Technical Data **TD083001EN**

Effective November 2018
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Eaton SPD MAX Series surge protection

Contents

Powering Business Worldwide

Introduction

Eaton's SPD MAX Series side-mounted surge protective devices are the latest and most advanced UL® 1449 4th Edition certified surge protectors. Applying SPD MAX Series units at main service entrances and critical loads will ensure that equipment is protected with the safest and most reliable surge protective devices (SPDs) available. Units are available in all common voltages and configurations, and also in a variety of surge current capacity ratings from 100 kA through 800 kA. Additionally, you may choose from two feature package options.

Applications

The breadth of the SPD MAX Series' features, options, and configurations ensures that the correct unit is available for all electrical applications, including service entrances, main switchgear, motor control centers, distribution switchboards, panelboards, and point-of-use applications.

Features

- Uses thermally protected metal oxide varistor (MOV) technology
- Lockout and tagout provisions
- Safety barriers
- 20 kA nominal discharge current (I_n) rating (maximum rating assigned by UL)
- 100 kA through 800 kA surge current capacity ratings
- Installation flexibility, #10 to 1/0 wire may be used
- Two feature package options
- 200 kA short-circuit current rating (SCCR) (maximum rating assigned by UL)
- Field serviceable
- Can be used for UL 96A compliance
- Can be used for NFPA compliance
- 15-year warranty standard, additional 5 years with product registration

Standards and certifications

- UL 1449 4th Edition
- UL 1283 7th Edition
- Canadian Standards Association (CSA®)
- Built in an ISO® 9001 facility
- Designed and tested in accordance with:
  - IEEE® C62.41.1
  - IEEE C62.41.2
  - IEEE C62.43-2005
  - IEEE C62.45-2002
  - IEEE C62.48-2005
  - IEEE C62.62-2010

Feature package options

The SPD MAX Series provides users with the option of selecting between two feature packages: basic and standard with surge counter. The proper feature package can be selected based on the application's requirements or specifications.

Table 1. Feature package comparison

Feature package comparison	Basic	Standard with surge counter
Surge protection using thermally protected MOV technology	■	■
Dual-colored protection status indicators for each phase	■	■
Dual-colored protection status indicators for the N–G protection mode	■	■
Audible alarm with silence button		■
Form C relay contact		■
EMI/RFI filtering that provides up to 50 dB of noise attenuation from 10 kHz to 100 MHz		■
Surge counter with reset button		■

Enclosure options, dimensions, and weights

There are two enclosure options for the SPD MAX Series, painted steel NEMA® 4 or stainless steel NEMA 4X. The maximum weight of the SPD MAX Series is 52 lb.

Performance data

The following table contains representative voltage protection rating (VPR) data for all SPD MAX Series voltage ratings, but the VPR varies based on the feature package, kA rating, number of modules, and enclosure option. The UL website contains the actual VPR for every possible configuration.

Table 2. ANSI/UL 1449 4th Edition voltage protection ratings

Nominal voltage	L–G VPR	L–L VPR	L–N VPR	N–G VPR	H–G VPR	H–L VPR	H–N VPR
208Y	800	1200	900	900	—	—	—
220Y	800	1200	900	900	—	—	—
230L	1500	—	1500	1200	—	—	—
240D	1200	1200	—	—	—	—	—
240H	800	1200	900	900	1500	2000	1500
240S	800	1200	900	900	—	—	—
400Y	1500	2000	1500	1200	—	—	—
480D	1500	2000	—	—	—	—	—
480Y	1500	2000	1500	1200	—	—	—
600D	1500	2500	—	—	—	—	—
600Y	1500	2500	1800	1500	—	—	—

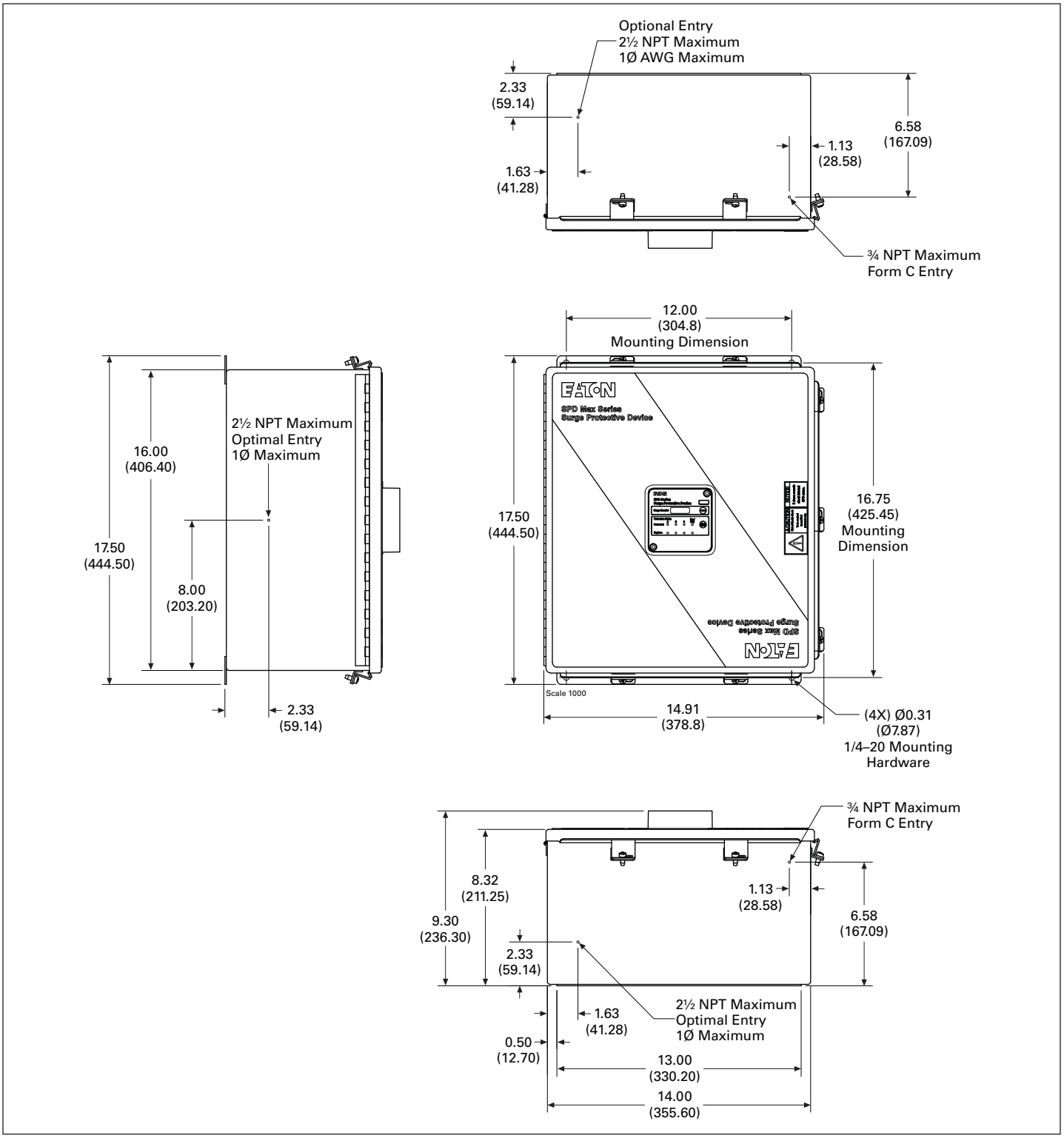

Figure 1. Product dimensions in inches (mm)

Specifications

Table 3. Specifications

Description	Specification
Surge current capacity per phase	100 kA, 120 kA, 160 kA, 200 kA, 250 kA, 300 kA, 320 kA, 400 kA, 600 kA, 800 kA ratings available
Nominal discharge current (I_n)	20 kA
Short-circuit current rating (SCCR)	200 kA
SPD type	Basic feature package = Type 1 (can also be used in Type 2 applications)
	Standard with surge counter feature package = Type 2
Enclosure types	NEMA 4, NEMA 4X enclosure
Circuit breaker—30 A	Eaton catalog number: FDC3030L
Circuit breaker load and line	
Terminal torque specifications	#10 AWG 35 lb-in; #8 AWG 40 lb-in; #6–#4 AWG 45 lb-in; #3–1/0 AWG 50 lb-in (SPD maximum wire range #10–1/0 AWG)
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 high leg phase wire will be identified with a tag from the factory
Input power frequency	50/60 Hz
Power consumption (standard with surge counter units)	
208Y, 220Y, 230L, 240S, 240D, and 240H voltage codes	0.6 W
400Y, 480Y, and 480D basic voltage codes	1.7 W
600Y and 600D voltage codes	2.1 W
Protection modes	Single split phase L–N, L–G, N–G, L–L, single-phase L–N, L–G, N–G, three-phase delta L–G, L–L, three-phase wye L–N, L–G, N–G, L–L, three-phase high leg delta L–N, L–G, N–G, L–L
Maximum continuous operating voltage (MCOV)	
230 V single-phase	320 V L–N, 320 V L–G, 320 V N–G
127 V/220 V wye, 120 V/240 V single split-phase	150 V L–N, 150 V L–G, 150 V N–G, 300 V L–L
120 V/240 V high leg	150 V L–N, 150 V L–G, 150 V N–G, 300 V L–L, 320 V H–N, 320 V H–G, 470 V H–L
230 V/400 V wye, 277 V/480 V wye	320 V L–N, 320 V L–G, 320 V N–G, 640 V L–L
347 V/600 V wye	420 V L–N, 420 V L–G, 420 V N–G, 840 V L–L
240 V delta	300 V L–G, 300 V L–L
480 V delta	640 V L–G, 640 V L–L
600 V delta	840 V L–G, 840 V L–L
Ports	1 or 2
Operating temperature and humidity	–20 °C through +50 °C (–4 °F through +122 °F), 5% through 95%, noncondensing
Storage temperature	–20 °C through +50 °C (–4 °F through +122 °F)
Operating altitude	Up to 16,000 ft (5000 m)
Weight	Not to exceed 52 lb
Form C relay contact ratings	Maximum 0.46 A, 150 Vac, 1 A, 30 Vdc
Form C terminal block ratings	Rated 300 V, 16 A, 30–12 AWG solid or stranded wire. Torque range 5–7 lb-in
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 with surge counter)	Up to 50 dB from 10 kHz to 100 MHz
Standards / agency certifications	UL 1449 4th Edition—standard for surge protective devices
	UL 1283 7th Edition—standard for EMI filters (Type 2 SPDs only)
	CSA Electrical Notice No. 516 1st Edition—surge/transient voltage suppressor (excludes 230L voltage code)
	CSA 22.2 NO. 8-M1986 4th Edition—EMI filters
Warranty	15 years from the date of delivery to the purchaser, 20 years if the product is properly registered at www.eaton.com
RoHS compliant	Yes

Catalog number selection

Table 4. Eaton SPD MAX Series

SPM 250 480D 3 R

SPM

kA rating options
100 = 100 kA per phase
120 = 120 kA per phase
160 = 160 kA per phase
200 = 200 kA per phase
250 = 250 kA per phase
300 = 300 kA per phase
320 = 320 kA per phase
400 = 400 kA per phase
600 = 600 kA per phase
800 = 800 kA per phase

Voltage code options ①
240 S = 120/240 split phase
280 Y = 120 wye/208 wye (4W + G)
220 Y = 127 wye/220 wye (4W + G)
400 Y = 230 wye/400 wye (4W + G)
600 Y = 347 wye/600 wye (4W + G)
240 D = 340 delta (4W + G)
480 D = 480 delta (4W + G)
600 D = 600 delta (4W + G)
240 H = 240 delta high leg (4W + G) on B phase
230 L = 230 single-phase

Application suffix
R = 1 module, NEMA 4 enclosure with internal circuit breaker
S = 2 module, NEMA 4 enclosure with internal circuit breaker
T = 1 module, NEMA 4 enclosure with internal terminal block
U = 2 module, NEMA 4 enclosure with internal terminal block
V = 1 module, NEMA 4X enclosure with internal circuit breaker
W = 2 module, NEMA 4X enclosure with internal circuit breaker
X = 1 module, NEMA 4X enclosure with internal terminal block
Y = 2 module, NEMA 4X enclosure with internal terminal block

Feature package options
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
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 that provides up to 50 dB of noise attenuation from 10 kHz to 100 MHz
Surge counter with alarm silence (reset) button

① Please consult the factory for 240 delta high leg (4W + G) applications with high leg on C phase.

Example: SPD250480D3R = SPD MAX Series, 250 kA per phase, 480 D voltage, standard with counter features package, NEMA 4 enclosure with internal circuit breaker.

Table 5. Valid module and enclosure configurations per kA

kA per phase	Number of surge modules	Available enclosure options
100	Single module only	R, T, V, X enclosures
120	Single module only	R, T, V, X enclosures
160	Single module only	R, T, V, X enclosures
200	Single or dual module	All enclosures
250	Single module only	R, T, V, X enclosures
300	Single module only	R, T, V, X enclosures
320	Dual module only	S, U, W, Y enclosures
400	Single or dual module	All enclosures
500	Dual module only	S, U, W, Y enclosures
600	Dual module only	S, U, W, Y enclosures
800	Dual module only	S, U, W, Y enclosures

Technical support information

If you have any questions or need additional information, please contact the Eaton Technical Resource Center at 1-800-809-2772, option 4, option 2. You may also submit inquiries via e-mail at spd@eaton.com.

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