Expertise, our source of energy

PRODUCT CATALOGUE

LIGHTNING AND SURGE PROTECTION SPECIALISTS

INDEX

Expertise in power quality

Your global electrical power partner

Mersen is a leading market player with innovative solutions in the field of lightning and surge protection.

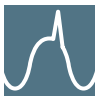
We design, manufacture, test and certify our products and your systems.

Safety & reliability for surge protection

- **Bringing together the experience** of the principal international **manufacturing and test standards** for SPDs (IEC and UL)
- **Unique expertise in the combination of SPD and fuse technology,** one of the hot topics in the SPD industry
- **Innovative ranges combining surge protection and ground monitoring** to provide full safety and continuity of service
- **World-class surge test platform,** with laboratories holding accreditations for both IEC/EN 61643-11 (Terrassa) and UL 1449 4th ed (Newburyport)
- **Global manufacturing footprint** of a comprehensive range of solutions covering both IEC and UL markets
- **Leadership in POP (TOV)** (Power-frequency Overvoltage Protection) and combined **SPD+POP** devices. EN 50550.
- Wide range of solutions targeting **industrial, commercial and residential applications**

Lightning and surge protection

Mersen offers a wide range of solutions along with advice and consulting services as well as after sale service



SPD – Surge-Trap®
Surge protective devices to IEC and NEMA/UL.
Also for telecom and signalling networks.
See page 12-30

GND – Grounding system monitors.

POP (TOV) – Power-frequency Overvoltage Protection.
EN 50550. (Temporary Overvoltages TOV)
See page 31

ESE – Electronic Early Streamer Emission lightning air terminals.

World-class surge test platform

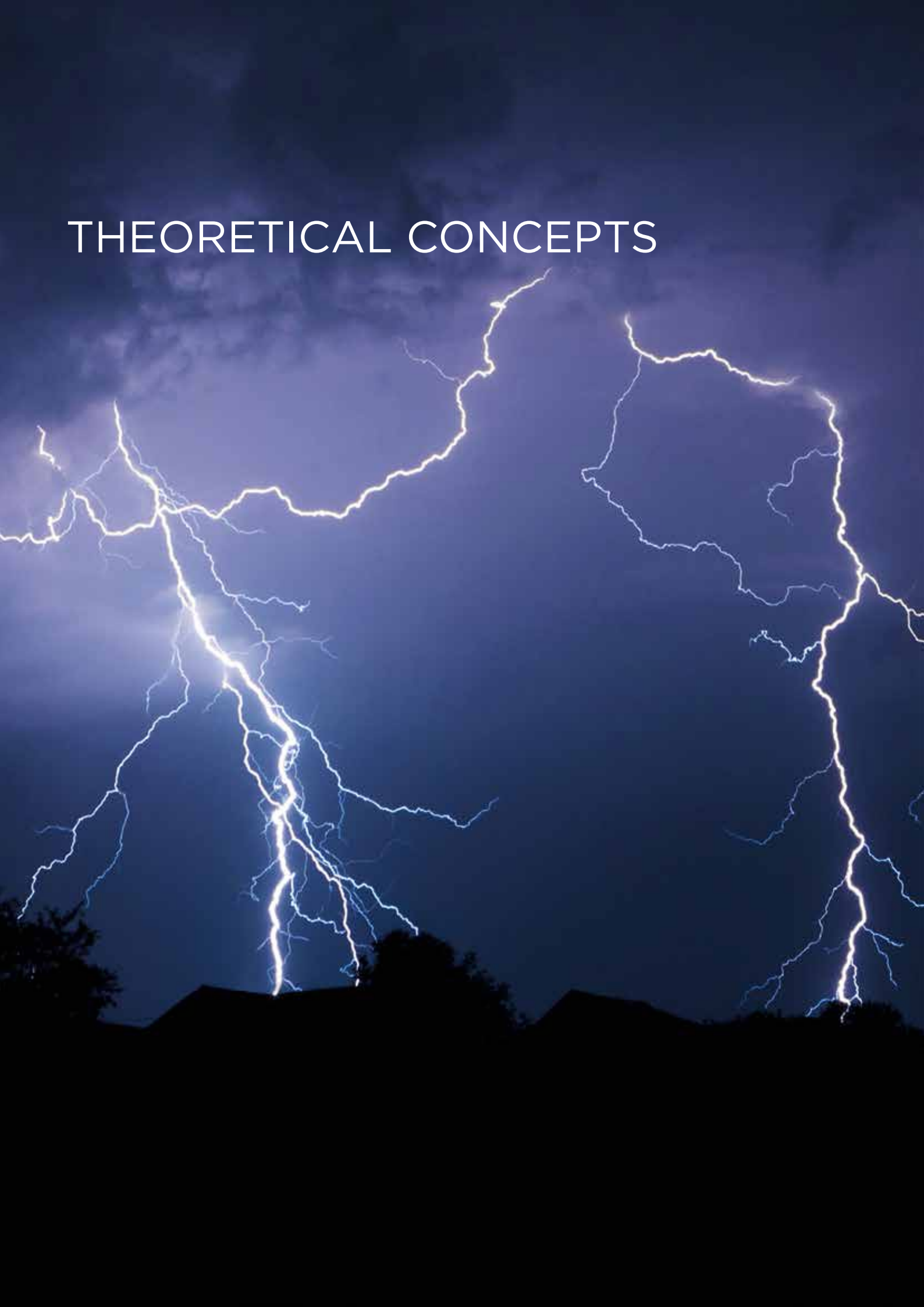
Mersen is committed to **innovation.** The proof of that quest for continual improvement: a total of more than a million tests in 25 years!

In the field of lightning and surge protection Mersen has a highly specialised team, test laboratories, high investment in R&D, international patents and presence on standards committees.

Mersen has two surge test labs: one in Newburyport, Massachusetts, and one state of the art Lightning and Surge protection test lab in Terrassa, Spain, namely the Global Center of Excellence for IEC Surge Protection. The two are complementary, in terms of the available resources, to be able to offer the **widest possible range of tests to IEC, UL and NFC standards.**

Mersen welcomes customers at both locations to run test campaigns focused on critical points in their own bills of requirements

THEORETICAL CONCEPTS

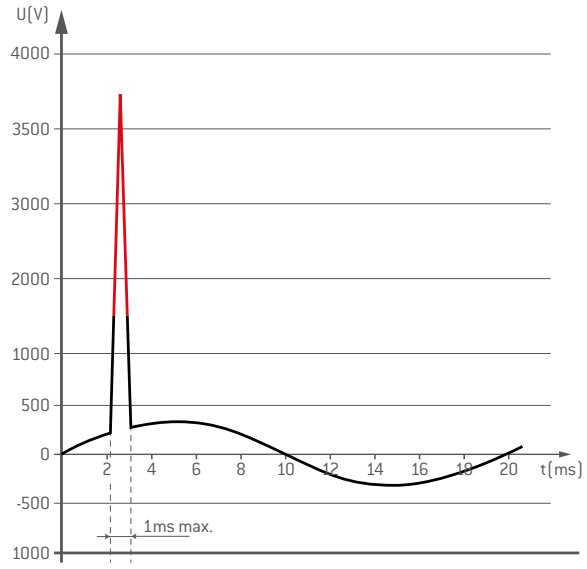


NEED OF PROTECTION

INTRODUCTION TO SURGE PROTECTION

What are surges?

Surges are transient over voltages that can reach tens of kilovolts with durations in the order of microseconds. Despite their short duration, the high energy content can cause serious problems to equipment connected to the line like premature ageing of electronic components, equipment failure or disruptions to service and financial loss.



When the peak voltage reaches a value higher than the equipment can withstand, it causes its destruction.

Origin of surges

- **Lightning:** The most destructive source of surge. Based on the IEC 61643-12 standard, energy from lightning can reach up to **200 kA**. However for reference, estimates indicate 65% are less than 20kA and 85% are less than 35kA.

- **Induction:** Sources include cloud to cloud lightning or nearby lightning impacts where the current flow induces an overvoltage on supply lines or other metallic conductors.

There is no way of really knowing when, where, the size, or the duration/waveform of a surge. Therefore, within the Standards, some assumptions have been made and 2 main waveforms have been chosen to simulate different surge events.

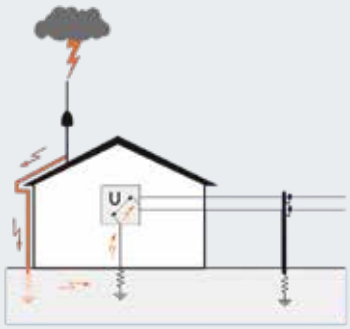
Types of Surges

Conduction
Conduction or 10/350 µs simulates energy from direct lightning impact

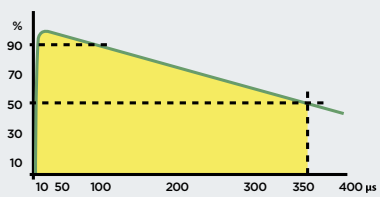
Induction
Induction or 8/20 µs simulates energy
from indirect lightning impact

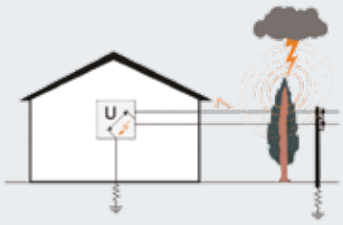
Do not confuse this kA rating with the fault levels of the installation.

Fault ratings given by the transformer are kA for 1 second. Surge kA rates are for microseconds. Protection in front of surge will be based on this statement.

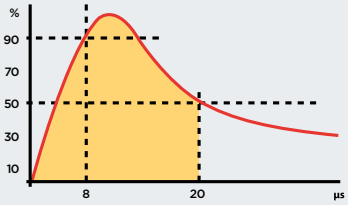


Current wave 10/350 µs





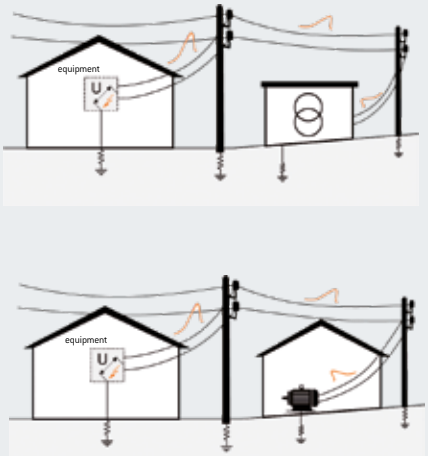
Current wave 8/20 µs



Internal surges:
These are the main sources of surge in real life

They come from utility grid switching, disconnection of motors or other inductive loads. Energy from these sources is also analysed with the 8/20 µs wave form.

Transient overvoltages do not occur solely in power distribution lines, they are also common in any line formed by metal conductors, such as telephony, communications, measurement and data.



Protector in front of surges: SPD (Surge Protection Device)

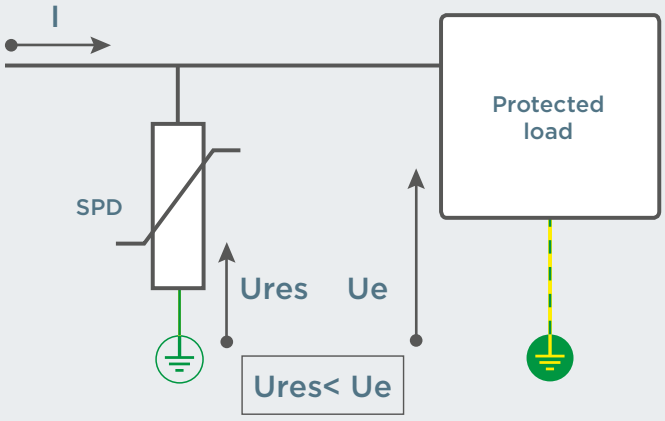
A transient overvoltage protection device acts as a voltage controlled switch and is installed between the active conductors and ground in parallel with the equipment to be protected. When the supply voltage is lower than its activation voltage, the protector acts as a high-impedance element so that no current flows through it. When the supply voltage is higher than the activation voltage, the protector acts as an element with impedance close to zero, diverting the over voltage to earth and preventing it from affecting equipment downstream.

Nevertheless, in the terminals of the SPD there will always be a residual voltage (Ures). This is not a fixed rate. Because of the surge current, there will be a residual voltage across the SPD, this means, the higher the surge current, the higher the residual voltage. To protect your electrical equipment the residual voltage across the SPD, including the wires and connections, needs
to be less than the over voltage withstand of the equipment.

I: peak current

Ures: voltage protection level.
Residual voltage at In.

Ue: impulse voltage the equipment can withstand



SPD FEATURES BASED ON THE IEC 61643 STANDARD

Protection parameters according to IEC 61643

Iimp
Impulse current
Peak current with **10/350µs** waveform that the protection device can withstand without reaching end of life.

Imax
Maximum discharge current
Peak current with **8/20µs** waveform that the protection device can withstand.

In
Nominal current
Peak current in **8/20µs** waveform that the protection device can withstand 20 times without reaching end of life.

Up
Voltage protection level
Maximum residual voltage between the terminals of the protection device during the application of a peak current equal to the nominal current (In).

Uc
Maximum continuous operating voltage
Maximum effective voltage that can be applied permanently to the terminals of the protection device.

Uoc
Open circuit voltage (combined voltage pulse)
This parameter is used only for the Class III test and is applicable to a Type 3 SPD. It consists of the application of a combination wave (**1.2/50µs** in open circuit - **8/20µs** in short circuit).

Ifi
Follow current extinction capability
This parameter is only devoted to surge protectors using “air gap” technology. Once they have “switched”, these surge protectors conduct part of the network current (follow current) and need to interrupt it.

Classification of protectors

Protection devices are classified into types according to discharge capacity:

- **Type 1:**
  Tested with a 10/350 µs waveform (Class I test), which simulates the current produced by a direct lightning strike.

  Ability to discharge very high currents to earth, providing a high Up - voltage protection level.

  Must be accompanied by downstream Type 2 protectors. Designed for use in incoming power supply panels where the risk of lightning strike is high, for example in buildings with an external lightning protection system (LPS).

- **Type 2:**
  Tested with a 8/20 µs waveform (Class II test), which simulates the current produced in the event of a switching or lightning strike on the distribution line or its vicinity.

  Ability to discharge high currents to earth, providing a medium Up - voltage protection level. Designed for use in distribution panels located downstream of Type 1 protectors or in incoming power supply panels in areas with low exposure to lightning strikes.

- **Type 3:**
  Tested with a combined 1.2/50 µs - 8/20 µs waveform (Class III test), which simulates the current and voltage that can reach the equipment to be protected.

  Ability to discharge medium currents to earth, providing a low Up - voltage protection level. Always installed downstream of a Type 2 protection device, they are designed to protect sensitive equipment or equipment located more than 20m downstream of the Type 2 device.

  The technology can provide protection solutions that combine different types of protection: Type 1+2 and Type 2+3.

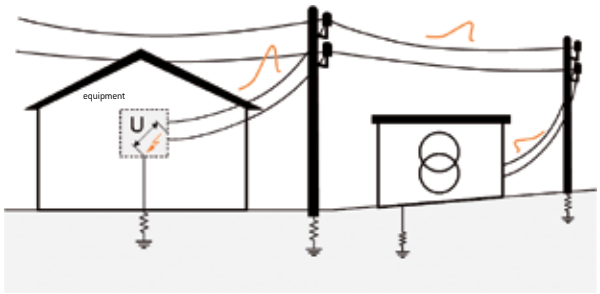
Typical current (Ityp); SPD performance that guarantees the surge protection in the real life

Iimp, Imax and In show the one off maximum robustness of the SPDs in heavy conditions. However, most surge currents are in practice lower and repetitive because of network switching or because of lightning inductions onto the power grid.

The Typical Surge Current (Ityp) is the value that statistically the SPD faces in real life. The value depends on the level of exposure:

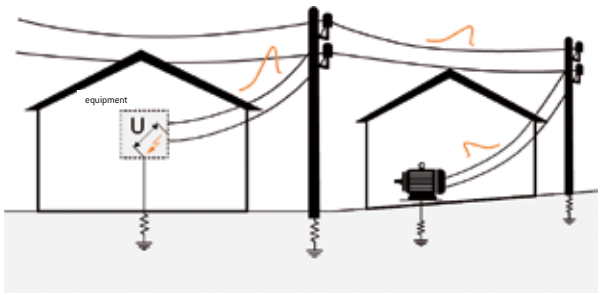
High exposed locations

Ityp=20kA 8/20µs



Low exposed locations or internal surges

Ityp=5kA 8/20 µs



The lifetime is defined by the number of hits that **the SPD is able to withstand at Typical Surge Current (Ityp).**

Lifetime of the SPDs: To estimate the lifetime of the SPD is a must in order to guarantee the protection. The **SPD must be designed in order to pass the test of the standards, but furthermore to guarantee a great performance in real life.**

The minimum lifetime values that we can expect are:

- **HIGH EXPOSED LOCATIONS: 100-200 peaks. Type 1+2 SPD** requirement; usually installed in the highest exposed locations.
- **LOW EXPOSED LOCATIONS OR INTERNAL SURGES: 500 peaks Type 2 SPD** requirement; usually installed in medium or lower exposed locations.

SPD PLACEMENT IN YOUR DESIGN

When selecting an SPD, several points must be considered

1. Where to start the protection design?

At the origin of the installation, the main switchboard is the place to start the design of SPDs on the network.

2. Network typology: TNS, TNC, TT, IT, PV and No. of conductors (see page 10).

3. Nominal voltage rating (Un) of the supply. Both features will condition **the maximum continuous operating voltage (Uc).** IEC/HD standard 60364-5-534 sets the minimum allowed value of Uc depending on the system configuration, taking into account a safety margin of the device above the nominal voltage.

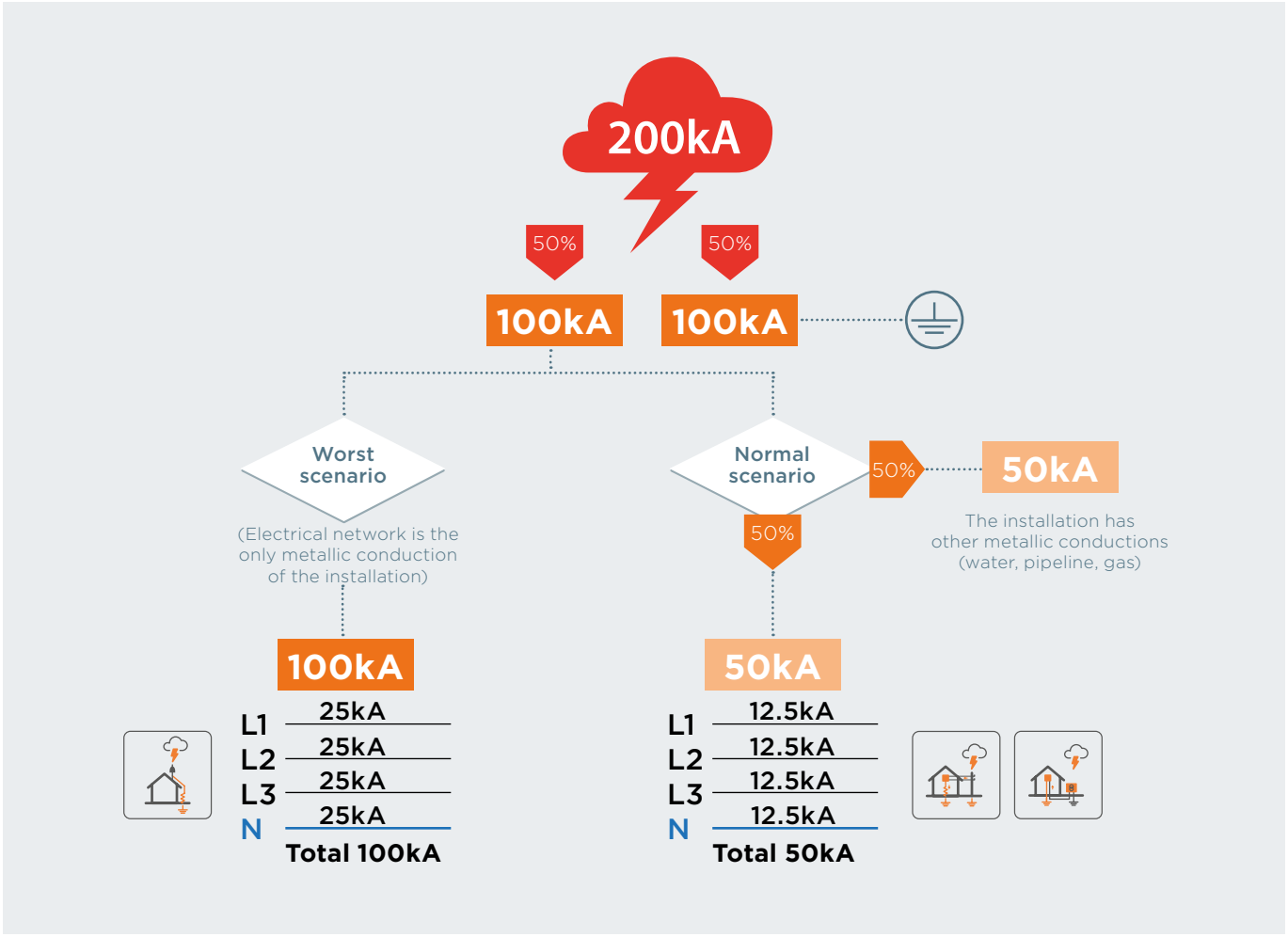
4. Type 1, Type 2, Type 3 which one has to be selected?

As previously stated, the SPD protection design does not depend on the fault ratings given by the transformer, it only depends on the level of exposure in front of a surge. So, which SPD do we have to install in the main switchboard?

See the diagram below from IEC 63205-1 standard which displays the dispersion of the highest lightning considered: 200kA @ 10/350µs.

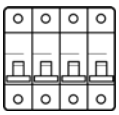
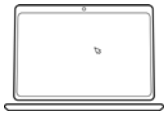
In the worst case scenario, 50% of this energy is conducted away to earth leaving 100kA potential across the networks 3 phase and neutral. Here a **25kA @ 10/350µs (Iimp) Type 1 SPD is recommended for insulated installations in extremely exposed locations to lightning.**

In the "Normal Scenario" it is assumed any direct lightning strike to the network will be at such a distance from the installation that another 50% of the energy is dispersed to earth via other conductors before entering your point of connection. In this scenario a device with **12.5kA @ 10/350µs (Iimp) Type 1** is recommended. **Furthermore, based on the IEC 61643-12 standard and even stated in section 534.4, 12.5kA is the minimum kA rate when a Type 1 is required.** If the level of exposure of the installation is lower than above described scenarios. Type 2 SPD (Imax) may be considered along with risk and cost of equipment and downtime.



Do we have to consider more SPDs?

The IEC 60634-4-443 standard classifies electrical devices in categories, depending on how sensitive they are to surge over voltage (Ue). Category 1 devices (electronic receivers) are the most sensitive, Ue has to be at least 1.5 kV. Whereas category 4 devices can withstand 6kV or more. Generally, components in main switchboards are category 4 devices ie ACB, MCCB etc.

Category	IV	III	II	I
230/400 lines	Counters / MCCB / ACB	MCBs and RCCDs	Electrical devices	Electronic receivers
Example				
Impulse voltage withstand	6kV	4kV	2.5kV	1.5kV

Then, let's consider an example below, where a Type 1+2 SPD is installed in the main distribution board of an installation. The following chart analysis the status of the SPD, the status of the category 1 loads (the most sensitive Ue: 1.5kV) in front of different surge scenarios:

		Surge example		
		≤ 25kA	100kA	> 100kA
Iimp = 25kA Imax = 100kA In = 25kA Up ≤ 1.5kV In accordance with the IEC 61643-11				
Ue = 1.5kV Robustness classification for electric and electronic devices according to IEC 60634-4-443				

According to the IEC 61643-1 declared Up rate is related to In. Although the SPD is able to withstand Imax probably Up level will be higher than Ue.

Statements:

1 - For discharges over the maximum capacity **(Imax)** of the SPD, the loads and the SPD itself will be damaged.
2 - Iimp and Imax define the maximum surge level the SPD itself can withstand but does not describe the protection
3 - Only **In** defines the level of protection as at **In** the residual voltage seen by the equipment being protected is Ue.
4 - As surges may be induced in cable between the main switchboard and distribution board, or by the final loads themselves, the switchboard may not be close enough to direct a surge in time to protect other final loads.

Conclusions:

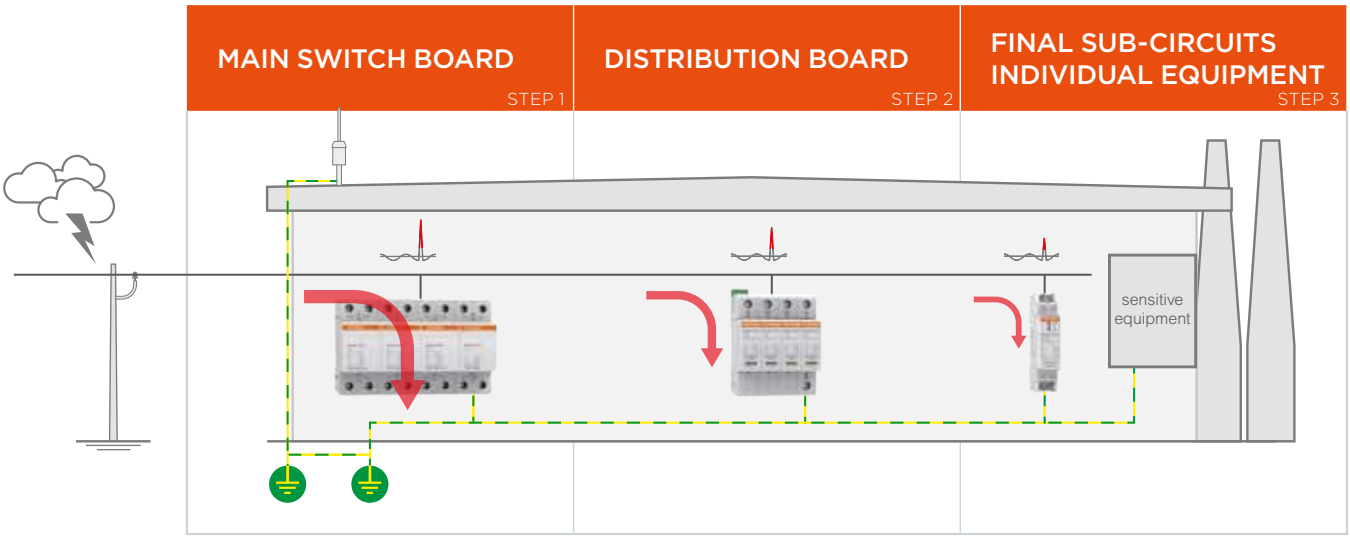
1 - With just one stage of protection only equipment close to the SPD is protected and only up to a surge of In.
2 - To improve the protection possibilities, at least, a second stage of protection in a distribution board is a must. This SPD design is called cascading protection.
3 - Further SPDs (Type 2 and Type 3) are required to protect sensitive and critical equipment downstream of the origin of the installation when a Type 1 is fitted at the origin of installation (534.4.1.1)

CONCLUSION: SPD PLACEMENT IN YOUR DESIGN

Protection system of coordinated stages: Type 1, 2 and 3 SPDs

The SPDs of a surge protection system must be able to withstand the discharged current and provide a Ures level (residual voltage) lower than the Ue peak voltage that the equipment can withstand.
As explained, most of the times it is not possible to achieve this with just one SPD, especially because the intensity of the surge is not known, and because of the induction of overvoltages when conductors exceed 10m.

The optimal system of protection is the **3-STEP approach, in which successive stages are combined in the performance of high discharge capacity devices and devices with an optimal voltage protection level (low).** This is addressed by the definition of "Types" or "Classes" of SPDs according to the type of transient pulses to which each protected zone in the installation is subject to.



Overvoltage category IEC 60364-4-443	IV	III	II	I
Overvoltage withstand (Ue) values for equipment at 230/400V	6kV	4kV	2,5kV	1,5kV

IEC/EN 61643-11	Type 1 / Class I	Type 2 / Class II	Type 3 / Class III
Definition	Designed for use in incoming power supply panels where the risk of lightning strike is high, in particular in buildings with an external lightning protection system. Must be accompanied by downstream Class II protectors.	Designed for use in distribution panels located downstream of class I protectors or in incoming power supply panels in areas with low exposure to lightning strikes, where the building is not fitted with an external LPS.	Always installed downstream of a Class II protection designed to protect sensitive equipment or equipment located more than 20m downstream of the Class II SPD.
LPZ IEC 62305-4 protection zone	LPZ 1	LPZ 2	LPZ 3
Class test to IEC/EN 61643-11	10/350µs waveform, Class I test.	8/20µs waveform, Class II test.	Combined 1.2/50µs-8/20µs waveform Class III test.
Surge	Direct impact of a lightning strike (current).	Indirect impact of a lightning strike on the distribution line (overhead lines) or its vicinity (rise of ground potential or induction by coupling of electromagnetic radiation of the strike) or in the event of a switching.	Indirect impact simulated by the current and voltage that can reach the long-distance circuits and individual equipment to be protected.
Discharge capacity (Iimp, Imax)	High	Medium	Low
Voltage protection level (Up)	√ (Coarse)	√√ (Fine)	√√√ (Very fine)
Mersen Surge-Trap® series	STM T1		
	STP T12; STP T12 PV		
		STP T2; STP T2 PV	
		STP T23; STM T23 S; STL T23; STE T23	

Do we have to consider “other” SPDs?

It is important to emphasize that when an atmospheric phenomenon causes a surge, it will be present in conduction or induction mode in all metallic cables: electrical supply **but also all communication lines, telephone, etc.**

Therefore, more protectors must be installed to **protect equipment from surges induced on control, data or communication lines.** For example, the inputs and the outputs of the PLC, communication bus, telephone lines or any antenna that the installation may have.

These protectors may be in DIN rail format and even aerial format; they must be installed as close as possible to the equipment to be protected.

In conclusion, besides the power line SPDs, it will be necessary to analyse other potential sources of surge and conclude if further protection is required and select the appropriate ones case by case.

APPLICATION	SIGNAL TYPE	FORMAT	MODEL	MERSEN PROTECTOR
DATA NETWORKS	Ethernet Cat. 5 E	DIN	STS NET CAT	 STS NET CAT Page 64
	Ethernet Cat. 6	DIN		
	Power over Ethernet, POE	DIN	STS NET CAT POE	
MEASUREMENT AND CONTROL	Modbus	DIN	STS 485 7V	 STS PLC 30V 4W Page 64  STS PLC 30V 2W Page 64  STS 485 7V Page 65  STS 485 5V Page 65  STS 485 5K 15V Page 65
	Profibus PA	DIN	STS 485 27V	
			STS PLC 30V 2W	
	RS 485 / 422 / RS 232	DIN	STS 485 5K 15V	
			STS 485 27V	
			STS 485 5V	
			STS PLC 30V 4W	
			STS PLC 30V 2W	
	4-20 mA	DIN	STS PLC 30V 4W	
			STS PLC 30V 2W	
	Device Net	DIN	STS 485 7V	
	Temperature probe (PTC)			
TELEPHONE LINES	ADSL Telephony	DIN	STS TEL ADSL	 STS TEL ADSL Page 66
RADIO FREQUENCY	Coaxial signal antennas	Coaxial	STS RF	 STS RF Page 66

LIGHTNING AND SURGE PROTECTION

RESIDENTIAL & INDUSTRIAL BUILDINGS

SURGE-TRAP® RANGE OVERVIEW

FIRST STEP OF PROTECTION 50kA

STM T1

See page 20

COMBINED TYPE 1+2

STP T12

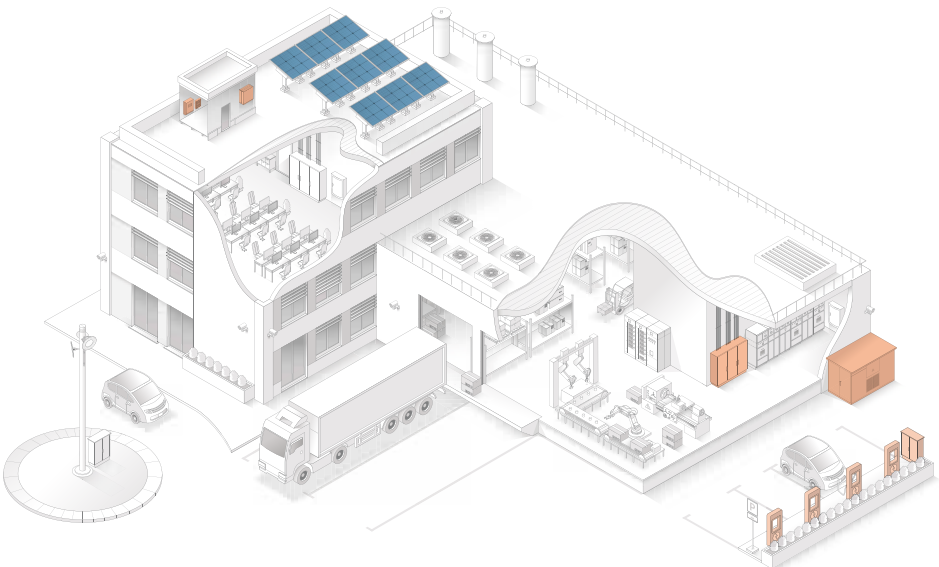
See page 21

WIDE RANGE

STP T2

See page 26

Location	First step of protection		First step of protection		Second step of protection	
SPD Type	Type 1 lightning current arrester to IEC/EN 61643-11		Type 1+2 SPD to IEC/EN 61643-11		Type 2 SPD to IEC/EN 61643-11 Type 2 SPD to UL 1449 4th Ed.	
Iimp (10/350µs)	50kA (phase) / 100kA (N-PE)		12.5kA / 25kA			
Imax (8/20µs)			50kA / 100kA		40kA	
In (8/20µs)	50kA (phase) / 100kA (N-PE)		20kA / 25kA		20kA	
Uoc (1.2/50µs)						
Special features	Ifi = 50kA follow current interrupt rating. Multi-sparkgap technology. Leakage current free.		ELV: Extra Low Voltage models available. Reversible & coded cartridges.		ELV: Extra Low Voltage models available. Reversible & coded cartridges.	
Supply voltage Un (L-N/L-L)	120/208V, 230/400V, 277/480V		60V 120/208V, 230/400V, 277/480V 400/690V		48V, 60V 120/208V, 230/400V, 277/480V 400/690V + above	
Network configuration	TNS, TNC, TT	Single phase Split phase 3-phase WYE; Delta	TNS, TNC, TT, IT	Single phase Split phase 3-phase WYE; Delta	TNS, TNC, TT, IT	Single phase Split phase 3-phase WYE; Delta
Format	DIN-rail mountable. Monobloc format		DIN-rail mountable. Pluggable format		DIN-rail mountable. Pluggable format	
Type according to EN 61643-11	TYPE 1		TYPE 1+2		TYPE 2	



ONE SOLUTION FOR EVERY STEP OF PROTECTION

FINE PROTECTION

STP T23

See page 29

SLIM: SPACE SAVING

STM T23 SLIM

See page 32

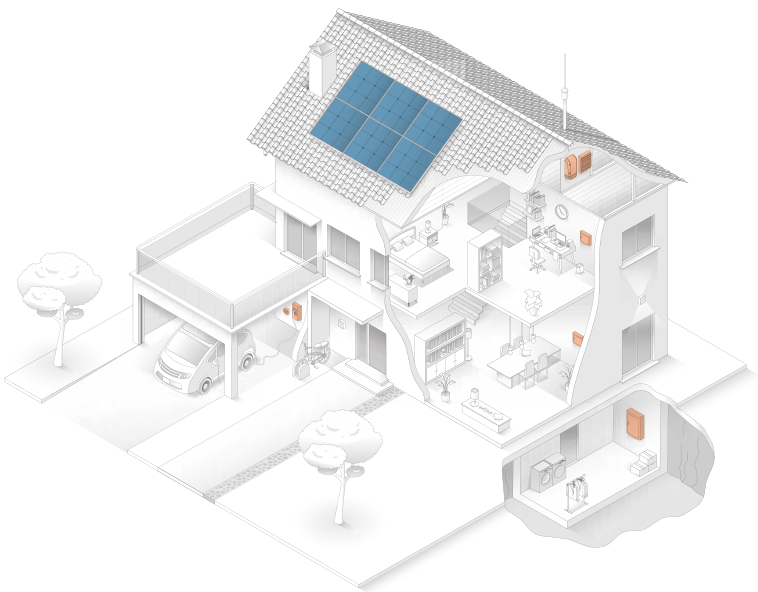
POWERFUL EMI FILTER

STE T23 EMI

See page 33

Final stage of protection (very fine)		Final stage of protection (very fine)	Final stage of protection (very fine)
Type 2+3 SPD to IEC/EN 61643-11		Type 2+3 SPD to IEC/EN 61643 -11	Type 2+3 SPD to IEC/EN 61643 -11
20kA		20kA / 6kA	20kA
10kA		10kA / 3kA	10kA
10kV		10kV / 6kV	6kV
PLC: Power Line Communication friendly solutions (LCF). Reversible & coded cartridge.		Ideal for limited spaces (1 module).	Filter attenuation up to 82dB (common mode) vs electromagnetic disturbances. Rated current load up to 20A.
120/208V, 230/400V, 277/480V 400/690V		12V, 24V, 48V, 60V, 120V, 230V Also for use in DC voltage applications	120V, 230V
TNS, TNC, IT, TT	Single phase Split phase 3-phase WYE; Delta	Single Phase TT, TNS	Single Phase TT, TNS
DIN-rail mountable. Pluggable format		DIN-rail mountable. Monobloc format	DIN-rail mountable. Monobloc format

TYPE 2+3



SURGE-TRAP® HIGHLIGHTS

STP Surge-Trap® Pluggable

See page 13-25

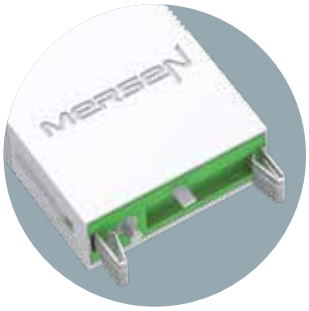
12 11 14

Remote indication

Dry contacts, optional in all ranges, for remote indication of protector end of life.

Biconnect connection

Two types of terminal: for rigid or flexible cable and for fork type comb busbar.

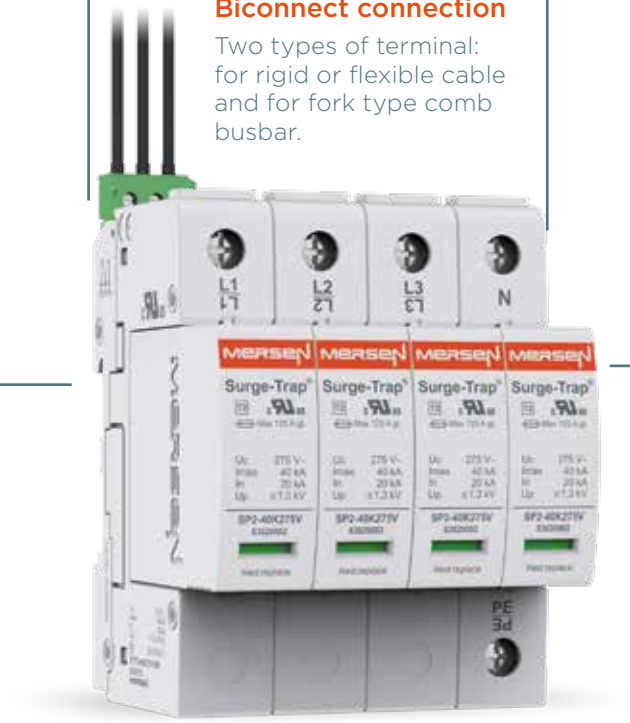


Mersen quality

Product range produced entirely by Mersen, with a thermal disconnection system. Use of the best materials and components. UL 1449 4th Ed.

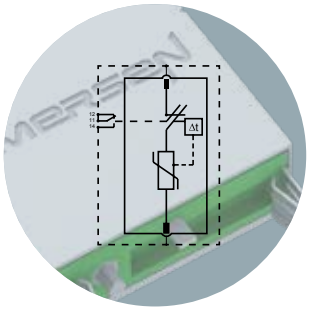
Protector lifetime status indication

Clear display of protection end of life.



Cartridge security system

Vibration proof according to the maximum levels specified in IEC 60721 (2M3 transport & 3M8 operation).



New, optimised disconnection system

Mersen has developed an optimised disconnection system for end of life. Complies with the disconnection tests of the standards for protectors for photovoltaic applications.

Reversible installation

Reversible chassis to allow cable entry from above or below.

Mechanical cartridge coding

Safety system to avoid possible cartridge replacement errors.

THE BEST PERFORMANCE IN THE MARKET

STM T1

See page 20

Type 1 lightning current arrester

- Discharges impulse currents with a 10/350µs waveform: 50kA per phase.
- Leakage current free (LCF).

Multi Spark Gap

- Follow current suppressing capacity. Ifi: 50kA.
- Low residual voltage.

STM T23 SLIM

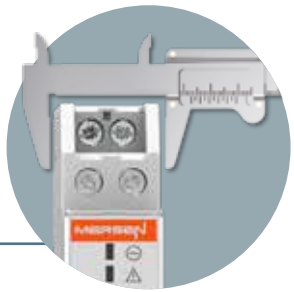
See page 32

Status indication

- Remote and visual indication of life status of the protection device.

Type 2+3, 2 poles in 1 module

- Compact combined device (Type 2+3) for fine protection. Ideal for limited spaces.

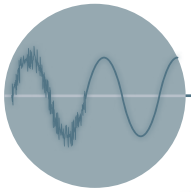


STE T23 EMI

See page 33

EMI / RFI Filter

- All models include an electromagnetic filter for network noise.



Combined SPD (Type 2+3)

- Combined devices for discharging induced transient overvoltages, while providing a very fine protection level for sensitive equipment.

STP TERRA

See page 58

TERRA® is the first protection device in the market that, in addition to indicating that it is properly wired, guarantees that there is an adequate path to earth, which is essential if the protection device is to shunt the energy peaks to earth effectively.

Earth status indicator

- Continuous LED display of the earth status.

STM T1 50

STM T1 50 is the most robust series of single pole Type 1/Class I lightning current arresters, able to discharge energy (current) from a direct lightning strike (10/350µs) on an external lightning protection system (LPS) or overhead supplies, in accordance with IEC/EN 61643-11. Suitable as the first step of protection in incoming power supply panels and areas with high exposure to lightning strikes, fitted with an external lightning protection system.

Ratings and features

- Lightning impulse current (10/350µs): 50kA
- Follow current suppressing capacity (Ifi): 50kA
- Leakage current free (LCF)
- Multi-discharge technology
- Single pole devices for TNS, TNC, IT and TT earthing systems
- Un(L-N/L-L): 120/208V, 230/400V, 277/480V, 400/690V
- DIN-rail mountable, monobloc format

limp
50kA

Approvals/Standards

- IEC/EN 61643-11
- CE

IEC CE

GUIDE

Example

STM T1 - 50K 275V - 1P

Surge-Trap® Monobloc Type 1 / Class I lightning current arrester (10/350µs)

Step 1 — Lightning impulse current

50K	limp (L-N) =50kA
100K	limp (N-PE) =100kA

Step 2 — Operating voltage

Uc	Un (L-N/L-L)
150V	120/208V
275V	230/400V
320V	277/480V
440V	400/690V
Blank	N-PE protection

Step 3 — Network configuration

1P	L-N; 1Ph (TNS,TNC,TT, IT)
N	N-PE; Neutral (TT Spark-Gap)

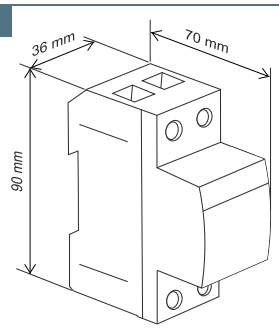
Catalogue numbers / Reference numbers

1 pole

REFERENCE NUMBER	CATALOGUE NUMBER	Network: SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	limp (10/350) [kA]	In (8/20) [kA]	Up@In(8/20) [kV]
83010103	**STMT1-50K150V-1P**	L-N (1Ph)	A	120	150	50	50	≤2
83010100	**STMT1-50K275V-1P**	L-N (1Ph)	A	230	275	50	50	≤2
83010104	**STMT1-50K320V-1P**	L-N (1Ph)	A	277	320	50	50	≤2
83010107	**STMT1-50K440V-1P**	L-N (1Ph)	A	400	440	50	50	≤2,5
83010102	**STMT1-100K-N**	N-PE (N)	B	Neutral	255	100	100	≤2

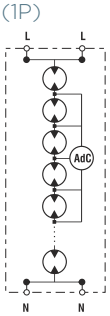
Dimensions

1 pole

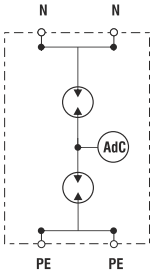


Electrical diagrams

A (1P)



B (N)



STP T12 12.5

STP T12 12.5 is the series of combined Type 1+2/Class I+II devices for discharging lightning currents and protecting against voltage surges, in accordance with IEC/EN 61643-11.

Suitable as the first step of protection in incoming power supply panels and areas with exposure to the atmosphere, where installations are usually provided with an external lightning protection system.

Ratings and features

- Lightning impulse current (10/350µs): 12.5kA per phase
- Maximum discharge current (8/20µs): 50kA per phase
- Nominal discharge current (8/20µs): 20kA per phase
- TNS, TNC, TT and IT networks
- Un(L-N/L-L): 60V, 120/208V, 230/400V, 277/480V and 400/690V
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid cartridge replacement errors

limp

12.5kA

Approvals/Standards

- IEC/EN 61643-11
- CE

GUIDE

Example

STP T12 - 12K 275V - 4PG M

Surge-Trap® Pluggable Type 1+2 / Class I+II combined lightning current arrester (10/350µs) and surge protective device (8/20µs)

Step 1	Lightning impulse current
12K	limp (L-N) =12.5kA
25K	limp (N-PE) =25kA
50K	limp (N-PE) =50kA

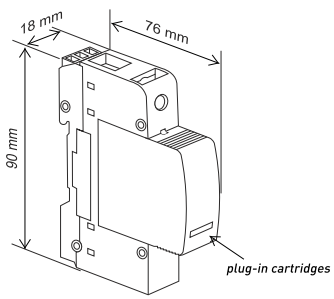
Step 2	Operating voltage	
Uc	Un (L-N/L-L)	
75V	60/-V	
150V	120/208V	
275V	230/400V	
320V	277/480V	
440V	230/400V "IT" 400/690V	
Blank	N-PE protection	

Step 3	Network configuration
1P	L-N; 1Ph (TNS, TNC, IT, TT)
N	N-PE; Neutral (TT Spark-Gap)
2P	2+0; 1Ph+N (TNS,IT)
2PG	1+1; 1Ph+N (TT)
3P	3+0; 3Ph (TNC,IT)
4P	4+0; 3Ph+N (TNS,IT)
4PG	3+1; 3Ph+N (TT)

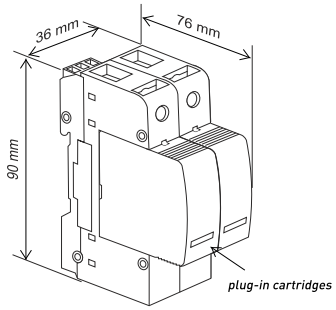
Step 4	Remote monitoring
M	Microswitch included

Dimensions

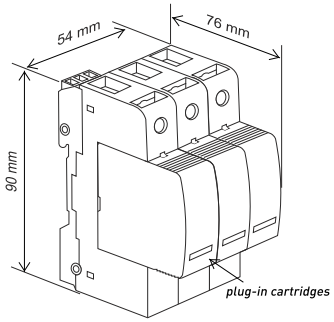
1 pole



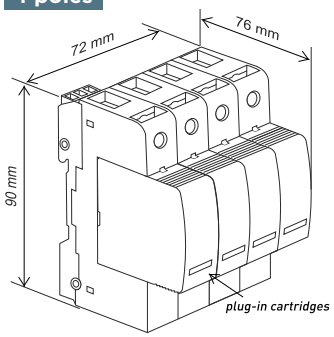
2 poles



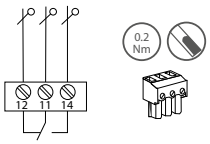
3 poles



4 poles



Microswitch diagram



U_{max} / I_{max}	
AC: 250 V/1 A	max 1.5 mm²
AC: 125 V/3 A	

Catalogue numbers / Reference numbers

1 pole

		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up@In (8/20) [kV]	REMOTE (M)	L	N
83120100	**STPT12-12K150V-1P**	L-N (1Ph)	A	120	150	12.5	50	20	≤1		C02	-
83120101	**STPT12-12K150V-1PM**	L-N (1Ph)	A	120	150	12.5	50	20	≤1	√	C02	-
83120102	**STPT12-12K275V-1P**	L-N (1Ph)	A	230	275	12.5	50	20	≤1.3		C03	-
83120103	**STPT12-12K275V-1PM**	L-N (1Ph)	A	230	275	12.5	50	20	≤1.3	√	C03	-
83120104	**STPT12-12K320V-1P**	L-N (1Ph)	A	277	320	12.5	50	20	≤1.4		C04	-
83120105	**STPT12-12K320V-1PM**	L-N (1Ph)	A	277	320	12.5	50	20	≤1.4	√	C04	-
83120106	**STPT12-12K440V-1P**	L-N (1Ph)	A	400	440	12.5	50	20	≤1.8		C05	-
83120107	**STPT12-12K440V-1PM**	L-N (1Ph)	A	400	440	12.5	50	20	≤1.8	√	C05	-
83120108	**STPT12-25K-N**	N-PE (N)	B	Neutral	255	25	50	25	≤1.5		-	C06
83120110	**STPT12-50K-N**	N-PE (N)	B	Neutral	255	50	50	50	≤1.5		-	C07

2 poles

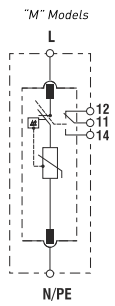
		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up@In (8/20) [kV]	REMOTE (M)	L	N
83120126	**STPT12-12K75V-2P**	TNS (1Ph+N); PV	C	60/-	75; 80 Ucpv	12.5	50	20	≤0.65		C01	
83120127	**STPT12-12K75V-2PM**	TNS (1Ph+N); PV	C	60/-	75; 80 Ucpv	12.5	50	20	≤0.65	√	C01	
83120112	**STPT12-12K150V-2PG**	TT (1Ph+N)	D	120/-	150	12.5 (L-N) 25 (N-PE)	50	20	≤1 (L-N) ≤1.5 (N-PE)		C02	C06
83120113	**STPT12-12K150V-2PGM**	TT (1Ph+N)	D	120/-	150	12.5 (L-N) 25 (N-PE)	50	20	≤1 (L-N) ≤1.5 (N-PE)	√	C02	C06
83120114	**STPT12-12K275V-2PG**	TT (1Ph+N)	D	230/-	275	12.5 (L-N) 25 (N-PE)	50	20	≤1.3 (L-N) ≤1.5 (N-PE)		C03	C06
83120115	**STPT12-12K275V-2PGM**	TT (1Ph+N)	D	230/-	275	12.5 (L-N) 25 (N-PE)	50	20	≤1.3 (L-N) ≤1.5 (N-PE)	√	C03	C06
83120116	**STPT12-12K320V-2PG**	TT (1Ph+N)	D	277/-	320	12.5 (L-N) 25 (N-PE)	50	20	≤1.4 (L-N) ≤1.5 (N-PE)		C04	C06
83120117	**STPT12-12K320V-2PGM**	TT (1Ph+N)	D	277/-	320	12.5 (L-N) 25 (N-PE)	50	20	≤1.4 (L-N) ≤1.5 (N-PE)	√	C04	C06
83120118	**STPT12-12K150V-2P**	TNS (1Ph+N)	F	120/-	150	12.5	50	20	≤1		C02	
83120119	**STPT12-12K150V-2PM**	TNS (1Ph+N)	F	120/-	150	12.5	50	20	≤1	√	C02	
83120120	**STPT12-12K275V-2P**	TNS (1Ph+N)	F	230/-	275	12.5	50	20	≤1.3		C03	
83120121	**STPT12-12K275V-2PM**	TNS (1Ph+N)	F	230/-	275	12.5	50	20	≤1.3	√	C03	
83120122	**STPT12-12K320V-2P**	TNS (1Ph+N)	F	277/-	320	12.5	50	20	≤1.4		C04	
83120123	**STPT12-12K320V-2PM**	TNS (1Ph+N)	F	277/-	320	12.5	50	20	≤1.4	√	C04	
83120124	**STPT12-12K440V-2P**	IT (1Ph+N); TNS(1Ph+N)	C	230/-; 400/-	440	12.5	50	20	≤1.8		C05	
83120125	**STPT12-12K440V-2PM**	IT (1Ph+N) TNS(1Ph+N)	C	230/-; 400/-	440	12.5	50	20	≤1.8	√	C05	

ELV Extra Low Voltage, also for use in DC Photovoltaic self-consumption / off-grid applications.

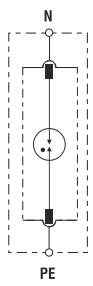
ELV

Electrical diagrams

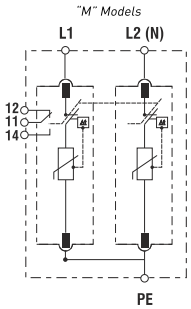
A (1P)



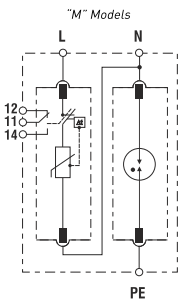
B (N)



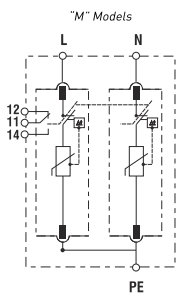
C 2+0 (2P)



D 1+1 (2PG)



F 2+0 (2P)



SURGE-TRAP® TYPE 1+2 SPDs | STP T12 12.5

3 poles

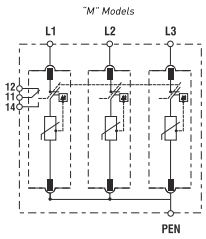
		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up@In (8/20) [kV]	REMOTE (M)	L	N
83120128	**STPT12-12K150V-3P**	TNC (3Ph)	H	-/208	150	12.5	50	20	≤1		C02	-
83120129	**STPT12-12K150V-3PM**	TNC (3Ph)	H	-/208	150	12.5	50	20	≤1	√	C02	-
83120130	**STPT12-12K275V-3P**	TNC (3Ph)	H	-/400	275	12.5	50	20	≤1.3		C03	-
83120131	**STPT12-12K275V-3PM**	TNC (3Ph)	H	-/400	275	12.5	50	20	≤1.3	√	C03	-
83120132	**STPT12-12K320V-3P**	TNC (3Ph)	H	-/480	320	12.5	50	20	≤1.4		C04	-
83120133	**STPT12-12K320V-3PM**	TNC (3Ph)	H	-/480	320	12.5	50	20	≤1.4	√	C04	-
83120134	**STPT12-12K440V-3P**	IT (3Ph); TNC (3Ph)	I; H	-/400; -/690	440	12.5	50	20	≤1.8		C05	-
83120135	**STPT12-12K440V-3PM**	IT (3Ph); TNC (3Ph)	I; H	-/400; -/690	440	12.5	50	20	≤1.8	√	C05	-

4 poles

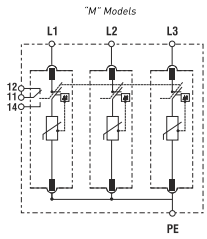
		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up@In (8/20) [kV]	REMOTE (M)	L	N
83120136	**STPT12-12K150V-4PG**	TT (3Ph+N)	J	120/208	150	12.5 (L-N) 50 (N-PE)	50	20	≤1 (L-N) ≤1.5 (N-PE)		C02	C07
83120137	**STPT12-12K150V-4PGM**	TT (3Ph+N)	J	120/208	150	12.5 (L-N) 50 (N-PE)	50	20	≤1 (L-N) ≤1.5 (N-PE)	√	C02	C07
83120138	**STPT12-12K275V-4PG**	TT (3Ph+N)	J	230/400	275	12.5 (L-N) 50 (N-PE)	50	20	≤1.3 (L-N) ≤1.5 (N-PE)		C03	C07
83120139	**STPT12-12K275V-4PGM**	TT (3Ph+N)	J	230/400	275	12.5 (L-N) 50 (N-PE)	50	20	≤1.3 (L-N) ≤1.5 (N-PE)	√	C03	C07
83120140	**STPT12-12K320V-4PG**	TT (3Ph+N)	J	277/480	320	12.5 (L-N) 50 (N-PE)	50	20	≤1.4 (L-N) ≤1.5 (N-PE)		C04	C07
83120141	**STPT12-12K320V-4PGM**	TT (3Ph+N)	J	277/480	320	12.5 (L-N) 50 (N-PE)	50	20	≤1.4 (L-N) ≤1.5 (N-PE)	√	C04	C07
83120142	**STPT12-12K150V-4P**	TNS (3Ph+N)	L	120/208	150	12.5	50	20	≤1		C02	
83120143	**STPT12-12K150V-4PM**	TNS (3Ph+N)	L	120/208	150	12.5	50	20	≤1	√	C02	
83120144	**STPT12-12K275V-4P**	TNS (3Ph+N)	L	230/400	275	12.5	50	20	≤1.3		C03	
83120145	**STPT12-12K275V-4PM**	TNS (3Ph+N)	L	230/400	275	12.5	50	20	≤1.3	√	C03	
83120146	**STPT12-12K320V-4P**	TNS (3Ph+N)	L	277/480	320	12.5	50	20	≤1.4		C04	
83120147	**STPT12-12K320V-4PM**	TNS (3Ph+N)	L	277/480	320	12.5	50	20	≤1.4	√	C04	
83120148	**STPT12-12K440V-4P**	IT (3Ph+N); TNS (3Ph+N)	L	230/400; 400/690	440	12.5	50	20	≤1.8		C05	
83120149	**STPT12-12K440V-4PM**	IT (3Ph+N); TNS (3Ph+N)	L	230/400; 400/690	440	12.5	50	20	≤1.8	√	C05	

Electrical diagrams

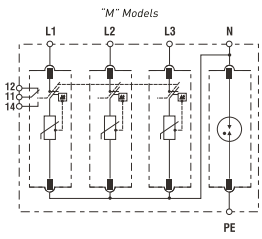
H 3+0 (3P)



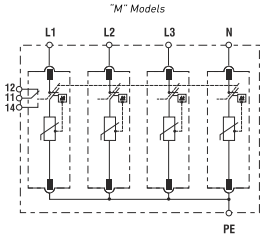
I 3+0 (3P)



J 3+1 (4PG)



L 4+0 (4P)



Replacement cartridges

REFERENCE NUMBER	CATALOGUE NUMBER	NETWORK	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up@In (8/20) [kV]	CARTRIDGE ID.
83120000	**SP12-12K75V**	L-N (1Ph)	60	75	12.5	50	20	≤0.65	C01
83120001	**SP12-12K150V**	L-N (1Ph)	120	150	12.5	50	20	≤1	C02
83120002	**SP12-12K275V**	L-N (1Ph)	230	275	12.5	50	20	≤1.3	C03
83120003	**SP12-12K320V**	L-N (1Ph)	277	320	12.5	50	20	≤1.4	C04
83120004	**SP12-12K440V**	L-N (1Ph)	400	440	12.5	50	20	≤1.8	C05
83120005	**SP12-25K-N**	N-PE (N)	Neutral	255	25	50	25	≤1.5	C06
83120006	**SP12-50K-N**	N-PE (N)	Neutral	255	50	50	50	≤1.5	C07

STP T12 25

STP T12 25 is the series of combined Type 1+2/Class I+II devices for discharging lightning currents and protecting against voltage surges, in accordance with IEC/EN 61643-11.

Suitable as the first step of protection in incoming power supply panels and areas with exposure to the atmosphere, where installations are usually provided with an external lightning protection system.

Ratings and features

- Lightning impulse current (10/350µs): 25kA per phase
- Maximum discharge current (8/20µs): 100kA per phase
- Nominal discharge current (8/20µs): 25kA per phase
- TNS, TNC and TT networks
- Un(L-N/L-L): 230/400V
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid cartridge replacement errors

limp

25kA

Approvals/Standards

- IEC/EN 61643-11
- CE

GUIDE

Example

STP T12 - 25K 275V - 4PG M

Surge-Trap® Pluggable Type 1+2 / Class I+II combined lightning current arrester (10/350µs) and surge protective device (8/20µs)

Step 1	Lightning impulse current
25K	limp (L-N) =25kA
100K	limp (N-PE) =100kA

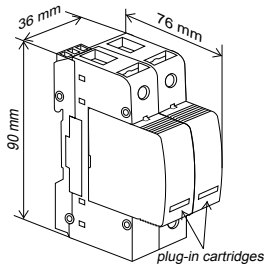
Step 2	Operating voltage
Uc	Un (L-N/L-L)
275V	230/400V
Blank	N-PE protection

Step 3	Network configuration
1P	L-N; 1Ph (TNS, TNC, IT, TT)
2P	2+0; 1Ph+N (TNS,IT)
2PG	1+1; 1Ph+N (TT)
3P	3+0; 3Ph (TNC,IT)
4P	4+0; 3Ph+N (TNS,IT)
4PG	3+1; 3Ph+N (TT)
N	N-PE; Neutral (TT Spark-Gap)

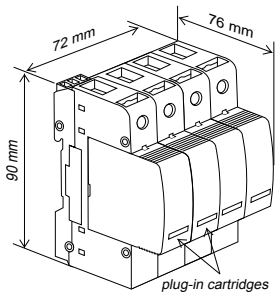
Step 4	Remote monitoring
M	Microswitch included

Dimensions

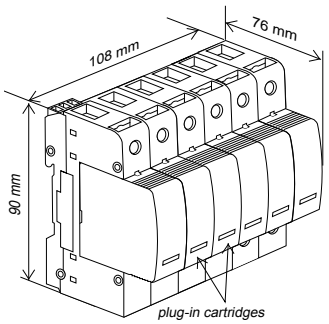
1 pole



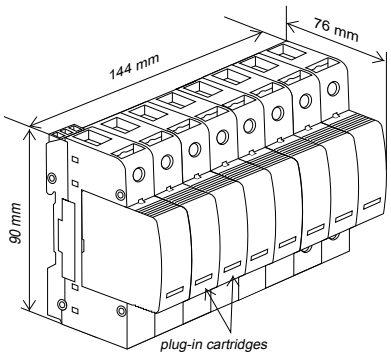
2 poles



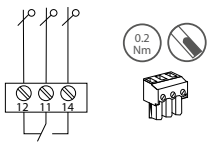
3 poles



4 poles



Microswitch diagram



U_{max} / I_{max}	max 1.5 mm²
AC: 250 V/1 A	
AC: 125 V/3 A	

Catalogue numbers / Reference numbers

1 pole

		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up [kV]	REMOTE (M)	L	N
83120152	**STPT12-25K275V-1P**	L-N (1Ph)	A	230	275	25	100	25	≤ 1,5		C65	
83120153	**STPT12-25K275V-1PM**	L-N (1Ph)	A	230	275	25	100	25	≤ 1,5	√	C65	
83120166	**STPT12-100K-N**	N-PE (N)	B	Neutral	255	100	100	50	≤ 1,5			C66

2 poles

		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up [kV]	REMOTE (M)	L	N
83120156	**STPT12-25K275V-2P**	TNS (1Ph+N)	C	230 / -	275	25	100	25	≤ 1,5		C65	
83120157	**STPT12-25K275V-2PM**	TNS (1Ph+N)	C	230 / -	275	25	100	25	≤ 1,5	√	C65	
83120154	**STPT12-25K275V-2PG**	TT (1Ph+N)	D	230 / -	275	25	100	25	≤ 1,5		C65	C67
83120155	**STPT12-25K275V-2PGM**	TT (1Ph+N)	D	230 / -	275	25	100	25	≤ 1,5	√	C65	C67

3 poles

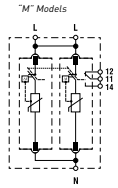
		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up [kV]	REMOTE (M)	L	N
83120158	**STPT12-25K275V-3P**	TNC (3Ph)	E	- / 400	275	25	100	25	≤ 1,5		C65	
83120159	**STPT12-25K275V-3PM**	TNC (3Ph)	E	- / 400	275	25	100	25	≤ 1,5	√	C65	

4 poles

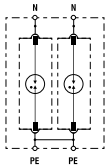
		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up [kV]	REMOTE (M)	L	N
83120160	**STPT12-25K275V-4P**	TNS (3Ph+N)	F	230 / 400	275	25	100	25	≤ 1,5		C65	
83120161	**STPT12-25K275V-4PM**	TNS (3Ph+N)	F	230 / 400	275	25	100	25	≤ 1,5	√	C65	
83120150	**STPT12-25K275V-4PG**	TT (3Ph+N)	G	230 / 400	275	25	100	25	≤ 1,5		C65	C66
83120151	**STPT12-25K275V-4PGM**	TT (3Ph+N)	G	230 / 400	275	25	100	25	≤ 1,5	√	C65	C66

Electrical diagrams

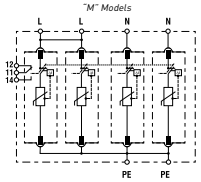
A (1P)



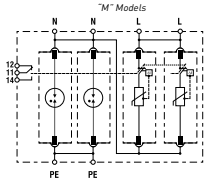
B (N)



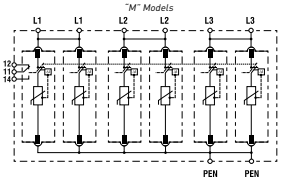
C 2+0 (2P)



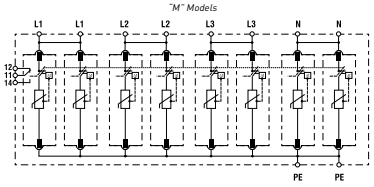
D 1+1 (2PG)



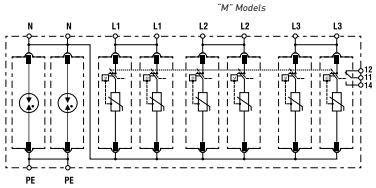
E 3+0 (3P)



F 4+0 (4P)



G 3+1 (4PG)



Replacement cartridges

REFERENCE NUMBER	CATALOGUE NUMBER	NETWORK	Un [Vac]	Uc [V]	Iimp (10/350) [kA]	Imax (8/20) [kA]	In (8/20) [kA]	Up [kV]	CARTRIDGE ID.
83120007	**SP12-25K275V**	L-N (1Ph)	230	275	25	100	25	≤ 1,5	C65
83120009	**SP12-50K-2PN**	N-PE (N)	Neutral	255	50	100	25	≤ 1,5	C66
83120008	**SP12-100K-N**	N-PE (N)	Neutral	255	100	100	50	≤ 1,5	C67

STP T2 40

STP T2 40 is the series of Type 2/Class II devices for discharging voltage surges, in accordance with IEC/EN 61643-11.

Suitable for the second stage of protection in supply distribution panels in which Type 1 protection devices are installed upstream, or for the first stage of protection in commercial or other applications not exposed to direct lightning strikes and with no external lightning protection system.

Ratings and features

- Maximum discharge current (8/20µs): 40kA per phase
- Nominal discharge current (8/20µs): 20kA per phase
- TNS, TNC, TT and IT networks
- Un(L-N/L-L): 48V, 60V, 120/208V, 230/400V, 277/480V, 400/690V & higher
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid cartridge replacement errors

Imax
40kA

Approvals/Standards

- IEC/EN 61643-11
- CE
- UL 1449 4th Edition

GUIDE

Example

STP T2 - 40K 275V - 4PG M

Surge-Trap® Pluggable Type 2 / Class II surge protective device (8/20µs)

Step 1	
Max. discharge current	
40K	Imax (L-N) =40kA
30K	Imax (L-N) =30kA (for 750V only)

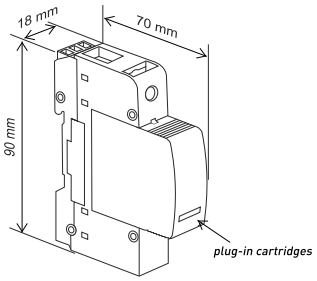
Step 2	
Operating voltage	
Uc	Un (L-N/L-L)
60V	48/-V
75V	60/-V
150V	120/208V
275V	230/400V
320V	277/480V
440V	230/400V "IT"; 400/690V
750V	400/690V; 690/1000V
Blank	N-PE protection

Step 3	
Network configuration	
1P	L-N; 1Ph (TNS,TNC,IT,TT)
N	N-PE; Neutral (TT Spark-Gap)
2P	2+0; 1Ph+N (TNS,IT)
2PG	1+1; 1Ph+N (TT)
3P	3+0; 3Ph (TNC,IT)
4P	4+0; 3Ph+N (TNS,IT)
4PG	3+1; 3Ph+N (TT)

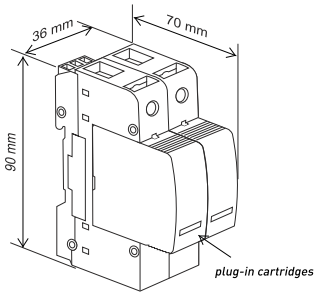
Step 4	
Remote monitoring	
M	Microswitch included

Dimensions

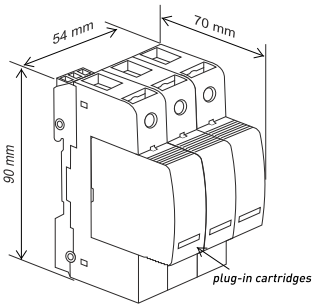
1 pole



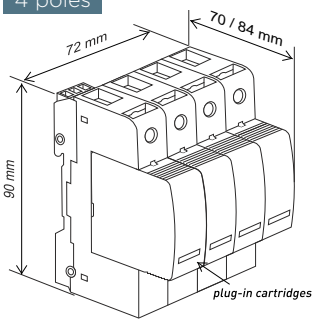
2 poles



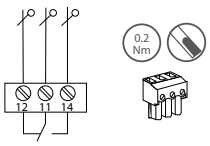
3 poles



4 poles



Microswitch diagram



U_{max} / I_{max}	
AC: 250 V/1 A	max 1.5 mm²
AC: 125 V/3 A	

Catalogue numbers / Reference numbers

1 pole

		Network								Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [VAC]	Uc [V]	Imax (8/20) [KA]	In (8/20) [KA]	Up@In (8/20) [KV]	REMOTE (M)	L	N
83020104	**STPT2-40K150V-1P**	L-N (1Ph)	A	120	175	40	20	≤1.0		C22	-
83020105	**STPT2-40K150V-1PM**	L-N (1Ph)	A	120	175	40	20	≤1.0	√	C22	-
83020106	**STPT2-40K275V-1P**	L-N (1Ph)	A	230	275	40	20	≤1.3		C23	-
83020107	**STPT2-40K275V-1PM**	L-N (1Ph)	A	230	275	40	20	≤1.3	√	C23	-
83020108	**STPT2-40K320V-1P**	L-N (1Ph)	A	277	320	40	20	≤1.5		C24	-
83020109	**STPT2-40K320V-1PM**	L-N (1Ph)	A	277	320	40	20	≤1.5	√	C24	-
83020110	**STPT2-40K440V-1P**	L-N (1Ph)	A	400	440	40	20	≤2		C25	-
83020111	**STPT2-40K440V-1PM**	L-N (1Ph)	A	400	440	40	20	≤2	√	C25	-
83020100	**STPT2-30K750V-1P**	L-N (1Ph)	A	690	750	30	15	≤3		C26	-
83020101	**STPT2-30K750V-1PM**	L-N (1Ph)	A	690	750	30	15	≤3	√	C26	-
83020112	**STPT2-40K-N**	N-PE (N)	B	Neutral	265	40	20	≤1.5		-	C27

2 poles

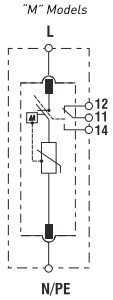
		Network								Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [VAC]	Uc [V]	Imax (8/20) [KA]	In (8/20) [KA]	Up@In (8/20) [KV]	REMOTE (M)	L	N
83020128	**STPT2-40K60V-2P**	TNS (1Ph+N); PV	C	48/-	60; 65 Ucpv	40	20	≤0.7		C20	
83020129	**STPT2-40K60V-2PM**	TNS (1Ph+N); PV	C	48/-	60; 65 Ucpv	40	20	≤0.7	√	C20	
83020130	**STPT2-40K75V-2P**	TNS (1Ph+N); PV	C	60/-	75; 80 Ucpv	40	20	≤0.8		C21	
83020131	**STPT2-40K75V-2PM**	TNS (1Ph+N); PV	C	60/-	75; 80 Ucpv	40	20	≤0.8	√	C21	
83020114	**STPT2-40K150V-2PG**	TT (1Ph+N)	D	120/-	175	40	20	≤1.0 (L-N) ≤1.5 (N-PE)		C22	C27
83020115	**STPT2-40K150V-2PGM**	TT (1Ph+N)	D	120/-	175	40	20	≤1.0 (L-N) ≤1.5 (N-PE)	√	C22	C27
83020116	**STPT2-40K275V-2PG**	TT (1Ph+N)	D	230/-	275	40	20	≤1.3 (L-N) ≤1.5 (N-PE)		C23	C27
83020117	**STPT2-40K275V-2PGM**	TT (1Ph+N)	D	230/-	275	40	20	≤1.3 (L-N) ≤1.5 (N-PE)	√	C23	C27
83020118	**STPT2-40K320V-2PG**	TT (1Ph+N)	D	277/-	320	40	20	≤1.5 (L-N) ≤1.5 (N-PE)		C24	C27
83020119	**STPT2-40K320V-2PGM**	TT (1Ph+N)	D	277/-	320	40	20	≤1.5 (L-N) ≤1.5 (N-PE)	√	C24	C27
83020120	**STPT2-40K150V-2P**	TNS (1Ph+N)	F	120/-	175	40	20	≤1.0		C22	
83020121	**STPT2-40K150V-2PM**	TNS (1Ph+N)	F	120/-	175	40	20	≤1.0	√	C22	
83020122	**STPT2-40K275V-2P**	TNS (1Ph+N)	F	230/-	275	40	20	≤1.3		C23	
83020123	**STPT2-40K275V-2PM**	TNS (1Ph+N)	F	230/-	275	40	20	≤1.3	√	C23	
83020124	**STPT2-40K320V-2P**	TNS (1Ph+N)	F	277/-	320	40	20	≤1.5		C24	
83020125	**STPT2-40K320V-2PM**	TNS (1Ph+N)	F	277/-	320	40	20	≤1.5	√	C24	
83020126	**STPT2-40K440V-2P**	IT (1Ph+N); TNS(1Ph+N)	C	230/-; 400/-	440	40	20	≤2		C25	
83020127	**STPT2-40K440V-2PM**	IT (1Ph+N); TNS(1Ph+N)	C	230/-; 400/-	440	40	20	≤2	√	C25	

ELV

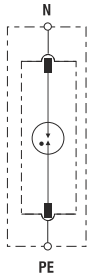
ELV Extra Low Voltage, also for use in DC Photovoltaic self-consumption / off-grid applications.

Electrical diagrams

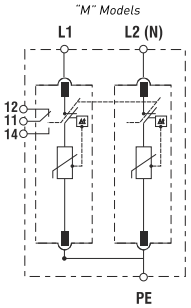
A (1P)



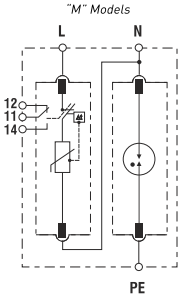
B (N)



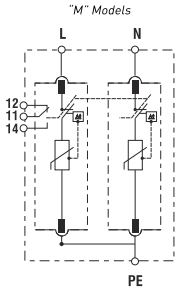
C 2+0 (2P)



D 1+1 (2PG)



F 2+0 (2P)



SURGE-TRAP® TYPE 2 SPDs | STP T2 40

3 poles

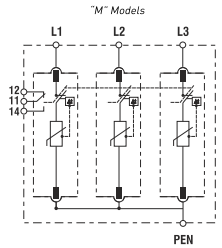
		Network								Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [VAC]	Uc [V]	Imax (8/20) [KA]	In (8/20) [KA]	Up@In (8/20) [KV]	REMOTE (M)	L	N
83020132	**STPT2-40K150V-3P**	TNC (3Ph)	H	-/208	175	40	20	≤1.0		C22	-
83020133	**STPT2-40K150V-3PM**	TNC (3Ph)	H	-/208	175	40	20	≤1.0	√	C22	-
83020134	**STPT2-40K275V-3P**	TNC (3Ph)	H	-/400	275	40	20	≤1.3		C23	-
83020135	**STPT2-40K275V-3PM**	TNC (3Ph)	H	-/400	275	40	20	≤1.3	√	C23	-
83020136	**STPT2-40K320V-3P**	TNC (3Ph)	H	-/480	320	40	20	≤1.5		C24	-
83020137	**STPT2-40K320V-3PM**	TNC (3Ph)	H	-/480	320	40	20	≤1.5	√	C24	-
83020142	**STPT2-40K440V-3P**	IT (3Ph); TNC (3Ph)	I	-/400; -/690	440	40	20	≤2		C25	-
83020143	**STPT2-40K440V-3PM**	IT (3Ph); TNC (3Ph)	I	-/400; -/690	440	40	20	≤2	√	C25	-
83020102	**STPT2-30K750V-3P**	TNC (3Ph)	H	-/690; -/1000	750	30	15	≤3		C26	-
83020103	**STPT2-30K750V-3PM**	TNC (3Ph)	H	-/690; -/1000	750	30	15	≤3	√	C26	-

4 poles

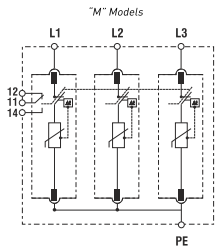
		Network								Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [VAC]	Uc [V]	Imax (8/20) [KA]	In (8/20) [KA]	Up@In (8/20) [KV]	REMOTE (M)	L	N
83020144	**STPT2-40K150V-4PG**	TT (3Ph+N)	J	120/208	175	40	20	≤1.0 (L-N) ≤1.5 (N-PE)		C22	C27
83020145	**STPT2-40K150V-4PGM**	TT (3Ph+N)	J	120/208	175	40	20	≤1.0 (L-N) ≤1.5 (N-PE)	√	C22	C27
83020146	**STPT2-40K275V-4PG**	TT (3Ph+N)	J	230/400	275	40	20	≤1.3 (L-N) ≤1.5 (N-PE)		C23	C27
83020147	**STPT2-40K275V-4PGM**	TT (3Ph+N)	J	230/400	275	40	20	≤1.3 (L-N) ≤1.5 (N-PE)	√	C23	C27
83020148	**STPT2-40K320V-4PG**	TT (3Ph+N)	J	277/480	320	40	20	≤1.5 (L-N) ≤1.5 (N-PE)		C24	C27
83020149	**STPT2-40K320V-4PGM**	TT (3Ph+N)	J	277/480	320	40	20	≤1.5 (L-N) ≤1.5 (N-PE)	√	C24	C27
83020150	**STPT2-40K150V-4P**	TNS (3Ph+N)	L	120/208	175	40	20	≤1.0		C22	
83020151	**STPT2-40K150V-4PM**	TNS (3Ph+N)	L	120/208	175	40	20	≤1.0	√	C22	
83020152	**STPT2-40K275V-4P**	TNS (3Ph+N)	L	230/400	275	40	20	≤1.3		C23	
83020153	**STPT2-40K275V-4PM**	TNS (3Ph+N)	L	230/400	275	40	20	≤1.3	√	C23	
83020154	**STPT2-40K320V-4P**	TNS (3Ph+N)	L	277/480	320	40	20	≤1.5		C24	
83020155	**STPT2-40K320V-4PM**	TNS (3Ph+N)	L	277/480	320	40	20	≤1.5	√	C24	
83020156	**STPT2-40K440V-4P**	IT (3Ph+N); TNS (3Ph+N)	L	230/400; 400/690	440	40	20	≤2		C25	
83020157	**STPT2-40K440V-4PM**	IT (3Ph+N); TNS (3Ph+N)	L	230/400; 400/690	440	40	20	≤2	√	C25	

Electrical diagrams

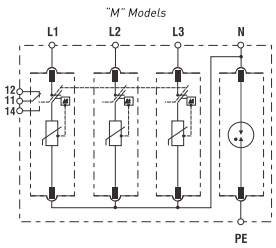
H 3+0 (3P)



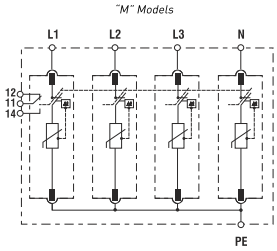
I 3+0 (3P)



J 3+1 (4PG)



L 4+0 (4P)



Replacement cartridges

REFERENCE NUMBER	CATALOGUE NUMBER	NETWORK	Un [VAC]	Uc [V]	Imax (8/20) [KA]	In (8/20) [KA]	Up@In (8/20) [KV]	CARTRIDGE ID.
83020008	**SP2-40K60V**	L-N (1Ph)	48	60	40	20	≤0.7	C20
83020009	**SP2-40K75V**	L-N (1Ph)	60	75	40	20	≤0.8	C21
83020001	**SP2-40K150V**	L-N (1Ph)	120	175	40	20	≤1.0	C22
83020002	**SP2-40K275V**	L-N (1Ph)	230	275	40	20	≤1.3	C23
83020003	**SP2-40K320V**	L-N (1Ph)	277	320	40	20	≤1.5	C24
83020004	**SP2-40K440V**	L-N (1Ph)	400	440	40	20	≤2	C25
83020007	**SP2-30K750V**	L-N (1Ph)	690	750	30	15	≤3	C26
83020000	**SP2-40K-N**	N-PE (N)	Neutral	265	40	20	≤1.5	C27

STP T23 20

STP T23 20 is the series of combined Type 2+3/Class II+III devices for discharging voltage surges while providing a very fine voltage protection level, in accordance with IEC/EN 61643-11.

Suitable as the final stage of protection in panels with Type 2 protection devices installed upstream such as STP T2 40 SPDs. These SPDs should be installed as close as possible to the equipment being protected.

Ratings and features

- Maximum discharge current (8/20µs): 20kA per phase
- Nominal discharge current (8/20µs): 10kA per phase
- Combined voltage pulse Uoc (1.2/50µs): 10kV
- TNS, TNC, TT and IT networks
- Un(L-N/L-L): 120/208V, 230/400V, 277/480V and 400/690V
- PLC friendly solutions (LCF) for Power Line Communications
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid cartridge replacement errors

Imax
20kA

Approvals/Standards

- IEC/EN 61643-11
- CE

GUIDE

Example

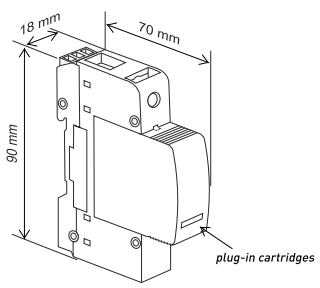
STP T23 - 20K 275V - 4PG LF M

Surge-Trap® Pluggable Type 2+3 / Class II+III surge protective device (8/20µs) and very fine protection of equipment (1.2/50µs)

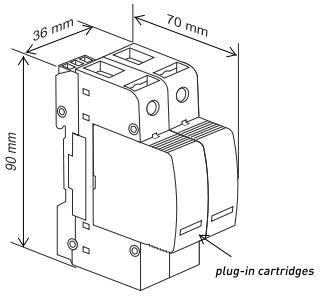
Step 1	Step 2		Step 3		Step 4		Step 5	
Max. discharge current	Operating voltage		Network configuration		Additional features		Remote monitoring	
20K	Imax (L-N) =20kA	Uc / Un (L-N/L-L)	1P	L-N; 1Ph (TNS,TNC,IT,TT)	LF	Leakage current free	M	Microswitch included
		150V 120/208V	N	N-PE; Neutral (TT Spark-Gap)				
		275V 230/400V (for LF models only)	2P	2+0; 1Ph+N (TNS)				
		320V 230/400; 277/480V	2PG	1+1; 1Ph+N (TT)				
		440V 230/400V "IT" 400/690V	3P	3+0; 3Ph (TNC)				
		Blank N-PE protection	4P	4+0; 3Ph+N (TNS)				
			4PG	3+1; 3Ph+N (TT)				

Dimensions

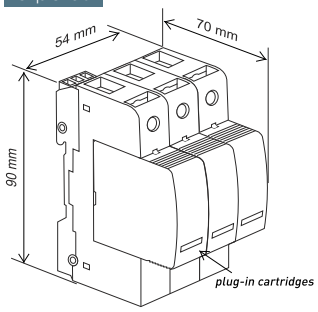
1 pole



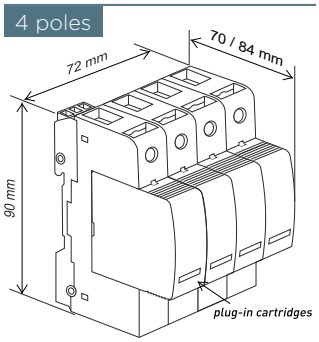
2 poles



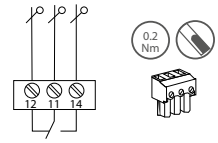
3 poles



4 poles



Microswitch diagram



U_{max} / I_{max}	
AC: 250 V/1 A	max 1.5 mm²
AC: 125 V/3 A	

Catalogue numbers / Reference numbers

1 pole

		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Uoc [kV]	Up@In (8/20) [KV]	REMOTE (M)	L	N
83230100	**STPT23-20K150V-1P**	L-N (1Ph)	A	120	150	20	10	10	≤0.8		C60	-
83230101	**STPT23-20K150V-1PM**	L-N (1Ph)	A	120	150	20	10	10	≤0.8	√	C60	-
83230102	**STPT23-20K320V-1P**	L-N (1Ph)	A	230; 277	320	20	10	10	≤1.4		C62	-
83230103	**STPT23-20K320V-1PM**	L-N (1Ph)	A	230; 277	320	20	10	10	≤1.4	√	C62	-
83230104	**STPT23-20K440V-1P**	L-N (1Ph)	A	400	440	20	10	10	≤2		C63	-
83230105	**STPT23-20K440V-1PM**	L-N (1Ph)	A	400	440	20	10	10	≤2	√	C63	-
83230106	**STPT23-20K-N**	N-PE (N)	B	Neutral	255	20	10	10	≤1.5		-	C64

2 poles

		Network								Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Uoc [kV]	Up@In(8/20) [kV]	REMOTE (M)	L	N
83230108	**STPT23-20K150V-2PG**	TT (1Ph+N)	D	120/-	150	20	10	10	≤0.8 (L-N) ≤1.5 (N-PE)		C60	C64
83230109	**STPT23-20K150V-2PGM**	TT (1Ph+N)	D	120/-	150	20	10	10	≤0.8 (L-N) ≤1.5 (N-PE)	√	C60	C64
83230112	**STPT23-20K320V-2PG**	TT (1Ph+N)	D	230/-; 277/-	320	20	10	10	≤1.4 (L-N) ≤1.5 (N-PE)		C62	C64
83230113	**STPT23-20K320V-2PGM**	TT (1Ph+N)	D	230/-; 277/-	320	20	10	10	≤1.4 (L-N) ≤1.5 (N-PE)	√	C62	C64
83230110	**STPT23-20K275V-2PG-LF**	TT (1Ph+N)	E	230/-	275	20	10	10	≤1.5 (L-N) ≤1.5 (N-PE)		C61	C64
83230111	**STPT23-20K275V-2PG-LFM**	TT (1Ph+N)	E	230/-	275	20	10	10	≤1.5 (L-N) ≤1.5 (N-PE)	√	C61	C64
83230114	**STPT23-20K150V-2P**	TNS (1Ph+N)	F	120/-	150	20	10	10	≤0.8		C60	
83230115	**STPT23-20K150V-2PM**	TNS (1Ph+N)	F	120/-	150	20	10	10	≤0.8	√	C60	
83230116	**STPT23-20K320V-2P**	TNS (1Ph+N)	F	230/-; 277/-	320	20	10	10	≤1.4		C62	
83230117	**STPT23-20K320V-2PM**	TNS (1Ph+N)	F	230/-; 277/-	320	20	10	10	≤1.4	√	C62	
83230134	**STPT23-20K275V-2P-LF**	TNS (1Ph+N)	G	230/-	275	20	10	10	≤1.5		C61	
83230135	**STPT23-20K275V-2P-LFM**	TNS (1Ph+N)	G	230/-	275	20	10	10	≤1.5	√	C61	

3 poles

		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Uoc [kV]	Up@In (8/20) [kV]	REMOTE (M)	L	N
83230118	**STPT23-20K150V-3P**	TNC (3Ph)	H	-/208	150	20	10	10	≤0.8		C60	-
83230119	**STPT23-20K150V-3PM**	TNC (3Ph)	H	-/208	150	20	10	10	≤0.8	√	C60	-
83230122	**STPT23-20K320V-3P**	TNC (3Ph)	H	-/400; -/480	320	20	10	10	≤1.4		C62	-
83230123	**STPT23-20K320V-3PM**	TNC (3Ph)	H	-/400; -/480	320	20	10	10	≤1.4	√	C62	-
83230120	**STPT23-20K275V-3P-LF**	TNC (3Ph)	N	-/400	275	20	10	10	≤1.5		C61	-
83230121	**STPT23-20K275V-3P-LFM**	TNC (3Ph)	N	-/400	275	20	10	10	≤1.5	√	C61	-

4 poles

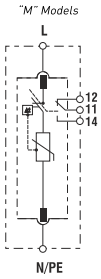
		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Uoc [kV]	Up@In(8/20) [kV]	REMOTE (M)	L	N
83230124	**STPT23-20K150V-4PG**	TT (3Ph+N)	J	120/208	150	20	10	10	≤0.8 (L-N) ≤1.5 (N-PE)		C60	C64
83230125	**STPT23-20K150V-4PGM**	TT (3Ph+N)	J	120/208	150	20	10	10	≤0.8 (L-N) ≤1.5 (N-PE)	√	C60	C64
83230128	**STPT23-20K320V-4PG**	TT (3Ph+N)	J	230/400; 277/480	320	20	10	10	≤1.4 (L-N) ≤1.5 (N-PE)		C62	C64
83230129	**STPT23-20K320V-4PGM**	TT (3Ph+N)	J	230/400; 277/480	320	20	10	10	≤1.4 (L-N) ≤1.5 (N-PE)	√	C62	C64
83230126	**STPT23-20K275V-4PG-LF**	TT (3Ph+N)	K	230/400	275	20	10	10	≤1.5 (L-N) ≤1.5 (N-PE)		C61	C64
83230127	**STPT23-20K275V-4PG-LFM**	TT (3Ph+N)	K	230/400	275	20	10	10	≤1.5 (L-N) ≤1.5 (N-PE)	√	C61	C64
83230130	**STPT23-20K150V-4P**	TNS (3Ph+N)	L	120/208	150	20	10	10	≤0.8		C60	
83230131	**STPT23-20K150V-4PM**	TNS (3Ph+N)	L	120/208	150	20	10	10	≤0.8	√	C60	
83230132	**STPT23-20K320V-4P**	TNS (3Ph+N)	L	230/400; 277/480	320	20	10	10	≤1.4		C62	
83230133	**STPT23-20K320V-4PM**	TNS (3Ph+N)	L	230/400; 277/480	320	20	10	10	≤1.4	√	C62	
83230136	**STPT23-20K275V-4P-LF**	TNS (3Ph+N)	M	230/400	275	20	10	10	≤1.5		C61	
83230137	**STPT23-20K275V-4P-LFM**	TNS (3Ph+N)	M	230/400	275	20	10	10	≤1.5	√	C61	

Replacement cartridges

REFERENCE NUMBER	CATALOGUE NUMBER	NETWORK	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Uoc [kV]	Up@In (8/20) [kV]	CARTRIDGE ID.
83230001	**SP23-20K150V**	L-N (1Ph)	120	150	20	10	10	≤0.8	C60
83230003	**SP23-20K275V-LF**	L-N (1Ph)	230	275	20	10	10	≤1.5	C61
83230002	**SP23-20K320V**	L-N (1Ph)	230; 277	320	20	10	10	≤1.4	C62
83230004	**SP23-20K440V**	L-N (1Ph)	400	440	20	10	10	≤2	C63
83230000	**SP23-20K-N**	N-PE (N)	Neutral	255	20	10	10	≤1.5	C64

Electrical diagrams

A (1P)



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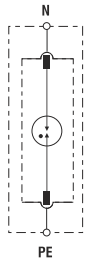

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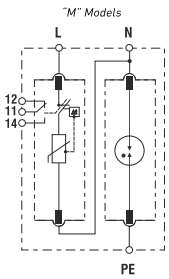

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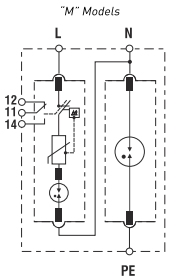

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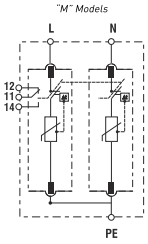
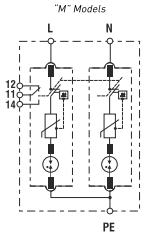
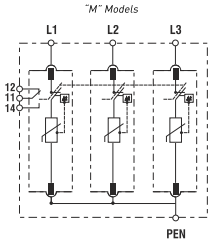


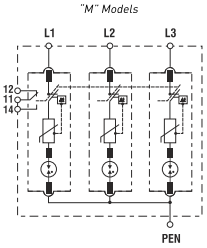
G 2+0 (2P) LF



H 3+0 (3P)



N 3+0 (3P) LF



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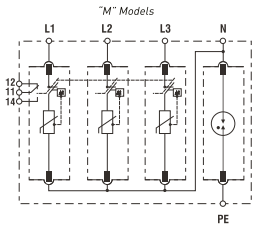

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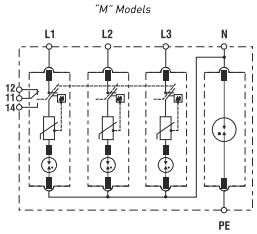

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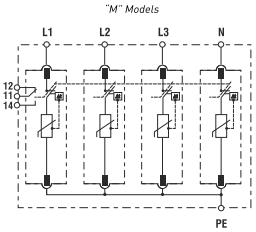
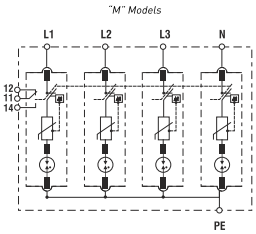


M 4+0 (4P) LF



STM T23 20 S

STM T23 20 S is the series of combined Type 2+3/Class II+III devices for discharging voltage surges while providing a very fine voltage protection level, in accordance with IEC/EN 61643-11.

Suitable as the final stage of protection in locations with Type 2 protection devices installed upstream. These SPDs should be installed as close as possible to the equipment being protected. Ideal for limited spaces. Wide range of voltage ratings.

Ratings and features

- Maximum discharge current (8/20µs): 20kA, 6kA
- Nominal discharge current (8/20µs): 10kA, 3kA
- Combined voltage pulse (1.2/50µs): 10kV, 6kV
- Single phase TT and TNS networks
- Un: 12V, 24V, 48V, 60V, 120V, 230V
- Typically for use also in the corresponding DC voltages
- DIN-rail mountable, monobloc format
- Visual (LED) and remote end of life indicators
- Power status (LED) indicator
- Space saving "slim" format

Imax
20kA

Approvals/Standards

- IEC/EN 61643-11
- CE

GUIDE

Example

STM T23 - 20K 275V - SP - S M

Surge-Trap®
Type 2+3 / Class II+III
surge protective device (8/20µs) and very fine protection of equipment (1.2/50µs)

Step 1	Step 2	Step 3	Step 4	Step 5
Max. discharge current	Operating voltage	Network configuration	Additional features	Remote monitoring
6K Imax (L-N) =6kA 20K Imax (L-N) =20kA	Uc / Un (L-N) 20V 12V 30V 24V 60V 48V 75V 60V 150V 120V 275V 230V	SP Single Phase; 1Ph+N (TT,TNS)	S Slim - space saving	M Microswitch included

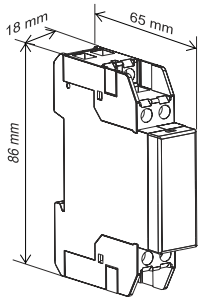
Catalogue numbers / Reference numbers

2 poles

REF. NUMBER	CATALOGUE NUMBER WITHOUT REMOTE MONIT.	CATALOGUE NUMBER WITH REMOTE MONIT.	Network: SYSTEM TYPE	Network: ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Uoc [kV]	Up@In (8/20) [kV]
83230500 83230501	STMT23-6K20V-SP-S	STMT23-6K20V-SP-SM	TT/TNS (1Ph+N)	A	12	20	6	3	6	≤0.22 (L1-L2) 0.7 (L1/L2-PE)
83230504 83230505	STMT23-6K30V-SP-S	STMT23-6K30V-SP-SM	TT/TNS (1Ph+N)	A	24	30	6	3	6	≤0.22 (L1-L2) 0.7 (L1/L2-PE)
83230506 83230507	STMT23-6K60V-SP-S	STMT23-6K60V-SP-SM	TT/TNS (1Ph+N)	A	48	60	6	3	6	≤0.33 (L1-L2) 0.7 (L1/L2-PE)
83230508 83230509	STMT23-6K75V-SP-S	STMT23-6K75V-SP-SM	TT/TNS (1Ph+N)	A	60	75	6	3	6	≤0.5 (L1-L2) 0.9 (L1/L2-PE)
83230502 83230503	STMT23-6K150V-SP-S	STMT23-6K150V-SP-SM	TT/TNS (1Ph+N)	A	120	150	6	3	6	≤0.7 (L1-L2) 0.9 (L1/L2-PE)
83230510 83230511	STMT23-20K275V-SP-S	STMT23-20K275V-SP-SM	TT/TNS (1Ph+N)	A	230	275	20	10	10	≤1.4 (L1-L2) 1.4 (L1/L2-PE)

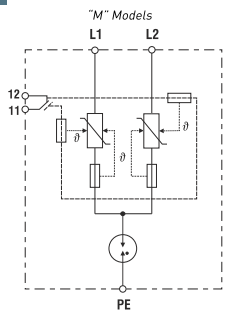
Dimensions

2 poles

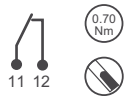


Electrical diagram

A



Microswitch diagram



	U_{max} / I_{max}
AC:	250 V/1 A
DC:	125 V/0.2 A

STE T23 20

STE T23 20 is the series of combined Type 2+3/Class II+III devices for discharging voltage surges while providing a very fine voltage protection level, in accordance with IEC/EN 61643-11.
Complete with a built-in powerful EMI filter.

Suitable as the final stage of protection in installations with electromagnetic disturbances which might interrupt, degrade or limit system performance.

Series connection for applications up to 20A rated current.

Ratings and features

- Maximum discharge current (8/20µs): 20kA
- Nominal discharge current (8/20µs): 10kA
- Combined voltage pulse (1.2/50µs): 6kV
- Filter attenuation up to 82dB (common mode)
- Rated current load (IL): 20A
- Single phase TT and TNS networks
- Un: 120V, 230V
- DIN-rail mountable, monobloc format
- Visual (LED) and remote end of life indicators
- Power status (LED) indicator

Imax
20kA

Approvals/Standards

- IEC/EN 61643-11
- CE

GUIDE

Example
STE T23 - 20K 275V - SP M

Surge-Trap® Type 2+3 / Class II+III surge protective device (8/20µs) and very fine protection of equipment (1.2/50µs). With EMI filter

Step 1	Step 2		Step 3	Step 4
Max. discharge current	Operating voltage		Network configuration	Remote monitoring
20K Imax (L-N) =20kA	Uc	Un (L-N)	SP Single Phase; 1Ph+N (TT,TNS)	M Microswitch included
	150V	120V		
	275V	230V		

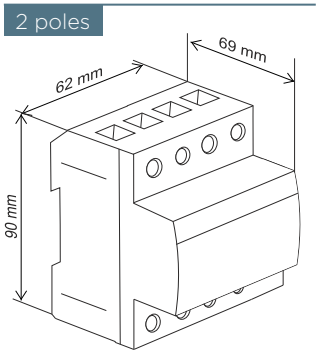
Catalogue numbers / Reference numbers

2 poles

		Network								
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Uoc [kV]	Up@In [kV]	IL [A]	REMOTE (M)
83230401	**STET23-20K150V-SPM**	TT/TNS (1Ph+N)	A	120	150	20	10	6	≤0.8	20	√
83230403	**STET23-20K275V-SPM**	TT/TNS (1Ph+N)	A	230	275	20	10	6	≤1.2	20	√

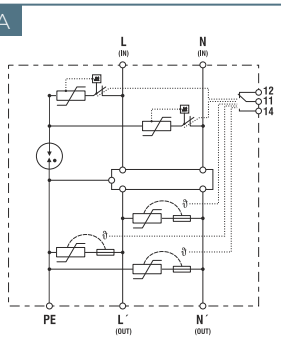
Dimensions

2 poles

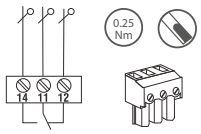


Electrical diagram

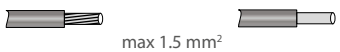
A



Microswitch diagram

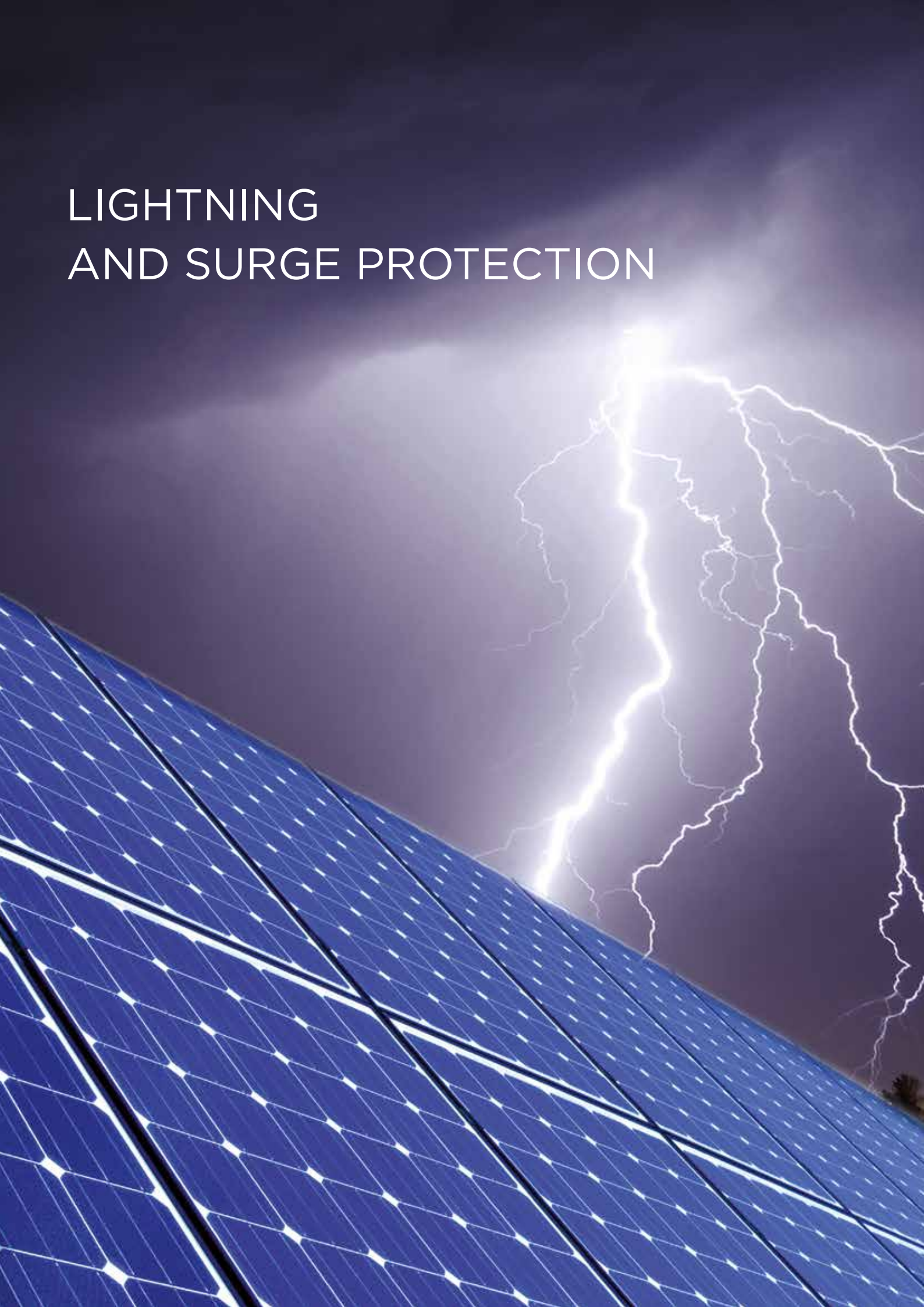


	U_{max} / I_{max}
AC:	250 V/1 A
DC:	125 V/0.2 A



max 1.5 mm²

LIGHTNING AND SURGE PROTECTION



PHOTOVOLTAIC SYSTEMS

SURGE-TRAP® HIGHLIGHTS

STP Surge-Trap® DC side

See page 13-25

1500 VDC READY

cULus

UL 1449 4th Ed
EN-50539-11
IEC/EN 61643-31
ROHS

Tested and certified

Mersen's highly specialised test labs for PV product development

Ucpv [VDC]
65
80
660
720
1060
1500

Wide voltage range

Ucpv up to 1500VDC

T1 T2

Type 1+2 and Type 2

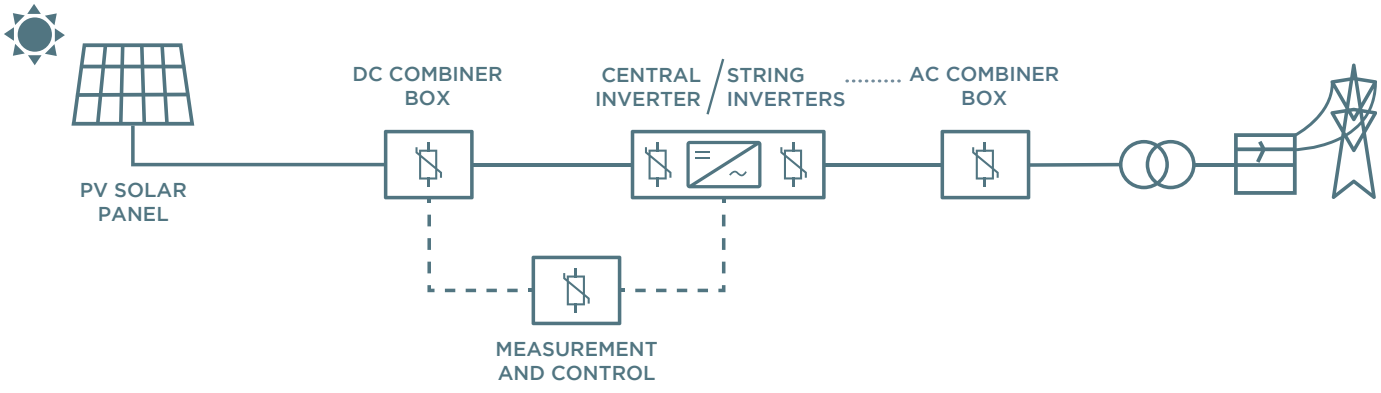
SPDs to EN 50539-11
IEC/EN 61643-31

PV: No back-up fuse required

Mersen has developed an optimised dynamic thermal disconnection system, which does not require back-up fuse

PV & Energy Storage System: GBAT fuses

The range of devices for photovoltaics withstands 50kA short-circuit current with 125A GBAT fuses



THE BEST PERFORMANCE IN THE MARKET

PV BOX

See page 41

DC junction boxes for inverters to IEC/EN standard

Available in several configurations

- Type 1+2 (5kA Iimp) or Type 2 (40kA Imax) SPDs
- MC4 or cable gland connectors
- 1 or 2 MPPT versions

Ready for installation

MPPT

See page 40

Suitable for all PV applications

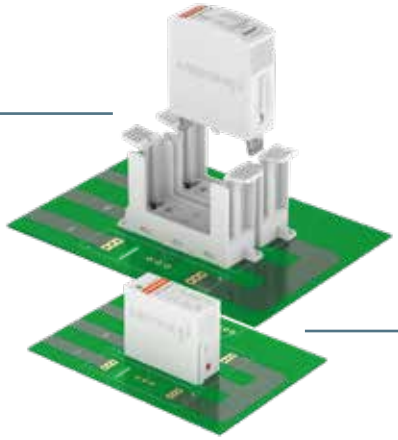
- Large-scale and rooftop
- Includes specific multipole products for multiple maximum power point tracker (MPPT) inverters

No back-up fuse required

PCB

See page 42

Integration of replaceable surge protection modules on PCBs



Optimal voltage protection level

Integration at early stage of PCB development

- Close to sensitive electronics
- No cable lengths

Cost & space efficiency

- No wiring wave soldered surge protection
- Space saving solution

Light version

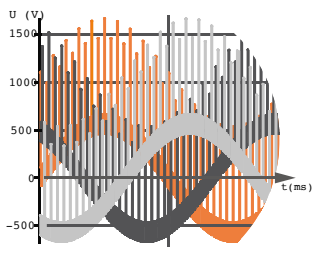
- Small footprint, socket-free assembly (direct PCB mounting)
- 10kA In and 25kA Imax Type 2 IEC/UL up to 1500 Vdc

AC Side

See page 47

AC reinforced SPDs

- For peak voltage withstand **up to 2,2kV** between L-PE
- Can cope with recurrent generation voltage-peaks in certain situations at **up to 800Vac**



Voltage to ground L-PE

STP T12 5 YPV

STP T12 5 YPV is the PHOTOVOLTAIC range of combined Type 1+2/Class I+II devices intended for discharging lightning currents (10/350 µs) and protecting against induced voltage surges (8/20 µs), in accordance with EN 50539-11 and IEC/EN 61643-31 standards.

Mersen uses a dynamic thermal disconnection system with high breaking capacity, optimised for DC voltages. This means there is no need to install a backup fuse to interrupt the typical short-circuit currents of any photovoltaic installation.

These lightning current and surge protection devices are suitable for all photovoltaic applications: large-scale, rooftop and self-consumption (off-grid) DC installations; especially in facilities provided with external LPS.

Ratings and features

- Lightning impulse current (10/350 µs): 5 kA
- Maximum discharge current (8/20 µs): 40 kA
- Nominal discharge current (8/20 µs): 20 kA
- Ucpv: 1060 Vdc and 1500 Vdc
- Iscpv: 10 kA (EN 50539-11), no back-up fuse required
- Plug-in DIN rail format
- Visual and remote end of life indication
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid replacement errors

limp
5kA

No back-up fuse required

Approvals/Standards

- EN 50539-11
- IEC/EN 61643-31
- UL 1449 4th Ed recognized, File No. E468946
- CE

Catalogue numbers / Reference numbers

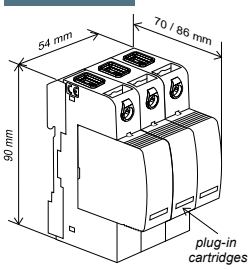
		Network									Cartridge Id.
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	UCPV [VDC]	ISCPV [A]	IIMP (10/350) [KA]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	REMOTE INDICATION (M)	L
83120167	STPT12-5K1000V-YPV	"Y" PV	A	1060	10 000	5	40	20	≤ 4		C43
83120168	STPT12-5K1000V-YPVM	"Y" PV	A	1060	10 000	5	40	20	≤ 4	√	C43
83120193	STPT12-5K1500V-YPV	"Y" PV	A	1500	10 000	5	40	20	≤ 5		C44
83120194	STPT12-5K1500V-YPVM	"Y" PV	A	1500	10 000	5	40	20	≤ 5	√	C44

Replacement cartridges

REF. NUMBER	CATALOGUE NUMBER	NETWORK	UCPV [VDC]	IIMP (10/350) [KA]	IMAX (8/20) [KA]	IN (8/20) @UP [KA]	UP@IN (8/20) [KV]	CARTRIDGE ID.
83120011	SP12-5K1000V-PV	PV	530	5	40	20	≤ 2	C43
83120023	SP12-5K1500V-PV	PV	750	5	40	20	≤ 2,5	C44

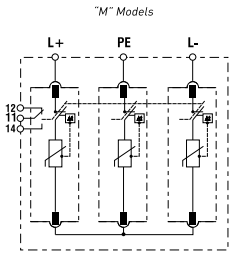
Dimensions

3 modules

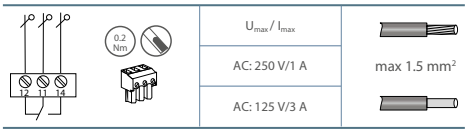


Electrical diagram

A Y PV



Microswitch diagram



SURGE-TRAP® DC TYPE 2 YPV PHOTOVOLTAIC SPD

STP T2 40 YPV

STP T2 40 YPV is the series of Type 2/Class II devices for discharging voltage surges in PV systems. This series provides advanced overvoltage protection by utilising Mersen's optimised dynamic thermal disconnection system.
This system does not require additional overcurrent protection (back-up fuse) due to its high short-circuit withstand rating.

Ratings and features

- Maximum discharge current (8/20µs): 40kA
- Nominal discharge current (8/20µs): 20kA
- Ucpv: 65, 80, 660, 1060 Vdc and 1500Vdc
- Iscpv: 10kA (EN 50539-11), no back-up fuse required
- SCCR: 50-100kA (UL 1449 4th Ed)
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid cartridge replacement errors

Imax
40kA

No back-up fuse required

Approvals/Standards

- EN 50539-11
- IEC 61643-31
- UL 1449 4th Ed recognized, File No. E468946
- CE

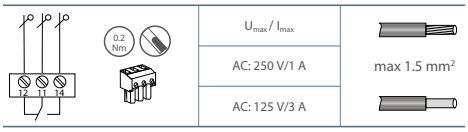
Catalogue numbers / Reference numbers

		Network								Cartridge Id.
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	UCPV [VDC]	ISCPV [A]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	REMOTE INDICATION (M)	L
Y PV. LARGE-SCALE AND ROOFTOP PV										
83020138	**STPT2-40K600V-YPV**	"Y" PV	A	660	10 000	40	20	≤2.6		C40
83020139	**STPT2-40K600V-YPVM**	"Y" PV	A	660	10 000	40	20	≤2.6	√	C40
83020140	**STPT2-40K1000V-YPV**	"Y" PV	A	1060	10 000	40	20	≤4		C41
83020141	**STPT2-40K1000V-YPVM**	"Y" PV	A	1060	10 000	40	20	≤4	√	C41
83020158	**STPT2-40K1500V-YPV**	"Y" PV	A	1500	10 000	40	15	≤5		C42
83020159	**STPT2-40K1500V-YPVM**	"Y" PV	A	1500	10 000	40	15	≤5	√	C42
U PV. SELF-CONSUMPTION										
83020128	**STPT2-40K60V-2P**	TNS (1Ph+N); PV	B	65	1000	40	20	≤0.7		Consult
83020129	**STPT2-40K60V-2PM**	TNS (1Ph+N); PV	B	65	1000	40	20	≤0.7	√	Consult
83020130	**STPT2-40K75V-2P**	TNS (1Ph+N); PV	B	80	1000	40	20	≤0.8		Consult
83020131	**STPT2-40K75V-2PM**	TNS (1Ph+N); PV	B	80	1000	40	20	≤0.8	√	Consult

Replacement cartridges

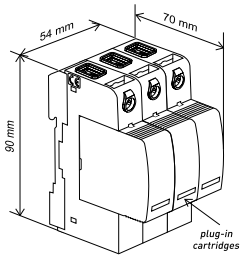
REF. NUMBER	CATALOGUE NUMBER	NETWORK	UCPV [VDC]	IMAX (8/20) [KA]	IN (8/20) @UP [KA]	UP@IN (8/20) [KV]	CARTRIDGE ID.
83020005	**SP2-40K600V-PV**	PV	330	40	20	≤1.3	C40
83020006	**SP2-40K1000V-PV**	PV	530	40	20	≤2	C41
83020010	**SP2-40K1500V-PV**	PV	750	40	10	≤2,5	C42

Microswitch diagram

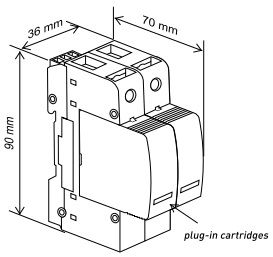


Dimensions

Y PV

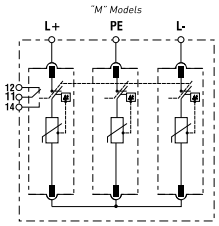


U PV

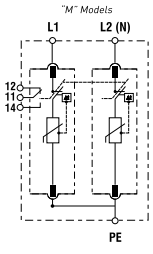


Electrical diagram

A Y PV



B U PV



SURGE-TRAP® DC T2 & T1+2 MPPT PHOTOVOLTAIC SPD

STP MPPT PV

STP MPPT PV is the PHOTOVOLTAIC range of combined Type 1+2 / Class I+II and T2 / Class II devices intended for discharging lightning currents (10/350 µs) and protecting against induced voltage surges (8/20 µs), in accordance with EN 50539-11, IEC 61643-31 and UL 1449 (for Type 2).

Mersen uses a dynamic thermal disconnection system with high breaking capacity, optimised for DC voltages. This means there is no need to install a backup fuse to interrupt the typical short-circuit currents of any photovoltaic installation.

The devices are suitable for all PV applications: large-scale and rooftop. Includes specific multipole products for multiple maximum power point tracker (MPPT) inverters.

Iimp **5kA** Imax **40kA**

Approvals/Standards

- EN 50539-11
- IEC 61643-31
- UL 1449 4th Ed recognized, File No. E468946
- CE

Ratings and features

- Maximum discharge current (8/20µs): 40kA
- Nominal discharge current (8/20µs): 20kA
- For Type 1+2, lightning impulse current (10/350µs): 5kA
- Ucpv: 1060 Vdc
- Iscpv: 10 kA (EN 50539-11), no back-up fuse required
- Multipole MPPT specific products
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid replacement errors

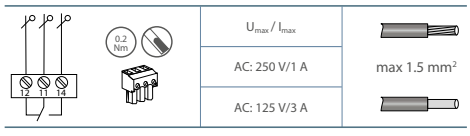
Catalogue numbers / Reference numbers

		Network									Cartridge Id.
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	UCPV [VDC]	ISCPV [A]	IIMP (10/350) [KA]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	REMOTE INDICATION (M)	L
TYPE 1+2											
83120192	**STPT12-5K1000V-5YPVM**	3+ , 1- , 1PE	A	1060	10000	5	40	20	4	√	C43
83120206	**STPT12-5K1000V-5Y2PVM**	2+ , 2- , 1PE	C	1060	10000	5	40	20	4	√	C43
83120190	**STPT12-5K1000V-8YPVM**	6+ , 1- , 1PE	B	1060	10000	5	40	20	4	√	C43
TYPE 2											
83020188	**STPT2-40K1000V-5YPVM**	3+ , 1- , 1PE	A	1060	10000	-	40	20	4	√	C41
83020223	**STPT2-40K1000V-5Y2PVM**	2+ , 2- , 1PE	C	1060	10000	-	40	20	4	√	C41
83020204	**STPT2-40K1000V-8YPVM**	6+ , 1- , 1PE	B	1060	10000	-	40	20	4	√	C41

Replacement cartridges

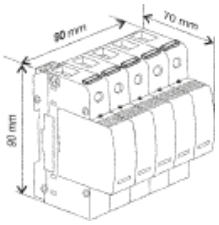
REF. NUMBER	CATALOGUE NUMBER	NETWORK	UCPV [VDC]	IIMP (10/350) [KA]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	CARTRIDGE ID.
83020006	**SP2-40K1000V-PV**	PV	530	-	40	20	≤2	C41
83020011	**SP12-5K1000V-PV**	PV	530	5	40	20	≤2	C43

Microswitch diagram

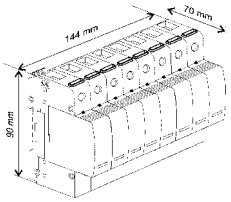


Dimensions

5 poles

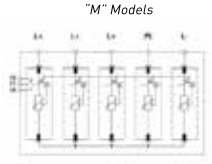


8 poles

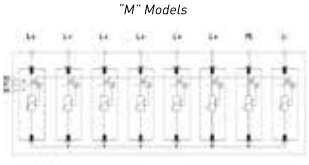


Electrical diagram

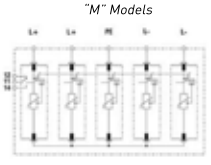
A



B



C



PV BOX

PV BOX is the series of DC photovoltaic surge protection connection boxes for inverters to IEC/EN standard.

Such boxes are ready for installation and just need to be connected in parallel upstream of residential and light commercial string inverters of several MPP trackers, mainly 1000Vdc rooftop installations.

Available in several configurations including Type 1+2 or Type 2 surge protection with MC4 or cable gland connectors. Please consult for availability and models, for instance 5pole and 8pole SPDs.

Ratings and features

- Pre-assembled junction box with SPDs for 1000VDC
- Quick installation of the DC protection, next to the inverter
- MC4 or cable gland connectors
- 1 or 2 MPPT versions
- 1 or 2 string inputs per MPPT
- Type 1+2 5kA Iimp or Type 2 40kA Imax SPDs
- Visual end of life indicator
- DC Switch disconnector available

Iimp **5kA** Imax **40kA**

Approvals/Standards

- IEC/EN 61439-12
- IEC/EN 61643-31
- CE

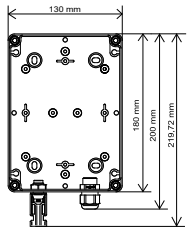
Catalogue numbers / Reference numbers

REFERENCE NUMBER	CATALOGUE NUMBER	NUMBER OF MPP TRACKERS	STRING INPUTS PER MPPT	IMAX PER STRING [KA]	PLUGGABLE CARTRIDGE	DIMENSIONS	ELECTRICAL DIAGRAM	CONNECTOR TYPE
TYPE 1+2								
83070102	**PVBT12-1000V-BH-113**	1	1	40	SP12-5K1000V-PV	I	A	**MC4**
83070106	**PVBT12-1000V-BH-213**	2	1	40	SP12-5K1000V-PV	II	B	**MC4**
83070110	**PVBT12-1000V-BH-223**	2	2	20	SP12-5K1000V-PV	III	D	**MC4**
83070010	**PVBT12-1000V-BH-225**	2	2	20	SP12-5K1000V-PV	III	D	**CABLE GLAND**
83070002	**PVBT12-1000V-B-113**	1	1	40	SP12-5K1000V-PV	I	A	**CABLE GLAND**
83070006	**PVBT12-1000V-B-213**	2	1	40	SP12-5K1000V-PV	II	B	**CABLE GLAND**
83070016	**PVBT12-1000V-B-215**	2	1	40	SP12-5K1000V-PV	II	C	**CABLE GLAND**
TYPE 2								
83070100	**PVBT2-1000V-BH-113**	1	1	40	SP2-40K1000V-PV	I	A	**MC4**
83070104	**PVBT2-1000V-BH-213**	2	1	40	SP2-40K1000V-PV	II	B	**MC4**
83070108	**PVBT2-1000V-BH-225**	2	2	20	SP2-40K1000V-PV	III	D	**MC4**
83070008	**PVBT2-1000V-B-225**	2	2	20	SP2-40K1000V-PV	III	D	**CABLE GLAND**
83070000	**PVBT2-1000V-B-113**	1	1	40	SP2-40K1000V-PV	I	A	**CABLE GLAND**
83070004	**PVBT2-1000V-B-213**	2	1	40	SP2-40K1000V-PV	II	B	**CABLE GLAND**
83070014	**PVBT2-1000V-B-215**	2	1	40	SP2-40K1000V-PV	II	C	**CABLE GLAND**

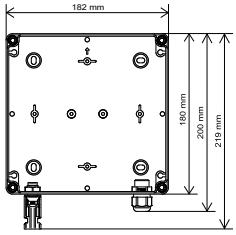
Other boxes available. Contact Mersen for more information.

Dimensions

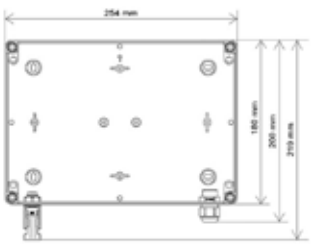
I



II



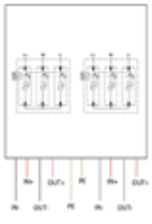
III



Electrical diagram

A

B



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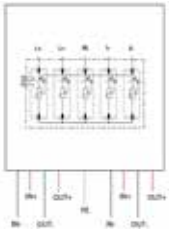
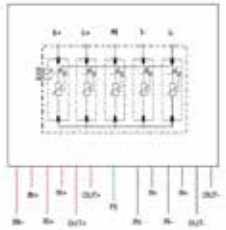


D



SURGE-TRAP® PCB PLUG-IN OR DIRECT ASSEMBLY

SB-PCB

SB PCB is the series of socket bases that allow for integration of Mersen's pluggable IEC surge protection cartridges directly on printed circuit boards. These surge cartridges will be easily replaceable upon reaching end of life.

SB PCB is an optimal solution for the industry of power electronics: inverters, converters, control panels for railway, PV combiner boxes, machines, OEM equipment, etc. Key benefits are cost efficiency, space efficiency, no wiring and optimal voltage protection of sensitive electronics.

Integration of surge protection on PCBs is often planned for at an early stage of development of the system. The surge sockets will be firmly fixed to the PCB during the wave soldering process. They'll host the entire range of IEC surge protection cartridges AC & DC, T2 & T1.

Iimp **25kA** Imax **80kA**

Approvals/Standards

- IEC/EN 61643-11
- CE

Ratings and features

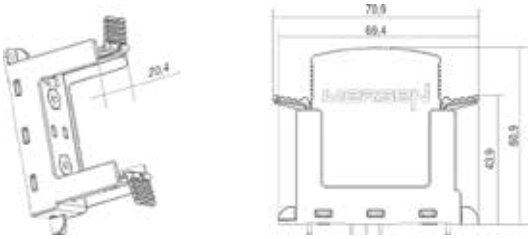
- Single pole sockets. All system configurations on PCBs.
- Up to 1500 VDC
- T1 & T2 surge protection (IEC 61643-11)
- Remote end of life indicator
- Voltage ratings DC: 660 - 1500VDC
- Voltage ratings AC: 60 - 850VAC
- Mechanical coding to avoid cartridge insertion errors
- Vibration proof (EN 60721-3-3)
- Cost efficiency
- Space efficiency
- No wiring
- Optimal voltage protection

Catalogue numbers / Reference numbers

				Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	UCPV [VDC]	REMOTE INDICATION (M)	REFERENCE NUMBER	CATALOGUE NUMBER
DC SIDE					
83050133	**SB-PCB-1000PV-M**	1000	√	83020006	**SP2-40K1000V-PV**
83050135	**SB-PCB-1500PV-M**	1500	√	83020010	**SP2-40K1500V-PV**
AC SIDE					
83050119	**SB-PCB-275V-M**	275	√	83020002	**SP2-40K275V**
83050123	**SB-PCB-440V-M**	440	√	83020004	**SP2-40K440V**
83050127	**SB-PCB-750V-M**	750	√	83020007	**SP2-30K750V**
83050129	**SB-PCB-N-M**	neutral	√	83020000	**SP2-40K-N**

Dimensions

1 pole



SP-PCB

Compact SPD SP-PCB base can be soldered directly on to the PCB, cartridges are pluggable and replaceable. This solution can save cost and installation space effectively, with no wiring and provides sensitive electronic components with optimal surge protection. SPD sockets will be fixed on PCB firmly during soldering.

The compact SP-PCB is an optimal solution for industrial power electronics: inverters, converters, control panel for railway, PV combiner box and others.

Imax
25kA

Approvals/Standards

- IEC/EN 61643-31
- UL 1449 4th Ed recognized, File No. E468946

Ratings and features

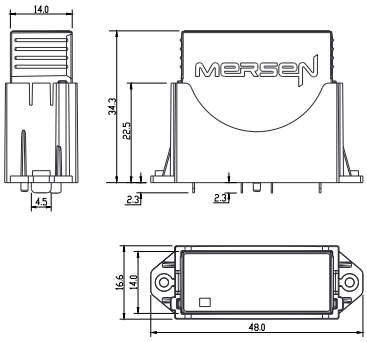
- Single pole design.
  Apply to all system structure on PCBs; Apply to anti-failure Y-circuits circuit protection structure (PV or AC).
- Up to 1500 VDC
  Air clearance & creepage distances comply with requirements of all applications (PV DC and AC).
- Fixed and reliable.
  SPD module has anti-vibration function and is easy to replace.
- T2 surge protection.
  Mechanical stress of Type 2 discharges won't loosen the protection module.
- Remote indication.
  Protection pole is equipped with visual end of life indication.

Catalogue numbers / Reference numbers

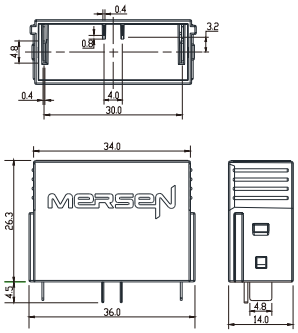
REFERENCE NUMBER	CATALOGUE NUMBER	UCPV [VDC]	IMAX (8/20) [KA]	IN (8/20) @UP [KA]	UP@IN (8/20) [KV]	DIMENSIONS
84020012	**SP2-10KA-PV**	up to 670	Socket directly soldered into PCB			A
84020013	**SP2-10K500V-PV**	500	25	10	≤ 1,5	B
84020014	**SP2-10K670V-PV**	670	25	10	≤ 1,8	B
84020016	**SP2-10K900V-PV**	900	25	10	≤ 2,5	C

Dimensions

A



B



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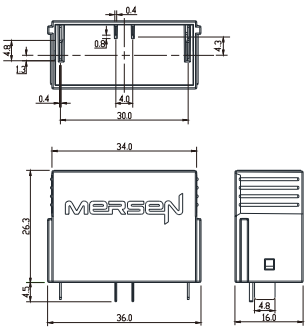
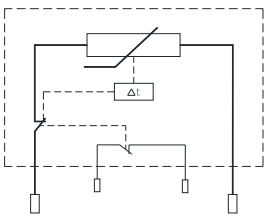


Electrical diagram



SURGE-TRAP® AC TYPE 1+2 PHOTOVOLTAIC SPD

STP T12 5

STP T12 5 is the series of combined Type 1+2 /Class I+II devices for discharging lightning currents and protecting against voltage surges, in accordance with IEC/EN 61643-11 and UL 1449.

Suitable as the first step of protection for the AC side in photovoltaic systems that supply power to the grid, especially installations which are provided with an external lightning protection system due to their exposure.

The series comprehends specific models for applications where high withstand voltage peaks are required, such as in the case of PV grid side with induced DC offsets or wind turbine generators.

Also suited for first or second stage of protection in commercial or residential applications.

Ratings and features

- Lightning impulse current (10/350µs): 5kA per phase
- Maximum discharge current (8/20µs): 40kA per phase
- Nominal discharge current (8/20µs): 20kA per phase
- TNS, TNC, TT and IT networks
- Un(L-N/L-L): 230/400V, 277/480V, 400/690V & higher
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid cartridge replacement errors

limp
5kA

Approvals/Standards

- IEC/EN 61643-11
- UL 1449 4th Ed recognized, File No. E468946
- CE

Catalogue numbers / Reference numbers

		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	UN [VAC]	UC [V]	IIMP (10/350) [KA]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	REMOTE INDICATION (M)	L	N
83120238	**STPT12-5K320V-1P**	L-N (1Ph)	A	277	320	5	40	20	≤1.5		C51	
83120239	**STPT12-5K320V-1PM**	L-N (1Ph)	A	277	320	5	40	20	≤1.5	√	C51	
83120240	**STPT12-25K-N1**	N-PE	B	Neutral	277	5	40	20	≤1.5			C53
83120214	**STPT12-5K320V-2P**	TNS (1Ph+N)	D	277	320	5	40	20	≤1.5		C51	
83120215	**STPT12-5K320V-2PM**	TNS (1Ph+N)	D	277	320	5	40	20	≤1.5	√	C51	
83120241	**STPT12-5K320V-2PG**	TT (1Ph+N)	C	277	320	5	40	20	≤1.5 / 1.5		C51	
83120242	**STPT12-5K320V-2PGM**	TT (1Ph+N)	C	277	320	5	40	20	≤1.5 / 1.5	√	C51	C53
83120202	**STPT12-5K320V-3P**	TNC (3Ph)	E	- / 480	320	5	40	20	≤1.5		C51	C53
83120203	**STPT12-5K320V-3PM**	TNC (3Ph)	E	- / 480	320	5	40	20	≤1.5	√	C51	
83120222	**STPT12-5K320V-4P**	TNS (3Ph+N)	H	277 / 480	320	5	40	20	≤1.5		C51	
83120223	**STPT12-5K320V-4PM**	TNS (3Ph+N)	H	277 / 480	320	5	40	20	≤1.5	√	C51	
83120200	**STPT12-5K320V-4PG**	TT (3Ph+N)	G	277 / 480	320	5	40	20	≤1.5 / 1.5		C51	C53
83120201	**STPT12-5K320V-4PGM**	TT (3Ph+N)	G	277 / 480	320	5	40	20	≤1.5 / 1.5	√	C51	C53
IT (3PH) - REINFORCED PEAK WITHSTAND												
83120243	**STPT12-5K680V-3P-R**	IT (3Ph)	F	800	1360	5	40	20	≤5		C52	
83120244	**STPT12-5K680V-3P-RM**	IT (3Ph)	F	800	1360	5	40	20	≤5	√	C52	
83120261	**STPT12-5K320V-3P-R**	IT (3Ph)	F	400	640	5	40	20	≤3		C51	
83120262	**STPT12-5K320V-3P-RM**	IT (3Ph)	F	400	640	5	40	20	≤3	√	C51	

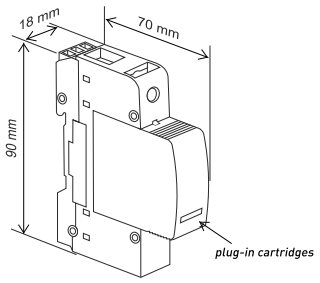
Replacement cartridges

REF. NUMBER	CATALOGUE NUMBER	NETWORK	UN [VAC]	UC [V]	IMAX (8/20) [KA]	IN (8/20) @UP [KA]	UP@IN (8/20) [KV]	CARTRIDGE ID.
83120020	**SP12-5K320V**	L-N (1Ph)	277	320	40	20	≤ 1,5	C51
83120015	**SP12-25K-N1**	N-PE (N)	Neutral	277	40	20	≤ 1,5	C53
83120025	**SP12-5K680V**	L-N (1Ph)	680	680	40	20	≤ 2,5	C52

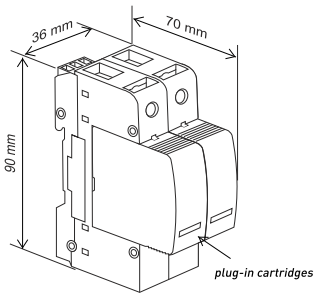
SURGE-TRAP® AC TYPE 1+2 PHOTOVOLTAIC SPD

Dimensions

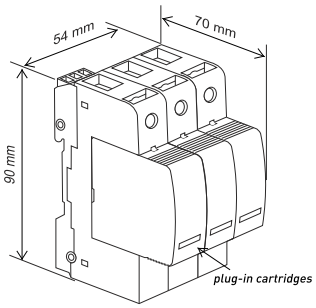
1 pole



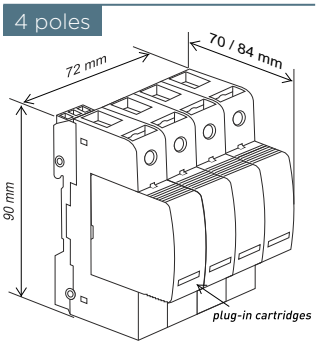
2 poles



3 poles

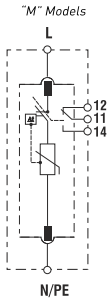


4 poles

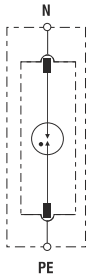


Electrical diagrams

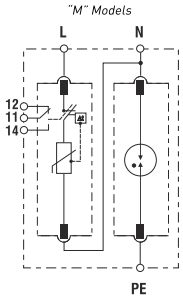
A (1P)



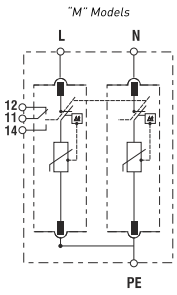
B (N)



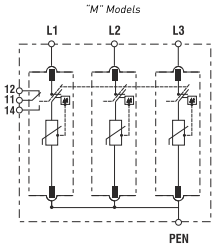
C 1+1 (2PG)



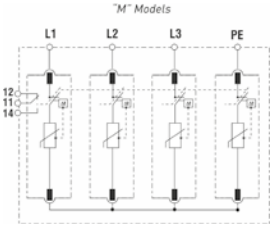
D 2+0 (2P)



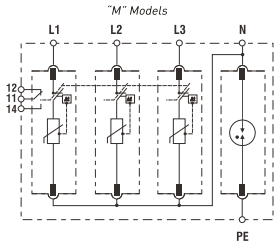
E 3+0 (3P)



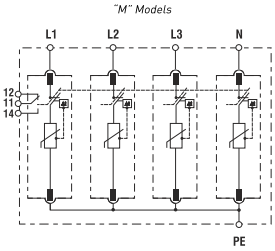
F 3+1 (3P reinforced)



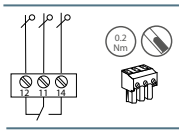
G 3+1 (4PG)



H 4+0 (4P)



Microswitch diagram



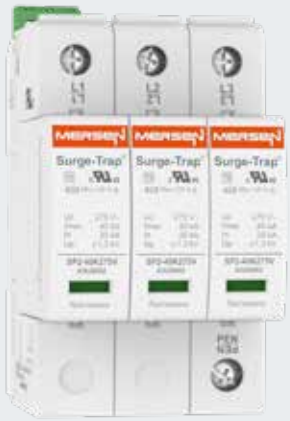
U_{max} / I_{max}	max 1.5 mm²
AC: 250 V/1 A	
AC: 125 V/3 A	

SURGE-TRAP® AC TYPE 2 PHOTOVOLTAIC SPD

STP T2 40

STP T2 40 3P is the series of type 2 /class II devices for discharging voltages surges, in accordance with IEC/EN 61643-11 and UL 1449. Suitable for the AC side protection in photovoltaic systems that provide power to the grid. Also suitable for first or second stage of protection in commercial and residential applications.

Imax
40kA



Ratings and features

- Maximum discharge current (8/20µs): 40kA per phase
- Nominal discharge current (8/20µs): 20kA per phase
- TNS, TNC, TT and IT networks
- Un(L-N/L-L): 48V, 60V, 120/208V, 230/400V, 277/480V, 400/690V & higher
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid cartridge replacement errors

Approvals/Standards

- IEC/EN 61643-11
- UL 1449 4th Ed recognized, File No. E468946
- CE

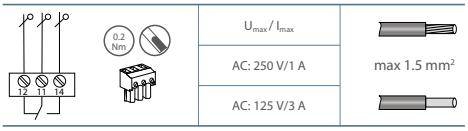
Catalogue numbers / Reference numbers

		Network								Cartridge Id.
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	UN [VAC]	UC [V]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	REMOTE INDICATION (M)	L
83020134	STPT2-40K275V-3P	TNC (3Ph)	D	-/400	275	40	20	≤1.3		C23
83020135	STPT2-40K275V-3PM	TNC (3Ph)	D	-/400	275	40	20	≤1.3	√	C23
83020136	STPT2-40K320V-3P	TNC (3Ph)	D	-/480	320	40	20	≤1.4		C24
83020137	STPT2-40K320V-3PM	TNC (3Ph)	D	-/480	320	40	20	≤1.4	√	C24
83020102	STPT2-30K750V-3P	TNC (3Ph)	D	-/690; -/1000	750	30	15	≤3		C26
83020103	STPT2-30K750V-3PM	TNC (3Ph)	D	-/690; -/1000	750	30	15	≤3	√	C26
83020246	STPT2-30K850V-3P	TNC (3Ph)	D	-/690; -/1000	850	30	15	≤3		C28
83020247	STPT2-30K850V-3PM	TNC (3Ph)	D	-/690; -/1000	850	30	15	≤3	√	C28
83020100	STPT2-30K750V-1P	L-N (1Ph)	C	690	750	30	15	≤3		C26
83020101	STPT2-30K750V-1PM	L-N (1Ph)	C	690	750	30	15	≤3	√	C26
83020234	STPT2-30K850V-1P	L-N (1Ph)	C	690	850	30	15	≤3		C28
83020235	STPT2-30K850V-1PM	L-N (1Ph)	C	690	850	30	15	≤3	√	C28

Replacement cartridges

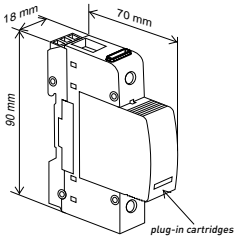
REF. NUMBER	CATALOGUE NUMBER	NETWORK	UN [VAC]	UC [V]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	CARTRIDGE ID.
83020002	SP2-40K275V	L-N (1Ph)	230	275	40	20	≤1.3	C23
83020003	SP2-40K320V	L-N (1Ph)	277	320	40	20	≤1.4	C24
83020007	SP2-30K750V	L-N (1Ph)	690	750	30	15	≤3	C26
83020022	SP2-30K850V	L-N (1Ph)	690	850	30	15	≤3	C28

Microswitch diagram

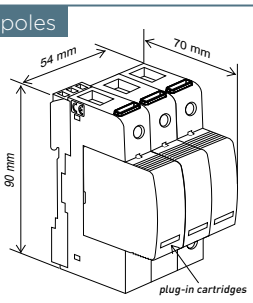


Dimensions

1 pole

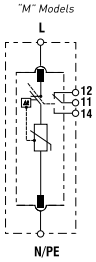


3 poles

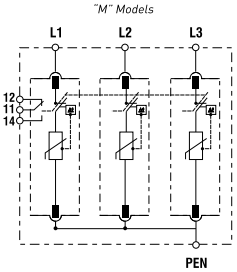


Electrical diagram

C



D



SURGE-TRAP® AC TYPE 2 REINFORCED PEAK WITHSTAND PHOTOVOLTAIC SPD

STP T2 30 3P-R

STP T2 30 3P-R is the series of type 2 /class II devices for discharging voltage surges, in accordance with IEC/EN 61643-11 and UL 1449. Suitable for AC side protection in photovoltaic systems that provide power to the grid. Suitable for special applications where high withstand voltage peaks are required. PV grid side with induced DC offsets or wind turbine generators.

Imax
30kA

Ratings and features

- Maximum discharge current (8/20µs): 30kA per phase
- Nominal discharge current (8/20µs): 15kA or 20kA per phase
- TNC and IT networks
- Un(L-N/L-L): 400/690V & higher
- Voltage peak withstand up to 2,2kV
- DIN-rail mountable, plug-in format
- Visual and remote end of life indicators
- Reversible chassis to allow cable entry from above or below
- Mechanically coded cartridges to avoid cartridge replacement errors

Approvals/Standards

- IEC 61643-11
- UL 1449 4th Ed recognized, File No. E468946
- CE

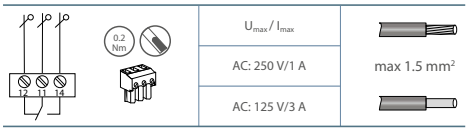
Catalogue numbers / Reference numbers

		Network									Cartridge Id.	
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	UN [VAC]	UC [V]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	REMOTE INDICATION (M)	UPEAK (L-PE) [KV]	L	PE
83020177	STPT2-30K440V-3P-R	IT	A	- / 400	440	30	20	5		1,6	C25	C26
83020178	STPT2-30K440V-3P-RM	IT	A	- / 400	440	30	20	5	√	1,6	C25	C26
83020213	STPT2-30K750V-3P-R	IT	A	- / 690	750	30	15	6		2,1	C26	C26
83020214	STPT2-30K750V-3P-RM	IT	A	- / 690	750	30	15	6	√	2,1	C26	C26
83020201	STPT2-30K850V-3P-R	IT	A	- / 690	850	30	15	6		2,2	C28	C28
83020202	STPT2-30K850V-3P-RM	IT	A	- / 690	850	30	15	6	√	2,2	C28	C28

Replacement cartridges

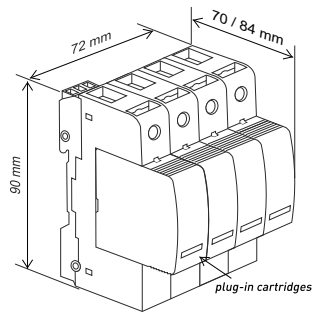
REF. NUMBER	CATALOGUE NUMBER	NETWORK	UN [VAC]	UC [V]	IMAX (8/20) [KA]	IN (8/20) [KA]	UP@IN (8/20) [KV]	CARTRIDGE ID.
83020004	SP2-40K440V	L-N (1Ph)	400	440	40	20	≤2	C25
83020007	SP2-30K750V	L-N (1Ph)	690	750	30	15	3	C26
83020022	SP2-30K850V	L-N (1Ph)	690	850	30	15	3	C28

Microswitch diagram



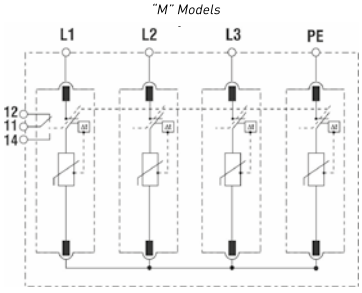
Dimensions

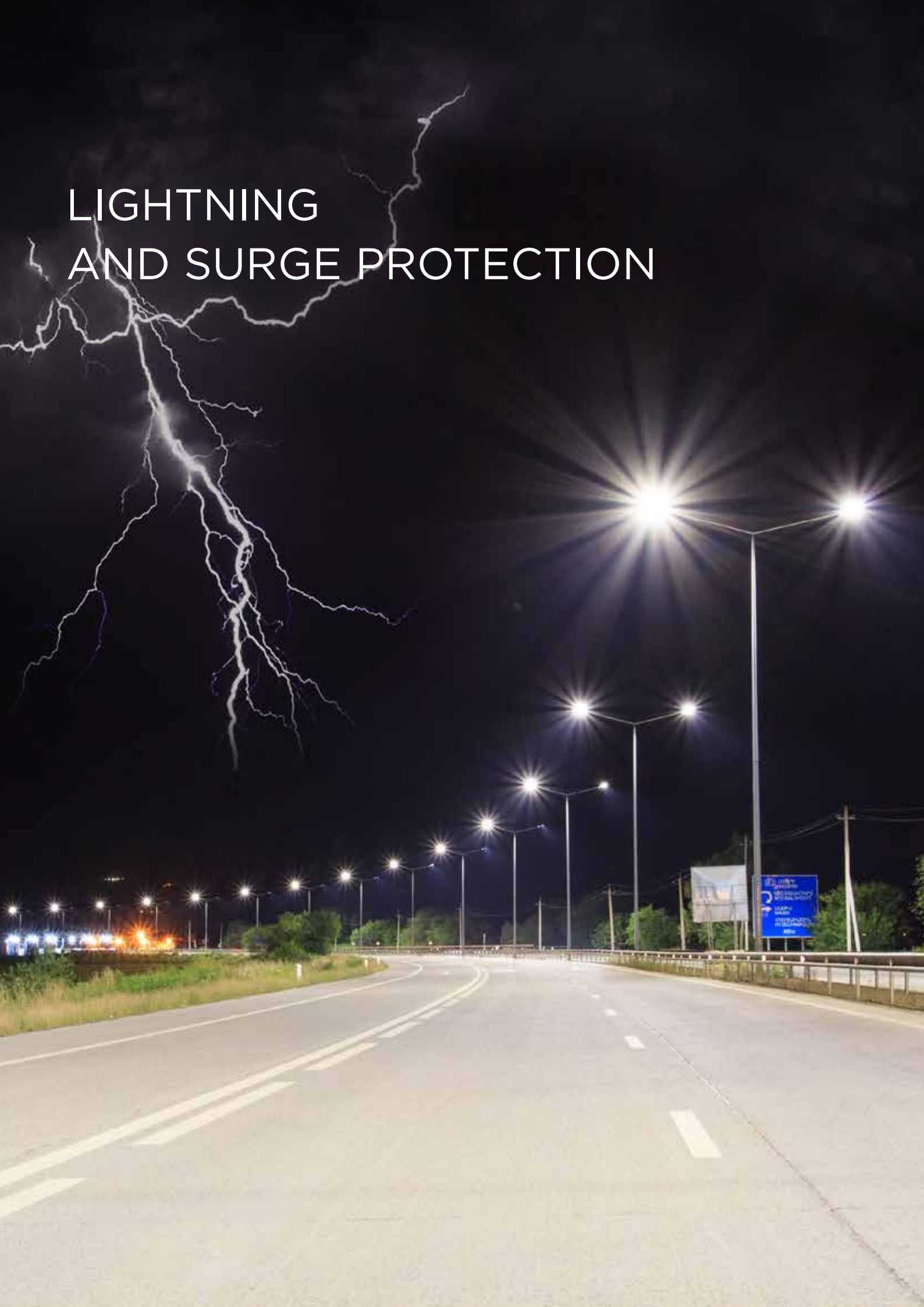
4 poles



Electrical diagram

A





LIGHTNING AND SURGE PROTECTION

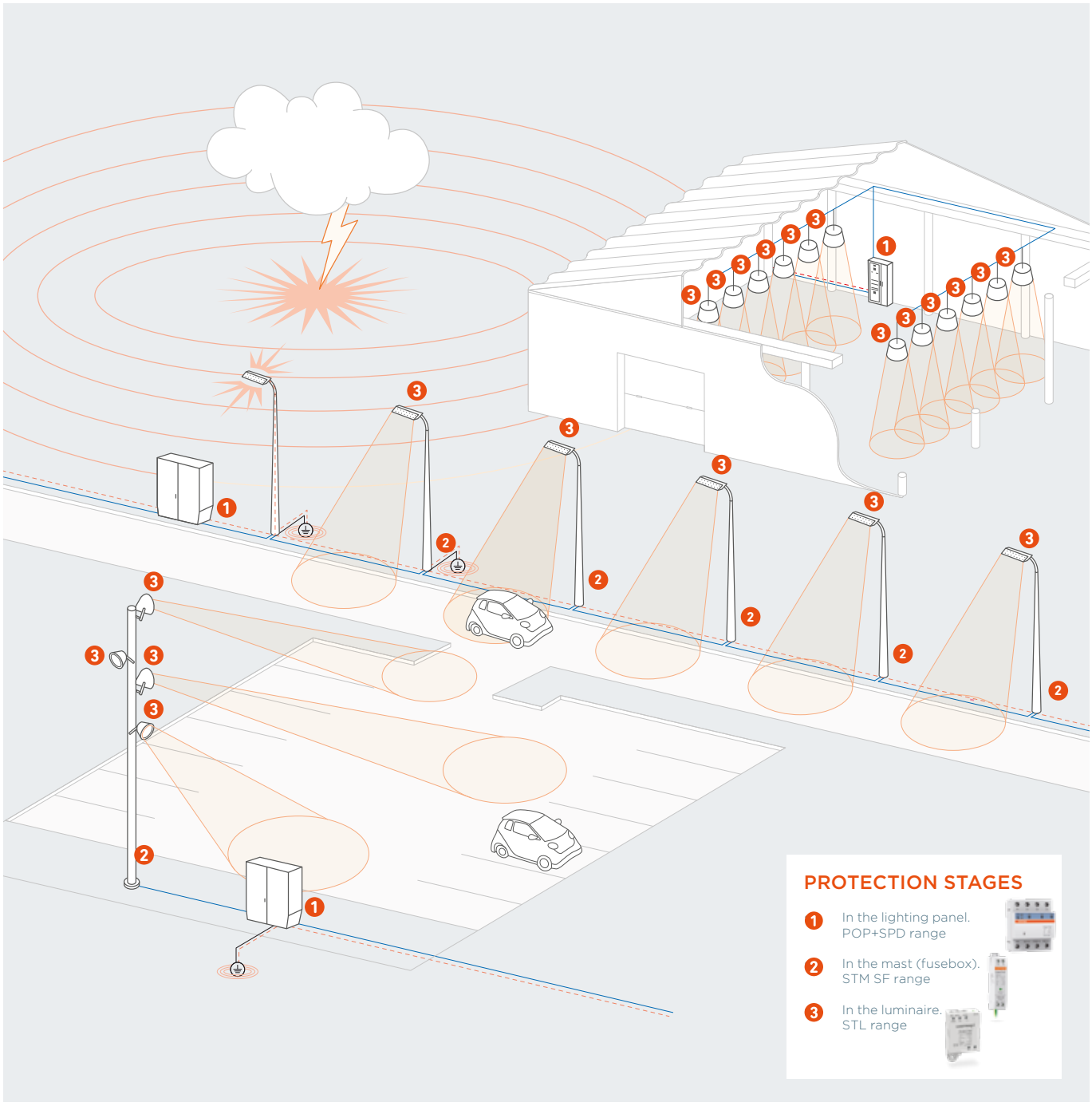
OUTDOOR LED LIGHTING

Comprehensive protection

Surge protection devices (SPD) protect equipment by discharging the overvoltage to earth, thus limiting the voltage reaching the equipment (residual voltage).

An effective overvoltage protection design comprises of staggered protection, with stages for each of the sensitive components in the installation. With this method, part of the overvoltage at discharged in each protection stage until only a small residual voltage is left close to the luminaire.

Protection in the lighting panel 1 although necessary, is by itself insufficient because overvoltages can also be induced in long cable runs, which means that the final **protection should always be as close as possible to the equipment being protected** 2 3.



SURGE-TRAP® HIGHLIGHTS

STL T23 | LUMINAIRE

See pages 52 and 53

Certified

- KEMA KEUR certification to IEC 61643-11
- First SPD for lighting fixtures to have ENEC certification

Proven quality

- STL series protects LED outdoor luminaires since 2011
- More than 8.000.000 effectively protected luminaires

Double end-of-life indication

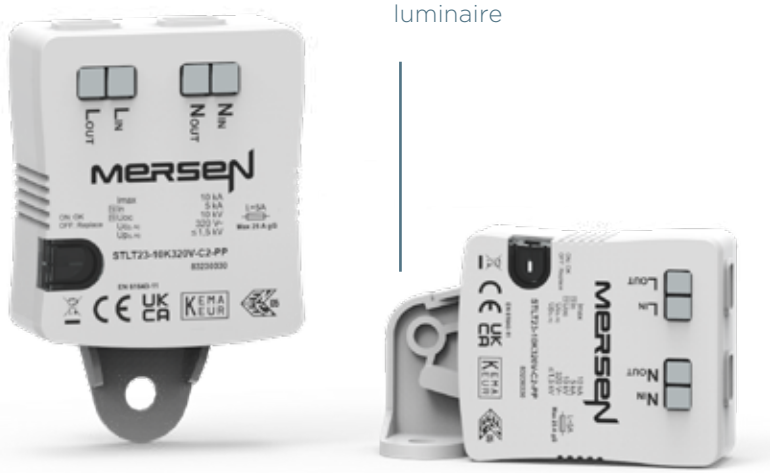
- Disconnection, if installed in series, the SPD will turn the luminaire off when it reaches end-of-life.
- Visual LED indication.

No leakage current

- STL with common mode protection has no leakage current to earth.

Versatile assembly

- The SPD can be installed upright or flat depending on the space constraints of the luminaire



STM T23 | MAST

See page 54

- Design adapted for the **fuse box**
- Perfect for **retrofitting**
- Compact and robust **(10kV / 10kA)**
- Ground cable/Ground terminal options

POP + SPD | LIGHTING PANEL

See page 55

- Combined power frequency overvoltage protection and surge protection device
- First step of protection
- Remote and visual **indication of life status** of the protection device

STL T23 10

STL T23 10 is the series of robust 10kV combined Type 2+3/Class II+III devices for discharging voltage surges while providing a very fine voltage protection level, in accordance with IEC/EN 61643-11. It is suitable for protection of LED outdoor luminaires (street-light). Due to the exposure of the extremely sensitive LED electronics to lightning-induced overvoltages, STL T23 10 is a widespread market solution amongst OEM manufacturers of LED lighting systems.

Ratings and features

- Combined voltage pulse (1.2/50µs): 10kV (Uoc)
- Maximum discharge current (8/20µs): 10kA
- Nominal discharge current (8/20µs): 5kA
- Class 1 and Class 2 luminaires
- Miniature size and easy to install
- End of life indication
- Push in terminals (in and out)

Uoc

10kV

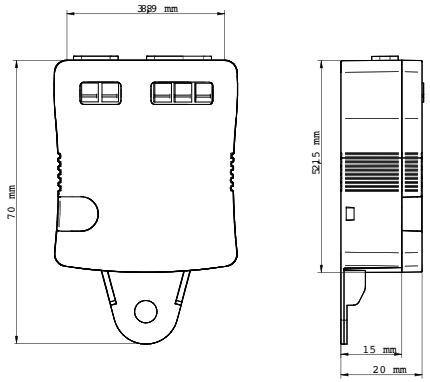
Approvals/Standards

- IEC/EN 61643-11
- KEMA & ENEC certifications
- CE

Catalogue numbers / Reference numbers

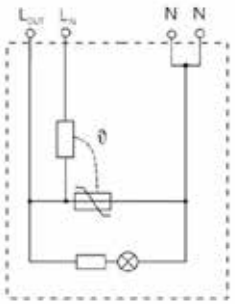
		Network								
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Uoc [kV]	Up@In (8/20) [kV]	IL [A]
83230330	**STLT23-10/320-C2-PP**	C2	A	230	320	10	5	10	≤1.5 (L1-L2)	5
83230333	**STLT23-10/320-C4-PP**	C4	B	230	320	10	5	10	≤1.5 (L1-L2) ≤1.8 (L1/L2-GND)	5

Dimensions

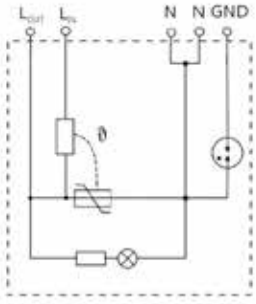


Electrical diagrams

A

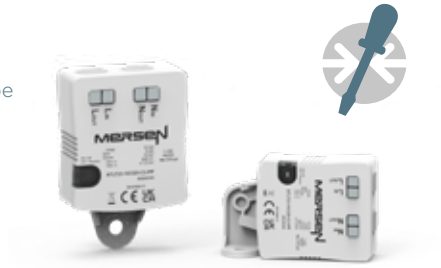


B



Accessory for vertical assembly

An accessory is available that allows the SPD to be installed upright or flat, depending on the space constraints of the luminaire.
Consult with your Mersen sales contact.



STLB T23 20

STL T23 20 is the series of robust 20kV combined Type 2+3/Class II+III devices for discharging voltage surges while providing a very fine voltage protection level, in accordance with IEC/EN 61643-11.

Ratings and features

- Combined voltage pulse (1.2/50µs): 20kV (Uoc)
- Maximum discharge current (8/20µs): 20kA
- Nominal discharge current (8/20µs): 10kA
- End of life indication
- Screw terminals (in and out)

Uoc
20kV

Approvals/Standards

- IEC/EN 61643-11
- CE

STLB T23 10 IP

STL T23 10 IP is the series of robust 10kV combined Type 2+3/Class II+III devices for discharging voltage surges with IP66, in accordance with IEC/EN 61643-11.

Ratings and features

- Combined voltage pulse (1.2/50µs): 10kV (Uoc)
- Maximum discharge current (8/20µs): 10kA
- Nominal discharge current (8/20µs): 5kA
- End of life indication
- IP 66

Uoc
10kV

150 mm
1,5 mm²

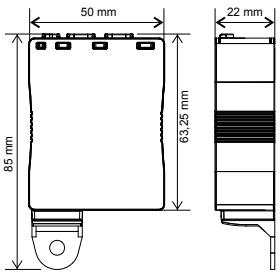
Approvals/Standards

- IEC/EN 61643-11
- CE

Catalogue numbers / Reference numbers

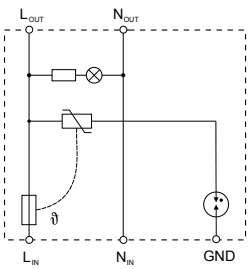
		Network								
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) @Up [kA]	Uoc [kV]	Up [kV]	IL [A]
STLB T23 20										
83230321	**STLBT23-20K275V-C4-DD**	C4	C	230	275	20	10	20	≤ 1.5 (L-N) ≤ 1.8 (N-GND)	2,5
STLB T23 10 IP										
83230311	**STLBT23-20K275V-C4-WW-IP**	C4	C	230	320	10	5	10	≤ 1.5 (L-N) ≤ 1.8 (N-GND)	2,5

Dimensions



Electrical diagrams

C



STM T23 10 SF / SE

STM T23 10 SF is the series of robust 10kV combined Type 2+3/ Class II+III devices for discharging voltage surges while providing a very fine voltage protection level, in accordance with IEC/EN 61643-11. **STM T23 10** has been designed to be installed in the mast/fusebox.

STM T23 10 SF has ground cable while **STM T23 10 SE** has ground terminals. Their dimensions are different to suit various different sizes of fusebox.

Ratings and features

- Combined voltage pulse (1.2/50µs): 10kV (Uoc)
- Maximum discharge current (8/20µs): 10kA
- Nominal discharge current (8/20µs): 5kA
- End of life indication
- For DIN-rail fuseboxes

Uoc
10kV

STM T23 10 SF

STM T23 10 SE

Approvals/Standards

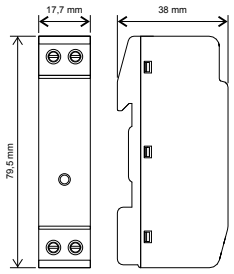
- IEC/EN 61643-11
- CE

Catalogue numbers / Reference numbers

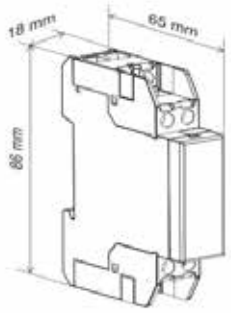
REFERENCE NUMBER	CATALOGUE NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [Vac]	Uc [V]	Imax (8/20) [kA]	In (8/20) @Up [kA]	Uoc [kV]	Up [kV]	IL [A]
83230512	**STMT23-10K320V-SP-SF**	C4	A	230	320	10	5	10	≤ 1.5 (L-N) ≤ 1.8 (N-PE)	2,5
83230515	**STMT23-10K320V-SP-SE**	C4	B	230	320	10	5	10	≤ 1.5 (L-N) ≤ 1.8 (N-PE)	10

Dimensions

SF

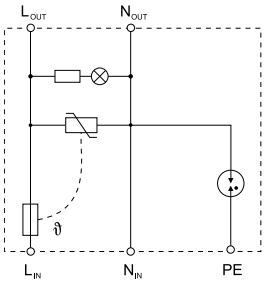


SE



Electrical diagrams

A C4



POP+SPD

Combined **POP + SPD** protector. 2 in 1.

POP+SPD is the series of combined transient and power frequency overvoltage protection devices, which includes solutions that especially meet outdoor lightning protection requirements.

These devices are intended for installation within the lightning panel as a 1st step of surge protection while providing protection against temporary overvoltages to all the luminaires installed downstream of the panel.

Ratings and features

- Maximum discharge current (8/20 µs): 40 kA
- Nominal discharge current (8/20 µs): 15 kA
- Un (L-N/L-L): 230/400 V
- End of life indication (LED)
- DIN rail mountable, monobloc format
- POP device to EN 50550, with Test Button
- POP actuation and reconnection via contactor (not included)
- Auto reconnect after voltage stabilisation via contactor

Imax
40kA

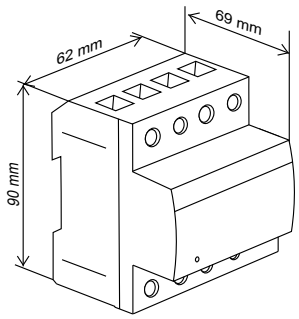
Approvals/Standards

- EN 50550
- EN/IEC 61643-11
- CE

Catalogue numbers / Reference numbers

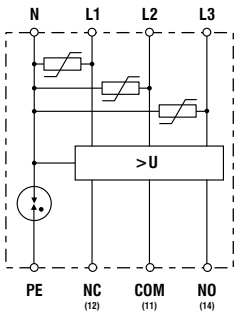
				POP	SPD Type 2				
REFERENCE NUMBER	CATALOGUE NUMBER	ELECTRICAL DIAGRAM	Un [Vac]	Ua [V]	Imax (8/20) [kA]	In (8/20) [kA]	Up@In (8/20) [kV]	ACTUATION METHOD	REMOTE (M)
83060100	**POP-40K230V-CT-4P**	A	230/400	> 275	40	15	≤ 1,8	Contactor	
83060101	**POP-40K230V-CT-4PM**	B	230/400	> 275	40	15	≤ 1,8	Contactor	√

Dimensions

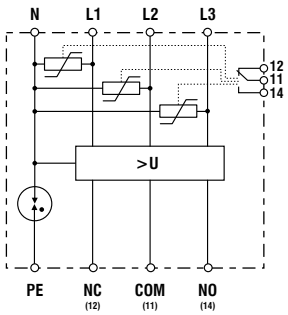


Electrical diagrams

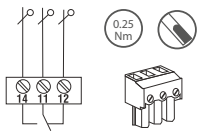
A



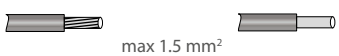
B



Microswitch diagram



	U_{max} / I_{max}
AC:	250 V/1 A
DC:	125 V/0.2 A



max 1.5 mm²

LIGHTNING AND SURGE PROTECTION

GROUNDING SYSTEM MONITORING

Monitoring the grounding system in the surge protection device itself

For the protection to work properly, the correct status of the grounding system in an electrical installation is essential.

DID YOU KNOW that nobody knows what percentage of installed surge protection devices are providing good protection?

TERRA® is the first protection device on the market that, in addition to indicating that it is properly wired, guarantees that there is an adequate path to ground, which is essential if the protection device is to shunt the energy peaks to ground effectively.

The premium solution for the most demanding installations

TERRA®'s simple information makes it the ideal solution for both unskilled personnel and maintenance professionals specialised in ground connections.

It helps to avoid situations that might cause power cuts and repair costs, with the resulting damage to your brand image.

It provides additional information about the grounding system, with potential synergies for protection and safety in general, not just for surge protection.

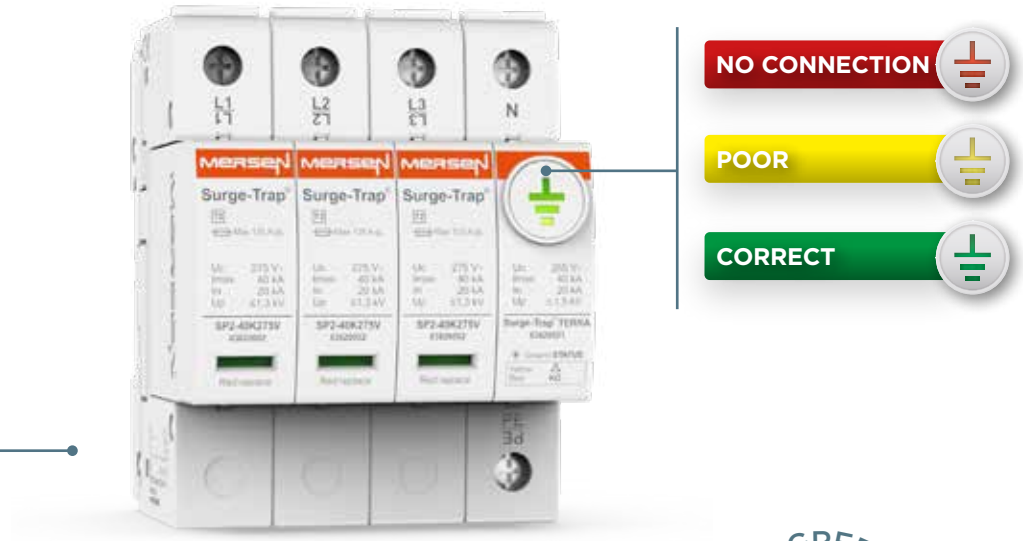
TERRA

Technology

TERRA® is based on the impedance loop technology already patented, sold and implemented by Mersen in thousands of protection solutions.
TERRA® patent pending.

Ground status indicator

Continuous LED display of ground status.



1st

The best SPD on the market

TERRA® is the premium protection device in the Mersen STP range, designed according to the most exacting standards. Intelligent protection.

GREEN FOR GO

Wiring safety

The only protection device on the market that tells you when it is properly installed, avoiding risks due to electrical wiring errors.

GROUND MONITORING INSIDE THE SPD

Confirmation of proper installation

Almost 25 years of experience in the sector confirm that it is relatively common for wiring **errors to occur** during the installation of surge protection devices. These errors result in the **loss of protection or risks to the installation itself.**

When the TERRA® LED is green, it means that the protection device is properly wired and powered up. Green for Go.

Effective surge protection

Even when equipped with surge protection devices, the electrical installation may still be subject to the effects of overvoltage if the ground connection is inadequate or in poor condition.

When the TERRA® LED is green, it indicates that the ground path is good enough to shunt the energy peaks to ground effectively. Green for Go.

Safety information in the event of indirect contact

Just as happens with surge protection devices, the safety of the electrical installation in the event of indirect contact is based on there being a grounding connection.

When TERRA® cannot detect any ground connection, it is advisable to check the installation status.

Ratings and features

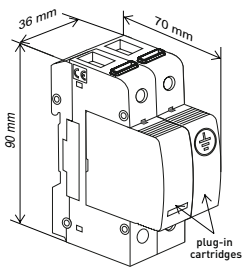
- Patented TERRA® technology for loop impedance monitoring
- Confirmation of correct device wiring at installation time
- Continuous indication of the effectiveness of the protection offered
- Additional safety information in the event of indirect contact
- Maximum discharge current (8/20 µs): 40 kA per phase
- Nominal discharge current (8/20 µs): 20 kA per phase
- TT and TNS networks
- Un (L-N/L-L): 230/400 V
- Plug-in DIN rail format

Catalogue numbers / Reference numbers

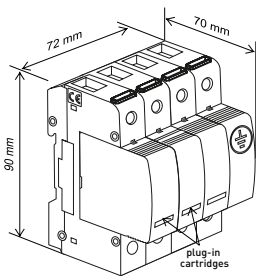
		Network						
REFERENCE NUMBER	Catalogue NUMBER	SYSTEM TYPE	ELECTRICAL DIAGRAM	Un [V]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Up@In (8/20) [kV]
83020183	**STPT2-40K275V-2P-TE**	1Ph+N	A	230	275	40	20	≤1,3w
83020185	**STPT2-40K275V-4P-TE**	3Ph+N	B	230/400	275	40	20	≤1,3 (L-N) ≤1,5 (N-PE)

Dimensions

2 poles

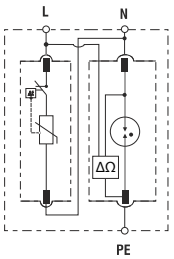


4 poles

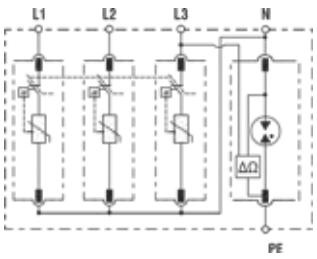


Electrical diagrams

A 1Ph+N



B 3Ph+N



CONFIGURABLE GROUNDING SYSTEM MONITORING

GMD®

GMD® is a control device that continuously monitors the state of the ground connection:

- Ensures proper operation of surge protection devices (SPDs) that discharge energy through the facility ground connection.
- Provides additional safety information to avoid indirect contact.
- Reduces preventative maintenance costs.

By the loop resistance calculation method, GMD® checks the impedance of the actual leakage path of an indirect contact, enabling it to **detect the following possible incidents,** both in the installation itself and in transformer centre to which it is connected:

- **Deterioration of the ground connection** due to ageing of the earth rods, due to theft or increased soil resistivity during dry periods.
- **Breakage or incorrect wiring of the neutral cable.**

Ratings and features

- The system of grounding measurement by loop impedance can be applied to the various neutral configurations: TT, TNS and TNC-S
- Un (L-N/L-L): 120/208 V, 230/400 V
- Monobloc DIN rail format
- Alarm function on the ground value (PE). Activates the output if it detects a value shown on the display exceeding a maximum preset by the user

24/7

Grounding system monitoring

Easy to install

Panel mounting

Assists with maintenance

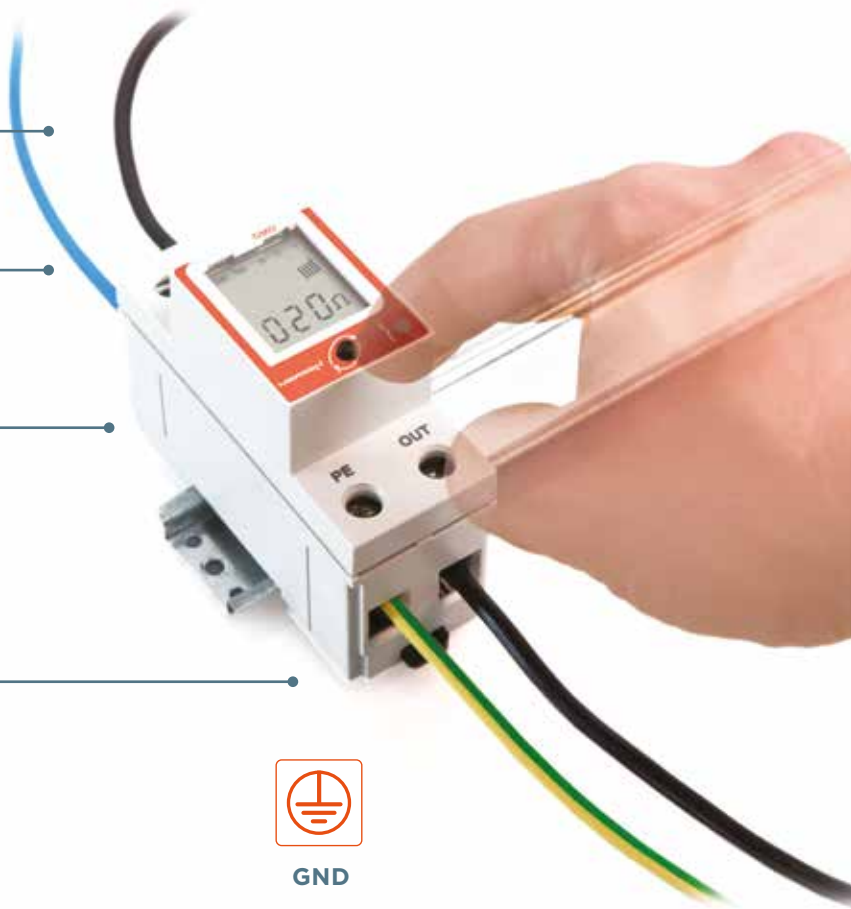
Complementary to regular grounding system maintenance

Real-time monitoring of the grounding system condition

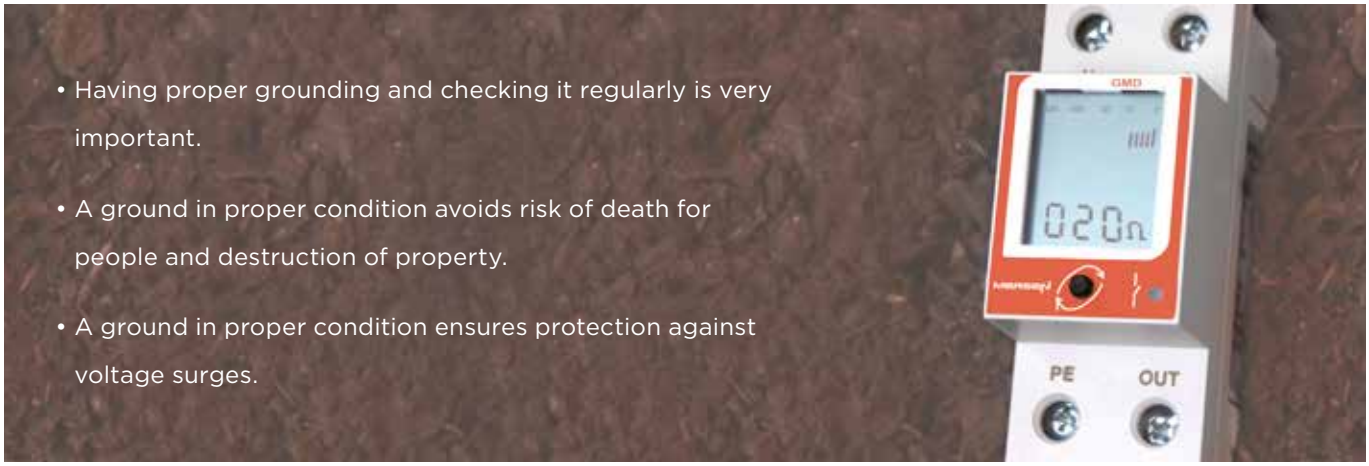
Monitors

Cable theft / Soil resistivity

Cable breakage / poor connection



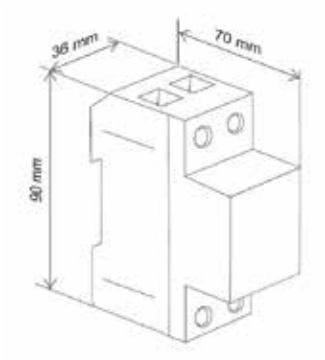
Importance of grounding systems



Catalogue numbers / Reference numbers

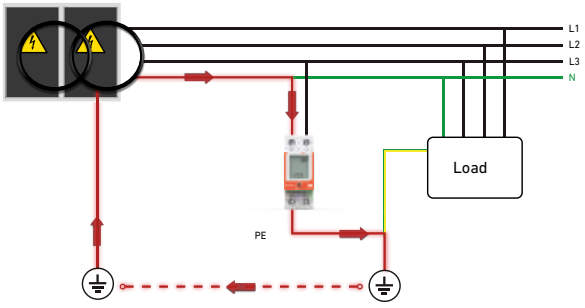
REFERENCE NUMBER	CATALOGUE NUMBER	Un [V]	FREQUENCY [Hz]	SETTING THRESHOLD	OUTPUT RELAY	RESPONSE TIME
83060251	**GMD-120V**	120	50 / 60	1...500 Ω	1 (OUT-N)	inst.
83060250	**GMD-230V**	230	50 / 60	1...500 Ω	1 (OUT-N)	inst.

Dimensions



Measurement

Measurement loop or leakage current loop in TT systems.



TELECOM	WATER TREATMENT	COMMERCIAL	DATA CENTER	INDUSTRIAL
				

LIGHTNING AND SURGE PROTECTION

TELECOM & SIGNALLING NETWORKS

STS NET (Ethernet)

Depending on the structure of the network in which they are used, they are classified by Ethernet categories into Cat. 5E, Cat. 6 and Cat. 6 with Power over Ethernet (using two pairs for communications and two for power supply).

These are protectors for a final step of very fine protection to be installed as close as possible to particularly sensitive equipment connected to these communication lines. Meets the IEC 61643-21 standard.

In
250A

Approvals/Standards

- IEC/EN 61643-21
- CE

Catalogue numbers / Reference numbers

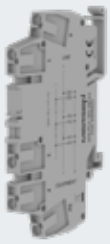
REFERENCE NUMBER	CATALOGUE NUMBER	Un [V]	Uc [V]	In (8/20) [kA]	Up at In [V]	IL [A]	BANDWIDTH (fg) [MHz]	PROTECTED WIRES	CONNECTION TYPE
CAT 5									
83040510	**STS-NET-CAT5-1P**	5	6	0.25	≤ 35	0.1	100	4 Pairs	RJ45
CAT 6									
83040520	**STS-NET-CAT6-1P**	5	6	0.25	≤ 35	0.1	250	4 Pairs	RJ45
83040525	**STS-NET-CAT6-PoE-1P**	5 48	6 55	0.25	≤ 35 ≤ 130	0.1 1	250	4 Pairs	RJ45

STS PLC

Cover a wide variety of applications in communications signals, such as RS232, RS485, 4-20 mA, Binary, KNX, PTC or Modbus. These ranges offer a number of formats, voltages and numbers of lines protected and are designed especially for such applications.

These are protectors for a final step of very fine protection to be installed as close as possible to particularly sensitive equipment connected to these communications lines. Meets the IEC 61643-21 standard.

Imax
5kA



STS-PLC-30V-2W-C1

STS-PLC-30V-4W1

Approvals/Standards

- IEC/EN 61643-21
- CE

Catalogue numbers / Reference numbers

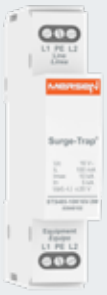
REFERENCE NUMBER	CATALOGUE NUMBER	Un [V]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Up at In [V]	IL [A]	BANDWIDTH (fg) [MHz]	PROTECTED WIRES	CONNECTION TYPE
2 wires										
83040220	**STS-PLC-30V-2W**	24	30	5	5	≤ 45	0.3	3	2 Wires	Spring terminal
83040221	**STS-PLC-30V-2W-C1**	24	30	5	5	≤ 50	0.37	3	2 Wires	Spring terminal
83040222	**STS-PLC-30V-2W-C2**	24	30	5	5	≤ 60	0.35	3	2 Wires	Spring terminal
83040223	**STS-PLC-30V-2W-C3**	24	30	5	5	≤ 40	0.3	3	2 Wires	Spring terminal
4 wires										
83040211	**STS-PLC-30V-4W1**	24	30	5	5	≤ 120	0.5	2	4 Wires	Spring terminal

SURGE-TRAP® SIGNAL MEASUREMENT AND CONTROL

STS 485

STS 485 is the new series of type D1 and C2 surge protection devices for signal lines in accordance with IEC/EN 61643-21. Especially designed for protecting RS485/RS232 communication lines used in PV applications against induced overvoltages. Suitable as a dedicated protection for special equipment connected to communication lines (i.e. string monitor), providing an extremely fine voltage protection level and an optimal discharge capacity.

Imax
10kA



STS485-7V-2W

STS485-5V-4WG

STS485-5K15V-3WI

Ratings and features

- Maximum discharge current (8/20): 10kA (Imax)
- Type D1 maximum discharge current (10/350µs): 2,5kA (Iimp)
- Type C2 nominal discharge current (8/20µs): 5kA (In)
- Models with end of life indication
- Multiple voltage options for different requirements (6, 12, 24V)
- Operational bandwitdh (fg) up to 10MHz
- Extremely fine voltage protection level
- DIN rail mountable, monobloc format

Approvals/Standards

- IEC/EN 61643-21
- CE

Catalogue numbers / Reference numbers

REFERENCE NUMBER	CATALOGUE NUMBER	Un [V]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Up at In [V] (L/L)	IL [A]	BANDWIDTH (fg) [MHz]	PROTECTED WIRES	CONNECTION TYPE
2 wires										
83040111	**STS485-7V-2W**	6	7	10	5	≤ 10	0.1	1	1 Pair	DIN rail
83040112	**STS485-16V-2W**	12	16	10	5	≤ 20	0.1	1.2	1 Pair	DIN rail
83040113	**STS485-27V-2W**	24	27	10	5	≤ 40	0.1	4	1 Pair	DIN rail
83040114	**STS485-56V-2W**	48	56	10	5	≤ 70	0.1	5	1 Pair	DIN rail
2 wires + GND										
83040110	**STS485-5K15V-3WI**	12	15	10	5	≤ 45 (L/L) ≤ 400 (L-PE)	0.25	10	1 Pair + GND	DIN rail
4 wires + GND										
83040120	**STS485-5V-4WG**	5	5.2	10	10	≤ 30	0.45	60	2 Pairs + GND	DIN rail

STS RF

There are several different compatible products, depending on the type of cable and connector. These are protectors for a final step of very fine protection to be installed as close as possible to particularly sensitive equipment connected to these communication lines. Meets the IEC 61643-21 standard.

Imax
20kA

Approvals/Standards

- IEC/EN 61643-21
- CE

Catalogue numbers / Reference numbers

REFERENCE NUMBER	CATALOGUE NUMBER	Un [V]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Up at In [V]	BANDWIDTH (fg) [MHz]	IMPEDANCE [Ω](OHM)	MAX. POWER [W]
N (m-f)									
83040715	**STS-RF-N**	24	230	20	10	≤ 600	3000	75	100
F (m-f)									
83040725	**STS-RF-F**	24	230	20	10	≤ 600	2500	75	100
UHF (m-f)									
83040735	**STS-RF-UHF**	24	230	20	10	≤ 600	3000	50	150

STS TEL

These are classified by format, depending on the application, into free-standing (inline) on RJ12 cable, DIN rail, and Krone power strips. There are protectors for ADSL protocol in turn within these categories. These are protectors for a final step of very fine protection to be installed as close as possible to particularly sensitive equipment connected to these communication lines. Meets the IEC 61643-21 standard.

Imax

10kA

Approvals/Standards

- IEC/EN 61643-21
- CE

Catalogue numbers / Reference numbers

REFERENCE NUMBER	CATALOGUE NUMBER	Un [V]	Uc [V]	Imax (8/20) [kA]	In (8/20) [kA]	Up at In [V]	IL [A]	BANDWIDTH (fg) [MHz]	PROTECTED WIRES	CONNECTION TYPE
83040610	**STS-TEL-ADSL**	50	180	10	5	≤ 200	0.1	3	1 Pair	Terminal

SPD GENERAL INSTALLATION FEATURES

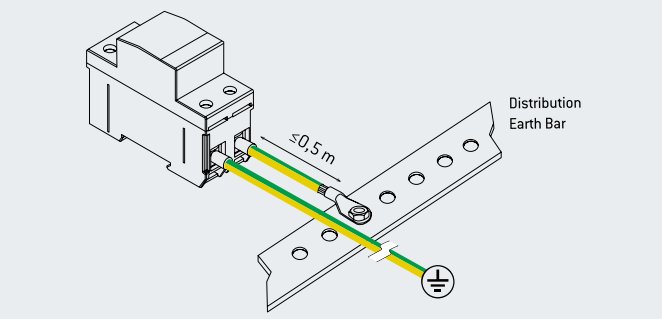
SPD GENERAL INSTALLATION FEATURES

INSTALLATION AND WIRING

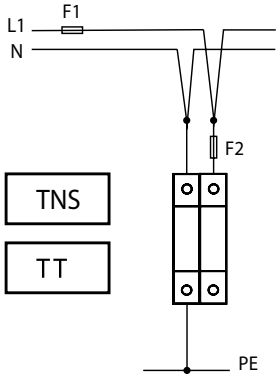
Recommended lengths and connection types according to 61643-12

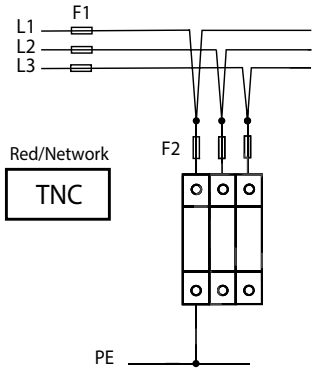
In order to achieve optimum overvoltage protection, connecting conductors of SPDs shall be as short as possible. Long lead lengths will degrade the protection offered by the SPD.

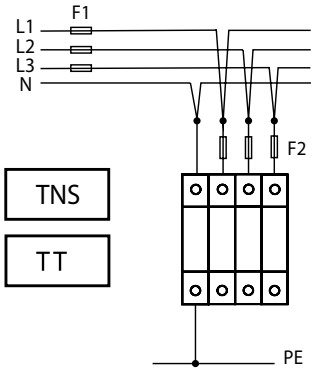
When connecting an SPD in parallel, the optimal connection is a “V-type” (see image below). Whenever this is not feasible, the maximum derivation cable length should be less than 0.5m.



Wiring, general considerations (lengths and sections)

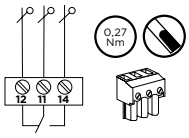






TYPE OF WIRE	STRANDED	RIGID
	10 mm	10 mm
Ø min. L,N	6 mm²	
Ø min. PE	6 mm²(T2)/16mm²(T1)	
Ø max. L,N,PE	25 mm²	35 mm²

Remote Indication

Umax/ Imax		
	AC:	50V/1A
	DC:	125V/0,2A
 max 1,5 mm² min 0,05 mm²		

When do we have to install a back-up fuse or circuit breaker?*

RANGE		MAXIMUM BACK-UP RATING ACCORDING TO MANUFACTURER		BACK-UP FUSE RECOMMENDED IN IEC61643
STP T12 25	Iimp 25 kA	If F1 >315 A then ↓ F2≤ 315 A	If F1 ≤315 A then ↓ F2 not required	250 A gG
STP T12 12.5	Iimp 12.5 kA	F1 >200 A ↓ F2≤ 200 A	If F1 ≤200 A then ↓ F2 not required	160 A gG
STP T2 40	Imax 40 kA	F1 >125 A ↓ F2≤ 125 A	If F1 ≤125 A then ↓ F2 not required	63 A gG
STP T2 20	Imax 20 kA	F1 >80 A ↓ F2≤ 80 A	If F1 ≤80 A then ↓ F2 not required	32 A gG

* If the main circuit breaker has a rating less than the maximum required by the SPD, then additional protection is not required.

SPD back-up fuse/ fuse holder guide selection

SPD			FUSE					
SPD RANGE	TYPE	RATING KA	MIN BACK-UP FUSE RECOMMENDED IN IEC61643	TYPE	3P&N FUSE HOLDER REFERENCE	3P FUSE HOLDER REFERENCE	FUSE REFERENCE GG	NEUTRAL LINK
STP T12 25	1+2	Iimp 25kA	250A gG	Multibloc DIN NH 1	Y1023061	S229878	E219815	A219834
STP T12 12	1+2	Iimp 12.5kA	160A gG	Multibloc DIN NH 00	J1023002	P1023007	P211084	Z218269
STP T2 40	2	Imax 40kA	63A gG	Modulostar 22x58	A331108	E331135	Y215646	N/A
STP T23 20	2+3	Imax 20kA	32A gG	Modulostar 22x58	A331108	E331135	F212594	N/A

MULTIBLOC® bottom fitting

CATALOG NUMBER	ITEM NUMBER	RATED VOLTAGE AC (IEC)	SIZE	POLES	CABLE TERMINATION COMPONENTS	DESIGN	PACKAGE	WEIGHT
1.000.405	Y1023061	690 VAC	NH1 250 A	4	8 M10 terminal screws	-	1 piece	3.4 kg
1.000.141	J1023002	690 VAC	NH00 160 A	4	8 M8 terminal screws	pole 4 right side	1 piece	1.04 kg
1.000.299	S229878	690 VAC	NH1 250 A	3	6 M10 terminal screws	-	1 piece	2.42 kg
2.030.000	P1023007	690 VAC	NH00 160 A	3	6 M8 terminal screws	-	1 piece	0.75 kg

NH fuse-links gG 500VAC

CATALOG NUMBER	ITEM NUMBER	RATED VOLTAGE AC (IEC)	RATED CURRENT IN	POWER DISSIPATION AT IN	PACKAGE	WEIGHT
NH1GG50V250	E219815	500 V	250 A	20 W	3	0.3 kg
NH00GG50V160	P211084	500 V	160 A	11.3 W	3	0.2 kg

Solid links with live tags

CATALOG NUMBER	ITEM NUMBER	SIZE	RATED CURRENT IN	PACKAGE	WEIGHT
NH1NEUTRAL	A219834	1	250 A	9	0.15 kg
NH00NEUTRAL	Z218269	000/00	160 A	15	80 g

Modulostar® CMS22 fuse-holders, without indicator

CATALOG NUMBER	ITEM NUMBER	NUMBER OF POLES/ PHASES	DESIGN	PACKAGE	WEIGHT
CMS223N	A331108	3 + N	CMS22 triple pole + neutral conductor	1	0.93 kg
CMS223	E331135	3	CMS22 triple pole	2	0.66 kg

Ferrule fuse-links 22x58 gG 500 to 690VAC

CATALOG NUMBER	ITEM NUMBER	RATED VOLTAGE AC (IEC)	RATED CURRENT IN	RATED BREAKING CAPACITY AC	POWER DISSIPATION AT IN	WEIGHT
FR22GG69V63	Y215646	690 V	63 A	120 kA	6.3 W	54 g
FR22GG69V32	F212594	690V	32 A	120 kA	3.7 W	54 g

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