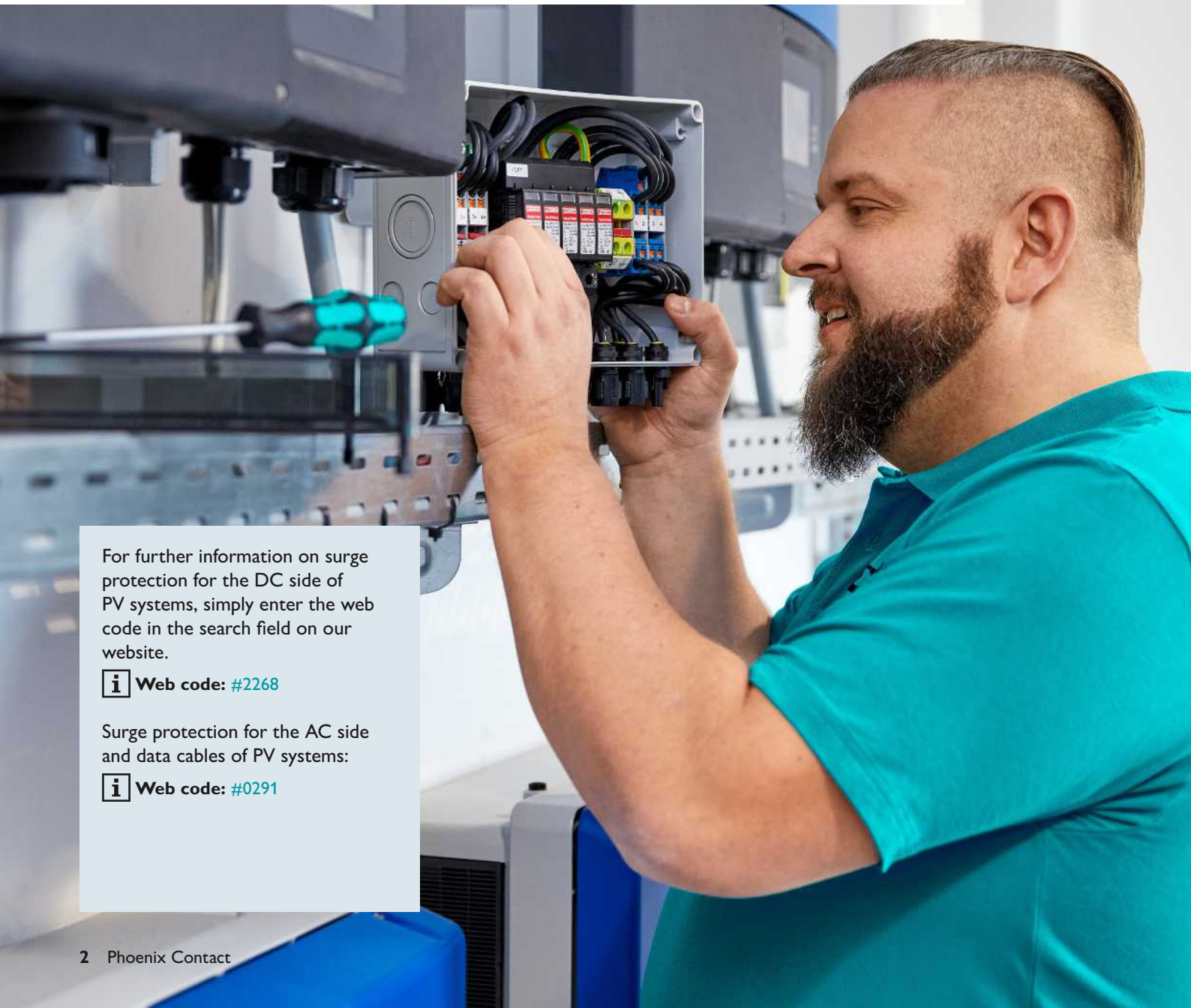
Solar power

Surge protection for photovoltaic rooftop systems

PHOENIX CONTACT
INSPIRING INNOVATIONS

Surge protection for photovoltaic systems

Solar power is an essential source of renewable energy. Decreasing system costs mean that photovoltaic power generation plants are attractive not only from an ecological perspective. They are also extremely competitive from an economic point of view when compared with conventional power generation. In order to provide optimum protection against surge voltages for the various system parts such as PV panels, inverters, and battery storage systems, surge protection must be used.



For further information on surge protection for the DC side of PV systems, simply enter the web code in the search field on our website.

Web code: #2268

Surge protection for the AC side and data cables of PV systems:

Web code: #0291

Directives for lightning and surge protection

Certain guidelines must be observed when installing and planning photovoltaic systems. The same also applies to the surge protection of the corresponding system parts.

HD 60364-7-712:2016 is a harmonized standard developed by CENELEC on behalf of the European Commission. It describes how to plan and install photovoltaic systems in Europe.
The German equivalent is DIN VDE 0100-712.

The requirement for surge protection in all building types is specified in VDE 0100-443. The resulting requirement for surge protection on the DC side in accordance with DIN EN 62305-3 Supplement 5 (VDE 0185-305-3 Supplement 5) is also common practice.

In an international context, the requirements for selecting the appropriate surge protection, which are described in IEC 61643-32, are very similar in terms of their content. One relevant difference, however, is the implementation of protection on the DC side. In Germany,

Country/region	Installation of PV systems	Surge protection on the DC side	Surge protection on the AC side
Europe/ internationally	HD 60364-7-712	IEC 61643-32	
Germany	DIN VDE 0100-712	DIN EN 62305-3 Supplement 5 (VDE 0185-305-3 Supplement 5)	VDE 0100-443

Standards for the installation of photovoltaic systems and the selection of surge protection for the DC and AC side

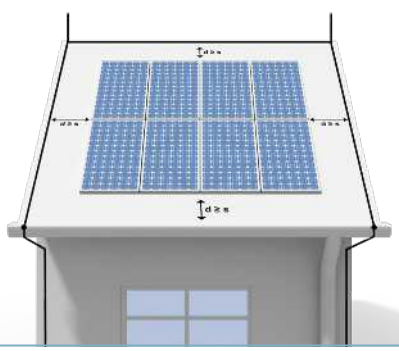
DC protection is mandatory in the proximity of PV panels. However, surge protection is only additionally required at the inverter if cable lengths exceed 10 m. This is entirely the other way round in IEC 61643-32: Surge protection is mandatory at the inverter, while surge protection in the proximity of PV panels is only additionally required if cable lengths exceed 10 m.

Selecting surge protective devices

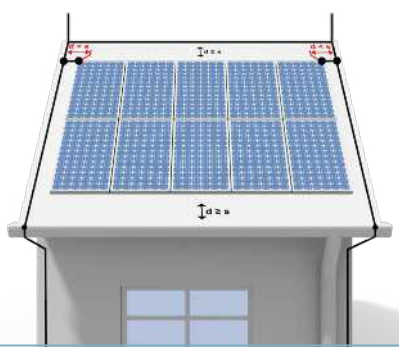
Below we have provided a selection guide indicating which type of surge protection is appropriate based on the conditions at your planned photovoltaic system.
Supplement 5 of DIN EN 62305-3 (VDE 0185-305-3 Supplement 5) distinguishes between three different application scenarios that need to be taken into consideration. Detailed information on all three scenarios can be found in the overview on pages 4 and 5.

1. **Building without external lightning protection**

2. **Building with external lightning protection**
   The separation distance is maintained: The distance “d” is greater than or equal to the separation distance “s” at every point in accordance with DIN EN 62305-3 Supplement 5 (VDE 0185-305-3 Supplement 5).

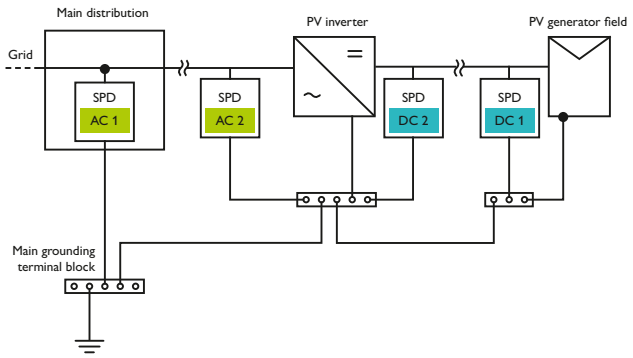


3. **Building with external lightning protection**
   The separation distance is not maintained: The distance “d” is less than the required separation distance “s” at at least one point.



Overview of lightning and surge protection for your PV rooftop system

Photovoltaic rooftop system without external lightning protection



DC 1	**DC surge protection in the proximity of the PV panels**	**Type 2** Define the installation location of the SPD* so that the device is installed as close as possible to the PV generator field, often directly after the entrance to the physical structure.
DC 2	**DC surge protection in the proximity of the inverter**	**Type 2** Surge protection is not required here if the cable length between “DC 1” and the inverter to be protected is less than 10 m.
AC 2	**AC surge protection on the AC side of the inverter**	**Type 2** A surge protective device is not required here if the cable length between “AC 1” and “AC 2” is less than 10 m.
AC 1	**AC surge protection in the main distribution**	**Type 2**

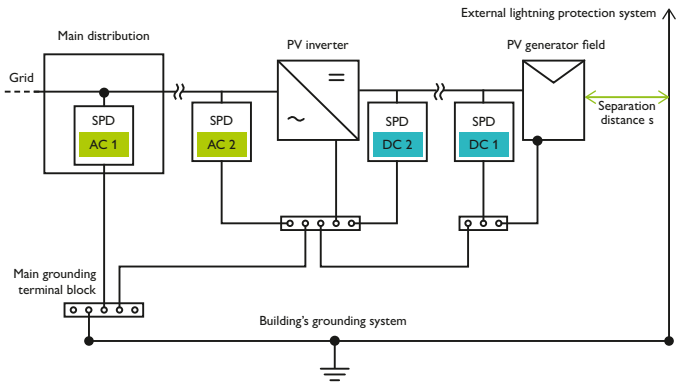
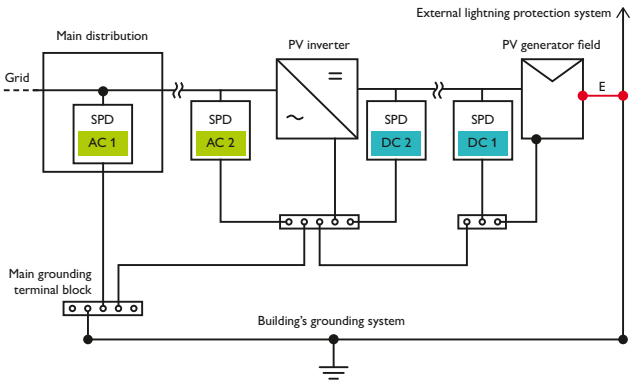
Tailor-made portfolio

When it comes to determining the appropriate protective circuit, the type of inverter plays a crucial role in the surge protection for photovoltaic systems. Phoenix Contact offers a wide range of surge protective devices for the AC side as well as a large variety of string combiner boxes, our PV sets, suitable for many types of inverter. Surge protection for communication cables, as also required in accordance with DIN EN 62305-3 Supplement 5 (VDE 0185-305-3 Supplement 5), completes our portfolio. Find out more about our products on the following pages.

Fast and flexible installation with safe connection technology

When it comes to the connection technology of the PV sets, the choice is yours. If you opt for the proven SUNCLIX system, all the necessary field connectors for tool-free cable assembly will always be included. Cable glands also support the tool-free wiring of conductors with ferrules by means of Push-in connection terminal blocks.

Photovoltaic rooftop system with external lightning protection

Separation distance “s” is maintained	Separation distance “s” is not maintained
	
Type 2 Define the installation location of the SPD* so that the device is installed as close as possible to the PV generator field, often directly after the entrance to the physical structure.	**Type 1** Define the installation location of the SPD* so that the device is installed as close as possible to the PV generator field, often directly after the entrance to the physical structure.
Type 2 Surge protection is not required here if the cable length between “DC 1” and the inverter to be protected is less than 10 m.	**Type 1**
Type 2 A surge protective device is not required here if the cable length between “AC 1” and “AC 2” is less than 10 m.	**Type 1**
Type 1	**Type 1**

* The surge protective device (SPD) contains at least one non-linear component and is intended to limit surge voltages and divert pulse currents.

Additional safety

Our PV sets with integrated fire department switch enable the external disconnection of the PV panels from the rest of the system.

Comprehensive portfolio

Whether a 3-conductor or 1-conductor system, and whatever the supply system configuration, we offer a broad portfolio for the protection of the AC side.

High data availability

When it comes to signal lines and communication cables, protection in accordance with DIN EN 62305-3 Supplement 5 (VDE 0185-305-3 Supplement 5) must be provided by means of surge protective devices.

Surge protection for the DC side

DC 1 **DC 2**

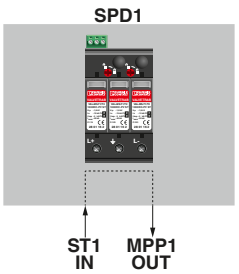
Below you will find a small selection of string combiner boxes, our PV sets, which you can use as surge protection for the DC side of your system.
They are produced in Germany and are available from stock for worldwide shipping.
We also offer corresponding accessories for all of our string combiner boxes.

You will find many more string combiner boxes in our product overview online. Visit our website at phoenixcontact.com and enter the following web code in the search field:

Web code: #2268

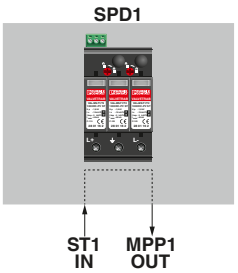
Type: SOL-SC-1ST-0-DC-1MPPT-1001
Item number 2404298

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1
- Current per string: 40 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 130 x 180 x 111 mm



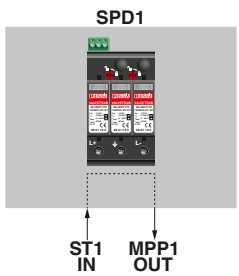
Type: SOL-SC-1ST-0-DC-1MPPT-2001
Item number 2403338

Technical data
- Surge protective device: type T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 1
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 130 x 180 x 111 mm



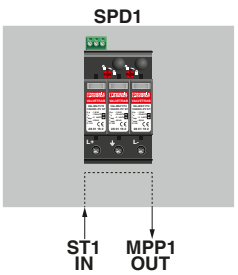
Type: SOL-SC-1ST-0-DC-1MPPT-1000
Item number 1182566

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1
- Current per string: 40 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 130 x 180 x 111 mm



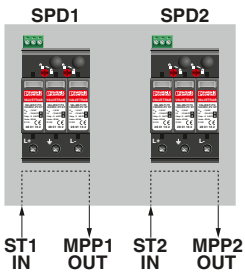
Type: SOL-SC-1ST-0-DC-1MPPT-2000
Item number 1105827

Technical data
- Surge protective device: type T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1
- Current per string: 40 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 130 x 180 x 111 mm



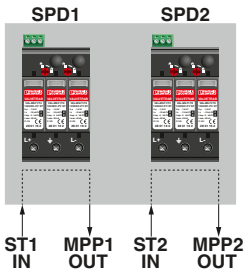
Type: SOL-SC-1ST-0-DC-2MPPT-1001
Item number 2404299

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



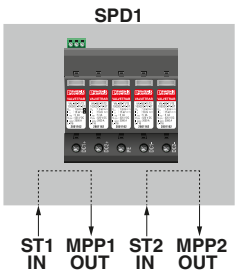
Type: SOL-SC-1ST-0-DC-2MPPT-2001
Item number 2403337

Technical data
- Surge protective device: type T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



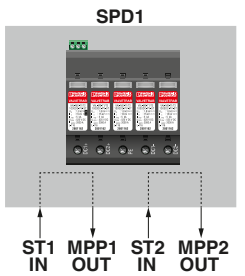
Type: SOL-SC-1ST-0-DC-2MPPT-1000SE
Item number 1101176

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



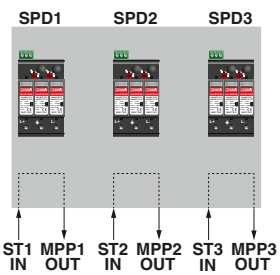
Type: SOL-SC-1ST-0-DC-2MPPT-2000SE
Item number 1105828

Technical data
- Surge protective device: type T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



Type: SOL-SC-1ST-0-DC-3MPPT-1001
Item number 2404301

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 3
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 254 x 180 x 111 mm

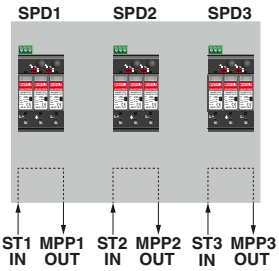


* SUNCLIX connectors included

DC 1 DC 2

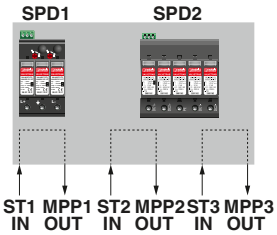
Type: SOL-SC-1ST-0-DC-3MPPT-2001
Item number 2403336

Technical data
- Surge protective device: type T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 3
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



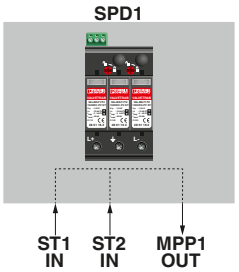
Type: SOL-SC-1ST-0-DC-3MPPT-1000SE
Item number 1182571

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 1 (per MPP tracker)
- Current per string: 40 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 3
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



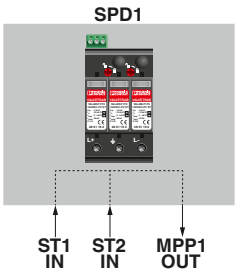
Type: SOL-SC-2ST-0-DC-1MPPT-1000
Item number 1016811

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2
- Current per string: 20 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



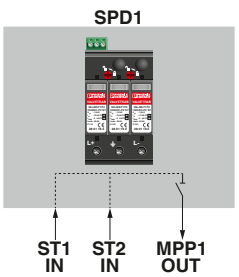
Type: SOL-SC-2ST-0-DC-1MPPT-2000
Item number 1055626

Technical data
- Surge protective device: type T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2
- Current per string: 20 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



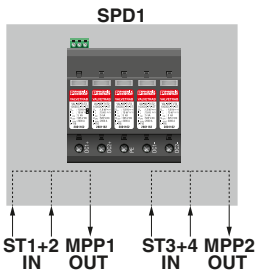
Type: SOL-SC-2ST-0-DC-1MPPT-1101
Item number 2404297

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2
- Current per string: 16 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Switching capacity: 32 A/1000 V DC
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



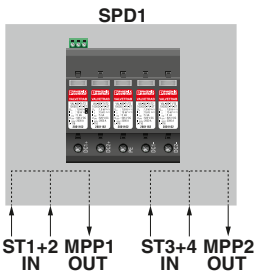
Type: SOL-SC-2ST-0-DC-2MPPT-1001SE
Item number 1016813

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



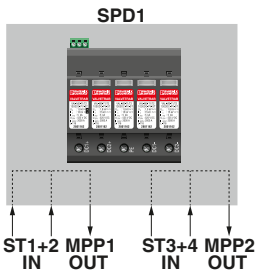
Type: SOL-SC-2ST-0-DC-2MPPT-1000SE
Item number 1016812

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



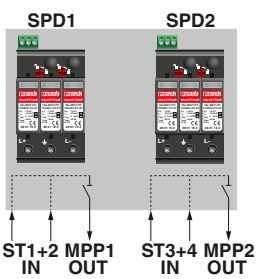
Type: SOL-SC-2ST-0-DC-2MPPT-2000SE
Item number 1055628

Technical data
- Surge protective device: type T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



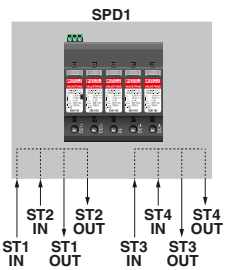
Type: SOL-SC-2ST-0-DC-2MPPT-1101
Item number 2404569

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Switching capacity: 32 A/1000 V DC (per MPP tracker)
- Switch disconnector type: rotary switch (lockable)
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



Type: SOL-SC-2ST-0-DC-2MPPT-1001EQ
Item number 1117754

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 2 (per MPP tracker)
- Number of supported MPP trackers: 2
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 254 x 180 x 111 mm

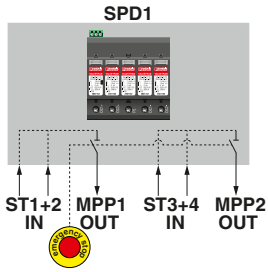


* SUNCLIX connectors included

DC 1 DC 2

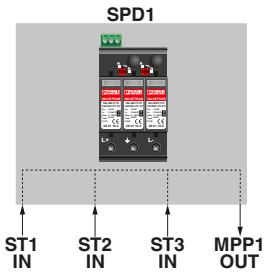
Type: SOL-SC-2ST-0-DC-2MPPT-1300FS
Item number 1137059

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- Switching capacity: 40 A for DC-PV1 (per MPP tracker)
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 400 x 400 x 200 mm



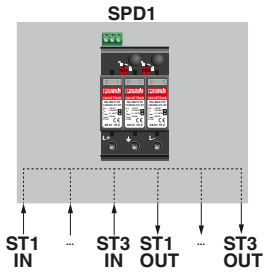
Type: SOL-SC-3ST-0-DC-1MPPT-1001
Item number 2404765

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 3
- Current per string: 13.3 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



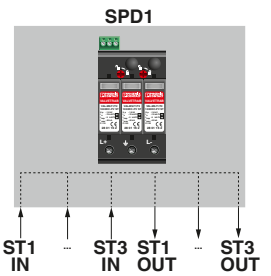
Type: SOL-SC-3ST-0-DC-1MPPT-1001EQ
Item number 1064363

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 3
- Current per string: 13.3 A (I_{max})
- Number of outputs: 3
- Number of supported MPP trackers: 1
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 180 x 180 x 111 mm



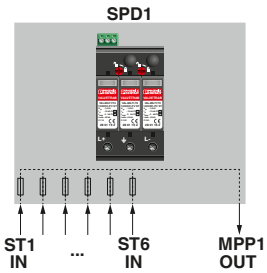
Type: SOL-SC-3ST-0-DC-1MPPT-1005EQ
Item number 1197151

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 3
- Current per string: 25 A (I_{max})
- Number of outputs: 3
- Number of supported MPP trackers: 1
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 254 x 180 x 111 mm



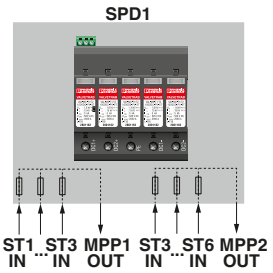
Type: SOL-SC-6ST-0-DC-1MPPT-1010
Item number 1113128

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 6
- Current per string: 10 A (I_{max})
- Number of outputs: 1
- Number of supported MPP trackers: 1
- String fuse: midget/10.3 x 38 (not included)
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



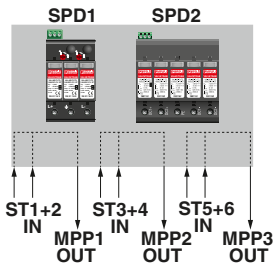
Type: SOL-SC-3ST-0-DC-2MPPT-1011SE
Item number 1042281

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 3 (per MPP tracker)
- Current per string: 12 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 2
- String fuse: midget/10.3 x 38 (12 A included)
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



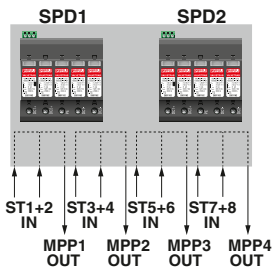
Type: SOL-SC-2ST-0-DC-3MPPT-1000SE
Item number 1053613

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 3
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



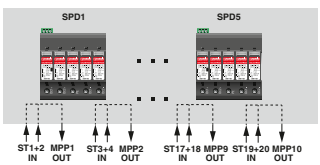
Type: SOL-SC-2ST-0-DC-4MPPT-1000SE
Item number 1081867

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 4
- Type of cable entry: cable gland
- Housing dimensions (W x H x D): 361 x 254 x 111 mm



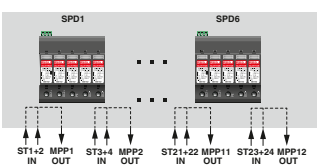
Type: SOL-SC-2ST-0-DC-10MPPT-1001SE
Item number 1253218

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 10
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 600 x 400 x 230 mm



Type: SOL-SC-2ST-0-DC-12MPPT-1001SE
Item number 1251937

Technical data
- Surge protective device: type T1/T2
- Open-circuit voltage (U_{OC}): max. 1100 V DC
- MPP voltage (U_n): max. 1000 V DC
- Number of string inputs: 2 (per MPP tracker)
- Current per string: 20 A (I_{max})
- Number of outputs: 1 (per MPP tracker)
- Number of supported MPP trackers: 12
- Type of cable entry: SUNCLIX*
- Housing dimensions (W x H x D): 600 x 400 x 230 mm



* SUNCLIX connectors included

Surge protection for the AC side

AC 1 **Web code:** #0291

Surge protection for the AC side (suitable for 3-phase TN-S or TT systems)						
Type of building	**With lightning protection**		**Without lightning protection, with overhead line**		**Without lightning protection, with overhead line**	
	or		or		or	
Description	Combined lightning current and surge arrester for the feed point of the low-voltage electrical installation. Installation in the proximity of the service panel (FLT-SEC-P-T1) or in the grid-side wiring space of the meter panel (FLT-SEC-ZP2).		Installation at the feed point is mandatory. The additional installation of an FLT-SEC-P-T1 at the roof pole connection is recommended. (See building with lightning protection).		Surge protection for the feed point of the low-voltage electrical installation. Installation in the system-side wiring space (VAL) or in the grid-side wiring space of the meter panel (FLT).	
Type	FLT-SEC-P-T1-3S-350/25-FM	FLT-SEC-ZP2-3S-255/12.5-FM *) **)	FLT-SEC-P-T1-3S-350/25-FM	FLT-SEC-ZP2-3S-255/7.5-FM *)	VAL-SEC-T2-3S-350/40-FM	FLT-SEC-ZP2-3S-255/7.5-FM *)
Item number	2905421	1168943	2905421	1168940	2909635	1168940

*) The remote signaling module shown is not supplied as standard and is available as an option under item number 1168947
**) Can only be used for lightning protection level III/IV

AC 2 **Web code:** #0291

Surge protection for the AC side (suitable for 1- and 3-phase TN-S or TT systems)				
Type of building	**With lightning protection, separation distance "s" maintained or without lightning protection**		**With lightning protection, separation distance "s" not maintained**	
Description	Additional surge protection in the immediate proximity of the inverter. Required if the distance to the surge protective device (SPD) at the feed point of the system is more than 10 m.		Additional combined lightning current and surge arrester in the immediate proximity of the inverter. Always required if the separation distance has not been maintained, regardless of the distance to the surge protective device (SPD) at the feed point of the system.	
Type	VAL-SEC-T2-1S-350-FM	VAL-SEC-T2-3S-350-FM	FLT-SEC-P-T1-1S-350/25-FM	FLT-SEC-P-T1-3S-350/25-FM
Item number	2905333	2905340	2905415	2905421

Surge protection for MCR signals and data interfaces

TC Web code: #0291

Surge protection for MCR signals at the inverter		
Signal type	**Digital signals (two single-core wires, 24 V DC, with common reference potential)**	**Analog signals (one double wire, 0/4 … 20 mA, 0 … 10 V)**
Description	Pluggable surge protection for digital signals. Protection of two single-core wires with common, non-grounded reference potential. With integrated overload protection and mechanical status indicator. Remote signaling with optional additional modules is possible.	Pluggable surge protection for an analog signal. Protects one double wire. With integrated overload protection and mechanical status indicator. Remote signaling with optional additional modules is possible.
Type	TTC-6P-2X1-F-24DC-PT-I	TTC-6P-1X2-24DC-PT-I
Item number	1065320	2906815

TC Web code: #0291

Surge protection for data interfaces at the inverter		
Signal type	**RS-485 (2-wire)**	**Ethernet in acc. with Class EA / CAT6$_A$ (up to 10 Gbps incl. PoE++)**
Description	Pluggable surge protection for an RS-485 interface (2-wire). With integrated overload protection and mechanical status indicator. Remote signaling with optional additional modules is possible.	Surge protection for an Ethernet interface. Intermediate plug with RJ45 connection on both sides. Can be snapped onto a DIN rail. Grounding is then performed directly via the metal housing.
Type	TTC-6P-3-HF-F-M-12DC-UT-I	DT-LAN-CAT.6+
Item number	2906786	2881007

Accessories for surge protection for the DC side

Web code: #0543

Accessories	Plug-in compatible		
	S PV connector	**L PV connector**	**PV string collection**
Description	Tool-free fast-connection technology	Reduction of cable losses	Greater flexibility in field cabling
	Cable connection of 2.5 to 6 mm²	Cable connection of 6 to 16 mm²	Y distributor for collecting two strings
Type Item number	PV-C3F-S 2,5-6 (+) 1386381	PV-C4F-S 6-16 (+) 1284634	PV-ED6/Y-120(2+/1-) 1030649
Type Item number	PV-C3M-S 2,5-6 (-) 1386384	PV-C4M-S 6-16 (-) 1284632	PV-ED6/Y-120(1+/2-) 1030650

	PV protective cap	**MC4 adapter**	**Replacement plug**
Description	IP67 protection for unused SUNCLIX connectors	MC4 to SUNCLIX	Replacement for faulty surge protection plugs
	Self-sealing	Up to 35 A	Type 2 or type 1/2
Type Item number	PV-C PROTECTION CAP 1785430	PV-AS-MC4/6-150-MN-SET1 1079531	VAL-MS 1000DC-PV-ST 2800624
Type Item number			VAL-MS-T1/T2 1000DC-PV-ST 2801162

	PV fuse plugs		
Description	Reduction of power dissipation inside the string combiner box		
	Fuse connector, 3.5 to 25 A		
Type Item number	PV-PRO/M/F-200/F-1000/3.5 1220881	PV-PRO/M/F-200/F-1000/10 1220876	PV-PRO/M/F-200/F-1000/19 1220866
Type Item number	PV-PRO/M/F-200/F-1000/6 1220879	PV-PRO/M/F-200/F-1000/11 1220874	PV-PRO/M/F-200/F-1000/23 1220863
Type Item number	PV-PRO/M/F-200/F-1000/8 1220878	PV-PRO/M/F-200/F-1000/14 1220873	PV-PRO/M/F-200/F-1000/25 1220861

Surge protection for home charging stations

Suitable surge protection can protect the charging station and the electric vehicle connected in the carport from costly damage.

Even if surge protection is already installed in the main distributor box, it may provide insufficient protection in the case of long cable routes to the home charging station, e.g., if the station is located in a carport some distance away. When a suitable surge protective device is installed in sufficient proximity to the home charging station, it can prevent costly damage to the charging station and vehicle.

As per VDE 0100-443, surge protection in the main distribution 1 has been a mandatory requirement for new buildings since 2016. This requirement also applies to extensions, e.g., when retrofitting a home charging station. According to the standard, the protective effect of the surge protective device is sufficient for cable lengths up to 10 m 2. For cable lengths greater than 10 m, additional protective measures are required directly at the home charging station 3.

With the right surge protection, damage can be prevented.

The CHARX protect product family from Phoenix Contact now includes a new IP65-protected surge protection box specifically for this application. It is designed to protect home charging stations with charging power ratings from 11 to 22 kW.

Your advantages

- Quick installation and startup
- Flexible selection of cable cross-sections, thanks to the variable sealing area
- Time savings during wiring, thanks to Push-in connection technology
- No additional installation material required, thanks to through-wiring
- Weatherproof, robust, and shockproof in accordance with impact protection rating IK08

CHARX protect

E-Mobility empowered by Phoenix Contact

Surge protection of home charging stations	
Web code: #2105 Type: CHARX-PROTECT-11-22KW Item number 1380466	
IEC test classification / EN type	II, T2
Nominal voltage U_N	240/415 V AC (TN-S/TT)
Nominal frequency	50 Hz (60 Hz)
Sealing area AC cable	6 mm … 20.5 mm
Sealing area remote indication contact	4.5 mm … 10 mm
Connection method	Push-in connection
Conductor cross-section flexible with ferrule	0.5 mm² … 6 mm²
Conductor cross-section rigid	0.5 mm² … 10 mm²
Maximum discharge surge current I_{max} (8/20) µs	40 kA
Nominal discharge current I_n (8/20) µs	20 kA
Voltage protection level U_P (L-N)	≤1.35 kV
Voltage protection level U_P (N-PE)	≤1.5 kV
Maximum backup fuse for V through-wiring	32 A (gG-6 mm²), 35 A (gG-10 mm²), 40 A (MCB C-10 mm²)

Open communication with customers and partners worldwide

Phoenix Contact is a global market leader based in Germany. We are known for producing future-oriented products and solutions for the electrification, networking, and automation of all sectors of the economy and infrastructure. With a global network reaching across more than 100 countries with over 20,000 employees, we maintain close relationships with our customers, something we believe is essential for our common success.

Our wide range of innovative products makes it easy for our customers to implement the latest technology in a variety of applications and industries. This especially applies to the target markets of energy, infrastructure, industry, and mobility.

You can find your local partner at

phoenixcontact.com

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VMM03-22.000.L3

INSPIRING INNOVATIONS