

# Eaton SPD Series

## Surge Protective Device

### For Integrated Units



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## 1.0 Introduction

### 1.1 Manual Organization

This Installation Manual describes the safe installation, testing and operation of the Eaton® SPD Series Surge Protective Device (SPD).

This manual is organized into seven sections, as follows:

- 1.0 Introduction
- 2.0 Installation
- 3.0 Operating Features
- 4.0 Troubleshooting
- 5.0 Specifications
- 6.0 Ordering Guidelines
- 7.0 Warranty

### 1.2 Product Overview

The Eaton SPD Series protects critical electrical and electronic equipment from damage by power surges. This is done by shunting high energy lightning surges (and other transient disturbances) away from the equipment being protected. It does this in nanoseconds by providing a low impedance surge path to ground while supporting power frequency voltage.

The Eaton SPD Series is designed to mount on Panelboards, Switchgear, Switchboards, Busway, and Motor Control Centers (MCCs). It is available with surge current capacity ratings from 50 to 400kA.

The Eaton SPD Series is available in three feature packages (Basic, Standard, and Standard with Surge Counter), as described in Section 3, "Operating Features." Each model is available in Delta, Wye, and Split Phase wiring configurations.

All Eaton SPD Series models have been tested and certified by Underwriter's Laboratory (UL®), to comply with UL Standard 1449, 4<sup>th</sup> Edition.

Eaton's One-Port low-voltage Surge Protective Device Wye Models SPD120480Y2C, SPD160480Y2C, SPD200480Y2C and Delta Models SPD120480D2C, SPD160480D2C, SPD200480D2C meet the requirements of IEC 61643-11 / EN 61643-11, Part 11: Test Class II, and are intended to be installed in indoor applications with a degree of protection rated IP 00.

### 1.3 Safety Precautions

A licensed/qualified electrician must complete all instructions in this manual in accordance with the National Electric Code (NEC®), state, and local codes, or other applicable country codes. All applicable local electrical codes supersede these instructions.

#### **⚠WARNING**

**IMPROPER INSTALLATION COULD CAUSE DEATH, INJURY AND EQUIPMENT DAMAGE. FOLLOW ALL WARNINGS AND CAUTIONS. COMPLETELY READ AND UNDERSTAND THE INFORMATION IN THIS INSTRUCTION MANUAL BEFORE ATTEMPTING TO INSTALL OR OPERATE THIS EQUIPMENT.**

**IMPROPER WIRING COULD CAUSE DEATH, INJURY AND/OR EQUIPMENT DAMAGE. ONLY LICENSED/QUALIFIED ELECTRICIANS WHO ARE TRAINED IN THE INSTALLATION AND SERVICE OF ELECTRICAL SERVICES ARE TO INSTALL AND SERVICE THIS EQUIPMENT.**

**HAZARDOUS VOLTAGES ARE PRESENT INSIDE THE SPD DURING NORMAL OPERATION. FOLLOW ALL SAFE WORK PRACTICES TO AVOID ELECTRICAL SHOCK.**

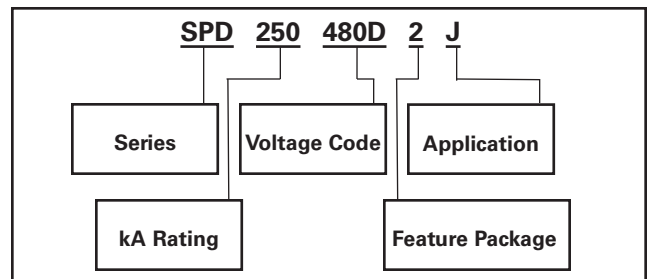
#### **⚠WARNING**

**ARC FLASH DURING INSTALLATION COULD CAUSE INJURY. USE APPROPRIATE SAFETY PRECAUTIONS AND EQUIPMENT FOR ARC FLASH PROTECTION.**

### 1.4 Catalog Numbering System

Each Eaton SPD Series unit has a name plate that identifies the parameters used for manufacture. These parameters are expressed in letters and numbers, to reflect the Series, kA Rating, Voltage Code, Feature Package, and Application.

Table 1. Catalog Numbering System



For example, a 480 volt Delta (3-wire plus Ground) for use in an MCC application requires an SPD model SPD 250480D2J, where:

SPD = SPD model,

250 = the kA rating (50 – 400 kA),

480D = the voltage,

2 = the feature package (Basic, Standard, Standard With Surge Counter), and,

J = the Application Suffix (such as Direct Bus Mounted in a panelboard or Connected Through a Circuit Breaker).

These numbers appear as part of the product label attached to the front left side of the SPD. See Figure 1.

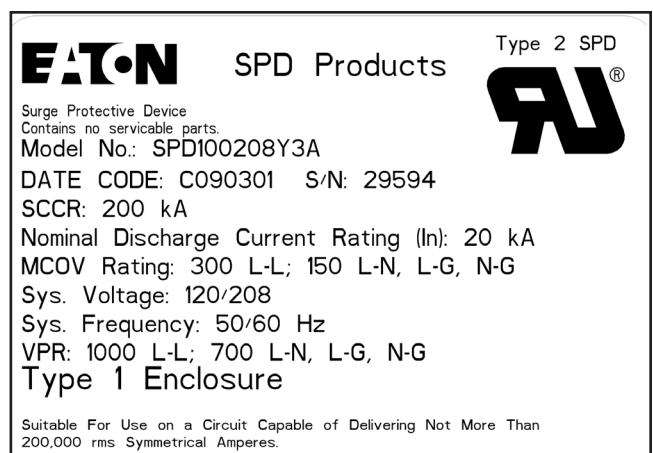


Figure 1. Product Label

## 1.5 Equipment Testing

### **⚠WARNING**

**CONDUCTING DIELECTRIC, MEGGER, OR HI-POTENTIAL TESTING WITH THE SPD INSTALLED WILL CAUSE INTERNAL DAMAGE TO THE SPD. THE SPD WILL ALSO CAUSE THE TEST TO FAIL.**

Every Eaton SPD Series unit is tested at the factory for dielectric breakdown. No further SPD testing is required for installation.

If you desire to test distribution equipment by performing dielectric, megger, or hi-potential tests, any installed SPD **must** be disconnected from the power distribution system to prevent damage to the unit.

Follow this procedure to safely disconnect the SPD:

1. Remove bus connected SPDs completely from the installation prior to performing any form of hi-potential testing.
2. Isolate SPDs connected via conductors as follows:
  - a. 3-wire delta SPDs: Turn off the circuit breaker to isolate the SPD, if connected through a circuit breaker.
  - b. Wye connected SPDs: Turn off the circuit breaker **and** remove the Neutral connection.
3. Remove MCC units with SPDs from the MCC structure.

## 2.0 Installation

### **⚠WARNING**

**INSTALLING AN SPD THAT IS IMPROPERLY RATED FOR THE ELECTRICAL SYSTEM VOLTAGE COULD CREATE A POTENTIALLY HAZARDOUS CONDITION, RESULTING IN INJURY OR EQUIPMENT DAMAGE.**

### 2.1 Preparation for Installation

#### **⚠CAUTION**

**EATON SPD SERIES PRODUCTS MUST BE INSTALLED OR REPLACED BY A QUALIFIED ELECTRICIAN TO AVOID INJURY OR EQUIPMENT DAMAGE.**

Before installing an Eaton SPD Series unit, do the following:

- Verify that the area is clear of any dirt, debris or clutter that may hamper the installation process.
- Verify that there is enough space in the cabinet or MCC to install the SPD. See Section 2.3, "Installation Procedures" for dimensions.
- Confirm that all tools and equipment needed for the installation are available.
- Confirm that the system voltage and wiring configuration is the same as the SPD you are installing. Check the voltage rating label on the front left side of the SPD. See Figure 1.

### **⚠WARNING**

**TURN OFF THE POWER SUPPLY BEFORE WORKING IN ANY ELECTRICAL CABINET OR ON ANY CIRCUIT BREAKER PANEL. FAILURE TO DO SO COULD RESULT IN INJURY OR DEATH FROM ELECTRICAL SHOCK.**

### **NOTICE**

**A POOR GROUND, OR GROUNDING/BONDING VIOLATIONS, COULD PREVENT THE SPD FROM PERFORMING AS SPECIFIED.**

**DO NOT USE THE SPD TO CARRY OR PASS THROUGH GROUND TO OTHER DEVICES OR LEADS. DAMAGE TO THE EQUIPMENT MAY RESULT.**

- Check the facility grounding system. All grounding, bonding, and earthing must meet the NEC and any other national, state and local electrical codes.

### 2.2 Installation Locations

Eaton's SPD Series can be installed directly to the bus for Panelboard applications.

The SPD can also be connected through a circuit breaker for installations in Panelboards, Switchboards, Switchgear, MCC's and Busway applications.

Follow these guidelines to determine the best location for mounting this product.

#### 2.2.1 Direct Bus Mount Applications

- Install the SPD on the load side of the main breaker. Connect the SPD directly to the bus located as close as possible to the main breaker.

#### 2.2.2 Connected Through a Circuit Breaker Applications

- Install the SPD next to the first breaker after the incoming main lugs or main breaker.

### 2.3 Installation Procedures

#### 2.3.1 Direct Bus Mount Applications

1. Verify that the SPD you are about to install is rated for the application voltage and system. See Table 5 in Section 6, "Ordering Guidelines".
2. Follow all national, state and local electrical codes when connecting the SPD.
3. Before mounting the SPD, first determine the bus bar configuration. If the panelboard uses an offset B-Phase bus bar configuration, no action is required. If the panelboard uses a coplanar bus bar configuration, remove the bus bar extension bushing from the back of the SPD and discard. See Figure 2.
4. Mount the SPD to the support brackets (customer supplied) using #10 fasteners and tighten to 4.1 Nm (36 in-lbs). See Figures 4 and 5 for mounting details.
5. Install the bus mount fasteners and tighten to 4.1 Nm (36 in-lbs). See Figure 3.

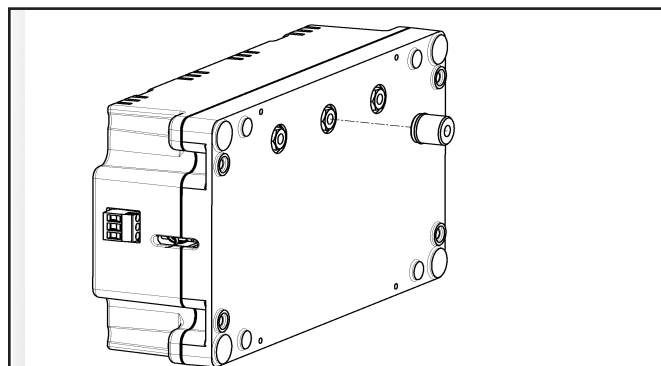


Figure 2. Bus Bar Extension Bushing

6. Select the correct wiring diagram for the SPD you are installing. You must refer to this diagram while wiring the SPD. See Figures 6, 7, 8, and 9, on page 4.

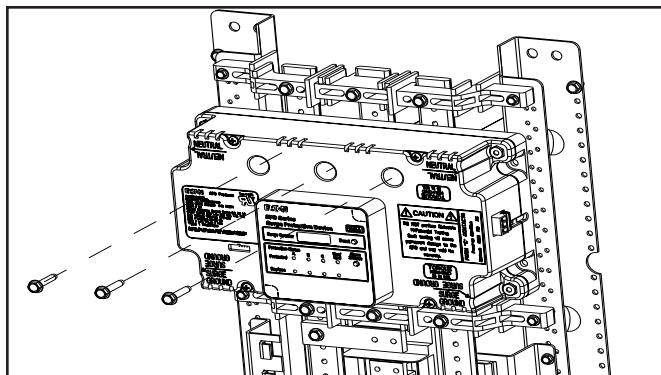


Figure 3. Bus Connection

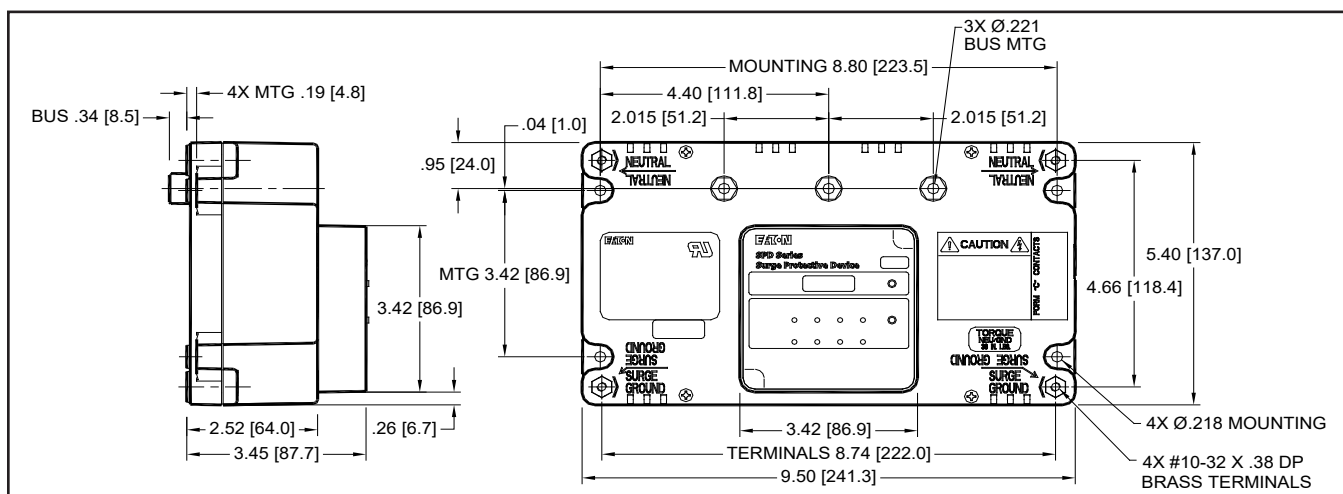


Figure 4. Dimensions for 50-200kA Units

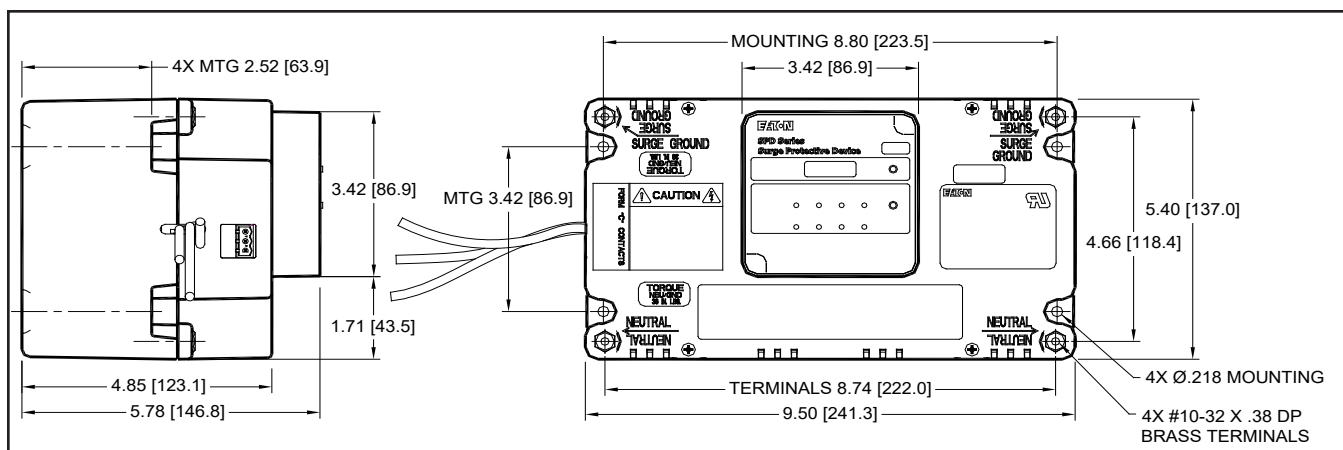


Figure 5. Dimensions for 250-400kA Units

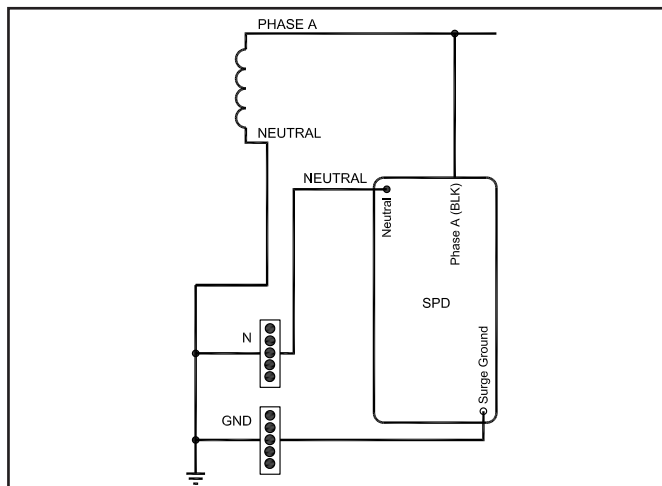


Figure 6. Wiring - Single Phase Units (230 L)

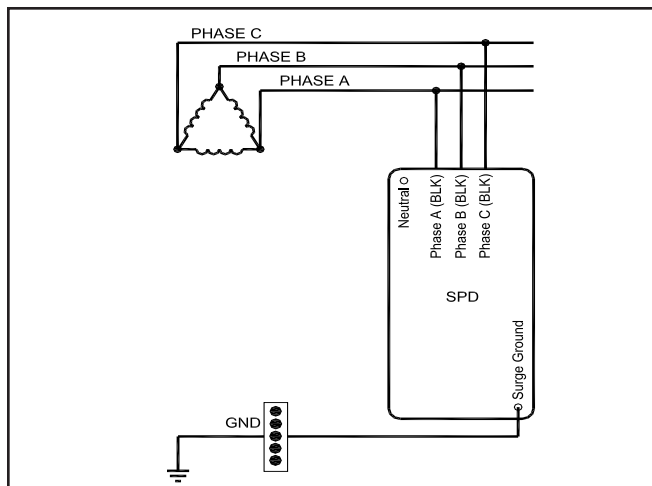


Figure 8. Wiring - 3-Phase Delta Units

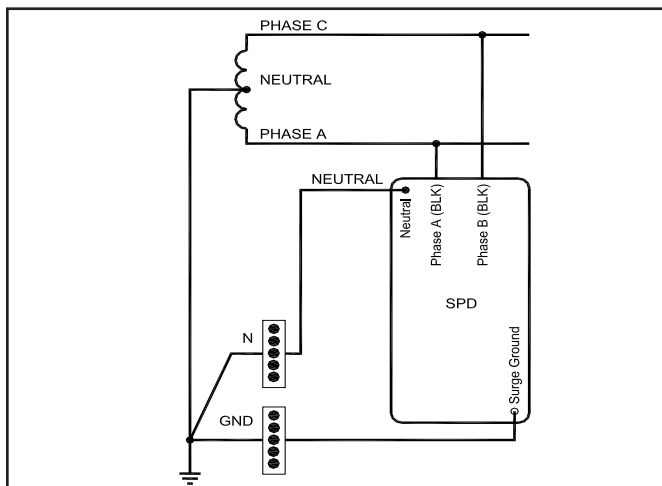


Figure 7. Wiring - Split Phase Units

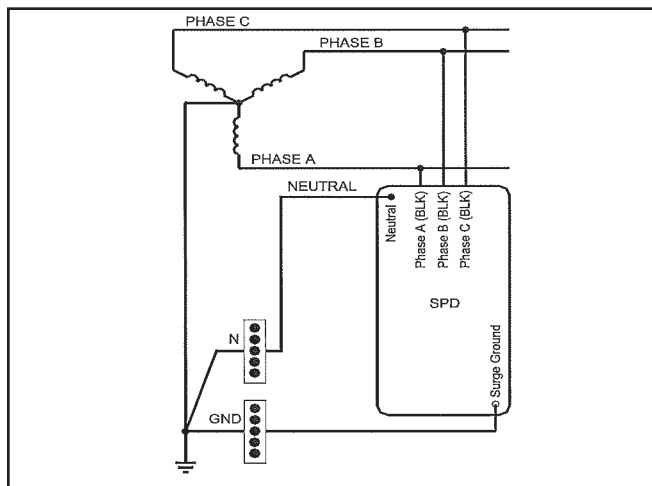


Figure 9. Wiring - 3-Phase Wye Units

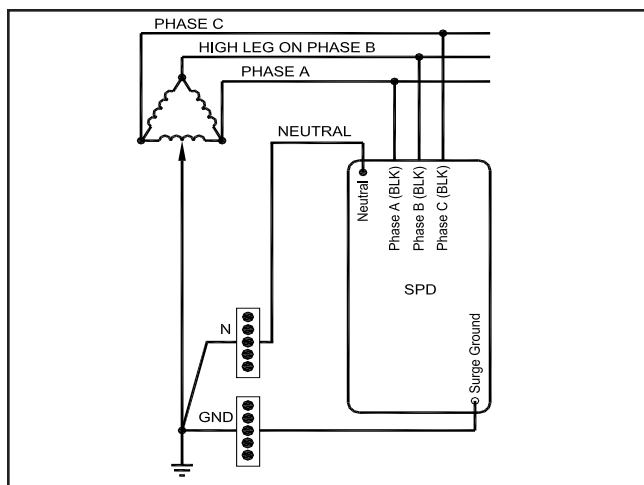


Figure 10. Wiring - High Leg Delta Units

**Note:** Please consult the factory for 240 delta high leg (4W+G) applications with high leg on the 'C' Phase.

- Connect the System Ground wire (green) to the SPD's Surge Ground connection using a ring terminal suitable for use with a #10 fastener and a #10-32 x 3/8" fastener (customer supplied). Tighten the Surge Ground connection to 4.1 Nm (36 in-lbs). If the system uses an isolated ground, connect the isolated ground wire to Surge Ground. There are two Surge Ground connection points provided on the SPD. Connect **only one** of them. See Figure 11.

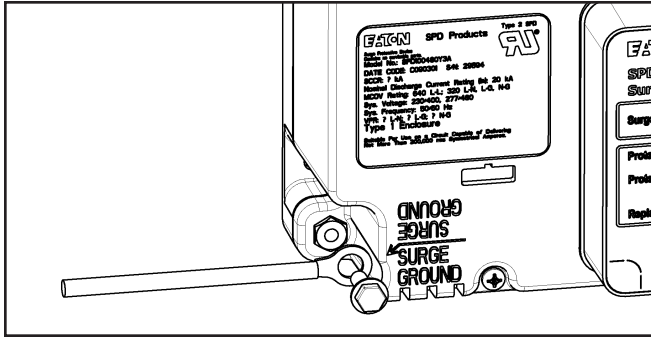


Figure 11. Ground Connection

- If equipped, connect the System Neutral wire (grey or white) to the SPD. Connect the System Neutral wire to the SPD's Neutral connection using a ring terminal suitable for use with a #10 fastener and a #10-32 x 3/8" fastener (customer supplied). Tighten the Neutral connection to 4.1 Nm (36 in-lbs). There are two Neutral connection points provided on the SPD. Connect **only one** of them. See Figure 12.

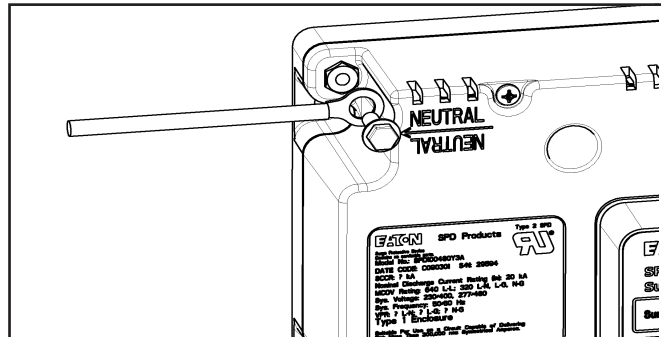


Figure 12. Neutral Connection

- The SPD (Standard and Standard with Surge Counter models) also has an available connection for remote monitoring of the Form C relay contacts. See Figure 13. This is a green connector located on the side of the SPD. To make the connection, remove the green connector and install the remote monitor leads (connector supports 12-24AWG wire). Fasten the remote monitoring wires to the N.O., N.C and COM connection points per the label on the front of the SPD. Contacts are rated: 150 Vac or 125 Vdc at 1A. Follow all national, state and local electrical codes. With wiring complete, plug the green connector into the SPD.

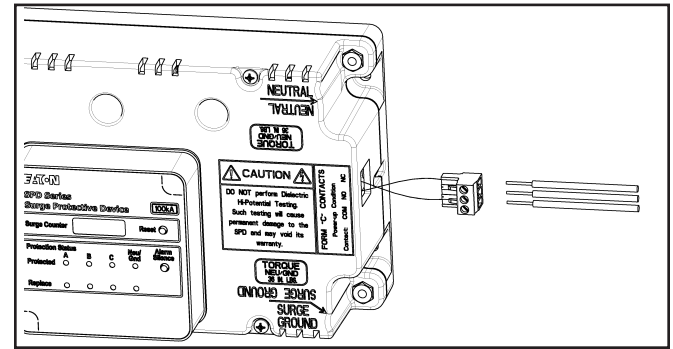


Figure 13. Form C Connection

- Install the dead-front panel to complete the installation.

### 2.3.2 Connected Through a Circuit Breaker Applications

- Verify that the SPD you are about to install is rated for the application voltage and system. See Table 5 in Section 6, "Ordering Guidelines".
- Follow all national, state and local electrical codes when connecting the SPD.
- Mount the SPD to the support brackets (customer supplied) using #10 x 2-3/4" fasteners and tighten to 4.1 Nm (36 in-lbs). For 50-200kA models, see Figure 4 for mounting dimensions. For 250-400kA models, see Figure 5 for mounting dimensions. **Note:** Mount the SPD as close as possible to the circuit breaker.
- Determine the wire length required to connect to the breaker and cut Phase wires to the appropriate length. (To maximize SPD performance, wire length should be as short as possible). **Note:** For wire lengths longer than 4", Phase wires should be twisted once for each 4" of wire length to maximize SPD performance.
- Connect Phase wire to circuit breaker. NEC requires that conductors to a surge device be protected by an overcurrent protection device. The cables on the SPD are #10 AWG, therefore would require a 30A 3-pole breaker. See Figure 14, and the wiring diagrams shown in Figures 6, 7, 8 and 9.

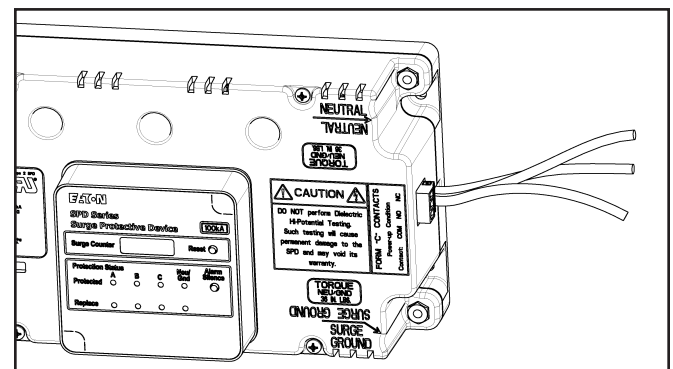


Figure 14. Phase Connections



6. Connect the System Ground wire (green) to the SPD's Surge Ground connection using a ring terminal suitable for use with a #10 fastener and #10-32 x 3/8" fastener (customer supplied). Tighten the Surge Ground connection to 4.1 Nm (36 in-lbs). If the system uses an isolated ground, connect the isolated ground wire to Surge Ground. There are two Surge Ground connection points provided on the SPD. Connect **only one** of them. See Figure 11.
7. If equipped, connect the System Neutral wire (grey or white) to the SPD. Connect the System Neutral wire to the SPD's Neutral connection using a ring terminal suitable for use with a #10 fastener and a #10-32 x 3/8" fastener (customer supplied). Tighten the Neutral connection to 4.1 Nm (36 in-lbs). There are two Neutral connection points provided on the SPD. Connect **only one** of them. See Figure 12.
8. The SPD (Standard and Standard with Surge Counter models) also has a connection available for remote monitoring of the Form C relay contacts. See Figure 14. This is a green connector located on the side of the SPD. To make the connection, remove the green connector and install the remote monitor leads (connector supports 12-24 AWG wire). Fasten the remote monitoring wires to the N.O., N.C. and COM connection points per the label on the front of the SPD. Contacts are rated: 150 Vac or 125 Vdc at 1A. Follow all national, state and local electrical codes. With wiring complete, plug the green connector into the SPD.
9. The final step of the SPD installation depends on the specific application. The various applications are listed below by catalog suffix.
  - a. Suffix 'B': This is the Remote Display Panel (RDP) option. The RDP option requires the addition of a factory supplied RDP cable. See Section 3.3, "Remote Display Panel (RDP) Option" for Cable Catalog numbers.
    1. Install the RDP using cutout and mounting dimensions provided in Figure 15.

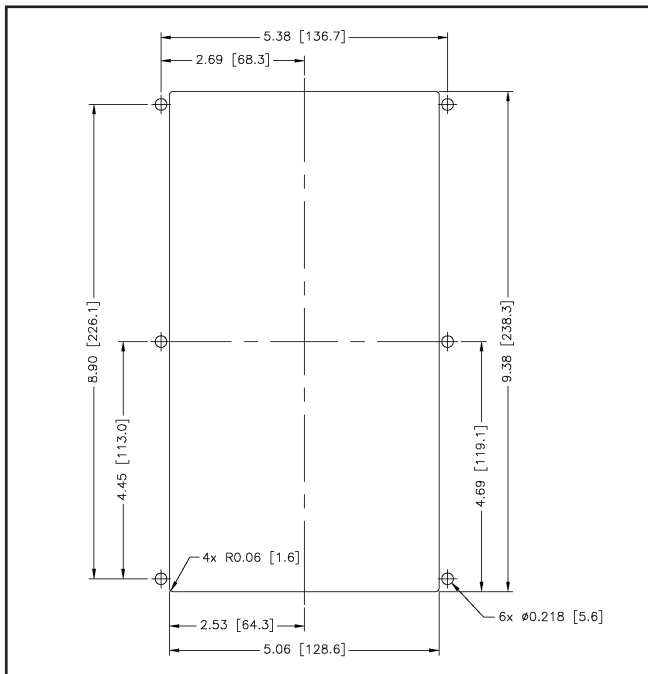


Figure 15. RDP Cutout and Mounting

2. Connect the RDP cable to the SPD. Use tie wraps (already on the SPD) to secure the cable to the SPD. See Figure 16. Cable can be routed as a right or left dress.

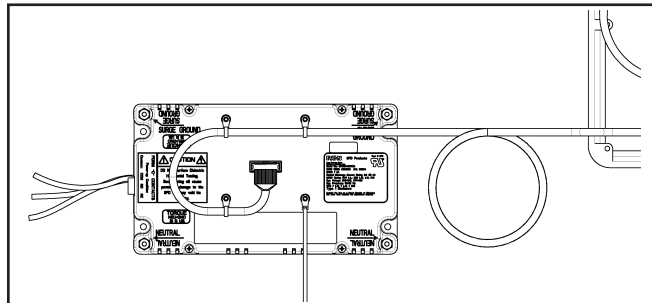


Figure 16. RDP to SPD Connection

3. Connect the RDP cable to the display. Use tie wraps (already on the RDP) to secure the cable to the RDP. See Figure 17.

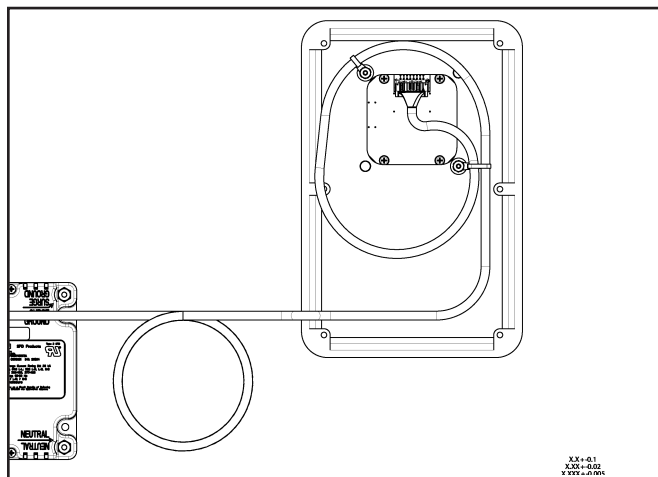


Figure 17. RDP Cable to Display Connection

- b. Suffix 'C': This unit is intended for use in Panelboard, Switchboard, and Busway applications.
  1. Ensure that the dead-front or door has the appropriate cut-out to accommodate the SPD Display. See Figure 4 or Figure 5.
  2. Install dead-front or door and secure.
- c. Suffix 'J': This unit is intended for MCC applications that require a NEMA 12 enclosure rating.
  1. Ensure that the MCC bucket door has the appropriate cut-out to accommodate the SPD Display. See Figure 4 or Figure 5.
  2. Place an appropriate NEMA 12 rated gasket around the Display opening on the inside of the door.
  3. Install the door and secure.



## 3.0 Operating Features

### 3.1 General

The Eaton SPD Series comes in three feature packages: Basic, Standard, and Standard with Surge Counter. The operating specifics of each feature package are described below.

The Eaton SPD Series requires no operator involvement, other than to monitor the display panel to determine status of the SPD.

After system power is applied, the SPD automatically begins protecting downstream electrical equipment from voltage transients.

Some SPD units have a Form C relay contact that allows for the remote indication of SPD status. Form C contact wires are connected via a three terminal connector. See Figure 13.

### 3.2 Displays and Indicators

All Eaton SPD Series units (Basic, Standard, and Standard With Surge Counter) use a display panel to indicate system status. The display panel is slightly different for each feature package.

Each display has both green and red light emitting diodes (LEDs) to indicate the status of the protection on each phase. Green indicates the phase is fully protected. Red indicates a loss of protection. Wye, Split Phase and High-Leg Delta units have an additional set of green/red LEDs to indicate status of Neutral/Ground protection.

When the LEDs turn red, an audible alarm will also sound on units equipped with an audible alarm.

Specific operating conditions displayed for each Eaton SPD Series Feature Package are described below.

#### 3.2.1 Basic Feature Package

The Eaton SPD Basic Feature Package display is shown in Figure 18.



Figure 18. Basic Feature Package Display

The Basic Feature Package has the following features:

- Green LEDs: Illumination indicates the phase is fully protected, and operating normally, with all protection active and available. Green LEDs also indicate Neutral to Ground protection on units with a Neutral wire. Green LEDs do not indicate on/off status of power.
- Red LEDs: Illumination indicates a loss of protection, and that one or more protective devices are now inactive and unavailable for that Phase. Red LEDs also indicate Neutral to Ground protection on units with a Neutral wire. Red LEDs do not indicate on/off status of power.

#### 3.2.2 Standard Feature Package

The Eaton SPD Series Standard Feature Package display is shown in Figure 19.



Figure 19. Standard Feature Package Display

The Standard Feature Package has the following features:

- All features of the Basic Feature Package.
- One Form C relay contact rated at 150Vac or 125Vdc @1A.
  - Normal operating conditions. N.O. = OPEN. N.C. = CLOSED.
  - Loss of protection on any phase or loss of power. N.O. = CLOSED. N.C. = OPEN.
- Audible alarm with Reset push button.
- EMI/RFI filtering.

#### 3.2.3 Standard With Surge Counter Feature Package

The Eaton SPD Series Standard With Surge Counter Feature Package display is shown in Figure 20.



Figure 20. Standard With Surge Counter Feature Package Display

The Standard With Surge Counter Feature Package has the following features:

- All features of the Standard Feature Package.
- LCD screen that displays surge count.
- Reset button to RESET the surge counter to zero.

3.2.4 SPD Display Rotation

The SPD display can be rotated on the SPD enclosure, up to 360 degrees. This allows you to position the display for the best visibility regardless of the position in which the SPD is installed.

Rotations are at 90, 180, and 270 degrees.

For a typical horizontal mounting see Figure 21. For a typical vertical mounting see Figure 22.

Reposition the SPD display as follows:

1. Remove power from the unit.
2. Remove and discard the perforated overlay material at the two opposite corners of the display.
3. Remove the two phillips head screws that hold the display.
4. Rotate the display to the desired position. Be careful not to overstress the display ribbon cable.
5. Place the display back onto the SPD enclosure. Again, be careful not to overstress or crimp the ribbon cable.
6. Replace the two phillips head screws. Tighten screws to 1.35 Nm (12 in-lbs).
7. Restore power to the unit.

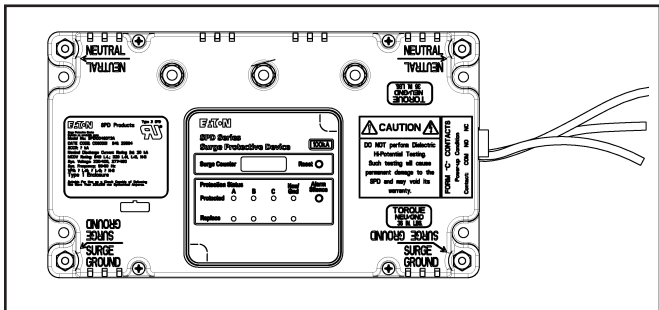


Figure 21. Typical Horizontal Display Mounting

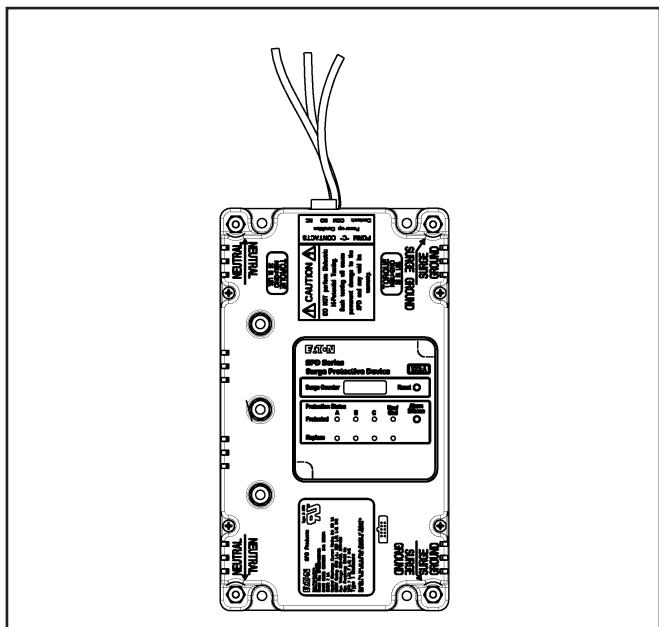


Figure 22. Typical Vertical Display Mounting

3.3 Remote Display Panel (RDP) Option

The Eaton Series SPD displays may be monitored on a remote display panel (RDP). This is indicated by the catalog style with a 'B' suffix (such as SPD250480D2B).

A separately purchased RDP cable is required to connect the SPD unit to the display.

Table 2 lists these cables and their part numbers.

Table 2. RDP Cable Options

Description	Catalog No.
4 ft. Cable for RDP	SPDRDCAB04
8 ft. Cable for RDP	SPDRDCAB08
12 ft. Cable for RDP	SPDRDCAB12

3.4 IEC Approved Models

Eaton's One-Port low-voltage Surge Protective Device Wye Models SPD120480Y2C, SPD160480Y2C, SPD200480Y2C and Delta Models SPD120480D2C, SPD160480D2C, SPD200480D2C meet the requirements of IEC 61643-11 / EN 61643-11, Part 11: Test Class II, and are intended to be installed in indoor applications with a degree of protection rated IP 00.

The SPD Delta and Wye Models are intended for use with a 3 Phase TN-S System with PE and Neutral Distribution, 5 conductor with a minimum 10 AWG or 6 mm<sup>2</sup>. The Delta Models are also intended for use with a 3 Phase TN-C System with PEN Distribution, 4 conductor with a minimum 10 AWG or 6mm<sup>2</sup>. Screws used for connection to ground shall be #10-32 x 3/8" and shall not be zinc or aluminum. This product is not serviceable and contains no replaceable parts.

Additional product information and ratings for IEC Applications:

- The SPD contains internal disconnects with a short circuit current rating  $I_{SCCR}$  of 200kA.
- Residual Current IPE for this product is 5 mA.
- Operating temperature is Normal -5°C to 40°C (23°F to 104°F).
- Humidity range is 5% through 95% non-condensing.
- The SPD may be mounted directly to earthed conductive surface, installed as per this manual.
- Temporary overvoltage rating  $U_T = 402.6$  V.
- Withstand or safe failure mode, for  $t_T = 120$  minutes,  $U_T = 526$  V.
- Modes of protection as marked on a Wye SPD = L-L, L-N, L-G(PE), N-G(PE).
- Modes of protection as marked on a Delta SPD = L-L, L-G(PE).

## 4.0 Troubleshooting

Many SPD failures result from improper installation. Once the SPD is installed properly, it is a highly reliable unit.

If the SPD does not function properly, first confirm that it is installed properly. See Section 2, "Installation."

If the SPD malfunctions after it has been operating routinely, refer to Table 3. This Troubleshooting Chart identifies possible causes and solutions to the malfunction. Further assistance may be obtained by calling Eaton's Applications Engineers, at 1-800-809-2772, option 4, sub-option 2, including being directed to the warranty process if applicable.

**Table 3. Troubleshooting Chart**

Condition	Probable Cause	Solution
Green LEDs ON (1 per phase) and one Green LED ON for Neu/Gnd Protection	Normal operation	N/A.
Audible Alarm OFF, Form C (N.C.) contact in the CLOSED state	Normal operation	N/A.
Phase Green LED is OFF, same Phase Red LED is ON, Audible Alarm is ON	Phase protection compromised or lost Extended Temporary Overvoltage (TOV) Significant surge event	Replace SPD Check electrical system for TOV sources, correct, replace SPD Replace SPD
Neu/Gnd Green LED is OFF, Neu/Gnd Red LED is ON, Audible Alarm is ON (for models with Neutral connections)	Neu/Gnd protection is compromised or lost Significant surge event	Replace SPD Replace SPD
All phase Green LEDs OFF, all phase RED LEDs ON, Audible Alarm is ON	All phase protection is compromised or lost SPD <u>rated</u> voltage is less than <u>system</u> voltage Extended Temporary Overvoltage (TOV) Significant surge event	Replace SPD Replace SPD with correct voltage model Check electrical system for TOV sources, correct, replace SPD Replace SPD
One of the display Red LEDs is ON. Audible Alarm is OFF	Audible Alarm Silence button has been depressed and Alarm is silenced	Normal operation If power is cycled and a fault condition still exists, the Audible Alarm will reactivate
All Green and Red LEDs are OFF, LCD display (on Surge Counter models) is OFF	SPD is not connected to a power source	Check system voltage at SPD connection Check SPD connections

## 5.0 Specifications

**Table 4. Specifications**

Description	Specification
Surge current capacity per phase	50, 80, 100, 120, 160, 200, 250, 300, 400 kA ratings available
Nominal discharge current ( $I_n$ )	20kA
Short circuit current rating (SCCR)	200kA
SPD Type	Basic feature package = Type 1 (can also be used in Type 2 applications) Standard and Standard with Surge Counter feature packages = Type 2
Standard split phase voltages available	120/240
Single phase	230
Three phase wye system voltages available	120/208, 127/220, 230/400, 277/480, 347/600
Three phase delta system voltages	240, 480, 600
Three phase high leg delta system voltages	120/240
Input Power Frequency	50/60 Hz
Power consumption (Basic units) 208Y, 220Y, 230L, 240S, 240D, and 240H voltage codes 400Y and 480Y and 480D voltage codes 600Y and 600D voltage codes	0.5W 1.1W 1.3W
Power consumption (Standard and Standard with Surge Counter units) 208Y, 220Y, 230L, 240S, 240D, and 240H voltage codes 400Y, 480Y, and 480D Basic voltage codes 600Y and 600D voltage codes	0.6W 1.7W 2.1W
Protection modes	Single split phase .....L-N, L-G, N-G, L-L Single phase .....L-N, L-G, N-G Three phase Wye..... L-N, L-G, N-G, L-L Three phase delta.....L-G, L-L Three phase high leg delta.....L-N, L-G, N-G, L-L
Maximum continuous operating voltage (MCOV) 208Y, 220Y, 240S, 240D, and 240H voltage codes 230L, 400Y and 480Y voltage codes 600Y voltage code 240 D voltage code 480 D voltage code 600D voltage code	150 L-N, 150 L-G, 150 N-G, 300 L- 320 L-N, 320 L-G, 320 N-G, 640 L-L 420 L-N, 420 L-G, 420 N-G, 840 L-L 320 L-G, 320 L-L 640L- L-G, 640 L-L 840 L-G, 840 L-L
Ports	1
Operating temperature	-40 through 50° C (-40 through 122° F)
Operating humidity	5% through 95%, non-condensing
Operating altitude	Up to 16,000 ft (5000 m)
Seismic withstand capability	Meets or exceeds the requirements specified in the IBC® 2006, CBC 2007, and UBC® Zone 4
Weight	50-200kA - Approximately 1.6 kg (3.5 lbs) — 250 - 400kA - Approximately 3.2kg (7.0 lbs)
Form C relay contact ratings	150 Vac or 125 Vdc, 1A maximum
Form C relay contact logic	Power on, normal state - NO contact = OPEN, NC contact = CLOSED Power off, fault state, - NO contact = CLOSED, NC contact = OPEN
EMI/RFI filtering attenuation (Standard and Standard With Surge Counter	Up to 50 dB from 10 kHz to 100 MHz
Agency certifications and approvals	UL1449 4th Edition recognized component for the US and Canada, UL1283 7th Edition (Type 2 SPDs only) IEC 61643-11/EN 61643-11, Part 11: Test Class II. See Section 6.0 Ordering Guidelines for specific models.
Warranty	10 Years, 15 Years if you register on <a href="http://www.eaton.com/spd">www.eaton.com/spd</a> and click the warranty registration icon.
UL 96A Compliant	Yes
NFPA 780 Compliant	Yes
ROHS Compliant	Yes
Wire Length and AWG	Factory prewired with 18 inches of 10 AWG wire for Mounting Suffix B,C,J

## 6.0 Ordering Guidelines

Table 5. Eaton SPD Series

		<u>SPD</u>	<u>250</u>	<u>480D</u>	<u>2</u>	<u>J</u>
<div>SPD</div>		<div><div>kA Rating</div><div>Options</div><div>50kA Per Phase 80kA Per Phase 100kA Per Phase 120kA Per Phase 160kA Per Phase 200kA Per Phase 250kA Per Phase 300kA Per Phase 400kA Per Phase</div></div>	<div><div>Voltage Code</div><div>Options</div><div>Integrated Units</div><div>240S = 120/240 Split Phase 208Y = 120/208 Wye (4W + G) 220Y = 127/220 Wye (4W + G) 400Y = 230/400 Wye (4W + G) 480Y = 277/480 Wye (4W + G) 600Y = 347/600 Wye (4W + G) 240D = 240 Delta (3W + G) 480D = 480 Delta (3W + G) 600D = 600 Delta (3W + G) 240H = 240 Delta High Leg (4W + G) on 'B' Phase 230L = 230 Single Phase* NOTE: Please consult the factory for 240 Delta High Leg (4W + G) applications with high leg on 'C' Phase</div></div>			
<div><div>Feature Package</div><div>Options</div><div>1 = Basic.  Dual colored LED per Phase to indicate Protection status Dual colored LED to indicate protection status of the N-G Mode on units with a Neutral Wire  2 = Standard.  Dual colored LED Per Phase to indicate Protection Status Dual colored LED to indicate Protection Status of the N-G Mode on units with a Neutral Wire Audible alarm with Silence button Form 'C' Relay Contact. See Table 4 Specifications EMI/RFI filtering Providing up to 50dB of Noise Attenuation from 10KHz to 100Mhz  3 = Standard With Surge Counter Dual colored LED Per Phase to indicate Protection Status Dual colored LED to indicate Protection Status of the N-G Mode on units with a Neutral Wire Audible alarm with Silence button Form 'C' Relay Contact EMI/RFI filtering Providing up to 50dB of Noise Attenuation from 10kHz to 100Mhz Surge Counter with Reset Button</div></div>		<div><div>Application Suffix</div><div>Options</div><div>Integrated Units</div><div>A = Panelboards, Direct Bus Mounted B = Switchgear (Includes remote display panel &amp; mounting hardware). Order cable separately C = Panelboards, Switchboards, Busway J = Motor Control Centers  NOTE: Units used in Panelboard applications are available in 50 – 200kA ratings only NOTE: Use the 'C' option for Panelboard Applications when unit is connected through a Circuit Breaker</div></div>				

\*\* Eaton's Wye Catalog Numbers SPD120480Y2C, SPD160480Y2C, and SPD200480Y2C and Eaton's Delta Catalog Numbers SPD120480D2C, SPD160480D2C, and SPD200480D2C meet the requirements of IEC 61643-11/EN 61643-11, Part 11: Test Class II, and intended to be installed in indoor applications with a degree of protection rated IP 00.

Example: SPD 250480D2J = SPD Series, 250kA Per Phase, 480D Voltage, Standard Feature Package, Motor Control Center Application.

## 7.0 Warranty

Eaton warrants these products for a period of 10 years from the date of delivery to the purchaser, 15 years if you register on [www.eaton.com/spd](http://www.eaton.com/spd) and click the warranty registration icon to be free from defects in both workmanship and materials. Eaton assumes no risk or liability for results of the use of the products purchased from it, including but without limiting the generality of the foregoing: (1) The use in combination with any electrical or electronic components, circuits, systems, assemblies, or any other materials or substances; (2) Unsuitability of any product for use in any circuit or assembly.

Purchaser's rights under the warranty shall consist solely of requiring Eaton to repair, or at Eaton's sole discretion, replace, free of charge, F.O.B. factory, and defective items received at said factory within said term determined by Eaton to be defective. The giving of or failure to give any advice or recommendations by Eaton shall not constitute any warranty by or impose any liability upon Eaton. The foregoing constitutes the sole and exclusive liability of Eaton AND IS IN LIEU OF ANY AND ALL OTHER WARRANTIES EXPRESSED, IMPLIED OR STATUTORY AS TO THE MERCHANTABILITY, FITNESS FOR PURPOSE SOLD, DESCRIPTION, QUALITY, PRODUCTIVENESS OR ANY OTHER MATTER.

In no event shall Eaton be liable for special or consequential damages or for delay in performance of the warranty.

This warranty does not apply if the product has been misused, abused, altered, tampered with, or used in applications other than specified on the nameplate. At the end of the warranty period, Eaton shall be under no further warranty obligation expressed or implied.

The product covered by this warranty certificate can only be repaired or replaced by the factory. For help on troubleshooting the SPD, or for warranty information, call 1-800-809-2772, Option 4, sub-option 2. Repair or replacement units will be returned collect. If Eaton finds the return to be a manufacturer's defect, the product will be returned prepaid.

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