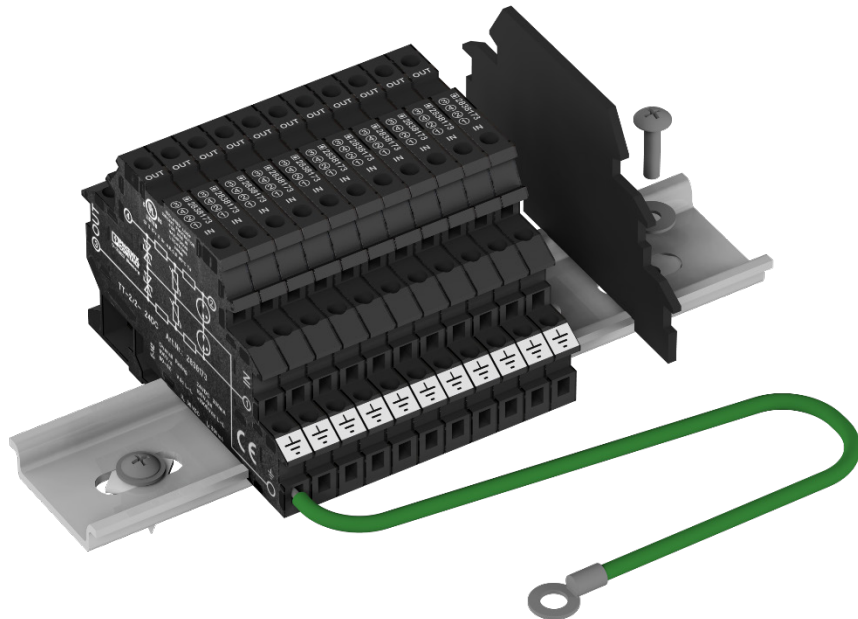


INSTRUCTION MANUAL



SVP100 Surge Voltage Protector

Revision: 12/16



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Limited Warranty

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CAMPBELL SCIENTIFIC, INC.

RMA# _____
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Safety

DANGER — MANY HAZARDS ARE ASSOCIATED WITH INSTALLING, USING, MAINTAINING, AND WORKING ON OR AROUND TRIPODS, TOWERS, AND ANY ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC. FAILURE TO PROPERLY AND COMPLETELY ASSEMBLE, INSTALL, OPERATE, USE, AND MAINTAIN TRIPODS, TOWERS, AND ATTACHMENTS, AND FAILURE TO HEED WARNINGS, INCREASES THE RISK OF DEATH, ACCIDENT, SERIOUS INJURY, PROPERTY DAMAGE, AND PRODUCT FAILURE. TAKE ALL REASONABLE PRECAUTIONS TO AVOID THESE HAZARDS. CHECK WITH YOUR ORGANIZATION'S SAFETY COORDINATOR (OR POLICY) FOR PROCEDURES AND REQUIRED PROTECTIVE EQUIPMENT PRIOR TO PERFORMING ANY WORK.

Use tripods, towers, and attachments to tripods and towers only for purposes for which they are designed. Do not exceed design limits. Be familiar and comply with all instructions provided in product manuals. Manuals are available at www.campbellsci.com or by telephoning (435) 227-9000 (USA). You are responsible for conformance with governing codes and regulations, including safety regulations, and the integrity and location of structures or land to which towers, tripods, and any attachments are attached. Installation sites should be evaluated and approved by a qualified engineer. If questions or concerns arise regarding installation, use, or maintenance of tripods, towers, attachments, or electrical connections, consult with a licensed and qualified engineer or electrician.

General

- Prior to performing site or installation work, obtain required approvals and permits. Comply with all governing structure-height regulations, such as those of the FAA in the USA.
- Use only qualified personnel for installation, use, and maintenance of tripods and towers, and any attachments to tripods and towers. The use of licensed and qualified contractors is highly recommended.
- Read all applicable instructions carefully and understand procedures thoroughly before beginning work.
- Wear a **hardhat** and **eye protection**, and take **other appropriate safety precautions** while working on or around tripods and towers.
- **Do not climb** tripods or towers at any time, and prohibit climbing by other persons. Take reasonable precautions to secure tripod and tower sites from trespassers.
- Use only manufacturer recommended parts, materials, and tools.

Utility and Electrical

- **You can be killed** or sustain serious bodily injury if the tripod, tower, or attachments you are installing, constructing, using, or maintaining, or a tool, stake, or anchor, come in **contact with overhead or underground utility lines**.
- Maintain a distance of at least one-and-one-half times structure height, 20 feet, or the distance required by applicable law, **whichever is greater**, between overhead utility lines and the structure (tripod, tower, attachments, or tools).
- Prior to performing site or installation work, inform all utility companies and have all underground utilities marked.
- Comply with all electrical codes. Electrical equipment and related grounding devices should be installed by a licensed and qualified electrician.

Elevated Work and Weather

- Exercise extreme caution when performing elevated work.
- Use appropriate equipment and safety practices.
- During installation and maintenance, keep tower and tripod sites clear of un-trained or non-essential personnel. Take precautions to prevent elevated tools and objects from dropping.
- Do not perform any work in inclement weather, including wind, rain, snow, lightning, etc.

Maintenance

- Periodically (at least yearly) check for wear and damage, including corrosion, stress cracks, frayed cables, loose cable clamps, cable tightness, etc. and take necessary corrective actions.
- Periodically (at least yearly) check electrical ground connections.

WHILE EVERY ATTEMPT IS MADE TO EMBODY THE HIGHEST DEGREE OF SAFETY IN ALL CAMPBELL SCIENTIFIC PRODUCTS, THE CUSTOMER ASSUMES ALL RISK FROM ANY INJURY RESULTING FROM IMPROPER INSTALLATION, USE, OR MAINTENANCE OF TRIPODS, TOWERS, OR ATTACHMENTS TO TRIPODS AND TOWERS SUCH AS SENSORS, CROSSARMS, ENCLOSURES, ANTENNAS, ETC.

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SVP100 Surge Voltage Protector

1. Introduction

Typical usage of the SVP100 (FIGURE 1-1) is to place its surge protectors in-line between the sensors and a Campbell Scientific datalogger. The SVP100 is used to supplement the built-in surge protection provided by the datalogger.

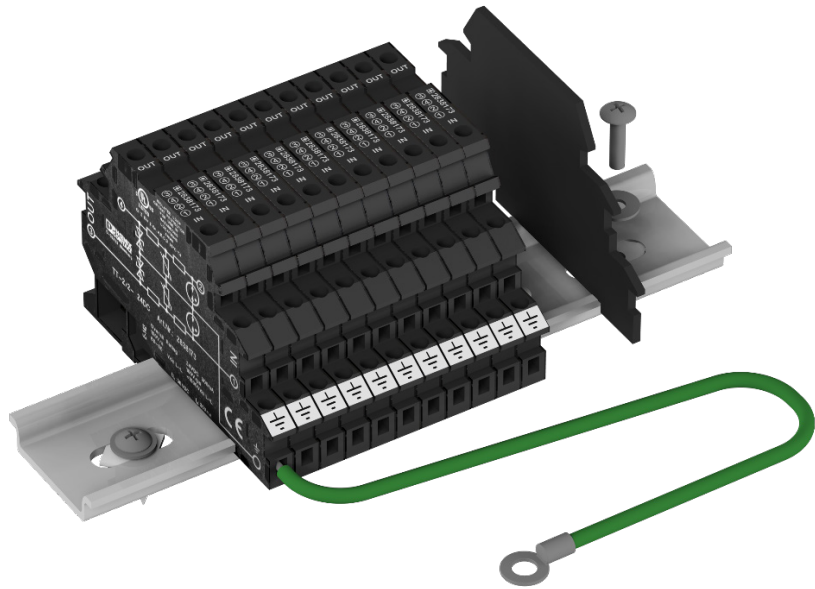


FIGURE 1-1. SVP100

2. Precautions

- READ AND UNDERSTAND the [Safety](#) section at the front of this manual.
- Always ensure no voltage is present when installing the SVP100, or when changing any wire connections.
- Warning: Improper wiring may damage the SVP100 beyond repair.

3. Initial Inspection

Upon receipt of the SVP100, inspect the packaging and contents for damage. File any damage claims with the shipping company. Ensure that all components are present. Smaller items may not be readily visible within the packaging.

4. Overview

The SVP100 consists of a DIN rail and surge protectors to provide three-stage surge protection to analog and digital circuits. The analog surge protector (pn 31273) provides protection for a floating double conductor, with a separate

ground connection. The digital surge protector (pn 31274) provides protection for two signal wires with a common reference potential, with a separate ground connection. Both versions provide protection up to 24 Vdc.

The SVP100 is designed to mount on Campbell Scientific’s standard enclosure backplates with 1-inch centered, pre-punched square accessory mounting holes.

The SVP100 consists of one or more surge protectors mounted on a DIN rail bracket. A single end plate is used to cover the last surge protector.

5. Specifications

Surge protection is provided by a three-stage surge protection system. Each surge protector provides supplementary protection for analog measurements (pn 31273), or for dc power circuits, including digital measurements (pn 31274).

DIN Rail

- Length:** 6.00 in (152.4 mm)
- Width:** 1.38 in (35.05 mm)
- Height:** .295 in (7.49 mm)

Surge Protector

- Length:** 3.13 in (79.6 mm)
- Width:** .24 in (6.2 mm)
- Height:** 2.15 in (54.6 mm)

The mounting holes in the DIN rail have the same 1-inch spacing as Campbell Scientific enclosures. The two outer mounting holes are used to secure the DIN rail.

Schematics for the analog (pn 31273) and digital (pn 31274) surge protectors are shown in FIGURE 5-1.

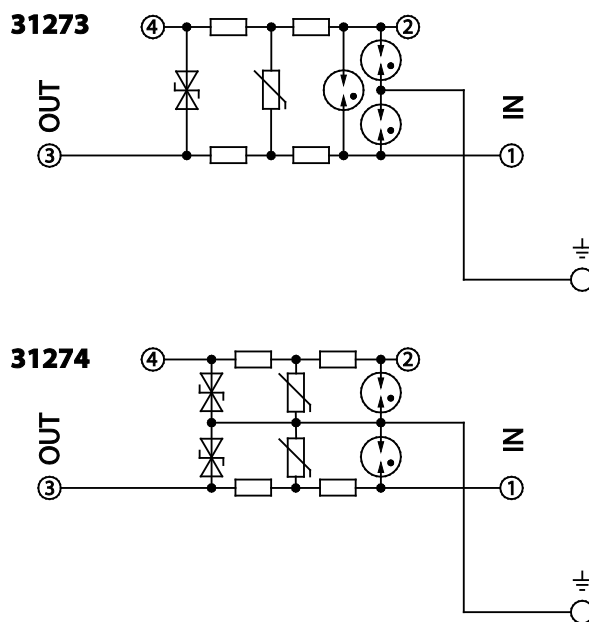


FIGURE 5-1. SVP100 surge protector schematics

6. Installation

6.1 Mounting the SVP100

The SVP100 uses a DIN rail to allow multiple surge protectors to be mounted in a compact space. Up to 22 surge protectors can be mounted on a single DIN rail.

1. Determine where the DIN rail is to be mounted inside the enclosure, noting which holes in the enclosure grid line up with the outside holes of the DIN rail.
2. Insert a plastic grommet into the two holes lining up with the outer DIN rail holes, and then secure the DIN rail to the enclosure grid using the mounting screws and washers included with the SVP100.
3. Mount the surge protectors on the DIN rail. The surge protectors are attached to the DIN rail as shown in [FIGURE 6-1](#).

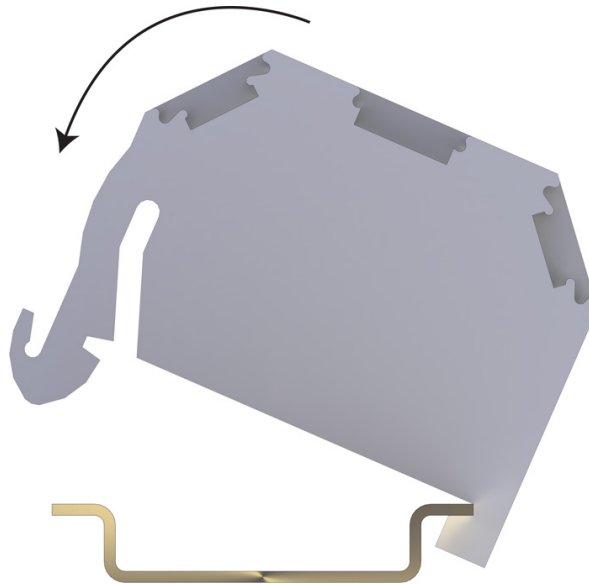


FIGURE 6-1. Installing surge protectors on a DIN rail

4. Press the end plate onto the open side of the last surge protector (see [FIGURE 6-2](#)).

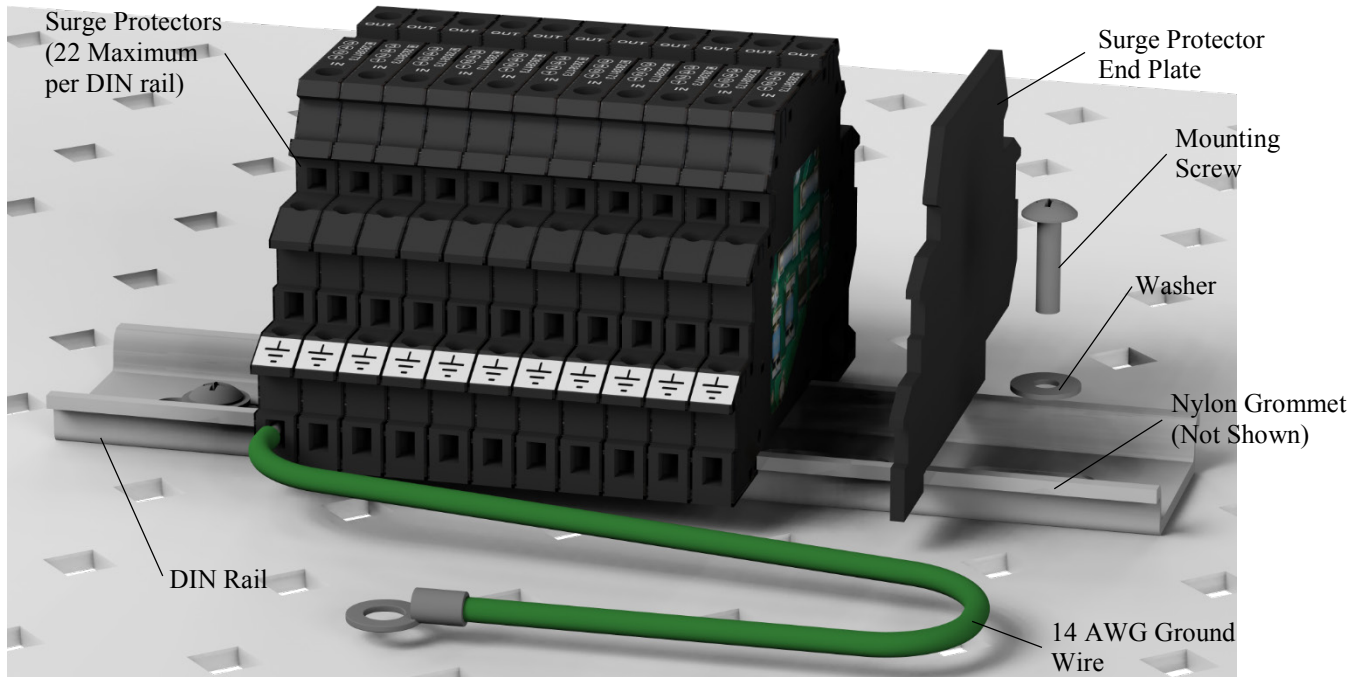


FIGURE 6-2. SVP100 with surge protectors installed

6.2 Ground Connections

The SVP100 is provided with a green 14 AWG ground wire (FIGURE 6-2) for connection to the ground lug in a Campbell Scientific enclosure. Remove the top nut on the ground lug and place the ring end of the ground wire on the ground lug. Replace the top nut. Insert the tinned end into any open ground clamp terminal (\oplus) on the surge protector. The ground lugs in each surge protector are connected together through contact with the DIN rail. Ground the enclosure to earth with 14 AWG or larger wire.

6.3 Attaching Sensors to the SVP100

To provide supplementary protection for the datalogger, all leads must pass through the SVP100. All shield wires terminate in one or more of the ground clamp terminals (\oplus).

To connect signal or excitation leads, insert the bare end of one lead into the terminal on either side of the surge protector. Run a short length of wire from the other side to the appropriate datalogger terminal. This short length of wire should be of the same gage and insulation type as the sensor leads provided by the manufacturer.

Blank labels (FIGURE 6-3) are available from Campbell Scientific allowing the user to customize how each terminal wire is marked.



FIGURE 6-3. SVP100 optional blank labels

CAUTION

Do not use wire with PVC insulation, as it can lead to a build-up of static electricity.

7. Maintenance

7.1 Replacement Considerations

In the event of an electrical surge, the surge protectors involved may need to be replaced. A symptom of a damaged surge protector may include incorrect measurements. Always refer to the service manual, provided by Phoenix Contact, prior to servicing.

Below are some steps to check for a damaged surge protector. Verify that all powered circuits have been safely de-energized prior to testing.

For pn 31273 (analog circuits):

1. Ensure that the in-series resistance is 3.7 Ω per path.
2. Ensure that there is no continuity between the ground and signal terminals.

For pn 31274 (digital and dc circuits):

1. Ensure that the in-series resistance is 6.6 Ω per path.
2. Ensure that there is no continuity between the ground and signal terminals.

7.2 Parts List

Order the SVP100 using “SVP100-X”, where X is the number of surge protectors desired (up to 22 per rail). Use the following part numbers for individual replacement items only.

31273	Surge Protector for Analog Circuits
31274	Surge Protector for Digital Circuits
31370	Surge Protector End Plate
8208	DIN Rail
6044	Nylon Grommet
505	Mounting Screws
5725	14 AWG Ground Wire

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