

GEH-6250 Installation Instructions

Voltage Module

For Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard*™, MicroVersaTrip® PM or MicroVersaTrip® Plus Trip Units

For Catalog Numbers ADSVMA120Y, ADSVMA208Y, ADSVMA240D, ADSVMA277Y, ADSVMA480Y, ADSVMA480D, ADSVMA600D
UL LISTED Circuit Breaker Accessory



Overview

The General Electric Voltage Module is used to provide +24Vdc Control Power to Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard*™, MicroVersaTrip® PM/Plus Trip Units via the Distribution Cable System. The Module also provides voltage-sensing signals to Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard*™ or MicroVersaTrip® PM Trip Units on the same UL Listed Circuit Breaker Accessory Distribution Cable System. The Voltage Module is rated 24 watts (+24Vdc @ 1.0 Amp) and has the maximum capacity to power a Distribution Cable System consisting of 20 Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard*™ or MicroVersaTrip® PM/Plus Trip Units with a maximum system cable length of 40 feet. The Voltage Module is designed to operate in temperature between 0°C and 70°C.

Figure 1 shows how the Voltage Module is used in a typical MicroVersaTrip® PM system. Figure 2 shows how the Voltage Module is used in a typical MicroVersaTrip® Plus system. The *microEntelliGuard*™ Trip Unit can support either configuration.

WARNING: Danger of electrical shock or injury. Turn OFF power ahead of the switchboard before working inside the equipment. *Do not* remove or install any circuit protective devices, or any other component until the power is turned OFF.

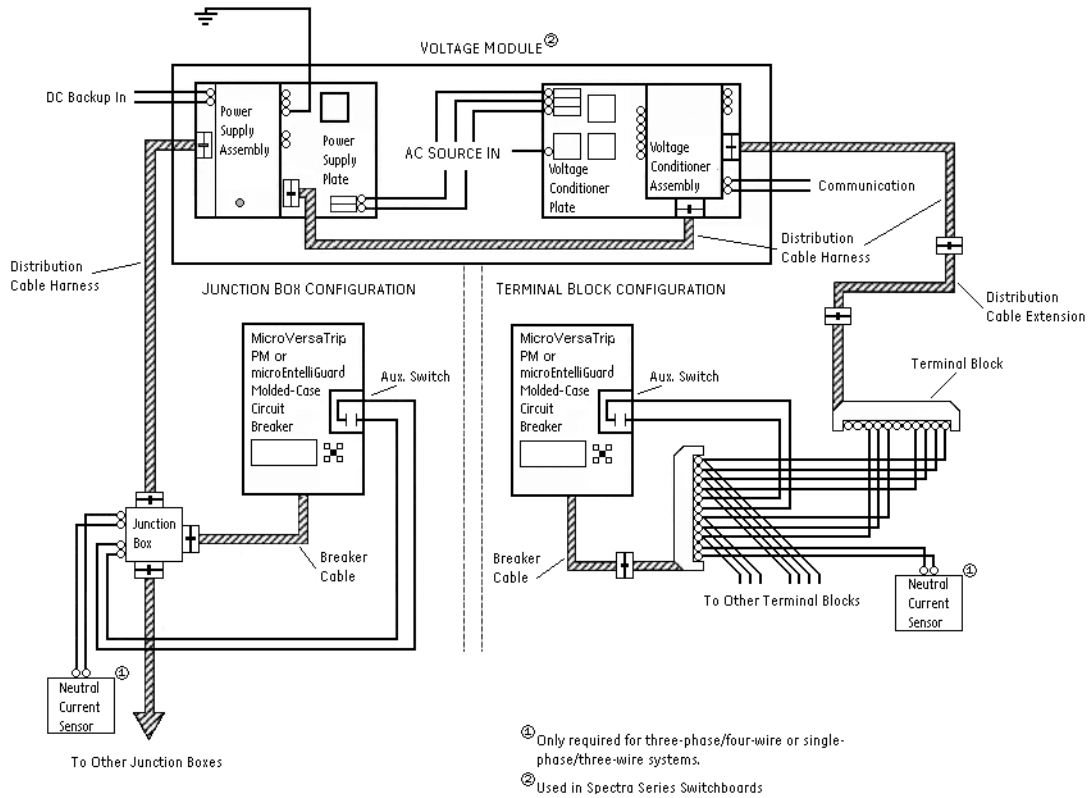


Figure 1. Typical *microEntelliGuard*[™] or *MicroVersaTrip*[®] PM Trip Unit System detailing the Voltage Module.

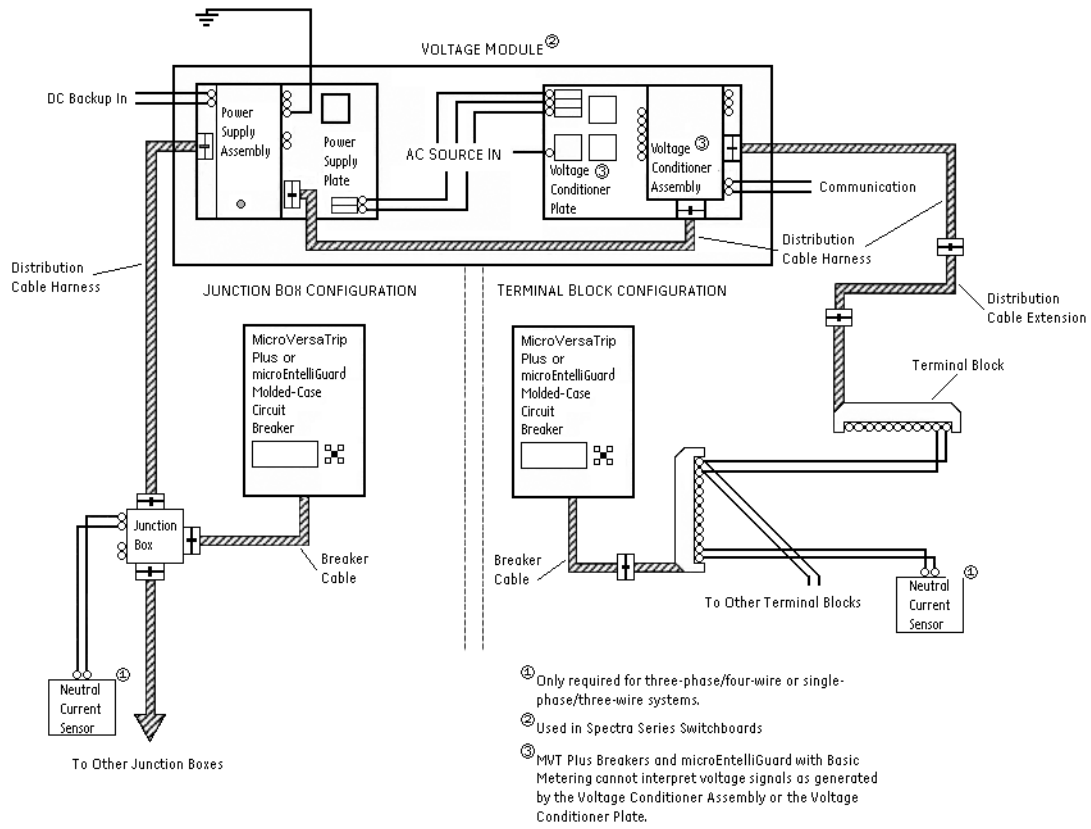


Figure 2. Typical *microEntelliGuard*[™] or *MicroVersaTrip*[®] Plus Trip Unit System detailing the Voltage Module.

The Voltage Module contains both a Power Supply Plate and a Voltage Conditioner Assembly as integral components. The module also includes fuse protection for the AC source input terminals (see Figure 3). The Voltage Module is available in seven ratings. Table 1 contains a listing of all GE Voltage Modules. All units are rated 60 Hz.

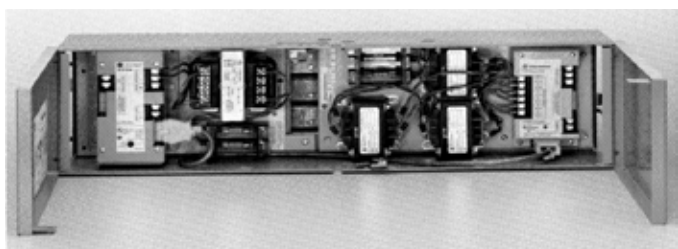


Figure 3. Interior view of the Voltage Module (left side Power Supply Plate, right side Voltage Conditioner Plate)

Table 1. GE Voltage Modules

Voltage Rating	System Configuration	Catalog Number	Sensing Connection
120Vac	3φ4W - Wye	ADSVMA120Y	Phase to Neutral potential
208Vac	3φ4W - Wye	ADSVMA208Y	Phase to Phase potential
240Vac	3φ3W - Delta	ADSVMA240D	Phase to Phase potential
277Vac	3φ4W - Wye	ADSVMA277Y	Phase to Neutral potential
480Vac	3φ4W - Wye	ADSVMA480Y	Phase to Phase potential
480Vac	3φ3W - Delta	ADSVMA480D	Phase to Phase potential
600Vac	3φ3W - Delta	ADSVMA600D	Phase to Phase potential

A communications connection is provided for applications where data is transmitted to an external intelligent device (See Table 2). The distribution cable system is used to interconnect the voltage signal on the Voltage Conditioner Plate and the Spectra® RMS Molded-Case Circuit Breakers.

CAUTION: The microEntelliGuard™ trip unit system uses modbus communications and should never be connected to a Commnet bus

An additional voltage output connection is available for applications where a voltage signal is needed on an Air Circuit Breaker or Insulated Case Circuit Breaker with an

EntelliGuard™ TU or a MicroVersaTrip® PM Trip Unit. (Do not connect this voltage signal to a Spectra® Trip Unit. The voltage signal structure is different between the MCCB and ACB/ICCB Trip Unit platforms).

CAUTION: The voltage-sensing signal structure for MicroVersaTrip® PM and EntelliGuard™ TU Trip Units used in Air Circuit/Insulated Case Breakers is different than the voltage-sensing signal structure used on Spectra® RMS Breakers with MicroVersaTrip® PM or *microEntelliGuard™* Trip Units.

Additional 24Vdc output connections are supplied for applications where +24Vdc control power is required independent of the Distribution Cable System (i.e. feeding Air Circuit Breakers and/or Insulated Case Breakers with a MicroVersaTrip® PM/Plus Trip Units).

NOTE: THE VOLTAGE MODULE IS SIZED FOR A MAXIMUM OF 20 BREAKERS. Use of the Voltage Module to provide voltage-sensing signals and/or +24Vdc control power to a main Air Circuit Breaker or a main Insulated Case Breaker with a MicroVersaTrip® or EntelliGuard™ TU Trip Unit reduces the total quantity of 20 Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard™* or MicroVersaTrip® PM/Plus Trip Units by one. The overall maximum cabling length of the system remains 40 feet.

Supplemental 24Vdc input terminals are provided for systems that have access to an external +24Vdc power supply. If this supplemental input is connected, the Voltage Module will continue to pass the control power to breakers and accessories connected to the Distribution Cable System if the primary AC power is lost or drops below the minimum requirement. This backup input must meet ANSI C37.90.1 for oscillatory and fast transient surges or damage to the Voltage Module may result (the Voltage Module provides this protection for the primary AC input). By plugging the Voltage Module into the Distribution Cable System, you create system wide signals that are available to all Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard™* or MicroVersaTrip® PM/Plus Trip Units connected to the system; a list of available signals appears in Table 2.

Table 2. Signals available on the Distribution Cable System by connection of the Voltage Module.

Spectra® RMS Breaker with MicroVersaTrip® PM Trip Unit	Spectra® RMS Breaker with MicroVersaTrip® Plus Trip Unit	Spectra® RMS Breaker with microEntelliGuard™ Trip Unit
control power (+24vdc)	control power (+24vdc)	control power (+24vdc)
control power (common)	control power (common)	control power (common)
system communications (comm. +)		system communications (comm. +)
system communications (comm. -)		system communications (comm. -)
voltage 1 (defined as potential between Aφ & N or between Aφ & Cφ)		voltage 1 (defined as potential between Aφ & N or between Aφ & Cφ)
voltage 2 (defined as potential between Bφ & N or between Cφ & Bφ)		voltage 2 (defined as potential between Bφ & N or between Cφ & Bφ)
voltage 3 (defined as potential between Cφ & N or between Bφ & Aφ)		voltage 3 (defined as potential between Cφ & N or between Bφ & Aφ)

The Voltage Module contains eight connection points. Refer to Figures 5A and 5B or 6A and 6B for connection details and location information. The following is a detailed list of the Voltage Module connection points:

- “To Distribution Cable” (2x)
 - 12-pin plug connectors that mate with the 12-pin receptacle of a Distribution Cable Harness (catalog number SDCHA11, SDCHA30 or SDCHA60). If the Voltage Module is factory installed in a Spectra® Series Switchboard these connections are factory wired to Distribution Cable Junction Boxes (catalog number SDCJBB).
- “Input”
 - Three-screw terminal block on the Power Supply assembly. Use the one-terminal “GND” screw for connection of the ground. If the Voltage Module is factory installed in a Spectra® Series Switchboard, this connection is wired to the switchboard equipment ground (the other two-terminal screws are pre-wired to the load side of the Power Supply Plate fuse block).
- “Communications”
 - Two-screw terminal block for Modbus communications link or for Commnet link to the GE POWER LEADER™ Network.
- “Supplemental Input 24Vdc”
 - Two-screw terminal block for connection to an external +24Vdc power supply.

- “Output to ACB/ICCB”
 - Three-screw terminal block for an additional voltage sensing signal output to MicroVersaTrip® PM or EntelliGuard™ TU Trip Units in Air Circuit Breakers and/or Insulated Case Breakers.
- “Output to 24Vdc”
 - Two-screw terminal block for an additional control power output to MicroVersaTrip® or EntelliGuard™ TU Trip Units in Air Circuit Breakers and/or Insulated Case Breakers.
- Three-phase rear pressure connector
 - Provides an AC source connection for control power and voltage sensing signals. If the Voltage Module is factory installed in a Spectra® Series Switchboard, these connections mate with the vertical bus bars in the switchboard. For catalog number ADSVMA120Y and ADSVMA277Y, an additional AC neutral connection must be made at one of the potential transformers. This connection is factory wired if the Voltage Module is factory installed in a Spectra® Series Switchboard.

Dimensions, Weights and Wiring Diagrams

A Voltage Module dimensioned drawing is provided in Figure 4 to assist in mounting the accessory. The maximum unit weight is 38 pounds.

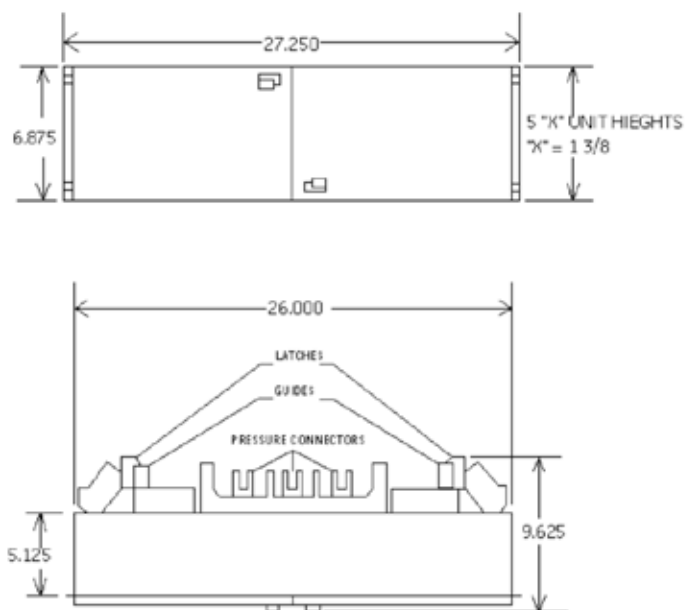


Figure 4. Dimensioned drawing of the Voltage Module (dimensions shown in inches).

Figures 5A and 5B contain point-to-point wiring diagrams for a Voltage Module as it integrates into a typical *microEntelliGuard*® or *MicroVersaTrip*™ PM Trip Unit System.

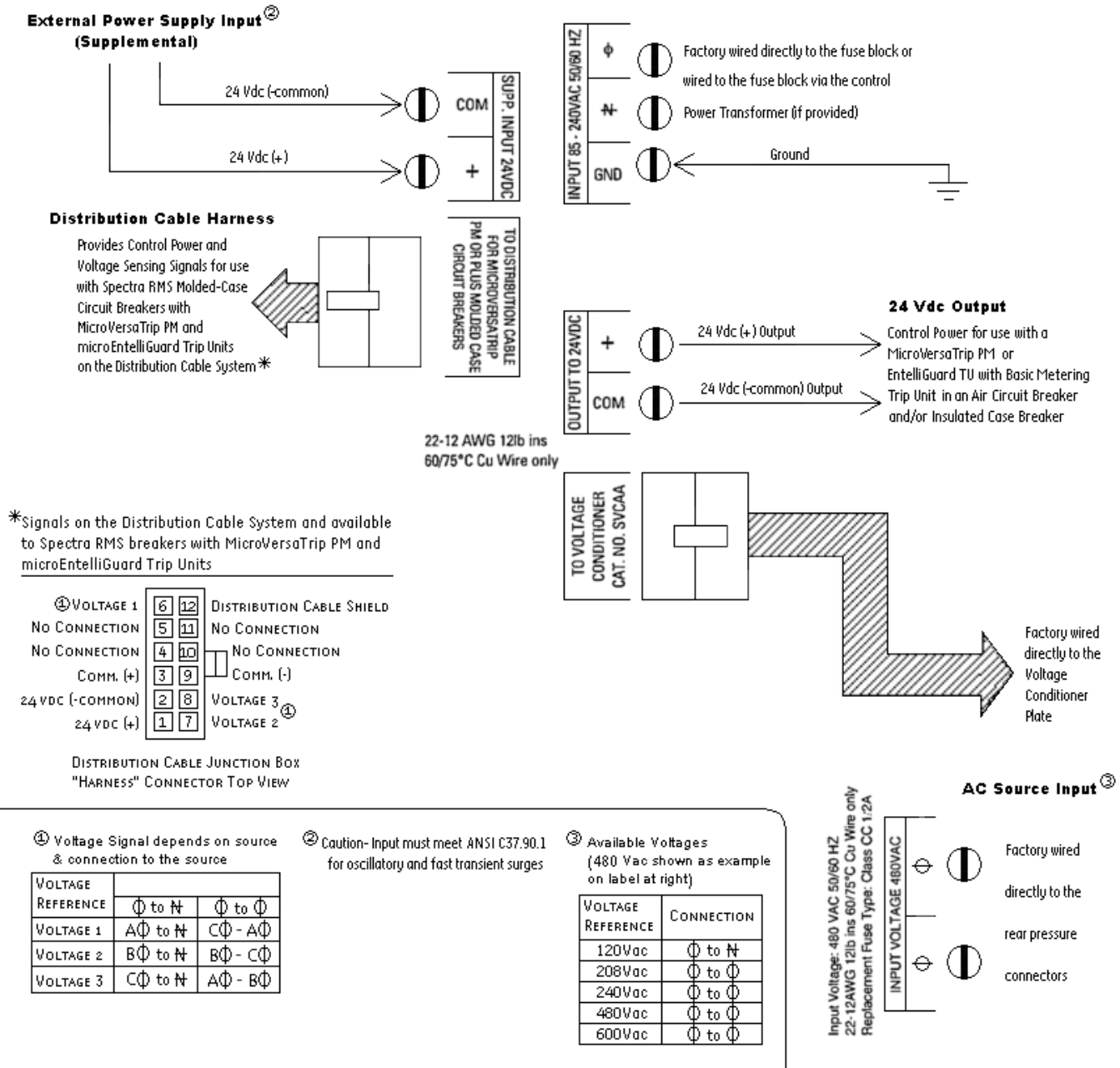


Figure 5A. Wiring Connections to the Voltage Module (left side) for a typical *microEntelliGuard*™ or *MicroVersaTrip*® PM System.

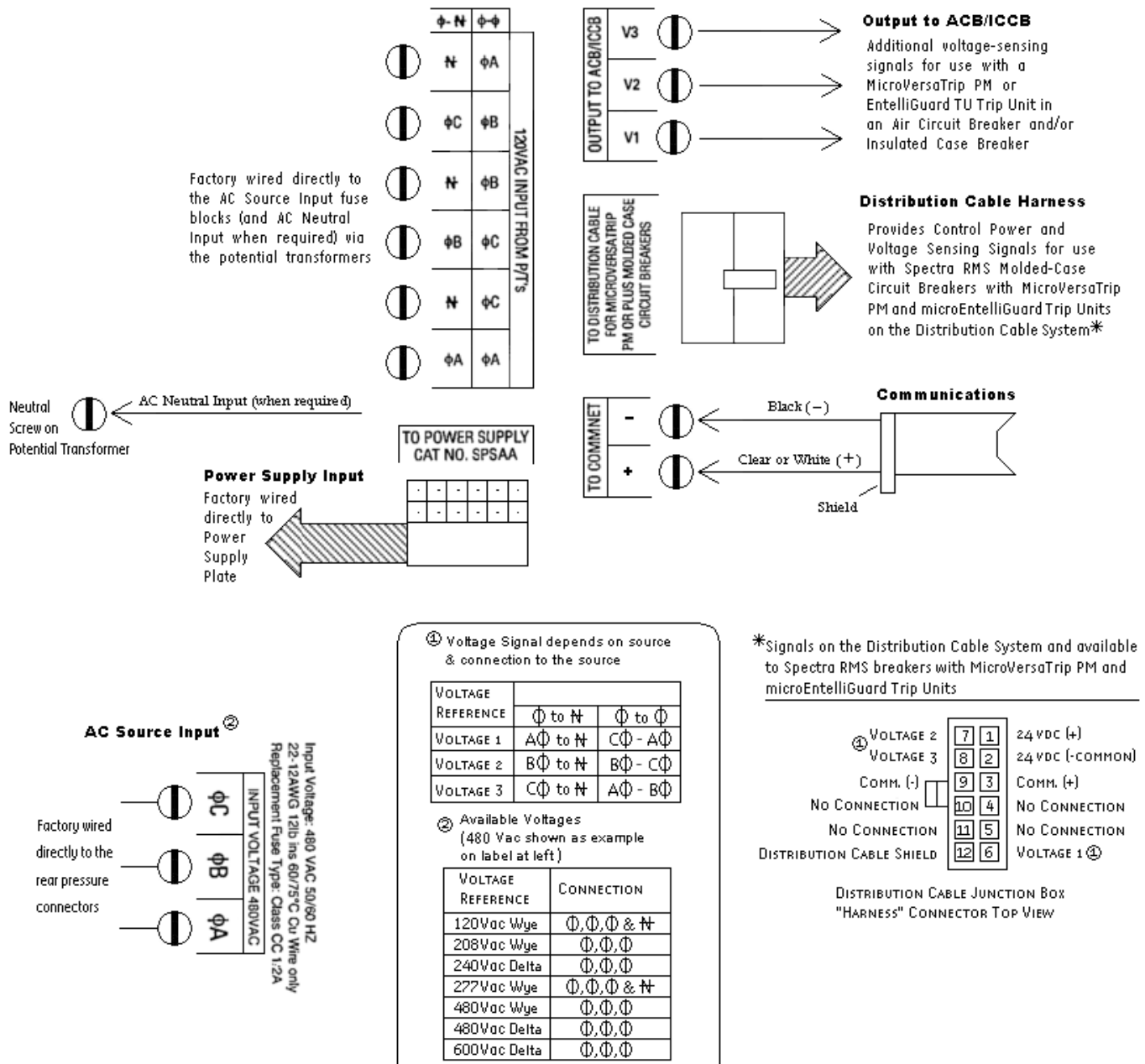


Figure5B. Wiring connections to the Voltage Module (right side) for a typical microEntelliGuard™ or MicroVersaTrip® PM System

Figures 6A and 6B contain point-to-point wiring diagrams for a Voltage Module as it integrates into a typical MicroVersaTrip® Plus or microEntelliGuard™ with Basic Metering Trip Unit System.

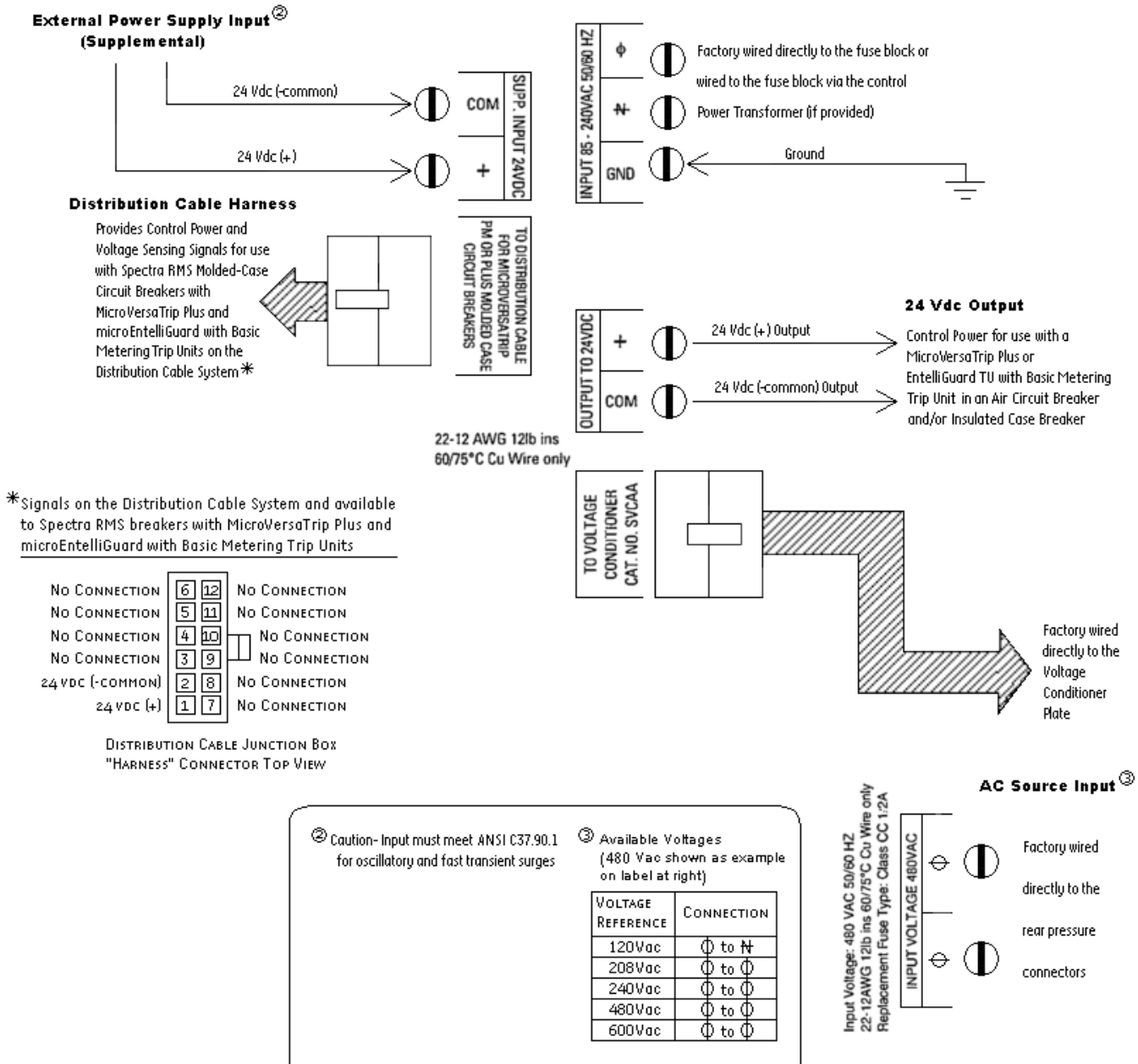


Figure 6A. Wiring connections to the Voltage Module (left side) for a typical microEntelliGuard™ or MicroVersaTrip® Plus System.

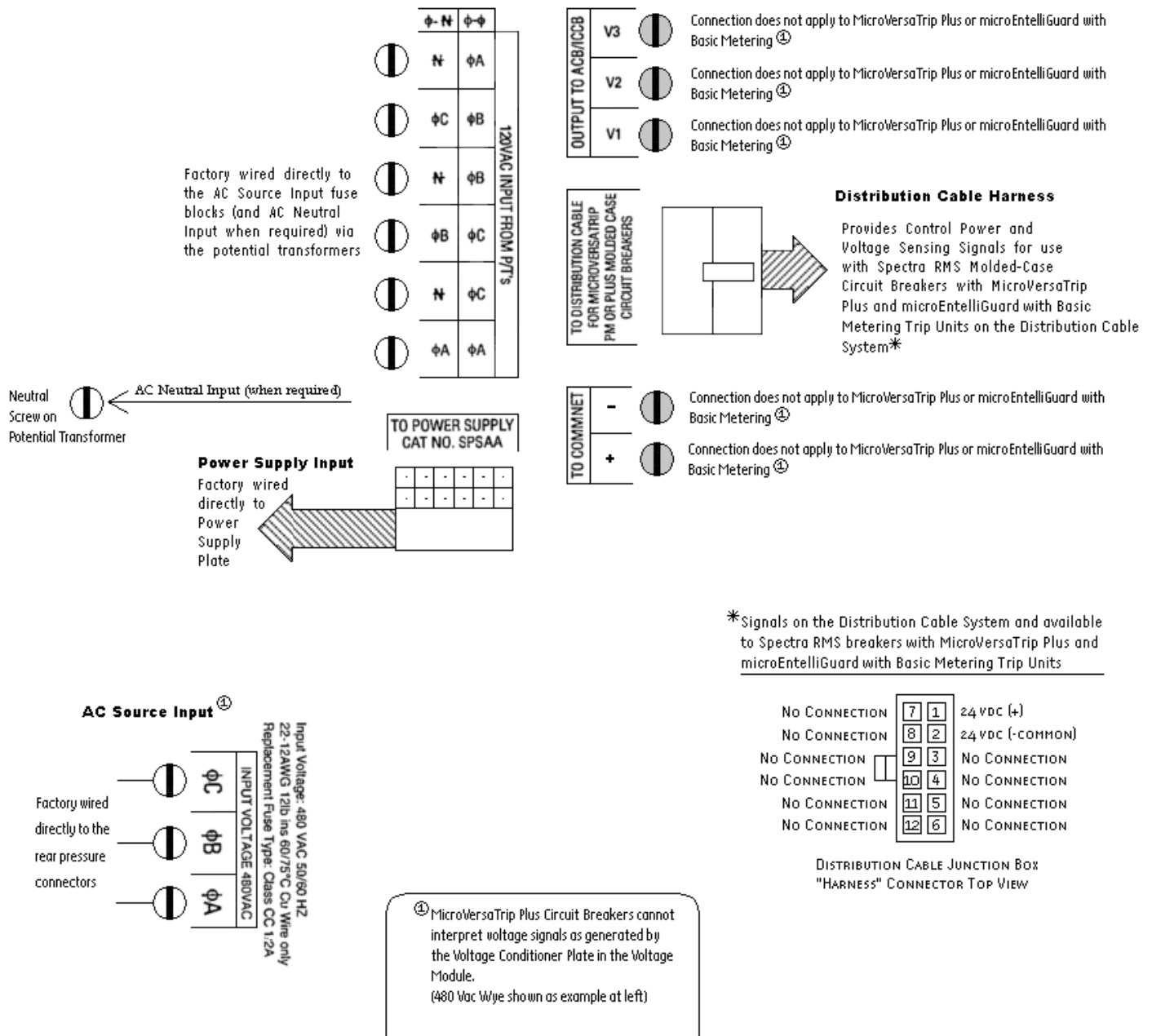


Figure 6B. Wiring connections to the Voltage Module (Right side) For a typical *microEntelliGuard*™ or *MicroVersaTrip*® Plus System.

Installation and Connections

Prior to installing the Voltage Module confirm that the module matches the voltage and system requirements (refer back to Table 1). Also turn OFF power ahead of the switchboard before proceeding with these instructions.

Step 1.

To install the Voltage Module into a Spectra® Series Switchboard, first loosen the rail latch screws (A) and retract latches (B) on both ends of the module as shown in Figure 7.

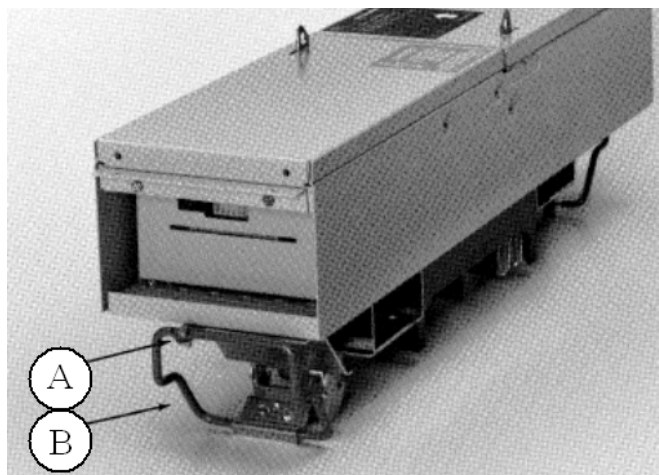


Figure 7. Retracting the rail latches of a Voltage Module.

Step 2.

Then line up the guides on both ends of the Voltage Module to notches in the Spectra® Series Switchboard interior vertical rails (C) as shown in Figure 8.

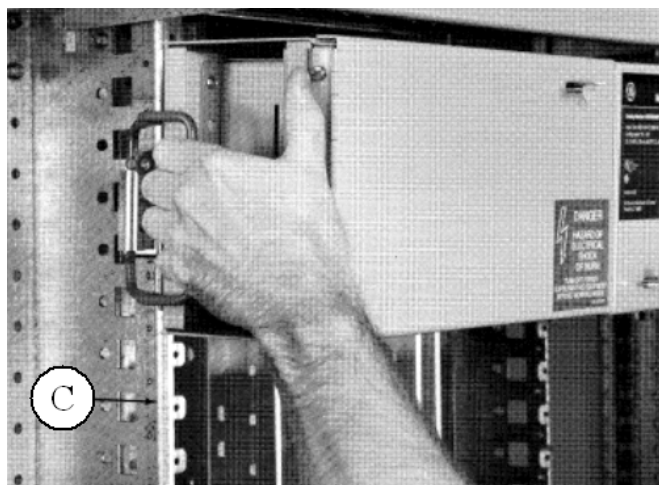


Figure 8. Aligning the Voltage Module.

Step 3. Finally push inward until the Voltage Module pressure connectors are fully engaged (plugged) into the interior bus bars. Release the latches. The latches will automatically lock into the interior rail when the module is fully engaged and installed. Tighten the rail latch screw to bolt and lock the Voltage Module in Module pressure connectors are fully engaged (plugged) into place as shown in Figure 9.

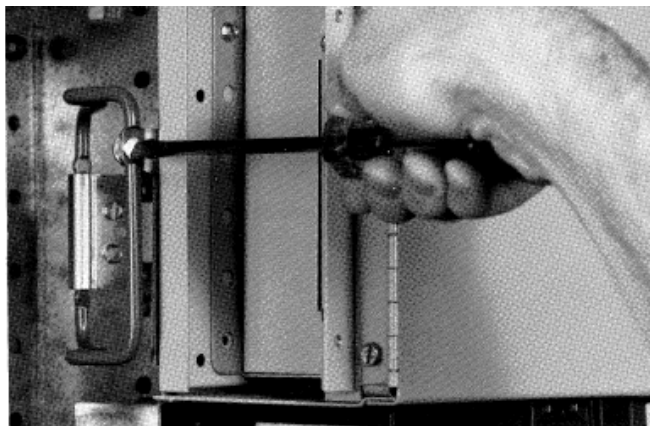


Figure 9. Locking the Voltage Module in place.

Once the Voltage Module is locked into place in the switchboard, wiring to the Voltage Module interior points should be made.

The screw terminals on the Voltage Module are labeled by function for clarity (refer back to Figures 5A and 5B or 6A and 6B for location information). The terminal strip pockets on all terminals will accommodate a spade lug or ring terminal with a tongue width up to 0.320 inches. The terminal screw size is 10-32. To make the connections, attach an appropriate spade lug or ring terminal to the wire, then slip the fastener beneath the terminal screw and tighten.

The Voltage Module also contains two 12-pin plug connectors. The connectors are keyed so they cannot be inserted incorrectly into a mating 12-pin receptacle connector. To connect to the Voltage Module plugs, align the receptacle interlock connector of a Distribution Cable Harness with the plug hook connector of the Voltage Module. Insert the receptacle until the interlock and hook catch (see Figure 10). To disconnect from the Voltage Module, press down at the rear of the receptacle interlock until the interlock clears the plug hook and withdraw the receptacle interlock (see Figure 11).

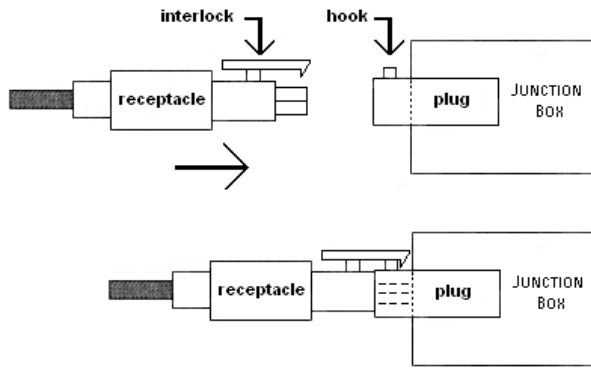


Figure 10. Side view of receptacle-plug insertion into the Voltage Module.

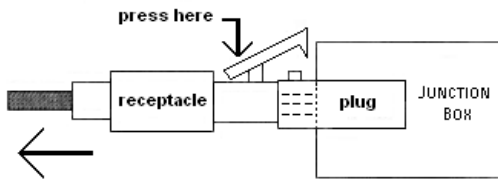


Figure 11. Side view of receptacle-plug removal from the Voltage Module.

Step 4.

IMPORTANT: The following connections are mandatory and MUST be made for all installations.

First, wire the 1-terminal “GND” screw on the Power Supply assembly to the switchboard ground. For catalog numbers ADSVMA120Y and ADSVMA277Y connect a wire from the appropriate potential transformer terminal screw on the Voltage Conditioner Plate to the switchboard neutral bus AND ground the **secondary neutral** on one of the potential transformers.

These additional connections are required if the Spectra® Series Switchboard has Air Circuit Breakers or Insulated Case Breakers installed; If the Air Circuit Breaker or Insulated Case Breaker has an EntelliGuard™ TU, MicroVersaTrip® PM, or a MicroVersaTrip® Plus Trip Unit, then wire the “OUTPUT TO 24Vdc” two-screw terminal block to the appropriate +24Vdc control power

screw terminals on the breaker. If the Air Circuit Breaker or Insulated Case Breaker has an EntelliGuard™ TU or MicroVersaTrip® PM Trip Unit then you must also wire the “OUTPUT TO ACB/ICCB -V1, V2, V3” three-screw terminal block to the appropriate voltage sensing screw terminals on the breaker.

These last connections are necessary only when the Voltage Module is being connected to a +24Vdc supplemental power supply and/or a communications network; For supplemental control power attach the +24Vdc and 24Vdc common wires from the external power supply to the “SUPP. INPUT 24Vdc” two-screw terminal block. For communications network connection, attach the black (-) and clear (+) wires of the network bus to the “Communications” two-screw terminal block.

Note: MicroVersaTrip® PM and *microEntelliGuard™* Trip Units communicate via different communication networks; *microEntelliGuard™* uses Modbus and MicroVersaTrip® PM uses Commnet. NEVER connect a *microEntelliGuard™* Trip Unit to a Commnet bus.

The Voltage Module is now functionally wired and ready to receive connections to the Distribution Cable System.

Step 5.

Spectra® Series Switchboards incorporate the Distribution Cable Junction Box (Cat. Nos. SDCJBB and SDCJBBC) in the front vertical support for each Spectra® RMS Breaker with MicroVersaTrip® PM or *microEntelliGuard™* Trip Units. Interconnection of the breakers (Refer back to Figures 1 and 2 for connections) is accomplished via the Distribution Cable Harness (Cat Nos. SDCHA11, SDCHA30, and SDCHA60) linking the Junction Box to the Voltage Module and additional Junction Boxes. **THE OVERALL MAXIMUM CABLING LENGTH OF THE SYSTEM IS 40 FEET.** Distance includes the Voltage Module and **ALL** breakers (Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard™* or MicroVersaTrip® PM/Plus Trip Units, Air Circuit Breakers and Insulated Case Breakers with EntelliGuard™ TU or MicroVersaTrip® PM/Plus Trip Units).

Step 6.

After a Spectra® RMS Molded-Case Circuit Breaker with *microEntelliGuard™* or *MicroVersaTrip®* PM/Plus Trip Unit is mounted on a Spectra® Series Circuit Breaker Module, the breaker/ mounting module assembly can be installed in the Spectra® Series Switchboard. If the breaker has a breaker cable with a 12-pin receptacle connector, plug the breaker receptacle into the “BREAKER” 12-pin plug connector of the nearest Distribution Cable Junction Box.

Step 7.

Spectra® RMS Molded-Case Circuit Breakers with *microEntelliGuard™* or *MicroVersaTrip®* PM Trip Units require one additional step. You **MUST** install an auxiliary switch (*microEntelliGuard™* Trip Units require an auxiliary switch with gold plated contacts) in the right accessory pouch of the breaker and route the red and white wires of the switch to the “AUX SWITCH” two-screw terminal block of the junction box. The installation of this auxiliary switch will also require that an 1X filler plate (catalog number APPIW) be installed between every Spectra® RMS Molded-Case Circuit Breaker with *microEntelliGuard™* or *MicroVersaTrip®* PM Trip Unit.

Another use of the junction box (independent of the Distribution Cable System) is the connection of the neutral current sensor to any Spectra® RMS Molded-Case Circuit Breaker with a *microEntelliGuard™*, *MicroVersaTrip®* PM or a *MicroVersaTrip®* Plus Trip Unit that has the equipment ground fault option. **3Ø/3W systems need no connection in order to function properly.** Wire the black and white wires of the neutral current sensor to the “NEUTRAL CURRENT SENSOR” two-screw terminal block on the junction box.

Figure 12 shows a completely wired installation of a Spectra® RMS Molded-Case Circuit Breaker with a *MicroVersaTrip®* PM Trip Unit detailing an installed Voltage Module (D), mounted Junction Box (E), connected Distribution Cable Harness (F), breaker connection (G), wired auxiliary switch leads (H), and connected current sensor wires (I).

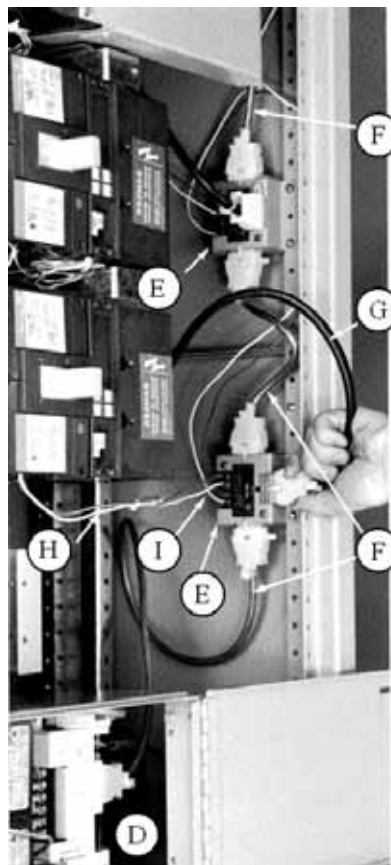


Figure 12. Voltage Module, Spectra® RMS Molded-Case Circuit Breakers with *MicroVersaTrip®* PM Trip Units and Distribution Cable Junction Boxes installed in a Spectra® Series Switchboard.

Step 8.

Filler plates (J) are included with the Voltage Module to assure a dead front and install the front plate (K) to the supports of the 1X filler plate as shown on Figure 13.

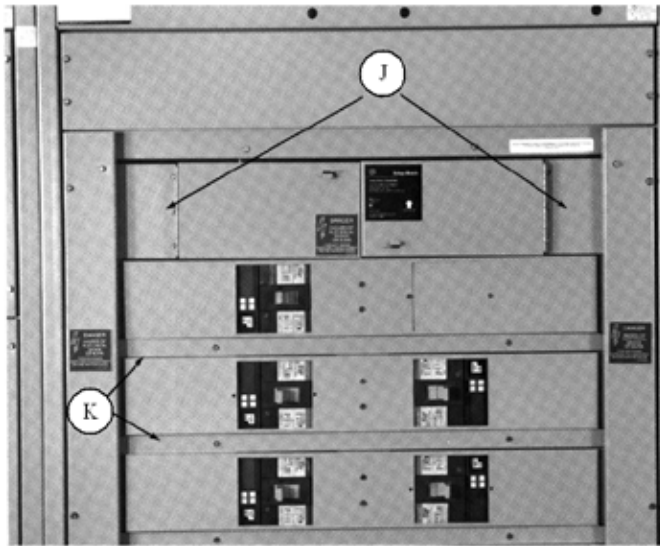


Figure 13. Voltage Module installed in the Spectra® Series Switchboard.

Parts and Options

The only user-serviceable components or parts on the Voltage Module are the fuses in the AC INPUT fuse blocks. The fuses listed in the Table 4 are recommended as Replacements for use with the voltage Module. Failure to use the proper type of fuses can result in the damage to the Voltage Module. Five fuses per Voltage Module are required.

Table 4. Recommended Replacement Fuses for use with the Voltage Module

Ampere Rating	Catalog Manufacturer	Number	Comments
2 amp	Gould-Shawmut	ATMR 2	Class CC current limiting fuse

Additional Information

Refer to these other user’s manuals for more details:

- 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-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
- GEH-704 MET Advanced Distribution Cable Junction Box
- 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-6491 POWER LEADER™ Modbus Concentrator
- GEH-6502 POWER LEADER™ PMCS 5.0 Network Architecture Guide
- 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

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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