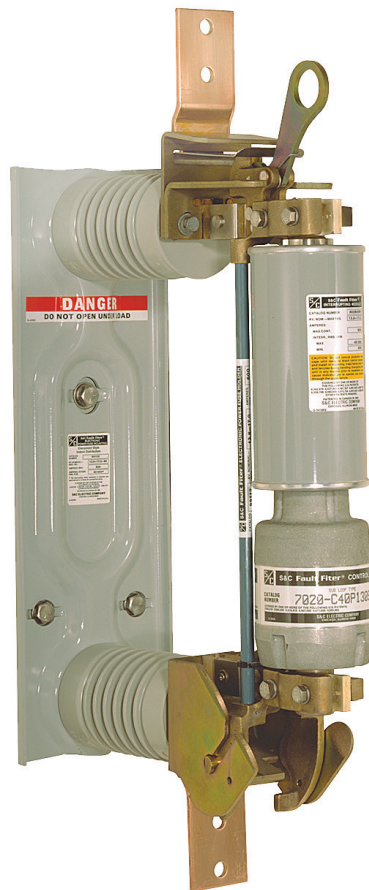


Operation


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Introduction

Qualified Persons

 WARNING
<p>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:</p> <ul style="list-style-type: none">• 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 <p>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.</p>


Read this Instruction Sheet

NOTICE
<p>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 Fault Fiter Electronic Power Fuse. 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/.</p>

Retain this Instruction Sheet

This instruction sheet is a permanent part of your S&C Fault Fiter Electronic Power Fuse. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

 WARNING
<p>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 S&C Fault Fiter Electronic Power Fuses are listed in the ratings table in Specification Bulletin 441-31. The ratings are also affixed to the product.</p>

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 Fault Fiter Electronic 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 Monitoring and Support Center at 1-888-762-1100.

NOTICE	
Read this instruction sheet thoroughly and carefully before installing your Fault Fiter Electronic 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



Fault Fiter Electronic 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 your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to the Fault Fiter Electronic Power Fuse 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. Always maintain proper clearance from energized components.
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 AND TAGS.** 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. All voltage transformers must be disconnected when external voltage is used to test any secondary-side wiring or devices, to avoid energizing the high-voltage conductors through the voltage transformers. Draw out the voltage transformers completely if draw out-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 leads.
6. **TEST FOR VOLTAGE.** Qualified persons should be certain that 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.
7. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.
8. **DO NOT REMOVE THE INTERRUPTING OR CONTROL MODULES FROM THEIR CARTONS UNTIL READY TO USE.**
9. **HANDLE INTERRUPTING AND CONTROL MODULES WITH CARE.** Do not drop or throw them.
10. **ENERGIZING EQUIPMENT.** When returning the equipment to service, the following procedure should be observed:
 - Make certain each switchgear or vault door permitting access to high voltage is closed and latched before energizing the circuit or operating any switching device.
 - Make sure any grounding switch is opened, or other grounding means is removed, before closing the associated interrupter switch(es).
 - Lock interrupter switches in the **Open** or **Closed** position, as dictated by circumstances.
 - 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.

The following instructions are for operation of Disconnect-Style S&C Fault Fiter Electronic Power Fuses.

A complete S&C Fault Fiter Electronic Power Fuse consists of a mounting, a holder, a control module, and an interrupting module, as shown in Figure 1. The control module includes a current transformer and electronic circuits that provide control power, current sensing, and

electronically determined time-current characteristics for the fuse. The interrupting module carries load current continuously through a main current section and, during a fault condition, transfers current to a circuit-interrupting section in response to a signal from the control module. Following a fault-clearing operation, the interrupting module is replaced. The control module is reusable.

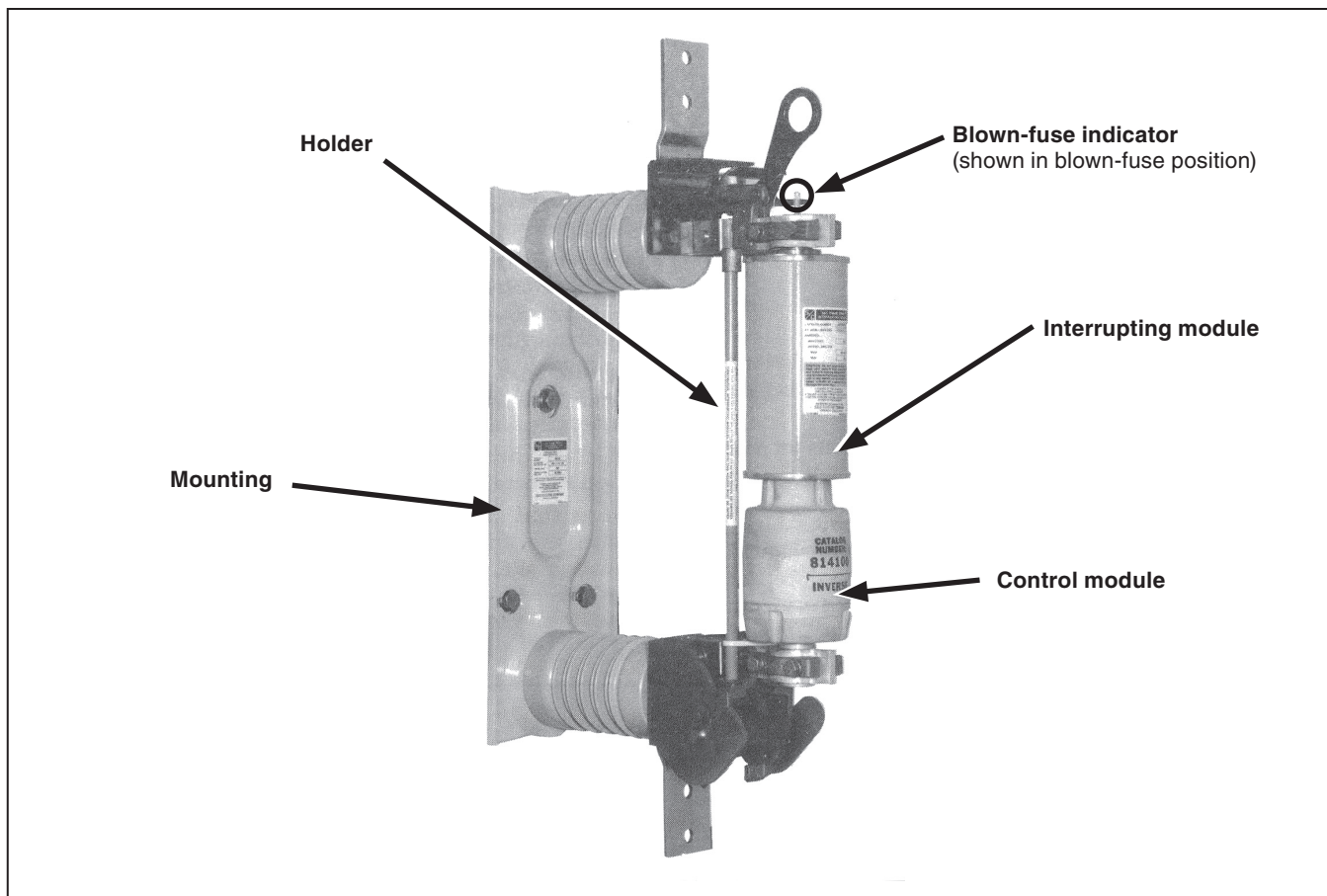


Figure 1. A Fault Fiter Electronic Power Fuse—Disconnect Style.

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 Modules in a Holder

Complete instructions for installation of Fault Fiter fuse control modules and Fault Fiter fuse interrupting modules in holders are provided in the instruction sheet furnished with each module.

Installing the Holder in the Mounting

A universal pole● equipped with an S&C Grappler™ Handling Tool■ or an S&C Extra-Large Clamp▲ can be used to install holders in mountings rated 4.16 kV and 13.8 kV. See Figure 2. Holders for fuses rated 25 kV should be installed by hand, provided the mounting has been de-energized and properly grounded in accordance with local operating practices.

- A 1½-inch (38-mm) diameter universal pole, at least 6 feet (183 cm) long, is recommended (S&C catalog number 4202R-2E or equivalent).
- S&C catalog number 4423.
- ▲ S&C catalog number 4424.

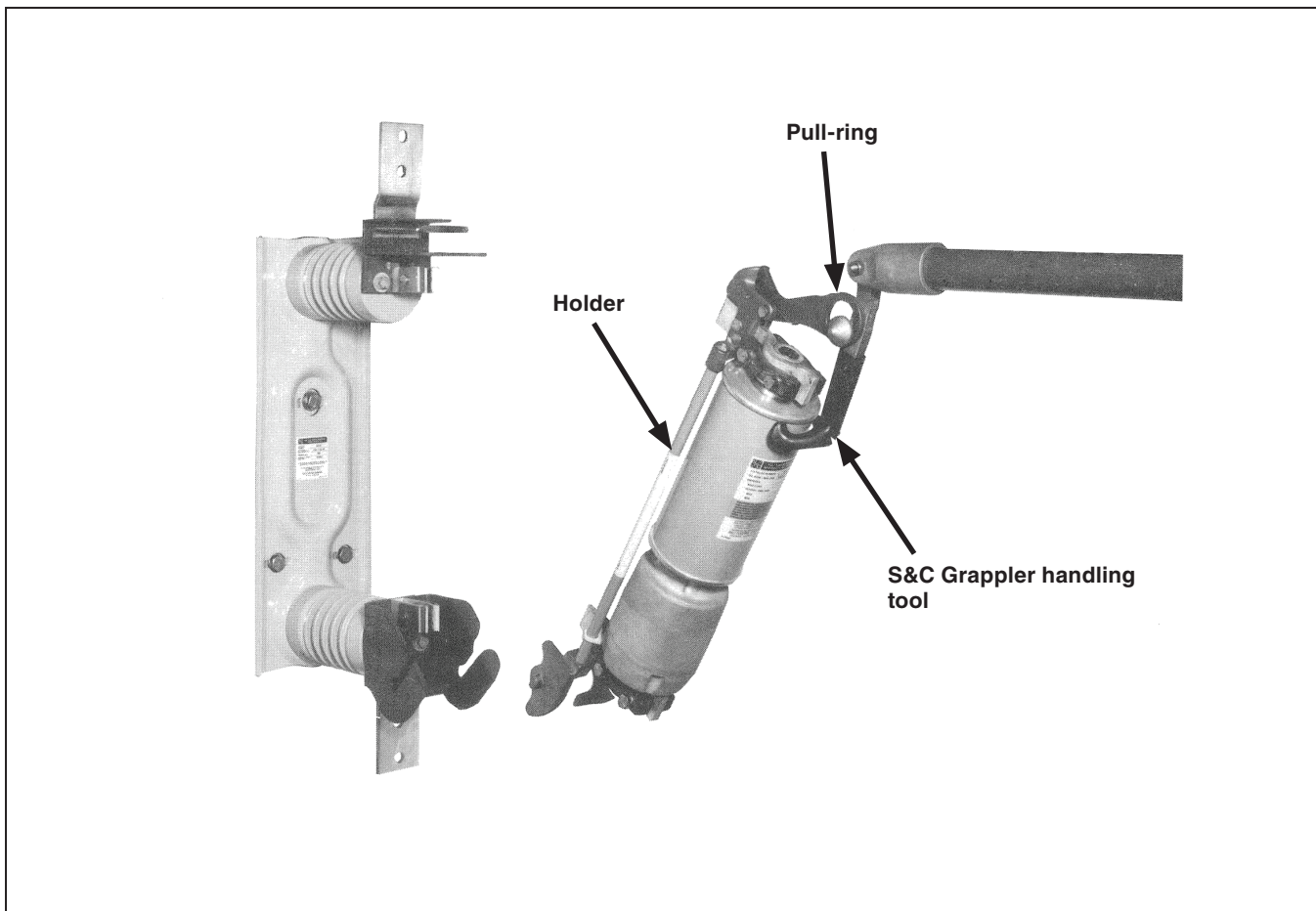


Figure 2. Installing (or removing) the holder using the S&C Grappler Handling Tool.

Using the S&C Grappler Handling Tool

Complete the following steps to use the Grappler tool:

STEP 1. Attach the Grappler tool to the universal pole at an angle of approximately 90 degrees relative to the center line of the pole, as shown in Figure 2 on page 6. However, because the most advantageous positioning for the Grappler tool depends on the elevation of the fuse mounting relative to the operator, the handling tool should be adjusted as required to accommodate conditions.

- (a) 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.
- (b) Position the Grappler tool cone in the pull-ring of the holder, as shown in Figure 2 on page 6.
- (c) Lift the holder and lower it into the hinge. Make sure the holder is securely seated in the hinge before disengaging the handling tool.

⚠ CAUTION

Do not perform these steps under load.

STEP 2. Use a universal pole equipped with an S&C Grappler tool to move the holder to the **Closed and Latched** position. Position the Grappler tool with the prongs pointed downward, and insert the longest prong in the pull-ring of the holder (see Figure 3). After the holder is in the **Closed** position, use the Grappler tool to push against the interrupting module to make sure complete closure was attained.

Remove the temporary grounds (if applicable).

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

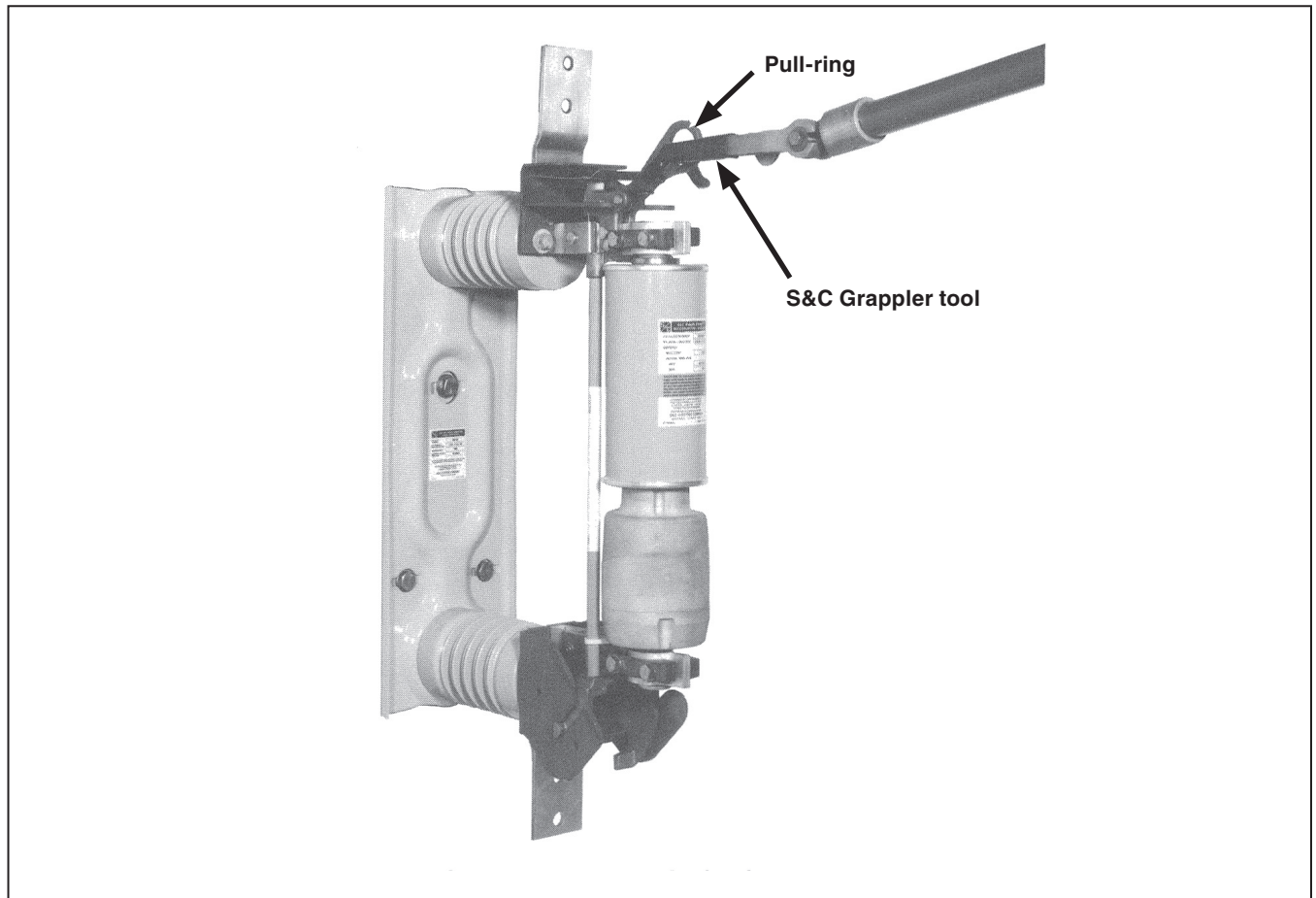


Figure 3. The Grappler tool, positioned for a closing (or opening) stroke, with the longer prong inserted in the holder pull-ring.

Using the S&C Extra-Large Clamp:

STEP 1. When handling holders using a universal pole equipped with an S&C Extra-Large Clamp, attach the clamp to the pole, as shown in Figure 4. However, because the most advantageous positioning for the extra-large clamp depends on the elevation of the fuse mounting relative to the operator, the handling tool should be adjusted as required to accommodate conditions.

- (a) 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 extra-large clamp.
- (b) Securely attach the handling tool at the location shown in Figure 4. Make certain the handling-tool jaws are fully tightened before attempting to lift the holder.
- (c) Lift the holder and lower it into the hinge. Make sure the holder is securely seated in the hinge before disengaging the handling tool.

STEP 2. Use a universal pole equipped with an S&C Grappler Handling Tool to move the holder to the **Closed and Latched** position. Position the Grappler tool with the prongs pointed downward, and insert the longest prong in the pull-ring of the holder. See Figure 3 on page 7. After the holder is in the **Closed and Latched** position, use the Grappler tool to push against the interrupting module to make sure complete closure was attained.

Remove the temporary grounds (if applicable).

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

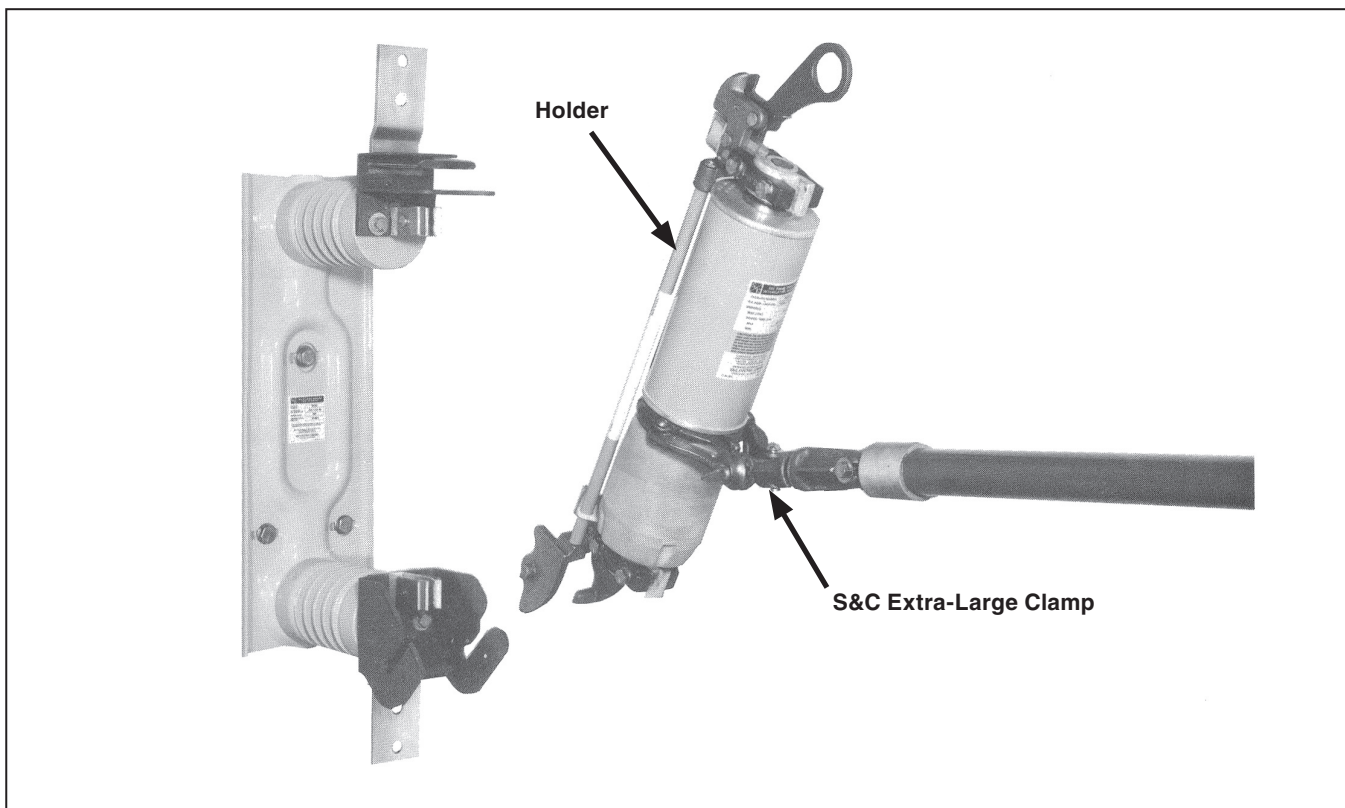


Figure 4. Installing (or removing) the holder using the S&C Extra-Large Clamp.

Preparatory Procedures

Follow the same procedures described in the “Fusing” section on pages 7 and 8.

How to Detect a Blown Fuse

From a safe distance, check for indication of a blown fuse. If the fuse has operated, a blown-fuse indicator will be visible at the upper end of the Fault Fiter fuse interrupting module (See Figure 1 on page 5).

Removing the Holder from the Mounting

Complete the following steps to remove the mounting from holder:

- STEP 1.** Use a universal pole● equipped with an S&C Grappler Handling Tool■ to move the holder to the **Open** position. Position the Grappler tool with the prongs pointed downward, and insert the longest prong in the pull-ring of the holder. See Figure 3 on page 7. Disengage the Grappler tool from the pull-ring after the holder is in the **Open** position.
- STEP 2.** Use a universal pole equipped with an S&C Grappler tool or an S&C Extra-Large Clamp▲ to remove holders from mountings for fuses rated 4.16 kV and 13.8 kV. See Figure 4 on page 8. Holders for fuses rated 25 kV should be removed by hand, provided the mounting has been de-energized and properly grounded in accordance with local operating practices.

Using the S&C Grappler Handling Tool:

Attach the Grappler tool to the universal pole at an angle of approximately 90 degrees relative to the center line of the pole, as shown in Figure 2 on page 6. However, because the most advantageous positioning for the Grappler tool depends on the elevation of the fuse mounting relative to the operator, the handling tool should be adjusted as required to accommodate conditions:

- 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 pull-ring of the holder, as shown in Figure 2 on page 6.
- Lift the holder from the hinge using an upward lifting motion.

Using the S&C Extra-Large Clamp:

When handling holders using a universal pole equipped with an S&C Extra-Large Clamp, attach the clamp to the pole as shown in Figure 4 on page 8. However, because the most advantageous positioning for the extra-large clamp depends on the elevation of the fuse mounting relative to the operator, the handling tool should be adjusted as required to accommodate conditions:

- 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 extra-large clamp.
- Securely attach the handling tool at the location shown in Figure 4. Make sure the handling-tool jaws are fully tightened before attempting to lift the holder.
- Lift the holder from the hinge using an upward lifting motion.

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

Replacing the Interrupting Module

Complete instructions for replacement of Fault Fiter fuse interrupting modules are provided in the instruction sheet furnished with each module.

Installing the Holder in the Mounting

Follow the instructions for this procedure described in the “Fusing” section on pages 7 and 8.

- A 1½-inch (38 mm) diameter universal pole, at least 6 feet (183 cm) long, is recommended (S&C catalog number 4202R-2E or equivalent).
- S&C catalog number 4423R1.
- ▲ S&C catalog number 4424.