



Wiring Device-Kellems

HUBBELL

SURGE PROTECTIVE DEVICES

SPIKESHIELD® BRANCH PANEL Non-Modular Surge Protective Device (SPD)

Installation Instruction

Catalog Numbers:

HBL3P120B
HBL4P120B
HBL6P120B
HBL8P120B
HBL10P120B



Contents

Precautions	3
Introduction	5
Unpacking and Preliminary Inspection	5
Storage	5
Safety Labels	5
Identification Nameplate	6
Installation Considerations	6
Environment	6
Audible Noise	6
Mounting	6
Service Clearance	6
Equipment Performance	6
Electrical	7
Voltage Rating	7
Terminals, Wire Size, and Installation Torque	8
Branch Circuit Overcurrent Protection and Disconnect Means	8
Integral Switch	9
Location of SPD	9
Grounding	10
Installation	11
Conduit Location and Recommendations	11
Special Enclosure Considerations	11
Removing and Reconnecting the RJ45 Patch Cables	11
NEMA 3R Applications	11
Optional Flush Mounting	11
Optional Integral Switch	11
Wiring	12
Wiring Diagrams without Integral Switch	13
Wiring Diagrams with Integral Switch	14
Operation	15
LED Status Indicators	15
Audible Alarm	16
Surge Counter	16
Dry Contacts	17
Remote Monitor Option	18
Maintenance and Troubleshooting	19
Preventive Maintenance	19
Troubleshooting	20
Replacement Parts	20

Precautions

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION

LOSS OF BRANCH CIRCUIT POWER/LOSS OF SURGE SUPPRESSION

- Ensure that the branch circuit breaker or fuse trip characteristic has been coordinated with the overcurrent components inside the SPD (See Tables 1 and 2).
- Perform periodic inspection of the SPD status indicator lights as part of the preventative maintenance schedule.
- Promptly service the SPD when an alarm state exists.
- Use dry contacts to signal an alarm state to the central supervisory system for unmanned, inaccessible, or critical installations.
- Use multiple SPDs to achieve redundancy for critical applications.

Failure to follow these instructions can result in injury or equipment damage.

At end-of-life conditions, Surge Protective Devices (SPDs) can lose their ability to block power system voltage and attempt to draw excessive current from the line. This SPD is equipped with overcurrent and overtemperature components that will automatically disconnect the surge suppression elements from the mains should the surge suppression elements reach end of life. Tripping of the branch circuit breaker or fuse feeding the SPD can occur. Mitigate the tripping of the branch circuit breaker or fuse feeding the SPD by coordinating the surge suppression elements with the branch circuits.

For the purposes of coordination, the SPD is equipped with overcurrent components that will limit the per phase I^2t , I_{apparent} , I_p , and I_{th} values to those listed in tables 1 and 2 when connected to a power system with a short-circuit current rating not exceeding 200,000 A.

Table 1: SPD Without Optional Sine Wave Tracking Module

SPD Device	Per Phase I ² t	I _{apparent}	I _p	I _{th}
HBL_P120B	175 kA ² seconds	17,000 A RMS	40,000 A RMS	220 A

Table 2: SPD With Optional Sine Wave Tracking Module

SPD Device	Per Phase I ² t	I _{apparent}	I _p	I _{th}
HBL_P120B	240 kA ² seconds	21,500 A RMS	48,000 A RMS	260 A

⚠ CAUTION

LOSS OF SURGE SUPPRESSION

- Do not energize the SPDs until the electrical system is completely installed, inspected, tested, and all conductors have been connected and functional, including the neutral.
- Verify the voltage rating of the device and system before energizing the SPD.
- Disconnect the SPD, including the neutral, from the power source before performing high-potential insulation testing or any tests where SPD components will be subjected to voltages higher than their rated turn-on voltage.

Failure to follow these instructions can result in injury or equipment damage.

Introduction

NOTE: Type 2 SPDs are designed for use on the load side of the service entrance Overcurrent Protection Device (OCPD).

NOTE: For assistance, call a Hubbell representative at 1-800-729-3406.

Unpacking and Preliminary Inspection

Storage

Safety Labels

⚠ DANGER
HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH
<ul style="list-style-type: none">• Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.• This equipment must only be installed and serviced by qualified electrical personnel.• Turn off all power supplying this equipment before working on or inside equipment.• Always use a properly rated voltage sensing device to confirm power is off.• Replace all devices, doors and covers before turning on power to this equipment.• This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.
Failure to follow these instructions will result in death or serious injury.

Proper installation is imperative to maximize the surge protective device's effectiveness and performance. The installer should follow the steps outlined in this instruction bulletin to ensure proper installation. Read the entire instruction bulletin before beginning the installation. These instructions are not intended to replace national or local electrical codes. Check all applicable electrical codes to verify compliance. Installation of surge suppressors should only be performed by qualified electrical personnel

Inspect the entire shipping container for damage or signs of mishandling before unpacking the device. Remove the packing material and further inspect the device for any obvious shipping damage. If any damage is found and is a result of shipping or handling, immediately file a claim with the shipping company.

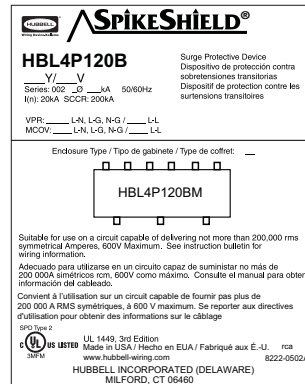
The device should be stored in a clean, dry environment. Storage temperature is -40 °F to +149 °F (-40 °C to +65 °C). All of the packaging materials should be left intact until the device is ready for installation.

English versions of all safety labels (danger, warning, caution) are provided.

Identification Nameplate

The identification nameplate is located on the inside of the door/cover.

Figure 1: SPD Nameplate Example



Installation Considerations

Environment

The device is designed to operate in an ambient temperature range of -4 °F to +149 °F (-20 °C to + 65 °C) with a relative humidity of 0 to 95% non-condensing. Refer to the product catalog for further details on enclosures. All SpikeShield® SPDs operate normally without reduction in performance when subjected to shock and vibrations described in IEC 60721-3-3, Class 3M4.

Audible Noise

The device background noise is negligible and does not restrict the location of the installation.

Mounting

The device is designed to be surface or flush mounted. Refer to the device submittal drawings or the product catalog for typical mounting dimensions and weight.

Service Clearance

The service clearance should meet all applicable code requirements.

Equipment Performance

To obtain the maximum system performance, locate the device as close to the circuit being addressed as possible to minimize the interconnecting wiring length. For every foot of wire length, approximately 160 volts (6 kV / 3 kA, 8/20 microsecond) is added to the suppressed voltage. The Voltage Protection Rating (VPR) is located on the device nameplate and is measured 6 inches from the device terminals, according to UL 1449 Third Edition.

Electrical

Voltage Rating

⚠ DANGER

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Confirm the SPD voltage rating on the module or nameplate label is the same as the operating voltage.

Failure to follow these instructions will result in death or serious injury.

Prior to mounting the SPD, verify that the device has the same voltage rating as the power distribution system in which it is installed. Compare the nameplate voltage or model number on the SPD with the nameplate of the electrical distribution equipment.

The specifier or user of the device should be familiar with the configuration and arrangement of the power distribution system in which any SPD is to be installed. The system configuration of any power distribution system is based strictly on how the secondary windings of the transformer supplying the service entrance main or load are configured. This includes whether or not the transformer windings are referenced to earth via a grounding conductor. The system configuration is not based on how any specific load or equipment is connected to a particular power distribution system. See Table 3 for the service voltage of each SPD.

Table 3: Voltage Ratings

Service Voltage	Peak Surge Current Rating Per Phase	Catalog Number
120/240 V, 1 phase, 3 wire	120 kA	HBL3P120B
120/208Y, ¹ 3 phase, 3-4 wire	120 kA	HBL4P120B
240/120 V, 3 phase, 4 wire (high-leg delta)	120 kA	HBL6P120B
277/480Y V, ² 3 phase, 3-4 wire	120 kA	HBL8P120B
347/600Y V, 3 phase, 3-4 wire	120 kA	HBL10P120B

¹ 120/208Y series also applies to the following voltage 127/220Y

² 277/480Y series also applies to the following voltages 220/380Y, 230/400Y, 240/415Y

Terminals, Wire Size, and Installation Torque

Terminals are provided for phase (line), neutral, and equipment ground connections. The terminals accept a range of 12 AWG (3 mm²) to 2 AWG (34 mm²) copper wire for phase, neutral, and ground connectors. Torque connections to the following values.

Table 4: Terminal Torque

Power Connection	Torque
AØ, BØ, CØ and N	35 lb-in. (4 N•m)
Ground	

Branch Circuit Overcurrent Protection and Disconnect Means

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Use conductors rated for the Overcurrent Protection Device (OCPD) per applicable codes.
- Use conductors rated for the application per applicable codes.

Failure to follow these instructions will result in death or serious injury.

A branch circuit Overcurrent Protection Device (OCPD) either in the form of a circuit breaker or fuse, must be provided for the SPD device. The branch circuit OCPD should either provide or include a disconnecting means.

Since the current drawn by the SPD during standby operation is negligible, the device can be connected to a dedicated, separate branch circuit or connected to a suitable existing branch circuit.

- When connected to a separate, dedicated branch circuit, the OCPD setting must be selected to protect the conductors feeding the SPD device.
- When connected to an existing branch circuit, the conductors connected to the SPD device must have an ampacity not less than the setting of the existing OCPD. Refer to Terminals, Wire Size, and Installation Torque section above, for the maximum conductor cross-section that can be connected to the SPD.

During overvoltage surge diversion, current will flow through the SPD. The branch circuit OCPD must pass this current without tripping for the SPD to function properly.

For further information concerning coordination of the OCPD with the SPD, refer to the Caution statement “Loss of Branch Circuit Power/Loss of Surge Suppression” on page 3.

Integral Switch

The integral switch is a mechanical means for qualified electrical personnel to isolate the entire surge suppressor to service the device's components. The switch opens the phase and neutral connections to the surge protective device.

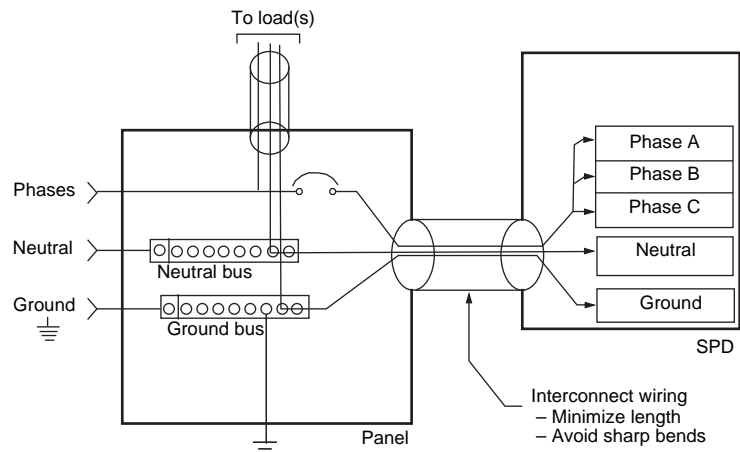
The integral switch feature allows the SPD device to be isolated for service without the necessity of interrupting power on the entire branch circuit. Turn switch handle to the OFF (O) position prior to opening the door of the unit. With the handle in the OFF (O) position, the SPD will be disconnected from the circuit and the circuit will not have surge suppression. Once the absence of voltage is verified, maintenance may now be performed inside the SPD enclosure. Upon completion of repairs, close the door of the unit and turn the handle to the ON (I) position.

Location of SPD

Install Type 2 SPDs on the load side of the main Overcurrent Protection Device (OCPD) to comply with NEC Article 285 for Type 2 SPDs.

Locate the SPD as close as possible to the circuit being addressed to minimize the wire length and optimize SPD performance. Avoid long wire runs so that the device will perform as intended. To reduce the impedance that the wire displays to surge currents, the phase, neutral, and ground conductors must be routed within the same conduit and tightly bundled or twisted together to optimize device performance. Avoid sharp bends in the conductors. See Figure 2.

Figure 2: SPD Wiring



Grounding

⚠ WARNING

HAZARDOUS TOUCH VOLTAGE

- Connect the SPD ground terminal to the building grounding grid structure.
- Use an appropriately sized equipment grounding conductor.
- When using metallic raceway or conduit:
 - Do not use the SPD ground unless augmented with an insulated equipment grounding conductor installed inside the metallic raceway or conduit.
 - Do not use isolated bushings to interrupt the metallic raceway or conduit.
 - Maintain electrical continuity at all raceway and conduit connections using appropriate bonding devices.
- Do not use a separate isolated ground for the SPD.
- Verify proper equipment connection to the grounding system.
- Verify ground grid continuity by performing regularly scheduled inspections and testing as part of a comprehensive electrical maintenance program.

Failure to follow these instructions can result in death or serious injury.

The SPD product has leakage current to ground when energized and can present a hazardous touch voltage.

The device has SPD components connected from phase to ground. To prevent hazardous touch voltage on the SPD enclosure during normal operation or during SPD end-of-life, it is critical that there be a robust and effective connection to the building grounding structure. The grounding connection must utilize an equipment grounding conductor run with the phase and neutral (if present) connection of the power system. The SPD should not be connected to a separate isolated ground.

When metallic raceway is used as the wiring method, an insulated grounding conductor should be run inside the raceway and sized in accordance with all applicable codes. Maintain electrical continuity at all raceway connections using appropriate bonding devices and do not install isolating bushings to interrupt a metallic raceway run.

For best overvoltage suppression by the SPD, use a single-point ground system where the service entrance grounding electrode system is connected to and bonded to all other available electrodes, building steel, metal water pipes, driven rods, etc. (for reference, see IEEE 142-2007). The ground impedance measurement of the electrical system should be as low as possible, and in compliance with all applicable codes.

SPD rated for use on solidly-grounded power systems must not be connected to resistance-grounded (for example HRG) or ungrounded power systems. Such a connection can result in damage to the components within the SPD product.

Installation

⚠ DANGER

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- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

Conduit Location and Recommendations

The recommended conduit entry is at the bottom of the device enclosure. Use a conduit seal that is appropriate for the enclosure rating.

Special Enclosure Considerations

Removing and Reconnecting the RJ45 Patch Cables

The RJ45 patch cables are marked with matching phase connections. If any of the cables are removed, reconnect the cables as marked.

NEMA 3R Applications

Remove screws from the bottom of the enclosure to create drain holes.

Optional Flush Mounting

The flush mount collar option provides a mechanical means to install the surge suppressor flush to the surface of sheetrock or firewall construction.

Optional Integral Switch

After making electrical cable connections to the SPD integral switch and prior to energizing the SPD, ensure that the line barrier is in place and intact.

Wiring

⚠ DANGER

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- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

Confirm the SPD voltage rating on the module or nameplate label is the same as the operating voltage.

Failure to follow these instructions will result in death or serious injury.

Follow the steps listed below when making wiring connections.

1. Turn off all power supplying this equipment before working on or inside any enclosure containing this equipment.
2. Confirm the SPD voltage rating and configuration is the same as the system voltage and power system configuration to which it will be connected.
3. Identify proper location for surge protective device. Locate as close as possible to the panel being addressed so the wires are as short as possible. Mount unit securely.
4. Install in accordance with National Electrical Code® (NEC®) and local electrical codes for overcurrent protection recommendations and wire ampacity considerations.
5. Twist conductors 1/2 turn or more for every 12 inches of length. Do not loop or coil wires. Be sure to maintain adequate wire bending space per NEC.
6. If the remote signaling contacts of the diagnostic display panel are to be used, refer to the section, “Dry Contacts”, on page 17 for wiring instructions.
7. On a high-leg delta installation, note the high leg connection per wiring diagram. See Figure 5.
8. Replace all devices, doors, and covers, including the line barrier for the optional integral disconnect, before turning on power to the equipment. If the SPD is properly installed and functioning, the green LED indicators on the display will be lit.

If you have any questions pertaining to the installation of this device, contact Hubbell at 1-800-729-3406.

NOTE: The surge protective device must be installed in an accessible location as described in the NEC®.

NOTE: The neutral connection is not present on 3-wire, 3-phase wye ground or 2-wire single-phase mid-point ground power systems. For these systems, bond the neutral and ground lugs together in the SPD. For installing wiring see Figures 3 through 8.

NOTE: See “Terminals, Wire Size, and Installation Torque” section for the acceptable wire size and installation torque on page 8.

NOTE: Always install the SPD on the LOAD side of the main Overcurrent Protection Device (OCPD).

Wiring Diagrams without Integral Switch

Figure 3: Single-Phase, 3-Wire, Grounded Installation

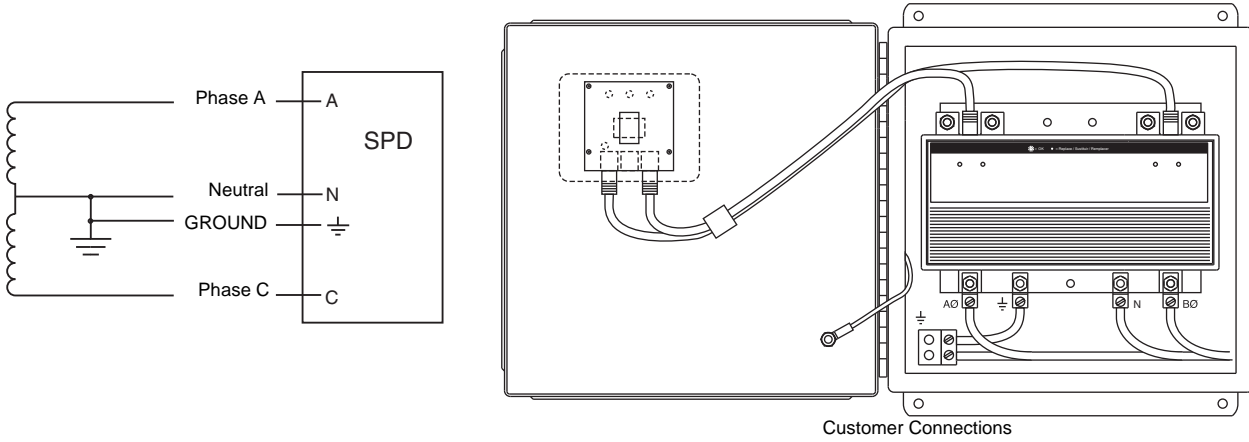
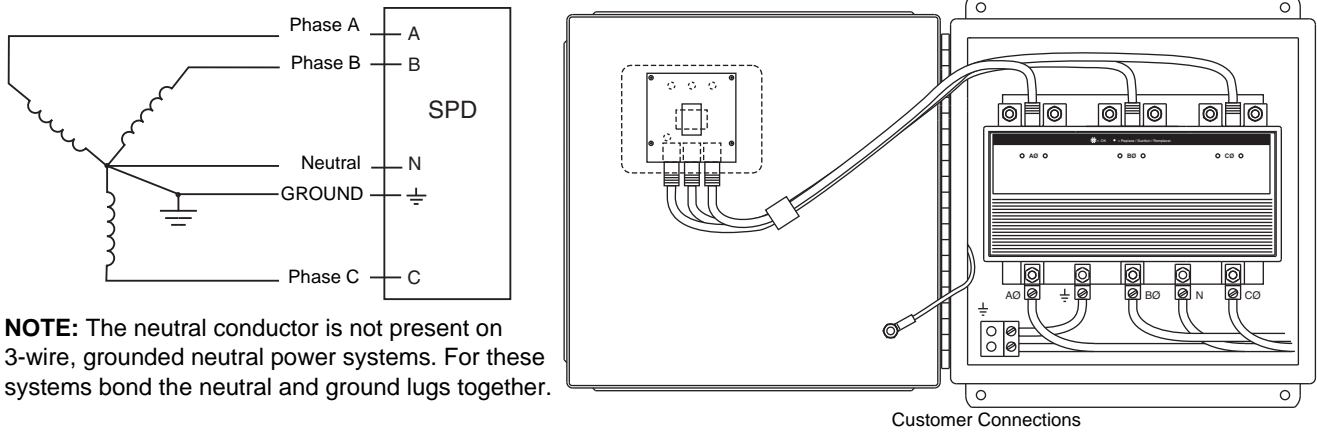
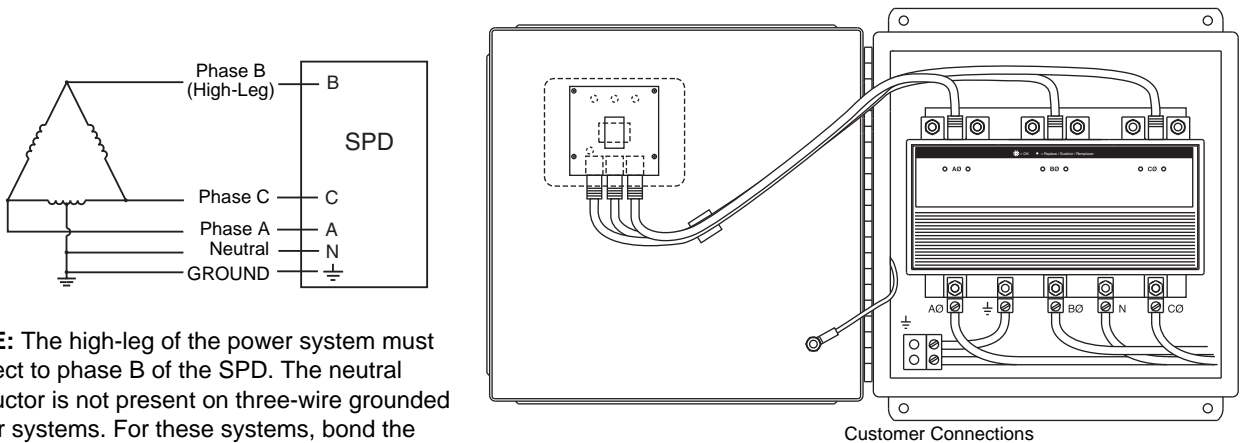


Figure 4: Three-Phase, 3- or 4-Wire, Grounded Wye Installation



NOTE: The neutral conductor is not present on 3-wire, grounded neutral power systems. For these systems bond the neutral and ground lugs together.

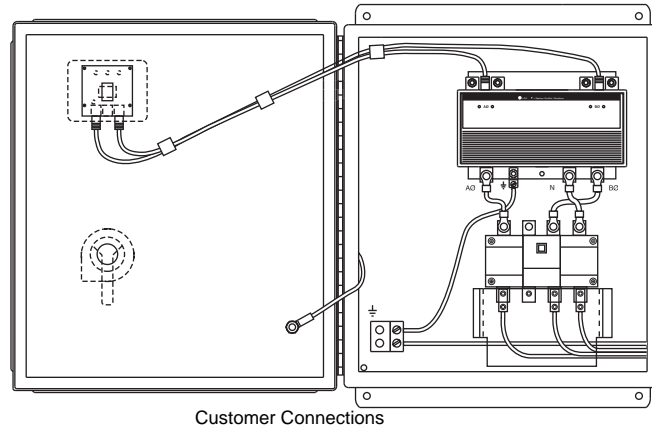
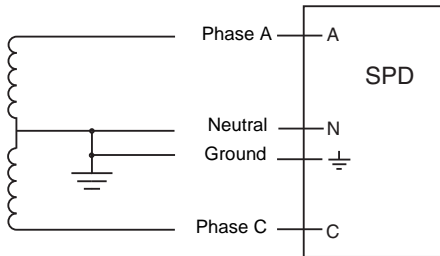
Figure 5: Three-Phase, 3- or 4-Wire, High-Leg Delta Installation



NOTE: The high-leg of the power system must connect to phase B of the SPD. The neutral conductor is not present on three-wire grounded power systems. For these systems, bond the neutral and ground lugs together inside the SPD using 10 AWG wire.

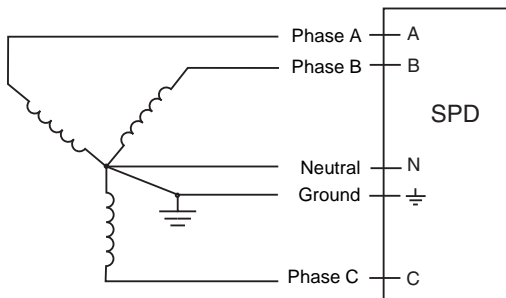
Wiring Diagrams with Integral Switch

Figure 6: Single-Phase, 3-Wire, Grounded Installation with Integral Switch

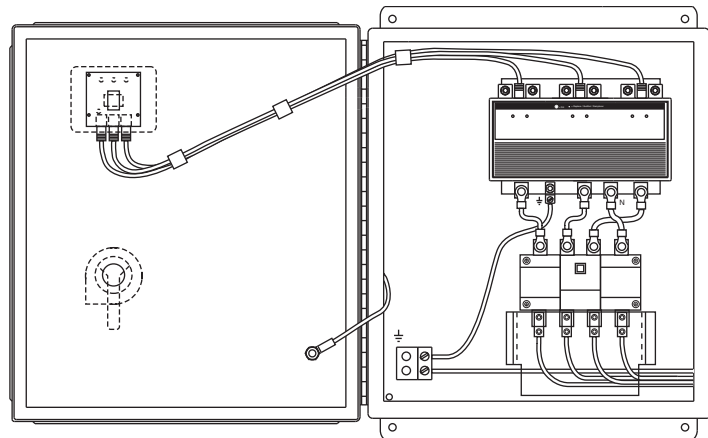


Customer Connections

Figure 7: Three-Phase, 3- or 4-Wire, Grounded Wye Installation with Integral Switch

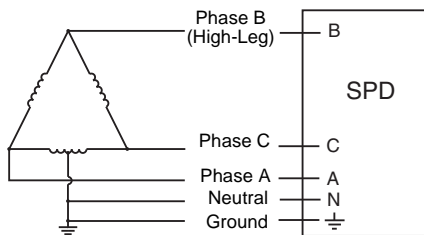


NOTE: The neutral conductor is not present on 3-wire, grounded neutral power systems. For these systems bond the neutral and ground lugs together.

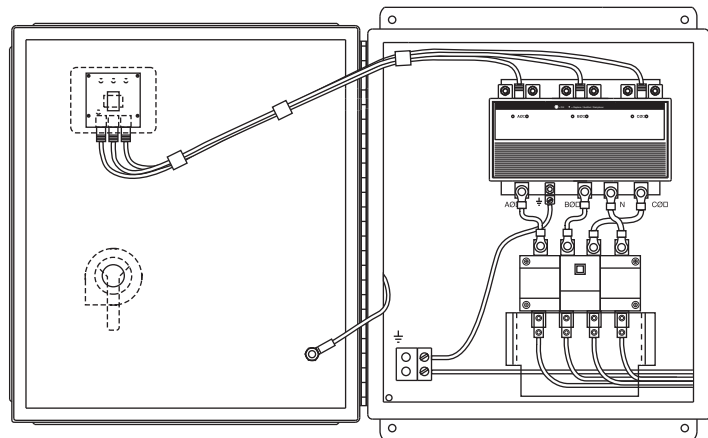


Customer Connections

Figure 8: Three-Phase, 3- or 4-Wire, High-Leg Delta Installation with Integral Switch



NOTE: The high-leg of the power system must connect to phase B of the SPD. The neutral conductor is not present on three-wire grounded power systems. For these systems bond the neutral and ground lugs together inside the SPD using 10 AWG wire.



Customer Connections

Operation

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

Failure to follow these instructions will result in death or serious injury.

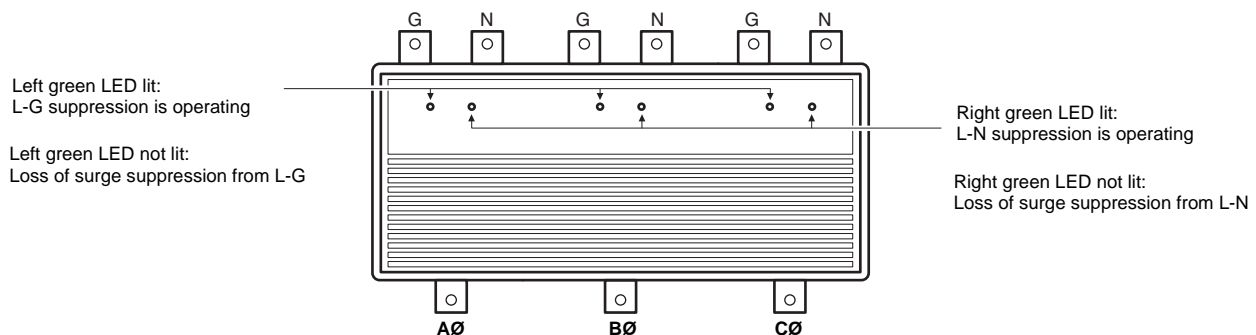
LED Status Indicators

The diagnostic display panel shows the status of the SPD module with diagnostically controlled green/red LEDs. If a unit is operating correctly, all the phase LEDs will be illuminated green. To test the integrity of the diagnostics for each phase, push the button below the phase LEDs on the diagnostic display panel. The green LED will turn red and the alarm will sound, if the alarm is enabled. Releasing the test button will complete the test; the red LED will turn green and the alarm will shut off.

If an inoperable condition occurs on any phase, the audible alarm sounds and the corresponding phase LED on the diagnostic display panel is illuminated red. This indicates that the device needs service by qualified electrical personnel. The audible alarm can be silenced by pressing the alarm enable/disable button. The alarm will silence and the green alarm LED will not be lit. The red phase LED will continue to be illuminated until the inoperative condition had been cleared.

On an SPD module (see Figure 9), if the left green LED is not lit, it indicates a loss of suppression from line-to-ground for that phase. If the right green LED is not lit, it indicates a loss of suppression from line-to-neutral for that phase. If the diagnostic display has power and both green LEDs are not lit the module should be replaced.

Figure 9: SPD Module LEDs



When power is applied to the SPD device and one or more of the diagnostic display panel LEDs are red, and one or more module LEDs are out, the module should be replaced. Refer to “Maintenance and Troubleshooting” on page 19 for proper troubleshooting procedures.

Table 5: Replacement Modules

System Voltage	Peak Surge Current Rating (kA)	Catalog Numbers
120/240 V, 1-phase, 3-wire	120	HBL3P120BM
120/208Y V, ¹ 3-phase, 3-4 wire	120	HBL4P120BM
240/120 V, 3-phase, 4-wire, high-leg delta	120	HBL6P120BM
277/480Y V, ² 3-phase, 3-4 wire	120	HBL8P120BM
347/600Y V, 3-phase, 3-4 wire	120	HBL10P120BM

¹ 120/208Y series also applies to the following voltage 127/220Y.

² 277/480Y series applies to the following voltages 220/380Y, 230/400Y, and 240/415Y.

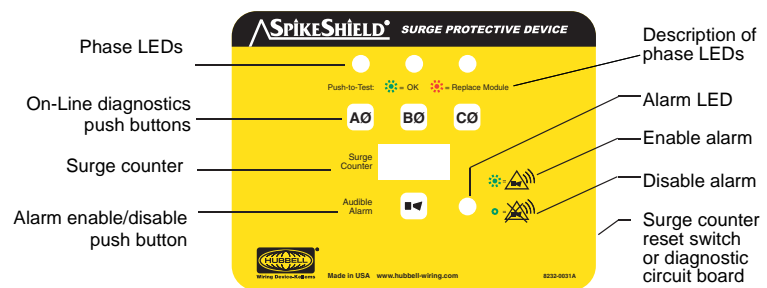
Audible Alarm

Push the alarm enable/disable button to enable or disable the alarm (see Figure 10). If the green alarm LED is lit the alarm is enabled. If the green alarm LED is not lit the alarm is disabled.

Surge Counter

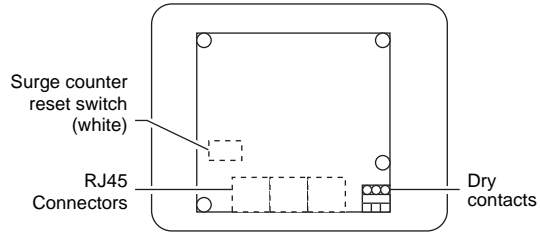
The surge counter displays the number of transient voltage surges since the counter was last reset. The counter is battery powered to retain memory in the event of a power loss to the diagnostic display panel. To reset the surge counter remove all power and press the small switch located inside the unit on the underside of the diagnostic circuit board near the RJ45 connectors (also refer to Figure 11). This will reset the counter to zero.

Figure 10: Three-Phase Diagnostic Display Panel with Surge Counter



NOTE: Phase B is not present on single-phase applications

Figure 11: Rear of Diagnostic Circuit Board



Dry Contacts

The SpikeShield® series SPDs are provided with dry contacts. The connection for the dry contacts is located on the back of the diagnostic display panel (lower right corner). The dry contacts are 3-position, Form “C” type with Normally Open, Normally Closed and Common connections. In the unpowered state the contact is closed between terminals NC and COM. This is also the alarm condition. The opposite state, closed between terminals NO and COM, indicates that power is on to the unit and that no alarm condition exists (See Table 6). These contacts can be used for remote indication of the SPD’s operating status to a computer interface board or emergency management system. Also, these contacts are designed to work with the SPD remote monitor option described below.

The dry contacts are designed for a maximum voltage of 24 Vdc / 24 Vac and a maximum current of 2 A. Higher energy applications may require additional relay implementation outside the SPD. Damage to the SPD’s relay caused by use with energy levels in excess of those discussed in this instruction bulletin are not covered by warranty. For application questions, contact Hubbell at 1-800-729-3406.

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Use 600 Vac rated dry contact wiring.
- Dry contact wiring must have less than 1/16 in. (1.6 mm) exposed wire from the dry contact block.
- Maintain at least 1.0 in. (25 mm) separation between dry contact wiring and the power wiring in the enclosure.

Failure to follow these instructions will result in death or serious injury.

Care must be taken in installing the dry contact wiring because the terminals are on a moving door. Avoid the door hinge, any switches, and the high voltage areas of the enclosure when routing the wiring. To avoid the door hinge, tie wrap any dry contact wiring to the existing cable harness which crosses the hinge. Once the dry contact wiring is secured on a non-moving point of the enclosure, it is the user’s responsibility to maintain at least 1.0 in. (25 mm) separation between 600 Vac rated dry contact wiring and the power wiring in the enclosure.

Table 6: Dry Contact Configuration

Alarm Contact Terminals	Contact State with Power Removed
NC	Normally closed
COM	Common
NO	Normally open

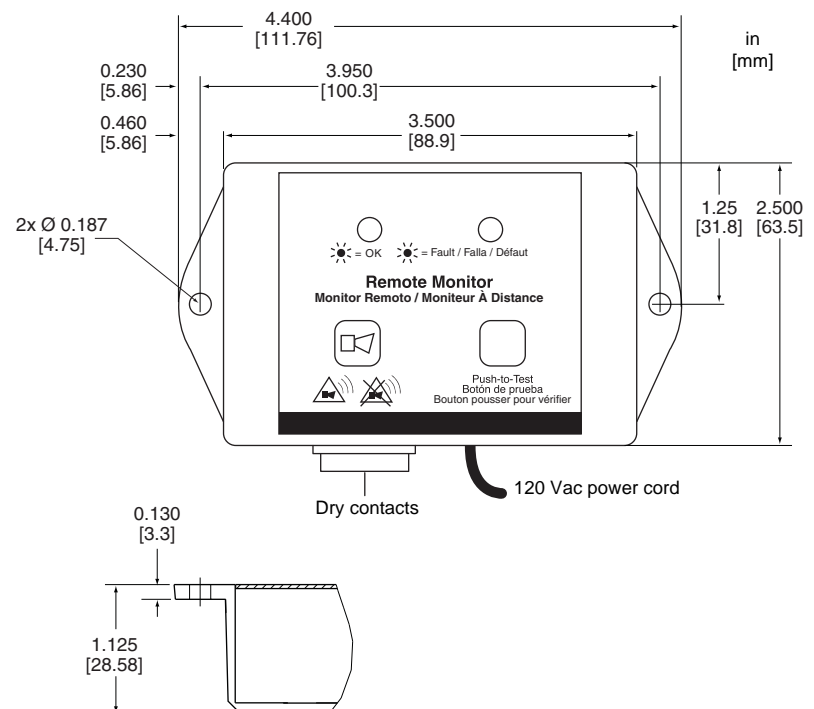
Remote Monitor Option

The remote monitor option (Figure 12) has two LEDs, one red and one green, and an audible alarm with an enable/disable switch. Normal status is a lit green LED, and no audible alarm. To test the integrity of the remote monitor, press the push-to-test switch. If the alarm is enabled, the green LED will turn off, the red LED will turn on, and the alarm will sound. Releasing the switch will complete the test; the red LED will turn off, the green LED will turn on and the alarm will shut off.

If suppression on any phase is lost, the green LED will turn off, the red LED will turn on and an alarm will sound. The audible alarm can be silenced by pushing the alarm enable/disable button. The alarm will silence and the green alarm LED will not be lit. The red LED will continue to be illuminated until the inoperative condition has been cleared.

The remote monitor includes a 120 Vac to 12 Vdc adapter with a six-foot power cord. Connections are made to the SPD diagnostic panel with 3-position Form "C" type dry contacts (provided) and the appropriate length of solid or stranded 22 to 14 AWG wire (not provided).

Figure 12: Remote Monitor Option



Maintenance and Troubleshooting

Preventive Maintenance

⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- This equipment must be effectively grounded per all applicable codes. Use an equipment-grounding conductor to connect this equipment to the power system ground.

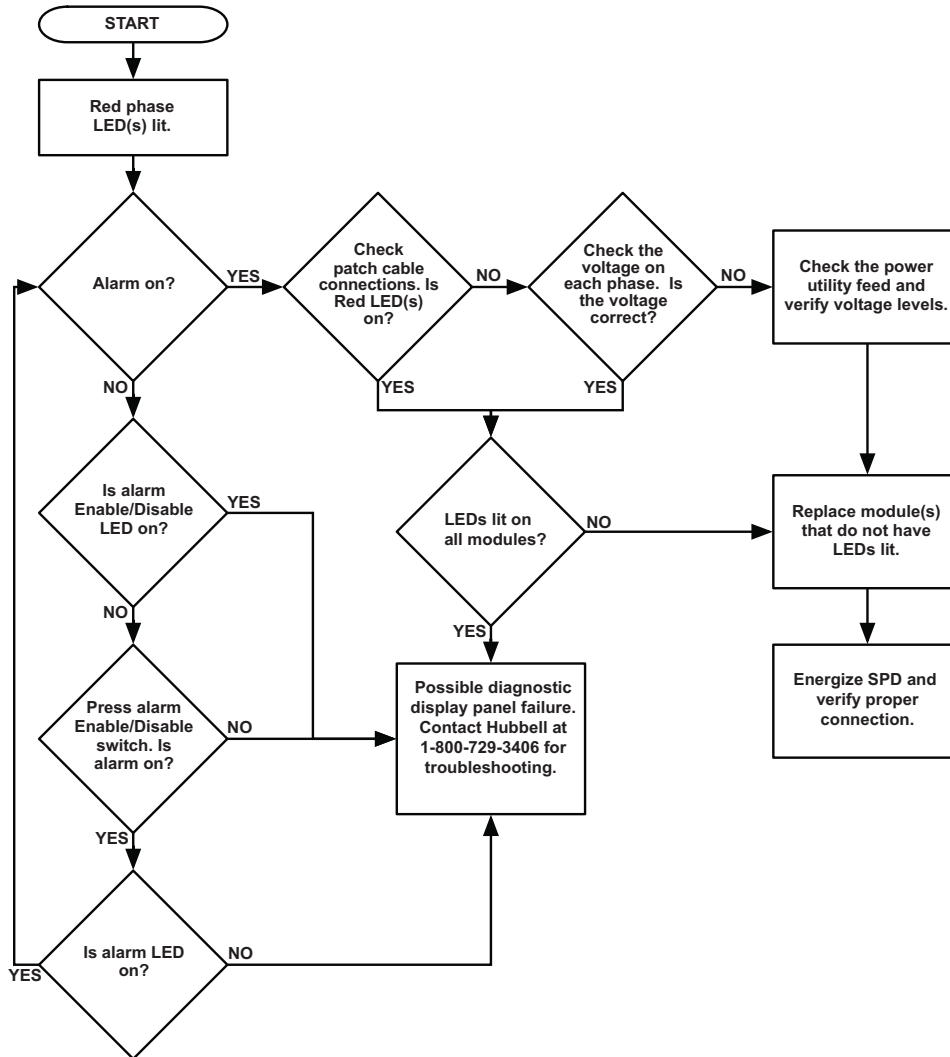
Failure to follow these instructions will result in death or serious injury.

Inspect the SPD periodically to maintain reliable system performance and continued transient voltage surge suppression. Periodically check the state of the diagnostic display panel LED status indicators. Routinely use the built-in diagnostics to inspect for inoperative modules

Troubleshooting

If a module shows two green indicator lights and the display panel shows a red phase indicator light, follow the Troubleshooting Flow Chart in Figure 13 below.

Figure 13: Troubleshooting Flowchart



Replacement Parts

The following replacement parts are available. For ordering information please contact your local distributor or refer to the product catalog.

- SpikeShield® modules. Replacement instructions are included with the replacement parts.
- Diagnostic display panel assemblies. Replacement instructions are included with the replacement parts.



Wiring Device-Kellems

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 1-800-729-3406
 www.Hubbell-Wiring.com