PSP series Surge Protective Devices

Category C1 series

(100~300 kA per phase)

The **PSP C1 series** are defined as high performance surge protection solution for most commercial and industrial environments with critical operations, and UL 1449 Type1/ 2 designed to protect against the harmful effects of transient surges. These surges are the result of:

– Direct and indirect lightning strikes

– Power company load switching

–Upstream load switching at other facilities

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PRODUCT SPECIFICATIONS

Note：* Items are optional

PSP category	C1
Certification	ANSI/UL1449 4th , Type 1 SPD
	ANSI/UL1449 4th , Type 2 SPD (With sine wave tracking function)
Connection Type	Parallel Connected
Ports	1
Surge capacity per phase	100~300 kA
Nominal discharge current (In)	20 kA
SCCR rating	200kArms
EMI/RFI filtering *	Sine wave tracking (for Type 2)
Lightning counter Current*	≥ 200A (with Reset button)
Failure pre-test *	Press 2S (test button)
Power Status Indication	Normal=Blue LED ON
Working Status Indication	Normal= Blue LED ON ; Fail= Blue LED turn to Red
Audible alarm	Buzzer inside, beep while SPD fail
Power Connecting	#10 AWG, 762mm (30") length A(L1)=black; B(L2)=red; C(L3)=blue; N=white; PE=green
Signal cable(Remote alarm)*	#16 AWG, 762mm (30") length C=red; NC=blue; NO=brown
Working environments	Temperature –40℃～+75℃, Humidity relative 5~95% (25℃) , Altitude≤3km
Storage	Temperature 0℃～+45℃, Humidity relative ≤75% (25℃)
Dimensions, W x D x H	200 x 150 x 100 mm
Threaded NPT	3/4"NPT
Enclosure	Plastic enclosure, NEMA 4X

The SPD Types Per ANSI/UL 1449 4th:

Type 1 – Permanently connected SPDs intended for installation between the secondary of the service transformer and the line side of the service equipment overcurrent device, as well as the load side, including watt-hour meter socket enclosures and Molded Case SPDs intended to be installed without an external overcurrent protective device. Type 1 SPDs for use in PV systems can be connected between the PV array and the main service disconnect.

Type 2 – Permanently connected SPDs intended for installation on the load side of the service equipment overcurrent device; including SPDs located at the branch panel and Molded Case SPDs.

Type 3 – Point of utilization SPDs, installed at a minimum conductor length of 10 meters (30 feet) from the electrical service panel to the point of utilization, for example cord connected, direct plug-in, receptacle type and SPDs installed at the utilization equipment being protected. The distance (10 meters) is exclusive of conductors provided with or used to attach SPDs.

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.

CONFIGURATION AND OPERATION

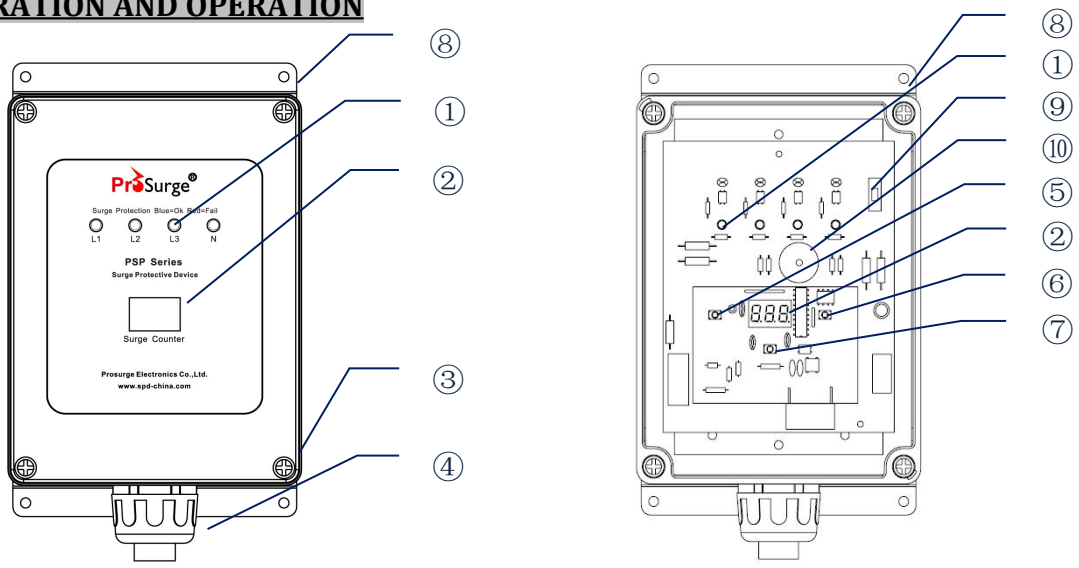


Fig 1: Diagram of PSP C1

① **Working Status Indication**, the line status LEDs provide visual indication of SPD health status. While the SPD is connected to the electrical system supply voltage, the line status indicators will be illuminated blue. There is one LED indicator per each protected phase on PSP Models. When the Line loses of protection, the LED will be illuminated red.

② **Lightning counter**, the lightning counter will detect the lightning strike /surge, and the screen will show the cumulative times of surge event, which can help user to investigate.

③ **Cover plate mounting screw**, to lock the cover.

④ **Threaded NPT**, 3/4" NPT, #10 AWG for power connection (L1=black; L2=red; L3=blue; N=white; PE=green); #16 AWG for remote signal connection (C=red; NC=blue; NO=brown).

⑤ **Failure pre-test button**, while press the button for 2 seconds, it will simulate that the protection mode of Line 1 failure, then the Working status indication of Line 1 will turn red, and remote signal (optional, if using) will change-over.

⑥ **Lightning Counting Circuit Reset Button**, press the button to reset the circuit /chip of surge counting.

⑦ **Lightning Counter reset button**, press this button to simply zero out the counter if needed.

⑧ **Fixed support,** used to mount the PSP models on the wall by bolt.

⑨ **Buzzer turn off/on toggle switch,** used to turn off/on buzzer.

⑩ **Buzzer**, buzzing while SPD fail.

INSTALLATION

Mounting – Mount unit as close as possible to the service panel, using mounting hardware. For best performance, unit should be positioned so that the length of the wiring to the surge protective device (SPD) unit is minimized.

Wire Sizing/Routing - #10 AWG and 762mm (30") length wiring is provided with unit. The length of wiring to the PSP must be kept at a minimum for the best performance, excess wires need to be cut and not coiled up. Wire lengths should be short, straight runs between the PSP and power source. To reduce the wiring impedance to surge currents, the phase, neutral (if required), and ground conductors are recommended to be twisted together and routed in the same race way (conduit). Avoid any sharp bends in the conductors. All wiring must comply with the National Electrical Code (NEC) and applicable local codes.

Conduit Connection - Feed all wires into the panel through the knockout selected and secure.

Wiring Connections – 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. Please check it according to below table 1.

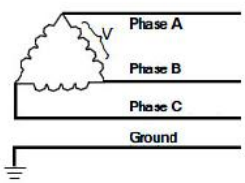
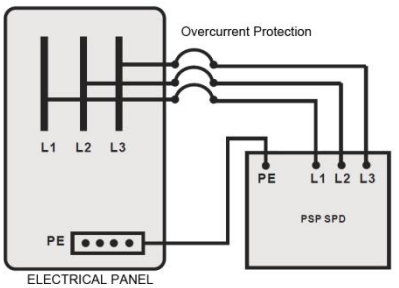
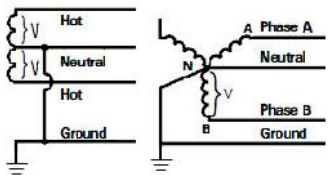
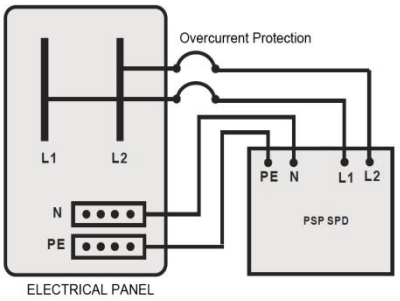
WARNING !

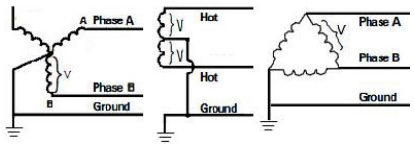
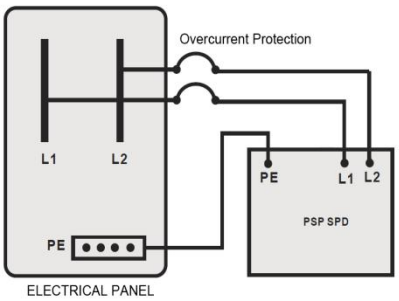
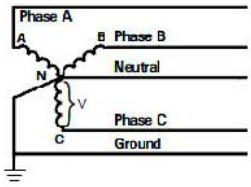
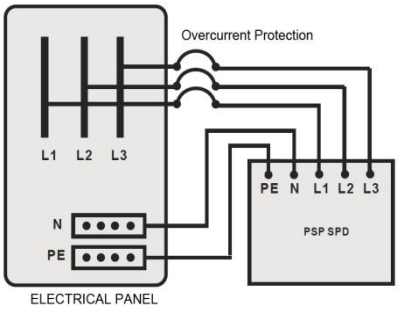
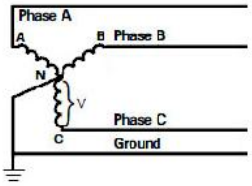
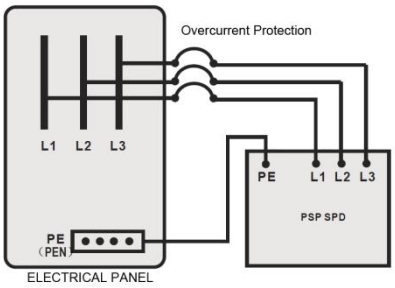
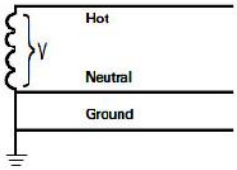
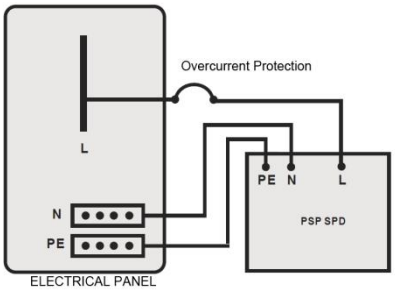
Select the proper PROSURGE PSP series SPD unit according to your system voltage, configuration and the anticipated surge environment.

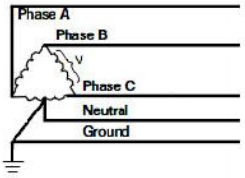
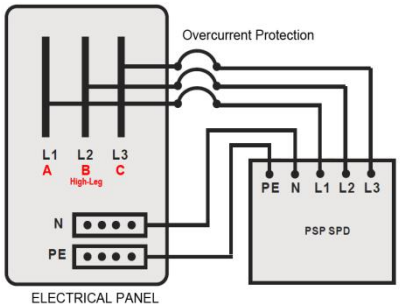
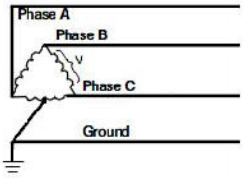
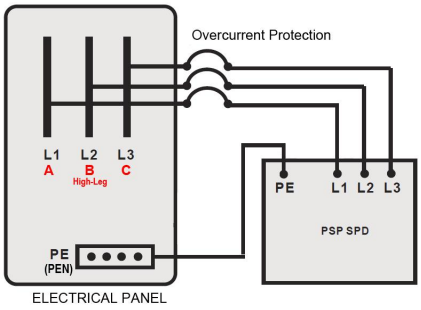
Prior to install the SPD, ensure that your facility electric supply system is properly installed and connected in according with all applicable national and local codes and safety procedure.

Never Hi-Pot test Any SPD. (Will prematurely fail SPD).

Table 1- Power distribution & wire connection

Part No.	Nominal Voltage Un (50/60Hz)	MCOV Uc	Power distribution	Wire connection
PSP240Dx2/T1CTA PSP240Dx2/T2FCTA	240 V	320 V	Three phase Delta, 3W+G 	
PSP480Dx2/T1CTA PSP480Dx2/T2FCTA	480 V	550 V		
PSP600Dx2/T1CTA PSP600Dx2/T2FCTA	600 V	690 V		
PSP120SPx2/T1CTA PSP120SPx2/T2FCTA	110-127V	150 V	Split phase or single/double phase, 3W+G 	

PSP240SPx2/T1CTA PSP240SPx2/T2FCTA	220-277V	320 V		
PSP120SPCx2/T1CTA PSP120SPCx2/T2FCTA	110-127V	150 V	Split phase or single/double phase (No neural), 2W+G 	
PSP240SPCx2/T1CTA PSP240SPCx2/T2FCTA	220-277V	320 V		
PSP120Yx2/T1CTA PSP120Yx2/T2FCTA	120/208 V	150 V	Three phase WYE, 4W+G 	
PSP127Yx2/T1CTA PSP127Yx2/T2FCTA	127/220 V	150 V		
PSP240Yx2/T1CTA PSP240Yx2/T2FCTA	240/415 V	320 V		
PSP277Yx2/T1CTA PSP277Yx2/T2FCTA	277/480 V	320 V		
PSP347Yx2/T1CTA PSP347Yx2/T2FCTA	347/600 V	420 V		
PSP120YCx2/T1CTA PSP120YCx2/T2FCTA	120/208 V	150 V	Three phase WYE (No neutral), 3W+G 	
PSP127YCx2/T1CTA PSP127YCx2/T2FCTA	120/208 V	150 V		
PSP240YCx2/T1CTA PSP240YCx2/T2FCTA	240/415V	320 V		
PSP277YCx2/T1CTA PSP277YCx2/T2FCTA	277/480 V	320 V		
PSP347YCx2/T1CTA PSP347YCx2/T2FCTA	347/600 V	420 V		
PSP120Sx2/T1CTA PSP120Sx2/T2FCTA	110-120 V	150 V	Single phase, 2W+G 	
PSP127Sx2/T1CTA PSP127Sx2/T2FCTA	127 V	150 V		
PSP240Sx2/T1CTA PSP240Sx2/T2FCTA	220-240V	320 V		
PSP277Sx2/T1CTA PSP277Sx2/T2FCTA	277 V	320 V		

PSP347Sx2/T1CTA PSP347Sx2/T2FCTA	347 V	420 V		
PSP120Hx2/T1CTA PSP120Hx2/T2FCTA	120/240(H) V	150/320(H) V	HI-LEG Delta(B high), 4W+G 	
PSP240Hx2/T1CTA PSP240Hx2/T2FCTA	240/480(H) V	320/550(H) V		
PSP120HCx2/T1CTA PSP120HCx2/T2FCTA	120/240(H) V	150/320(H) V	HI-LEG Delta(B high) (No neutral), 3W+G 	
PSP240HCx2/T1CTA PSP240HCx2/T2FCTA	240/480(H) V	320/550(H) V		

Note: "x" means number 2~6.

1. Connect Black /Red/Blue Phase Wires to corresponding phase on the service panel.
2. Connect the White wire of the SPD (if provided) to the neutral of the supply and the Green wire of the SPD to source ground.
3. If using remote sensing, connect the Red (COM), Blue (NC), and Brown (NO) wires (#16 AWG). If not using relay contacts for remote sensing, cut and dress wires.

Remote alarm contact type	Floating changeover contact
Remote Alarm Contact Capability Un/In	AC: 250V/5A DC: 30V/5A
Com-No Breakover	SPD Fault, need to be replaced
Com-Nc Breakover	SPD is OK

Suggested Circuit Breaker

Over current Protection: 30A Recommended.

In addition to safety, the dedicated breaker performs the following functions:

- Allows power to the protector's to be removed without interrupting power to other loads.
- Should a component fail inside the protector, only the protector's breaker will trip, and power to other loads is not disturbed.

Applying Power – Apply power to the SPD and assure status indications are normal. Under normal conditions, all Blue OK LEDs are illuminated. If normal status indication does not exist, red LEDS will be illuminated.

To be noticed that indication circuit is powered by L1 (or L, if single phase), if L1 (or L) is not connected to power line, the indication circuit will not work,

To be noticed that buzzer will beep briefly while the SPD is powered.

FAULT INDICATION

When the phase Line loses of protection, the LED on the front panel will be illuminated red. At the same time, the COM and NO remote signal contacts will be closing.

The buzzer will beep while

- SPD fail (one or more phase loss of protection)
- L1(or L, if single phase) is under-voltage
- While L1 (or L, if single phase) is loss, beep briefly (2s).

PRODUCT RATINGS AND LIMITATIONS

Voltage Protection Rating – To obtain the voltage protection ratings (VPRs), in accordance with the Standard for Safety, Surge Protective Devices (SPDs), Standard 1449 Fourth Edition, released 2014, indicated on this product, the wire supplied must be utilized to connect the SPD to your facilities power grid. Connections made with unapproved conductors may result in different VPRs.

Circuit Ampacity Limitations – This device has been investigated to withstand, without exposing live circuits or components on power sources, a voltage of two times (2x) the device ratings, and fault currents of up to200,000 AIC, as described in the Standard for Safety, Surge Protective Devices (SPDs), Standard 1449, Fourth Edition, released 2014.

NEMA 4X –NEMA 4X boxes provide a watertight protection against splashing water, indoor wash down from a commercial hose as well as ingress protection from dirt, rain, sleet, snow, ice and windblown dust. NEMA 4X provides an additional level of protection against corrosion.

NEMA 4X enclosures can be an equivalent replacement for International Protection Ratings: IP56 & IP66.

TROUBLESHOOTING

If any of the diagnostic indicators indicates 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.prosurge.com.

NOTE

This instruction is not comprehensive. It's assumed the user will follow established safety precautions for working in an electrical environment. For more information on safety precautions and procedures, please find from related organizations as below.

- *Underwriters Laboratories(UL)*
- *American National Standards Association(ANSI)*
- *Institute of Electrical and Electronics Engineers (IEEE).*
- *National Fire Protection Association (NFPA)*
- *National Electrical Manufacturers Association (NEMA)*

Installation Dimension

Note: units are in mm