Spectra RMS* Molded-Case Circuit Breakers with MicroVersaTrip* Plus and MicroVersaTrip PM Trip Units

Product Overview

SPECTRA RMS MOLDED-CASE CIRCUIT BREAKER

The General Electric line of Spectra RMS Breakers have a true digital RMS sensing trip unit which provides reliable system protection for industrial and commercial applications. The field installable, front-mounted rating plugs are used to establish or change the breaker ampere rating. Spectra breakers are rated up to 100,000 amperes RMS symmetrical interrupting capacity at 480 volts ac and are available in standard (80%) UL ratings and 100% UL ratings. The compact size offers extreme flexibility in space intensive applications.

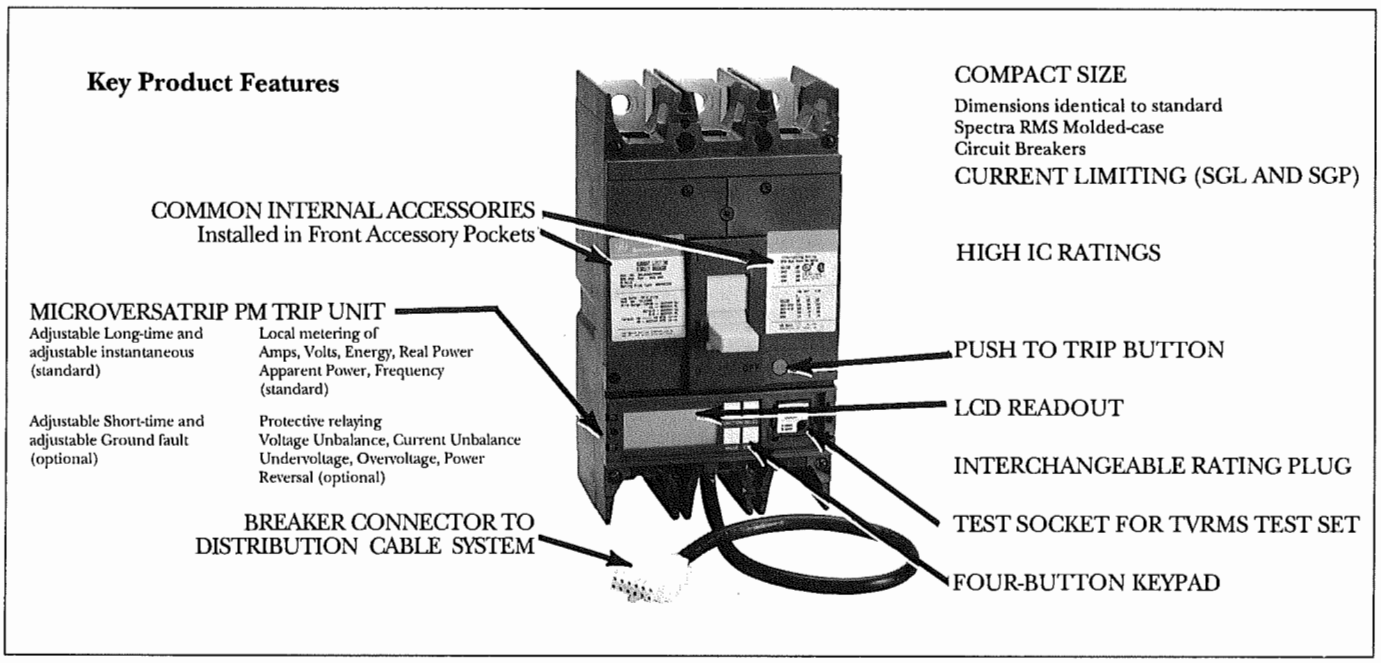
All Spectra RMS breakers meet UL, CSA, IEC and JIS standards and are UL listed for reverse feed. The SGL and SGP frames are UL listed as current limiting breakers. Spectra RMS breakers are ambient insensitive. Trip times will not vary over the range of -20°C to +55°C breaker ambient. All frames use the same UL listed, field installable internal accessories (auxiliary switch, shunt trip, undervoltage release and bell alarm).

MICROVERSATRIP PLUS TRIP UNIT

The MicroVersaTrip Plus Trip Unit utilizes a microprocessor and LCD display with a four-function keypad to provide local set-up and readout of trip settings. A selectable phase ammeter and trip indicators are standard. A clear plastic cover with provisions for sealing to allows tamper-resistant installation. The trip unit digitally measures the current waveform in each phase to determine the true RMS value of the current, regardless of the waveshape. The MicroVersaTrip Plus trip unit provides accurate, predictable overload and short circuit protection for distribution systems that include ac and dc variable speed drives, rectifiers, induction heating and other loads that cause high harmonic distortion as well as standard circuits. The 11 available settings for long-time pickup and 18 available settings for instantaneous pickup provides extreme breaker-to-breaker selectivity and custom load protection. Short-time and equipment ground fault functions include up to 16 pickup settings and 8 time delay bands which include the flexibility of coordination with or without an I^2t ramp. This provides maximum flexibility for system coordination. All this is accomplished with no increase in physical frame size.

MICROVERSATRIP PM TRIP UNIT

The optional MicroVersaTrip PM trip unit adds power management system capability, including local display of five additional metering parameters and five protective relay functions to the basic capabilities of the MicroVersaTrip Plus trip unit. Spectra RMS breakers with the MicroVersa Trip PM trip unit communicate directly on the POWER LEADER* communication network (commnet).



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FUNCTIONS

Wide Current Settings Range—Interchangeable rating plugs combined with five breaker current sensor ratings and a long-time pickup range of 0.5X to 1.0X, yields ampere ratings from 30A to 1200A.

Universal internal accessories—Uses the same front-mounted, field-installable shunt trips, undervoltage releases, bell alarms and auxiliary switches as standard Spectra RMS breakers.

Interrupting Ratings—RMS Symmetrical kA (UL File No. E11592; CSA LR 84929-8 and LR 84929-7)

Frame	240Vac	480Vac	600Vac
SGH	65	35	25
SGL	100	65	65
SGP	200	100	65
SKH	65	50	25
SKL	100	65	42
SKP	200	100	65

Spectra RMS Molded-Case Circuit Breaker with MicroVersaTrip Plus⑥ and MicroVersaTrip PM⑦ Trip Unit Characteristics

Long-time①		Short-time		Instantaneous	Equipment Ground Fault	
Current Setting (C) Pickup (Multiple of Rating Plug Amps) (X)	Delay (Seconds)	Pickup (Multiple of Current Settings) (C)	Delay (Seconds)	Pickup (Multiple of Rating Plug Amps) (X)	Pickup (Multiple of Sensor Amp Rating) (S)	Delay (Seconds)
0.50 to 1.0 in increments of 0.05 **(11 Settings)**	2.4, 4.9, 9,8, 20 ②③ **(3 - 4 Bands)**	1.5 to 9.0 in increments of 0.5 **(16 Settings)**	I^2t IN③ 0.44 I^2t OUT⑤ 0.1, 0.2, 0.3, 0.4 **(8 Bands)**	1.5 to 10.0 in increments of 0.5 **(18 Settings)**	0.2 to 1.0 in increments of 0.05 **(17 Settings)**	I^2t IN④ 0.41 I^2t OUT⑤ 0.1, 0.2, 0.3, 0.4 **(8 Bands)**

X = Rating plug amps
S = Sensor amp rating
C = Long-time current settings (Pickup)
C = X times Long-time Pickup Setting

① Pickup fixed at 1.1C.
② 20 Second delay (band) not available on SG frames.
③ Time delay at 600% of current setting at lower limit of each band

④ Time delay at 200% of pickup setting at the lower limit of each band.
⑤ Time delay shown at lower limit of each band. Pickup tolerances ±10%. Ground Fault Pickup not to exceed 1200 amps.

Spectra RMS Molded-Case Circuit Breaker with MicroVersaTrip PM⑦ Trip Unit Features

Functions	Accuracy and Description	Trip Unit Choice	
		Metering (Standard)	Metering and Relaying (Optional)
Amperes (A/kA)⑥	Current ±4% Selectable Phase	X	X
Voltage (V)	Volts ±2% Selectable Phase in L-L or L-N⑧	X	X
Energy (kWh/MWh)	Watt hours 7% Total energy flow through breaker	X	X
Real Power (kW/MW)	Watts ±6% L-L or L-N Power⑧	X	X
Apparent Power (kVA/MVA)	Volt amps ±6% L-L or L-N Power⑧	X	X
Frequency (Hz)	Hertz ±6%	X	X
Voltage Unbalance Relay	Adjustable pickup, 10 to 50% Adjustable delay, 1 to 15 seconds or OFF		X
Current Unbalance Relay	Adjustable pickup, 10 to 50% Adjustable delay, 1 to 15 seconds or OFF		X
Undervoltage Relay	Adjustable pickup, 50 to 90% Adjustable delay, 1 to 15 seconds or OFF		X
Overvoltage Relay	Adjustable pickup, 110 to 150% Adjustable delay, 1 to 15 seconds or OFF		X
Power Reversal Relay	Adjustable pickup, 0.01 MW to .90 MW Adjustable delay, 1 to 15 seconds or OFF		X
Communications	POWER LEADER Communications System Link (commnet)	X	X

⑥ Selectable Phase ammeter standard on MicroVersaTrip Plus Trip Unit. +24Vdc control power option is available (requires use of Power Supply Plate, Power Supply Assembly or Voltage Module).

⑦ MicroVersaTrip PM Trip Unit requires +24Vdc control power from a Power Supply Plate, Power Supply Assembly or Voltage Module and voltage sensing signals from a Voltage Conditioner Plate or Voltage Conditioner Assembly or Voltage Module.

⑧ Configuration based on choice of Voltage Conditioner Plate, Voltage Module or connection of potential transformers to Voltage Conditioner Assembly.

Spectra RMS Molded-Case Circuit Breaker with MicroVersaTrip PM Trip Unit Communication Features

Information	Local LCD Display	POWER LEADER Monitor①	POWER LEADER Distribution Software①
Breaker Status On (Normal), Off, Tripped	X②	X	X
Breaker Setting③ All available overcurrent functions LT pickup and delay, ST pickup and delay, Inst pickup, GF pickup and delay All available trip setpoints VU pickup and delay or OFF, CU pickup and delay or OFF, UV pickup and delay or OFF, OV pickup and delay or OFF, PR pickup and delay or OFF	X		X
Breaker Trip Information③ Overcurrent functions - LT, ST, Inst, GF Protective relay functions - VU, CU, UV, OV, PR	X	X	X④
Metering Information Current (A/kA), Voltage (V), Energy (kWh/MWh), Real Power (kW/MW), Apparent Power (kVA/MVA), Frequency (Hz)	X	X	X⑤
Additional Metering Information Reactive Power (kVAR), Power Factor, Total Real Power (kW), Total Reactive Power (kVAR), Total Apparent Power (kVA), Power Demand (kW), Peak Power Demand (kW)			X⑤⑥
Energy Collection Information (User defined 15, 30 or 60 minute demand interval) Accumulate, Trend or Disable			X
Trending Information⑦ (User defined interval of 15, 30 minutes, 1, 2, 3, 5, 8, 12, 24 hours, 1, 4 weeks) Single Phase Parameters Current (A), Voltage (V), Real Power (kW), Reactive Power (kVAR), Apparent Power (kVA) Three Phase Parameters Real Power (kW), Reactive Power (kVAR), Apparent Power (kVA), Power Factor, Frequency (Hz)			X⑤
Independent Alarm (no-breaker trip) function (User defined 15 minute, 30 minute, 1 hour or 8 hour interval) (User defined maximum or minimum threshold) Current (Amps AΦ BΦ CΦ), Voltage (Volts L-to-L, AΦ BΦ CΦ or L-to-N, AΦ BΦ CΦ), Real Power (kW, AΦ BΦ CΦ), Total Real Power (kW), Reactive Power (kVAR, AΦ BΦ CΦ), Total Reactive Power (kVAR), Apparent Power (kVA, AΦ BΦ CΦ), Total Apparent Power (kVA), Power Factor, Power Demand (kW), Energy (kWh)			X④
User defined notes for a particular device (maintenance records, details about feeder device, log of trip events, etc.)			X

LT = Long-time
ST = Short-time
Inst = Instantaneous
GF = Ground Fault
VU = Voltage Unbalance
CU = Current Unbalance
UV = Undervoltage
OV = Overvoltage
PR = Power Reversal

① Must be version 2.0 or higher.
② Uses breaker mechanical status indicator.
③ Breaker functions that are not part of the breaker trip unit characteristics will not be displayed locally and will show as "N/A" through the software.
④ Magnitude and phase information available with date/time stamping.
⑤ All values (AΦ, BΦ, CΦ, L-to-L and L-to-N where applicable) are available on one Device Metering screen.
⑥ Custom metering display is available allowing the display of any three metering parameters for up to eight devices)
⑦ Trending information can be routed to screen, printer or file. Views may be plotted (X-Y or Bar Graph; 3 maximum) or reported.

Dimensions and Weights (all breakers are 3 pole and rated 600Vac maximum)

Circuit Breaker Type	Ampere Range	Dimensions inches (mm)			Approximate Weight each
		Height	Width	Depth	pounds (kg)
SG600	60-150 150-400 300-600	10.09⑧ (256)	5.50 (140)	3.81 (97)	17 (7.7)
SK1200	300-800 600-1200	15.50⑨ (394)	8.25 (210)	5.50 (140)	47 (21.3)

⑧ Add 1.76 inches (45mm) to each end with lugs and lug cover installed.
⑨ Add 4.00 inches (101mm) to upper end for SKP (100kAIC @ 480Vac) lug cover.

CATALOG NUMBERS

Circuit Breaker

SG HB 3 6 B A 0150

	Description		Code
Frame Designation	SG600 SK1200		SG SK
IC/Capacity Rating	Standard UL Rating	SG=35kA @ 480Vac SK=50kA @ 480Vac SG and SK=65kA @ 480Vac SG and SK=100kA @ 480Vac	HB HB LB PB
	100% Continuous UL Rating	SG=35kA @ 480Vac SK= 50kA @ 480Vac SG and SK=65kA @ 480Vac SG and SK=100kA @ 480Vac	HH HH LL PP
Poles	3 Pole		3
UL Voltage	600 Vac		6
Trip Unit	MicroVersaTrip Plus① MicroVersaTrip PM② with Metering and POWER LEADER Communication MicroVersaTrip PM② with Metering and POWER LEADER Communication and Protective Relays		B C D
Overcurrent Protective Functions	LI LSI LIG LISG LI-CP LSI-CP		A B C D E F
Breaker Sensor Rating (S)	G-Frame	150 Amps 400 Amps 600 Amps	0150 0400 0600
	K-Frame	800 Amps 1200 Amps	0800 1200

① MicroVersaTrip Plus Trip Unit with optional control power requires +24Vdc control power source.

② MicroVersaTrip PM Trip Unit requires +24Vdc control power source and voltage sensing signals.

LI = Long time, Instantaneous (standard)
LSI = Long time, Short time, Instantaneous
LIG = Long time, Instantaneous, Ground Fault
LSIG = Long time, Short time, Instantaneous, Ground Fault
LI-CP = Long time, Instantaneous with Control Power (Plus only)
LSI-CP = Long time, Short time, Instantaneous with Control Power (Plus only)

Lugs

Frame Types	Frame or Sensor Amps (S)	Wire Range	Catalog Number
SGHB SGHH, SGLB, SGLL, SGPB, SGPP	150 400 600	**Aluminum:** (2) 2/0-500kcmil or (1) #6-600kcmil **Copper:** (2) 2/0-400kcmil or (1) #1-600kcmil	TCLK365 (3 lugs per kit)
SKHB, SKHH, SKLB, SKLL, SKPB, SKPP	800	**Aluminum:** (3) 3/0-500kcmil **Copper:** (3) 3/0-500kcmil	TCAL81 (1 lug per kit)
	1200	**Aluminum:** (4) 250-500kcmil **Copper:** (4) 250-350kcmil	TCAL121 ③ (1 lug per kit)

③ Suitable for 500kcmil copper, 1200A maximum rating.

Rating Plugs

Frame Types	Sensor Amps (S)	Current Rating	Rating Plug (X) Catalog Number
SGHB, SGHH, SGLB, SGLL, SGPB, SGPP	150	60	SRPG150B60
		80	SRPG150B80
		100	SRPG150B100
		125	SRPG150B125
		150	SRPG150B150
	400	150	SRPG400B150
		200	SRPG400B200
		225	SRPG400B225
		250	SRPG400B250
		300	SRPG400B300
		350	SRPG400B350
		400	SRPG400B400
	600	300	SRPG600B300
		400	SRPG600B400
		500	SRPG600B500
		600	SRPG600B600
SKHB, SKHH, SKLB, SKLL, SKPB, SKPP	800	300	SRPK800B300
		400	SRPK800B400
		500	SRPK800B500
		600	SRPK800B600
		700	SRPK800B700
		800	SRPK800B800
	1200	600	SRPK1200B600
		700	SRPK1200B700
		800	SRPK1200B800
		900	SRPK1200B900
		1000	SRPK1200B1000
		1100	SRPK1200B1100
		1200	SRPK1200B1200

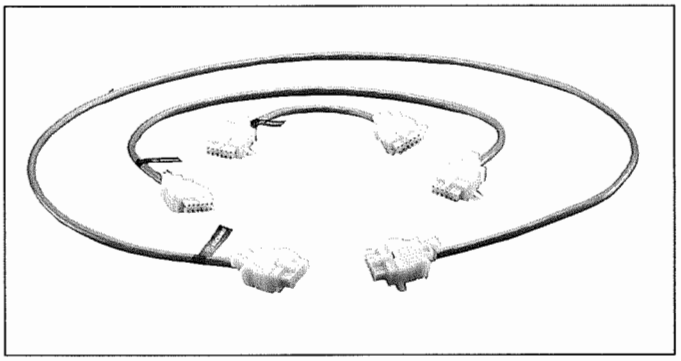
Accessories for Spectra RMS Breakers with MicroVersaTrip Plus and MicroVersaTrip PM Trip Unit

All these UL listed circuit breaker accessories utilize the Distribution Cable System (a modular system that provides quick, easy and reliable interconnection between breakers and accessories).

Distribution Cable Harness (UL File No. E57253)

The Distribution Cable Harness is a modular connector used to carry a variety of electronic signals (control power, voltage sensing and communications) between Spectra RMS Molded Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Units and Distribution Cable Accessories. The harnesses come in three lengths.

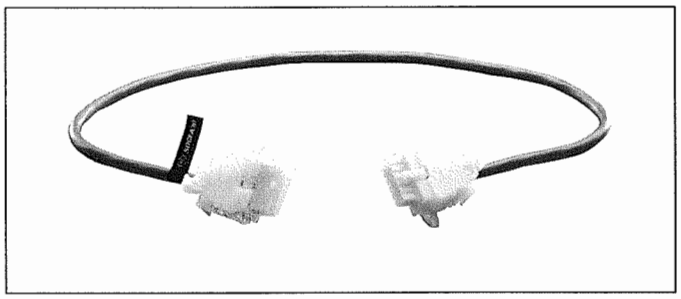
Description	Harness Length	Catalog Number
Distribution Cable Harness	11 inches	SDCHA11
	30 inches	SDCHA30
	60 inches	SDCHA60



Distribution Cable Extension (UL File No. E57253)

The Distribution Cable Extension is used to provide modular expansion of the Distribution Cable System.

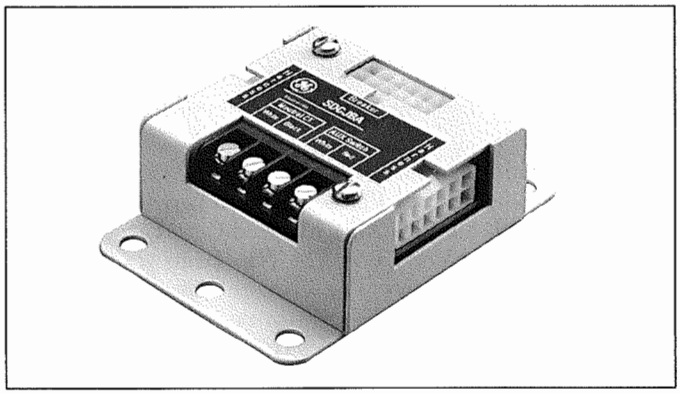
Description	Harness Length	Catalog Number
Distribution Cable Extension	30 inches	SDCEA30



Distribution Cable Junction Box (UL File No. E57253)

The Distribution Cable Junction Box is the primary connector used to attach Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Units to the Distribution Cable System. The Junction Box provides two Distribution Cable Harness plugs, one breaker plug and a terminal block for the connection of a neutral current sensor and an auxiliary switch.

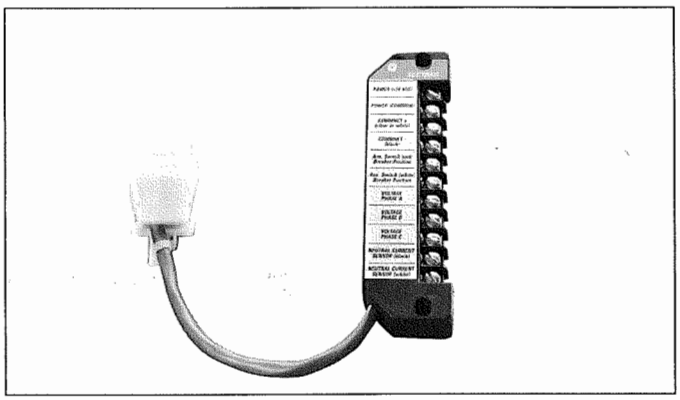
Description	Catalog Number
Distribution Cable Junction Box	SDCJBA



Distribution Cable Terminal Block (UL File No. E57253)

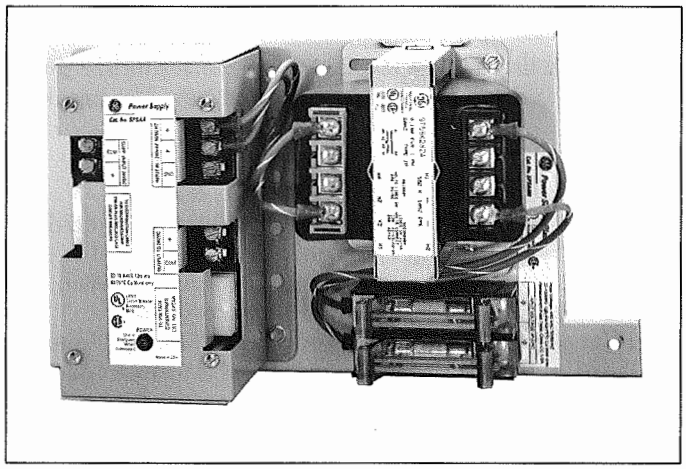
The Distribution Cable Terminal Block is used as an alternate means of input to Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip Plus or Micro VersaTrip PM Trip Units. The Terminal Block plugs into the breaker distribution cable receptacle allowing the direct connection of breaker signals via screw terminals.

Description	Catalog Number
Distribution Cable Terminal Box	SDCTBA11



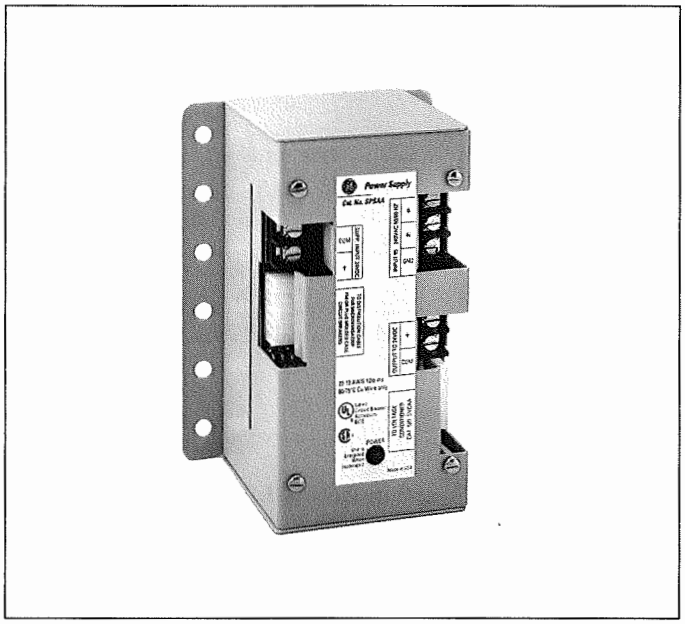
Power Supply Plate (UL File No. E57253)
The Power Supply Plate is used to provide +24Vdc Control Power to Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Units via the Distribution Cable System. The Power Supply Plate includes the Power Supply Assembly as an integral component and also includes fuse protection for the AC source input. Five versions are available.

Description	Voltage Rating	Catalog Number
The Power Supply Plate is rated 24 watts (+24Vdc @ 1.0 Amp) and has the maximum capacity to power a Distribution Cable System consisting of 20 breakers and has a maximum system cable length of 40 feet.	120 Vac 208Vac 240Vac 480Vac 600Vac	SPSA120 SPSA208 SPSA240 SPSA480 SPSA600



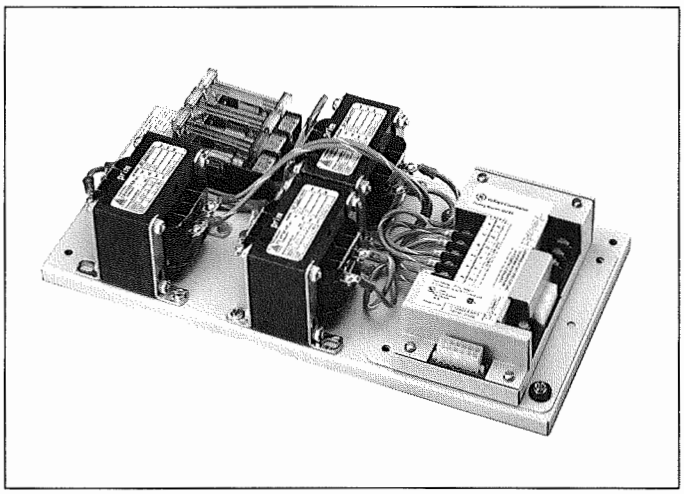
Power Supply Assembly (UL File No. E57253)
The Power Supply Assembly is used to provide +24Vdc Control Power to Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Units via the Distribution Cable System. The assembly requires a minimum input voltage of 85Vac to operate properly (the maximum voltage rating is 240Vac). The input must be fused with 1/2 amp class CC fuses (not included).

Description	Voltage Rating	Catalog Number
The Power Supply Assembly is rated 24 watts (+24Vdc @ 1.0 Amp) and has the maximum capacity to power a Distribution Cable System consisting of 20 breakers and has a maximum system cable lengthof 40 feet.	85Vac to 240Vac	SPSAA



Voltage Conditioner Plate (UL File No. E57253)
The Voltage Conditioner Plate is used to provide voltage sensing signals to Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip PM Trip Units via the Distribution Cable System. The Voltage Conditioner Plate includes the Voltage Conditioner Assembly as an integral component and includes fuse protection for the AC source input terminals and three 1-VA high accuracy potential transformers. The Voltage Conditioner Plate requires a control power source of +24Vdc (the Power Supply Assembly or Power Supply Plate can provide this required input). The unit also requires direct AC voltage inputs from the AC source. Connections allowing access to the POWER LEADER network are also provided. Seven versions are available.

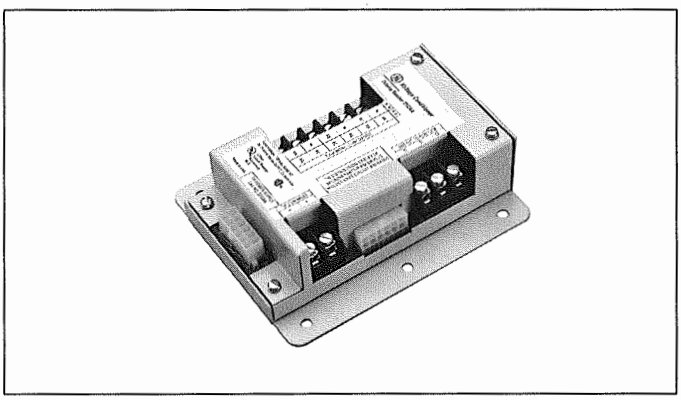
Source Voltage Rating	Comments	Catalog Number
120Vac Wye service	(Φ to N potential)	SVCA120Y
208Vac Wye service	(Φ to Φ potential)	SVCA208Y
240Vac Delta service	(Φ to Φ potential)	SVCA240D
277Vac Wye service	(Φ to N potential)	SVCA277Y
480Vac Wye service	(Φ to Φ potential)	SVCA480Y
480Vac Delta service	(Φ to Φ potential)	SVCA480D
600Vac Delta service	(Φ to Φ potential)	SVCA600D



The Voltage Conditioner Plate has the maximum capacity to provide voltage sensing signals to a Distribution Cable System consisting of 20 breakers and has a maximum system cable length of 40 feet.

Voltage Conditioner Assembly (UL File No. E57253)
The Voltage Conditioner Assembly is used to provide voltage sensing signals to Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip PM Trip Units via the Distribution Cable System. The Voltage Conditioner Assembly requires a control power source of +24Vdc (the Power Supply Assembly or Power Supply Plate can provide this required input). The assembly also requires 120Vac voltage inputs from the secondary of three 1-VA high accuracy potential transformers (not included). The primary side of the potential transformers must be fused with three - 1/2 amp class CC fuses (not included).Connections allowing access to the POWER LEADER network are also provided.

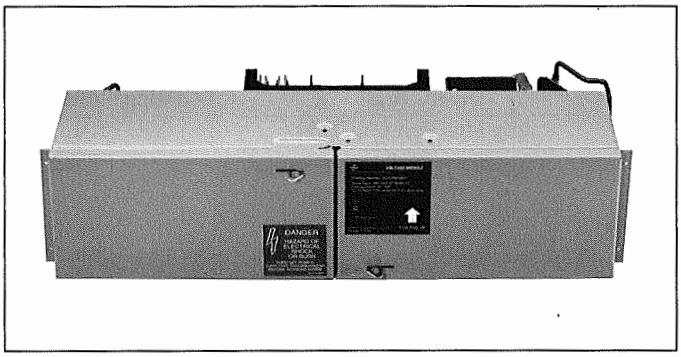
Comments	Voltage Rating	Catalog Number
Requires 120Vac voltage inputs from the secondary of three 1-VA high accuracy potential transformers	120Vac	SVCAA

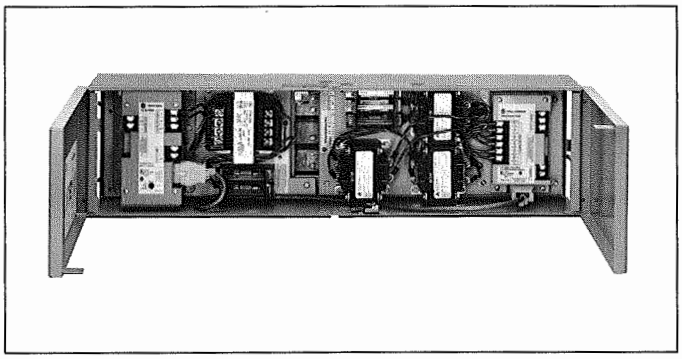


The Voltage Conditioner Assembly has the maximum capacity to provide voltage sensing signals to a Distribution Cable System consisting of 20 breakers and has a maximum system cable length of 40 feet.

Voltage Module (UL File No. E57253)
The Voltage Module is used primarily as a Spectra Series Switchboard component to provide +24Vdc Control Power to Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Units via the Distribution Cable System. The Module also provides voltage sensing signals to Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip PM Trip Units on the same Distribution Cable System. The module contains a Power Supply Plate and a Voltage Conditioner Plate with a Power Supply Assembly and a Voltage Conditioner Assembly as integral components. It has fuse protection for the ac source input terminals (the module's pressure connectors which mate with the switchboard interior bus bars). A GE POWER LEADER Network (commnet) connection is provided as well as supplemental 24Vdc input terminals for backup control power applications. Additional +24Vdc output terminals and voltage sensing output terminals are supplied for connection to Air Circuit Breakers and/or Insulated Case Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Programmers. The Voltage Module is available in seven ratings.

Source Voltage Rating	Comments	Catalog Number
120Vac Wye service	(Φ to N potential)	ADSVMA120Y
208Vac Wye service	(Φ to Φ potential)	ADSVMA208Y
240Vac Delta service	(Φ to Φ potential)	ADSVMA240D
277Vac Wye service	(Φ to N potential)	ADSVMA277Y
480Vac Wye service	(Φ to Φ potential)	ADSVMA480Y
480Vac Delta service	(Φ to Φ potential)	ADSVMA480D
600Vac Delta service	(Φ to Φ potential)	ADSVMA600D





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 breakers and has a maximum system cable length of 40 feet.

OTHER ACCESSORIES

Neutral Current Sensor

The current sensor is used in conjunction with breakers that have a MicroVersaTrip Plus or MicroVersaTrip PM trip units with the optional equipment ground fault function AND the breaker is connected to a grounded neutral service (3Φ/4W OR 1Φ/3W). The neutral current sensor provides a neutral input signal to the breaker. Breakers connected to services without a neutral (3Φ/3W) require no external connection or shorting of the breaker cable connector for ground fault to function properly.

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

MicroVersaTrip Rating Plug Removal Tool

The removal tool provides easy removal of the breaker rating plug from the breaker.

Description	Catalog Number
Rating Plus Removal Tool	TRTOOL

MicroVersaTrip Portable Power Pack.

The hand held portable power pack provides an independent power source for breakers with MicroVersaTrip Plus or MicroVersaTrip PM trip units. It is used to energize the trip unit in the breaker to set or adjust trip set points when the breaker is not otherwise powered up. The power pack connects to the trip unit circuitry through the rating plug test socket. It requires three standard 9Vdc alkaline batteries (not included).

Description	Catalog Number
Portable Power Pack	TVPBP

MicroVersaTrip Portable Test Kit

The portable, battery powered, test kit provides MicroVersaTrip Plus or MicroVersaTrip PM trip units self-tests and functional trip/no trip tests. It also provides defeat of the ground fault function and can be used in conjunction with high current test equipment. Interface is via the rating plug test socket. The kit uses six rechargeable ni-cad or standard alkaline "D" cells (not included). The test kit can also be powered by 120 volt ac source.

Description	Catalog Number
Portable Test Kit	TVRMS

UNIVERSAL FIELD-INSTALLABLE INTERNAL ACCESSORIES

Auxiliary Switch (UL File No. E57253)

The auxiliary switch provides remote indication of whether the circuit breaker main contacts are opened or closed via open or closed SPDT switch elements.

Switch Rating	Number of Switch Elements	Catalog Number
5A @ 240Vac and 0.5A @ 125Vdc	1 form C	SAUXPAB1
	2 form C	SAUXPAB2
Gold-plated Contacts 0.5A @ 30V	1 form C	SAUXGAB1
	2 form C	SAUXGAB2

Shunt Trip (UL File No. E57253)

The shunt trip provides remote tripping of the breaker, use with momentary close contact. Not for use with latching relay contact. Maximum VA is 75.

Voltage		Current (mA)		
ac	dc	inrush	cont.	Catalog Number
120	125	500	6.0	SAST1
240	250	400	5.0	SAST2
24	24	300	10.0	SAST3
48	48	300	10.0	SAST4

Undervoltage Release (UL File No. E57253)

The undervoltage release provides automatic breaker tripping when there is a loss or major dip (35% to 70%) in accessory control voltage.

Voltage			
ac	dc	Peak Current (mA)	Catalog Number
120	125	500	SAST1
240	250	400	SAST2
24	24	300	SAST3
48	48	300	SAST4

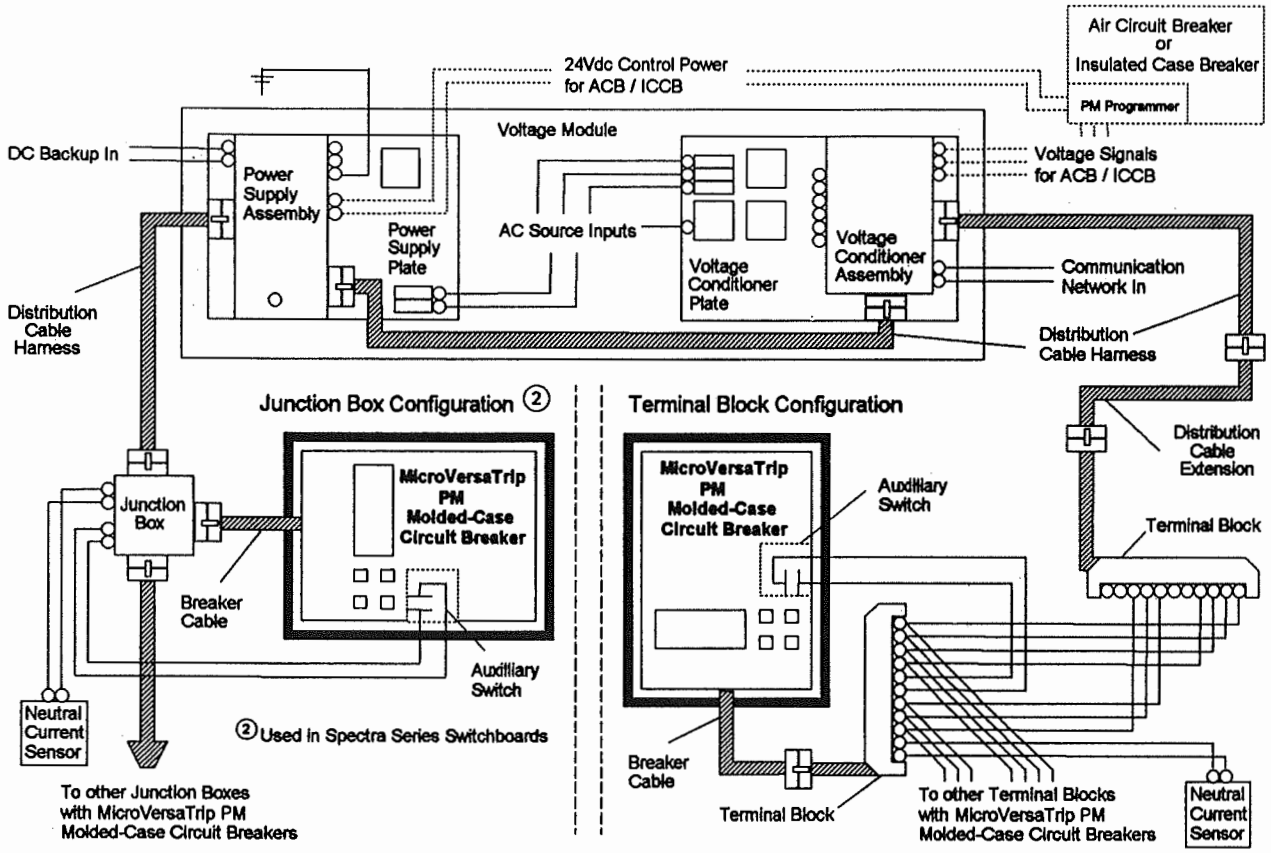
Bell Alarm Switch (UL File No. E57253)

The bell alarm provides remote indication of whether the circuit breaker has tripped via open or closed SPDT switch elements. It remains unchanged during "ON/OFF" breaker operation and during operation by the "Push-to-trip" button.

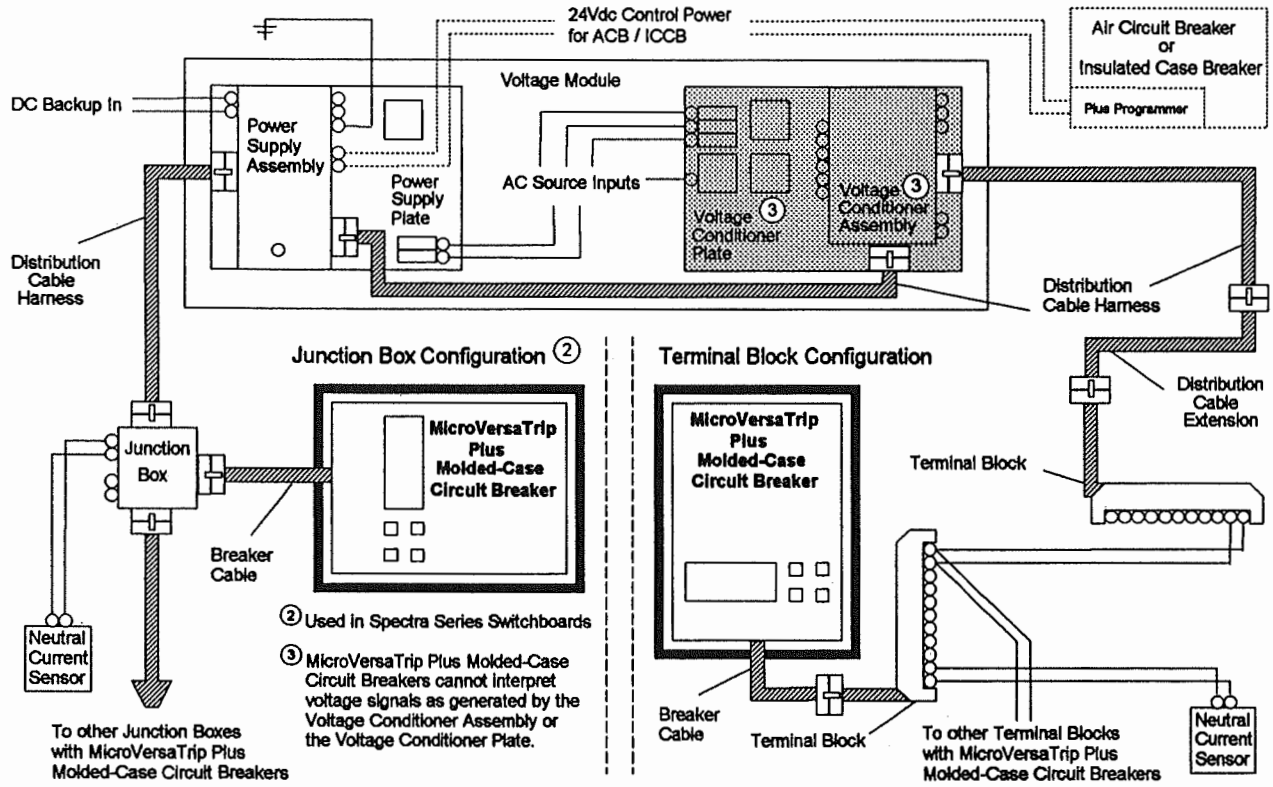
Switch Rating	Number of Switch Elements	Catalog Number
5A @ 240Vac and 0.5A @ 125Vdc	1 form C	SABAP1
Gold-plated Contacts 0.5A @ 30V	1 form C	SABAG1

WIRING CONNECTIONS

Typical MicroVersaTrip PM Trip Unit System detailing the Spectra RMS Circuit Breaker①.



Typical MicroVersaTrip Plus Trip Unit System detailing the Spectra RMS Circuit Breaker①.



① System limits: 20 breakers with MicroVersaTrip PM Trip Unit and/or MicroVersaTrip Plus Trip Unit, 40 feet total cabling length.

GUIDE FORM SPECIFICATIONS

General

Circuit breakers shall be General Electric Spectra RMS Molded-Case Circuit Breakers or equal and shall be UL Listed in accordance with UL Standard 489. The breaker shall contain a digital solid state, ambient insensitive trip unit. The microprocessor based trip unit shall accurately sense sinusoidal and non-sinusoidal current waveforms (fundamental through the 40th harmonic order on a 60 hertz base) by continuously sampling each phase throughout every cycle.

All molded case circuit breakers shall have an over-center, toggle handle-operated, trip-free mechanism with quick-make, quick-break action independent of the speed of the toggle handle operation. The designs shall provide common tripping of all poles. Breaker frame sizes SG600 (with internal current sensors of 150A, 400A and 600A) and SK1200 (with internal current sensors of 800A and 1200A) shall use field-installed, UL Listed rating plugs to establish (or change) the ampere rating. Rating plugs shall cover all standard ampere ratings (SG600 frame rating plug range shall be 60A to 600A, SK1200 frame rating plug range shall be 300A to 1200A). A breaker (frame/current sensor combination) shall reject a rating plug not intended for use in it. All breakers shall be suitable for reverse feed (i.e. no line/load markings). The minimum interuption rating shall be 35kA@480Vac.

A single four button keypad with integral liquid crystal display (LCD) shall be used to establish (or change) the adjustable pickup and delay characteristic responses for the trip unit. The LCD display shall include multiple segments allowing visual indication of the type of setpoint, magnitude of setpoint, status of trip unit and local indication of any trip event.

Circuit breaker frames shall employ high-strength, molded-glass-reinforced polyester cases and covers. All breaker frame sizes shall have a Verifier or equal to provide an external means for manually tripping the breaker and exercising the mechanism and trip latch member.

Internal accessories shall be UL Listed for field installation and shall not require circuit breaker cover removal. All internal accessories shall be common to all Spectra RMS molded-case breaker frame sizes. Shunt trips, undervoltage releases, auxiliary switches and bell alarms shall be available and shall install from the front of the circuit breaker.

External accessories, such as motor-operated mechanisms, various handle operators, plug-in base assemblies, back-connected studs, etc., shall be UL Listed for field installation on circuit breakers.

MicroVersaTrip Plus trip unit shall include as standard:

- True RMS current sensing for long time characteristics
- Time current characteristic adjustments via digital keypad and LCD readout for maximum reliability and setting accuracy.
- Rating plugs for application flexibility.
- Adjustable long-time current pickup settings of 0.5 to 1.0 of rating plug value (**X**) with a minimum of 11 setpoints.
- Adjustable long time delay with 3 bands for SG600 frame and 4 bands for SK1200 frame.
- Integral long-time pickup indicator.
- Adjustable instantaneous pickup settings of 1.5 to 10.0 of breaker current setting (**C**) with a minimum of 18 setpoints.
- Integral test provisions of the trip unit, easily available through the rating plug test socket.
- Selectable phase ammeter display.
- OVERLOAD trip and SHORT CIRCUIT trip target indicators.

MicroVersaTrip Plus Optional Functions:

- True RMS sensing short-time characteristics.
- Adjustable short-time pickup settings of 1.5 to 9.0 of breaker current setting (**C**) with a minimum of 16 setpoints.
- Adjustable short time delay with 8 bands (4 bands with I^2t ramp IN and 4 bands with I^2t ramp OUT).
- True RMS sensing ground fault characteristics.
- Adjustable ground fault pickup settings of 0.2 to 1.0 of breaker sensor rating (**S**) with a minimum of 17 setpoints.
- Adjustable ground fault delay with 8 bands (4 bands with I^2t ramp IN and 4 bands with I^2t ramp OUT).

(Trip Units equipped with the ground fault option will also have integral GROUND FAULT trip indication)

MicroVersaTrip PM trip unit shall include as standard:

- All the standard features of the MicroVersaTrip Plus trip unit.
- Local display of the following metering functions:
  - Current (A/kA) selectable phase
  - Voltage (V) selectable phase in line-to-line or line-to-neutral
  - Energy (kWh/MWh)
  - Real Power (kW/MW) selectable line-to-line or line-to-neutral
  - Apparent Power (kVA/MVA) selectable line-to-line or line-to-neutral
  - Frequency (Hz) selectable phase
- Communication capability for all metering, event signaling, status indication and trip unit setpoints on to the POWER LEADER communication network (commnet).

MicroVersaTrip PM Optional Functions:

- True RMS sensing short-time characteristics.
- Adjustable short-time pickup settings of 1.5 to 9.0 of breaker current setting (**C**) with a minimum of 16 setpoints.
- Adjustable short time delay with 8 bands (4 bands with I^2t ramp IN and 4 bands with I^2t ramp OUT).
- True RMS sensing ground fault characteristics.
- Adjustable ground fault pickup settings of 0.2 to 1.0 of breaker sensor rating (**S**) with a minimum of 17 setpoints.
- Adjustable ground fault delay with 8 bands (4 bands with I^2t ramp IN and 4 bands with I^2t ramp OUT).

(Trip Units equipped with the ground fault option will also have integral GROUND FAULT trip indication)

- Protective relaying functions
  - Voltage Unbalance (adjustable pickup, adjustable delay or OFF)
  - Current Unbalance (adjustable pickup, adjustable delay or OFF)
  - Undervoltage (adjustable pickup, adjustable delay or OFF)
  - Overvoltage (adjustable pickup, adjustable delay or OFF)
  - Power Reversal (adjustable pickup, adjustable delay or OFF)

(communication capability for event signaling, and trip unit setpoints for protective relay option is standard with Protective Relay option).

Network/System Functions

When the breaker is connected to a host PC equipped with POWER LEADER Distribution Software, the following functions shall be available at the host PC:

Event/Status Information:

- Event (trip) information shall be detailed with magnitude, phase and date/time stamp
- User defined notes (maintenance records, trip event details, etc.)

Metering Functions:

- Current (A)
- Voltage (V)
- Energy (kWh)
- Real Power (kW)
- Apparent Power (kVA)
- Frequency (Hz)
- Reactive Power (kVAR)
- Power Demand (kW)
- Peak Power Demand (kW)
- Total Real Power (kW)
- Total Reactive Power (kVAR)
- Total Apparent Power (kVA)
- Power Factor
- Energy collection information (user defined as accumulate, trend or disable with a choice of 15, 30 or 60 minute demand interval)

Trending Information:

- Single phase parameters (user defined interval of 15, 30 minutes, 1, 2, 3, 5, 8, 12, 24 hours, 1, 4 week)
  - Current (A)
  - Voltage (V)
  - Real Power (kW)
  - Reactive Power (kVAR)
  - Apparent Power (kVA)
- Three phase parameters (user defined interval of 15, 30 minutes, 1, 2, 3, 5, 8, 12, 24 hours, 1, 4 weeks)
  - Real Power (kW)
  - Reactive Power (kVAR)
  - Apparent Power (kVA)
  - Power Factor
  - Frequency (Hz)

Independent Alarm (no-breaker trip)

(user defined interval of 15 minute, 30 minute, 1 hour or 8 hours and choice of minimum or maximum threshold):

- Current (A all phases)
- Voltage (V all phases as line-to-line or line-to-neutral)
- Real Power (kW all phases)
- Total Real Power (kW)
- Reactive Power (kVAR all phases)
- Total Reactive Power (kVAR)
- Apparent Power (kVA all phases)
- Total Apparent Power (kVA)
- Power Factor
- Power Demand (kW)
- Energy (kWh)

When the breaker is connected to a POWER LEADER Monitor the following Event Information shall be available at the Monitor:

Event/Status Information:

- Status (OPEN, CLOSED, TRIPPED)
- Trip information (OVERCURRENT, SHORT CIRCUIT, GROUND FAULT)

Metering Functions:

- Current (A)
- Voltage (V)
- Real Power (W)
- Reactive Power (VAR)
- Apparent Power (VA)
- Power Factor
- Energy (Wh)
- Power Demand (W)
- Frequency (Hz)

RELATED REFERENCE PUBLICATIONS

User's Manuals and Instruction Sheets

GEH-5959	Spectra RMS SG Frame Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit
GEH-5960	Spectra RMS SK Frame Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit
GEH-5934	MicroVersaTrip Plus and MicroVersaTrip PM Trip Units in Spectra RMS Molded-Case Circuit Breakers
GEH-5887	Rating Plug for Spectra RMS Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit
GEJ-3052	Lug Kits for Types SG
GEJ-4656	Lug Kits For Types SK
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-6255	Distribution Cable Harness
GEH-6256	Distribution Cable Extension
GEH-6257	Distribution Cable Terminal Block
GEH-6258	Distribution Cable Junction Box
GEH-5551	Internal Accessories - Shunt Trip and Undervoltage Release
GEH-5593	Internal Accessories - Auxiliary Switch and Bell Alarm
GEK-97367	Digital Test Kit for MicroVersaTrip - Trip Units
DEJ-001	Portable Power Pack

Other Publications

DEM-066	Outline Drawing for Spectra RMS SG Frame Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit
DEM-067	Outline Drawing for Spectra RMS SK Frame Molded-Case Circuit Breakers with MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit
GES-9867	Time-Current Curve for Spectra RMS Molded-Case Circuit Breakers Type SG and SK with MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit (LSI)
GES-9868	Time-Current Curve for Spectra RMS Molded-Case Circuit Breakers Type SG and SK with MicroVersaTrip Plus or MicroVersaTrip PM Trip Unit (G)

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

GE Electrical Distribution & Control

General Electric Company
41 Woodford Ave., Plainville, CT 06062

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