



General Information

The Bourns® Model 1420A series is designed to protect DC power systems (such as the DC-side of photovoltaic systems) against the risk of the harmful effects of transient surges, up to rated limits. These surges can be the result of:

- Direct and indirect lightning strikes
- Power company load switching
- Upstream load switching at other facilities

This series is intended for the protection of sensitive electrical equipment of photovoltaic systems and other DC power systems like EV charging stations, AC-DC Inverters, and monitoring devices. It should be connected in parallel with the DC power system.



WARNING!

Only qualified personnel should install or service this system. Electrical safety precautions must be followed when installing or servicing this equipment. To prevent risk of electrical shock, turn off and lock out all power sources to the unit before making electrical connections or servicing.

For proper and safe operation, neutral and ground **MUST** be reliably connected. Failure to operate this unit from a solidly grounded power source of the proper configuration will reduce or impede operation, and may result in unit failure.

Installation

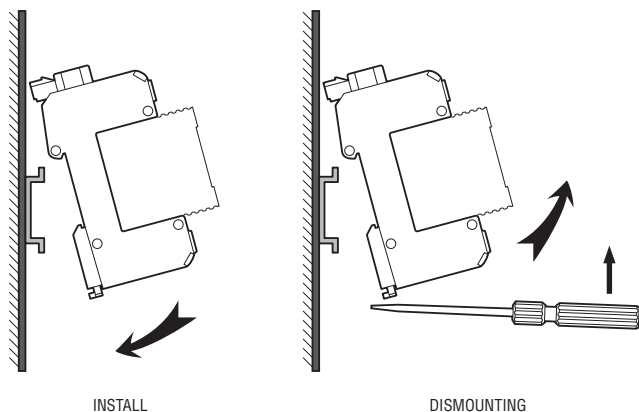
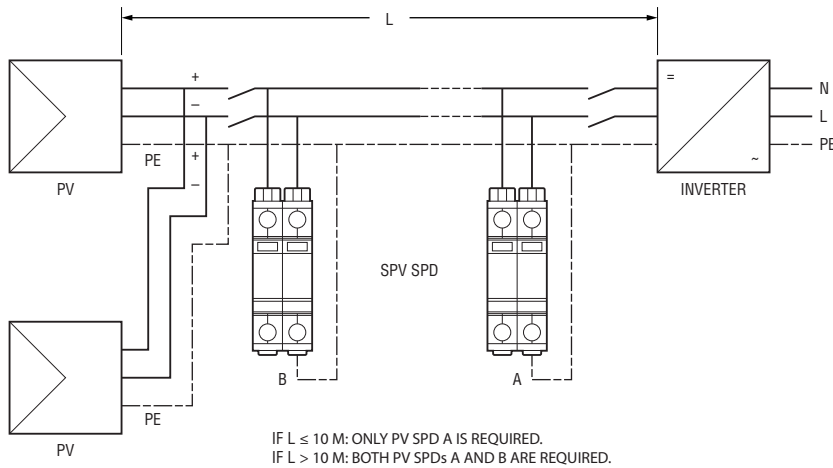


Fig.1: SPD mounting on DIN-Rail

1. When installing or replacing the SPD, it must be in a de-energized condition
2. Install the DIN mounting rail (35 mm, re: EN 50022).
3. Snap-lock the SPD to the rail.
4. Connect wiring to the indicated terminals.
5. Ensure compliance with supplied instructions.
6. Apply power and observe correct operation of status indicators and, if utilized, remote alarm facilities.
7. Never Hi-Pot test any SPD. (This will cause premature failure or damage to the SPD.)

Wiring



Before making connections to the unit, verify that the unit model number and nameplate voltage rating are appropriate for connection to the intended power source.

For best performance, the unit should be positioned so that the length of the wiring to the Surge Protective Device (SPD) unit is minimized.

Wiring SPDs in PV system

A PV SPD should be installed as close as possible to the inverter. If the length of the wiring between this SPD and the PV generator (distance L, see Figures 2 & 3) is greater than 10 m, the PV generator requires a complementary SPD nearby, for protection (see Figures 2 & 3).

Fig.2: Positions of SPDs (V configuration) in the DC part as stipulated in Guide IEC 61643-32

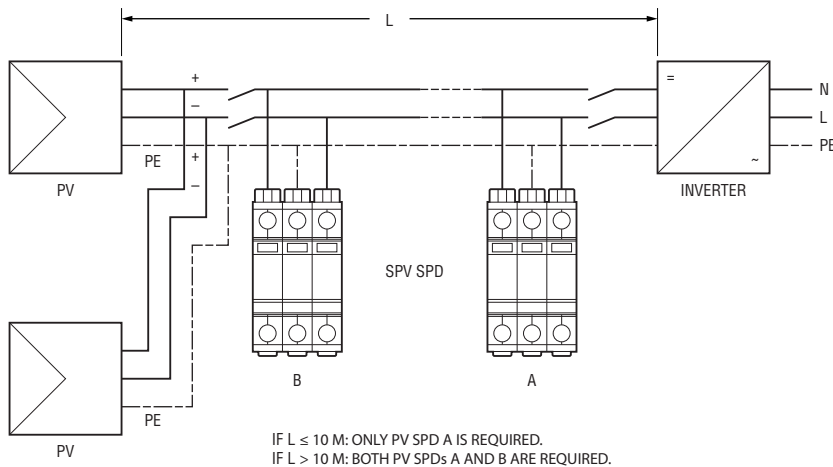


Fig.3: Positions of SPDs (Y configuration) in the DC part as stipulated in Guide IEC 61643-32

Wiring Connections

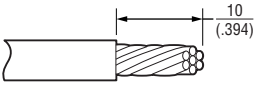
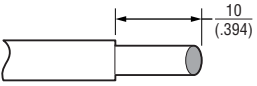
Conductor Type		
Min. Cross-section	+/- terminal: #12AWG (4 mm ²) PE terminal: #10AWG (6 mm ²)	
Max. Cross-section	#4AWG or 25 mm ² (stranded)	#2AWG or 35 mm ² (solid)
Insulation Stripped Back	0.4 in. or 10 mm	

Table 1: Connection wire size

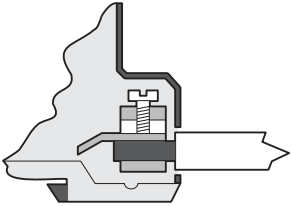
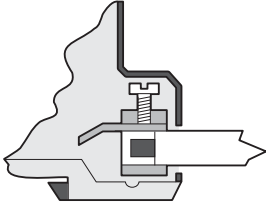
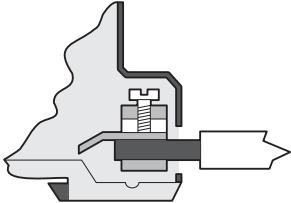
Correct	Incorrect
	
	Insulation not cut back enough
	
	Insulation cut back too far

Fig. 4: Tightening the terminal

Each SPD terminal is designed to accept wire sizes from #12AWG (4 mm²) to #2AWG (35 mm²) solid conductor or #4AWG (25 mm²) stranded conductor. Insulation should be stripped back 10 mm before terminating into tunnel terminal.

Do not use excessive force when tightening the terminal; 2 ~ 2.5 Nm (18-22 lb-in) is recommended.



WARNING!

Select the proper Bourns® SPD unit according to your system voltage, configuration, and the anticipated surge environment.

Prior to installing the SPD, ensure that your facility's electric supply system is properly installed and connected in accordance with all applicable national and local codes and safety procedures.

Status Indicator & Remote Signal

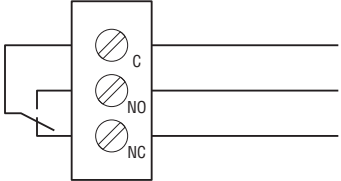
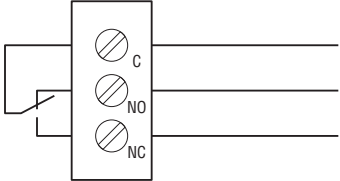
Remote Signal Contact	
	
Normal	Fault (Needs to be Replaced)

Table 2: Remote signal contact indication

A characteristic of all transient and surge protection devices is that they degrade in proportion to the magnitude and number of surge incidents to which they have been subjected. Status indication should be periodically monitored to determine if replacement is required. When the SPD indicator window turns **RED**, the remote signal contact closes between C (common) and NO (normally open). The pluggable module should be replaced as soon as possible.

Product Ratings & Limitations

Type 1CA SPD – Permanently connected SPDs for use in PV systems can be connected between the PV array and the main service disconnect as described in the Standard for Safety, Surge Protective Devices (SPDs), UL-1449, Fifth Edition, released 2021.

Voltage Protection Rating – To obtain the Voltage Protection Rating (VPR), in accordance with the Standard for Safety, Surge Protective Devices (SPDs), UL-1449, Fifth Edition, released 2021, as indicated on this product, the wire specified must be utilized to connect the SPD to your facility’s power grid. Connections made with unapproved conductors may result in different VPRs.

Circuit Ampacity Limitations – This product has been tested to withstand a voltage at or above the U_{pVdc} rating, and fault currents of up to 30 kA for 48 VDC network voltage products and 50 kA for network voltage products higher than 600 VDC without exposing live circuits or components on power sources, as described in the Standard for Safety, Surge Protective Devices (SPDs), UL-1449, Fifth Edition, released 2021.

Troubleshooting

If any of the diagnostic indicators reveal a problem, check all connections and voltages to the unit. If all connections are made and reliable, and proper voltages are supplied to the unit, please contact www.bourns.com.

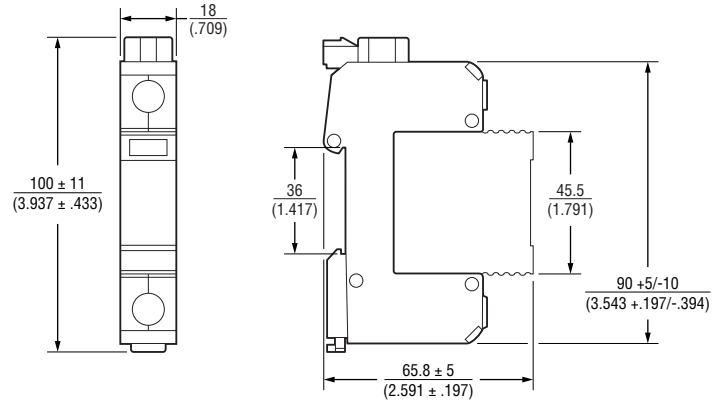
NOTE

This guide is not comprehensive. It is assumed that the user will follow established safety precautions for working in an electrical environment. For more information on safety precautions and procedures, please consult the related organizations listed below.

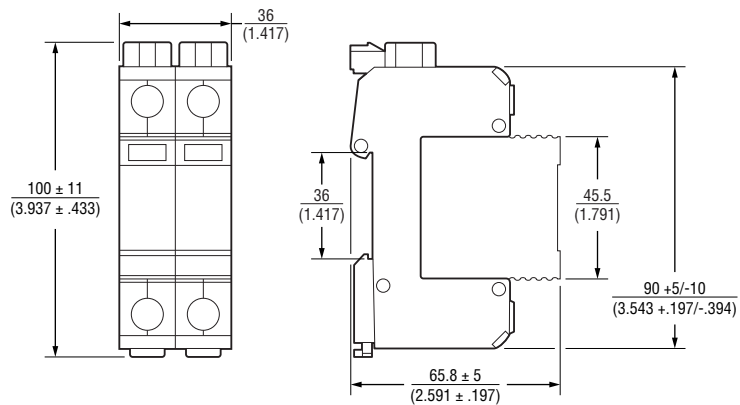
- Underwriters Laboratories (UL)
- American National Standards Association (ANSI)
- Institute of Electrical and Electronics Engineers (IEEE).
- National Fire Protection Association (NFPA)
- National Electrical Mfgs. Association (NEMA)
- International Electrotechnical Commission (IEC)

Product Dimensions

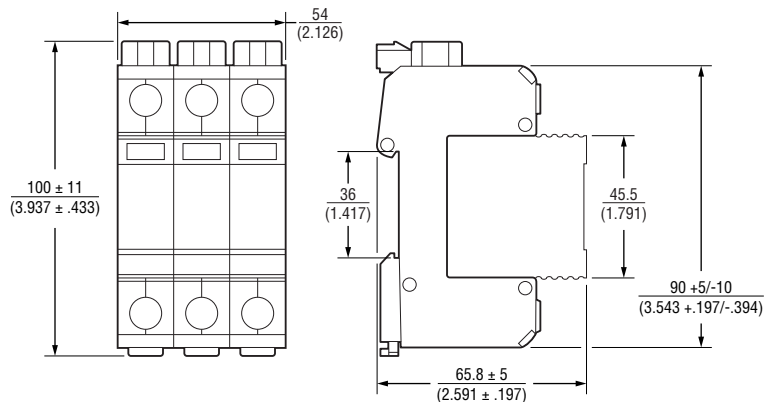
Single Pole, "I" Configuration



Two Poles, "V" Configuration



Three Poles, "Y" Configuration



DIMENSIONS: $\frac{\text{MM}}{(\text{INCHES})}$

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Specifications are subject to change without notice.

Users should verify actual device performance in their specific applications.

The products described herein and this document are subject to specific legal disclaimers as set forth on the last page of this document, and at www.bourns.com/docs/legal/disclaimer.pdf.