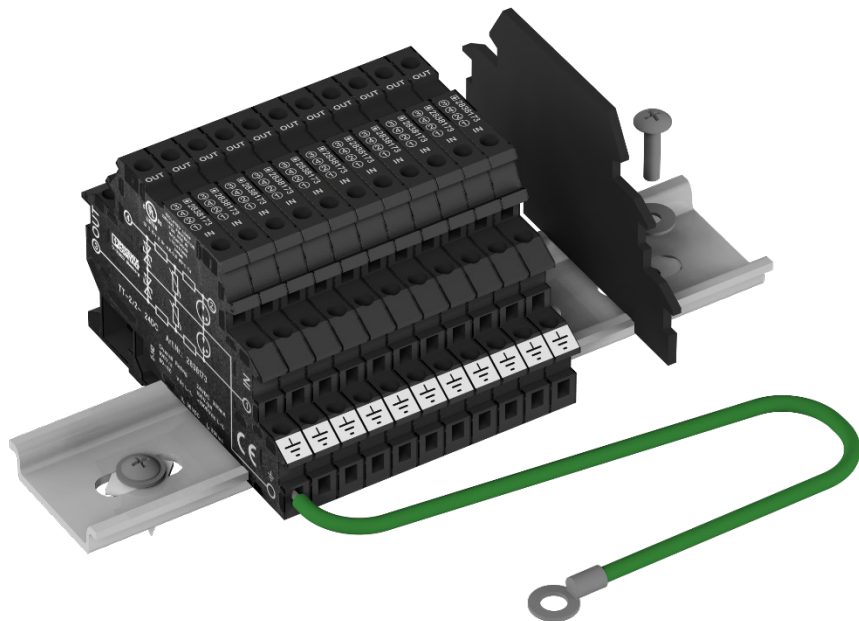


INSTRUCTION MANUAL



SVP100 Surge Voltage Protector

Revision: 12/16



Copyright © 2015-2016
Campbell Scientific, Inc.

Limited Warranty

“Products manufactured by CSI are warranted by CSI to be free from defects in materials and workmanship under normal use and service for twelve months from the date of shipment unless otherwise specified in the corresponding product manual. (Product manuals are available for review online at www.campbellsci.com.) Products not manufactured by CSI, but that are resold by CSI, are warranted only to the limits extended by the original manufacturer. Batteries, fine-wire thermocouples, desiccant, and other consumables have no warranty. CSI’s obligation under this warranty is limited to repairing or replacing (at CSI’s option) defective Products, which shall be the sole and exclusive remedy under this warranty. The Customer assumes all costs of removing, reinstalling, and shipping defective Products to CSI. CSI will return such Products by surface carrier prepaid within the continental United States of America. To all other locations, CSI will return such Products best way CIP (port of entry) per Incoterms ® 2010. This warranty shall not apply to any Products which have been subjected to modification, misuse, neglect, improper service, accidents of nature, or shipping damage. This warranty is in lieu of all other warranties, expressed or implied. The warranty for installation services performed by CSI such as programming to customer specifications, electrical connections to Products manufactured by CSI, and Product specific training, is part of CSI’s product warranty. **CSI EXPRESSLY DISCLAIMS AND EXCLUDES ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. CSI hereby disclaims, to the fullest extent allowed by applicable law, any and all warranties and conditions with respect to the Products, whether express, implied or statutory, other than those expressly provided herein.”**

Assistance

Products may not be returned without prior authorization. The following contact information is for US and international customers residing in countries served by Campbell Scientific, Inc. directly. Affiliate companies handle repairs for customers within their territories. Please visit www.campbellsci.com to determine which Campbell Scientific company serves your country.

To obtain a Returned Materials Authorization (RMA), contact CAMPBELL SCIENTIFIC, INC., phone (435) 227-9000. Please write the issued RMA number clearly on the outside of the shipping container. Campbell Scientific's shipping address is:

CAMPBELL SCIENTIFIC, INC.

RMA# _____
815 West 1800 North
Logan, Utah 84321-1784

For all returns, the customer must fill out a "Statement of Product Cleanliness and Decontamination" form and comply with the requirements specified in it. The form is available from our website at www.campbellsci.com/repair. A completed form must be either emailed to repair@campbellsci.com or faxed to (435) 227-9106. Campbell Scientific is unable to process any returns until we receive this form. If the form is not received within three days of product receipt or is incomplete, the product will be returned to the customer at the customer's expense. Campbell Scientific reserves the right to refuse service on products that were exposed to contaminants that may cause health or safety concerns for our employees.

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.

Table of Contents

PDF viewers: These page numbers refer to the printed version of this document. Use the PDF reader bookmarks tab for links to specific sections.

1. Introduction	1
2. Precautions	1
3. Initial Inspection.....	1
4. Overview	1
5. Specifications.....	2
6. Installation.....	3
6.1 Mounting the SVP100.....	3
6.2 Ground Connections	4
6.3 Attaching Sensors to the SVP100	4
7. Maintenance	5
7.1 Replacement Considerations	5
7.2 Parts List	5

Figures

1-1. SVP100	1
5-1. SVP100 surge protector schematics.....	2
6-1. Installing surge protectors on a DIN rail.....	3
6-2. SVP100 with surge protectors installed	4
6-3. SVP100 optional blank labels	5

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.

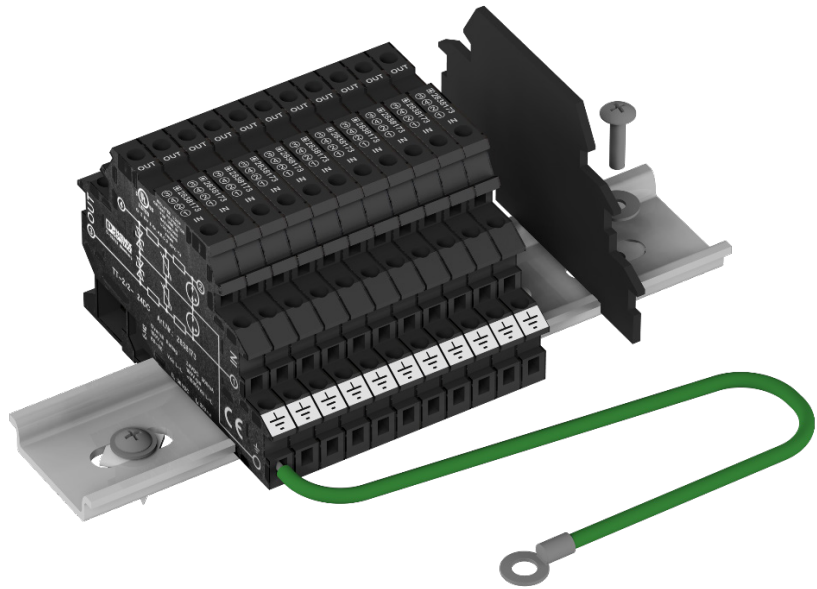


FIGURE 1-1. SVP100

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.

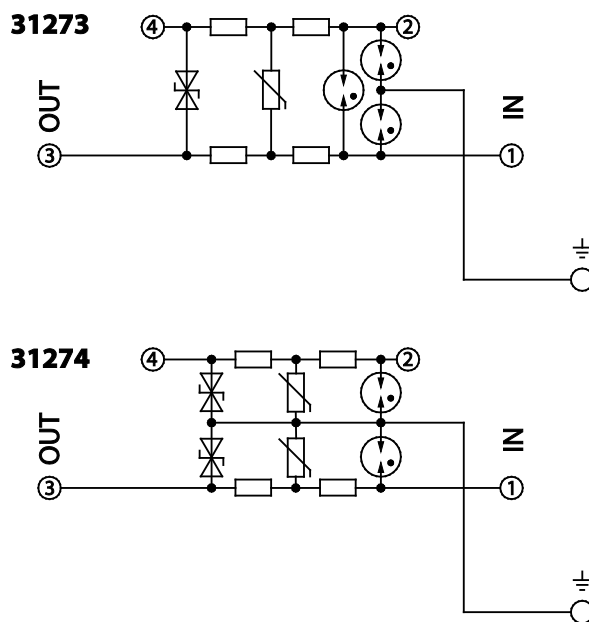


FIGURE 5-1. SVP100 surge protector schematics

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](#).

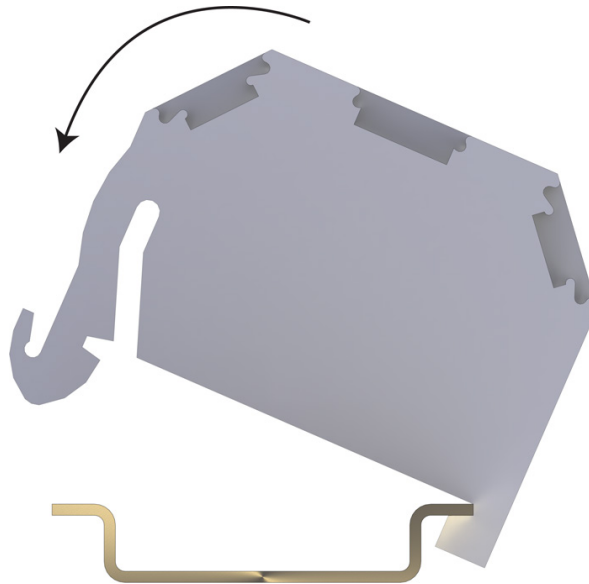


FIGURE 6-1. Installing surge protectors on a DIN rail

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

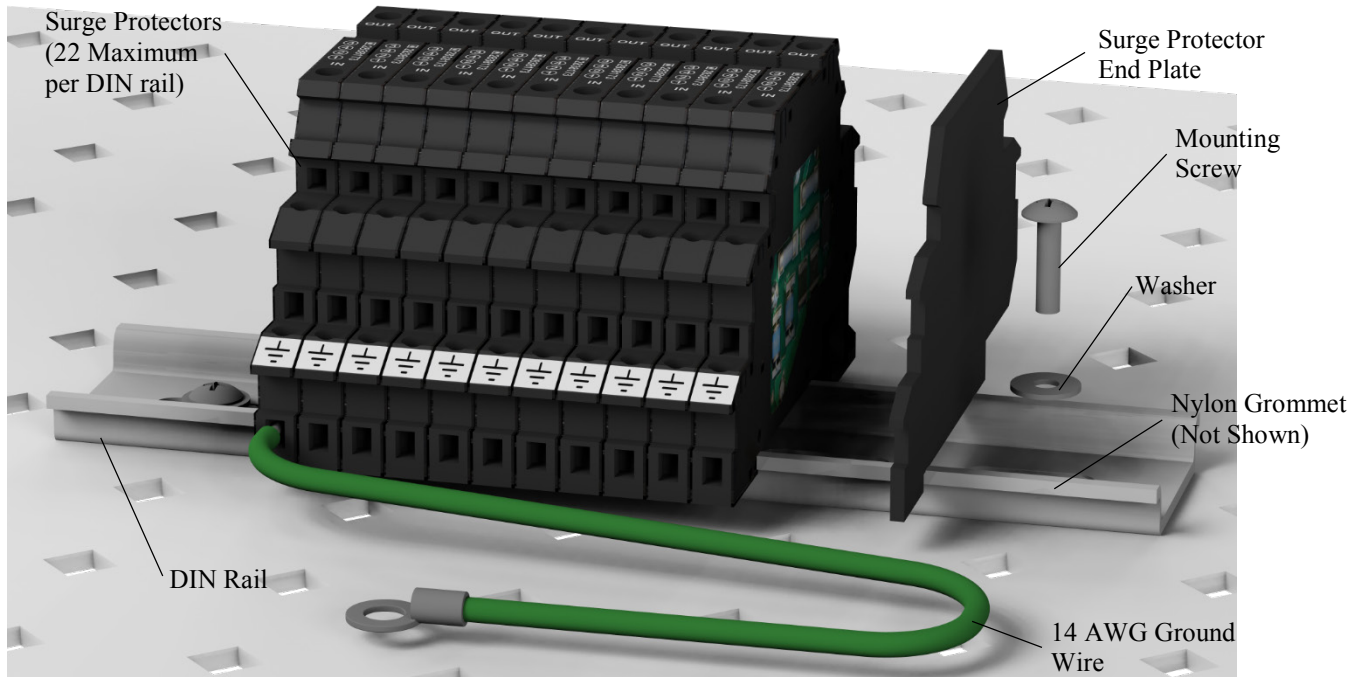


FIGURE 6-2. SVP100 with surge protectors installed

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

Campbell Scientific Companies

Campbell Scientific, Inc.

815 West 1800 North
Logan, Utah 84321
UNITED STATES

www.campbellsci.com • info@campbellsci.com

Campbell Scientific Canada Corp.

14532 – 131 Avenue NW
Edmonton AB T5L 4X4
CANADA

www.campbellsci.ca • dataloggers@campbellsci.ca

Campbell Scientific Africa Pty. Ltd.

PO Box 2450
Somerset West 7129
SOUTH AFRICA

www.campbellsci.co.za • cleroux@csafrica.co.za

Campbell Scientific Centro Caribe S.A.

300 N Cementerio, Edificio Breller
Santo Domingo, Heredia 40305
COSTA RICA

www.campbellsci.cc • info@campbellsci.cc

Campbell Scientific Southeast Asia Co., Ltd.

877/22 Nirvana@Work, Rama 9 Road
Suan Luang Subdistrict, Suan Luang District
Bangkok 10250
THAILAND

www.campbellsci.asia • info@campbellsci.asia

Campbell Scientific Ltd.

Campbell Park
80 Hathern Road
Shepshed, Loughborough LE12 9GX
UNITED KINGDOM

www.campbellsci.co.uk • sales@campbellsci.co.uk

Campbell Scientific Australia Pty. Ltd.

PO Box 8108
Garbutt Post Shop QLD 4814
AUSTRALIA

www.campbellsci.com.au • info@campbellsci.com.au

Campbell Scientific Ltd.

3 Avenue de la Division Leclerc
92160 ANTONY
FRANCE

www.campbellsci.fr • info@campbellsci.fr

Campbell Scientific (Beijing) Co., Ltd.

8B16, Floor 8 Tower B, Hanwei Plaza
7 Guanghua Road
Chaoyang, Beijing 100004
P.R. CHINA

www.campbellsci.com • info@campbellsci.com.cn

Campbell Scientific Ltd.

Fahrenheitstraße 13
28359 Bremen
GERMANY

www.campbellsci.de • info@campbellsci.de

Campbell Scientific do Brasil Ltda.

Rua Apinagés, nbr. 2018 – Perdizes
CEP: 01258-00 – São Paulo – SP
BRASIL

www.campbellsci.com.br • vendas@campbellsci.com.br

Campbell Scientific Spain, S. L.

Avda. Pompeu Fabra 7-9, local 1
08024 Barcelona
SPAIN

www.campbellsci.es • info@campbellsci.es

Please visit www.campbellsci.com to obtain contact information for your local US or international representative.