

Operation

Table of Contents

Section	Page	Section	Page
Introduction		Overview	6
Qualified Persons	2	Fusing	
Read this Instruction Sheet	2	Preparatory Procedures	7
Retain this Instruction Sheet.	2	Installing the Fuse Unit	7
Proper Application	2	Installing the Fuse in its Mounting	7
Warranty	2	Re-Fusing	
Safety Information		Preparatory Procedures	8
Understanding Safety-Alert Messages.	3	How to Detect a Blown Fuse	8
Following Safety Instructions	3	Removing the Fuse from the Mounting	8
Replacement Instructions and Labels	3	Replacing the Fuse Unit	8
Safety Precautions	4	Installing the Fuse in its Mounting	8
Shipping and Handling			
Inspection	5		

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 SM-20 Power Fuses. Familiarize yourself with the Safety Information and Safety Precautions on pages 3 through 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 should be available for reference whenever S&C Type SM-20 Power Fuses are used. Retain this instruction sheet in a location where you can easily retrieve and refer to it.

Proper Application

 **WARNING**

S&C Type SM-20 Power Fuses must only be used for specific fusing applications that are within the ratings of the model selected. S&C Type SM-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.)

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 SM-20 Power Fuses. 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 Monitoring and Support Center at 1-888-762-1100.

NOTICE

Read this instruction sheet thoroughly and carefully before installing your S&C Type SM-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



S&C Type SM-20 Power Fuses 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, users should follow their company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to S&C Type SM-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.

Inspection

Examine the shipment for external evidence of damage as soon after receipt as possible, preferably before removal from the carrier's conveyance. Check the bill of lading to make sure all listed shipping skids, crates, and containers are present.

If there is visible loss and/or damage:

1. Notify the delivering carrier immediately.
2. Ask for carrier inspection.
3. Note the condition of shipment on all copies of the delivery receipt.
4. File a claim with the carrier.

If concealed damage is discovered:

1. Notify the delivering carrier within 15 days of receipt of shipment.
2. Ask for carrier inspection.
3. File a claim with the carrier.

Also, notify S&C Electric Company in all instances of loss and/or damage.

Overview

S&C Type SM-20 Power Fuses feature fuse-unit end-fittings, including S&C's Silencer exhaust control device that virtually eliminates venting, and an SMU-20® Fuse Unit, which is replaced after the fuse operates. A specially designed hinge provides self-guiding action for the fuse unit during opening or closing. See Figure 1.

The upper end-fitting features a brilliant-red blown-fuse target that projects from the top of the upper end-fitting when the fuse unit has operated, making it easy to check the fuse condition with the fuse in the **Closed** position. The blown-fuse target retracts within the end-fitting when the blown fuse unit is replaced.

NOTICE

The present-design upper end-fitting for use in SM-20 Power Fuses uses a free-floating blown-fuse target that can move (by force of gravity) into the **Blown Fuse** position should the fuse unit be inverted during handling. The fuse condition can be verified by returning the fuse unit to the **Upright** position. If the fuse unit is blown, the target will remain in the **Extended** (projecting) position.

NOTICE

These power fuses are not designed for live-switching duties.

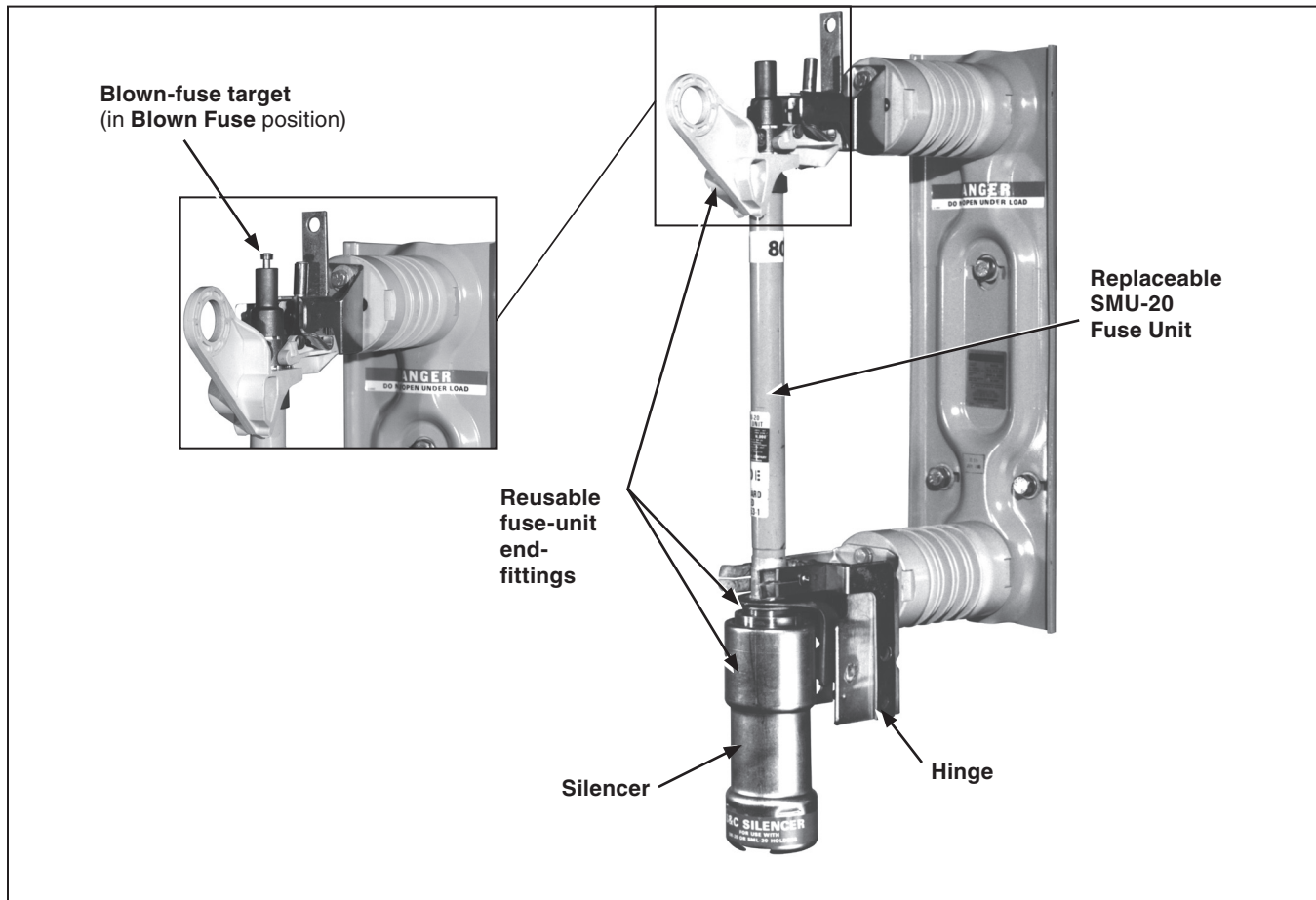


Figure 1. S&C Type SM-20 Power Fuse.

Preparatory Procedures

Observing the Safety Precautions outlined on page 4, open the interrupter switch associated with the affected fuse(s). If the fuses are not applied in conjunction with an interrupter switch, open and lock the upstream interrupting device and tag the interrupting device with an appropriate cautionary tag in accordance with established safety practices. Then, open the switchgear door to gain access to the fuse(s).

Installing the Fuse Unit

Complete instructions for insertion of new SMU-20 Fuse Units into their end-fittings are described in Instruction Sheet 252-550 furnished with each fuse unit.

Installing the Fuse in its Mounting

For SM-20 Power Fuses Rated 13.8 kV and 25 kV:

- STEP 1.** Insert the fuse (i.e., the fuse unit with the end-fittings attached) in its hinge, using a universal pole● equipped with an S&C Grappler™ Handling Tool.■ Position the Grappler tool cone in the fuse pull-ring and cradle the fuse tube in the Grappler tool prongs. See Figure 2.
- STEP 2.** Grasp the universal pole with both hands approximately 2 feet (61 cm) apart, with one hand at the end of the pole opposite from the Grappler tool. Lift the fuse and lower it into its hinge. Make sure the fuse is seated securely in the hinge, and then disengage the Grappler tool from the fuse.

Alternately, the fuse-mounting contacts may be tested for voltage and then grounded by means of grounding leads properly connected to both source- and load-side fuse-mounting contacts, after which the fuse may be inserted into the hinge by hand using insulating rubber gloves.

- STEP 3.** Use a universal pole equipped with an S&C Grappler tool to move the fuse to the **Closed and Latched** position. Position the Grappler tool with the prongs downward and insert the longest prong into the pull-ring of the fuse.

Remove the temporary grounds (if applicable)

For SM-20 Power Fuses Rated 34.5 kV:

- STEP 1.** Test the fuse-mounting contacts for voltage. Then, ground the contacts by means of grounding leads properly connected to both source- and load-side contacts. Insert the fuse (i.e., the fuse unit with its end-fittings attached) into its hinge by hand, using insulating rubber gloves.
- STEP 2.** Use a universal pole equipped with an S&C Grappler tool to move the fuse to the **Closed and Latched** position. Then, remove the temporary grounds.

- A 1½-inch (38-mm) universal pole, at least 6 feet (183 cm) long, is recommended (S&C catalog number 4202R2-E or equivalent).
- S&C catalog number 4423R1.

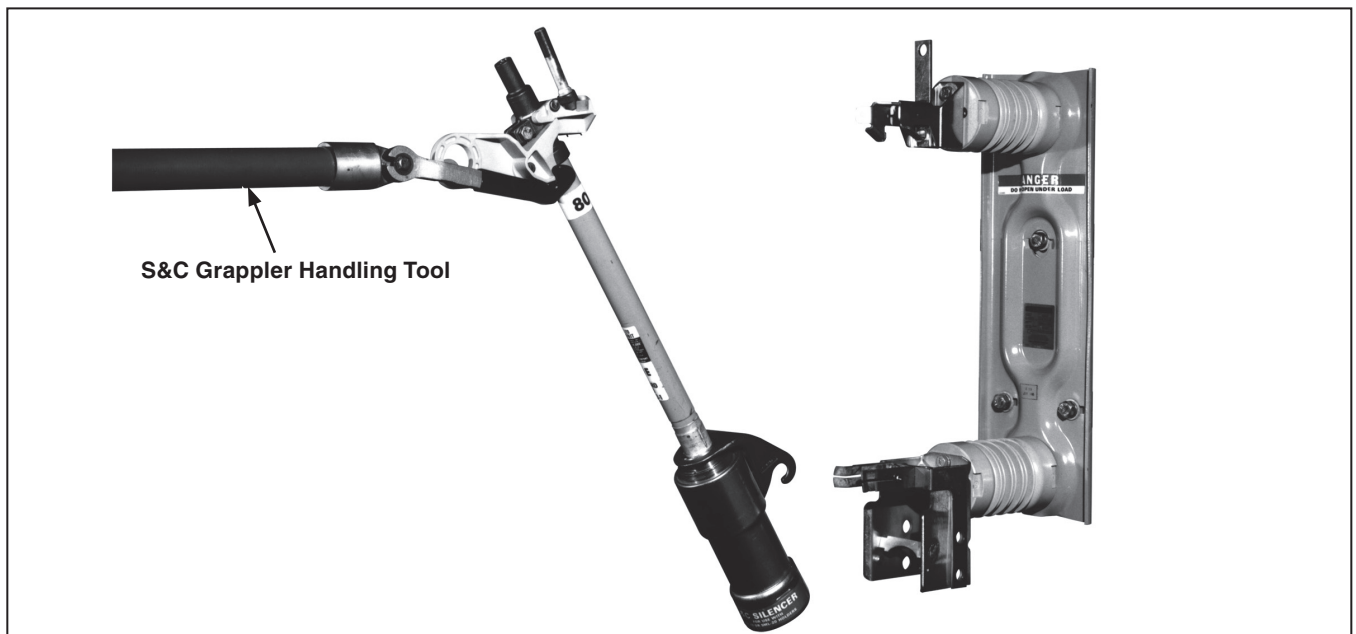


Figure 2. Installing (or removing) a fuse using a Grappler Handling Tool.

Preparatory Procedures

Follow the same procedures as outlined in the “Fusing” section on page 7.

How to Detect a Blown Fuse

From a safe distance, observe the blown-fuse target. The upper end-fitting features a brilliant-red blown-fuse target that projects from the top of the upper end-fitting when the fuse unit has operated . . . making it easy to check the fuse condition with the fuse in the **Closed** position. The blown-fuse target retracts within the end-fitting when the blown fuse unit is replaced.

NOTICE

The present-design upper end-fitting for use in SML-20 Power Fuses uses a free-floating blown-fuse target that can move (by force of gravity) into the **Blown Fuse** position should the fuse unit be inverted during handling. The fuse condition can be verified by returning the fuse unit to the **Upright** position. If the fuse unit is blown, the target will remain in the **Extended** (projecting) position.

Removing the Fuse from the Mounting

For SM-20 Power Fuses Rated 13.8 kV and 25 kV:

- STEP 1.** Use a universal pole equipped with an S&C Grappler tool to unlatch the fuse. Position the Grappler tool with the prongs downward. Insert the longest prong of the Grappler tool into the fuse pull-ring and pull outward. Bring the fuse to the fully **Open** position so the silencer rests against its stop, and disengage the Grappler tool.
- STEP 2.** Using the universal pole with the S&C Grappler tool, remove the fuse from its hinge as follows:
- Grasp the universal pole with both hands approximately 2 feet (61 cm) apart, with one hand at the end of the pole opposite from the Grappler tool.
 - Position the Grappler tool cone in the fuse pull-ring and cradle the fuse in the Grappler tool prongs. See Figure 2 on page 7.
 - Stand in a normal, upright position facing the universal pole. Move the pole forward until resistance between the Grappler tool and the fuse is felt, or approximately 2 inches (5 cm). Then, remove the fuse from its hinge with a forward and upward lifting motion.

Alternately, the fuse-mounting contacts may be tested for voltage and then grounded by means of grounding leads properly connected to both source- and load-side fuse-mounting contacts, after which the fuse may be removed from the hinge by hand, using insulating rubber gloves.

For SM-20 Power Fuses Rated 34.5 kV:

- STEP 1.** Use a universal pole equipped with an S&C Grappler tool to unlatch the fuse. Position the Grappler tool with the prongs downward. Insert the longest prong of the Grappler tool into the fuse pull-ring and pull outward. Bring the fuse to the fully **Open** position so the Silencer rests against its stop, and disengage the Grappler tool.
- STEP 2.** Test the fuse-mounting contacts for voltage. Then, ground the contacts by means of grounding leads properly connected to both source- and load-side contacts. Remove the fuse from the hinge by hand, using insulating rubber gloves.

Replacing the Fuse Unit

Complete instructions for removing blown (or unblown) SMU-20 Fuse Units from their end-fittings, and for insertion of new fuse units, are described in the instruction sheet furnished with each fuse unit.

Installing the Fuse in its Mounting

Follow the same procedures as outlined in the “Fusing” section on page 7.