

Photovoltaic (PV) system Surge Protection SPV

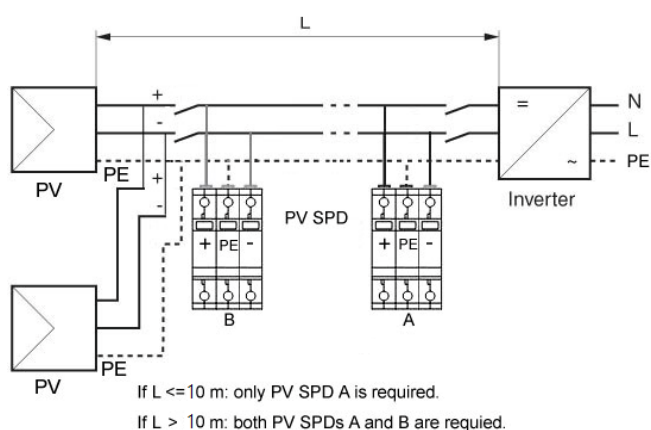
Nowadays, **Photovoltaic systems (PV System)** range from small, rooftop-mounted or building-integrated systems with capacities from a few to several tens of kilowatts, to large utility-scale power stations of hundreds of megawatts, and in the meanwhile the potential impact of lightning events increases with PV system size. Where lightning occurrences are frequent, unprotected PV systems can suffer repeated and significant damage to key components. This results in substantial repair and replacement costs, system downtime and the loss of revenue. Properly installed surge protective devices (SPDs) will minimize the potential impact of lightning events



PROSURGE® SPV series employ high energy Metal Oxide Varistor (MOV), and constructed with our patented thermal protection and arc extinguishing technology which ensure safe disconnection while faulty current or abnormal voltage happened. These series are of single pole, Y connection and V connection for various applications in worldwide Photovoltaic systems, while the Y connection configuration is consisting of three protective paths for both Common mode & Differential mode protection, and the V connection configuration has two protective paths for Common mode protection.

Usually, sensitive electrical equipments of photovoltaic system like AC/DC Inverter, monitoring devices and PV array should be protected by PV surge protective devices (SPDs).

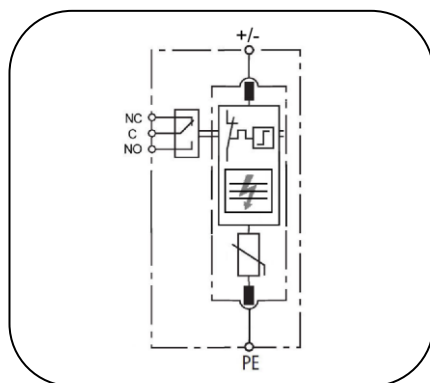
PROSURGE® SPV series are recommended for used on the dc-side of the DC-AC inverter, and **PROSURGE® SP** series on the ac-side to protect AC mains power supplies. The number and location of SPV SPDs on the DC side depend on the length of the cables between the PV array and inverter. The SPV SPD should be installed as close as possible to the inverter if the length is less than 10 meters. If it is greater than 10 meters, two SPDs are necessary, and one should be located in the box close to the PV array, another is located in



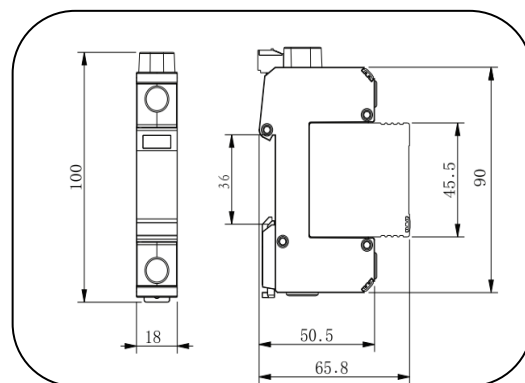
the inverter area.

PROSURGE® SPV series are fully comply with UL1449 5th edition as Type 1ca SPDs, and Class II/T2 SPDs per IEC/EN 61643-11/31.

SPV...-V-S (Single pole)



Basic circuit diagram



Dimension drawing

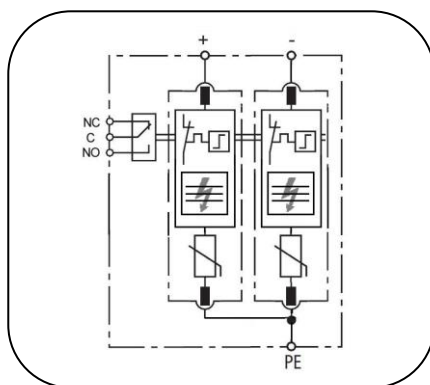
PROSURGE's Type 1ca Surge Protective Devices are designed for DC application such as PV/ Photovoltaic system dc-side protection against the damaging from surges and spikes caused by lightning and other electrical sources.

Technical Features

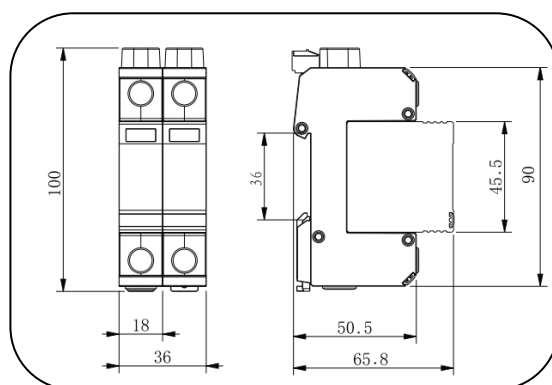
- UL1449-5th Type 1ca recognized SPDs for use in PV/Photovoltaic systems and other DC power system like charging system for electric vehicles etc.
- For single mode protection
- UL1449-5th, Short circuit current rating (SCCR) up to 100kA
- Pluggable design with window fault indication
- Surge capacity 50kA 8/20 per pole
- Remote alarm signal optional
- Fully comply with IEC/EN 61643-31/11, EN 50539-11 standards.

Part No.		SPV48-V-S	SPV500-V-S	SPV600-V-S
In accordance with		ANSI/UL1449-5 th ; IEC/EN 61643-31/11, EN 50539-11		
Category UL/IEC/EN		Type 1ca /Class II /T2		
Protection Mode		Single mode		
Nominal voltage (Vdc)	Un	48	500	600
Max. permitted DC voltage	Vpdc	85	560	670
Nominal discharge current(8/20)	In	20kA		
Max. discharge current(8/20)	I _{max}	50kA		
Voltage protection rating	VPR	0.4kV	1.5kV	1.5kV
Leakage (Quiescent) current	I _q	≤20μA	≤20μA	≤20μA
Short Circuit Current Rating	SCCR	30kA	100kA	50kA
Response time		≤25 ns		
Max Ambient temperature		- 40°C ~ + 85°C		
Cross-section of connection wire		Single-strand 35mm ² ; multi-strand 25mm ²		
Mounting		35mm DIN-rail in accordance with EN 50022/DIN46277-3		
Enclosure material		Thermoplastic; extinguishing degree UL94 V-0		
Degree of protection		IP20		
Installation width		1 module, DIN 43880		
Thermal disconnect		Internal green – normal ; red - failure		
Remote alarm contact		“-S” means with remote alarm contact		
Additional data for Remote Alarm Contacts				
Remote alarm contact type		Isolated Form C		
Switching capability Un/In		AC: 250V/0.5A DC: 250V/0.1A; 125V/0.2A; 75V/0.5A		
Max. Size of connecting wire		Max. 1.5mm ² (or # 16AWG)		
Replaceable Module Part No.		SP85D	SP560D	SP670D

SPV...-V-C-S ("V" configuration)



Basic circuit diagram



Dimension drawing

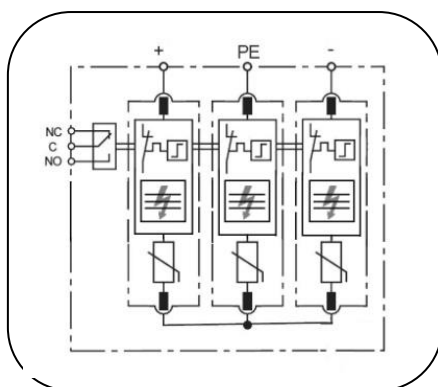
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Technical Features

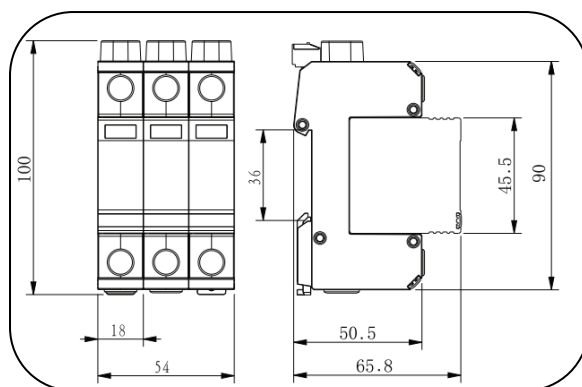
- UL1449-5th Type 1ca recognized SPDs for use in PV/Photovoltaic systems and other DC power system like charging system for electric vehicles etc.
- V protection circuit for common mode protection
- UL1449-5th, Short circuit current rating (SCCR) up to 100kA
- Pluggable design with window fault indication
- Surge capacity 50kA 8/20 per pole
- Remote alarm signal optional
- Fully comply with IEC/EN 61643-31/11, EN 50539-11 standards.

Part No.		SPV48-V-C-S	SPV500-V-C-S	SPV600-V-C-S
In accordance with		ANSI/UL1449-5 th ; IEC/EN 61643-31/11, EN 50539-11		
Category UL/IEC/EN		Type 1ca /Class II /T2		
Protection Mode		Common mode		
Nominal voltage (Vdc)	Un	48	500	600
Max. permitted DC voltage	Vpdc	85	560	670
Nominal discharge current(8/20)	In	20kA		
Max. discharge current(8/20)	I _{max}	50kA		
Voltage protection rating ("+/–" - PE)	VPR	0.4kV	1.5kV	1.5kV
Voltage protection rating ("+" – "–")	VPR	0.8kV	3.0kV	3.0kV
Leakage (Quiescent) current	I _q	≤20μA	≤20μA	≤20μA
Short Circuit Current Rating	SCCR	30kA	100kA	50kA
Response time		≤25 ns		
Max Ambient temperature		- 40°C ~ + 85°C		
Cross-section of connection wire		Single-strand 35mm ² ; multi-strand 25mm ²		
Mounting		35mm DIN-rail in accordance with EN 50022/DIN46277-3		
Enclosure material		Thermoplastic; extinguishing degree UL94 V-0		
Degree of protection		IP20		
Installation width		2 modules, DIN 43880		
Thermal disconnecter		Internal green – normal ; red - failure		
Remote alarm contact		“-S” means with remote alarm contact		
Additional data for Remote Alarm Contacts				
Remote alarm contact type		Isolated Form C		
Switching capability Un/In		AC: 250V/0.5A	DC: 250V/0.1A; 125V/0.2A; 75V/0.5A	
Max. Size of connecting wire		Max. 1.5mm ² (or # 16AWG)		
Replaceable Module Part No.		SP85D	SP560D	SP670D

SPV...-V-CD-S (“Y” Configuration)



Basic circuit diagram



Dimension drawing

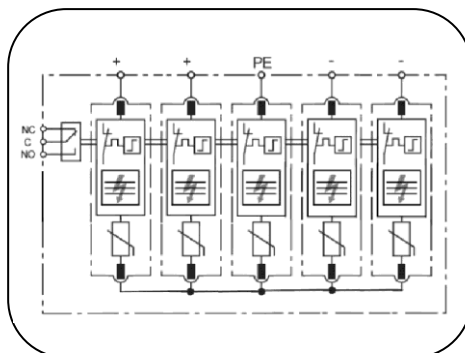
PROSURGE's Type 1ca Surge Protective Devices are designed for DC application such as PV/ Photovoltaic system dc-side protection against the damaging from surges and spikes caused by lightning and other electrical sources.

Technical Features

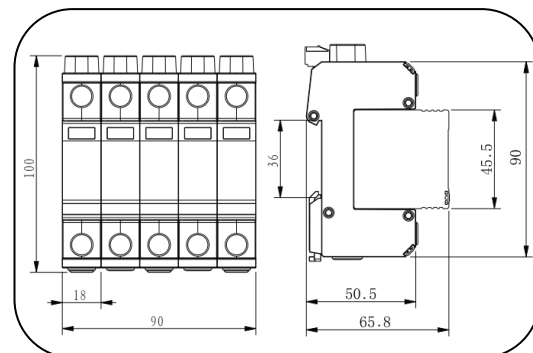
- UL1449-5th Type 1ca recognized SPDs for use in PV/Photovoltaic systems and other DC power system like charging system for electric vehicles etc.
- Y protection circuit for common mode & differential mode protection
- UL1449-5th, Short circuit current rating (SCCR) up to 50kA
- Surge capacity 50kA 8/20 per pole
- Remote alarm signal optional
- Fully comply with IEC/EN 61643-31/11, EN 50539-11 standards

Part No.		SPV600-V-CD-S	SPV800-V-CD-S	SPV1000-V-CD-S	SPV1200-V-CD-S	SPV1500-V-CD-S
In accordance with		ANSI/UL1449-5 th ;IEC/EN 61643-31/11,EN 50539-11				
Category UL/IEC/EN		Type 1ca /Class II /T2				
Protection Mode		Common mode & Differential mode				
Nominal voltage (Vdc)	Un	600	800	1000	1200	1500
Max. permitted DC voltage	Vpdc	700	920	1120	1340	1500
Nominal discharge current(8/20)	In	20kA				
Max. discharge current(8/20)	Imax	50kA				
Voltage protection rating per mode	VPR	0.9kV	1.2kV	1.5kV	1.5kV	1.8kV
Voltage protection rating (“+/-“ - PE)		1.8kV	2.5kV	2.5kV	3.0kV	4.0kV
Leakage (Quiescent) current	Iq	≤20μA	≤20μA	≤20μA	≤20μA	≤20μA
Short Circuit Current Rating	SCCR	50kA	50kA	50kA	50kA	50kA
Response time		≤25 ns				
Max Ambient temperature		- 40°C ~ + 85°C				
Cross-section of connection wire		Single-strand 35mm ² ; multi-strand 25mm ²				
Mounting		35mm DIN-rail in accordance with EN 50022/DIN46277-3				
Enclosure material		Thermoplastic; extinguishing degree UL94 V-0				
Degree of protection		IP20				
Installation width		3 modules, DIN 43880				
Thermal disconnect		Internal green – normal ; red - failure				
Remote alarm contact		“-S” means with remote alarm contact				
Additional data for Remote Alarm Contacts						
Remote alarm contact type		Isolated Form C				
Switching capability Un/In		AC: 250V/0.5A		DC: 250V/0.1A; 125V/0.2A; 75V/0.5A		
Max. Size of connecting wire		Max. 1.5mm ² (or # 16AWG)				
Replaceable Model Part No.		SP350D	SP460D	SP560D	SP670D	SP825D

SPV...-V-CD2-S ("2Y" Configuration)



Basic circuit diagram



Dimension drawing

PROSURGE's Type 1ca Surge Protective Devices are designed for DC application such as PV/ Photovoltaic system dc-side protection against the damaging from surges and spikes caused by lightning and other electrical sources.

Technical Features

- UL1449-5th Type 1ca recognized SPDs for use in PV/Photovoltaic systems and other DC power system like charging system for electric vehicles etc.
- Y protection circuit for common mode & differential mode protection
- Protecting of two MPP-systems.
- UL1449-5th, Short circuit current rating (SCCR) up to 50kA
- Pluggable design with window fault indication
- Surge capacity 50kA 8/20 per pole
- Remote alarm signal optional
- Fully comply with IEC/EN 61643-31/11, EN 50539-11 standards

Part No.		SPV600-V-CD2-S	SPV800-V-CD2-S	SPV1000-V-CD2-S	SPV1200-V-CD2-S	SPV1500-V-CD2-S
In accordance with		ANSI/UL1449-5 th ;IEC/EN 61643-31/11,EN 50539-11				
Category UL/IEC/EN		Type 1ca /Class II /T2				
Protection Mode		Common mode & Differential mode				
Nominal voltage (Vdc)	Un	600	800	1000	1200	1500
Max. permitted DC voltage	Vpvc	700	920	1120	1340	1500
Nominal discharge current(8/20)	In	20kA				
Max. discharge current(8/20)	I _{max}	50kA				
Voltage protection rating per mode	VPR	0.9kV	1.2kV	1.5kV	1.5kV	1.8kV
Voltage protection rating (“+/-” - PE)		1.8kV	2.5kV	2.5kV	3.0kV	4.0kV
Leakage (Quiescent) current	Iq	≤20μ	≤20μA	≤20μA	≤20μA	≤20μA
Short Circuit Current Rating	SCCR	50kA	50kA	50kA	50kA	50kA
Response time		≤25 ns				
Max Ambient temperature		- 40°C ~ + 85°C				
Cross-section of connection wire		Single-strand 35mm ² ; multi-strand 25mm ²				
Mounting		35mm DIN-rail in accordance with EN 50022/DIN46277-3				
Enclosure material		Thermoplastic; extinguishing degree UL94 V-0				
Degree of protection		IP20				
Installation width		5 modules, DIN 43880				
Thermal disconnecter		Internal green – normal ; red - failure				
Remote alarm contact		“-S” means with remote alarm contact				
Additional data for Remote Alarm Contacts						
Remote alarm contact type		Isolated Form C				
Switching capability Un/In		AC: 250V/0.5A DC: 250V/0.1A; 125V/0.2A; 75V/0.5A				
Max. Size of connecting wire		Max. 1.5mm ² (or # 16AWG)				
Replaceable Model Part No.		SP350D	SP460D	SP560D	SP670D	SP825D