

Operation

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Introduction

Qualified Persons

WARNING

Only qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of special precautionary techniques, personal protective equipment, insulated and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment

These instructions are intended **ONLY** for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet and all materials included in the product's instruction handbook before installing or operating Mini-Rupter Switches. Familiarize yourself with the Safety Information and Safety Precautions on pages 3 and 4. The latest version of this publication is available online in PDF format at sandc.com/en/support/product-literature/.

Retain this Instruction Sheet

This instruction sheet is a permanent part of your Mini-Rupter Switch. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

WARNING

The equipment in this publication is only intended for a specific application. The application must be within the ratings furnished for the equipment. Ratings for the Mini-Rupter Switch are listed in the ratings table in Specification Bulletin 785-31. The ratings are also on the nameplate affixed to the product.

Warranty

The warranty and/or obligations described in S&C's Price Sheet 150, "Standard Conditions of Sale—Immediate Purchasers in the United States," (or Price Sheet 153, "Standard Conditions of Sale—Immediate Purchasers Outside the United States"), plus any special warranty provisions, as set forth in the applicable product-line specification bulletin, are exclusive. The remedies provided in the former for breach of these warranties shall constitute the immediate purchaser's or end user's exclusive remedy and a fulfillment of the seller's entire liability. In no event shall the seller's liability to the immediate purchaser or end user exceed the price of the specific product that gives rise to the immediate purchaser's or end user's claim. All other warranties, whether express or implied or arising by operation of law, course of dealing, usage of trade or otherwise, are excluded. The only warranties are those stated in Price Sheet 150 (or Price Sheet 153), and **THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ANY EXPRESS WARRANTY OR OTHER OBLIGATION PROVIDED IN PRICE SHEET 150 (OR PRICE SHEET 153) IS GRANTED ONLY TO THE IMMEDIATE PURCHASER AND END USER, AS DEFINED THEREIN. OTHER THAN AN END USER, NO REMOTE PURCHASER MAY RELY ON ANY AFFIRMATION OF FACT OR PROMISE THAT RELATES TO THE GOODS DESCRIBED HEREIN, ANY DESCRIPTION THAT RELATES TO THE GOODS, OR ANY REMEDIAL PROMISE INCLUDED IN PRICE SHEET 150 (OR PRICE SHEET 153.)**

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to your Mini-Rupter Switch. Familiarize yourself with these types of messages and the importance of these various signal words:

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| ⚠ DANGER |
| “DANGER” identifies the most serious and immediate hazards that will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed. |


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| ⚠ WARNING |
| “WARNING” identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed. |

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| ⚠ CAUTION |
| “CAUTION” identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed. |

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| NOTICE |
| “NOTICE” identifies important procedures or requirements that can result in product or property damage if instructions are not followed. |

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C’s website sandc.com, or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

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| NOTICE | |
| Read this instruction sheet thoroughly and carefully before installing your Mini-Rupter Switch. |  |

Replacement Instructions and Labels

If additional copies of this instruction sheet are needed, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.
 It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

DANGER



Mini-Rupter Switches operate at high voltage. Failure to observe the precautions below will result in serious personal injury or death.

Some of these precautions may differ from company operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

- 1. QUALIFIED PERSONS.** Access to Mini-Rupter Switches must be restricted only to qualified persons. See the "Qualified Persons" section on page 2.
 - 2. SAFETY PROCEDURES.** Always follow safe operating procedures and rules.
 - 3. PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing, in accordance with safe operating procedures and rules.
 - 4. SAFETY LABELS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels.
 - 5. HIGH-VOLTAGE ISOLATION.** Switch operators and controls are isolated from high voltage in grounded, metal-enclosed compartments. Access to these components is controlled by padlockable covers, which incorporate a nonremovable manual handle. Other low-voltage components, such as meters, selector switches, toggle switches, etc., are similarly isolated.
 - 6. ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded.
 - 7. MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.
 - 8. GROUNDING EQUIPMENT.** Install suitable grounding equipment before touching any device to be inspected, serviced, or repaired in the high-voltage compartments.
 - 9. DO NOT APPLY UNDUE FORCE.** Avoid the use of undue force in attempting to operate a Mini-Rupter switch. The operating mechanism is designed properly for the switch, and any undue force applied, such as by use of an extension of the operating handle, may cause severe damage to the switch or mechanism. For example, an interlock mechanism can be jammed by an attempt to operate an associated switch while the switchgear door is unlatched. Verify the switching operation is in the sequence dictated by the key- or mechanical-interlock scheme provided.
- Voltage levels can be as high as the peak line-to-ground voltage last applied to the unit. Units energized or installed near energized lines should be considered live until tested and grounded.

Construction and Performance

The Mini-Rupter Switch—Indoor Distribution is a three-pole, group-operated interrupter switch, factory-assembled on a rugged base of welded construction. Included is an integral quick-make, quick-break mechanism for swift, positive opening and closing, independent of the speed of handle operation—thereby contributing to Mini-Rupter Switch’s ability to achieve fast circuit interruption and two-time duty-cycle fault-closing ratings●.

This ability permits quick restoration of service following a fault without the need for an extended outage for replacement of switch parts or for temporary restoration of service through an alternate switch until replacement parts can be obtained. It also permits use of a Mini-Rupter Switch in fault sectionalizing (lockout) schemes where switches are closed and then opened sequentially until the fault is isolated. The ability to open following a fault-closing operation is of special importance where remote or automatic control is used.

In marked contrast to Mini-Rupter Switches, with their duty-cycle fault-closing ratings, are switches with simple “fault-closing” or “make-and-latch” ratings which, following an initial fault-closing operation, offer no assurance of an ability to subsequently carry or interrupt rated current—much less any expectation of tolerating a second fault closing.

The Mini-Rupter Switch interrupts the circuit without external arc or flame. No oil or vacuum is used. The arc is entirely contained and extinguished within the air-filled interrupter.

Operating Mechanisms

Manually Operated Style Mini-Rupter Switches can be supplied with the following types of operating handles:

Nonremovable front handles. These are used for the majority of applications, typically with single- and multi-bay metal-enclosed switchgear installations, and permit switch operation from the front.

Nonremovable side handles. These are used for single-bay metal-enclosed switchgear or vault applications where side operation is desired.

Removable side handles. These fold into a compact unit for storage and are used for pad-mounted gear where side operation is desired.

● The two-time duty-cycle fault-closing rating defines the ability to close the switch twice against a three-phase fault with asymmetrical current in at least one phase equal to the rated value, with the switch remaining operable and able to carry and interrupt rated current.

Opening or Closing the Switch

Follow these steps to open or close the switch:

With Nonremovable Front Handle:

- STEP 1.** Remove the handle cover, if furnished, and unlock the handle (key interlock or padlock).
- STEP 2.** Swing the handle without hesitation through its full travel to open or close the switch.
- STEP 3.** Lock the handle and replace the handle cover, if furnished.

With Nonremovable Side Handle:

- STEP 1.** Unlock the handle by removing the padlock (or by means of the key interlock, if applicable).
- STEP 2.** Swing the handle without hesitation through its full travel to open or close the switch.
- STEP 3.** Lock the handle.

With Removable Side Handle:

- STEP 1.** Open the switch-operating shaft-access cover, if furnished, and slide the handle onto the switch-operating hex shaft. (When the optional folding switch-operating handle is not included, a 3/4-inch hex deep-socket wrench or a 3/4-inch hex shallow-socket wrench with extension can be used.)
- STEP 2.** Note the switch-position indicator attached to the switch-operating hex shaft that rests against a stop in either the **Open** or **Closed** position. Arrows indicate the **Switch Open** or **Switch Closed** positions. Rotate the handle to the **Open** or **Closed** position, as applicable, and check the switch-position indicator to verify the switch is in the desired position.
- STEP 3.** Remove the operating handle, and then close and padlock the access cover.

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| ⚠ CAUTION |
| <p>Make sure all doors and switch-operating handles are fully locked before leaving the installation site, even momentarily. Observe this procedure even in those cases where the gear is accessible only to qualified persons. In addition, do not remove any of the precautionary signs affixed to the gear, e.g., “Caution—High Voltage—Keep Out” or “Do not enter or operate this high-voltage equipment unless you are qualified.” The responsibility for the presence of these or equivalent signs must be assumed by the purchaser, the installer, and the ultimate user.</p> |

Maintenance★

No routine maintenance is required for Mini-Rupter Switches or Mini-Rupter Switches with Power Fuses. However, cleaning and inspection of switch (and fuse) support insulators and barriers should be performed periodically, at intervals based on environmental conditions. Also, occasional exercising of Mini-Rupter Switches is recommended.

When access to high-voltage bays (or vaults) is required for such purposes, it should be restricted to qualified persons only, who should observe the following procedure:

- STEP 1.** At all times adhere to the prescribed safety rules applicable to such devices as circuit breakers, fuses, interrupter switches, power switching equipment, and their mechanisms.
- STEP 2.** Make sure any such device is disconnected from all power sources and all control sources and is grounded before being inspected, serviced, or repaired.
- STEP 3.** Always assume both sets of power terminals on any device are energized unless proved otherwise by test, by visual evidence of open circuit conditions on both terminal ends, or by grounding.

| ⚠ CAUTION |
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| The voltage transformers must be disconnected when external voltage is used to test any secondary-side wiring and devices to avoid energizing the high-voltage conductors through the voltage transformers. Draw out the voltage transformers completely if drawout-type transformers are provided. Otherwise, remove the primary fuses of the voltage transformers and disconnect the secondaries by removing the secondary fuses or by disconnecting the secondary connections to the transformers. If secondary connections are disconnected, tape the ends of the leads to prevent inadvertent short circuits or contact with the transformer secondary terminals. |

★ These recommendations may differ from the user's operating and safety procedures. Where a discrepancy exists, users should follow their procedures.

As a safety precaution, S&C recommends in any event all voltage-transformer fuses be completely removed and kept out until just prior to final energizing of the switchgear. With unfused transformers, remove the secondary connections (as described in the preceding paragraph) until tests are completed.

- STEP 4.** Test for voltage. Qualified persons should make sure they have, and know how to operate, the correct test equipment for determining the voltage on both sets of power terminals in any circuit breaker, power fuse, or interrupter-switch equipment.
- STEP 5.** After the electrical switchgear has been completely disconnected from all sources of power, properly connect the grounding leads to both sides of the equipment, that is, to the source- and load-side power terminals or contacts of each phase of the equipment to be maintained.

Note: Occasionally, low-voltage components may require maintenance. In the servicing or repair of space heaters, voltage-transformer secondary wiring, and any other components located in a high-voltage bay, all of the preceding safety procedures apply. The maintenance of other low-voltage components (control devices, meters, etc.) isolated from high-voltage bays may be performed under the safety rules for equipment rated 600 volts or less.

Restoring to Normal Operation

To ensure the Mini-Rupter Switch is ready for normal operation, verify the following conditions exist:

- Voltage transformers are reconnected and their fuses are installed.
- Temporary grounds are removed.
- High-voltage fuses (Types SM-20, SM-4Z, SM-5S, or SM-5SS), if applicable, are closed and latched (disconnect style) or secured in their clips (non-disconnect style).
- Screen doors, if furnished, are closed and bolted.
- The switchgear bay (or vault) access door is closed and padlocked (or interlocked).
- The Mini-Rupter Switch is in the correct position—**Open** or **Closed**—as required by the system operating arrangement.
- The Mini-Rupter Switch operating handle is padlocked and the operating-handle cover, if furnished, is installed and padlocked.