetic field	Full magnetic filed		Damped magnetic filed	Further damped magnetic filed	Magnetic field is further reduced due to shielding measures (such as metallic casing of equipment)
Current wave shapes carried by power lines	10/350 µs & 8/20 µs - partial lightning currents from direct lightning strikes (10/350 µs). - magnetic field coupling from direct lightning strike (8/20 µs). - switching surges from operations on the grid (8/20 µs).	8/20 µs - magnetic field coupling from direct lightning strike. - switching surges from operations on the gird.	8/20 µs - The conducted lightning currents and/or switching surges are reduced com-pared with the external zones.	1.2/50 µs (voltage impulse) - oscillation effects/ amplification phenomena. - remnants of lightning impluse currents are further reduced compared to LPZ-1. - voltage surges arising due to operations on the internal wiring.	1.2/50 voltage impulse with very low energy.
SPDs at the boundaries		Type 1 Type 1+2 Type 2		Type 2	Type 3

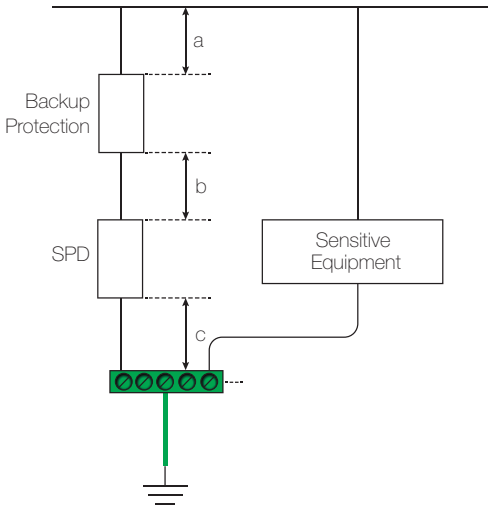
Selection of Arrester



Installation:

Backup Protection: In the case of natural end of life due to ageing, protection is of the thermal type. SPDs with varistor have an internal disconnector which disables them. SPDs should be provided with an external backup protection which can be either an MCB or a fuse. These protect SPD in case of short circuit due to very high surge transient current, fault in distribution system, gradual deterioration of varistor etc.

Connection Cabling of SPD: To gain maximum protection from the SPD, the connecting conductors should be kept as short as possible. This is to minimize any additive voltage drops on the connecting cables (a + b + c < 50 cm). Refer installation manual for detailed instruction.



AC Surge Protection Devices

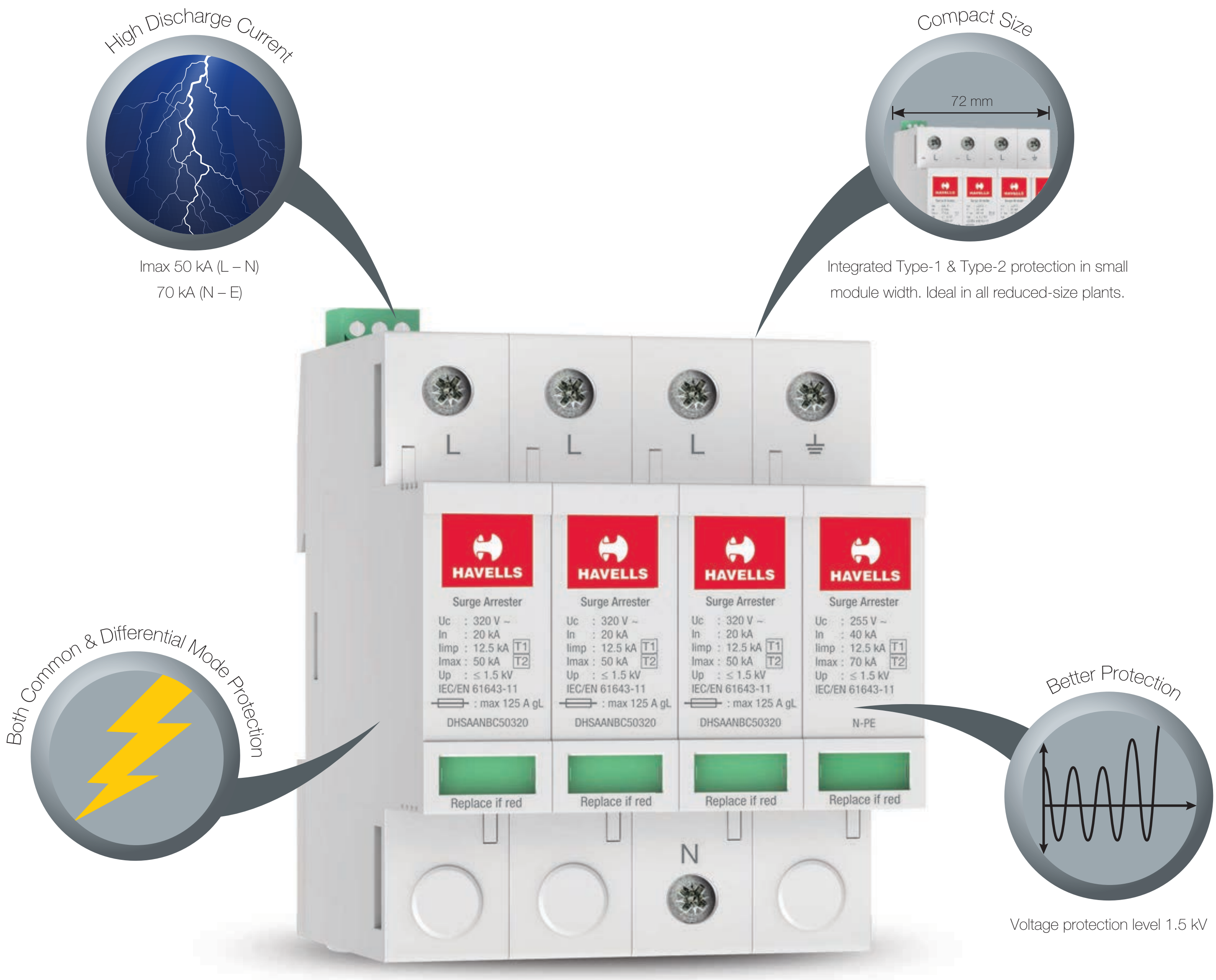
IEC / EN 61643-11: 2011

A Complete AC SPD Range, Tested and Certified With The Latest Standard

Residential | Commercial | Industrial


L
L
L
L
HAVELLS
Surge Arrester
Uc : 320 V ~
In : 20 kA
Iimp : 12.5 kA T1
Imax : 50 kA T2
Up : ≤ 1.5 kV
IEC/EN 61643-11
: max 125 A gL
DHSAARAC50320
HAVELLS
Surge Arrester
Uc : 255 V ~
In : 40 kA
Iimp : 12.5 kA T1
Imax : 70 kA T2
Up : ≤ 1.5 kV
IEC/EN 61643-11
N-PE
HAVELLS
Surge Arrester
Uc : 320 V ~
In : 20 kA
Imax : 40 kA T2
Up : ≤ 1.5 kV
IEC/EN 61643-11
: max 125 A gL
DHSA2RBN40320
HAVELLS
Surge Arrester
Uc : 320 V ~
In : 20 kA
Imax : 40 kA T2
Up : ≤ 1.5 kV
IEC/EN 61643-11
: max 125 A gL
DHSA2RBN40320
HAVELLS
Surge Arrester
Uc : 320 V ~
In : 20 kA
Imax : 40 kA T2
Up : ≤ 1.5 kV
IEC/EN 61643-11
: max 125 A gL
DHSA2RBN40320
HAVELLS
Surge Arrester
Uc : 255 V ~
In : 20 kA
Imax : 40 kA T2
Up : ≤ 1.5 kV
IEC/EN 61643-11
N-PE
Replace if red
Replace if red
Replace if red
Replace if red
Replace if red
N
N

Type 1+2 AC Surge Protection Devices



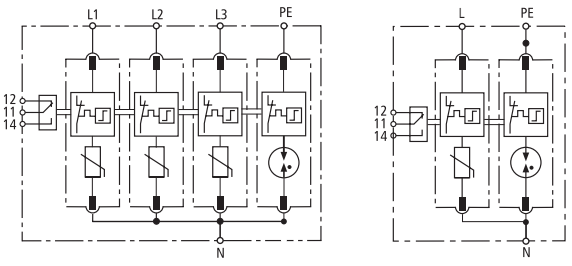
These are very compact SPDs which protect both from overvoltage surges due to direct and indirect lightning strikes as well as switching surges. They are an integrated solution, equivalent to an automatically coordinated Type 1 and Type 2 SPDs. They shall be installed at the line entrance of the installation (meter board or main distribution board). They are dedicated to applications where space is very limited.

Technical Specifications:

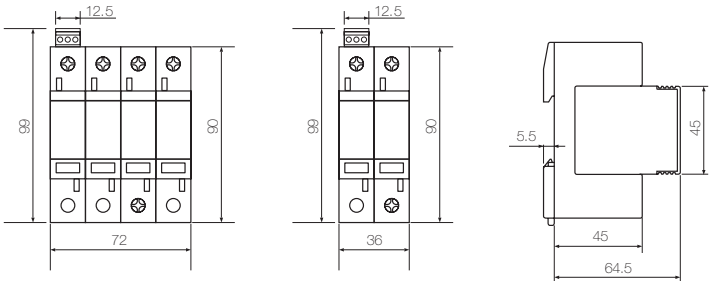
Standard Compliance	IEC/EN 61643-11
Type / Class	Type 1+2 / Class I+II
Max Continuous Operating AC Voltage Uc	320 V (L - N), 255 V (N - PE)
Lightning Impulse (10/350 microsecond) Iimp	12.5 kA
Nominal Discharge Current (8/20 microsecond) In	20 kA (L - N), 40 kA (N - PE)
Max Discharge Current (8/20 microsecond) Imax	50 kA (L - N), 70 kA (N - PE)
Voltage Protection Level Up	<1.5 kV
Voltage Protection Level 5kA Up	<1.2 kV
Max Backup Fuse	125 A gL/gG
Temporary Overvoltage Charactersitcs (5 second) Ut	335 V
Residual Current At Uc - Ipe	<100 µA
Response Time	<25 ns
Short Circuit Current Rating I_{SCCR}	3 kA
Follow Current extinguishing Capability [N-PE] a.c. Ifi	100 Arms
Number of Ports	One Port SPD
Location	Indoor
Humidity	5-95%
Operating Temperature Range	–40°C - 80°C
Operating State/Fault Indication	Green/Red
Cross-section Area	4-35 sq mm
For Mounting on	35 mm Din Rail
Enclosure Material	Thermoplastic UL94-V0
Degree of Protection	IP20
Ordering Code (SPN - SPD)	DHSAANAC50320 / DHSAARAC50320*
Ordering Code (TPN - SPD)	DHSAANBC50320 / DHSAARBC50320*

*SPD with remote signalling contact.

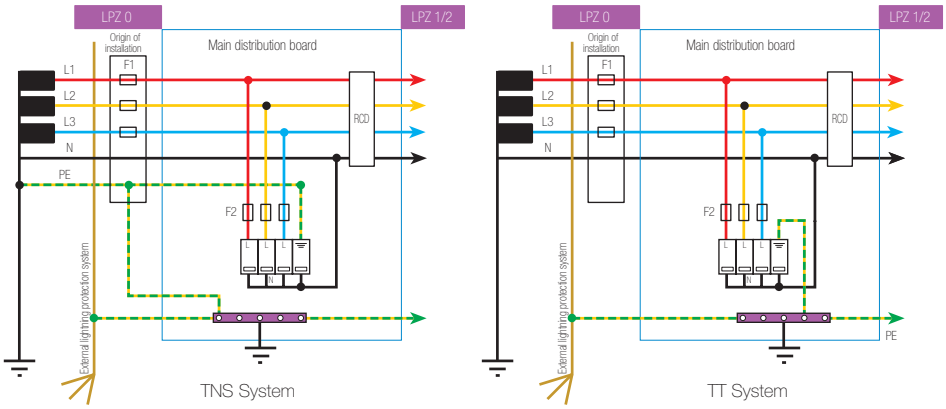
Circuit Diagram:



Dimensions:

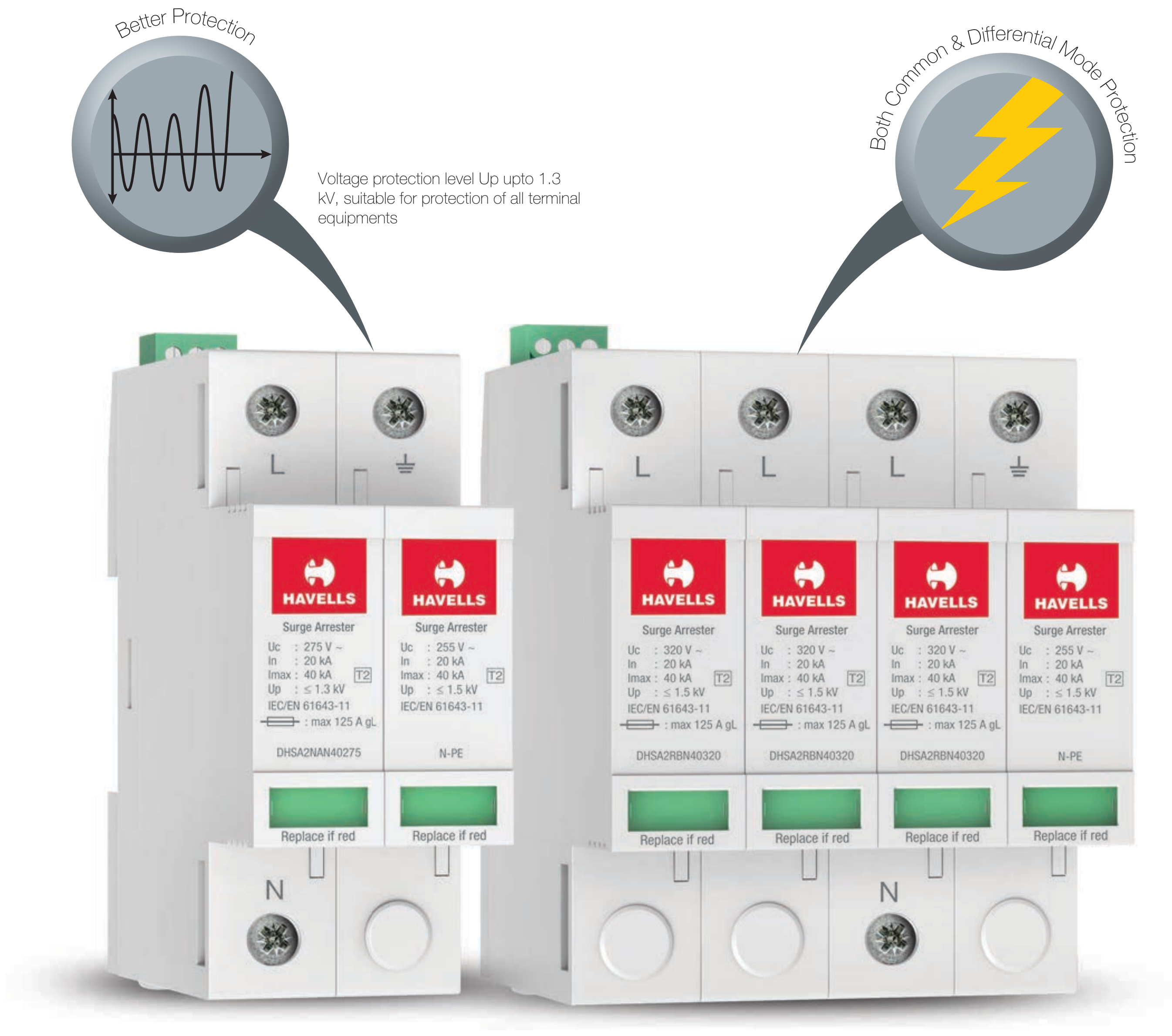


Connections:



F1: Overcurrent protection device
F2: Backup protection

Type 2 AC Surge Protection Devices



These are suitable for second level of protection in supply distribution panels in which Type 1 protectors are installed, or the first level of protection in residential, commercial or other applications not exposed to direct strikes or with no external lightning protection system.

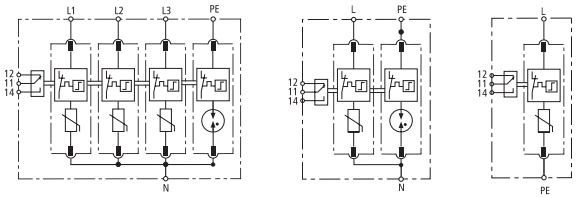
They are installed at the origin of the low voltage system or close to sensitive equipment to protect against transient voltages coupled into the low voltage network.

Technical Specifications:

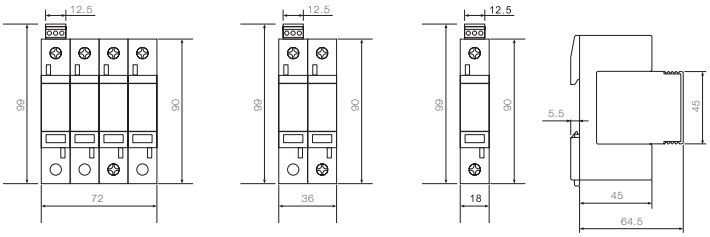
Standard Compliance	IEC/EN 61643-11	IEC/EN 61643-11
Type / Class	Type 2 / Class II	Type 2 / Class II
Max Continuous Operating AC Voltage Uc	275 V	320 V
Max Continuous Operating AC Voltage [N-PE] Uc	255 V	255 V
Nominal Discharge Current (8/20 microsecond) In	20 kA	20 kA
Max Discharge Current (8/20 microsecond) Imax	40 kA	40 kA
Voltage Protection Level Up	<1.3 kV	<1.5 kV
Voltage Protection Level 5kA Up	<1 kV	<1.2 kV
Voltage Protection Level [N-PE] Up	<1.5 kV	<1.5 kV
Temporary Overvoltage with Stand (5 second) Ut	335 V	335 V
Residual Current At Uc- Ipe	<100 µA	<100 µA
Short Circuit Current Rating I_{SCCR}	3 kA	3 kA
Follow Current extinguishing Capability [N-PE] a.c. Ifi	100 Arms	100 Arms
Max Backup Fuse	125 A gL/gG	125 A gL/gG
Response Time	<25 ns	<25 ns
Response Time [N-PE]	<100 ns	<100 ns
Operating Temperature Range	–40°C - 80°C	–40°C - 80°C
Operating State/Fault Indication	Green/Red	Green/Red
Cross-section Area	4-35 sq mm	4-35 sq mm
For Mounting on	35 mm Din Rail	35 mm Din Rail
Enclosure Material	Thermoplastic UL94-V0	Thermoplastic UL94-V0
Degree of Protection	IP20	IP20
Ordering Code (SP - SPD)	DHSA2N1N40275 / DHSA2R1N40275*	DHSA2N1N40320 / DHSA2R1N40320*
Ordering Code (SPN - SPD)	DHSA2NAN40275 / DHSA2RAN40275*	DHSA2NAN40320 / DHSA2RAN40320*
Ordering Code (TPN - SPD)	DHSA2NBN40275 / DHSA2RBN40275*	DHSA2NBN40320 / DHSA2RBN40320*

*SPD with remote signalling contact.

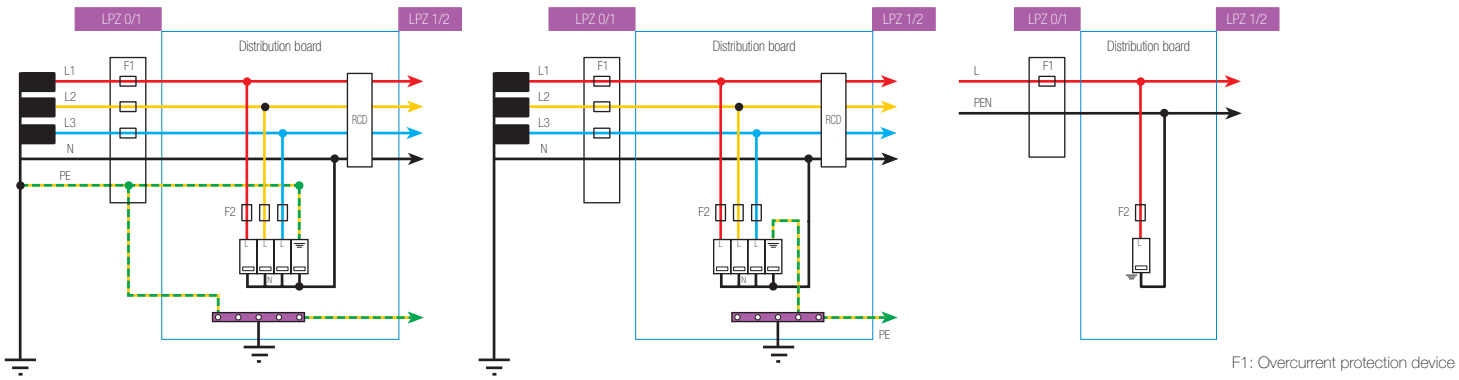
Circuit Diagram:



Dimensions:



Connections:



F1: Overcurrent protection device
F2: Backup protection

Photovoltaic Surge Protection Devices

EN 50539-11: 2013

A Complete DC SPD Range, Tested and Certified With The Latest Standard

Residential | Commercial | Industrial


HAVELLS
PV Surge Arrester
Ucpv : 1200 Vdc
In : 20 kA
Iimp : 6 kA T1
Imax : 40 kA T2
Up : ≤ 4 kV
EN 50539-11
DHSDARCB4012H
Replace if red
HAVELLS
PV Surge Arrester
DHSDARCC6012H
Ucpv : 1200 Vdc
Iimp : 12.5 kA T1
Up : ≤ 4 kV
In : 20 kA
Imax : 60 kA T2
EN 50539-11
Replace if no light

Type 1+2 Photovoltaic Surge Protection Devices

For photovoltaic systems, often located in isolated and exposed locations and with a generally large surface of area, the threat of lightning is quite common. The risk is multiple: direct effect (lightning strike on the panels) and indirect (surge on cells, solar chargers, inverters), or on other lines (data). When the PV system is located on industrial sites, the risk of switching overvoltage surges must also be taken into account. For this reason, and given the high value of the components and the high cost of any down time, SPDs are highly recommended.

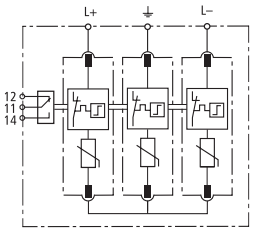
The Type 1+2 PV SPD range allows the DC side of each PV installation to be effectively protected against over voltages, both due to direct lightning strikes (10/350 µs discharge current wave) as well as indirect lightning strike and switching surges (8/20 µs discharge current wave).

Technical Specifications:

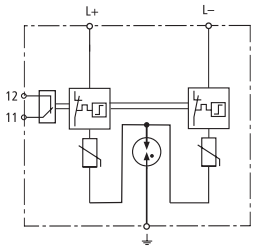
	Type 1+2 (12.5 kA)	Type 1+2 (6 kA)
Standard Compliance	EN 50539-11	EN 50539-11
Type	Type 1+2	Type 1+2
Max Continuous Operating DC Voltage Ucpv	1200 Vdc	1200 Vdc
Lightning Impulse (10/350 microsecond) Iimp	12.5 kA	6 kA
Nominal Discharge Current (8/20 microsecond) In	20 kA	20 kA
Max Discharge Current (8/20 microsecond) Imax	60 kA	40 kA
Voltage Protection Level Up	<4 kV	<4 kV
Short Circuit Current with Stand Iscpv	1000 A	1000 A
Leakage Current	<100 µA	<100 µA
Response Time	<25 ns	<25 ns
Operating State/Fault Indication	Green/No Light	Green/Red
Thermal Disconnector	Internal	Internal
Fuses	Without	Without
Operating Temperature Range	-40°C - 80°C	-40°C - 80°C
Cross-section Area	4-35 sq mm	4-35 sq mm
For Mounting on	35 mm Din Rail	35 mm Din Rail
Enclosure Material	Thermoplastic UL94-V0	Thermoplastic UL94-V0
Degree of protection	IP20	IP20
Ordering Code	DHSDANCC6012H	DHSDANCB4012H
	DHSDARCC6012H*	DHSDARCB4012H*

*SPD with remote signalling contact.

Circuit Diagram:

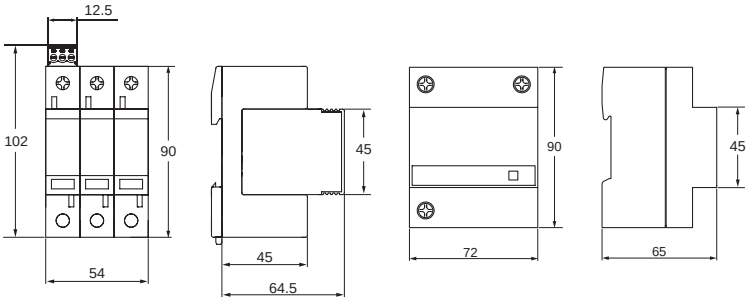


Type 1+2 SPD (6kA)



Type 1+2 SPD (12.5kA)

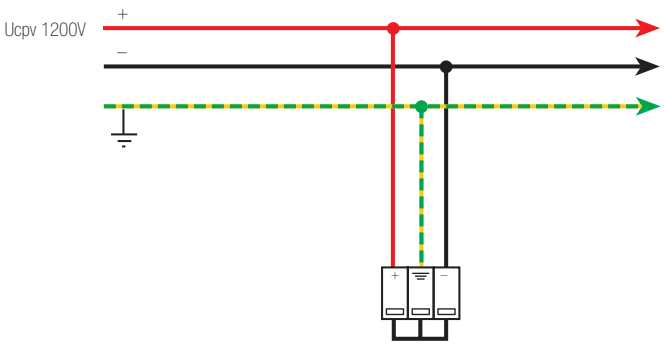
Dimensions:



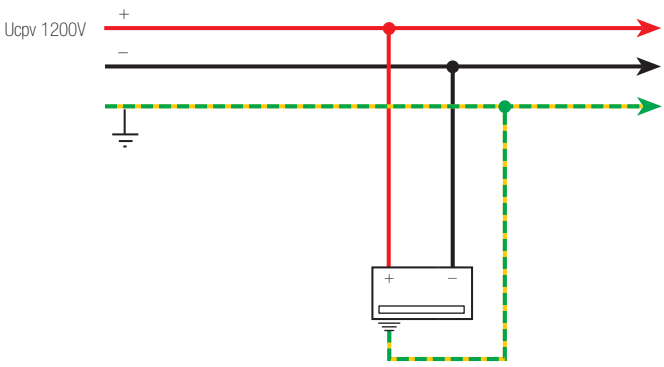
Type 1+2 SPD (6kA)

Type 1+2 SPD (12.5kA)

Connections:

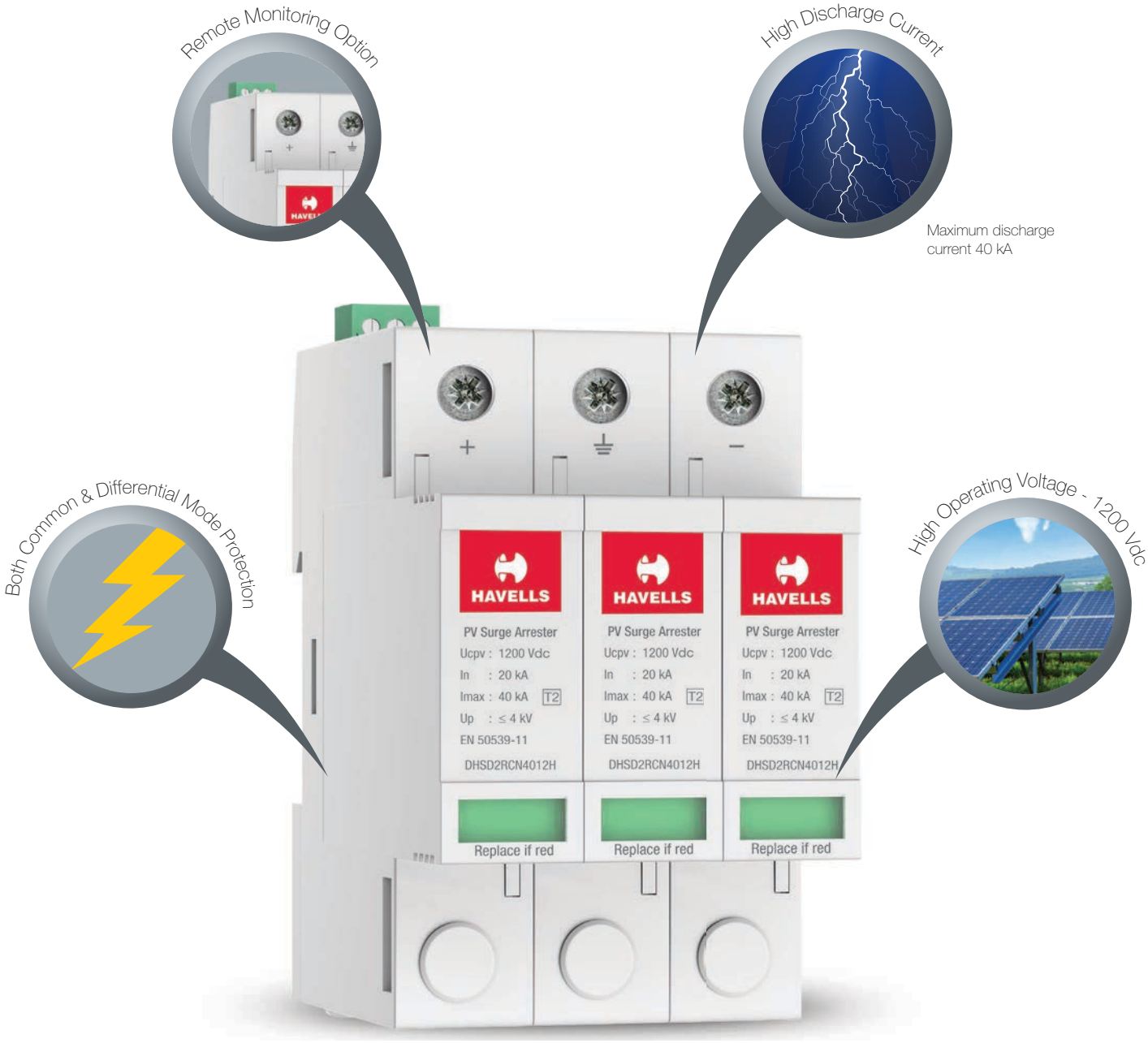


Type 1+2 SPD (6kA)



Type 1+2 SPD (12.5kA)

Type 2 Photovoltaic Surge Protection Devices



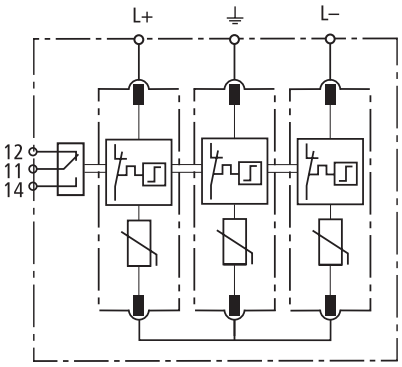
The Type 2 PV SPD range allows the DC side of each PV installation to be effectively protected against over voltages due to indirect lightning strikes and switching surges (8/20 µs discharge current wave).

Technical Specifications:

Standard Compliance	EN 50539-11
Type	Type 2
Max Continuous Operating DC Voltage Ucpv	1200 Vdc
Nominal Discharge Current (8/20 microsecond) In	20 kA
Max Discharge Current (8/20 microsecond) Imax	40 kA
Voltage Protection Level Up	<4 kV
Short Circuit Current Withstand Iscpv	1000 A
Leakage Current	<100 µA
Response Time	<25 ns
Operating Temperature Range	-40°C - 80°C
Humidity	5-95%
Installation	Indoor
Thermal Disconnector	Internal
Fuses	Without
Operating State/Fault Indication	Green/Red
Cross-section Area	4-35 sq mm
For Mounting on	35 mm Din Rail
Enclosure Material	Thermoplastic UL94-V0
Degree of protection	IP20
Ordering Code	DHSD2NCN4012H
	DHSD2RCN4012H*

*SPD with remote signalling contact.

Circuit Diagram:



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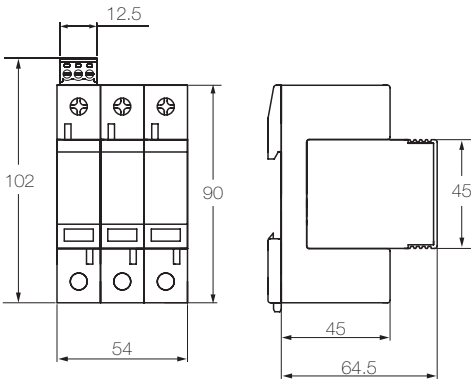
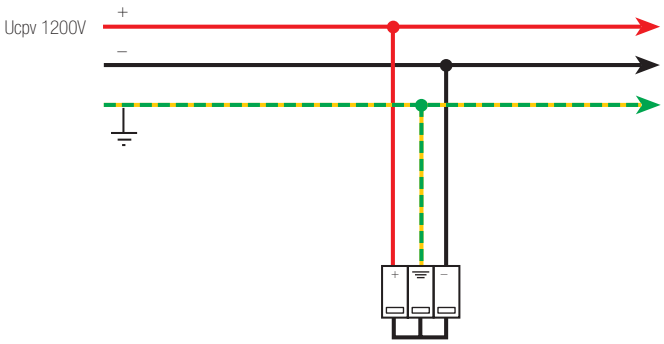
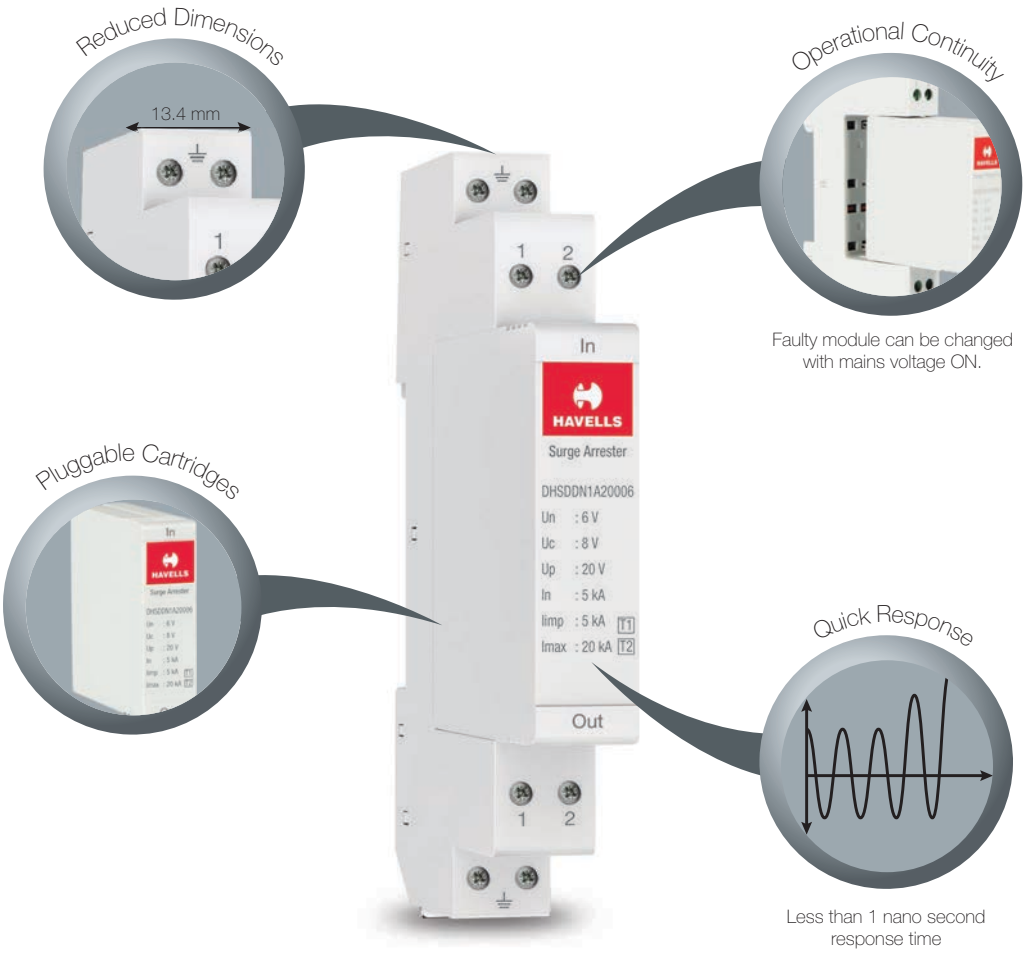


Connections:



Data Line Surge Protection Devices

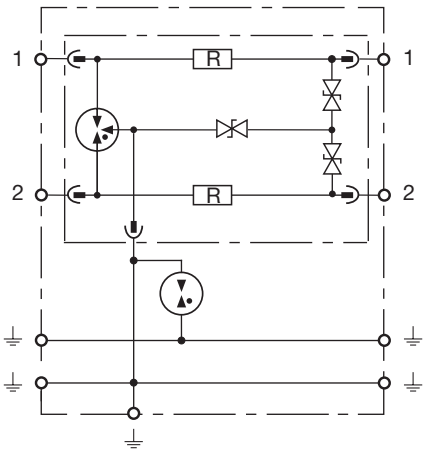


Telecommunication and data transmission devices (PBX, modems, data terminals, sensors, etc...) are increasingly more vulnerable to lightning induced voltage surges. They have become more sensitive, complex and have a high vulnerability to induced surges due to their possible connection across several different networks. These devices are critical to a companies' communications and information processing. Thus, it is advisable to insure them against these potentially costly and disruptive events. A data line surge protector installed in-line, directly in front of a sensitive piece of equipment will increase their useful life and maintain the continuity of the flow of your information.

Technical Specifications:

Nominal Voltage type	6V	12V	24V	48V
Network	RS422	RS232, RS485	4-20mA, Analog Signals, Digital Signals	ISDN, 48V Line
SPD Configuration	1 Pair + Shielded	1 Pair + Shielded	1 Pair + Shielded	1 Pair + Shielded
Nominal Line Voltage Un	6 V	12 V	24 V	48 V
Max DC Operating Voltage Uc	8 V	15 V	28 V	53 V
Max Load Current I_L	300 mA	300 mA	300 mA	300 mA
Max Frequency fmax	>3 MHz	>3 MHz	>3 MHz	>3 MHz
Insertion Loss	<1dB	<1dB	<1dB	<1dB
Nominal Discharge Current (8/20 Microsec) In	5 kA	5 kA	5 kA	5 kA
Max Discharge Current (8/20 Microsecond) Imax	20 kA	20 kA	20 kA	20 kA
Impulse Current (10/350 microsecond) Iimp	5 kA	5 kA	5 kA	5 kA
Voltage Protection Level Up	20 V	30 V	40 V	70 V
Response Time	<1 ns	<1 ns	<1 ns	< 1ns
Series Resistance	2Ω	2Ω	2Ω	2Ω
Humidity	5-95%	5-95%	5-95%	5-95%
Operating Temperature Range	–40°C - 80°C			
For Mounting on	35 mm Din Rail			
Cross-section Area	0.4-2.5 sq mm			
Standards Compliance	IEC 61643-21/EN 61643-21			
Enclosure Material	Thermoplastic UL94-0			
Degree of Protection	IP20			
Ordering Code	DHSDDN1A20006	DHSDDN1A20012	DHSDDN1A20024	DHSDDN1A20048

Circuit Diagram:



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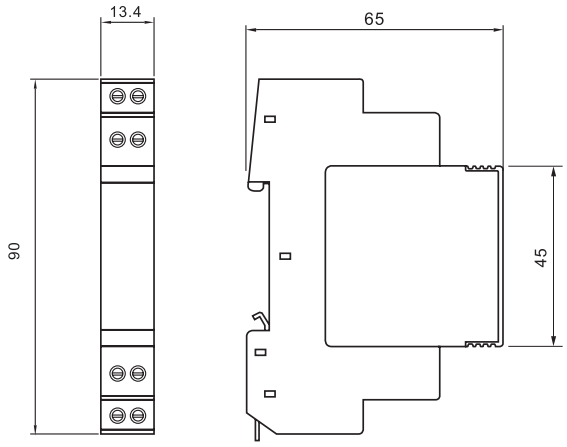

Notes

Notes

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