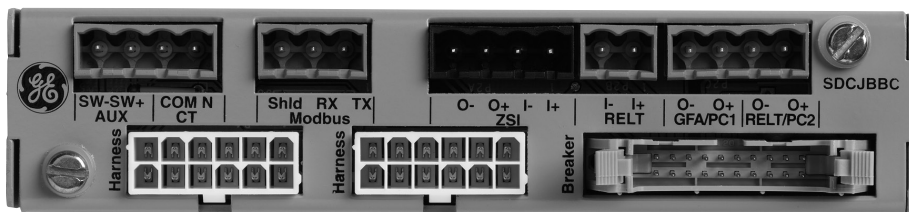


## GEH-704 Installation Instructions

# Advanced Distribution Cable Junction Box

For Spectra® RMS Molded-Case Circuit Breakers  
with Advanced Feature *microEntelliGuard*™ Trip Units

For Catalog Number SDCJBBC  
**UL LISTED** Circuit Breaker Accessory



### Overview

The General Electric Advanced Distribution Cable Junction Box is a modular connector used to provide quick, easy and reliable attachment of Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard*™ Trip Units to the Distribution Cable System. The electronic signals supported by the Advanced Distribution Cable Junction Box appear below.

### Input/output signals to Spectra® RMS Breaker with *microEntelliGuard*™ Trip Unit

- control power (+24vdc)
- control power (common)
- voltage A  $\phi$  (must be from Voltage Module or Voltage Conditioner Plate or Voltage Conditioner Assembly)
- voltage B  $\phi$  (must be from Voltage Module or Voltage Conditioner Plate or Voltage Conditioner Assembly)
- voltage C  $\phi$  (must be from Voltage Module or Voltage Conditioner Plate or Voltage Conditioner Assembly)
- neutral current sensor - black (for equipment ground fault)<sup>1</sup>
- neutral current sensor - white (for equipment ground fault)<sup>1</sup>
- breaker position (via installed aux. switch - red wire)
- breaker position (via installed aux. switch - white wire)
- system communications (Comm +)
- system communications (Comm -)
- zone select interlock (ZSI O -)
- zone select interlock (ZSI O +)
- zone select interlock (ZSI I -)
- zone select interlock (ZSI I +)
- reduced energy let-through (REL I -)
- reduced energy let-through (REL I +)
- ground fault alarm (GFA/PC1 O -)
- ground fault alarm (GFA/PC1 O +)
- reduced energy let-through (REL/PC2 O -)
- reduced energy let-through (REL/PC2 O +)

<sup>1</sup> Neutral current sensor input is required for 3 $\phi$  /4W or 1 $\phi$  /3W systems. For 3 $\phi$  /3W systems, do not make any connections.

Figure 1 shows how the Advanced Distribution Cable Junction Box is used in a typical *microEntelliGuard*™ system.

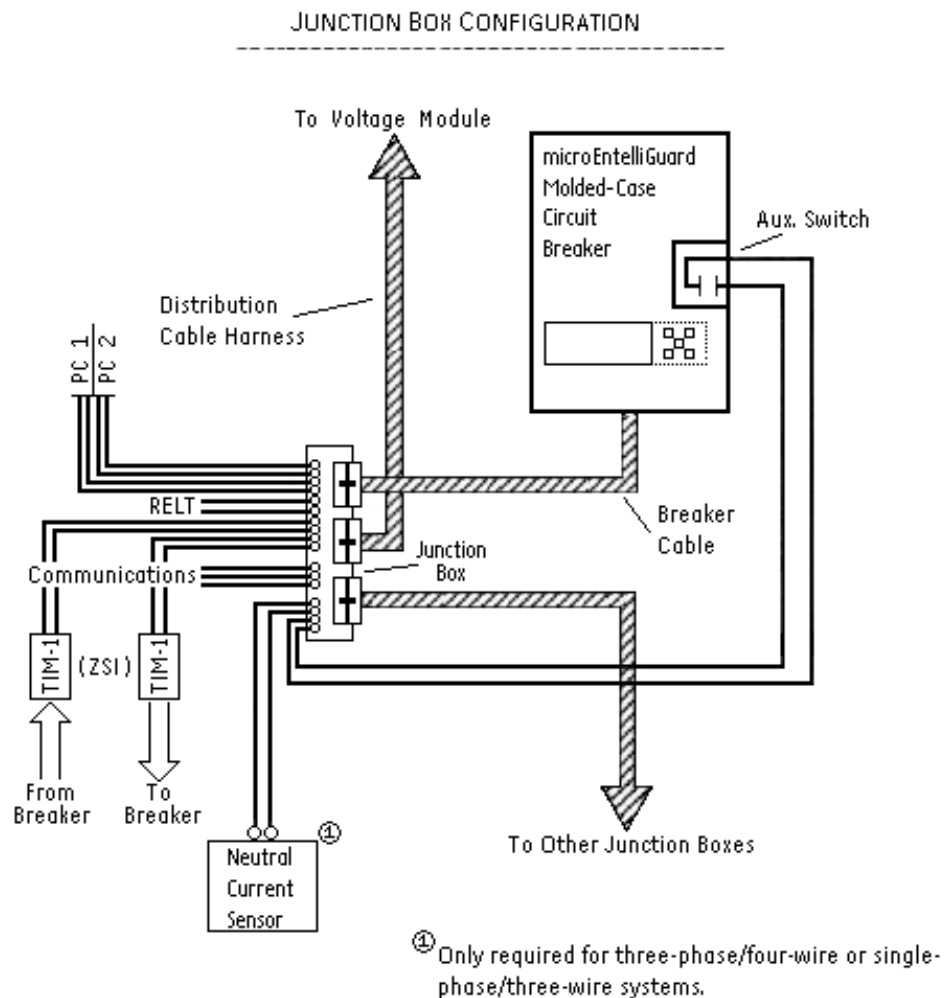


Figure 1. Typical *microEntelliGuard*™ Trip Unit (using 20-pin connector) system.

The Advanced Distribution Cable Junction Box has a 20-pin plug connector on the front face labeled "BREAKER". This connector mates to the 20-pin receptacle connector of the Spectra® RMS Molded-Case Circuit Breaker with a *microEntelliGuard*™ Trip Unit. Figure 2 shows this "BREAKER" input connector pinout for the Advanced Distribution Cable Junction Box.

The Advanced Distribution Cable Junction Box also has two 12-pin plug connectors on the front face labeled "HARNESS". These connectors mate with the 12-pin receptacle connectors of a Distribution Cable Harness (cat. nos. SDCHA11, SDCHA30 or SDCHA60). By connecting to these plugs, the Advanced Distribution Cable Junction Box provides a connection into or out of the Distribution Cable System. Figure 3 shows the "HARNESS" connector pinout for the Advanced Distribution Cable Junction Box.

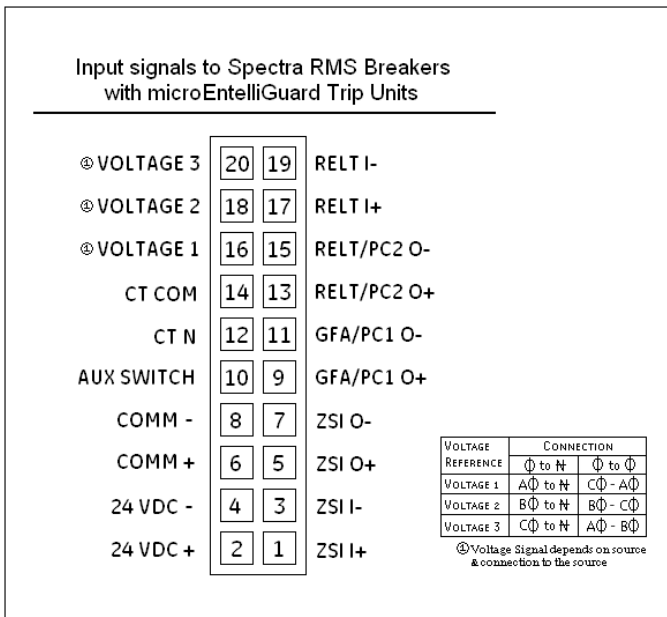


Figure 2. BREAKER input pinout connections for the Advanced Distribution Cable Junction Box.

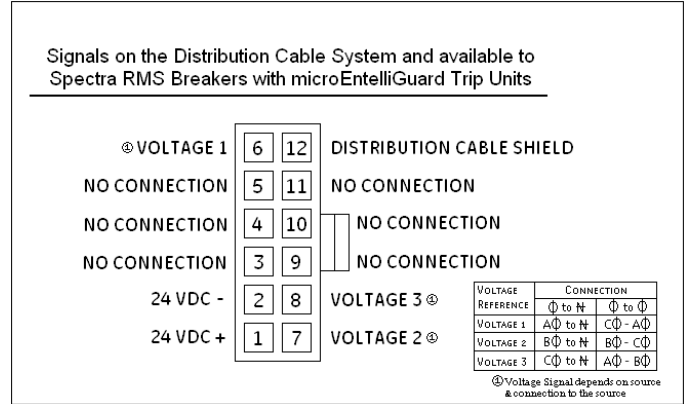


Figure 3. HARNESS pinout connections for the Advanced Distribution Cable Junction Box.

The system is used to carry a variety of electronic signals between Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard*™ Trip Units and Distribution Cable accessories. The electronic signals supported by the Distribution Cable System are as follows.

**Spectra® RMS Breaker with *microEntelliGuard*™ Trip Unit**

- control power (+24vdc;)
- control power (common)
- voltage A φ (must be from Voltage Module or Voltage Conditioner Plate or Voltage Conditioner Assembly)
- voltage B φ (must be from Voltage Module or Voltage Conditioner Plate or Voltage Conditioner Assembly)
- voltage C φ (must be from Voltage Module or Voltage Conditioner Plate or Voltage Conditioner Assembly)

### Dimensions and Wiring Diagrams

An Advanced Distribution Cable Junction Box dimensioned drawing is provided in Figure 4 to assist in mounting the accessory.

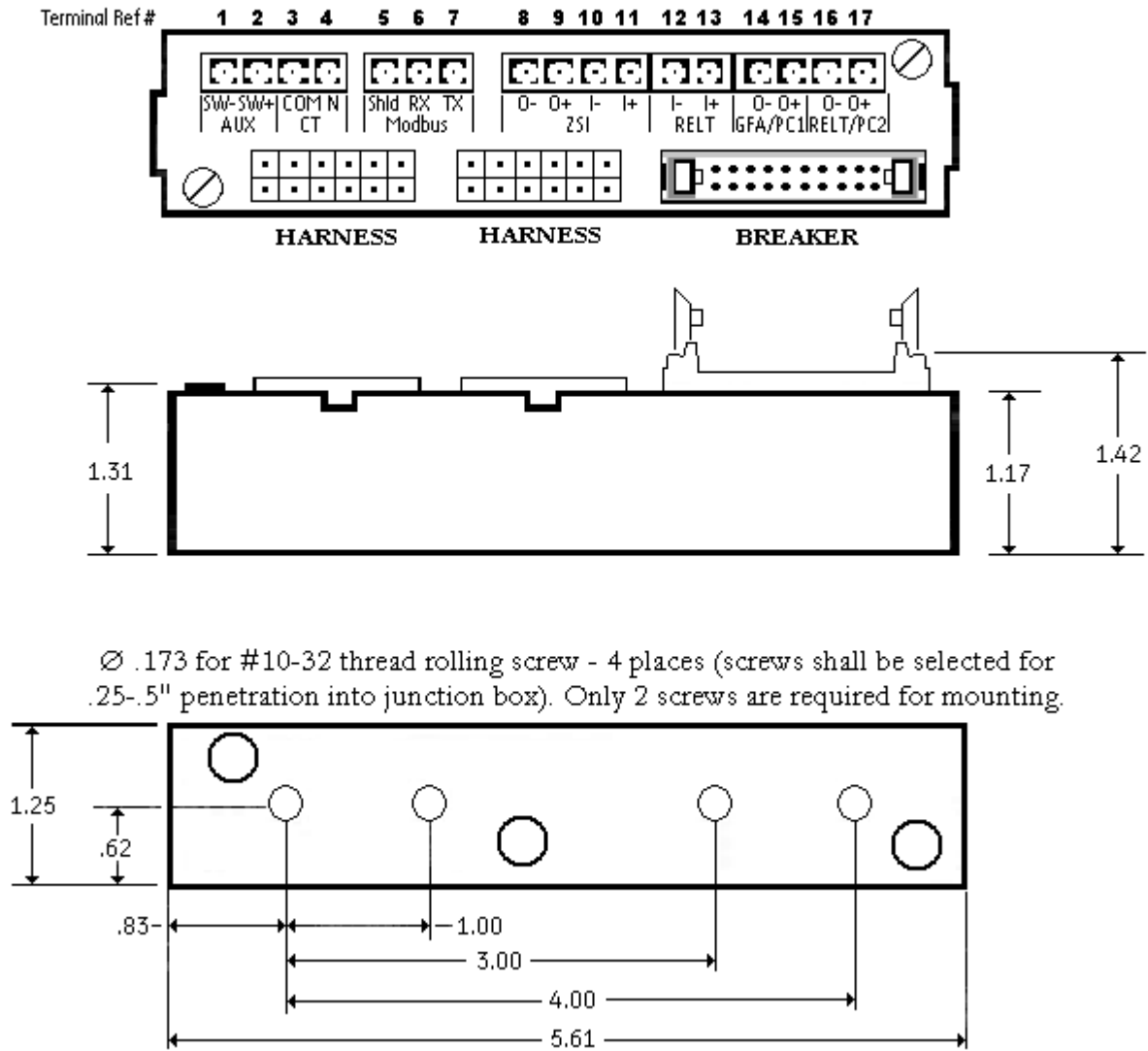


Figure 4. Dimensioned Drawing of the Advanced Distribution Cable Junction Box (dimensions shown in inches).

Figure 5 contains a point-to-point wiring diagram for an Advanced Distribution Cable Junction Box connected to a Spectra® RMS Molded-Case Circuit Breaker with a *microEntelliGuard*™ Trip Unit.

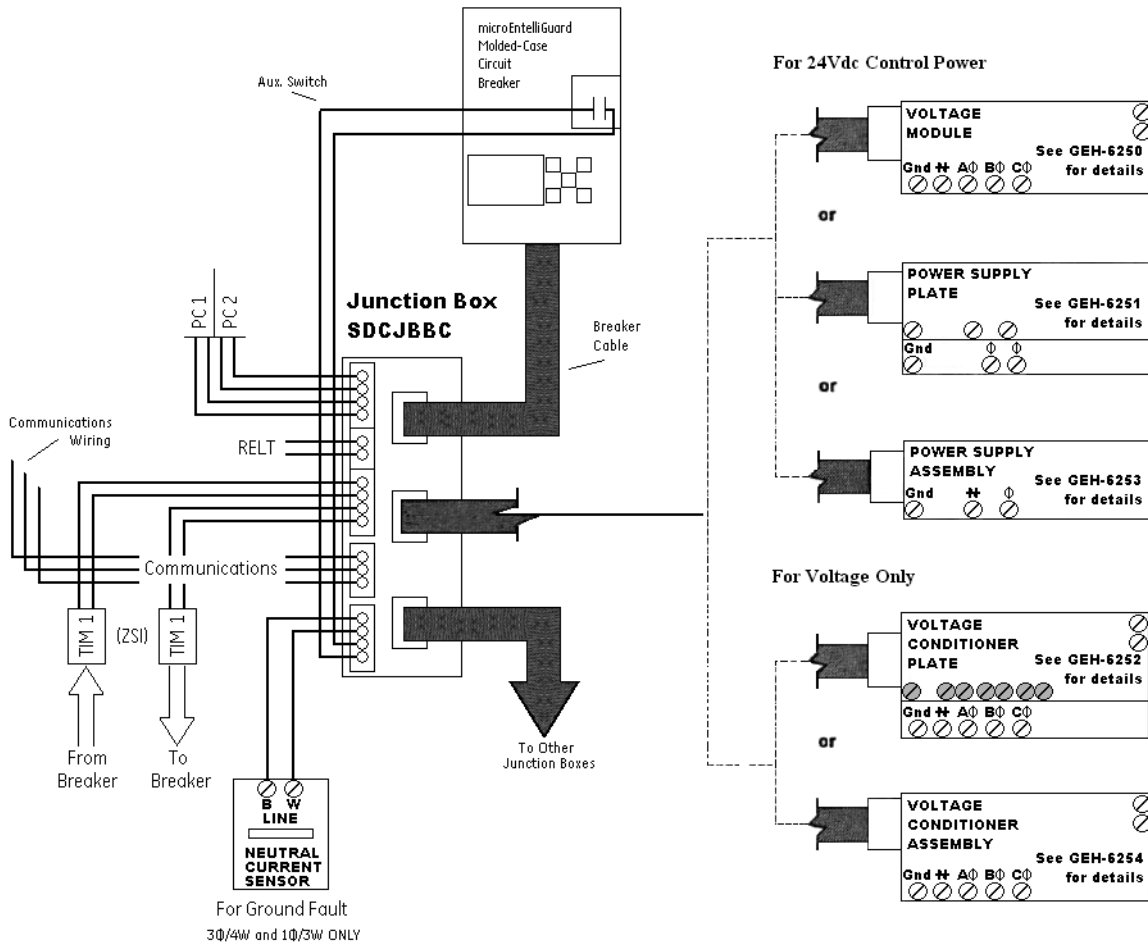


Figure 5. Wiring and power connections to the Advanced Distribution Cable Junction Box for a Spectra® RMS breaker with a *microEntelliGuard*™ Trip Unit.

### Connections

The Advanced Distribution Cable Junction Box has five additional connectors, which are labeled by function for clarity. The four-pin receptacle is used for the connection of a neutral current sensor signal (2 pins) and an auxiliary switch signal (2 pins) into the breaker. The three-pin terminal block is for the communication wiring. The black four-pin terminal is used for the input and output connections for zone selective interlock (ZSI), the two-pin connector is used for the input of reduced energy let-through (RELT) wiring, and the last four-pin receptacle is used for ground fault alarm (GFA) and RELT output connections.

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**Note:** If the Spectra® RMS Molded-Case Circuit Breaker with a *microEntelliGuard*™ Trip Unit has the ground fault option AND is connected to either a three phase/ four wire system or single phase/three wire system, then a neutral input is required for the circuit breaker to function properly. A Neutral CT is also required for Trip Units optioned with neutral protection.

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The connectors are a .200" on-center European Style receptacle such that stripped wire (AWG #12-26) can be used. The recommended torque for the connector screws is 5 in-lbs. This connector is keyed to help prevent incorrect mating. When connecting to the four-pin connectors, it is recommended that two 2-pin connectors be used, one for auxiliary switch connections, one for neutral current sensor connections, etc... (although one 4-pin may be used).

### Neutral

A Neutral CT is required for advanced features such as ground fault, ground fault alarm, and neutral protection. The neutral input is accomplished by connecting a neutral current sensor between the system neutral (line) and breaker neutral (load), then wiring the BLACK and WHITE neutral current sensor screw terminals to the two screw terminals of the plug connector. This junction box connector is then plugged into the front face of the 4-pin receptacle of the Advanced Distribution Cable Junction Box labeled "CT COM" (white wire) and "CT N" (black wire). Available neutral transformers are shown in the following table.

**Table 1. Neutral Transformers**

Breaker Type	Breaker Current Sensor Rating (S)	Catalog Number
SG	150	TSRG201
	400	TSRG204
	600	TSRG206
SK	800	TSKG408
	1200	TSKG412

### Auxiliary Switch

Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard*™ Trip Units require an auxiliary switch mounted in the right side accessory pouch to provide a breaker position signal via communication network. The switch is a form C contact and is used to convey breaker position (closed or open). This position input signal is accomplished by connecting the red and white auxiliary switch leads to the two screw terminals of the plug connector. This connector is then plugged into the front face of the 4-pin receptacle of the Advanced Distribution Cable Junction Box labeled "AUX SW-" (white) and "AUX SW+" (red).

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**Note:** The *microEntelliGuard*™ Trip Unit requires an Auxiliary Switch with gold plated contacts (Use table below).

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**Table 2. Auxiliary Switches**

Catalog Number	No. of Switch Elements	Switch Rating
SAUXGAB1	1 form C	Gold-Plated Contacts 0.5 A @ 30 V
SAUXGAB2	2 form C	

### Modbus Communications

Spectra® RMS Breakers with *microEntelliGuard*™ Trip Units communicate via a modbus link, which is accomplished by connecting the clear, black, and shield leads of AWG #16 twisted shielded wire (Belden 9841) to the three screw terminals on the Advanced Distribution Cable Junction Box labeled Modbus RX, Modbus TX, and Modbus Shld. Communication links between similar breakers may be daisy chained between Advanced Distribution Cable Junction Boxes (refer to Figure 5). The wiring should begin at the master device and wire from device to device. At the end of the wiring chain the last connection should be to the Multilin Modbus terminator (RC network part number is 1810-0106). The Tx connection should connect to other Mod-bus Tx (+) connections. The Rx connection should connect to other Modbus Rx (-) connections.

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**Important:** Modbus links (*microEntelliGuard™* may not be directly connected to Commnet links (*MicroVersaTrip®*). Commnet connections must run through a Modbus concentrator before connected to a Modbus signal.

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**Zone Selective Interlock (ZSI)**

The ZSI signals are connected to terminals 8-11 (Refer back to Figure 4 for terminal connector reference #'s). The ZSI inputs and outputs are used to setup coordination with other breakers. The interface between the Spectra RMS breaker and additional breakers is accomplished through the TIM1 module.

**Ground Fault Alarm (GFA)**

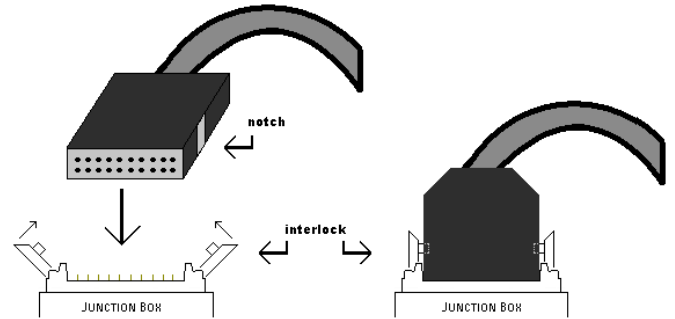
If the unit is configured for GFA, terminals 14 & 15 (Figure 4) are used to indicate the ground fault. These terminals are dry contact outputs with a 1 amp maximum capability. If the unit does not have ground fault, terminals 14 & 15 (Figure 4) are used as a programmable alarm output. The 1 amp maximum applies in this situation also.

**Reduced Energy Let-Through (RELT)**

The RELT system is used to put breakers in a reduced energy mode for service and preventative maintenance. RELT has an input and an output. To enter RELT mode, 24 volts (AC or DC) is applied to terminals 12 & 13 (Figure 4). If DC is used, observe the polarity markings on the Advanced Distribution Junction Box. Terminals 16 & 17 (Figure 4) provide a dry contact output signal to indicate RELT mode has been activated. These are 1 amp maximum dry contacts.

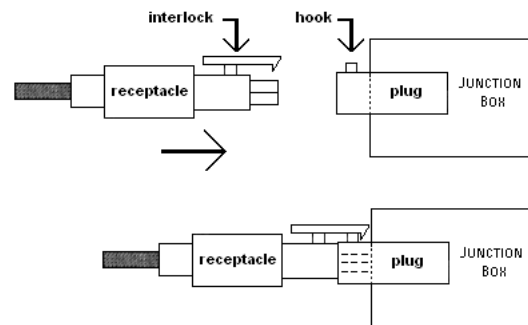
If RELT is not optioned in the breaker the RELT signals can be used as programmable inputs and programmable outputs to the breaker.

The Advanced Distribution Cable Junction Box also contains two 12-pin plug connectors and one 20-pin connector. To connect a Spectra® RMS Molded-Case Circuit Breaker to the Advanced Distribution Cable Junction Box, align the 20-pin breaker receptacle interlock connector with the mating "BREAKER" plug hook connector of the Advanced Distribution Cable Junction Box and lock the two hinged interlocks into the connector (See Figure 6).



**Figure 6. Side view of breaker cable-junction box insertion and attachment.**

To connect a Distribution Cable Harness (12-pin) to the Advanced Distribution Cable Junction Box, insert the receptacle into the plug until the interlock and hook catch (see Figure 7). The 12-pin connectors are keyed so they cannot be inserted incorrectly into a mating 12-pin receptacle connector. To disconnect from the Advanced Distribution Cable Junction Box, press down at the rear of the receptacle interlock until the interlock clears the plug hook and withdraw the receptacle interlock (see Figure 9).



**Figure 7. Side view of a receptacle-plug connection insertion.**

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**Note:** If the Distribution Cable Harness has a plastic hinge on the strain relief, then cut this hinge off, as it will interfere with other Junction Box Connectors (see Figure 8).

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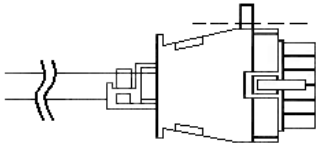


Figure 8. Cable Harness Strain Relief. Dotted line shows approximate location for cutoff.

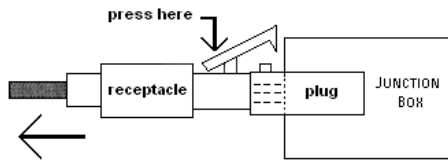


Figure 9. Side-view of a receptacle-plug connection removal

**Additional Information**

Refer to these other publications for additional information.

GEH-5934 MicroVersaTrip® Plus and MicroVersaTrip® PM Trip Units in Spectra® RMS Molded-Case Circuit Breakers

- GEH-700 Spectra® G Breaker w/ microEntelliGuard™ Trip Unit
- GEH-701 Spectra® K Breaker w/ microEntelliGuard™ Trip Unit
- GEH-702 microEntelliGuard™ Trip Unit Users Manual
- DEH-41318 Universal Rating Plug
- GEH-6250 Voltage Module
- GEH-6251 Power Supply Plate
- GEH-6252 Voltage Conditioner Plate
- GEH-6253 Power Supply Assembly
- GEH-6254 Voltage Conditioner Assembly
- GEH-703 MET Battery Pack Adapter
- DEH-006 Distribution Cable Junction Box
- GEH-705 MET Distribution Cable Extension (20-pin)
- GEH-6256 Distribution Cable Extension (12-pin)
- GEH-6255 Distribution Cable Harness (12-pin)
- GEH-706 MET Distribution Cable Terminal Blocks (11 point & 22 point)
- GEH-6257 Distribution Cable Terminal Block (11 point)
- GEH-707 MET Sealable Cover kits
- DEH-4568 GTU digital test kit (GTUTK20)
- GEH-5551 Shunt Trip and UVR instructions
- GEH-5593 Aux switch and bell alarm
- GEK-64467 TIM-1 Zone Selective Interlock Module

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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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