Multi-Phase Surge Protective Device

Cat. Nos. 57000

For main distribution and branch circuit panels

PK-93736-10-00-0C

INSTALLATION

ENGLISH

WARNINGS AND CAUTIONS:

- **TO AVOID FIRE, SHOCK, OR DEATH; TURN OFF POWER AT CIRCUIT BREAKER OR FUSE AND TEST THAT THE POWER IS OFF BEFORE WIRING!**
- TO BE INSTALLED AND/OR USED IN ACCORDANCE WITH LOCAL ELECTRICAL CODES AND REGULATIONS (INCLUDING NEC/CEC), AS APPLICABLE.
- IF YOU ARE NOT SURE ABOUT ANY PART OF THESE INSTRUCTIONS, CONSULT AN ELECTRICIAN.
- THIS DEVICE IS A SURGE PROTECTIVE DEVICE (SPD) AND MUST BE CONNECTED ON THE LOAD SIDE OF THE SERVICE ENTRANCE PER UL 1449.
- OPERATE INDOORS BETWEEN 30-90% RELATIVE HUMIDITY.

WARNINGS AND CAUTIONS:

- THIS DEVICE IS NOT A LIGHTNING ARRESTOR. IT WILL NOT SURVIVE LIGHTNING STRIKES IN CLOSE PROXIMITY TO THE PREMISES OR SUSTAINED OVERVOLTAGES.
- ELECTROCUTION, FATAL, OR SERIOUS INJURY AND PROPERTY OR EQUIPMENT DAMAGE CAN RESULT FROM FAULTY INSTALLATION AND/OR SERVICING. ALWAYS **TURN POWER OFF** BEFORE REPLACING MODULE.
- IT IS RECOMMENDED THAT THE 57000 SPD PANEL PROTECTION SYSTEM BE INSTALLED BY AN ELECTRICIAN.
- USE THIS DEVICE **WITH COPPER OR COPPER CLAD WIRE ONLY**.

DESCRIPTION

The 57000 SPD Panel Protection System is a high-performance Surge Protective Device designed for use on main distribution and branch circuit panels.

FEATURES

- Replaceable plug-in modules, which facilitate maintenance.
- Hybrid component suppression design.
- SPD protection on all phases.
- Common Mode SPD protection for WYE Systems.
- Redundant Phase Protection design, providing full phase protection in the event of failure or removal of any one module.
- Diagnostic monitoring of each phase module.
- Acoustic as well as visual failure indicators.
- Provisions for operation with an optional Remote Supervisor Panel, allowing monitoring of SPD status from distant locations.
- cULus - 57120, 57240, 57277 and 57480 models and CSA - 57347 & 57600 models
- 48-62 Hz operation.
- Location per IEC std: Class III.
- Optional surge counter with front panel LCD display.

TO INSTALL

1. **WARNING:** TO AVOID FIRE, SHOCK, OR DEATH; **TURN OFF POWER** AT CIRCUIT BREAKER OR FUSE AND TEST THAT THE POWER IS OFF BEFORE WIRING!
2. **Identify the device or load to be protected:** The 57000 Panel should be located as close as possible to the electrical panel serving the load to be protected in order to minimize connection lead length resistance and inductance.
3. **Identify the electrical system in use (Delta or WYE system voltage):** Matching SPD module and line voltages is critical! Identify the system in use by measuring L-N and L-L voltages.
   CAUTION: VOLTAGE MEASUREMENTS CAN BE DANGEROUS TO LIFE AND/OR PROPERTY! Confirm that the MAXIMUM measured voltages **DO NOT** exceed the AC RMS Voltage Rating specified on the 57000 Replaceable Modules, or damage may occur to the modules. **See Figs. 1-3.**
4. **Cutting Access Holes:** Cut holes for conduit in panel using approved metal cutting tools. Prevent any metallic filings from remaining inside the panel. If any metallic filings enter panel, care must be exercised to remove them using a vacuum device or other tools, as required.
   Mount securely: Refer to the *"Panel Mounting"* instruction sheet (enclosed).
   Conduit Installation: Conduit should be installed with lock nut and bushing. Lock nut should be adjusted so that bushing secures properly, and conduit and bushing extend as little as possible into enclosure.
5. **Connections:** With the line **POWER OFF**, remove Terminal Block Cover and connect leads using the largest stranded wire size possible (#10 to #3 AWG) as illustrated in the wiring diagrams. **Screw terminal torque requirements:** #10 AWG (35 in.-lbs.), #8 AWG (40 in.-lbs.), #3 - #6 AWG (45 in.-lbs.).
   Connecting wire lengths from the circuit breaker panel to the 57000's terminal block should be minimal (less than 18" if possible). Power leads may be connected to L1, L2, and L3 without regard to phase A, B, or C. **Figs. 4** illustrate method for connection lead attachment.
   In Method on Fig. 4, the SPD Panel provides a feed through connection between the circuit breaker panel and a load.
   NOTE: Maximum wire size is #3 AWG.
   This feed through hookup provides the best connection with regard to surge protection for the dedicated load. This type of connection is desirable when the branch feeds sensitive loads that need to be protected, such as a computer room or an area of electronic instrumentation. Note that protection components are in parallel with any loads.
   The SPD Panel should be mounted as close as possible to the circuit breaker panel to provide maximum surge protection to other branches fed by other circuit breakers within the circuit breaker panel. It should be noted that during installation or maintenance of the 57000 SPD Panel, the circuit breakers which feed the 57000 must be opened, therefore power to the load will be momentarily disconnected.
   NOTE: The load current is limited to wire size in use, but must not exceed 24 Amps, maximum continuous current.
   For maximum surge protection, the SPD Panel should be mounted as close as possible (no more than 18 inches) from the circuit breaker panel. Use wire size #10 to #3 AWG. In a variation of this connection, the panel circuit breakers can also feed a load by connecting the SPD panel to the circuit within an approved connection enclosure. In this case, the circuit breakers must be rated for this load. The SPD panel should be connected to these breakers through a 30-amp rated (minimum), 3-pole disconnect switch. This facilitates SPD disconnection for installation or maintenance without interrupting power to the load.
6. **Conduit attachment:** A 2-inch hole in the enclosure is recommended to be used for In-Out conduit connection.
   CAUTION: THE ENCLOSURE MUST BE PROPERLY GROUNDED BY USE OF #10 AWG MINIMUM SIZE COPPER WIRE ROUTED TO THE "G" TERMINAL LUG.
7. **Attaching the connection leads - SPD to power lines:**
   CAUTION: THE FOLLOWING INSTALLATION SHOULD BE PERFORMED WITH THE POWER OFF! ALWAYS TURN OFF POWER BEFORE WORKING ON THE SPD PANEL, SUCH AS WHEN CHANGING FUSES AND INSERTING OR REMOVING REPLACEABLE MODULES.
   The ground terminal within the SPD Panel is connected to the metal enclosure. For isolated ground systems, the isolated ground wire should not be connected to the In-Out ground terminals. However, as indicated in step 5, the enclosure must be grounded via a ground conductor to the ground terminal. With the power OFF, connect phase leads to L1, L2, and L3 without regard to phase A, B, or C. Connect the neutral, for WYE systems, to the neutral terminal. Connect ground to ground terminal. **Fig. 4** illustrate connection system which use circuit breakers (either dedicated or load sharing). Connection leads should be cut to length and wrapped. **Avoid sharp bends**. Lead wire insulation should not be cut or damaged except to expose ends for connection.
8. **Remote connection:**
   - Relay status circuit and contacts rated at 5 Amps. The voltage rating is 250VAC/30VDC. Contacts accommodate 20-12 AWG wire secured to terminals using 3.5 in.-lbs. of torque. Wiring must be rated 600 VAC, dressed and secured away from live parts and protected from sharp edges and door entrapment. Hole must be cut in enclosure for conduit connection. If surge protection fails, continuity will be between the "NO" and "C" contacts.
     NOTE: If surge suppression failure has occurred, a transient surge has exceeded the rating of the module and it should be replaced immediately.
   - A 7/8 inch hole cut on the hinged side of the enclosure is recommended for the Remote Supervisor Panel connections. See Remote Supervisor Panel instructions for its connection method.
9. **Battery Installation:** A 9-Volt alkaline battery is included in the shipping carton. The purpose of the 9-Volt battery is to power the diagnostic warning circuitry in the event of a power failure or multiple fuse failures. Remove the battery holder from the diagnostic assembly. Insert the 9-Volt battery (be sure to follow the polarity markings on the battery compartment), and slide the battery holder back in.
10. **Secure modules** and replace terminal block cover. Be certain all SPD Modules are tightly in place and remove any extra materials. Close and secure enclosure cover door before applying power.
11. **Activate the system by turning AC power ON:** The 6 Green Module Status lights should be illuminated and visible through the ports in the enclosure door, and all other lights should be OFF. If problems are encountered that can not be resolved using the Problem Isolation Procedure printed on the inside of the enclosure door, contact Leviton Technical Support: 1-800-824-3005.
12. **Diagnostic Test:** Press and hold down the test button. The Red warning indicator should blink, the audible tone signal should beep, the Yellow low battery light should illuminate, and the Remote Supervisor Panel warning indicator, if wired in, will be activated. Release the test button.
13. **Surge Counter Test:** If the 57000 Panel has a LCD surge counter on it's front panel, press it's "Reset" switch, then the "Test" switch. The display should register surge counts each time the "Test" switch is depressed. The "Reset" switch should be depressed whenever the LCD display is at a maximum (the LCD unit's red LED will be illuminated). "Reset" may be depressed anytime to clear the display.

SERVICING INSTRUCTIONS

Leviton Series 57000 SPD Servicing Instruction Procedure: Carefully read these instructions as well as the Module and Fuse Replacement Instruction Procedure before attempting service.

CAUTION: BEFORE OPENING SPD ENCLOSURE COVER, POWER MUST BE TURNED OFF. ELECTROCUTION AND FATAL OR SERIOUS INJURY AND PROPERTY DAMAGE CAN RESULT FROM FAULTY SERVICING. IT IS RECOMMENDED THAT THE 57000 SPD PANEL PROTECTION SYSTEM BE SERVICED BY AN ELECTRICIAN.

Diagnostic Indicator Functions: Table 1 lists the diagnostic functions of the 57000 series panels.

Module Diagnostics: Each module contains two Green LEDs. When illuminated, they indicate that the module is properly seated, power for that phase is present, and the protection fuse for that module is intact. **For the 57000-M3**, one of the two LEDs indicates proper functioning of the primary surge protection circuitry, while the other LED monitors the alternate (back-up) surge protection circuitry. Alternate surge protection circuitry is located in a different module than the primary protection for any phase. Therefore, if one module fails or is removed, all phases retain their surge protection (at a reduced level).

Modules should be replaced as soon as possible after a failure is noted (unlit Green LED). Absence of illuminated LEDs indicates either a loss of power or a blown fuse due to excessive transients, such as due to a direct lightning strike. When this occurs, refer to the Module LED/Fuse Correspondence Chart (located inside panel door) for the list of the Green LED indicators and their designated fuses.

Fault Indication: A flashing Red warning LED, in addition to an audible beep tone, indicates loss of power to the modules. This can be due to the absence of main phase power, or a blown fuse caused by module failure due to transient over-stress (a condition which causes the Fault Indication). It also transmits the occurrence to a remote indicator (an accessory item) via an optically isolated Class II wire pair.

NOTE: (For Delta panels only). If the Red LED flashes and the audible tone is activated, but all Green module LEDs are illuminated, the cause is an open phase voltage rather than an open fuse.

Beep Disable Switch: When a fault has been indicated and noted by authorized personnel, the audible beep tone may be disabled by momentarily pressing the beep disable switch. The Red warning LED will continue to flash. When the malfunctioning fuse and module have been replaced, the beep disable switch should be pressed again in order to re-enable the audible beep tone.

Battery Function: In the unlikely event that more than one fuse has blown, a 9-volt alkaline battery is utilized to power the diagnostic circuitry so as to alert the user that there is a problem. When this occurs, the flashing Red warning LED, audible beep tone, and remote transmitter are activated. When multiple Green module LEDs are OFF, it is probable that the unit's diagnostic circuitry is being powered from the battery. In order to conserve battery life, it is recommended that the user press the beep disable switch to turn OFF the audible beep. After the fuses and modules are replaced, the Red flashing LED will turn OFF. Press the beep disable switch in order to reactivate the audible warning tone.

Battery Disable: The unit is shipped with the battery disable switch in the disable position so the battery will not continually discharge in the absence of AC power. When AC power is first applied, the Red battery-disable LED and Yellow low-battery LED will be lit. The battery disable switch should be pressed momentarily to enable the battery. This will be indicated by both the battery disable and low battery LEDs turning OFF.

Low Battery Indication: An illuminated Yellow LED indicates an abnormally low battery condition. This may be due to low battery voltage or a missing battery. When this happens the Red warning LED will flash, the audible beep will sound, and the remote indicator will be enabled. When the user is alerted to the warning status, the illuminated condition of the Yellow LED and the lighted condition of all the Green module LEDs denotes a battery fault and not a SPD module power or fuse fault. The Disable Battery switch should then be pressed to silence the audible alarm beep, flashing LED, and remote warning for the battery malfunction. The Yellow LED may remain illuminated as a reminder that the battery needs replacing. This action re-enables the warning function to continue to monitor SPD faults. When the battery is replaced, the Disable Battery switch should be momentarily pressed. A fresh battery will cause the Yellow LED to turn OFF and will re-enable the Low Battery warning function after pressing the battery disable switch.

Battery Replacement: Press battery holder and slide battery out. Be sure to follow the battery polarity marking on the battery compartment.

Test Switch: A "Press to Test Switch" enables the user to test for proper operation of all the functions described. When the test switch is held down, the following functions will occur:

- The Yellow low battery LED will illuminate.
- The Red warning LED will flash.
- The audible tone beeper will sound.
- The Remote Warning Supervisor (an accessory item), if wired in, will be activated, thus also testing the Remote unit.

WEB VERSION

Table 1 - Diagnostic Indicator Functions: List of the diagnostic functions of the 57000 series panels.						**Beeper** (“Audio Alarm”)		**Battery Disable** (“Low Battery”)		**Self Test** (“Test”)
Mode	**Fault LED (Red)**	**Beeper**	**Remote**	**Module LEDs (Green)**	**Battery Status LED (Yellow)**	**Disable Button**	**Disable LED**	**Disable Button**	**Disable LED**	**Momentary Action Button**
Normal	OFF OFF	OFF OFF	OFF OFF	ON ON	OFF OFF	OUT IN	OFF ON	OUT OUT	OFF OFF	OUT OUT
Module Fault	ON ON	ON OFF	ON ON	one or more OFF	OFF OFF	OUT IN	OFF ON	OUT OUT	OFF OFF	OUT OUT
Low Battery	ON OFF	ON OFF	ON OFF	ON ON	ON ON	OUT OUT	OFF OFF	OUT IN	OFF ON	OUT OUT
No AC Power	ON ON OFF	ON OFF OFF	ON ON ON	OFF OFF OFF	OFF OFF OFF	OUT IN OUT	OFF OFF OFF	OUT OUT IN	OFF OFF OFF	OUT OUT OUT
Self Test	ON	ON	ON	ON	ON	OUT	OFF	OUT	OFF	IN

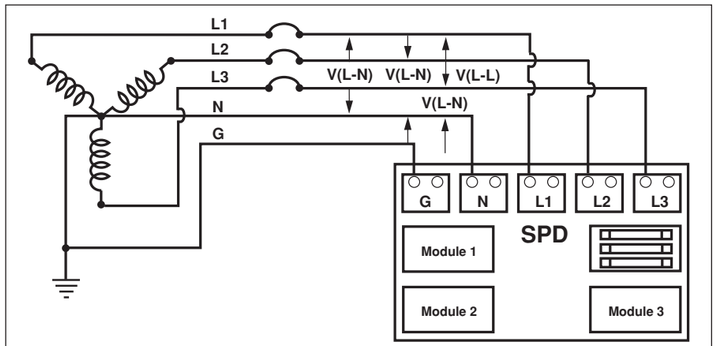

Fig. 1 - Three Phase, 4 Wire with Ground, WYE

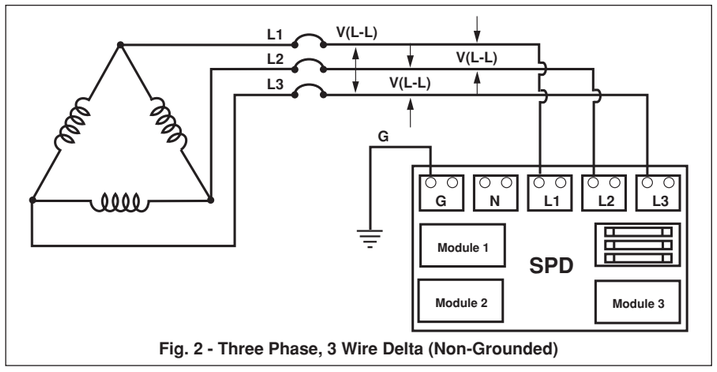

Fig. 2 - Three Phase, 3 Wire Delta (Non-Grounded)

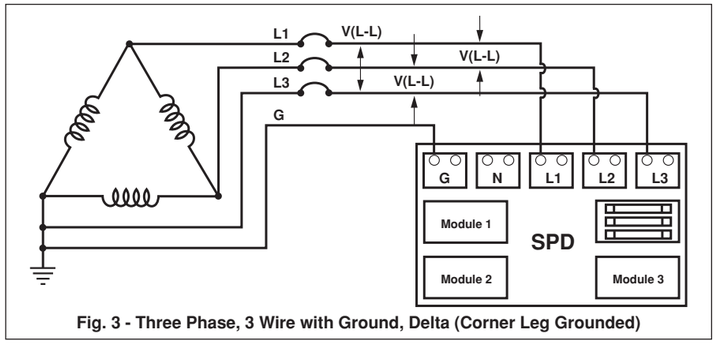

Fig. 3 - Three Phase, 3 Wire with Ground, Delta (Corner Leg Grounded)

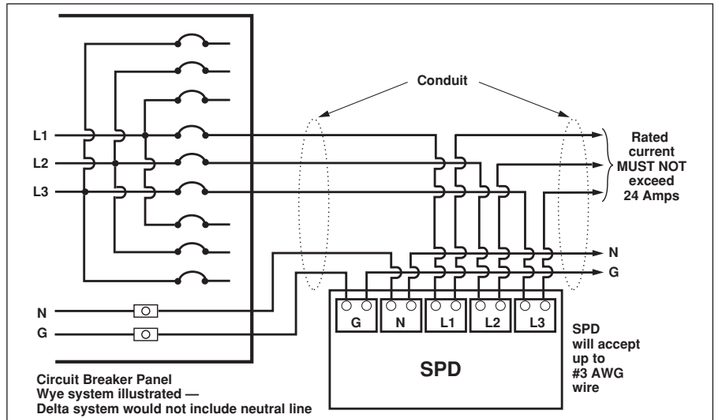

Fig. 4 - SPD Feed Through Connection

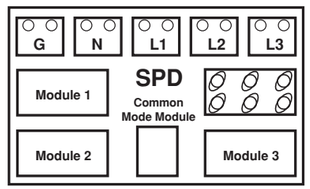

Fig. 5 - Fuse Configuration for Cat Nos. 57347 & 57600

LIMITED 5 YEAR WARRANTY AND EXCLUSIONS

Leviton warrants to the original consumer purchaser and not for the benefit of anyone else that this product at the time of its sale by Leviton is free of defects in materials and workmanship under normal and proper use for five years from the purchase date. Leviton’s only obligation is to correct such defects by repair or replacement, at its option. **For details visit www.leviton.com or call 1-800-824-3005.** This warranty excludes and there is disclaimed liability for labor for removal of this product or reinstallation. This warranty is void if this product is installed improperly or in an improper environment, overloaded, misused, opened, abused, or altered in any manner, or is not used under normal operating conditions or not in accordance with any labels or instructions. **There are no other or implied warranties of any kind, including merchantability and fitness for a particular purpose**, but if any implied warranty is required by the applicable jurisdiction, the duration of any such implied warranty, including merchantability and fitness for a particular purpose, is limited to five years. **Leviton is not liable for incidental, indirect, special, or consequential damages, including without limitation, damage to, or loss of use of, any equipment, lost sales or profits or delay or failure to perform this warranty obligation**. The remedies provided herein are the exclusive remedies under this warranty, whether based on contract, tort or otherwise.

For Technical Assistance Call: 1-800-824-3005 (USA Only) or 1-800-405-5320 (Canada Only) www.leviton.com

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