

# ASCO SourcePacT Source Isolation Switch

## Installation Manual

381333-521

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# Safety Information

## Important Information



Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service, or maintain it. The following special messages may appear throughout this manual or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that accompany this symbol to avoid possible injury or death.

### **⚠ DANGER**

**DANGER** indicates a hazardous situation which, if not avoided, **will result in** death or serious injury.

### **⚠ WARNING**

**WARNING** indicates a hazardous situation which, if not avoided, **could result in** death or serious injury.

### **⚠ CAUTION**

**CAUTION** indicates a hazardous situation which, if not avoided, **could result in** minor or moderate injury.

### **NOTICE**

**NOTICE** is used to address practice not related to physical injury. The safety alert symbol shall not be used with the signal word.

## Please note

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by ASCO POWER TECHNOLOGIES for any consequences arising out of the use of this material.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.

Electrical equipment should be transported, stored, installed, and operated only in the environment for which it is designed.

## Safety Precautions

### DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or NOM-029-STPS.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.
- Replace all devices, doors and covers before turning on power to this equipment.
- Beware of potential hazards, and carefully inspect the work area for tools and objects that may have been left inside the equipment


**Failure to follow these instructions will result in death or serious injury.**

### CAUTION

#### POSSIBLE CUSTOM ENGINEERED EQUIPMENT

- This manual contains general information about a standard design. It does not contain information about modifications to the standard design.
- Thoroughly review all documentation supplied by the factory for any deviations to the standard design.
- Contact your local Schneider Electric representative if you have any questions concerning the source isolation switch.

**Failure to follow these instructions can result in injury or equipment damage.**

 **WARNING:** This product can expose you to chemicals including Nickel compounds, which are known to the State of California to cause cancer, and Bisphenol A (BPA), which is known to the State of California to cause birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

Refer to the outline and wiring drawings provided with the source isolation switch for all installation and connection details and accessories.

Refer to *Source Isolation Switch Controller User's Guide* 381333–520 for status display messages, time delays, pickup & dropout settings and adjustments.

## Shipping, Receiving, and Storage

The Source Isolation Switch is included as part of already-assembled equipment. Refer to the labels on shipment for complete receiving, handling, and storage instructions for the equipment. Also refer to the controller's user guide for additional environmental restrictions.

After receiving the equipment and allowing it to acclimate to the environment, remove the packaging and inspect the equipment for damage that may have occurred in transit. If damage is found or suspected, immediately file a claim with the carrier and notify Schneider Electric.

## Exposure to Moisture, Chemicals, and Condensation

If liquids such as moisture, chemicals, and condensation contact the electronics, circuit breakers, fuses, bussing, or other electrical components, do not attempt to clean or repair the equipment as this may lead to unreparable damage. If the equipment is energized, de-energize it. If equipment is not energized, do not energize it. Contact the ASCO POWER SERVICES, Inc at 1-800-800-2726 (ASCO).

## Rating Label

Each Source Isolation Switch contains a rating label to define the loads and circuit withstand/closing ratings. Refer to the label on the isolation switch for specific values.

|  |
|--|
| <b>⚠ WARNING</b>   |
| <b>POTENTIAL OF EQUIPMENT OVERHEATING</b>  |
| Do not overload this Source Isolation Switch by exceeding the maximum calculated load in accordance with NEC Article 220, as shown on the Source Isolation Switch nameplate label. |
| <b>Failure to follow these instructions can result in death, serious injury, or equipment damage.</b>  |

## Nameplate

The Source Isolation Switch nameplate includes data for each specific SourcePacT Source Isolation Switch. Use the switch only within the limits shown on this nameplate.

## Catalog Number Identification

A typical Catalog Number is shown below with its elements explained. The example is for a solid neutral, 3 pole, 600 Ampere, 480 Volts, Source Isolation Switch in Type 3R enclosure.

|                                 |                |                    |                |                |                   |                           |                  |
|---------------------------------|----------------|--------------------|----------------|----------------|-------------------|---------------------------|------------------|
| P03SIS                          | A              | 3                  | 0600           | N              | S                 | 0                         | M                |
| <b>Frame &amp; Catalog Type</b> | <b>Neutral</b> | <b>Phase Poles</b> | <b>Amperes</b> | <b>Voltage</b> | <b>Controller</b> | <b>Optional Accessory</b> | <b>Enclosure</b> |
| P03SIS-Automatic                | A-solid        | 3-three            | 0600           | N-480          | S-standard        | 0-for none                | M-Type 3R        |

## Installation

The Source Isolation Switch is factory wired and tested. Installation requires mounting, connecting service cables, and connecting the Battery Energy Storage System (BESS) Inverter interface and auxiliary control circuits (if required).

To avoid severe equipment damage, the external BESS deployed with this Source Isolation Switch (SIS) must have automatic shutdown capabilities, and the complete electrical installation must have appropriate upstream and/or downstream protective devices.

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or NOM-029-STPS.
- This equipment must only be installed and serviced by qualified electrical personnel.
- The control circuit of the Source Isolation Switch are energized during the performance tests. Thoroughly review the equipment drawings, documentation, and design before starting any performance testing.
- Turn off all power supplying this equipment before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is off.

**Failure to follow these instructions will result in death or serious injury.**

## Supporting Foundation

This equipment is intended to be mounted on a secure wall. For Source Isolation Switch (SIS) mounted on the floor, the supporting foundation for the enclosure must be level and straight. Refer to the applicable enclosure outline drawing included with the Source Isolation Switch for all mounting details including door opening space.

If bottom cable entry is used, the foundation must be prepared so that the conduit stubs are located correctly. Refer to the enclosure outline drawing for the specified areas and locations.

## Mounting

Refer to the outline and mounting diagram and mount the Source Isolation Switch according to details and instructions shown on the diagram. Mount it vertically to a rigid supporting structure. Level all mounting points by using flat washers behind the holes to avoid distortion of the cabinet.

### **⚠ WARNING**

#### **HAZARD OF CONTAMINATION**

Protect the Source Isolation Switch from construction dust and metal chips to prevent overheating, improper operation and shortened life of the Source Isolation Switch.

**Failure to follow these instructions can result in death, serious injury, or equipment damage .**

## Line Connections

Refer to the wiring diagram provided with the Source Isolation Switch. All wiring must be made in accordance with the National Electrical Code and local codes.

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Practice lock-out/tag-out procedures according to OSHA requirements.
- Ensure that all energy sources (upstream and downstream) are de-energized.
- De-energize the conductors before making any line or auxiliary circuitry connections.
- Be sure that Source 1 and Load line connections are in proper phase rotation.

**Failure to follow these instructions will result in death or serious injury**

## Testing Power Conductors

Do not connect the power conductors to the Source Isolation Switch until they are tested. Installing power cables in conduit, cable troughs, and ceiling-suspended hangers often requires considerable force. The pulling of cables can damage insulation and stretch or break the conductor's strands. For this reason, after the cables are pulled into position, and before they are connected, they should be tested to verify that they are not defective or have been damaged during installation.

## Connecting Power Cables

After the power cables have been tested, connect them to the appropriate terminal lugs on the Source Isolation Switch as shown on the wiring diagram provided. Make sure that the lugs provided are suitable for use with the cables being installed. Standard terminal lugs are solderless screw type and will accept the wire sizes listed on the drawings provided with the Source Isolation Switch. Be careful when stripping insulation from the cables; avoid nicking or ringing the conductor. Remove surface oxides from cables by cleaning with a wire brush. When aluminum cable is used, apply joint compound to conductors. Tighten cable lugs to the torque specified on rating label. After power cables have been connected, ensure all cable entry points are properly sealed.

## Controller Ground

A grounding wire must be connected to the controller's lower left mounting stud. Since the electronic controller is mounted on the inner enclosure door, a conductive strap must also be used between the enclosure and the door. This connection provides proper grounding which does not rely upon the door hinges.

## Harnesses

The Source Isolation Switch is connected to the controller by a harness. The plug connection for the harness is located on the left-hand side of the controller.

## Auxiliary Circuits

Connect auxiliary circuit wires to appropriate terminals on the Source Isolation Switch controller or terminal block as shown on the wiring diagram.

Read all instructions on the wiring diagram and labels affixed to the Source Isolation Switch. Note the control features that are provided and review their operation before proceeding.



## Functional Switch Test

The functional test consists of two checks: voltage checks, and electrical operation.

### **NOTICE**

#### **EQUIPMENT DAMAGE**

Perform these checks in the order presented to avoid damaging the Source Isolation Switch.

**Failure to follow these instructions can result in equipment damage.**

Read all instructions on the wiring diagram and labels affixed to the Source Isolation Switch. Note the control features that are provided and review their operation before proceeding.

### **⚠ DANGER**

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or NOM-029-STPS.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Turn off all power supplying this equipment and lock-out before working on or inside equipment.
- Always use a properly rated voltage sensing device to confirm power is OFF.
- Perform these checks in the order presented to avoid damaging the Source Isolation Switch.
- Replace all devices, doors and covers before turning on power to this equipment.

**Failure to follow these instructions will result in death or serious injury.**

## Voltage Checks

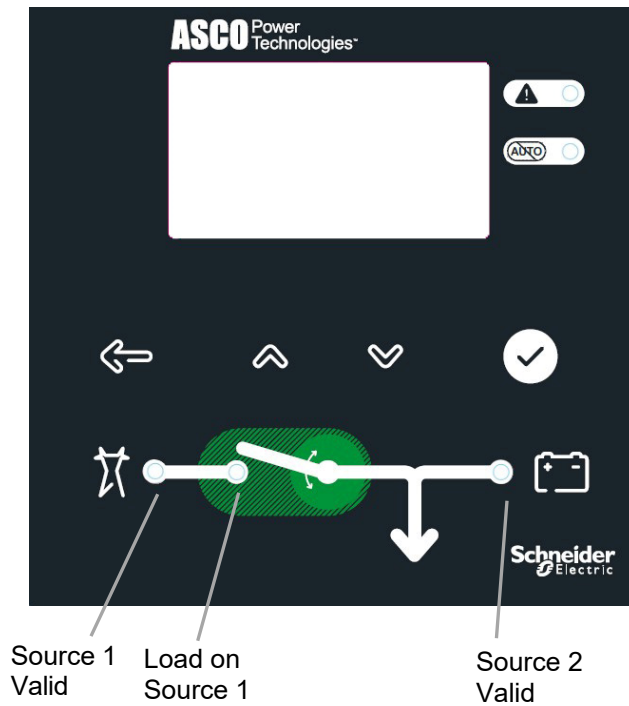
First check the nameplate on the Source Isolation Switch; the Source 1 line voltages must be the same as the rated voltage.


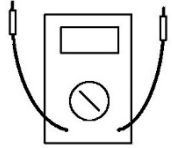

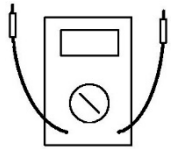
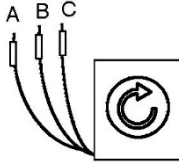

Perform steps 1 through 6 on the next page. Observe the indicator lights. See Figure 1.

- Black circle means the light is ON.
- White circle means the light is OFF.

Refer to SourcePacT Source Isolation Switch Controller User Guide **381333-520** for voltage settings in the controller.

Figure 1. Three Status Indicator Lights



|   |  |   |
|---|--|---|
| 1 | Close the upstream Source 1 breaker . The <i>Source 1 Valid</i> and the <i>Load on Source 1</i> lights should come ON.   |    |
| 2 | Use an accurate voltmeter to check phase-to-phase and phase-to-neutral voltages present at the Source Isolation Switch Source 1 terminals. Open the upstream Source 1 breaker.   |  |
| 3 | Close the downstream isolation circuit breaker. Place the Source 2 BESS or inverter into grid forming mode, if necessary. The <i>Source 2 Valid light</i> should come on.  |  |
| 4 | Use an accurate voltmeter to check the Source 2 inverter phase-to-phase and phase-to-neutral voltages present at the Source Isolation Switch Load terminals.   |  |
| 5 | Use a phase rotation meter to check phase rotation of Source 2; it must be the <u>same</u> at Source 1.  |  |
| 6 | Shut down the Source 2 inverter or place it into grid follow mode. The <i>Source 2 Valid</i> light should go OFF.<br>Close the Source 1 upstream breaker, if it was opened when testing the Source 2 inverter voltage. Close enclosure door. |  |

## Electrical Operation

This procedure will check the electrical operation of the Source Isolation Switch.

**⚠ DANGER**

**HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Close the Source Isolation Switch enclosure door and tighten the screws before testing electrical operation.

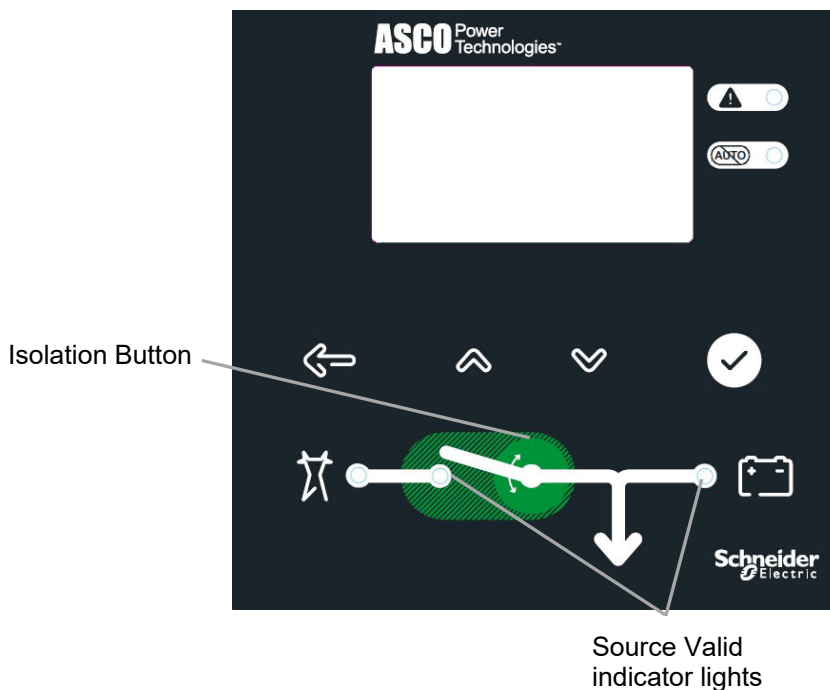
**Failure to follow these instructions will result in death or serious injury.**

Perform steps 1 through 5 below. Observe the status lights. See Figure 2.


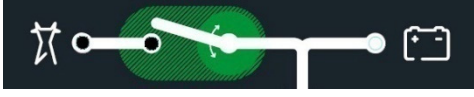

- Black circle means light is ON.
- White circle means light is OFF.

This completes the functional test of the Source Isolation Switch.

**Figure 2. User Interface for Normal Operation.**



|   |  |  |
|---|--|--|
| 1 | Source 1 must be valid, and the Source 2 BESS or inverter must be ready to provide power. Check that <i>Source 1 Valid light</i> is ON.  |  |
| 2 | <p>Press the  Isolation Button. Accept the request to test the function.</p> <p>The Source Isolation Switch will disconnect from Source 1 after the expiration of the isolate delay timer. The <i>Load on Source 1</i> light should go OFF.</p> <p>To bypass the isolate delay timer, press the isolation button again to immediately isolate from Source 1.</p> |  |

|   |   |   |
|---|---|---|
| 3 | The Source Isolation Switch will place the Source 2 inverter into grid forming mode. The <i>Source 2 Valid</i> light should come ON.  |  |
| 4 | After the expiration of the reconnect delay timer, the <i>Source 2 Valid</i> light will go OFF, and the Source Isolation Switch will reconnect to Source 1. The <i>Load on Source 1</i> light will come ON.<br>As the reconnect delay timer is counting down, press the isolation button again to bypass the delay timer and immediately reconnect to Source 1. |  |
| 5 | The <i>Source 2 Valid</i> light should go OFF.  |  |

## Testing & Service

### ⚠ DANGER

#### HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E or NOM-029-STPS.
- This equipment must only be installed and serviced by qualified electrical personnel.
- Disconnect all sources of electric power before beginning visual inspections, tests, or maintenance.
- Check all power sources, including possible backfeeding.
- Assume all circuits are live until completely deenergized, tested, grounded, and tagged.
- Use a properly rated voltage sensing device to confirm that the power is off.
- Replace all devices, doors and covers before turning on power to this equipment

**Failure to follow these instructions will result in death or serious injury.**

## Isolation Test

Operate the Source Isolation Switch at least once a month by following the **Electrical Operation** procedure on page 11.

## Preventive Maintenance

Reasonable care in preventive maintenance will ensure high reliability and long life for the Source Isolation Switch. An annual preventive maintenance program is recommended.

ASCO Power Services, Inc. is ASCO Power Technologies' national service organization. They can be contacted at 1-800-800-2726 for information on preventive maintenance agreements.

## Yearly Inspection

**Clean the enclosure.** Deenergize all sources, then wipe and vacuum away any excessive dust accumulation.


**Check all cable connections and retighten if necessary.** Tighten torque to values specified on the Source Isolation Switch label.

**Inspect the enclosure.** Visually examine enclosure ensuring proper sealing at cable entry points and around the front door when closed.

## Replacement Parts

When ordering replacement parts provide the Serial No., Bill of Material No. (BOM), and Catalog No. from the Source Isolation Switch nameplate. In the US call 800-800-2726 (ASCO) or contact [customercare@ascopower.com](mailto:customercare@ascopower.com).

## Troubleshooting

| Problem  | Operation  | Voltage   |
|--|--|---|
| The Source 2 BESS inverter does not go into grid forming mode when the isolation button is pressed or Source 1 becomes not valid | During normal operation, the Source 1 outage must be long enough to allow for the isolate delay starting time.   |   |
| The Source Isolation Switch does not open.   | Wait for the isolate delay timer. For immediate isolation, press the Isolation Button (bypass timer).            | Refer to SIS Controller User Guide 381333-520 for voltage settings. |
| The Source Isolation Switch does not reclose on Source 1 after Source 1 becomes valid.   | Wait for the reconnect time delay. For immediate reconnection, press the Isolation Button (bypass timer).        | Refer to SIS Controller User Guide 381333-520 for voltage settings. |
| <br>Alert light is on.                        | Read the message on the user display for more information. Refer to SourcePacT Controller User Guide 381333-520. | -   |

If the isolation switch experiences an overcurrent event, due to a load problem, and the isolation switch opens, the SIS Controller will not be able to control (close) the switch. A red plunger will pop out on the upper left corner of the isolation switch breaker and an error message will appear on the User Interface Display Panel. The user must push in the red plunger and acknowledge the error message before the SIS Controller will be able to close the switch.

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ASCO Power Technologies  
160 Park Avenue  
Florham Park, NJ 07932-1591 USA  
Phone: 1 800 800-2726 (ASCO) for sales or service  
[www.ascopower.com](http://www.ascopower.com)

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