

Electronic Trip Units

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Circuit Breakers

Two types of interchangeable trip units for the SB Encased Systems Breakers are available. The basic type "TL" Trip Unit features a full range of industry standard protective settings and the high-performance Systems Breaker Energy Communicating Trip Unit (SB-EC Trip Unit) offers advanced metering, protective relaying, time-stamped logs, and power quality monitoring functions, including an integral keypad and LCD graphical display for menu-driven system configuration and real-time voltage

and current waveform displays. Both units offer unique models to provide an efficient combination of options versus cost for every application.

Interchangeable Rating Plugs

SB Breaker trip units use field interchangeable rating plugs allowing the effective ampere rating of the circuit breaker to be field-modified and provides security against indiscriminate changes in the breaker's ampere rating.

Advanced True RMS Current Sensing

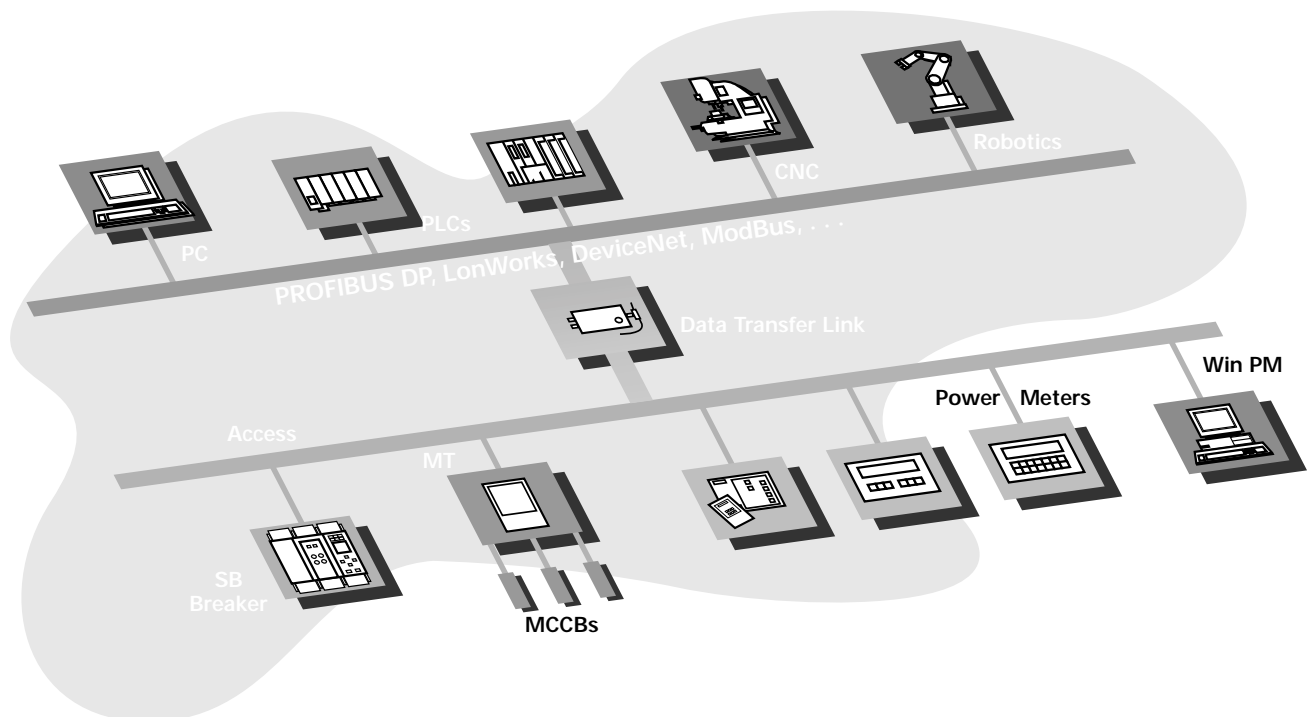
Both the basic type "TL" and the premium SB-EC Trip Unit feature advanced digital-processing techniques to measure the true heating content of the current waveform. This True RMS value of current measurement virtually eliminates nuisance tripping due to the presence of harmonics on the distribution bus.

Communications

All SB Circuit Breaker trip units feature two levels of communication: Zone Selective Interlocking and ACCESS™ System Open-protocol communications, allowing integration into Siemens WinPM™ V4.0 supervisory software, along with other popular third party energy monitoring networks and components. WinPM™ V4.0 delivers a powerful energy management system providing sophisticated monitoring capability to a host computer and other components in the electrical distribution system at an affordable cost. It also provides process

control, including peak demand, trend analysis, waveform analysis, and harmonic calculations and displays. These functions help pinpoint energy consumption, power quality issues, and the energy cost of any process. Outages and potential outages can be quickly diagnosed and plans can be generated for expansion and preventative plant maintenance. Communications is accomplished via EIA-485 twisted pair wire or modem, providing communications to a remote site and allowing access to multiple plants. WinPM™ utilizes a Windows DDE (dynamic data exchange) server that allows data

exchange to other Windows software such as spreadsheets and word-processors. Protocol Converters are available from Siemens for connection to a variety of open and proprietary automation protocols, including Profibus DP, LonWorks, the Siemens S7 PLC, and many other third party PLCs and associated networks. The SB-EC Trip Unit's EIA-232 communications port provides additional local PC communications for available trip unit data displays and trip unit configuration via Siemens SBWin™ software.

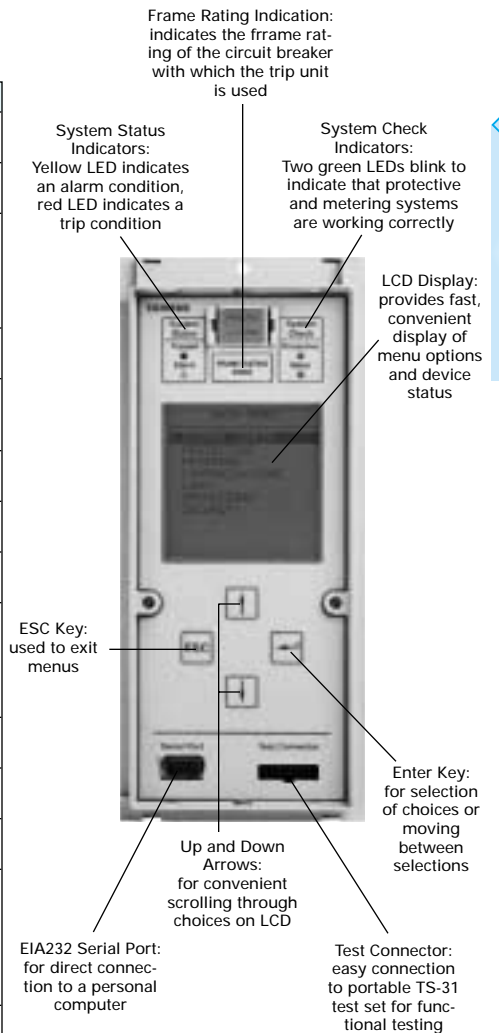




SB-EC Trip Unit

Features by Model Type

Feature	SBxxTP01	SBxxTP01G	SBxxTP02	SBxxTP02G
Integral Keypad & Display Voltage/Current Waveform Displays	✓	✓	✓	✓
Protective Functions Long Time, Short Time, Instantaneous	✓	✓	✓	✓
Metering Functions Volts, Amps, PF, Frequency, Watts, VARs, VA, Crest Factor, Amp and Watt Demand, Voltage and Current Waveforms, Voltage and Current Unbalance	✓	✓	✓	✓
Communications PC (RS-232), ACCESS (RS-485)	✓	✓	✓	✓
Counters Breaker Test (Trip/No Trip), Mechanical Counter, Interruption Level Fault Counter	✓	✓	✓	✓
Security Password Protection	✓	✓	✓	✓
Event Log Time-stamped—10 Most Recent Events	✓	✓	✓	✓
Trip Log Time-stamped—5 Most Recent Events	✓	✓	✓	✓
Alarms (Alarm Only) Overcurrent, Gnd. Overcurrent, Over Amp Demand, Over kW Over kW Demand, Phase Sequence, Over KVAR, Over KVA, Under/Over P.F.	✓	✓	✓	✓
Advanced Alarms Total Harmonics			✓	✓
Min./Max. Logs Volt/Amp, Power, PF, Freq., %THD			✓	✓
Harmonic Analysis Up to 19th Per Phase, THD			✓	✓
Protective Relay Functions (Alarm and/or Trip) Neutral Overcurrent, Current Balance, Under/Over Voltage, Voltage Unbalance, Reverse Power, Under/Over Frequency, Phase Loss			✓	✓
Ground Fault Protection Residual or Ground Return		✓		✓



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Wave Form Displays

The SB-EC Trip Unit offers digital waveform sampling as a standard feature that allows a real-time graphical view of a complete cycle of line and neutral currents or phase voltages, including voltage and current phase relationships and harmonic distortion. On-board harmonic analysis functions are available on premium units, allowing harmonic analysis up to the 19th multiple and permitting the data to be viewed and examined on the integral LCD graphical panel. Sampled data can also be stored in memory and transmitted to a PC via the serial communications port, using Siemens WinPM™ Version 4.0 or later

Further Information
Refer to SB Encased Systems Breaker Bulletin IPPS-2209A for additional price and catalog information. SB-EC Trip Unit Product Bulletins are also available (IPPS-2208A, IPFL-2207A).

or SBWin™ Software to display the waveforms and automatically perform harmonic analysis using Fast Fourier transformation techniques. Both the resident trip unit and the PC-based harmonic analysis functions provide the value of Total Harmonic Distortion (THD) of the waveforms and are useful in locating the source and severity of harmonics and developing corrective strategies.

Remote Operation

Remote, automatic open and close operation of the breaker is possible via the trip unit's EIA-232 or EIA-485 communication ports or a hard-wire input. For remote operation via a communica-

tion port, WinPM Version 4.0 or later, Shunt Trip and Remote Open/Close Relay accessories are required for the remote open function, and an Electrical Operator accessory is required in addition for both remote open and close operations.

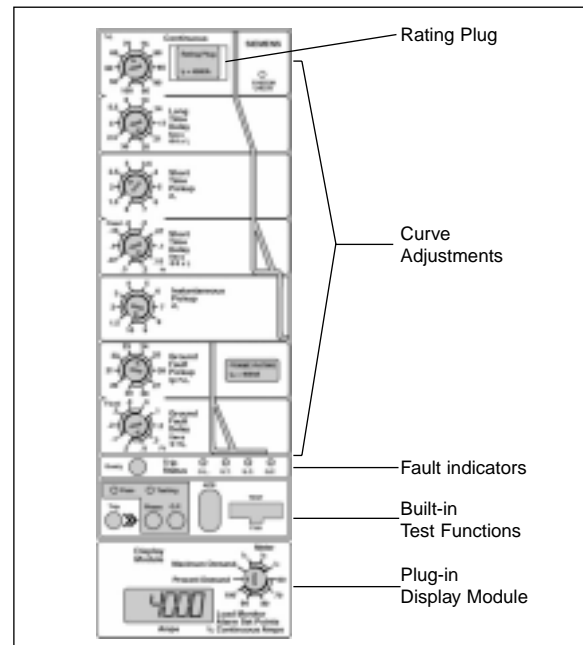
For remote operation via a hard-wire input, only a Shunt Trip accessory is necessary for the remote open function, and an Electrical Operator is additionally required for both remote open and close operations.



Basic Type "TL" Trip Unit

Available Type "TL" Features by Model^②

Trip Unit Function	Catalog Number					
	SB ^③ T ^④					
Adjustable Continuous Current	✓	✓	✓	✓	✓	✓
Adjustable Long Time Delay	✓	✓	✓	✓	✓	✓
Adjustable Short Time Pickup		✓	✓		✓	✓
Adjustable Short Time Delay (I ² T)		✓	✓		✓	✓
Adjustable Short Time Delay (Fixed)		✓	✓		✓	✓
Adjustable Instantaneous Pickup	✓	✓		✓		✓
Adjustable Ground Fault Pickup ^⑤				✓	✓	✓
Adjustable Ground Fault Time Delay (I ² T) ^⑤				✓	✓	✓
Adjustable GF Time Delay (Fixed) ^⑤				✓	✓	✓
Fixed Instantaneous Override	✓	✓	✓	✓	✓	✓
Internal Watchdog	✓	✓	✓	✓	✓	✓
Integral Testing Functions	✓	✓	✓	✓	✓	✓
Local Trip Indication:						
Overload	✓	✓	✓	✓	✓	✓
Short Time		✓	✓		✓	✓
Short Circuit	✓	✓	✓	✓	✓	✓
Ground Fault		✓	✓	✓	✓	✓
Access Communications Compatibility ^⑥	✓	✓	✓	✓	✓	✓
Catalog Number Suffix ^⑥	LI	LSI	LS	LIG	LSG	LSIG



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The interchangeable trip unit system of the SB breaker showcases the latest advancements in microprocessor controlled circuit protection technology. Using the speed and power of its microprocessor to drive sophisticated digital sampling techniques, the SB trip unit measures the true heating content of the current waveform (RMS current) hundreds of times each second, effectively eliminating nuisance tripping due to the presence of harmonics and other "noise" on the system.

All standard trip units feature:

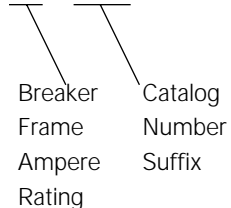
- Integral Testing Functions
- Built-in Trip Indicators
- Instantaneous "Override"
- Continuous Self-Diagnostic "Watchdog"
- System LED on front cover

Available protective function adjustments include:

- Continuous Current
- Long Time Delay
- Short Time Pickup and Delay
- Instantaneous Pickup
- Ground Fault Pickup and Delay

Choose the appropriate function package and catalog number as shown below:

Example: SB 20 T L S G



2000 ampere breaker ampere rating with:

- Adjustable Continuous Current
- Adjustable Long Time Delay
- Adjustable Short Time Pickup and Time Delay
- Adjustable Ground Fault Pickup and Time
- Delay Breaker Ampere Ratings: 04=400, 08=800, 12=1200, 16=1600, 20=2000, 25=2500, 32=3200, 40=4000

^①Consult Siemens Sales Office for pricing or refer to SB Encased Systems Breaker Bulletin IPPS-2209A for additional price and catalog information. (SB-EC Trip Unit Product Bulletins are also available IPPS-2208A, IPFL-2207A).

^②For 3 phase, 4 wire systems, order correct 4th wire (neutral) transformer as separate item.

^③Expansion Plug and Multiplexer/Translator required.

^④Insert appropriate breaker frame ampere rating designation into catalog number. See example below.

^⑤Add appropriate catalog number suffix as required. See example below.