



## Spectra RMS™ Molded-Case Circuit Breaker Accessories

### Shunt Trip Undervoltage Release

#### Introduction

These instructions describe the steps necessary for field installation of Spectra RMS™ circuit breaker Shunt Trip and Undervoltage Release accessories in Spectra RMS circuit breaker frame sizes SE, SF, SG, and SK. A #2 Philips screwdriver and pliers are required for installation.

#### Shunt Trip Device (Black Wires)

The Shunt Trip allows the circuit breaker to be tripped electrically from a remote location by application of control voltage to the accessory leads. The Shunt Trip leads are black and are marked C1 and C2. The device is not sensitive to the polarity applied to the leads. The Shunt Trip can be momentarily or continuously energized without the need of a cutout switch.

The first breaker trip after the Shunt Trip has been off (de-energized) for one second or more is always instantaneous.

If the Shunt Trip is *continuously* energized, the first trip after control voltage is applied is instantaneous, following which the Shunt Trip continues a slow, repetitive sequence of trip commands. For catalog numbers SAST1, SAST2, SAST3, SAST4, and SAST6, these ongoing trips are approximately 2 seconds apart, so that it could take 1–2 seconds to trip a breaker that is reclosed. For catalog number SAST5, the continuing trip commands after the initial instantaneous trip are less than 100 millisecond apart.

*If the Shunt Trip must be continuously energized and a trip time of several seconds after reclose of the breaker is not acceptable, use Bell alarm in series with control power for SE150 and SF250 frames and Auxiliary switch for SG600 and SK1200. See GEH-5593 for detailed Auxiliary and Bell alarm switches installation instructions.*

Table 1 lists the electrical specifications of the available Shunt Trip models. Catalog numbers SAST1, SAST2, SAST3, and SAST4 only are suitable for use with ground-fault sensing and relaying equipment. Catalog numbers SAST5 and SAST6 should *not* be used with ground-fault sensing and relaying equipment. Maximum VA is 100. Ac devices are rated for 50–400 Hz and are UL listed for 50–60 Hz.

Shunt Trip Cat. No.	Voltage*		Current (mA)	
	ac	dc	Inrush	Cont
SAST1	120	125	500	6.0
SAST2	240	250	400	5.0
SAST3	24	24	300	10.0
SAST4	48	48	300	10.0
SAST5	—	12	1000	800
SAST6	480	—	500	10.0

\* Maximum permissible voltage is 110% of rated for ac, 125% for dc.

Table 1. Shunt Trip electrical specifications.

#### Undervoltage Release (Blue Wires)

The Undervoltage Release accessory trips the circuit breaker whenever the control voltage to the accessory drops to 35–70% or less of the rated voltage. The Undervoltage Release leads are blue and are marked D1 and D2. The device is not sensitive to the polarity applied to the leads.

Table 2 lists the electrical specifications of the available Undervoltage Release models. Ac devices are rated for 50–400 Hz and are UL listed for 50–60 Hz.

Undervoltage Cat. No.	Voltage*		Peak
	ac	dc	Current (mA)
SAUV1	120	125	200
SAUV2	240	250	200
SAUV3	24	24	100
SAUV4	48	48	100

\* Maximum permissible voltage is 110% of rated for ac, 125% for dc.

Table 2. Undervoltage Release electrical specifications.

## Installation in SE, SF, and SG Frame Breakers

**WARNING:** Danger of electrical shock or injury. Turn OFF power ahead of the circuit breaker before installing accessories. Do not remove circuit protective devices until the power is turned OFF.

### Step 1. Trip the Breaker

Trip the circuit breaker by activating the red trip button on the front of the breaker as illustrated in Figure 1.

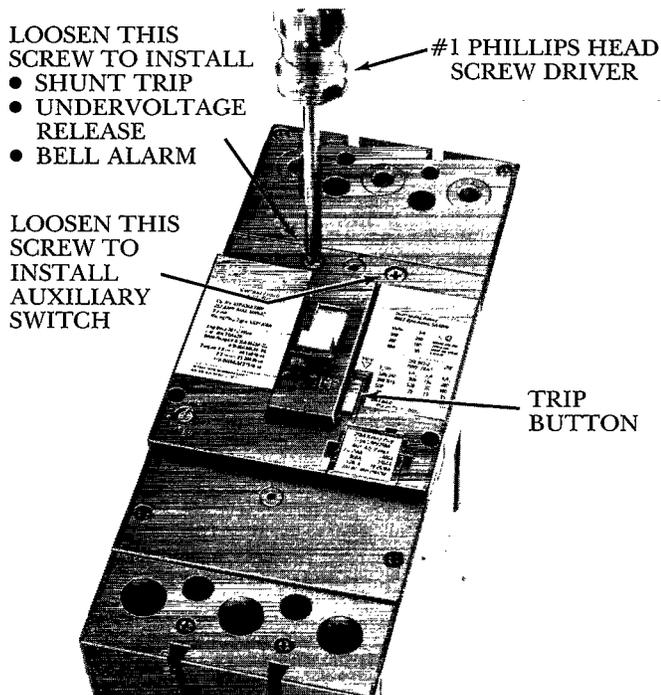


Figure 1. Front of breaker, showing trip button and left-side accessory compartment cover screw

### Step 2. Expose Accessory Compartment

Loosen, but do not completely remove, the single captive screw at the top of the left-side breaker accessory cover, as shown in Figure 1. Rotate the accessory cover downward to expose the accessory compartment built into the left side of the breaker cover.

If there is an accessory already installed in this compartment, it must be removed before the new accessory can be installed.

**NOTE:** The Shunt Trip or Undervoltage Release accessory must be installed in the compartment on the left side of the circuit breaker cover.

### Step 3. Removing Device Previously Installed in Left-Side Compartment

Remove the Philips-head accessory-mounting screw in the recessed area in the lower-right corner of the accessory, as illustrated in Figure 2.

- If there are no wires exiting the left side of the breaker – Take hold of the accessory removal tab with pliers and, with a gentle rocking motion, pull upward until the accessory is released. The removal tab is located just above the accessory mounting screw, as shown in Figure 2.

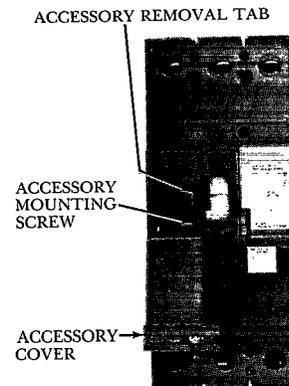


Figure 2. Accessory mounting screw and removal tab in accessory compartment.

- If there are wires exiting the left side of the breaker – Push upward and inward on the wires while simultaneously pulling upward on the accessory removal tab. Use a gentle rocking motion until the device is released.

It may be desirable to label and save the removed device.

### Step 4. Installing the New Accessory

Orient the accessory with the lead wires to the left, the wide part of the device at the top, and the accessory mounting screw aligned with its mating hole in the cover. The mounting screw is held captive in the mounting tab of the new accessory.

**CAUTION:** Do not install an accessory in a breaker with a stripped accessory mounting hole. If the mounting hole is stripped, proper seating of the accessory may be impossible, which may result in improper operation of the accessory.

Feed the accessory lead wires through the large vertical slot in the breaker cover so that the leads exit at the left side of the breaker, as shown in Figure 3. The lead wires must be oriented side by side as they exit the accessory module and must be fed into the slot in the breaker cover in the same way. If the wires are allowed to cross, they will not fit properly in the slot and the

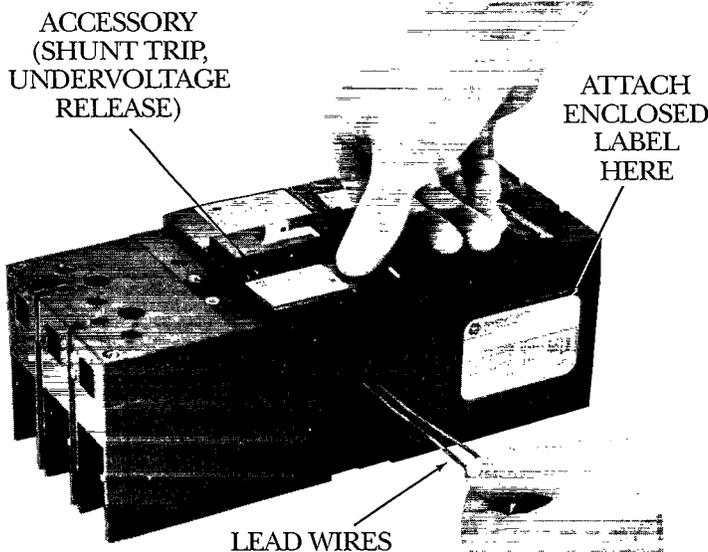


Figure 3. Accessory lead wires exiting the side of the breaker.

accessory can not be properly seated. If you have difficulty, remove the accessory and start again.

### Step 5. Seating the Accessory

With the lead wires started in the vertical slot, gently push down on the top of the accessory, while simultaneously pulling gently on the lead wires where they exit the breaker. Firmly seat the accessory with a rocking motion.

### Step 6. Tighten the Mounting Screw

Fasten the accessory to the breaker cover by tightening the accessory mounting screw, shown in Figure 2, to 7-10 in-lb. Do not overtighten this screw.

### Step 7. Secure the Accessory Cover

Rotate the breaker accessory cover upward and check to see that the cover lies flat over the accessory without bulging. If there is a bulge, the accessory is not seated properly (refer to Step 5). Tighten the accessory cover screw to a maximum of 7 in-lb. Do not overtighten this screw.

### Step 8. Attach the New Rating Label

Attach the rating label supplied with the new accessory to the left side of the circuit breaker, adjacent to the wire trough, as shown in Figure 3. It is a UL requirement that this label be properly displayed, to provide the electrical ratings and the proper identification and connection of the accessory.

## Step 9. Trip Confirmation Test

**CAUTION:** Accessory installation is not complete without the following functional tests. Each test must be successfully completed at least twice before reconnecting the circuit breaker.

- *Shunt Trip* – Close the circuit breaker and then energize the two black Shunt Trip leads with the rated voltage. The circuit breaker must trip immediately.
- *Undervoltage Release* – Energize the two blue Undervoltage Release leads with the rated voltage, then close the circuit breaker. Remove the voltage from the blue leads, or reduce it to less than 35% of the rated voltage. The circuit breaker must trip immediately.

If the circuit breaker fails the trip test, remove the test voltage and de-energize the circuit breaker. Carefully remove the accessory and reinstall it, following the installation instructions. Be sure that the accessory is fully seated in the accessory compartment without forcing. Repeat the appropriate test.

If the trip confirmation test is not successful, do not reconnect the circuit breaker. Contact your local GE distributor or GE sales office for further advice.

## Installation in SK Frame Breakers

**WARNING:** Danger of electrical shock or injury. Turn OFF power ahead of the circuit breaker before installing accessories. Do not remove circuit protective devices until the power is turned OFF.

### Step 1. Trip the Breaker

Trip the circuit breaker by depressing the Push-To-Trip button, as shown in Figure 4.

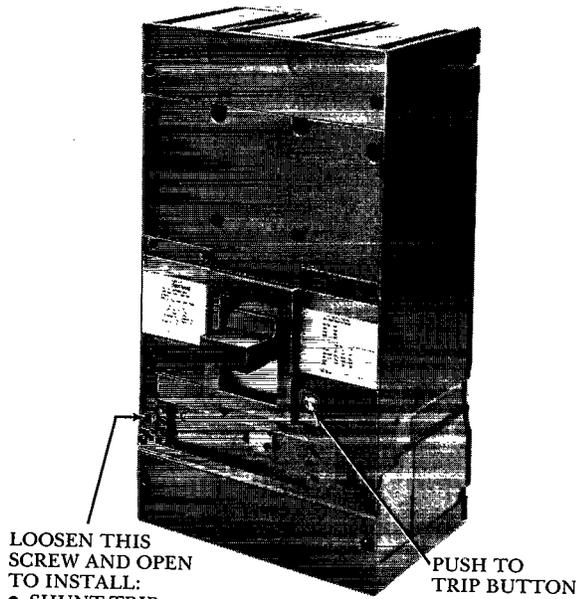
### Step 2. Expose the Accessory Compartment

Loosen the captive screw on the accessory cover on the left side of the breaker and rotate the cover until it is fully open. If there is an accessory already installed in this compartment, it must be removed before the new accessory can be installed.

**NOTE:** The Shunt Trip or Undervoltage Release accessory must be installed in the compartment on the left side of the circuit breaker cover.

### Step 3. Removing Device Previously Installed in Left-Side Compartment

Remove the Phillips-head accessory-mounting screw in the recessed area in the lower-right corner of the accessory, as illustrated in Figure 5.



LOOSEN THIS SCREW AND OPEN TO INSTALL:  
 • SHUNT TRIP  
 • UNDERVOLTAGE RELEASE

PUSH TO TRIP BUTTON

Figure 4. Front of SK Frame circuit breaker.

- If there are no wires exiting the left side of the breaker – Take hold of the accessory removal tab with pliers and, with a gentle rocking motion, pull upward until the accessory is released. The removal tab is located just above the accessory mounting screw, as shown in Figure 5.
- If there are wires exiting the left side of the breaker – Push upward and inward on the wires while simultaneously pulling upward on the accessory removal tab. Use a gentle rocking motion until the device is released.

It may be desirable to label and save the removed device.

#### Step 4. Install the New Accessory

Orient the accessory with the lead wires to the left and the wide part of the device at the top. Lower the accessory into the accessory compartment, carefully aligning the two lead wires in the top two of the three wire slots. Route the wires through the exit trough in the cover. Firmly seat the accessory with a gentle rocking motion.

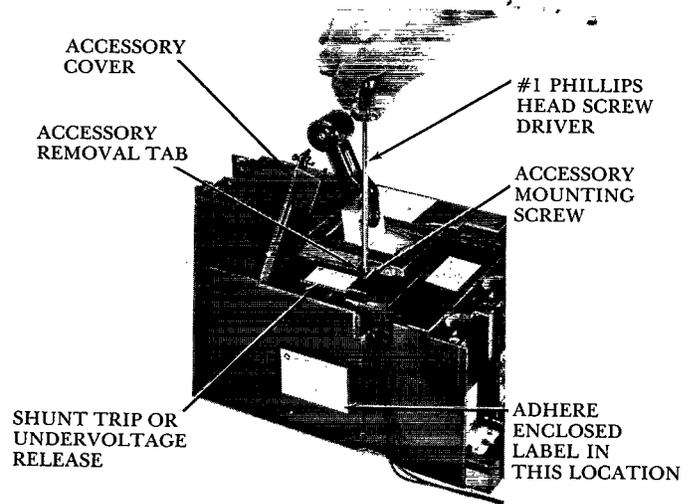


Figure 5. SK Frame accessory mounting compartment.

#### Step 5. Tighten the Mounting Screw

Secure the accessory to the breaker cover by tightening the accessory mounting screw to a maximum of 7 in-lb. Do not overtighten this screw.

#### Step 6. Secure the Accessory Cover

Rotate the accessory cover to the closed position and tighten the cover screw to a maximum of 12 in-lb.

#### Step 7. Attach the New Rating Label

Attach the rating label supplied with the new accessory to the left side of the circuit breaker, adjacent to the wire trough, as shown in Figure 5. It is a UL requirement that this label be properly displayed, to provide the electrical ratings and the proper identification and connection of the accessory.

#### Step 8. Trip Confirmation Test

Follow the procedure for the appropriate trip confirmation test as described in Step 9 of the installation procedure for SE, SF, and SG Frame breakers above.

These instructions do not cover all details or variations in equipment nor do they provide for every possible contingency that may be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise that are not covered sufficiently for the purchaser's purposes, the matter should be referred to the GE Company.



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