

Power Break® II Circuit Breaker Accessories

Shunt Trip and Shunt Trip with Lockout

Introduction

The Shunt Trip and Shunt Trip with Lockout accessories, shown in Figures 1 and 2, can be installed in 800-4000 ampere frame Power Break®II circuit breakers. These accessories allow the breaker to be tripped electrically from a remote location.

In addition to providing a trip signal to the breaker, the Shunt Trip accessories can be set up to interact with other Power Break II accessories, when used with a MicroVersaTrip Plus™ or MicroVersaTrip PM™ Trip Unit. DIP switches on the rear of the breaker Trip Unit can configure the Shunt Trip accessories to activate a Bell Alarm-Alarm Only accessory or a Bell Alarm with Lockout accessory when a shunt trip occurs. The Accessory Configuration section below describes how this can be done. If the breaker is equipped with a Power+™ Trip Unit, it is configured so that only protection trips will activate a Bell Alarm-Alarm Only or Bell Alarm with Lockout.

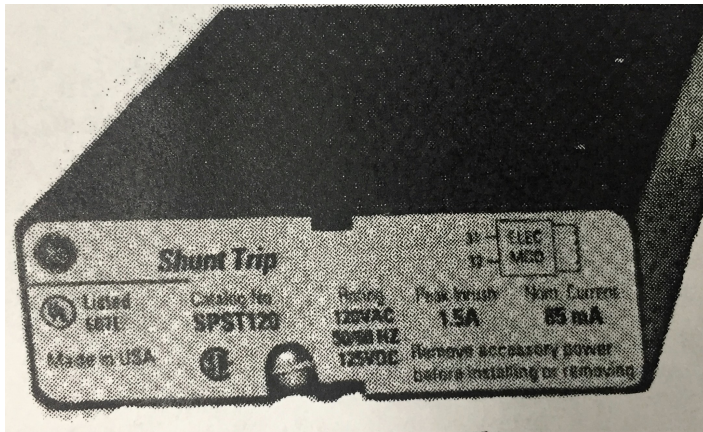


Figure 1. Shunt Trip.

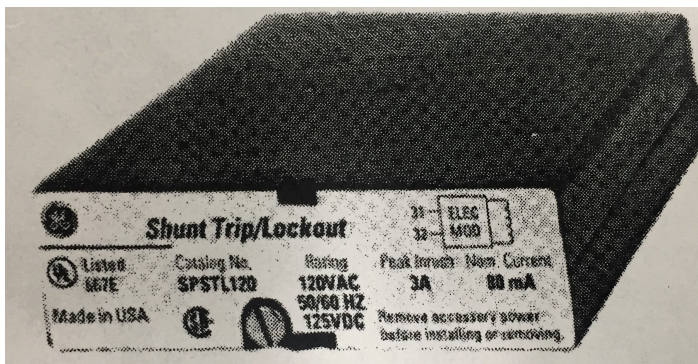


Figure 2. Shunt Trip with Lockout.

The catalog numbers for various voltage applications are listed in Table 1 for the Shunt Trip and in Table 2 for the Shunt Trip with Lockout.

Catalog Number	Voltage Rating (1)	Peak Inrush Current, A (2)	Nominal RMS Current, mA
SPST012	12 Vdc	3.0	200
SPST024	24 Vac 24 Vdc	1.5	140
SPST048	48 Vac 48 Vdc	1.5	110
SPST120	120 Vac 125 Vdc	1.5	85
SPST208	208 Vac	1.5	50
SPST240	240 Vac 250 Vdc	1.5	40

(1) 24-240 Vac devices are rated for 50/60 Hz.

(2) Peak inrush current is present for 2-6 ms after activation. This number is provided so that fuses and supplies can be chosen appropriately.

Table 1. Catalog numbers and voltages for the Shunt Trip.

Catalog Number	Voltage Rating (1)	Peak Inrush Current, A (2)	Nominal RMS Current, mA
SPSTL012	12 Vdc	19	300
SPSTL024	24 Vac 24 Vdc	15	300
SPSTL048	48 Vac 48 Vdc	7.5	200
SPSTL120	120 Vac 125 Vdc	3.0	80
SPSTL208	208 Vac	1.9	60
SPSTL240	240 Vac 250 Vdc	1.5	45

Table 2 Catalog numbers and voltages for the Shunt Trip with Lockout.

Operation

Apply control voltage to terminals 31 and 32 of the terminal strip on the right side of the breaker to trip the circuit breaker. The Shunt Trip will cause the circuit breaker to trip when the control voltage is greater than 75% of the rated dc voltage or 55% of the rated ac voltage. Control power to the Shunt Trip must be removed before the breaker can be closed. Control power to the Shunt Trip with Lockout must be removed for a minimum of 0.25 second before the breaker can be closed.

Installation

WARNING: Before installing any accessories, turn the breaker off, disconnect it from all voltage sources, and discharge the charging springs.

AVERTISSEMENT: Avant d'installer tout accessoire, mettre le disjoncteur en position OFF, le déconnecter de toute tension d'alimentation, et décharger les ressorts d'armement.

WARNING: For Shunt Trip operation using Entelliguard Trip Units: If a shunt trip device is used, the breaker can be closed normally after trip, even if the shunt trip is continuously energized. For the "Shunt Trip w/Lockout" device, power must be removed from the "Shunt Trip w/lockout" device in order to close the breaker.

AVERTISSEMENT: Pour l'opération du déclencheur shunt du déclencheur Entelliguard: Si un déclencheur shunt est utilisé, le disjoncteur peut être fermé d'une façon normale suite au déclenchement même si le déclencheur shunt est énergisé continuellement. Pour un déclencheur shunt muni d'un verrouillage (lockout), l'alimentation doit être enlevée du déclencheur shunt avant de procéder à la fermeture du disjoncteur.

The Shunt Trip accessory is installed in the accessory compartment through the front of the circuit breaker in the position shown in Figure 3.

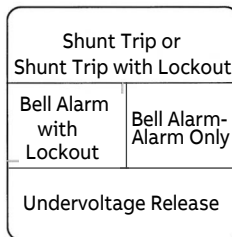


Figure 3. Accessories compartment on the front of the circuit breaker, with the Shunt Trip slot indicated

Use the following procedure to install the Shunt Trip accessory into the Shunt Trip slot of the accessory compartment:

1. Open the hinged door over the accessory compartment and Trip Unit.
2. To remove an existing accessory, loosen the accessory locking screw and pull the module out with the Rating Plug Removal Tool (catalog number TRTOOL).
3. Insert the Shunt Trip accessory into the proper slot, as illustrated in Figure 4. The Shunt Trip accessory is keyed for the correct slot in the accessory compartment. If the accessory cannot be fully seated in the compartment, check that the compartment position is correct.

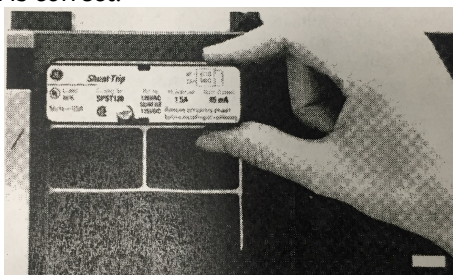


Figure 4. Inserting a Shunt Trip into the accessory compartment.

4. Tighten the locking screw on the front of the accessory until it is snug (9 in-lb).

CAUTION: Over tightening the locking screw may damage or distort the case of the accessory.

ATTENTION: Le serrage excessif de la vis de verrouillage peut déformer le boîtier d'accessoire.

5. If the breaker is equipped with a MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit, the Shunt Trip accessory can be configured to activate installed Bell Alarm-Alarm Only or Bell Alarm with Lockout accessories when a shunt trip occurs, with the procedure described in the Accessory Configuration section.
6. Connect the control wiring for either Shunt Trip to terminals 31 and 32 at the terminal block on the right side of the breaker.
7. Test to ensure proper operation, according to the procedures below.
8. Reconnect power to the circuit breaker and any other accessories.
9. Close and lock or seal the door over the accessory compartment and Trip Unit to prevent unauthorized changes to Trip Unit settings and to keep contaminants out of empty accessory slots.

Accessory Configuration

This section only applies if Bell Alarm-Alarm Only or Bell Alarm with Lockout accessories are installed in the breaker, along with a MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit. If the breaker is equipped with a Power+ Trip Unit, the factory default settings, listed in Table 3, can not be changed.

The Shunt Trip accessory can be configured to activate the Bell Alarm-Alarm Only or Bell Alarm with Lockout accessories if a shunt trip occurs. The configuration can be changed by removing the Trip Unit from the breaker, setting the DIP switches on the rear of the Trip Unit, and reinstalling the Trip Unit. Figure 5 illustrates the Trip Unit rear DIP switches and their functions. Table 3 lists the switch functions and the factory settings for each.

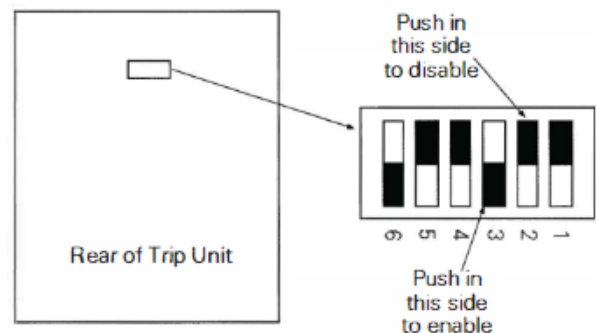


Figure 5 Accessory switch on the rear of the MicroVersaTrip Plus™ or Micro Versa Trip PM™ Trip Unit, showing the factory settings (solid part indicates that the switch is pushed in on that side)

Switch	Factory Setting	Function
1	Disabled	Shunt trip activates Bell Alarm- Alarm Only
2	Disabled	UVR trip activates Bell Alarm-Alarm Only
3	Enabled	Protection trip activates Bell Alarm Alarm Only
4	Disabled	Shunt trip activates Bell Alarm with Lockout
5	Disabled	UVR trip activates Bell Alarm with Lockout
6	Enabled	Protection trip activates Bell Alarm with Lockout

Table 3. Accessory switch settings, including factory defaults.

Description of Switch Settings

Following are descriptions of the effects of each accessory switch when it is enabled.

1. When a Shunt Trip accessory causes the breaker to trip, the contacts of the Bell Alarm-Alarm Only also change state. (The factory switch setting is disabled.)
2. When an Under voltage Release accessory causes the breaker to trip, the contacts of the Bell Alarm-Alarm Only also change state. (The factory switch setting is disabled.)
3. When a protection trip (long-time, short-time, instantaneous, ground-fault, or protective-relay) occurs, the contacts of the Bell Alarm-Alarm Only also change state. (The factory switch setting is enabled.)
4. When a Shunt Trip accessory causes the breaker to trip, the contacts of the Bell Alarm with Lockout also change state. (The factory switch setting is disabled.)
5. When an Under voltage Release accessory causes the breaker to trip, the contacts of the Bell Alarm with Lockout also change state. (The factory switch setting is disabled.)
6. When a protection trip (long-time, short-time, instantaneous, ground-fault, or protective-relay) occurs, the contacts of the Bell Alarm with Lockout also change state. (The factory switch setting is enabled.)

Procedure for Changing Switch Settings

Change the accessory switch settings with the following procedure:

WARNING: Before beginning this procedure, turn the breaker off, disconnect it from all voltage sources, and discharge the closing springs.

AVERTISSEMENT: Avant de commencer cette procédure, mettre le disjoncteur en position OFF, le déconnecter de toute tension d'alimentation, et désarmer les ressorts de fermeture.

1. Loosen the four #8-32 screws on the breaker trim-plate assembly and remove the trim plate.

2. Loosen the four #10-32 screws at the corner of the breaker cover.
3. Remove the cover from the breaker face.
4. Pull the Trip Unit locking lever to the right, then hold the Trip Unit near the battery cover and lift it straight out of the breaker.
5. Refer to Figure 5 and Table 3 to determine the switches to be changed. Push in the appropriate "Enable" or "Disable" side of the switch.
6. Confirm all switch settings before reinstalling the Trip Unit in the breaker.
7. Pull the Trip Unit locking lever to the right. While holding the lever, carefully align the connector on the rear of the Trip Unit with the connector in the breaker. Press down on the Trip Unit, while holding it near the battery cover. When the Trip Unit is fully seated, slide the locking lever back to the left.
8. Reinstall the breaker top cover and tighten the four #10-32 screws to 32 in-lb.
9. Replace the trim plate and tighten the four #8-32 screws to 20 in-lb.
10. Verify that the switch settings are correct by inducing breaker trips from the Shunt Trip and Undervoltage Release (if present) and checking the responses of the Bell Alarm-Alarm Only and Bell Alarm with Lockout accessories.

Test the Shunt Trip for proper operation with the following procedure.

1. Turn off the power to the Shunt Trip.
2. Close the breaker contacts.
3. Apply at least 55% of the rated ac voltage or at least 75% of the rated dc voltage to the Shunt Trip; the breaker should trip immediately.
4. If a Bell Alarm-Alarm Only or Bell Alarm with Lockout is present, ensure that it activates (or does not activate) as selected by the MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit.

If a Shunt Trip with Lockout has been installed, continue with the following steps:

5. After the breaker has tripped and with the power still applied to the Shunt Trip with Lockout, attempt to close the breaker. The breaker should not close nor attempt to close.
6. If a MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit is installed, check that the Trip Unit display is active (powered).
7. Remove power from the Shunt Trip with Lockout.
8. Attempt to close the breaker; it should close as normal.

Trouble-Shooting

The following guide is provided for troubleshooting and isolating common problems. It does not cover every possible situation. Contact the Customer Support Center at 800-843-3742 if any problem is not resolved by these procedures.

Symptom	Possible Cause	Corrective Action
1. The Shunt Trip will not insert completely into the breaker.	The accessory is inserted incorrectly.	Ensure that the accessory is inserted in the correct slot, as in Figure 3, and that the label is upright.
2. The breaker will not trip when control power is applied to the Shunt Trip.	The Shunt Trip is not energized.	Check that Shunt Trip control power is applied at greater than 75% of the rated dc voltage or 55% of the rated ac voltage. Check that the accessory is completely inserted; reinsert if necessary. If a 12 Vdc Shunt Trip is installed, check that the polarity of the control power matches that shown on the label of the Shunt Trip accessory.
	The installed Shunt Trip has an incorrect voltage rating.	Check for the proper voltage rating on the Shunt Trip.
	The Shunt Trip connection is poor.	Check that the Shunt Trip accessory is completely inserted. Check that the Trip Unit is seated correctly. If the Trip Unit was removed to set the switches, check that it has been correctly installed; remove and reinstall, if necessary. Note that an otherwise unpowered Trip Unit is powered up by an energized Shunt Trip. Verify that the breaker is closed.
	The breaker is not closed.	
3. The breaker closes manually when the Shunt Trip with Lockout is energized.	The Shunt Trip with Lockout solenoid is not energized.	Check that the Shunt Trip with Lockout control power is applied at greater than 75% of the rated dc voltage or 55% of the rated ac voltage. Check that the accessory is completely inserted; re-insert if necessary. Note that an otherwise unpowered Trip Unit is powered by an energized Shunt Trip accessory.
	The Shunt Trip with Lockout control power connection is poor.	Check that the Shunt Trip with Lockout accessory is completely inserted.
4. The breaker will not close manually when the Shunt Trip or Shunt Trip with Lockout control power is removed.	The Shunt Trip or Shunt Trip with Lockout control power is actually still applied.	Check that control power to the Shunt Trip or Shunt Trip with Lockout has been removed.
	The breaker is already closed.	Check that the breaker is not closed; if so, open it and try again.
	The Shunt Trip with Lockout plunger is not retracted.	Remove the Shunt Trip with Lockout accessory. If the lockout plunger protrudes out of the accessory, replace the accessory. If the plunger does not protrude, reinsert the accessory, ensuring proper alignment of the accessory in the pocket.
5. The breaker fails to close after power is removed from the Shunt Trip with Lockout.	Control power was not removed for a minimum of 0.25 second.	Wait at least 0.25 seconds before closing the breaker after removing control power from the Shunt Trip with Lockout.