

# VAL-SQ SI...

25 and 40 kA Surge Protective Device for small installation protection



## TRABTECH

Data Sheet  
2532\_en\_A

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### 1 Description

The VAL-SQ SI... Surge Protective Device (SPD) provides surge protection in a compact, affordable package.

A high-energy suppression circuit provides 25 or 40 kA (depending upon the model) of surge current rating per phase. Each surge suppression mode in the VAL-SQ SI... is individually fused.

The VAL-SQ SI... SPD uses a sealed, NEMA 4X housing, allowing installation in harsh environments with limited space. Operating status lights are easily observed and provide verification of protection.

### 2 Features

- Compact design for flexible mounting locations
- 25 or 40 kA surge current capacity per phase (L-N and N-G) protects against high-energy lightning strikes and transient voltages
- NEMA Type 4X enclosure
- LEDs provide continuous feedback on the status of each phase
- UL/cUL listed; meets UL 1449 2<sup>nd</sup> edition February 2007 requirements



#### DANGER:

Risk of electric shock. Disconnect power before installing or servicing. Service to be performed by qualified personnel only.



Make sure you always use the latest documentation.  
It can be downloaded at [www.download.phoenixcontact.com](http://www.download.phoenixcontact.com).

A conversion table is available on the Internet at  
[www.download.phoenixcontact.com/general/7000\\_en\\_00.pdf](http://www.download.phoenixcontact.com/general/7000_en_00.pdf).



This data sheet is valid for all products listed on the following page:

### 3 Ordering Data

#### Products

| Description   | Type                | Part No. | Pcs./Pkt. |
|---|---------------------|----------|-----------|
| Surge protective device, 25 kA, 2-phase, 2-wire + ground for 120 V (L-N) applications with common GND-N                 | VAL-SQ SI 25-2C-120 | 2800003  | 1         |
| Surge protective device, 40 kA, 2-phase, 2-wire + ground + neutral for 120 V (L-N) applications with separate GND and N | VAL-SQ SI 40-2S-120 | 2800005  | 1         |
| Surge protective device, 40 kA, 2-phase, 2-wire + ground + neutral for 240 V (L-N) applications with separate GND and N | VAL-SQ SI 40-2S-240 | 2800006  | 1         |
| Surge protective device, 40 kA, 3-phase, 3-wire + ground for up to 600 V (L-N) applications with common GND-N           | VAL-SQ SI 40-3C-600 | 2800007  | 1         |

### 4 Technical Data

| Surge Protection Data               | 2800003                            | 2800005       | 2800006       | 2800007                            |
|-------------------------------------|------------------------------------|---------------|---------------|------------------------------------|
| Maximum surge current per phase     | 25 kA                              | 40 kA         | 40 kA         | 40 kA                              |
| Short circuit current rating (SCCR) | 22 kA                              | 25 kA         | 10kA          | 200 kA                             |
| Nominal voltage                     | 120 V                              | 120 V         | 240 V         | 600 V <sup>1</sup>                 |
| Circuit type                        | MOV technology                     |               |               |                                    |
| UL Class                            | Type 1 + 2 (Surge arrester & TVSS) | Type 2 (TVSS) | Type 2 (TVSS) | Type 1 + 2 (Surge arrester & TVSS) |

<sup>1</sup> Up to 600 V

| Part No. | Type                | MCOV | Surge Voltage Rating (SVR) |      |     |
|----------|---------------------|------|----------------------------|------|-----|
|          |                     |      | L-N                        | N-G  | L-L |
| 2800003  | VAL-SQ SI 25-2C-120 | 150  | 500                        | –    | 900 |
| 2800005  | VAL-SQ SI 40-2S-120 | 150  | 500                        | 800  | –   |
| 2800006  | VAL-SQ SI 40-2S-240 | 320  | 900                        | 900  | –   |
| 2800007  | VAL-SQ SI 40-3C-600 | 650  | 1800                       | 2000 | –   |

| General Data          | 2800003   | 2800005   | 2800006   | 2800007   |
|-----------------------|---|---|---|---|
| Dimensions (WxHxD)    | 2.24 x 2.08 x 2.25 in.<br>(56.9 x 52.8 x 56.9 mm) | 3.00 x 2.73 x 3.60 in.<br>(76.2 x 69.3 x 91.4 mm) | 3.00 x 2.73 x 3.60 in.<br>(76.2 x 69.3 x 91.4 mm) | 3.60 x 2.73 x 3.00 in.<br>(91.4 x 69.3 x 76.2 mm) |
| Weight                | 0.53 lb. (0.24 kg)                                | 1.2 lb. (0.54 kg)                                 | 1.2 lb. (0.54 kg)                                 | 1.0 lb. (0.45 kg)                                 |
| Enclosure material    | Non-metallic                                      | Non-metallic                                      | Non-metallic                                      | Non-metallic                                      |
| Housing rating        | NEMA 4X   | NEMA 4X   | NEMA 4X   | NEMA 4X   |
| Phase connection      | Parallel<br>#14 AWG                               | Parallel<br>#10 AWG                               | Parallel<br>#10 AWG                               | Parallel<br>#12 AWG                               |
| Conduit connector     | 1/2-in. NPT                                       |   |   |   |
| Operating frequency   | 50/60 Hz  |   |   |   |
| Operating temperature | -40 to 70°C (-40 to 160°F)                        |   |   |   |
| Operating altitude    | 0 to 12,000 ft. (3,658 m)                         |   |   |   |

#### Approvals

|        |  |
|--------|--|
| UL/cUL | 1449 2 <sup>nd</sup> edition, February 2007 requirements<br>1283 |
| CSA    | C22.2 No. 8-M1986  |
| IEEE   | C62.41.1-2002<br>C62.41.2-2002<br>C62.45-2002                    |

## 5 Dimensions

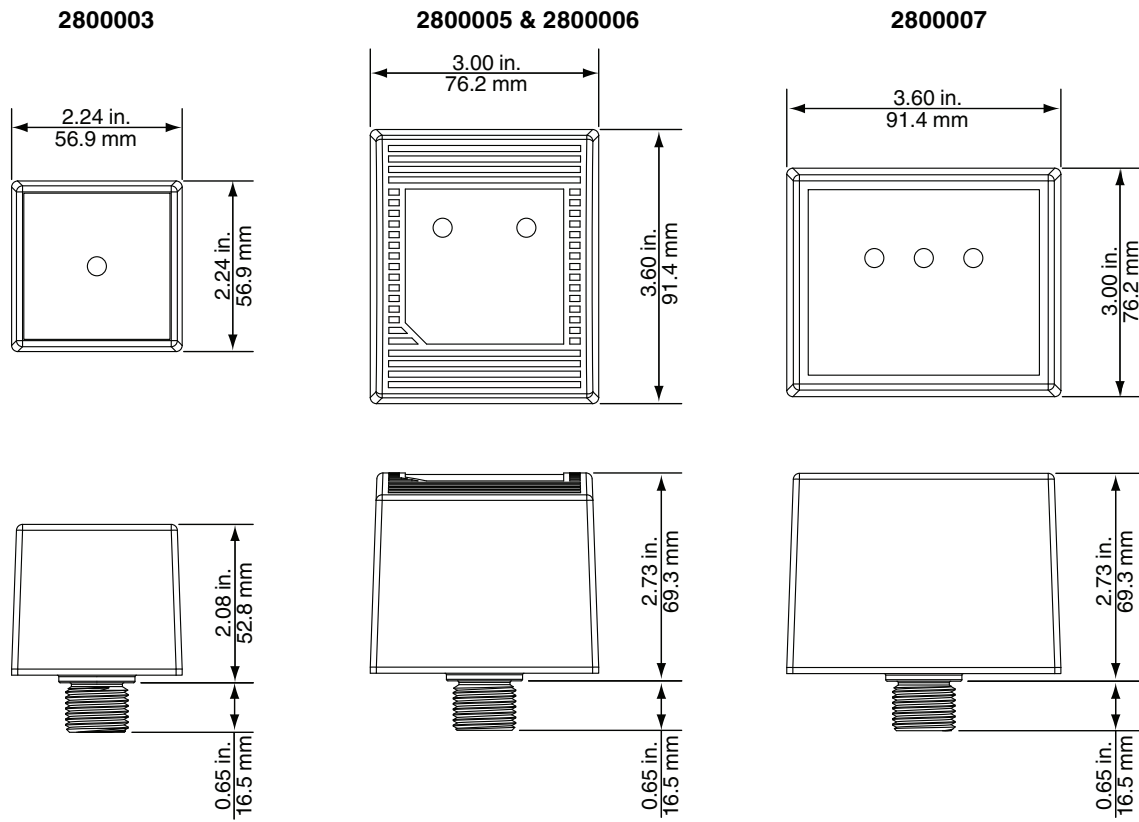


Figure 1 Dimensions

## 6 Installation



### DANGER:

Turn off all power supplying this equipment before working on or inside equipment.  
Always follow federal and local regulations during installation. Apply appropriate personal protective equipment (PPE) and follow electrical work practices.  
Only qualified electrical personnel may install and service this equipment.  
Never open SPD. No serviceable parts are inside.



### WARNING:

This equipment depends upon an effective ground. Failure to obtain a quality ground connection may result in explosion or arc flash.



### NOTE:

Megger® or hi-potential tests will damage this surge protective device. Turn off all power supplying the equipment and isolate the surge protective device before testing.

### 6.1 Mounting and connection

- Position the VAL-SQ SI... so the LEDs are visible and the wires are as short and straight as possible.  
The SPD can be mounted in any orientation. It attaches through any side of the enclosure being protected using 1/2-NPT threaded nipple.



### NOTE:

Cover or remove components inside any enclosure before drilling to prevent shavings from causing short-circuits across terminals and races.

- Create a hole in the enclosure, 2, for 1/2-in. conduit attachment, approximately 7/8 in. (22 mm) diameter.
- Route the wires and nipple through the hole and secure the VAL-SQ SI... to the enclosure with the strain relief nut, 3.

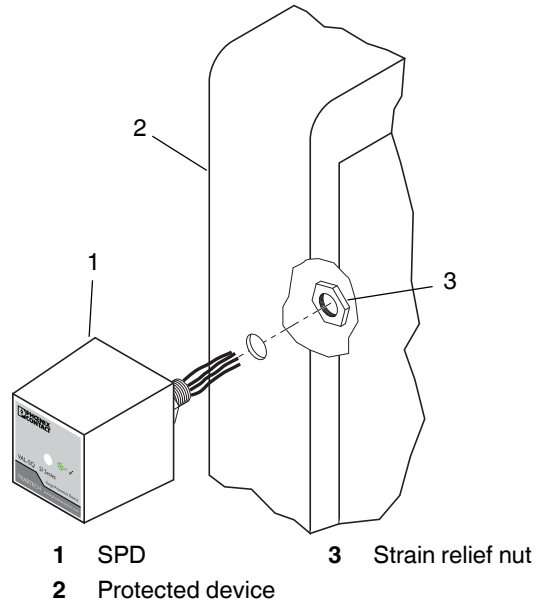


Figure 2 Mounting the SPD

- Connect the VAL-SQ SI... to the appropriate phases and ground lines as shown on the following illustrations. Wires are color coded as shown. If equipped with a green wire, it must be connected to ground.

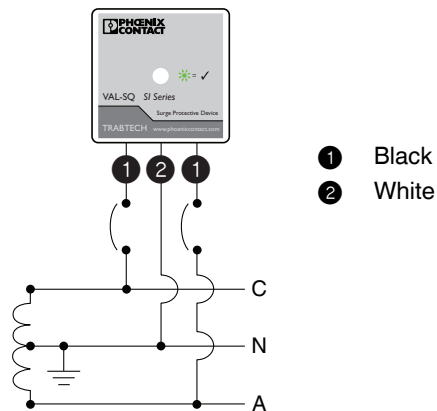


Figure 3 Single-phase, 3-wire, 120/240 V AC VAL-SQ SI 25-2C-120 connection

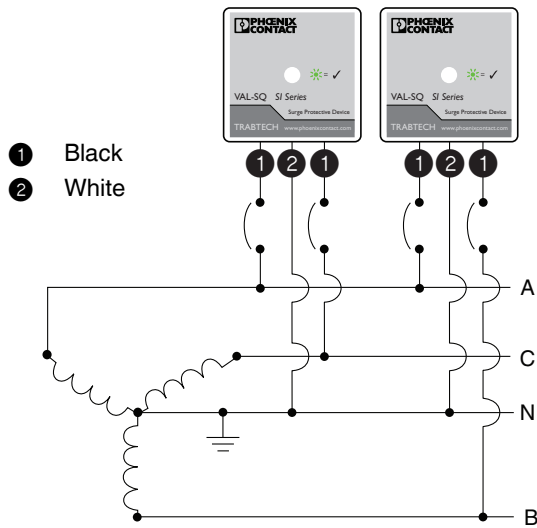


Figure 4 3-phase Wye, 208 V AC  
VAL-SQ SI 25-2C-120 connection

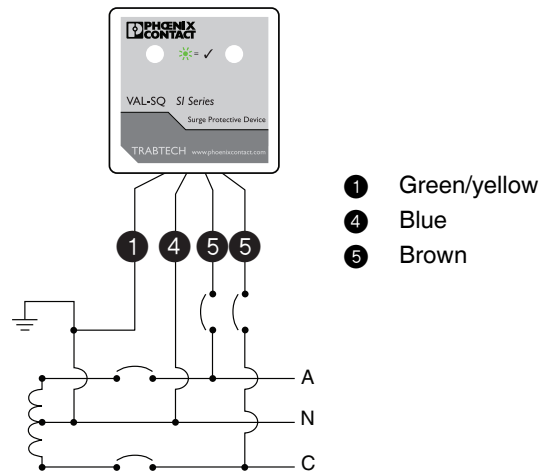


Figure 6 1- or 2-phase, 240 V AC  
VAL-SQ SI 40-2S-240 connection

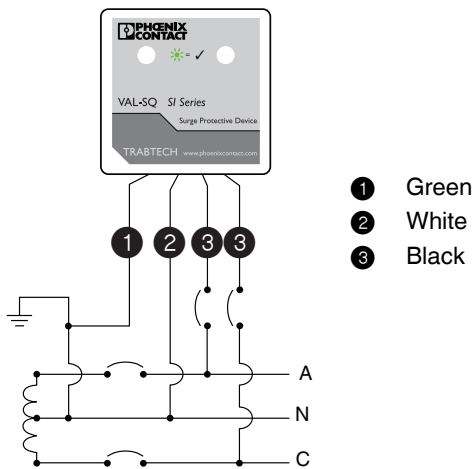


Figure 5 1- or 2-phase, 120 V AC  
VAL-SQ SI 40-2S-120 connection

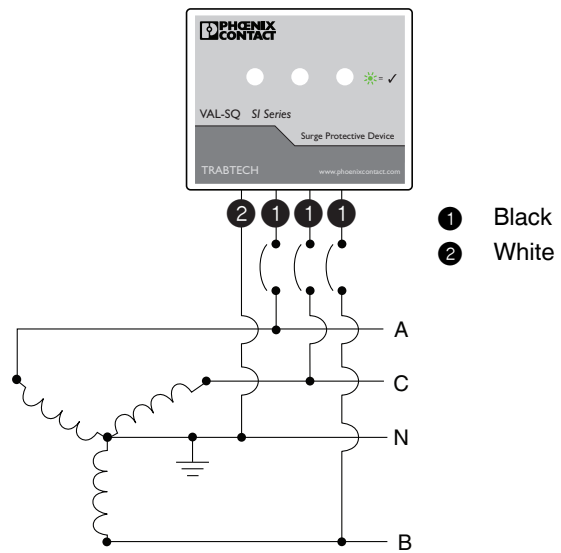


Figure 7 3-phase Wye, 208, 480 or 600 V AC  
VAL-SQ SI 40-3C-600 connection

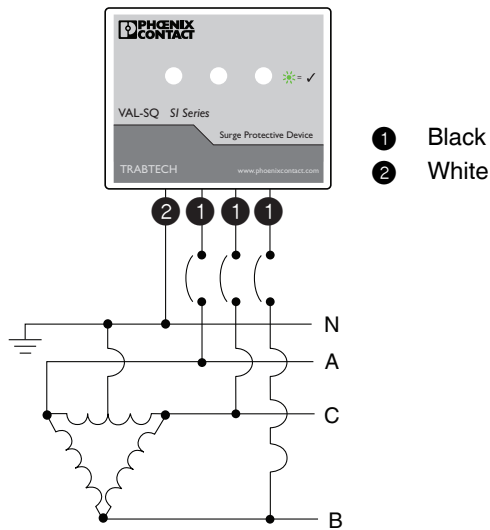


Figure 8 3-phase High-Leg Delta, 120/240 V AC VAL-SQ SI 40-3C-600 connection

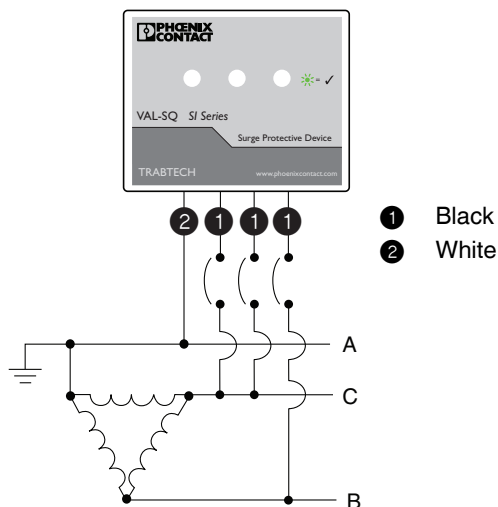


Figure 9 3-phase, Delta, 240, 480, 600 V AC, VAL-SQ SI 40-3C-600 connection

Type 1 (Lightning Arrestor) SPDs can be connected on either side of the service entrance. Type 2 (TVSS) SPDs must be connected on the load side of the service entrance breakers as shown. Disconnects to the SPD are recommended.

All wires must be attached to the appropriate wires; phase, neutral or ground. The SPD must be connected to power through a circuit breaker rated appropriately for the connected wire gauge. Use an appropriate breaker, i.e., 2- or 3-pole, for the electrical configuration.



All wires must be connected for the SPD to function correctly.

The wires between the SPD and protected device should be twisted 1/2 turn every 12 in. (300 mm). Do not loop or coil wire. Excess wire must be removed without applying stress to wires.

## 7 Operation

LEDs indicate the operating status of the individual phases of the VAL-SQ SI... The LEDs illuminate when the relevant phase is operating correctly.

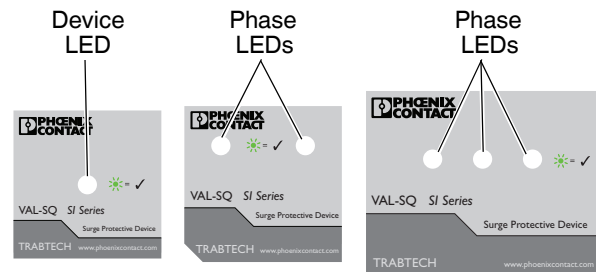


Figure 10 LED location

If a phase is not operating correctly or a fault occurs, the corresponding LED is not lit.

When a phase LED is not lit, verify the correct voltage is present on each phase. If power is present, the VAL-SQ SI... must be replaced. There are no serviceable parts.