PQ Protection PQD
Din Rail Series Surge Protection Devices (SPDs)

PQ Protection Din Rail SPDs are designed to protect sensitive electrical equipment from high energy impulses found on electrical distribution systems.

Please read and follow the following instructions carefullly.

⚠ DANGER

ELECTRICAL SHOCK OR BURN HAZARD. INSTALLATION OF THIS UNIT SHOULD ONLY BE MADE BY QUALIFIED PERSONNEL. FAILURE TO LOCK-OUT/ TAG-OUT ELECTRICAL POWER DURING INSTALLATION OR MAINTENANCE CAN RESULT IN FATAL ELECTROCUTION OR SEVERE BURNS.

⚠ CAUTION

Check and make sure that the electrical system voltages do not exceed the SPD voltage requirement and that the correct SPD voltage and model have been selected.

⚠ CAUTION

This unit must be installed in accordance with the National Electrical Code (ANSI/NFP A-70), national and local codes where applicable.

⚠ CAUTION

Ungrounded power systems are inherently unstable and can produce excessively high line-to-ground voltages during certain fault conditions.
During these fault conditions any electrical equipment including an SPD, may be subjected to voltages that exceed the designed ratings.
This information is being provided to the user so that an informed decision can be made before installing any electrical device on an ungrounded power system.
Diagrams are for reference only. Schematics are representative of typical applications and are only to be used for reference.

⚠ CAUTION

If applicable, do not power three phase connected devices without the upstream neutral connected. Failure to do so may damage the SPD and/or can cause damage to the sensitive electrical equipment.
Where the SPD includes an earth terminal, the earth terminal must be connected to a low impedance earth (<10 Ω) for correct operation.

Overcurrent protection must be installed in the upstream circuit of every PQD to provide protection to the unit itself, the load and the wiring in case of fault situations. The overcurrent protection device should be a 48A (continuous) 65 kAIC or less non-current limiting circuit breaker listed to UL 489, or a 65A (continuous), 65 kAIC or less current limiting circuit breaker listed to UL 489.

⚠ CAUTION

PQ Protection products shall be installed and used only as indicated in PQ Protection product instruction sheets and training materials. Instruction sheets are available at www.pqprotection.com and from your PQ Protection customer service representative.
PQ Protection products must never be used for a purpose other than the purpose for which they were designed or in a manner that exceeds specified load ratings. All instructions must be completely followed to ensure correct, safe installation and product performance. Improper installation, misuse, misapplication or failure to completely follow PQ Protection's instructions and warnings may cause product malfunction, property damage, serious bodily injury and or death.

Installation Instructions

1. VERIFY SYSTEM VOLTAGE AND ELECTRICAL CONFIGURATION

- Verify system voltage by measuring L-N, L-G, L-L and N-G of the system.
- Confirm that the SPD is correctly rated for the system by comparing the measured voltages to the SPD voltage ratings shown on the product rating label. The measured system voltage should be equal to or less than the maximum continuous operating voltage (MCOV).
- Blue labels on the SPD indicate an MCOV of 170V. Purple labels indicate an MCOV of 275V. Yellow labels on the SPD indicate an MCOV of 320V. Brown labels on the SPD indicate an MCOV of 610V.
- Specifications must not be exceeded.

2. IDENTIFY PROPER LOCATION

- Locate the unit as close as physically possible to the load, electrical circuit, or electrical panel being protected; avoid the need for sharp bends in the conductors. Mount the SPD enclosure in a location where the internal temperature of the enclosure does not exceed the maximum specified rating of -40°C (-40°F) to 80°C (176°F).
- Mount the SPD enclosure securely. Use only the enclosure provided to maintain overall assembly UL rating. The enclosure is NEMA 4/12 rated to prevent the ingress of moisture and water. Use appropriate cable glands or conduit to preserve the NEMA enclosure rating.
- Use included mounting foot kit to preserve the NEMA enclosure rating when necessary.
- Ensure that the SPDs are mounted securely on the enclosure DIN rail, and set SPDs in the vertical position with the status windows positioned closer to the enclosure hinges.
- SPD Status Indication is provided via the viewing window.

Before proceeding ensure that the supply panel has been turned off and the panel is safe to work on.

SAFETY INSTRUCTIONS:
All governing codes and regulations and those required by the job site must be observed.
Always use appropriate safety equipment such as eye protection, hard hat, and gloves as appropriate to the application.

3. CONNECT GROUND CONDUCTOR(S)

• Connect an insulated grounding conductor from the supply panel to the SPD enclosure ground stud/ terminal and from the same ground stud/ terminal connect a conductor to the protected circuit. Tighten to a rated torque of 10.7 - 16.8 lbf-in.

• The ground conductor must be equal in size, insulating material and insulation thickness to the neutral and phase circuit conductors according to Table 2 of these instructions, except that it is green with or without one or more yellow stripes.

• Multiple insulated ground conductors may be required based on the number of circuits to be protected; both single and multiple circuit enclosures are available as options.

• Do not use excessive force when tightening terminals.

• The housing of the enclosure is bonded to the grounding conductor for equipment safety ground purposes as per the National Electrical Code. The grounding conductor is to be grounded to earth at the supply equipment or other acceptable building ground such as the building frame in the case of a high-rise steel frame structure.

Note: For isolated ground systems the enclosure grounding conductor from the supply panel is bonded to the non-isolated equipment ground, not the isolated equipment ground.

4. CONNECT NEUTRAL CONDUCTOR(S)

• Connect a neutral conductor from the supply panel to the neutral terminal of the SPD, and from the same terminal connect a conductor to the protected circuit.

• Size the neutral conductor according to Table 2 of these instructions.

• Do not use excessive force when tightening terminals. Tighten to the rated torque of 40.5 lbf-in.

• Multiple neutral conductors may be required based on the number of circuits to be protected; both single and multiple circuit enclosures are available as options.

5. CONNECT PHASE CONDUCTORS(S)

• Connect a phase conductor from the supply panel to the phase (live) terminal of the SPD, and from the same terminal connect a conductor to the protected circuit.

• Size the phase conductor according to Table 2 of these instructions.

• Do not use excessive force when tightening terminals. Tighten to the rated torque of 40.5 lbf-in.

• Multiple phase conductors may be required based on the number of circuits to be protected; both single and multiple circuit enclosures are available as options.

• Upstream overcurrent protection for each phase (live) conductor or circuit must be provided for in the supply panel. Size a suitable fuse or circuit breaker according to Table 2 of these instructions.

Table 1. Type 2 SPD operation specifications

Maximum Continuous Operating Voltage, Uc (AC)	170VUc for 120-150VAC; 275VUc for 220-240VAC; 320VUc for 240-277VAC & 610VUc for 480-560VAC. Important: Ensure the correct device is selected; Uc must be higher in voltage.
Maximum Main Terminal acceptable wire cross section	Multi strand- (1) conductor 25mm² (4AWG) Single strand- (1) conductor 35mm² (2AWG) Multiple conductors- Max (2) conductors limited to 4mm² (6AWG) each.
Remote Status Contacts	1.5mm² (16AWG); Max 30V resistive load/1.0A, max 125VAC/ 0.3A general use.

6. CONNECT REMOTE MONITORING CONDUCTORS (IF NEEDED)

• The Form C dry contacts terminal block (N/O, N/C & Common) is located on the top of the SPD device.

• The quick-connect remote terminals are labeled as follows:

Terminal 11 - COM

Terminal 12 - NO

Terminal 14 - NC

• Failure of the SPD device is signified by the N/O contacts (11, 14) closing and the N/C contacts (11, 12) opening.

• Ensure that the voltage and current ratings of the contacts are not exceeded.

• Refer to Table 1 for remote monitoring conductor size.

7. ACTIVATE UNIT

• Before applying power, inspect all phase, neutral and ground conductor connections for proper tightness and installation.

• Inspect the SPD devices for correct mounting on the din rail.

• Close / lock the enclosure door.

• With power applied check all device status indications for correct operation via the enclosure viewing window.

8. STATUS INDICATION

A characteristic of **all** transient and surge protection devices is that they degrade in proportion to the magnitude and number of incident surges they are subjected to. Status indication should be periodically monitored to ensure correct operation at all times.

• PQD SPDs include an internal disconnect element that automatically disconnects the device from the network in the event of a thermal overload. Should the internal disconnect operate, a RED flag appears in the transparent window (Status Window) on the front of the device. When this occurs the SPD must be replaced.

9. MAINTENANCE & TESTING

• Prior to removing an SPD from the enclosure or service, ensure that power to the enclosure/ device is turned off for safe removal. Replacement of any SPD should only be undertaken in accordance with all relevant Electric and Safety Standards by qualified personnel.

• SPDs should be inspected periodically, especially following lightning or transient activity. Check the status indicator window (per section 8), and replace damaged SPDs if necessary.

• PQD SPDs are designed for optimum performance under severe transient activity. To provide this performance, electronic components in the SPD are encased in a patented proprietary shock and thermal absorbent compound.

• SPDs cannot be repaired & must be replaced. Replacement plug-in modules are available.

Do not attempt to open or tamper with the devices in any way, as this may compromise performance and void the manufacturer's warranty.

• Do not "Megger" or perform any form of electrical testing that may apply voltages greater than the nominal voltage rating of the SPD as this may damage the SPD. The SPD will attempt to limit voltages that exceed the SPD voltage rating, thereby affecting the test result. Remove the SPD from the electrical circuit prior to testing.

Table 2. Type 2 SPD Recommended Wire Size and Circuit Breaker Protection

*Conductor Size Copper @75°C	*Circuit Breaker Rating	* Circuit current (Amperes)
3mm² (12AWG)	20A	25A
6mm² (10AWG)	30A	35A
8mm² (8AWG)	45A	50A
12mm² (6AWG)	60A	65A

*Always follow NEC, national & local codes for sizing conductors and circuit breakers.
Reference NEC Handbook 2014 Table 310.15(B) & 240.4(D) for conductor overcurrent protection

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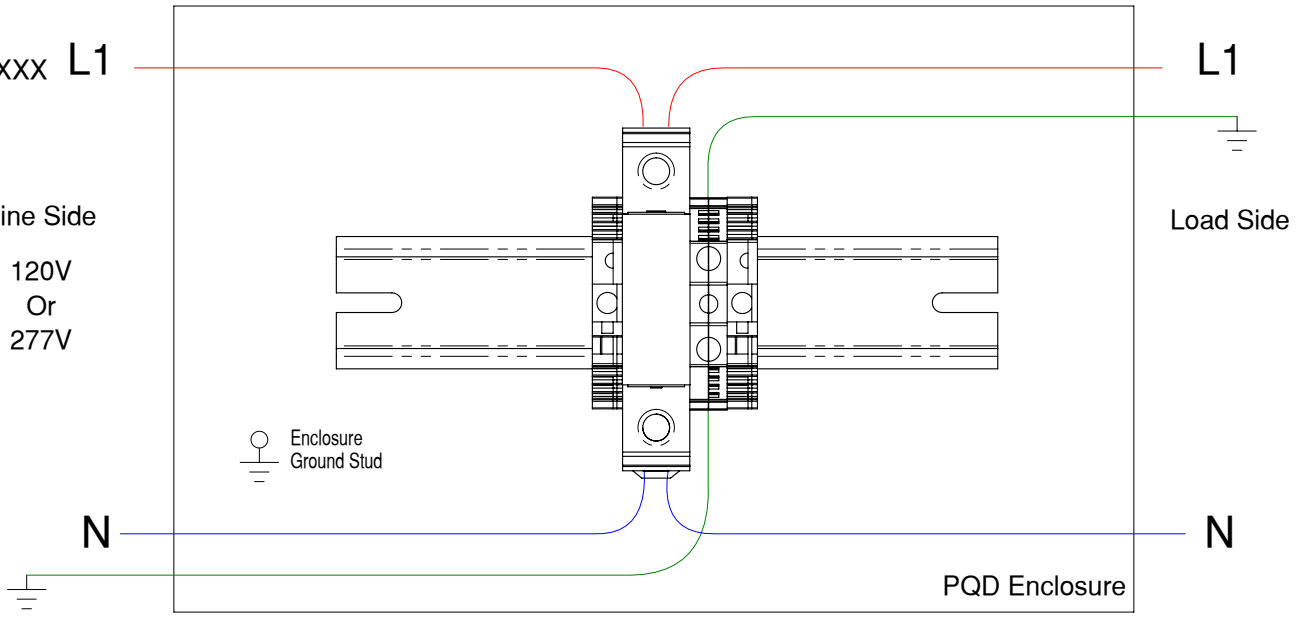
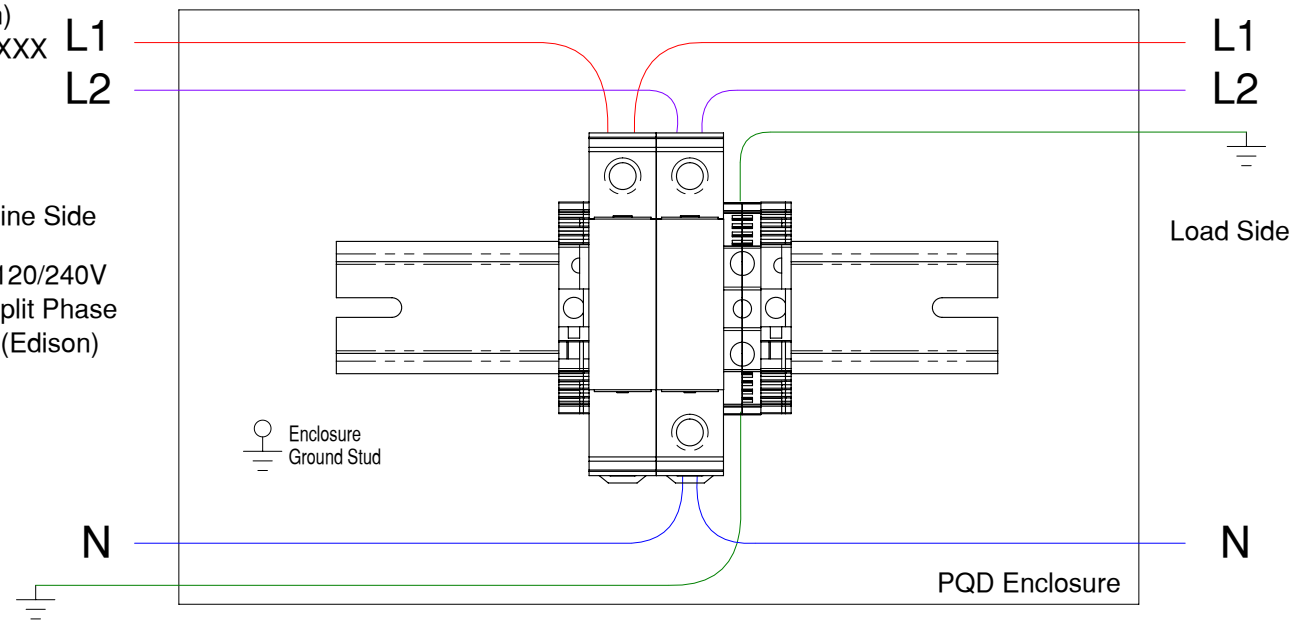
PQD Surge Protection
Enclosure Wiring Guide

PQD Series
Single Pole (1P)
Part# PQDX-X-1P-XXX



PQD Series
Two Pole (2P)
Split Phase (Edison)
Part# PQDX-X-2P-XXX



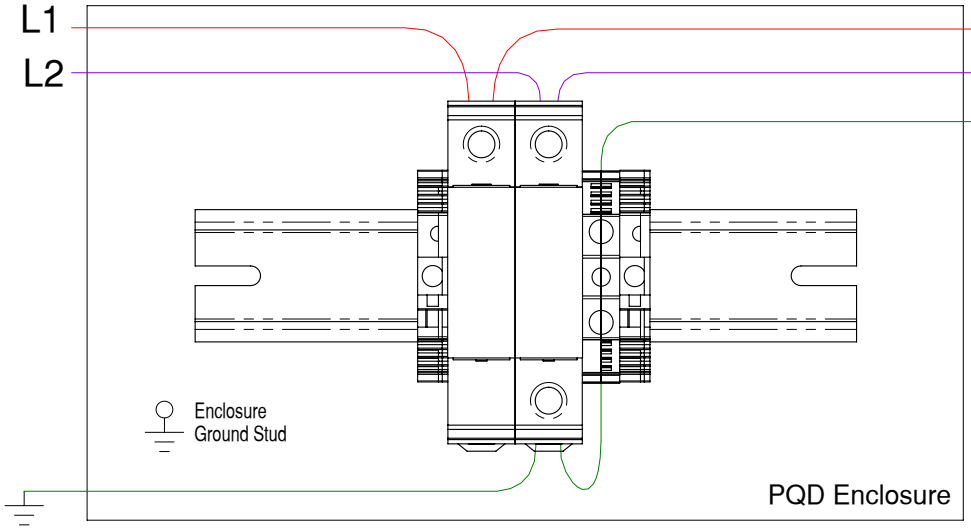
Note:
1. Wiring shown is typical for one circuit; multiple circuits may be included in one enclosure. Wire each cicuit individually as shown in wiring diagram.
2. One (1) ground terminal is included for every three (3) circuits.
3. Install proper wire size following all NEC requirements and manufacturer specificiations.
4. When tightened, the ground terminals provided make secure contact with the enclosure steel/ground.
5. Select the best method by grounding at the enclosure ground stud and/or the ground terminal provided.
6. Always ground the enclosure per NEC code.

WARNING:
1. All products shall be installed and used only as indicated in product instruction sheets and training materials.
2. Products must never be used for a purpose other than the purpse for which they wer designed or in a manner that exceeds specified load ratings.
3. All instructions must be completely follwed to ensure proper and safe installation and performance.
4. Improper installation, misuse, misapplication or other failure to completely follow instructions and warnings may cause product malfunction, property damage, serious bodily injury and/or death, and void your warranty.

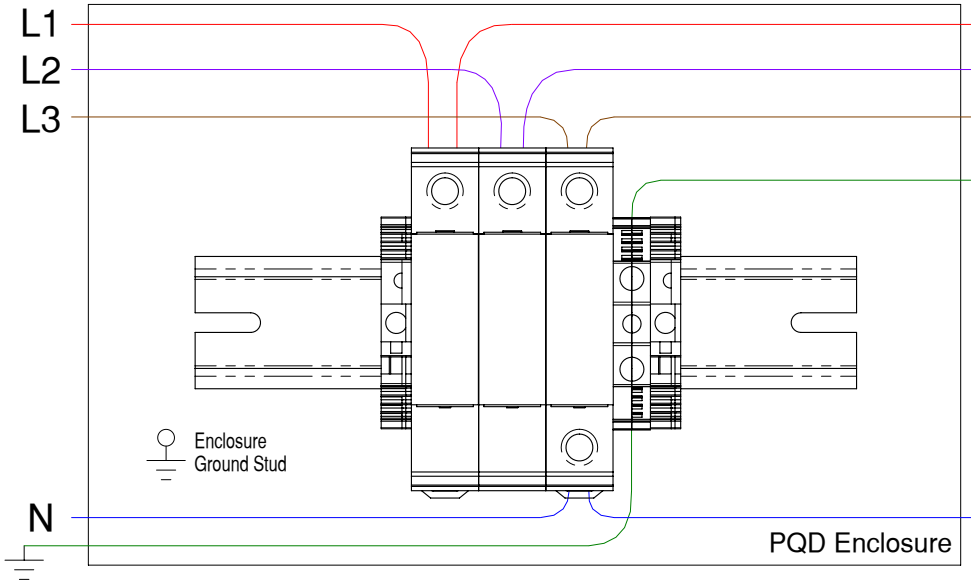
SAFETY INSTRUCTIONS:
All governing codes and regulations and those required by the job site must be observed.
Always use appropriate safety equipment such as eye protection, hard hat, and gloves as appropriate to the application.

PQD Surge Protection
Enclosure Wiring Guide

PQD Series
Two Pole Derived From A
208Y Or 480Y Panel Board
Part# PQDX-X-2P-XXX



PQD Series
Three Phase 120Y/208V
Or 277Y/480V
Part# PQDX-X-3Y-XXX



PQD Series
Three Phase Delta
(Ungrounded) 240V
Part# PQDX-X-3D-XXX