

Installation and Adjustment

Table of Contents

Section	Page	Section	Page
Introduction		Safety Precautions	5
Qualified Persons	2	Overview	
Read this Instruction Sheet	2	Live Switching–Opening	6
Retain this Instruction Sheet	2	Live Switching–Closing	6
Proper Application	2	A Note on Single-Pole Switching	6
Warranty	2	Installation	7
Warranty Qualifications	3	Adjustments	8
Safety Information			
Understanding Safety-Alert Messages	4		
Following Safety Instructions	4		
Replacement Instructions and Labels	4		



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 your Type SML-20 Power Fuses. Familiarize yourself with the Safety Information and Safety Precautions on pages 4 and 5. 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 should be available for reference whenever Type SML-20 Power Fuses are used. Retain this instruction sheet in a location where you can easily retrieve and refer to it.

Proper Application

WARNING

Type SML-20 Power Fuses must only be used for specific fusing applications within the ratings of the model selected. Type SML-20 Power Fuse ratings are listed on a ratings label attached to the unit.

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**

For the standard warranty contained in S&C's standard conditions of sale (as set forth in S&C Price Sheet 150) to apply to Type SML-20 Power Fuses, these mountings must be installed in accordance with the instructions found in this publication. Furthermore, when installed in indoor, outdoor, or indoor-outdoor enclosures of other than S&C manufacture, the enclosures must be constructed in accordance with S&C's applicable minimum construction specifications to be found in the current revision of the following publication:

INFORMATION BULLETIN 252-64:

S&C Power Fuses Type SML Indoor
Distribution (13.8 kV and 25 kV)

Minimum Construction Specifications
for Indoor and Outdoor Metal Enclosures
with Fuses

With respect to Type SML-20 Power Fuses, when installed in submersible enclosures of other than S&C manufacture, warranty does not apply unless enclosures are furnished by an approved supplier and are of water-tight construction providing proper electrical clearances and proper space for fuse handling.

The standard warranty contained in seller's standard conditions of sale (as set forth in Price Sheet 150) does not apply when fuse units of other than S&C manufacture are used in S&C SML-20 Mountings or when S&C fuse units are used in mountings of other than S&C manufacture.

Safety Information

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the Type SML-20 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, 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 Type SML-20 Power Fuses.



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



Type SML-20 Power Fuses contain 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, users should follow their company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to Type SML-20 Power Fuses 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, arc-flash clothing, and fall-protection, 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 and tags. Remove tags ONLY if instructed to do so.
5. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded.
6. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.
7. **Do not remove the fuse unit from its carton until ready to use.**
8. **Handle fuse units with care.** Do not drop or throw them.
9. **Do not place hand over the upper seal of the fuse unit when handling.** There is the remote possibility that the current-responsive section of the fuse unit may have been weakened in shipping or handling. As a result, the spring-loaded actuating pin may be unpredictably released and driven forcibly through the upper seal.

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 rating)

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—22,400 at 14.4 kV, 20,000 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.

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 Uni-Rupter Interrupters—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 of any kVA rating when 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 or if the transformer or bank is temporarily grounded at the primary neutral during switching.*)
- 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 of any kVA rating when 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 lighting-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.*)
- 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 lighting-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.*)

Follow these steps for fuse installation:

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 bolted to an irregular surface.

Adjustments

SML-20 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 (Dimension P in Figure 1). Make sure Dimension P is within the specified tolerance on both sides of the 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 the Uni-Rupter Interrupter as required to bring Dimension P within the specified limits. Make sure this dimension is maintained on both sides of the mounting. Tighten both mounting bolts.
- STEP 2.** Install an SMU-20 Fuse-Unit assembly (with end-fittings, including the silencer attached, as directed in S&C Instruction Sheet 252-550) in the hinge-and-lower contact assembly and slowly close the fuse-unit assembly into the Uni-Rupter Interrupter. Make sure the contact rod on the fuse-unit assembly 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 fuse-unit assembly as a lever, bring the hinge-and-lower contact assembly into proper alignment with the Uni-Rupter Interrupter. Recheck Dimension P (on both sides of the Uni-Rupter Interrupter) and adjust as required. Then, retighten both mounting bolts.

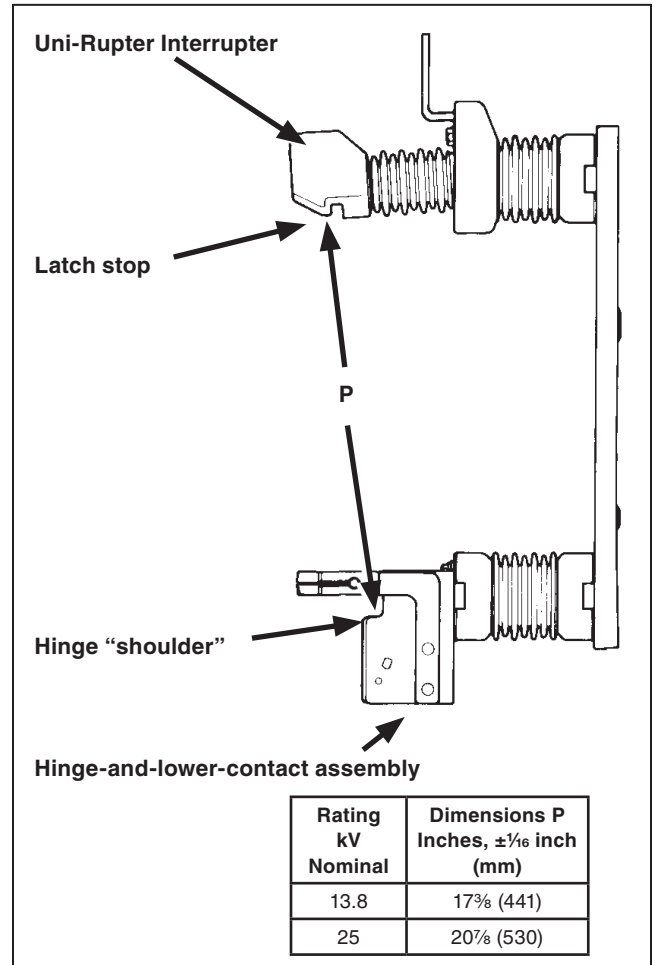


Figure 1. Proper separation between latch stop and “shoulder” on hinge

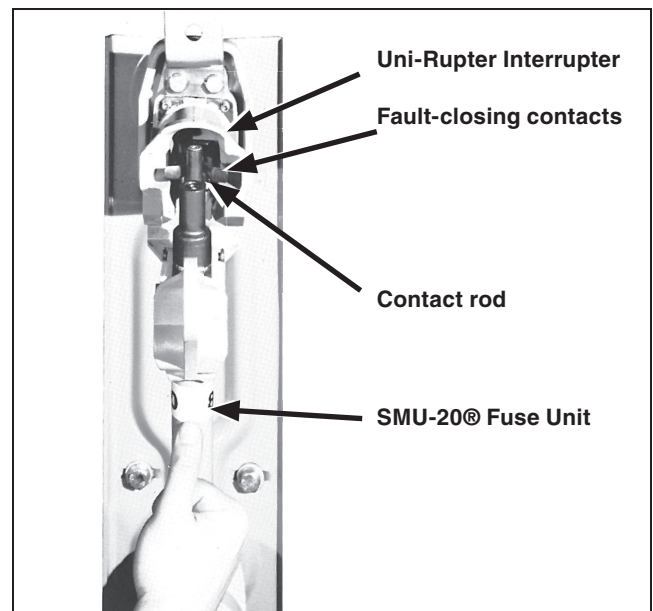


Figure 2. “On center” approach of contact rod to fault-closing contacts of the Uni-Rupter Interrupter.

STEP 3. Using a conventional hookstick (or an S&C Universal Pole equipped with an S&C Grappler™ Handling Tool●), operate the fuse-unit assembly by moving it from the **Closed** position to the **Open** position and back again. Make sure the fuse-unit assembly closes on center (as described in Step 2) 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 fuse-unit upper end-fitting, with the fuse unit in the **Closed** position. See Figure 3. Note that a firm, steady pull with a hookstick is required to open the fuse-unit assembly.

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

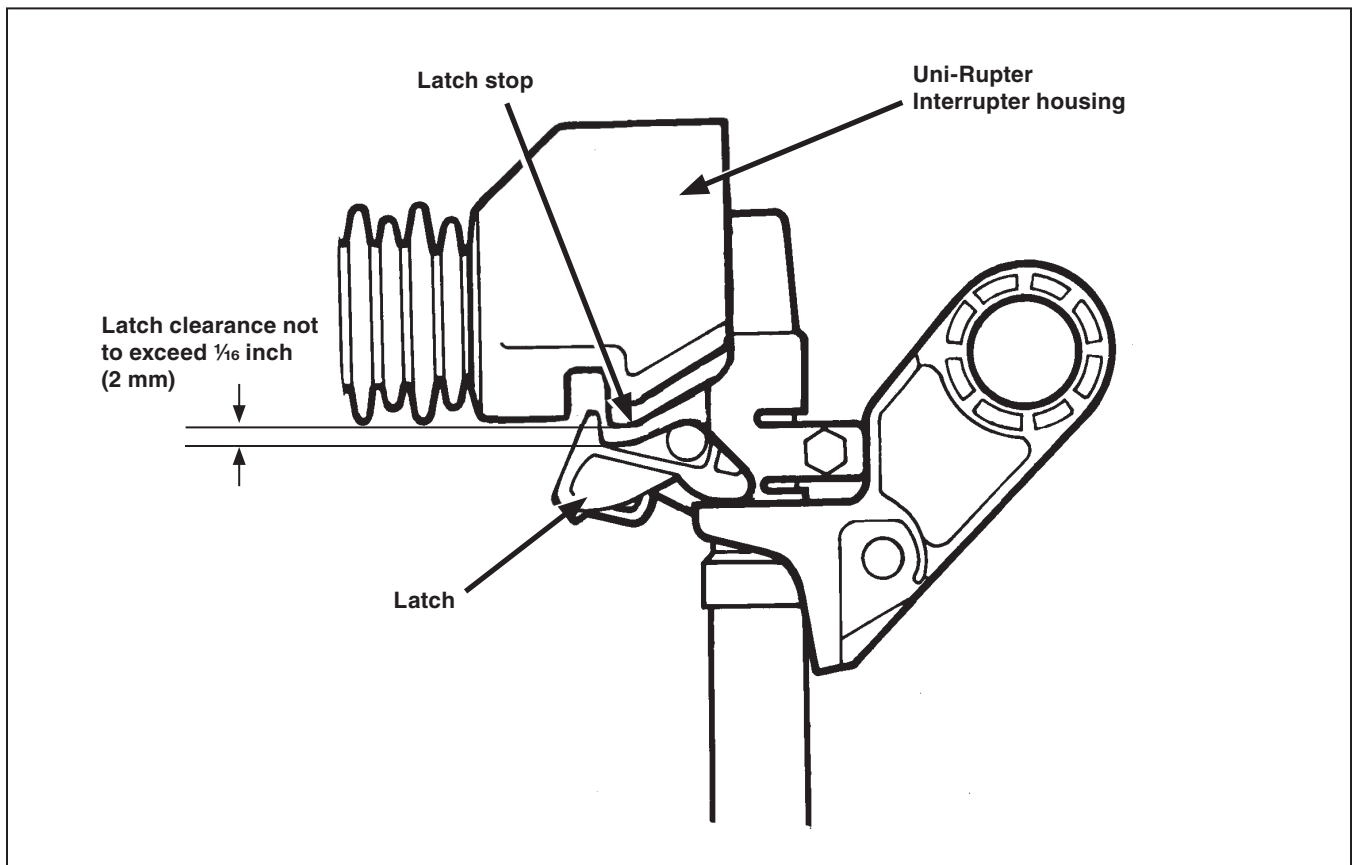


Figure 3. Proper latch engagement.