

# Avoiding Surge Protective Device Procurement Errors

White Paper

# Avoiding SPD Procurement Errors

*Application Information and Manufacturer Support are Keys to Receiving Correct SPDs*

## BACKGROUND INFORMATION

Surge protection devices (SPDs) provide protective capabilities for a wide range of electrical systems, circuits, and equipment. Available in various form factors, SPDs are further differentiated by surge capacities, component technologies, UL types, nominal voltages, electrical system configurations, and more. For example, Square D and ASCO offer many unique models of SPDs. Because most models can be configured for a wide range of applications (Figure 1), it is important to avoid ordering errors that could result in receiving inappropriate SPDs. Manufacturers typically can provide technical support advice to customers to assure proper SPD selection.

Voltage	Surge Current per Phase	Modes of Protection	Configuration	Model Number	MCOV	I <sub>n</sub>	L-N	L-G	L-L	N-G
120/240V	100	6	1 Ø, 3-wire+G	SSP01XDSE10A( )	150V	20 kA	700V	700V	600V	1000V
208Y/120V <sup>1</sup>	100	10	3 Ø, Wye, 4-wire+G	SSP02XDSE10A( )	150V	20 kA	700V	700V	600V	1000V
240/120V HLD	100	10	3 Ø, HLD*, 4-wire+G	SSP03XDSE10A( )	150/320V	20 kA	700/1200V	700/1200V	600V	1000/2000V
480Y/277V <sup>2</sup>	100	10	3 Ø, Wye, 4-wire+G	SSP04XDSE10A( )	320V	20 kA	1200V	1200V	1200V	2000V
480V Delta <sup>3</sup>	100	6	3 Ø, Delta, 3-wire+G	SSP05XDSE10A( )	552V	20 kA	N/A	1800V	N/A	2000V
240V Delta	100	6	3 Ø, Delta, 3-wire+G	SSP06XDSE10A( )	300/320V	20 kA	N/A	320V	300V	N/A
600Y/347V	100	10	3 Ø, Wye, 4-wire+G	SSP08XDSE10A( )	420V	20 kA	1500V	1500V	1500V	2500V
600V Delta <sup>4</sup>	100	6	3 Ø, Delta, 3-wire+G	SSP09XDSE10A( )	690V	20 kA	N/A	2500V	2500V	N/A
120/240V	150	6	1 Ø, 3-wire+G	SSP01XDSE15A( )	150V	20 kA	700V	700V	600V	1000V
208Y/120V <sup>1</sup>	150	10	3 Ø, Wye, 4-wire+G	SSP02XDSE15A( )	150V	20 kA	700V	700V	600V	1000V
240/120V HLD	150	10	3 Ø, HLD*, 4-wire+G	SSP03XDSE15A( )	150/320V	20 kA	700/1200V	700/1200V	600V	1000/2000V
480Y/277V <sup>2</sup>	150	10	3 Ø, Wye, 4-wire+G	SSP04XDSE15A( )	320V	20 kA	1200V	1200V	1200V	2000V
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600Y/347V	200	10	3 Ø, Wye, 4-wire+G	SSP08XDSE20A( )	420V	20 kA	1500V	1500V	1500V	2500V



**Figure 1: With choices for voltages, enclosures, UL Types, and more, the Square D XDSE SPD is available in many configurations. Consequently, it is important to confirm application details before an order is placed.**



## CONSEQUENCES OF RECEIVING INCORRECT SPDS

To obtain optimal surge protection, it is important to specify an appropriate SPD for a facility or application. The consequences of receiving incorrect SPDs from a vendor include the following:

### *SPD Failure & Disruption of Operations*

If incorrect SPDs are installed in a power distribution system, their subsequent operation could result in damage to the units and potential damage to downstream equipment. In such instances, customers could experience downtime, delays, or other impacts to operations. Customers could also incur costs for repairing or replacing SPDs and connected load equipment.

### *Project Delays*

Receiving incorrect SPDs could delay installation or startup of new equipment, systems, or facilities. For common models already in a vendor's inventory, the delay would continue while the incorrect unit is returned and the appropriate model is shipped to the job site. For uncommon, custom-built, or out-of-stock SPDs, the delays could extend until new units are manufactured and shipped.

### *Increased Costs*

If a procurement error is not the fault of a manufacturer, obtaining a replacement SPD could incur additional shipping, labor, and other related expenses.

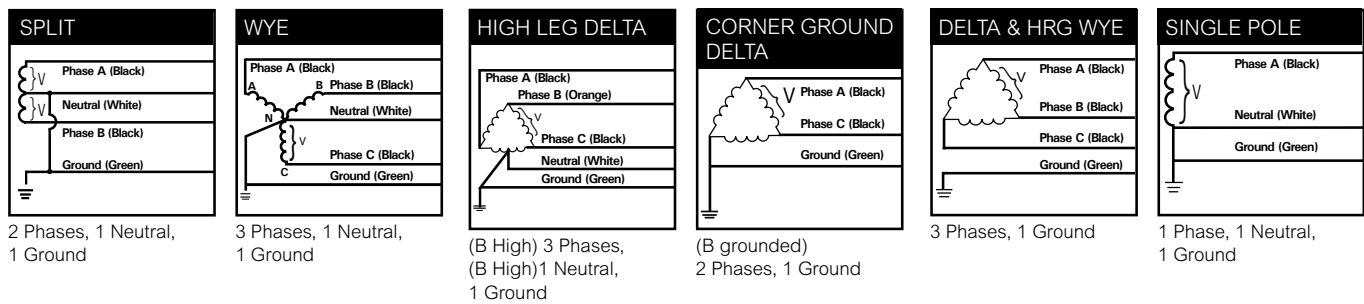
## COMMON PROCUREMENT ERRORS

SPD product returns most commonly result from customer-provided ordering information that is either inaccurate or incomplete. This often occurs when customers do not understand or provide important information regarding the system in which SPDs will be installed.

### *System Configuration and Voltage*

Proper specification of the electrical system configuration is essential to avoiding SPD procurement errors. For example, a manufacturer may receive an order for SPDs for a Delta-configured power distribution system. Without receiving additional information, the manufacturer cannot know that an SPD for Wye system is actually necessary. Similarly, the appropriateness of an order for a 3-phase, 3-wire, corner-grounded Delta SPD cannot be confirmed without more information about the

application. If the customer has requested an SPD for 3-phase, 3-wire, ungrounded Delta application, the SPD it receives will be useless. Consequently, all SPD requirements such as system configuration, grounding, and nominal voltage must be understood by the customer and shared with the manufacturer.



**Figure 2: Because electrical system configuration is important for correct ordering, diagrams for available configuration options are often placed directly on the product data sheets.**

Because SPDs are voltage-limiting devices, it is important to specify the correct system voltage when placing an order. Selecting an SPD with a voltage rating that exceeds the nominal system voltage can subject downstream equipment to greater stresses because the SPD will provide higher let-through voltages. Ordering a unit with a voltage rating that is less than the nominal circuit voltage will lead to SPD failure. In this instance, the line voltage level will cause the SPD to continually shunt voltage, causing its internal components to overheat.

### **Equipment Enclosure Selection**

Another common error occurs when customers request incorrect equipment enclosures. If the enclosure type or rating is not presented in specifications or on drawings, SPDs may be shipped in enclosures that are inadequate for the environment where they will be installed. This can result in the delays and added costs described earlier in this document.

To avoid enclosure ordering errors, users must understand both the conditions in which SPDs will be used and the types of enclosures that are available. Originally written for automatic transfer switching products, the ASCO Power Technologies white paper entitled [Equipment Enclosure Classifications](#) describes characteristics of common enclosure types and the industry standards that apply to them. A video summary of the paper is viewable [here](#).

## **AVOIDING ORDERING ERRORS**

SPD manufacturers typically can provide application support to ensure that the most appropriate SPDs will be provided for a specific application. Manufacturers can offer the most comprehensive pre-sale support when customers provide electrical system one-line diagrams, project specifications, and electrical panel schedules. Qualified manufacturer representatives can use these resources in the following ways.

Many customers routinely provide project specifications when ordering SPDs, relying on the manufacturer to propose and provide an appropriate model. When customers also provide drawings of the electrical system, a qualified manufacturer can review them to confirm SPD requirements. Although information on drawings typically supersedes specification information, differing information on drawings and in specifications can prompt the manufacturer to request clarification so that SPD selection errors can be avoided.

Panel schedules typically describe ratings and information for dedicated circuit breakers that serve SPDs. Manufacturers can review schedules for entire panels to verify that appropriate SPDs will be selected. This review can help customers avoid having to change circuit breakers, or having to return SPDs to obtain units that will suitably protect load equipment.



## SUMMARY

When incorrect SPDs are shipped, customers can experience SPD failures, project delays, and increased costs. The most common ordering errors include incorrect voltage and electrical system configuration information. By reviewing project specifications, one-line diagrams, and panel schedules before ordering, qualified manufacturers can help customers avoid procurement errors to obtain the most appropriate SPDs for their applications.

For technical assistance in selecting Square D and ASCO SPDs, contact Surge Protection Support at **1-888-778-2733** or online at **[se.com/us/en/work/support](https://www.se.com/us/en/work/support)**



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