

GEH-700 Installation Instructions

Spectra® RMS SG Frame Molded-Case Circuit Breaker

With *microEntelliGuard*™ Trip Units

Introduction

Spectra® RMS molded-case circuit breakers with *microEntelliGuard*™ trip units provide adjustable overload and short-circuit protection for electrical equipment. Frame types SGHC, SGLC, SGPC, SGHH, SGLL, and SGPP are available with a selection of rating plugs to a maximum of 600 amperes, depending on the sensor rating.

SG Frame circuit breakers are listed per Underwriters Laboratories standard UL489 and Canadian Standards Association standard CSA22.2 No.5 and meet the requirements of the International Electrotechnical Commission standard IEC947-2.

WARNING: Danger of electrical shock or injury. Turn OFF the power ahead of equipment before installing this device or removing any other device.

IMPORTANT: Danger d'électrocution. Couper l'alimentation avant d'installer cet appareil ou avant de retirer un autre appareil.

CAUTION: This product is NOT suitable for use in equipment not specifically designed to accept it. Contact the equipment manufacturer for possible equipment modifications.

IMPORTANT: Cet appareil ne doit pas être employé dans un équipement qui n'est pas spécialement adapté à cet effet. Contactez le fabricant concernant les possibles modifications à apporter à l'équipement.



SG 600 amp Frame breaker with *microEntelliGuard*™ Trip Unit

Assembly

1. Unpack the circuit breaker and inspect it for any shipping damage. Ensure that the breaker has the proper ampere range, sensor rating, voltage rating, and interruption rating for the application. Since this breaker is available in a wide variety of configurations, compare the catalog number of your purchased breaker with the catalog number key in Table 1. Installation of an incorrect breaker could result in misapplication, lack of system coordination, or reduction in system functionality.

Code	Description	Function
SG	SG600	Frame Designation
HC	35kA at 480Vac	Standard UL Rating
LC	65kA at 480Vac	
PC	100kA at 480 Vac	
HH	35kA at 480Vac	100% Continuous UL Rating
LL	65kA at 480Vac	
PP	100kA at 480 Vac	
3, 6	3 Poles, 600Vac	Poles, Max UL Voltage
01	150 Amps	Max Amps
04	400 Amps	
06	600 Amps	
L3	LSI	Standard Protection Functions
L4	LSIG	
L5	LSIA	
L7	LSI-CP	
X	None	Advanced Protection Functions
K	Neutral Protection	
Z	ZSI (ST/GF)	
T	ZSI (ST/GF/INST)	
R	RELT	
L	ZSI (ST/GF) + RELT	
M	ZSI (ST/GF) + Neutral Protection	
N	ZSI (ST/GF) + RELT + Neutral Protection	
V	RELT + Neutral Protection	
P	ZSI (ST/GF/INST) + RELT	
S	ZSI (ST/GF/INST) + Neutral Protection	
W	ZSI (ST/GF/INST) + RELT + Neutral Protection	
X	Metering (Basic)	Advanced Features & Communications
2	Metering (Basic) + Modbus	
6	Metering (Adv) + Modbus + Waveform Capture	
8	Metering (Adv) + Modbus + Waveform Capture + Protective Relays	

Table 1. Catalog numbering system for Spectra RMS™ SG Frame breakers with *microEntelliGuard™* trip units

Example – a breaker with catalog number SGPC3604L4R6 has the following features:

- 1 SG600 frame (SG)
 - 2 100 kA at 480 Vac Standard UL rating (PC)
 - 3 3 pole, 600 Vac maximum (36)
 - 4 400 A sensors (04)
 - 5 Long-time, Short-time, Instantaneous and Ground Fault functions (L4)
 - 6 RELT – Reduced Energy Let-Through (R)
 - 7 Advance Metering, Modbus Communications, and Waveform Capture (6)
2. Following the instructions supplied with the rating plug, install the plug into the breaker body. Available rating plugs, with their catalog numbers, are listed in Table 2.

Table 2. SG Frame Rating Plugs

Catalog Numbers	Trip Amps	SG (Max Amps)		
		150	400	600
GTP0060U0101	60	x		
GTP0080U0101	80	x		
GTP0100U0103	100	x		
GTP0125U0103	125	x		
GTP0150U0104	150	x	x	
GTP0200U0204	200		x	
GTP0225U0306	225		x	x
GTP0250U0407	250		x	x
GTP0300U0408	300		x	x
GTP0350U0408	350		x	x
GTP0400U0410	400		x	x
GTP0450U0612	450			x
GTP0500U0613	500			x
GTP0600U0616	600			x

3. Install any internal accessories, following the instructions supplied with each accessory. Available accessories and their mounting locations are listed in Table 3. Check all accessories for proper installation and wire routing. Verify breaker operation with the installed accessories. Accessory leads can be routed along the side of the breaker and across the back. An auxiliary switch is required for the breaker status signal.

Table 3. Internal Accessories

Internal Accessory	Maximum Number of Accessories	Accessory Installation Location
Auxiliary Switch (SPDT or DPDT)	1	Right
Bell Alarm Switch	1	Left
Shunt Trip or Undervoltage Release	1	Left

4. Attach the terminal lugs, listed in Table 4, following the instructions supplied with the lug kit. Use one kit for either line or load end; two kits are required for both.

Table 4. Available Lug Kits

Catalog Number	Description	Wire Type	Lug Material
TCLK265	2 Pole Lug Kit	Cu/Al	Tin-plated Aluminum
TCLK365	3 Pole Lug Kit		
TCOK265	2 Pole Lug Kit	Cu only	Tin-plated Copper
TCOK365	3 Pole Lug Kit		

5. Ensure that all terminals are torqued to the proper value, as listed in the lug kit instruction sheet. Install the terminal covers, ensuring that they are firmly seated.

NOTE: Aluminum wire must be used with a joint compound recommended by the wire manufacturer.

IMPORTANT: Si un cable en aluminium est employé, utilisez le lubrifiant recommandé par le fabricant.

WARNING: It is important that the terminal covers are installed correctly to ensure proper circuit breaker operation.

IMPORTANT: Il est important de vérifier que tous couvercles ou caches de protection sont correctement installés afin d'assurer le bon fonctionnement de l'appareil.

6. Finally, connect all associated components that are required for the breaker to function properly, using the instructions supplied with each component. The following is a list of available associated components:
 - Terminal board connector
 - Neutral current sensor connector
 - Control power connector
 - Extension cable
 - Control power module (control power transformer may be required)
 - Voltage conditioners (potential transformers may be required)
 - Voltage module
 - Neutral current sensor

Mounting

All Spectra® RMS circuit breakers are suitable for reverse feed and have no line or load markings. Incoming power cables or busbars may be connected to either the upper or lower terminals as required by the application.

WARNING: Danger of electrical shock or injury. Turn OFF the power ahead of equipment before installing this device or removing any other device.

IMPORTANT: Danger de choc électrique ou de blessure. Couper l'alimentation entrant dans l'appareil avant de monter celui-ci ou de démonter d'autres appareils.

For individual front panel mounting:

1. Drill and tap all mounting holes and make any necessary front-panel escutcheon cutouts, as shown in Figure 1.

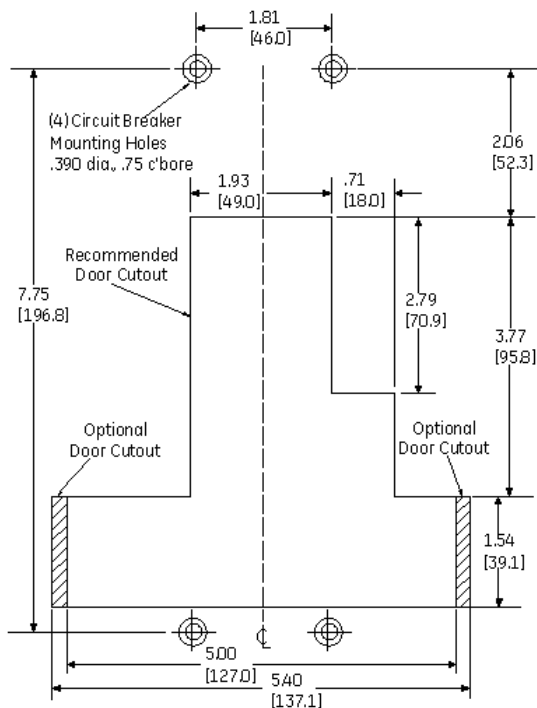


Figure 1. Mounting Hole and Escutcheon Cutout Pattern in/(mm)

2. Mount the breaker with the hardware described in Table 5, following the instructions supplied with the kit.

Table 5. Breaker Mounting Screw Kits

Catalog Number	Application	Kit Description
SFGMSK1	Mounting plate with tapped holes	Four #12-24x3-3/4 screws and lock washers
SFGMSK2	Mounting plate with clearance holes	Four #12-24x4-1/4 screws, nuts, and lock washers

For GE switchboard and panelboard mounting:

Install the breaker into the equipment according to the instructions supplied with the equipment. Available mounting hardware kits are listed in Table 6.

Table 6. Equipment Mounting Hardware Kits

Equipment	Double Branch	Single Branch
Panelboard-Spectra Series	AMC6GBFP	AMC3GMFP
Switchboard – Spectra Series class 1 and 2	AMC6GBFP	AMC3GMFP
Switchboard – AV1, AV2	N/A	N/A
Switchboard – AV3, AV5	N/A	ContactFactory

For individual mounting in a GE enclosure:

Install the breaker according to the instructions supplied with the enclosure. Available enclosures are listed in Table 7 (refer to the BuyLog for other accessories and/or any enclosure limitations).

Table 7. Enclosures

Enclosure Type	400A Catalog No.	600A Catalog No.
NEMA 1 (indoor)	SG400F SG400S	SG600F SG600S
NEMA 3R (outdoor)	SG400R	SG600R
NEMA 12 (oil-tight and dust-tight)	SG400J	SG600J

Setup and Adjustment

The Spectra RMS *micro*EntelliGuard™ trip units are digital, rms sensing, electronic trip units with an LCD and keypad for viewing and/or changing the various function settings. Refer to User’s Manual GEH-702 for detailed information concerning the operation, adjustment, and setting of the breaker trip unit.

You should record the overcurrent protection and protective relay set points for future reference.

NOTE: Trip units as received may have settings that are undesirable for the specific application. Ensure that settings are appropriately adjusted before energizing the breaker.

Operation

The circuit breaker status is indicated by ON/OFF markings, universal I/O symbols, and an indicator window that shows red for ON, yellow for TRIP, and green for OFF. The corresponding handle positions are illustrated in Figure 2. To close the breaker from the OFF position, move the handle to the ON position. To close the breaker from the TRIP position, first move the handle to the OFF (reset) position, and then back to the ON position.

A Push-To-Trip button is provided for convenience in testing the mechanical operation of the breaker.

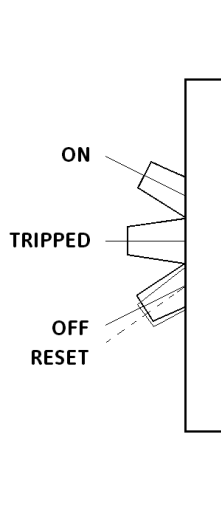


Figure 2. Handle Positions for ON, Tripped, OFF, and RESET

External Accessories

The following external accessories are available for Spectra RMS SK Frame breakers. Catalog numbers and other ordering information for these external accessories may be obtained from your authorized GE distributor.

- Mounting kits
- Plug-in base, bolt-on base
- Back-connected studs
- Padlocking devices
- External Handle operator
- Motor operators
- Mechanical interlock

Maintenance

It is recommended that the following operations be performed annually:

WARNING: Danger of electrical shock or injury. Turn off power ahead of equipment before attempting to service.

IMPORTANT: Danger d'électrocution. Couper l'alimentation avant d'affectuer toute action d'entretien.

1. Turn off the power to the equipment being serviced.
2. Clean the surfaces of the breaker and surrounding area of any dirt, soot, or other debris.
3. Inspect the breaker for any signs of damage.
4. Operate the push-to-trip button and toggle handle several times to exercise the mechanism and test the mechanical operation of the breaker.
5. Check all overcurrent protection and protective relay settings for correct values as established for the system.
6. If any sign of damage is found, or the mechanism has a sluggish or sticky operation, or the trip unit display designates an error status, replace the circuit breaker.

The circuit breaker is sealed and contains no user-serviceable parts. Opening the breaker will void any and all warranties.

Notes

Notes

Spectra and MicroVersaTrip are registered trademarks and EntelliGuard and *microEntelliGuard* are trademarks of the General Electric Company.

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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