Field Assembly, Installation, and Maintenance

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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 Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 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 Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 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 Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuses must only be used for specific fusing applications that are within the ratings of the model selected. S&C Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 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 Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 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 Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 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 Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 Power Fuses are installed in high-voltage applications. 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 Types SMD-1A, SMD-2B, SMD-2C, and SMD-3 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 leave fuse units installed in the fuse mounting hanging open. When closed in, the fuse units will not be damaged by rain or high humidity. However, the watertightness of the exhaust end of the fuse units cannot be guaranteed; therefore, as a precaution, fuse units should not be left hanging open. Any rain or snow that might enter could affect the solid-materials lining. Moreover, when in storage, these fuse units should be protected from excessive moisture.

8. Do not remove the fuse unit from its carton until ready to use.

9. Handle fuse units with care. Do not drop or throw.

10. 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.
The following instructions are for field assembly, installation, and maintenance of SMD-1A, SMD-2B, SMD-2C, and SMD-3 fuse units in ratings of 34.5, 46, and 69 kV. When equipped with the proper end-fittings, SMD-1A, SMD-2B, SMD-2C, and SMD-3 Fuse Units are interchangeable in the same mountings except as follows:

- An SMD-2B, SMD-2C, or SMD-3 Fuse Unit must not be installed in an SMD-1A right-angle style mounting unless the catalog number stamped on the nameplate of the mounting carries an “R” supplement such as catalog number 192006R2.

- An SMD-3 Fuse Unit cannot be installed in an SMD-1A, SMD-2B, or SMD-2C upright or pedestal style mounting; conversely, an SMD-1A, SMD-2B, or SMD-2C Fuse Unit cannot be installed in an SMD-3 upright or pedestal style mounting.

   Because of differences in interrupting ratings, fuse units of different types should not be interchanged without first checking application requirements.

Note: In April 1955, the latch-and-upper-contact assemblies and the upper end-fittings used on these power fuses were redesigned. To identify mountings (or live parts) and fuse unit end-fittings reflecting this change, a supplement was added to the corresponding catalog numbers—186924R1, for example.

   Upper end-fittings of the pre-April 1955 design will not necessarily latch into the latch-and-upper-contact assembly of the improved design. More specifically, if the casting that mounts on the upper insulator bears No. S-60015 or S-60016, do not attempt to use fuse unit end-fittings having “nose” casting No. S-55979 or S-55562.

   The latch-and-upper-contact assembly of the previous design will, however, accommodate the new upper end-fittings.
Follow these steps to attach the fuse unit end-fittings:

**STEP 1.** Check the upper end-fitting to ensure the release tube slides freely. See Figure 1 or Figure 2 on page 8 as applicable. If it does not, use a new upper end-fitting.

**STEP 2.** Carefully remove the blocking assembly (if provided) from the upper end of the fuse unit.

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**WARNING**

There is a remote possibility that rough handling in shipping has damaged the fusible element of the fuse unit. In this event, spring loading may cause the arcing rod of an SMD-1A Fuse Unit to be forcibly expelled when the blocking assembly is removed.

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**CAUTION**

Make certain the weather seal is seated in the groove located on the upper ferrule of the fuse unit. See Figure 1 or Figure 2 on page 8 as applicable.

**STEP 3.**

- **SMD-1A Fuse Units:** Attach the upper end-fitting to the upper ferrule of the fuse unit using the two stainless steel captive screws provided. See Figure 1. The correct position is determined by an alignment pin in the upper end-fitting.

- **SMD-2B, SMD-2C, and SMD-3 Fuse Units:** Attach the upper end-fitting to the upper ferrule of the fuse unit using the 5/16–18×1/2-inch stainless steel bolts and lock washers provided with the lower end-fitting for SMD-2B and SMD-2C Fuse Units or the 3/8–18×3/4-inch stainless steel bolts and lock washers provided with the upper end-fitting for SMD-3 Fuse Units. See Figure 2 on page 8. The correct position is determined by mounting holes in the lower end-fitting.

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**CAUTION**

Do not stand fuse unit on vent cover when attaching fuse-unit end-fittings.

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Figure 1. End-fittings for SMD-1A Fuse Units.
STEP 4. **SMD-1A Fuse-Units:** Attach the lower end-fitting to the lower ferrule of the fuse unit using the 5/16–18-inch stainless steel U-bolt, lock washers, and nuts provided. The correct position is determined by an alignment pin in the lower end-fitting.

**SMD-2B, SMD-2C, and SMD-3 Fuse Units:** Attach the lower end-fitting to the lower ferrule of the fuse unit using the 5/16–18×½-inch stainless steel bolts and lock washers provided with the lower end-fitting for SMD-2B and SMD-2C Fuse Units, or the 3/8–18×¾-inch stainless steel bolts and lock washers provided with the lower end-fitting for SMD-3 Fuse Units. The correct position is determined by mounting holes in the lower end-fitting.

STEP 5. **Unused Fuse-Unit End-Fittings:** A coating of NO-OX-ID® “A” Contact Lubricant (available from Sanchem, Inc.) was applied to the current-carrying contact surfaces of the upper end-fitting and lower end-fitting at the factory. Verify the presence of this oxidation-inhibiting grease and that it is still free of contaminants. If necessary, clean the contact surfaces with a nontoxic, nonflammable solvent and apply a coating of NO-OX-ID® “A” Contact Lubricant or a similar nonmetallic-filler oxidation-inhibiting grease.

**Reused Fuse-Unit End-Fittings:** Remove the existing coating of oxidation-inhibiting grease and dirt from the current-carrying contact surfaces of the upper end-fitting and lower end-fitting using a nontoxic, nonflammable solvent. Inspect these surfaces for evidence of pitting. If pitting has occurred, file down any projections, abrade the surfaces until smooth with an abrasive cloth or scratch brush, and wipe clean. Apply a new coating of NO-OX-ID® “A” Contact Lubricant or similar nonmetallic-filler oxidation-inhibiting grease to the current-carrying contact surfaces. If a contact has been burned, that contact and its mating contact should be replaced.
Figure 2. End-fittings for SMD-2B, SMD-2C, and SMD-3 Fuse Units.

Do not stand fuse unit on vent cover when attaching fuse-unit end-fittings.
DANGER
All incoming and outgoing leads to the fuse mountings must be de-energized and properly grounded before installing or removing fuse units.

All fuse-unit assemblies covered by this publication can be installed and removed by hand.

How to Use the Round Socket Fitting
To install the fuse unit, attach an S&C Large Round Socket (for the SMD-2B, SMD-2C, or SMD-3) or an S&C Small Round Socket (for the SMD-1A) to a universal pole short enough to permit handling the fuse unit in a nearly vertical position (in no case farther then 5° from the vertical). Slip the socket over the release tube of the fuse unit and lift into place in the hinge of the fuse mounting. See Figure 3. Swing the fuse unit to the Closed position. The prong on the side of the socket may be used for this purpose, with a pole extension attached to the universal pole to provide sufficient length. (To remove the fuse unit, reverse the above process.)

Figure 3. Use of round socket for fuse-unit removal or replacement.
DANGER
All incoming and outgoing leads to the fuse mountings must be de-energized and properly grounded before installing or removing fuse units.

Vertical, Vertical Offset, Inverted, and Right Angle Styles

Hookstick operation: Opening and closing operations are to be performed only on fuse mountings that have been de-energized. The fuse-unit assembly is opened by a downward pull on the pull-ring using a conventional hookstick. It can be eased down or permitted to drop freely. To close the fuse-unit assembly, use a conventional hookstick to engage the pull-ring and to swing the fuse unit to within 2 or 3 inches (51 to 76 mm) of the latch-and-upper-contact assembly and then move it sharply to the Closed position.

Hand operation: These fuse-unit assemblies can be opened and closed by hand.

Upright and pedestal styles: The fuse-unit assembly is opened by pulling the pull-ring back toward the hinge end of the fuse unit. Opening and Closing operations must be performed by hand.
Replacing Blown Fuse Units

When the fuse operates, the blown fuse unit swings to the Open position. Remove it from the mounting as described on page 9; detach the upper and lower end-fittings from the blown fuse unit and attach them to a new fuse unit, following directions in Steps 1 through 5 on pages 6 and 7. The blown fuse unit cannot be reused. Discard it.

For quick replacement of blown fuses, extra end-fittings may be purchased and attached to spare fuse units.

If practical, inspect the stationary-contact surfaces of the latch-and-upper-contact assembly and the hinge-and-lower-contact assembly.

**DANGER**

All incoming and outgoing leads to the fuse mountings must be de-energized and properly grounded before installing or removing fuse units.

Remove the existing coating of oxidation-inhibiting grease from these surfaces using a nontoxic, nonflammable solvent. Inspect these surfaces for evidence of pitting. If pitting has occurred, file down any projections, abrade the surfaces until smooth with an abrasive cloth or scratch brush, and wipe clean. Apply a new coating of NO-OX-ID® “A” Contact Lubricant or similar nonmetallic-filler oxidation-inhibiting grease. If a contact has been burned, that contact and its mating contact should be replaced.

**How to Double-Check for a Blown Fuse Unit**

If the vent cover at the lower end of the fuse unit is intact, it should not be assumed the fuse unit is unblown. Double-check for a blown fuse unit by removing the upper end-fitting from the fuse unit. If the latch drive spring is extended beyond the end of the fuse unit, the fuse is blown.
Fuse-Unit Tube Refinishing

The exterior finish of the fuse-unit tubes should be inspected periodically for weather damage. If the finish has become discontinuous or if deep scratches are evident, the tube should be resurfaced using the fuse-tube recoating kit available. See Table 1. This kit contains two components: a ½-pint can of Tile Red Epoxy Polyester Gloss Enamel 13-R-1 and a ½-pint can of Catalyst 13-C-0. A 1-pint can of thinner is also available for use with this kit (ordered separately).

Before resurfacing, sand off the old finish with No. 1 sandpaper. Smooth the surface with No. 0 sandpaper. Remove any oil or grease with a nontoxic, nonflammable solvent and allow to dry. Do not immerse the fuse unit in solvent.

Mix together only the amount of enamel and catalyst appropriate for the number of fuse-unit tubes to be recoated: ¼-pint enamel and ¼-pint catalyst for each fuse-unit tube. Add thinner as required. Wait approximately 30 minutes for the paint components to react.

Spray or brush coat the fuse tube, taking care not to coat the fuse-tube ferrules. Allow the tube to air dry for five hours, then apply a second coat. Air dry for five hours after applying the second coat. DO NOT BAKE FINISH.

Discard any mixed finish not used.

Fuse-Unit Bore Inspection

To determine whether SMD Fuse Units are in proper operating condition, the condition of the fuse-unit bore should be checked periodically—whenever the protected device is taken out of service for routine maintenance. SMD-1A, SMD-2B, and SMD-2C Fuse Units can be easily checked in the field using the S&C Airflow Test Instrument. SMD-3 Fuse Units are not suitable for airflow testing but can be returned to S&C for disassembly inspection of the fuse-unit bore. See Table 2.

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<tr>
<td>Fuse-unit recoating kit—one-half pint tile red epoxy polyester gloss enamel 13-R-1 and one-half pint catalyst 13-C-0 (sufficient for two coats for four fuse units). Requires thinner listed below</td>
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<td>Thinner for above—one pint</td>
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<th>Table 2. Inspection Equipment and Service</th>
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<td>S&amp;C airflow test instrument—including all necessary meters and gauges for measuring the rate of airflow through applicable SMD Fuse Units, the necessary adapters and hoses for coupling the instrument to fuse units, complete operating instructions, and a laminated 8½x11-inch card providing recommended minimum airflow values. Source air pressure is not included</td>
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<tr>
<td>Disassembly inspection of fuse-unit bore at S&amp;C</td>
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Contact the nearest S&C Sales Office for return authorization.