

# Installation and Adjustment

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# Introduction

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## 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 S&C Instruction Handbook before installing or operating your S&C Type SML-4Z Power Fuse. Familiarize yourself with the Safety Information and Safety Precautions on pages 4 through 5. The latest version of this publication is available online in PDF format at [sandc.com/en/support/product-literature/](http://sandc.com/en/support/product-literature/).

## Retain this Instruction Sheet

This instruction sheet is a permanent part of your S&C Type SML-4Z Power Fuse. 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 fusing applications. The application must be within the ratings furnished for the equipment. Ratings for the S&C Type SML-4Z Power Fuse are listed in the ratings table in Specification Bulletin 252-31. 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.)

**Warranty  
Qualifications**

The following instructions are for installation and adjustment of S&C Type SML-4Z Power Fuse mountings.

**Information Bulletin 252-64:**

S&C Type SML Power Fuses Indoor Distribution (13.8 kV and 25 kV)	Minimum Construction Specifications for Indoor and Outdoor Metal Enclosures with Fuses
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With respect to S&C live parts, when installed in submersible enclosures not manufactured by S&C, the warranty does not apply unless the enclosures are furnished by an approved supplier and are of watertight construction providing proper electrical clearances and proper space for fuse handling.

The standard warranty contained in the seller's standard conditions of sale (as set forth in Price Sheet 150) does not apply when fuses not manufactured by S&C are used in conjunction with S&C live parts or when S&C refill units are used in mountings not manufactured by S&C.

## Safety Information

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### Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to your S&C Type SML-4Z Power Fuse. Familiarize yourself with these types of messages and the importance of these various signal words:

#### **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.

#### **WARNING**

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

#### **CAUTION**

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

#### **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](http://sandc.com), or call the S&C Global Support and Monitoring Center at 1-888-762-1100.

#### **NOTICE**

Read this instruction sheet thoroughly and carefully before installing your S&C Type SML-4Z Power Fuse.



### 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**



**The S&C Type SML-4Z Power Fuse operates at high voltage. Failure to observe the precautions below will result in serious personal injury or death.**

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

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|---|---|
| <ol style="list-style-type: none"> <li>1. <b>QUALIFIED PERSONS.</b> Access to the S&amp;C Type SML-4Z Power Fuse must be restricted only to qualified persons. See the "Qualified Persons" section on page 2.</li> <li>2. <b>SAFETY PROCEDURES.</b> Always follow safe operating procedures and rules. Always maintain proper clearance from energized components.</li> <li>3. <b>PERSONAL PROTECTIVE EQUIPMENT.</b> Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, arc-flash clothing, and fall-protection, in accordance with safe operating procedures and rules.</li> </ol> | <ol style="list-style-type: none"> <li>4. <b>SAFETY LABELS.</b> Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels and tags. Remove tags ONLY if instructed to do so.</li> <li>5. <b>ENERGIZED COMPONENTS.</b> Always consider all parts live until de-energized, tested, and grounded.</li> <li>6. <b>MAINTAINING PROPER CLEARANCE.</b> Always maintain proper clearance from energized components.</li> </ol> |
|---|---|

S&C Power Fuses with Uni-Rupter® Interrupters are designed for the following single-pole live-switching duties in single-phase or three-phase circuits of distribution systems rated 14.4 kV or 25 kV:

### Live Switching—Opening

- **Transformer switching**—Transformer load currents up through 200 amperes, as well as transformer magnetizing currents associated with the applicable loads
- **Line switching**—Load splitting (parallel or loop switching) and load dropping of currents up through 200 amperes; also line dropping (charging currents typical for distribution systems of these voltage ratings)
- **Cable switching**—Load splitting (parallel or loop switching) and load dropping of currents up through 200 amperes; also cable dropping (charging currents typical for distribution systems of these voltage ratings)

### Live Switching—Closing

- **Circuit closing**—Inrush currents associated with the above opening duties
- **Duty-cycle● fault closing**—One-time capability equal to the interrupting rating of the fuse (in amperes RMS asymmetrical): 20,000 at 14.4 kV, 15,000■ at 25 kV, and two-time capability of 13,000 amperes RMS asymmetrical at 14.4 kV and 25 kV

● These values represent the fault-closing capabilities of the fuse with a Uni-Rupter Interrupter when the fuse is closed with a purposeful thrust without hesitation. The values are the available fault currents into which the fuse can be closed the specified number of times (once or twice) with the Uni-Rupter Interrupter remaining operable and able to carry and interrupt rated current.

■ 20,000 amperes RMS asymmetrical when applied on solidly grounded-neutral systems only with fuses connected by single-conductor, concentric-neutral type cable (or directly coupled) to a transformer or transformers.

### A Note on Single-Pole Switching

In single-pole switching of ungrounded-primary three-phase transformers or banks (or single-phase transformers connected line to line), circuit connections or parameters may, in some cases, produce excessive overvoltages. In particular, for the following applications above 22 kV, single-pole switching by any means, including with a Uni-Rupter Interrupter, should be performed only under the conditions stated in italics:

- Switching unloaded or lightly loaded delta-connected or ungrounded-primary wye-wye connected three-phase transformers or banks (or line-to-line-connected single-phase transformers), rated 150 kVA or less three-phase, or 50 kVA or less single-phase—or any kVA rating when combined with unloaded cables or lines—where the maximum system operating voltage exceeds 22 kV (*Single-pole switching should be performed only if each phase is carrying 5% load or more, or if the transformer or bank is temporarily grounded at the primary neutral during switching.*)
- Switching loaded or unloaded ungrounded-primary wye-delta connected three-phase transformers or banks—alone or combined with unloaded cables or lines—where maximum system operating voltage exceeds 22 kV (*Single-pole switching should be performed only if each phase is carrying 5% load or more and if the lightning-load phase is always switched open first (or switched closed last), or if the transformer or bank is temporarily grounded at the primary neutral during switching.*)

Complete the following steps to install SML-4Z Power Fuse mountings:

- STEP 1.** Remove the mounting from its shipping crate, taking care not to lift it by the insulators or live parts.
- STEP 2.** Attach the mounting to the supporting frame or structure using appropriate hardware (not included with mounting).

**Note:** This base uses bossed mounting holes arranged in a triangular pattern to permit “three-point mounting” (attachment to supporting structure using only three fasteners) to minimize the possibility of deforming a base being bolted to an irregular surface.

## Adjustment

S&C Type SML-4Z Power Fuses are factory-assembled and adjusted, and further adjustment should not be required. However, to verify no misalignment of parts has occurred during shipping or installation, the following precautionary checks are recommended:

**STEP 1.** Accurately measure the distance between the lower edge of the latch stop on the Uni-Rupter Interrupter and the “shoulder” on the hinge-and-lower-contact assembly. See Figure 1. Make sure the distance is within the specified tolerance for Dimension P, shown in Figure 1, on both sides of Uni-Rupter Interrupter. If adjustment is necessary, slightly loosen the mounting bolts that secure the hinge-end insulator to the base. Then, move the insulator toward or away from Uni-Rupter Interrupter as required to bring the distance to within the specified Dimension P limits. Make sure this dimension is maintained on both sides of the mounting. Tighten both mounting bolts.

**STEP 2.** Install an SML-4Z Fuse Holder (with an S&C Silencer attached, as directed in S&C Instruction Sheet 252-525) in the hinge-and-lower-contact assembly and slowly close the holder into the Uni-Rupter Interrupter. Make sure the contact rod on the holder makes an “on center” approach to the fault-closing contacts of the Uni-Rupter Interrupter. See Figure 2. If adjustment is necessary, slightly loosen the two bolts securing the hinge-and-lower contact assembly to its insulator and, using the holder as a lever, bring the hinge-and-lower-contact assembly into proper alignment with the Uni-Rupter Interrupter. Recheck the distance (on both sides of the Uni-Rupter Interrupter) and adjust as required so they remain within the Dimension P limits. Then, retighten both mounting bolts.

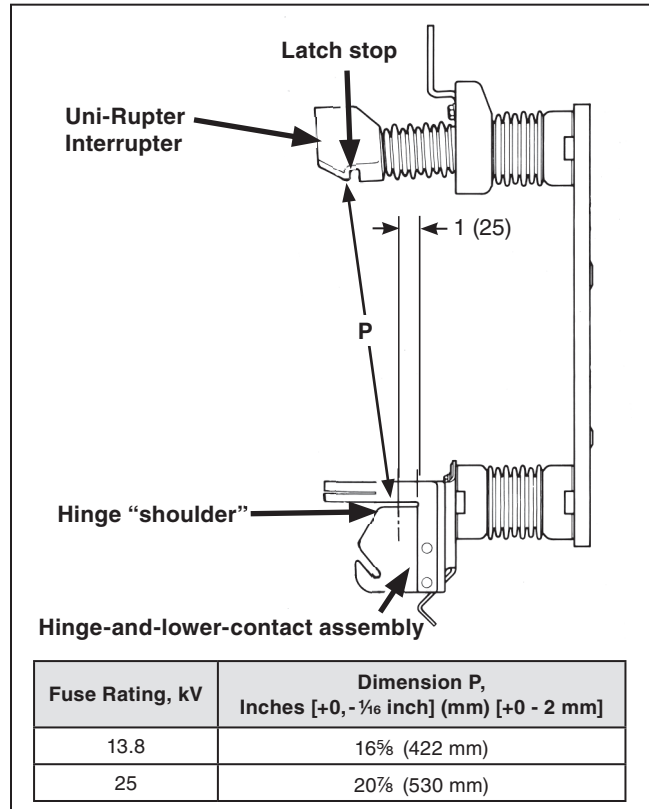


Figure 1. Proper separation between the latch stop and the “shoulder” on the hinge.

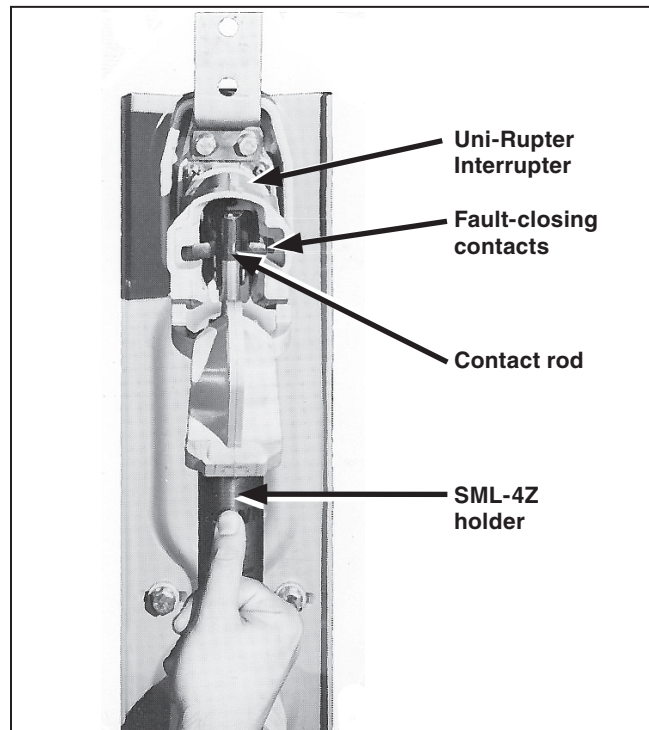


Figure 2. “On center” approach of the contact rod to the fault-closing contacts of the Uni-Rupter Interrupter.

**STEP 3.** Using a conventional hookstick (or an S&C Universal Pole equipped with an S&C Grappler™ Handling Tool●), operate the holder by moving it from the **Closed** position to the **Open** position and back again. Make sure the holder closes on center (as described in Step 2 on page 8) and that not more than a  $\frac{1}{16}$ -inch (2-mm) clearance exists between the latch stop on the Uni-Rupter Interrupter and the latch on the holder, with the holder in the **Closed** position (see Figure 3). Note that a firm, steady pull with a hookstick is required to open the holder.

● The Grappler Handling Tool is the S&C fuse-handling fitting especially suited for use with disconnect-style S&C Type SM and Type SML Power Fuses.

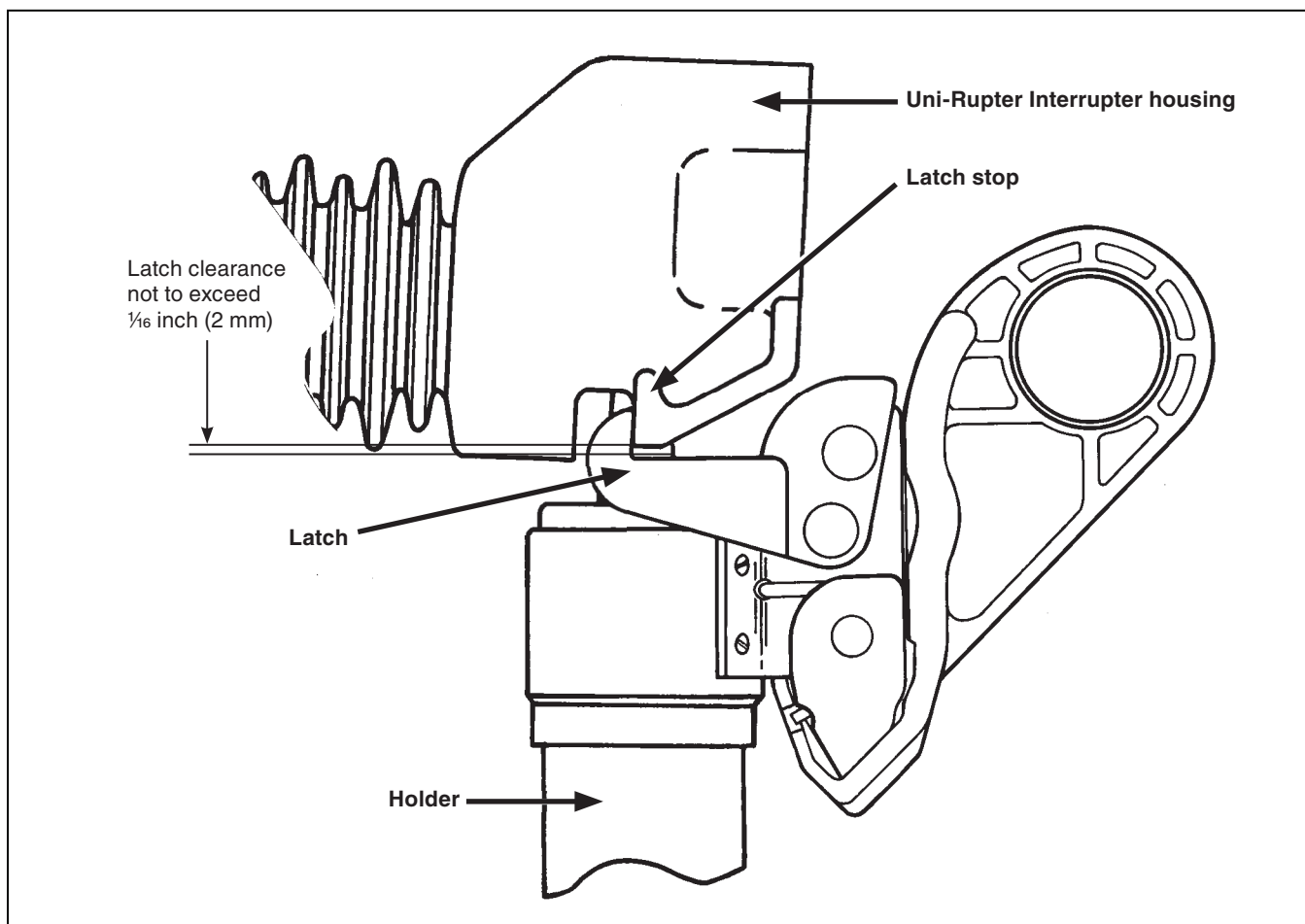


Figure 3. Proper latch engagement.