PSP series Surge Protective Devices

PS series

(150~900 kA per phase)

The **PS series** are defined as ultra-Large surge capacity design 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

PRODUCT SPECIFICATIONS

Note：* Items are optional

SPD series	PS
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	150~900 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	AFM (Three stage indication) Normal= Blue LED ON ; Need replace= Yellow, Fail= Turn to Red
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℃～+85℃, Humidity relative 5~95% (25℃) , Altitude≤3km
Dimensions, W x D x H	350 x 370 x 223 mm
Threaded NPT	1"NPT
Enclosure	Metal enclosure, NEMA 4

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

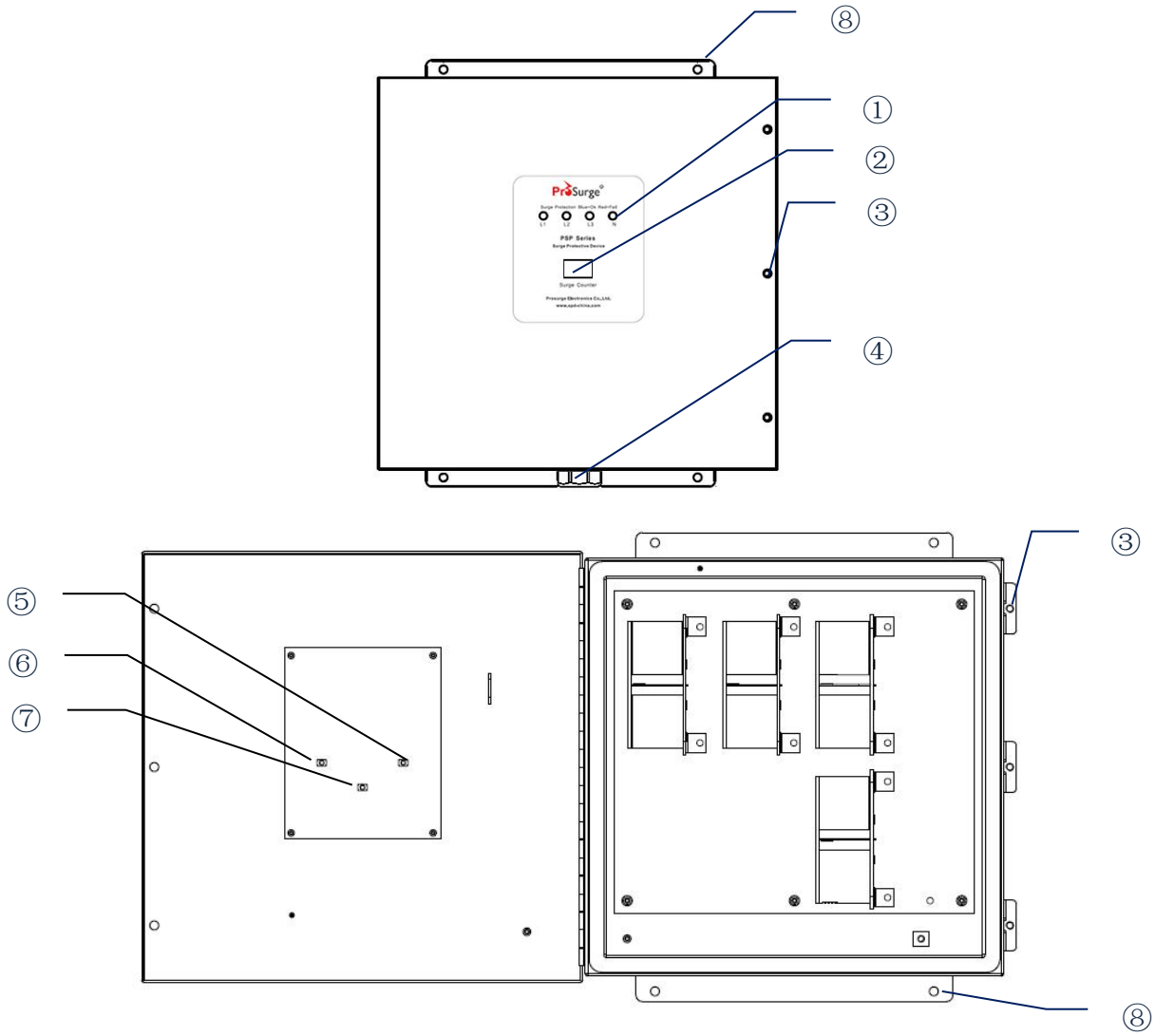


Fig 1: Diagram of PS

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 PS Models. When the Line loses of protection, the LED will be illuminated red.

While indicators is illuminated yellow, it means the potentially anticipatory failure of the panel SPD, at this point, the user is recommended to replace the panel SPDs. If the SPDs are not replaced, also they will continue to provide limited protection, but further overloads on the SPD, such as a follow up higher or repeated discharge of lightning currents, may lead to the increased risk of surge damage.

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**, 1" NPT, #8 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 Reboot Button**, press the button to reboot 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

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 PS 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 PS 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.

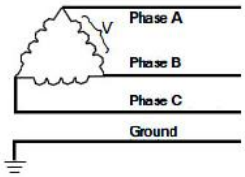
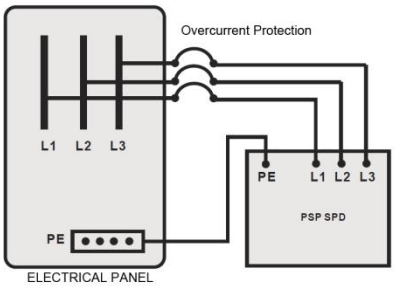
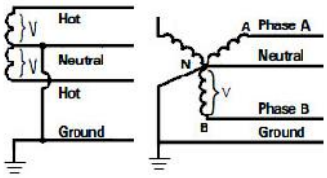
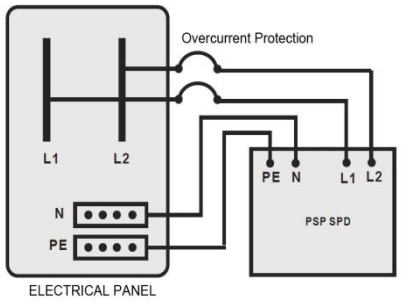
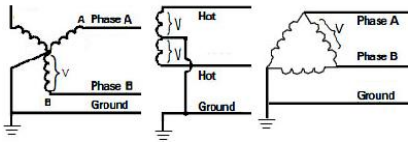
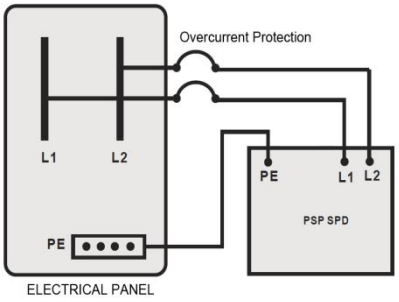
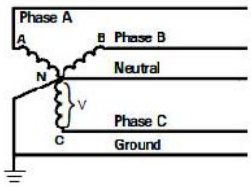
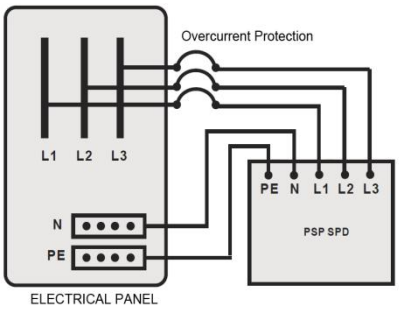
Wiring Connections – Before making connections to the unit, verify that the unit model number and nameplate voltage rating are appropriate for connection to the intended power source. Please check it according to below table 1.

WARNING !

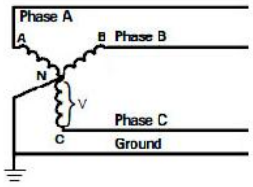
Select the proper PROSURGE PSP series SPD unit according to your system voltage, configuration and the anticipated surge environment.

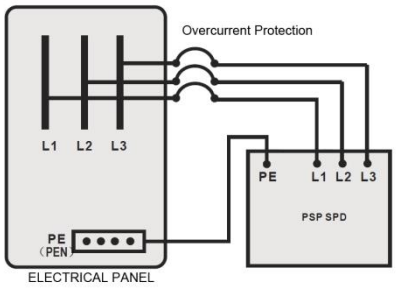
Prior to install the SPD, ensure that your facility electric supply system is properly installed and connected in according with all applicable national and local codes and safety procedure.

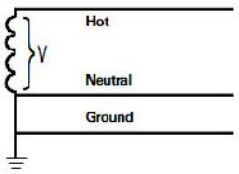
Table 1- Power distribution & wire connection

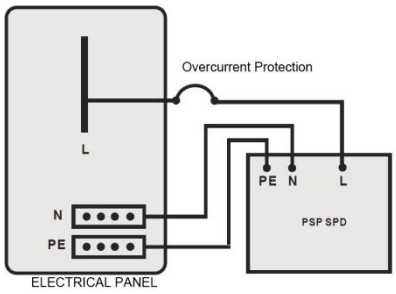
Part No.	Nominal Voltage Un (50/60Hz)	MCOV Uc	Power distribution	Wire connection
PS240D.../T1CA PS240D.../T2FCA	240 V	320 V	Three phase Delta, 3W+G 	
PS480D.../T1CA PS480D.../T2FCA	480 V	550 V		
PS600D.../T1CA PS600D.../T2FCA	600 V	690 V		
PS120SP.../T1CA PS120SPx2/T2FCA	120/208-240 V	150 V	Split phase or single/double phase, 3W+G 	
PS240S.../T1CA PS240SP.../T2FCA	240/415-480 V	320 V		
PS120SPCx1/T1CA PS120SPCx1/T2FCA	120 V	150 V	Split phase or single/double phase (No neural), 2W+G 	
PSP240SPCx1/T1CA PSP240SPCx1/T2FCA	240 V	320 V		
PS120Y.../T1CA PS120Y.../T2FCA	120/208 V	150 V	Three phase WYE, 4W+G 	
PS127Y.../T1CA PS127Y.../T2FCA	127/220 V	150 V		
PS240Y.../T1CA PS240Y.../T2FCA	240/415 V	320 V		
PS277Y.../T1CA PS277Y.../T2FCA	277/480 V	320 V		
PS347Y.../T1CA PS347Y.../T2FCA	347/600 V	420 V		

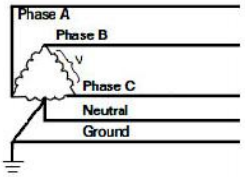
PS120YCx1/T1CA PS120YCx1/T2FCA	120/208 V	150 V	Three phase WYE (No neutral), 3W+G	
PS127YCx1/T1CA PS127YCx1/T2FCA	120/208 V	150 V		
PS240YCx1/T1CA PS240YCx1/T2FCA	240/415V	320 V		
PS277YCx1/T1CA PS277YCx1/T2FCA	277/480 V	320 V		
PS347YCx1/T1CA PS347YCx1/T2FCA	347/600 V	420 V		
PS120S.../T1CA PS120S.../T2FCA	120 V	150 V	Single phase, 2W+G	
PS127S.../T1CA PS127S.../T2FCA	127 V	150 V		
PS240S.../T1CA PS240S.../T2FCA	220-240V	320 V		
PS277S.../T1CA PS277S.../T2FCA	277 V	320 V		
PS347S.../T1CA PS347S.../T2FCA	347 V	420 V		
PS120H.../T1CA PS120H.../T2FCA	120/240 V	150/320 V	HI-LEG Delta(B high), 4W+G	
PS240H.../T1CA PS240H.../T2FCA	240/480 V	320/550 V		
PS120HCx1/T1CA PS120HCx1/T2FCA	120/240 V	150/320 V	HI-LEG Delta(B high) (No neutral), 3W+G	
PS240HCx1/T1CA PS240HCx1/T2FCA	240/480 V	320/550 V		

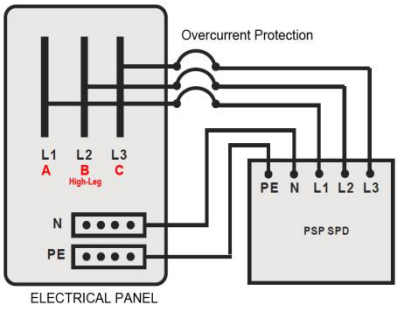


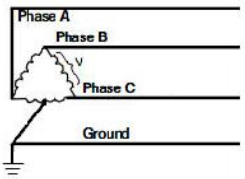


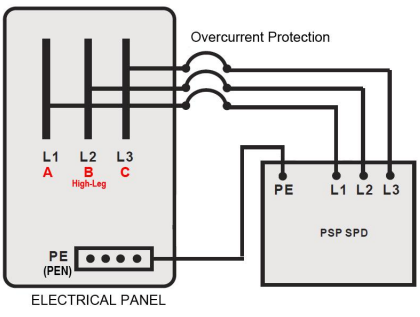












Note: "x" means number 3~6.

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 or potentially anticipatory failure. need to be replaced
Com-Nc Breakover	SPD is OK

Suggested Circuit Breaker

Over current Protection: 50A 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.

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