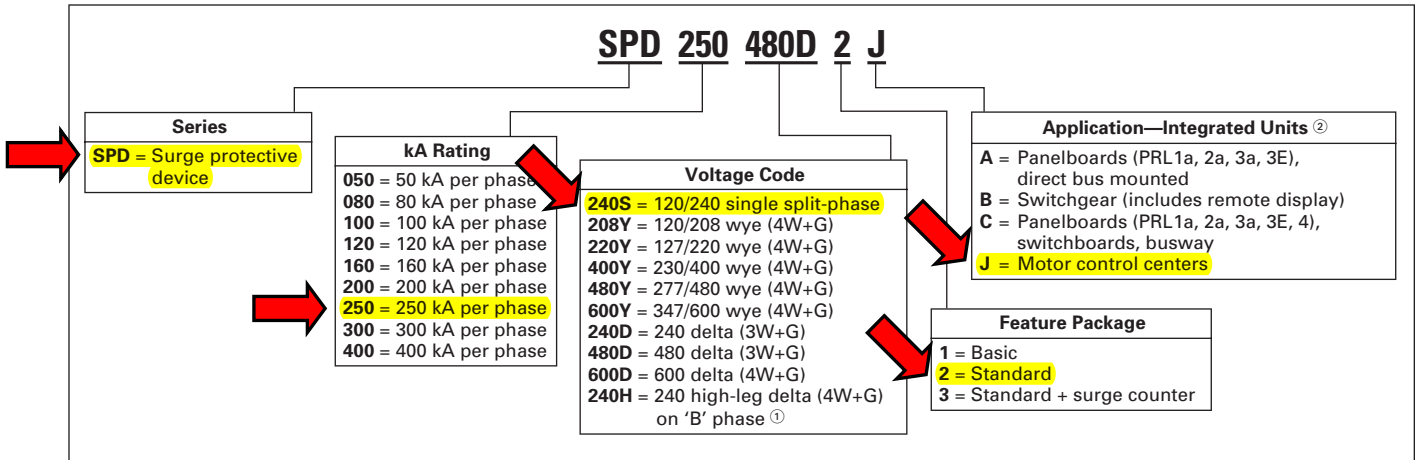


SPD Series

Catalog Numbering System

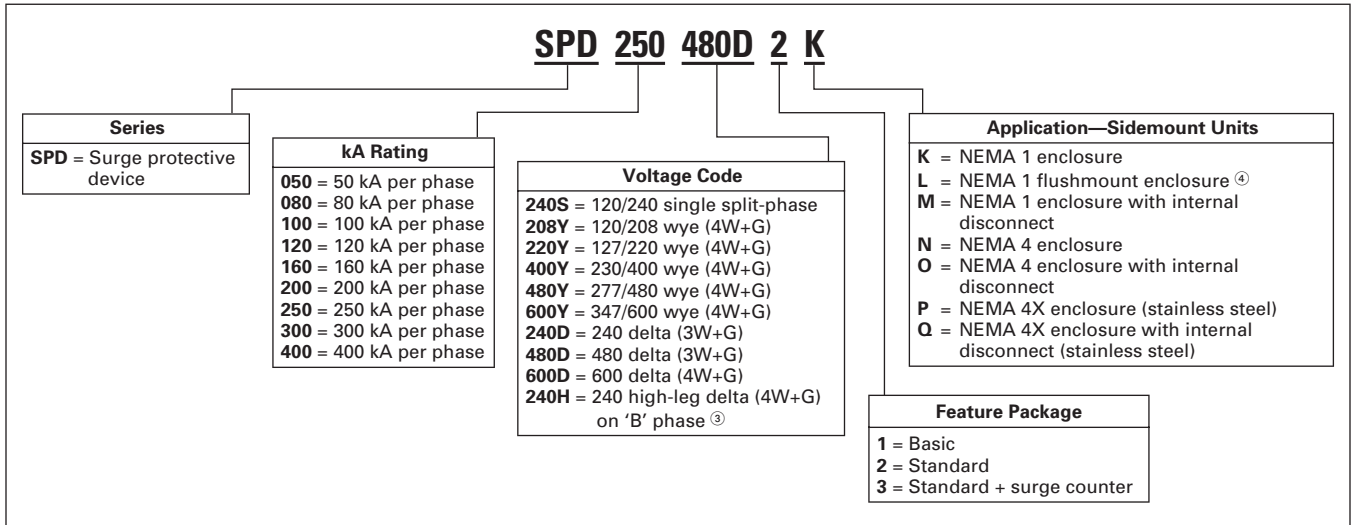
Table 34.1-5. SPD Series Units Mounted Internal to Electrical Distribution Equipment (Integrated Units)



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

② Units used in PRL1a, 2a, 3a and 3E panelboard applications are available in 50–200 kA ratings only. Use the 'C' option for PRL1a, 2a, 3a and 3E panelboard applications when unit is connected through a circuit breaker.
Example: SPD250480D2J = SPD Series, 250 kA per phase, 480D voltage, standard feature package, motor control center application.

Table 34.1-6. SPD Series Units for Mounting External to Electrical Distribution Equipment (Sidemount Units)



③ Please consult the factory for 240 high-leg delta (4W+G) applications with high leg on 'C' phase.

④ NEMA 1 flushmount units are available in 50–200 kA ratings only.
Example: SPD250480D2K = SPD Series, 250 kA per phase, 480D voltage, standard feature package, housed in NEMA 1 enclosure.

SPD Series

Technical Data

Table 34.1-7. SPD Series Specifications

Description	Specification	
Surge capacity ratings available	50, 80, 100, 120, 160, 200, 250, 300, 400 kA per phase	
Nominal discharge current (I _n)	20 kA (maximum rating assigned by UL)	
Short-circuit current rating (SCCR)	200 kA	
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	
Single split-phase voltages available	120/240	
Three-phase wye system voltages available	120/208, 127/220, 230/400, 277/480, 347/600	
Three-phase delta system voltages available	240, 480, 600	
Input power frequency	50/60 Hz	
Power consumption (basic units): 208Y, 220Y, 240S, 240D and 240H voltage codes 400Y, 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, 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 Three-phase wye Three-phase delta Three-phase high-leg delta	L-N, L-G, N-G, L-L L-N, L-G, N-G, L-L L-G, L-L L-N, L-G, N-G, L-L
Maximum continuous operating voltage (MCOV): 240S, 208Y, 220Y and 240H MCOV 400Y and 480Y MCOV 600Y MCOV 240D MCOV 480D MCOV 600D MCOV	150 L-N, 150 L-G, 150 N-G, 300 L-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 640 L-G, 640 L-L 840 L-G, 840 L-L	
Ports	1	
Operating temperature	-40°F through 122°F (-40°C through 50°C)	
Operating humidity	5% through 95%, noncondensing	
Operating altitude	Up to 16,000 ft (5000m)	
Seismic withstand capability	Meets or exceeds the requirements specified in IBC 2006 and CBC 2007	
Form C relay contact ratings	150 Vdc or 125 Vac, 1A maximum	
Form C relay contact logic	Power ON, normal state—NO contact = open, NC contact = closed Power OFF or fault state—NO contact = closed, NC contact = open	
EMI/RFI filtering attenuation	Up to 50 dB from 10 kHz to 100 MHz	

SPD Series

Voltage Protection Rating (VPR)

The measured limiting voltage test in UL 1449 3rd Edition uses a 6 kV/3 kA combination wave surge to determine the voltage protection rating (VPR) of the SPD. This test is similar to the suppressed voltage rating (SVR) as performed in UL 1449 2nd Edition. The key difference between the tests in the 2nd Edition and the 3rd Edition is that the magnitude of the current used for the test is six times greater in the 3rd Edition versus the 2nd Edition. This much higher current level will mean that the measured limiting voltage will likely be significantly higher for the higher current level. For example, the VPR for an SPD will likely be much higher than the SVR of an identical SPD. With higher current levels come higher limiting voltages. Please note that VPR ratings fall into predefined voltage categories as outlined in the UL 1449 3rd Edition. The standard VPR voltages are shown in the following table.

Table 34.1-8. Voltage Protection Ratings

Measured Limiting Voltage	Minimum Voltage Protection Rating (VPR)
330V or Less	330
331 to 400V	400
401 to 500V	500
501 to 600V	600
601 to 700V	700
701 to 800V	800
801 to 900V	900
901 to 1000V	1000
1001 to 1200V	1200
1201 to 1500V	1500
1501 to 1800V	1800
1801 to 2000V	2000
2001 to 2500V	2500
2501 to 3000V	3000
3001 to 4000V	4000

Therefore, if an SPD is tested with a 6 kV/3 kA combination wave surge and the let-through voltage is measured to be 610V, the SPD is given a VPR of 700V. The SPD is given the same 700V VPR if the same test results in a let-through voltage measurement of 698V. Additionally, if the let-through voltage is measured to be 2005V, the SPD is given a VPR of 2500V.

It is important that users are familiar with the difference in testing methods and the subsequent effect on the value of the VPR. Without considering or understanding the differences in the level of currents used in the test, one might assume that a UL 1449 3rd Edition device with a VPR of 700V has a higher limiting voltage than a UL 1449 2nd Edition device with an SVR of 400V. Such a conclusion would be

inaccurate. The higher VPR rating of 700V is likely caused by the higher level of surge current during the measured limiting voltage test. In order to make an accurate assessment of devices, the VPR rating of one device must be compared with the VPR rating of another device. Comparing a VPR rating to an SVR rating yields no useful or conclusive information.

Table 34.1-9. VPR Ratings for 80–400 kA Units Rated 120/240V Single Split-Phase ①

Type (All Voltage Code 240S)	Protection Mode			
	L-N	L-G	N-G	L-L
Integrated direct bus connected ②	500	600	500	900
Integrated circuit breaker connected	700	700	700	1000
Sidemount NEMA 1	700	800	700	1200
Sidemount NEMA 1 with breaker	800	900	700	1500
Sidemount NEMA 4/4X	900	900	700	1200
Sidemount NEMA 4/4X with breaker	900	900	700	1500

① Highest VPR shown for each model and mode. Specific units may have lower VPR ratings based upon options used. Refer to specific VPR ratings shown in TD01005006E for integrated SPDs and TD01005025E for sidemount SPDs.

② Direct bus connected not available above 200 kA.

Note: VPR ratings of 50 kA units and ratings of each specific configuration can be found in TD01005006E for integrated SPDs and TD01005025E for sidemount SPDs.

Table 34.1-10. VPR Ratings for 80–400 kA Units Rated 120/208V Wye (4W + G) and 127/220V Wye (4W + G) ③

Type (All Voltage Code 208Y and 220Y)	Protection Mode			
	L-N	L-G	N-G	L-L
Integrated direct bus connected ④	500	600	500	900
Integrated circuit breaker connected	700	700	700	1000
Sidemount NEMA 1	700	800	700	1200
Sidemount NEMA 1 with breaker	800	1200	700	1500
Sidemount NEMA 4/4X	900	900	700	1500
Sidemount NEMA 4/4X with breaker	900	900	700	1500

③ Highest VPR shown for each model and mode. Specific units may have lower VPR ratings based upon options used. Refer to specific VPR ratings shown in TD01005006E for integrated SPDs and TD01005025E for sidemount SPDs.

④ Direct bus connected not available above 200 kA.

Note: VPR ratings of 50 kA units and ratings of each specific configuration can be found in TD01005006E for integrated SPDs and TD01005025E for sidemount SPDs.

Table 34.1-11. VPR Ratings for 80–400 kA Units Rated 230/400V Wye (4W + G) and 277/480V Wye (4W + G) ⑤

Type (All Voltage Code 400Y and 480Y)	Protection Mode			
	L-N	L-G	N-G	L-L
Integrated direct bus connected ⑥	1000	1200	1000	1800
Integrated circuit breaker connected	1200	1200	1200	1800
Sidemount NEMA 1	1200	1200	1200	2500
Sidemount NEMA 1 with breaker	1500	1500	1200	2500
Sidemount NEMA 4/4X	1200	1200	1200	2500
Sidemount NEMA 4/4X with breaker	1200	1500	1200	2500

⑤ Highest VPR shown for each model and mode. Specific units may have lower VPR ratings based upon options used. Refer to specific VPR ratings shown in TD01005006E for integrated SPDs and TD01005025E for sidemount SPDs.

⑥ Direct bus connected not available above 200 kA.

Note: VPR ratings of 50 kA units and ratings of each specific configuration can be found in TD01005006E for integrated SPDs and TD01005025E for sidemount SPDs.