Systems Pow-R Breaker
With Pow-R TRIP 7

Approximate Weights, Lbs.

Frame Rating Amperes	Fixed Mounted Breakers	Drawout Mounted Breakers	
		Drawout Element Only	Drawout Stationary Frame
250-800	100	110	85
1600	120	133	95
2000-3000	185	207	105

Further Information
List Prices: Price List 29-820

Westinghouse Electric Corporation
Low Voltage Breaker Division
Beaver, Pennsylvania U.S.A. 15009

Printed in USA

Systems Pow-R Breaker
With Digitrip RMS Trip Unit

Introduction

The Westinghouse Systems Pow-R Breaker, the world's first encased power breaker, now includes a new family of Westinghouse microprocessor-based trip units called Digitrip RMS.

The Systems Pow-R Breaker with Digitrip RMS affords the Consulting Engineers, the Switchboard Assemblers, and the users with opportunities to improve systems control, monitoring, testing, and circuit protection while providing for present and future energy monitoring and remote communications requirements.

Application

Systems Pow-R Breakers can be applied as individual breakers in separate enclosures or in switchboards as mains, ties and feeder breakers. They can be applied in low voltage distribution systems through 600 volts AC, 50 or 60 Hertz. Because they combine high interrupting capacity with short-time delay tripping, Systems Pow-R Breakers can be applied in fully rated, selective systems while providing full selectivity through the applied breaker's short-time rating.

Features

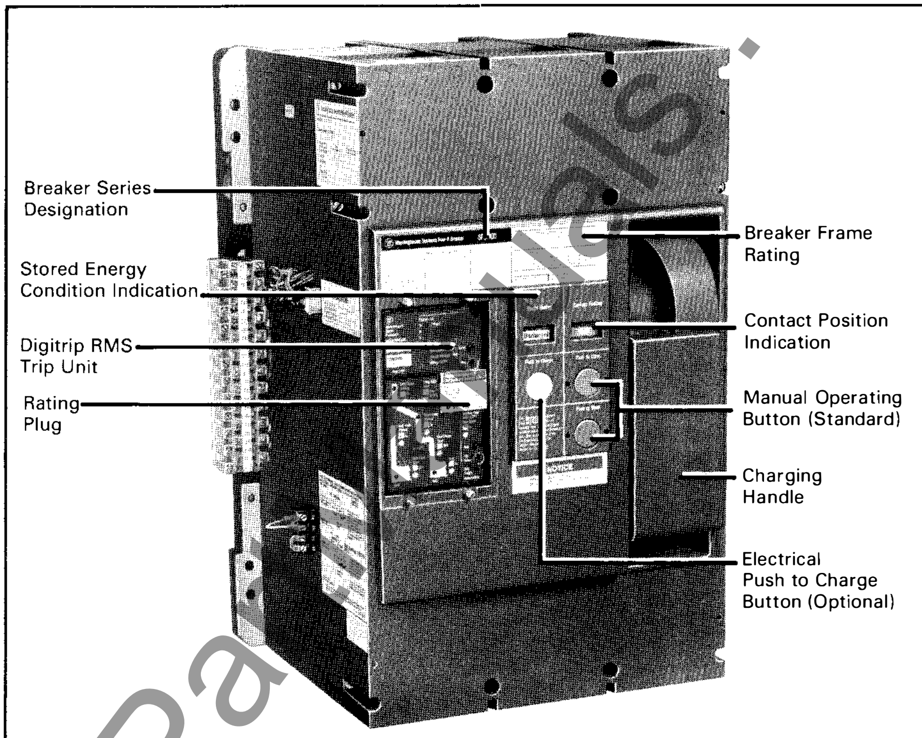
Systems Pow-R Breaker features most beneficial to users:

- Underwriter's Laboratory label
- High interrupting capacity without fuses
- Increased short-time ratings for system continuity
- 100% rated
- Application flexibility of "options oriented" design
- Safety considerations for personnel and equipment
- Maximum five cycle closing
- Selective curves for greater coordination
- Integral testing
- Remote communications and control
- Energy monitoring
- Compact size and layout flexibility
- Compliance with various local and national codes
- I^2t or flat response curves on short-time and ground fault
- True RMS current sensing
- Mode of trip information

Description

The Systems Pow-R Breakers are identified by four series: SPB-50, SPB-65, SPB-100 and SPB-150. The numbers after the SPB refer to the interrupting capacity in thousands of rms symmetrical amps at 480 volts AC without fuses. All are U.L. listed per UL 489. Complete interrupting ratings are shown in Table 1. Non-Automatic ratings are shown in Table 3.

The Systems Pow-R Breaker family consists of fixed breakers — either front connected or rear connected and drawout breakers — either behind the door or through the door design. Four pole breakers are only available in the fixed design — front or rear connected. The available frame size for each of the breaker series are shown in Table 2.



Systems Pow-R Breakers with Digitrip RMS

Table 1: Interrupting Ratings Table for Systems Pow-R Breakers with Digitrip RMS Trip Unit

Series		SPB-50	SPB-65		SPB-100						SPB-150					
Frame Continuous Ampere Rating		400A 800A	1200A	1600A 2000-CA②	400A 800A	1200A	1600A 2000-CA②	2000A 2500A	3000A	4000A 5000A	400A 800A	1200A	1600A 2000-CA②	2000A 2500A	3000A	4000A 5000A
Short-Time Rating with Selective Override①		25KA	35KA	35KA	25KA	35KA	35KA	35KA	35KA	65KA	25KA	35KA	51KA	51KA	51KA	85KA
Maximum Short-Time Delay Setting (Seconds)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Interrupting Capacity KA RMS Symmetrical Amps Ⓦ AC Rating Volts	240V	65	85	85	100	100	100	100	100	100	200	200	200	200	200	200
	480V	50	65	65	100	100	100	100	100	100	150	150	150	150	150	150
	600V	42	42	50	50	50	85	85	85	85	100	100	100	100	100	100

Table 2: Frame Size in Amperes for Systems Pow-R Breakers with Digitrip RMS Trip Unit

Breaker Series	Fixed Breakers		Drawout Breakers	
	Front Connected	Rear Connected	Behind Door	Through Door
SPB-50	400 800	400 800	400 800	400 800
SPB-65	1200 1600 2000-C②	1200 1600 2000-C②	1200 1600 2000-C②	1200 1600 2000-C②
SPB-100 and SPB-150 ③	400 800 1200 1600 2000-C② 2000 2500 3000 4000	400 800 1200 1600 2000-C② 2000 2500 3000 4000 5000	400 800 1200 1600 2000-C② 2000 2500 3000 4000	400 800 1200 1600 2000-C② 2000 2500 3000

① Short-time rating (RMS symmetrical amps) in 600V, 50/60 Hz system with X/R ratio of 6.6.
② 2000-C designates 2000 amp rating in a 16 inch high frame.
③ Not available on through door design.
④ Must be protected within this time by some other device.

Table 3: Non-Automatic Switch Application Guide

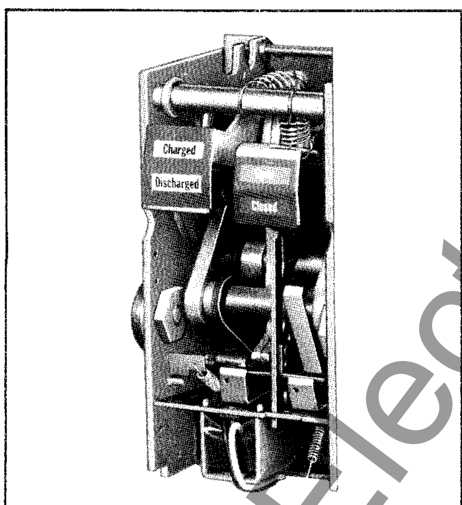
Switch Rating	Application With Fuses			Application Without Fuses
	Max. Fuse Rating	Fuse Class	Maximum Short Circuit RMS Symmetrical	Maximum Short Circuit RMS Symmetrical For a Maximum of 1.0 Seconds④
Standard Withstand (SPBN)				
250	250	K5	200,000-480/600 Volts	35,000-480/600 Volts
800	800	L	200,000-480/600 Volts	35,000-480/600 Volts
1200	1200	L	100,000-480/600 Volts	35,000-480/600 Volts
1600	1600	L	35,000-480/600 Volts	35,000-480/600 Volts
2000C②	2000	L	35,000-480/600 Volts	35,000-480/600 Volts
2000	2000	L	35,000-480/600 Volts	35,000-480/600 Volts
2500	2500	L	35,000-480/600 Volts	35,000-480/600 Volts
3000	3000	L	35,000-480/600 Volts	35,000-480/600 Volts
4000	4000	L	65,000-480/600 Volts	65,000-480/600 Volts
5000	5000	L	65,000-480/600 Volts	65,000-480/600 Volts
High Withstand (SPBNH)				
250	250	K5	200,000-480/600 Volts	50,000-480/600 Volts
800	800	L	200,000-480/600 Volts	50,000-480/600 Volts
1200	1200	L	200,000-480/600 Volts	50,000-480/600 Volts
1600	1600	L	100,000-480/600 Volts	50,000-480/600 Volts
2000C②	2000	L	100,000-480/600 Volts	50,000-480/600 Volts
2000	2000	L	100,000-480/600 Volts	50,000-480/600 Volts
2500	2500	L	50,000-480/600 Volts	50,000-480/600 Volts
3000	3000	L	50,000-480/600 Volts	50,000-480/600 Volts
4000	4000	L	85,000-480/600 Volts	85,000-480/600 Volts
5000	5000	L	85,000-480/600 Volts	85,000-480/600 Volts

Standard Features

U.L. Listing for 100% application All Systems Pow-R Breakers are suitable for continuous operation at 100% of the frame rating. Thus, the Systems Pow-R Breaker, including the load size bus or cable, can be sized to connected load, eliminating need for oversizing as with conventional overcurrent devices.

Uniform Appearance All fixed mounted Systems Pow-R Breaker ratings have the same depth. All drawout mounted Systems Pow-R Breaker ratings have the same depth. Breakers with 400A to 3000A frames have the same width and pole spacings for both manual and electrically operated units. The 4000A and 5000A ratings are larger but both manual and electrically operated units have the same width and pole spacings. These designs permit simplified bus arrangements and assembly layouts.

True Two-Step Stored Energy Mechanism Both mechanical and electrically operated versions feature a true two-step stored energy mechanism with no change in dimensions. This mechanism allows maximum five cycle closing usually required for generator paralleling.



Breaker Mechanism

Solid State Trip Unit The Systems Pow-R Breaker uses the Digitrip RMS solid state trip unit. This technologically advanced microprocessor-based trip unit has four models. They are numbered 500, 600, 700 and 800. The differences are described in Table 5, page 7.

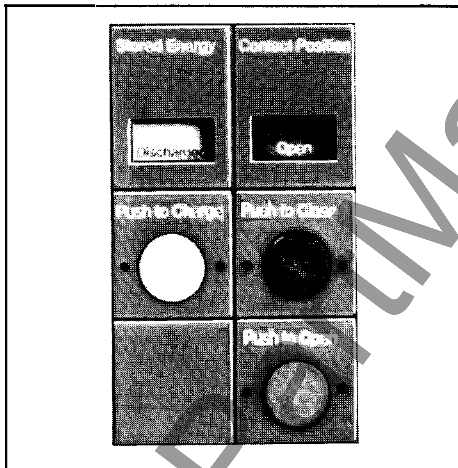
Continuous Rating Plugs Rating plugs establish the nominal maximum continuous ampere rating of the breaker. They plug into the trip unit and are interchangeable between compatible breaker ratings thus eliminating the need to change sensor rating. Rating plugs offer multiple layers of protection interlocking.

Breaker Status Indicators Color coded visual indicators are provided to indicate position of contacts:

Open — White letters on green background
Closed — White letters on red background

And closing spring status:

Charged — Black letters on yellow background
Discharged — Black letters on white background



Operating Panel

Common Wiring Diagram All Systems Pow-R Breakers with Digitrip RMS use the same wiring diagram regardless of the number of attachments requested. This common wiring diagram simplifies the equipment assembler's task of preparing his schematic diagram.

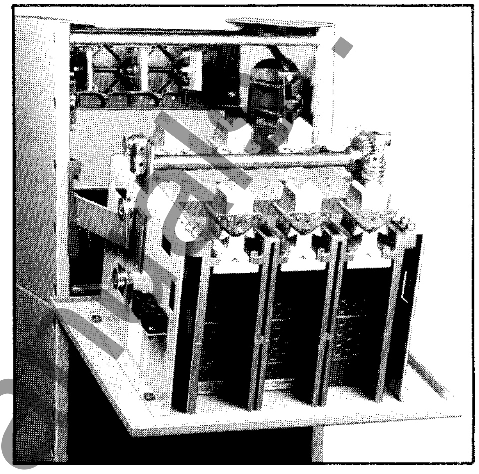
Durability The Systems Pow-R Breaker meets or exceeds UL endurance ratings as listed in Table 4.

Table 4: UL Endurance Ratings

Amperes	Full Load Interruptions	No Load Operations	Total Operations
400	1000	5000	6000
800	500	3000	3500
1200	500	2000	2500
1600	500	2000	2500
2000-C①	500	2000	2500
2000	500	2000	2500
2500	500	2000	2500
3000	400	1100	1500
4000	400	1100	1500
5000	400	1100	1500

① 2000-C designates 2000 amp rating in a 16 inch high frame.

Ease of Maintenance Drawout Systems Pow-R Breakers with Digitrip RMS 400A thru 3000A frame may be rotated 180° in the fully withdrawn position for access to main and secondary disconnects.



Breaker Rotated 90°

Operation

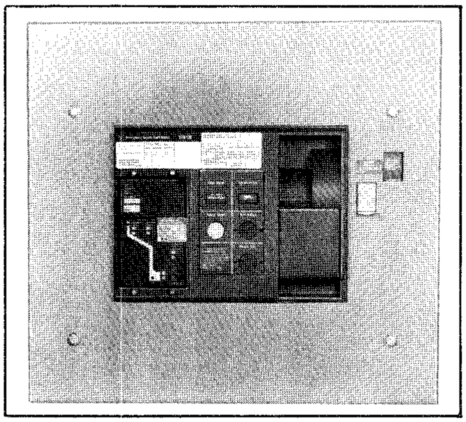
The solid state trip unit is the heart of the Systems Pow-R Breaker. Sensors continuously monitor the load current flow thru each phase and ground (if present). The outputs from the sensors go to the trip unit. The trip unit employs microprocessor-based technology that provides true RMS current values. The primary function of the Digitrip RMS Trip Unit is circuit protection. This is achieved by analyzing the sensor signals, comparing them to pre-set system coordination values and initiating trip signals to a special low-energy flux transfer shunt trip. This shunt trip requires no external control power to trip the breaker.

Time/Current System Coordination Adjustments
The standard Digitrip RMS Trip Unit provides adjustable long time and instantaneous settings (LI). Other coordination curves are available as an option:

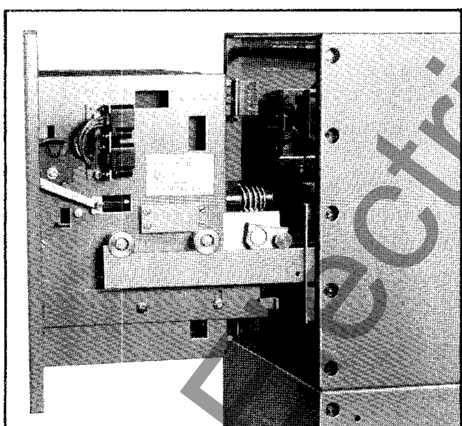
Long Time/Short-Time	LS
Long Time/Short-Time/Instantaneous	LSI
Long Time/Instantaneous/Ground	LIG
Long Time/Short-Time/Ground	LSG
Long Time/Short-Time/Instantaneous/Ground	LSIG

LS and LSG curves are provided with selective over-ride. This is a high set non-adjustable instantaneous value to protect the breaker. Short-time and ground adjustments may be set for a flat or I^2t curve. LEDs placed in the time-current curves depicted on the face of the trip unit provide mode of trip indications.

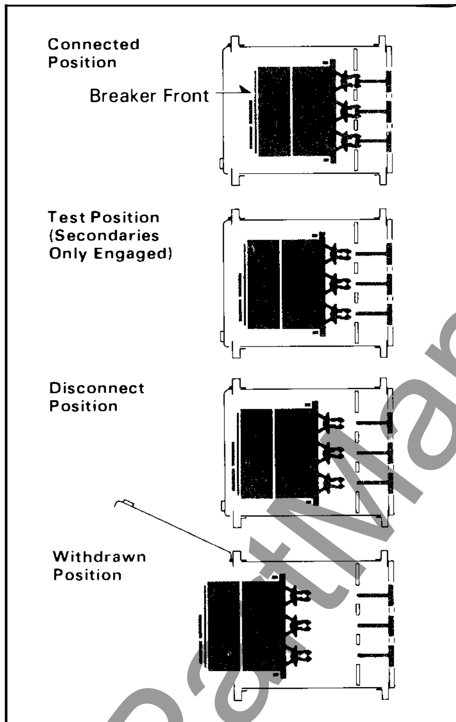
Draw-out Mounting
Systems Pow-R draw-out assemblies consist of a stationary frame and a moving carriage with four positions: Connected, Test, Disconnected and Fully Withdrawn. Extension rails and racking mechanism are part of the draw-out assembly and are self contained. The operating handle is a standard commercially available socket wrench with ratchet. The draw-out mechanism is mechanically interlocked with the breaker draw-out element so that the breaker cannot be racked in or out of the connected position with its main contacts closed. Drawout breakers have two designs: Behind the door design and through the door design.



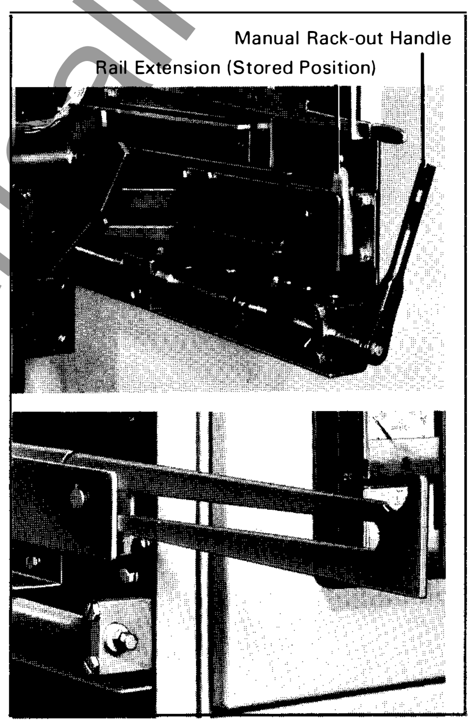
Behind the Door Design



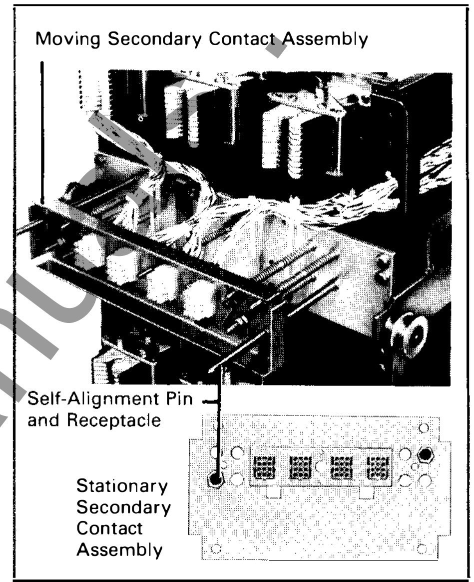
Behind the Door Design in Withdrawn Position



Breaker Positions



Extension rail drawn-out



Secondary contacts having a maximum of 48 points are located at the rear of the draw-out element. Engagement of secondary contacts is assured by automatic self-alignment and positive contact of mating parts.

Charging and Closing of Stored Energy Mechanism
The two-step stored energy system employed by the Systems Pow-R Breaker provides maximum five cycle closing, either manually or electrically operated. The charging and closing actions in the mechanism utilize separate operating shafts, which allow design optimizing of the components in each portion of the mechanism.

Manual charging is accomplished by a constant-force charging handle, using four full strokes or several partial inching strokes as desired. Electrical charging by a motor-driven operator is available as an option.

Both manual and electrically operated breakers have multiple charge-close provisions which makes possible the charge-close-recharge-open-close-open sequence. As a safety feature, the stored energy can be discharged without closing the breaker.

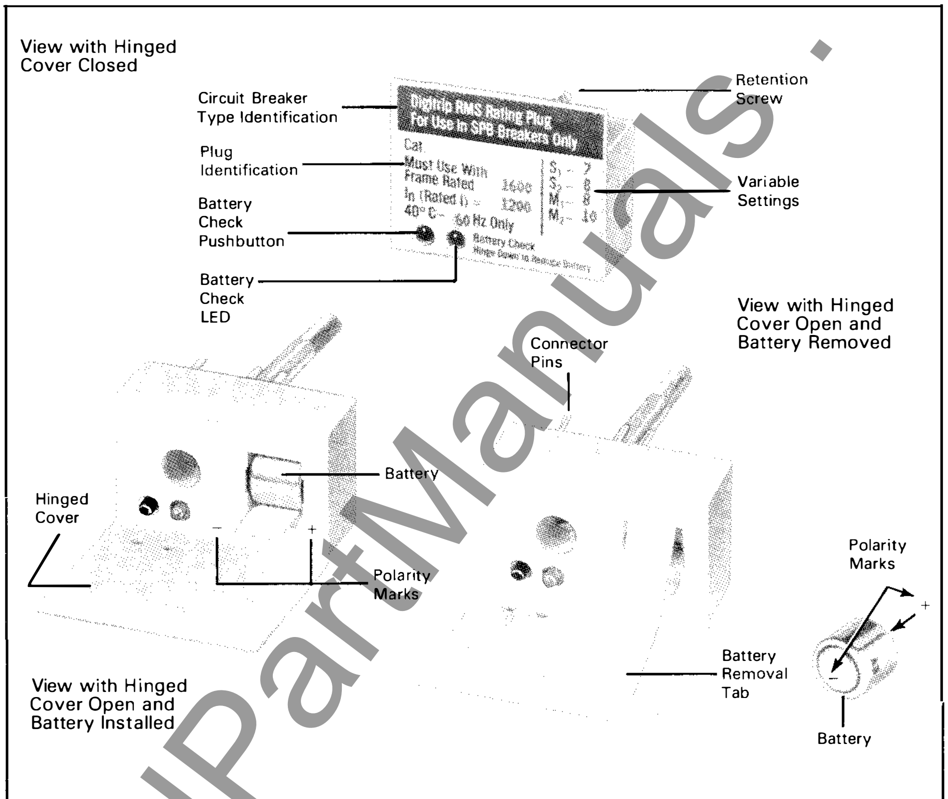
Rating Plug
The continuous ampere rating of Systems Pow-R Breakers is determined by a rating plug which is inserted in the trip unit. Plugs must be selected to match the desired continuous current rating of the circuit breaker as well as the frame rating of the breaker and system frequency. Rating plugs are interchangeable within the same frame size thus eliminating the need to change sensor rating.

Safety Interlocking Systems Pow-R Breaker offer multiple layers of protection interlocking:

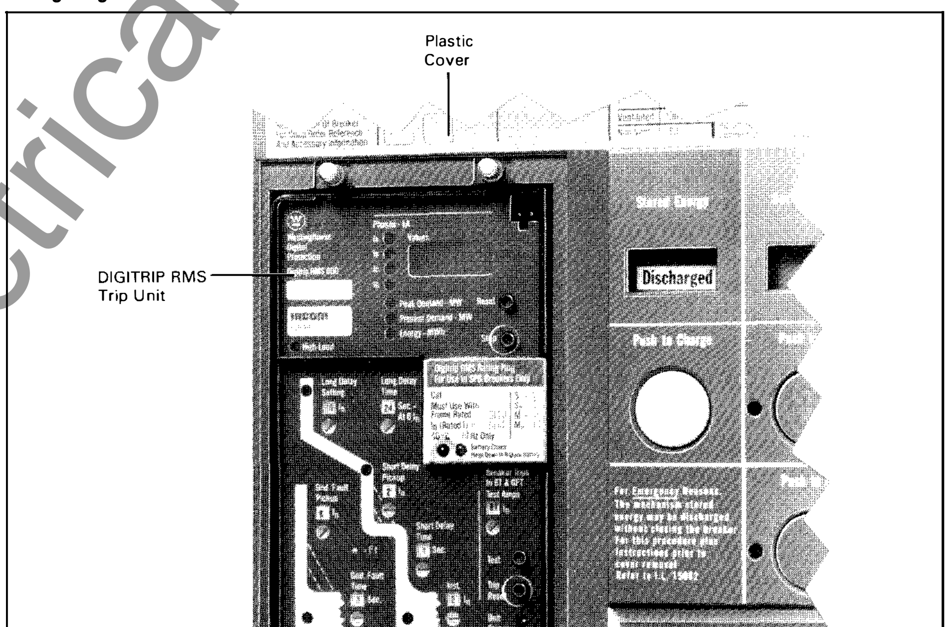
1. Rating plugs are keyed to insure that they cannot be inserted in any frame except the correct one.
2. The rating plug is interlocked with the breaker tripping mechanism to automatically open the breaker when the plug is removed. The breaker remains "trip free" until plug is replaced.
3. A breaker cannot be closed unless a rating plug is installed.

Rating plugs are equipped with a back-up battery to provide power to the LEDs indicating mode of trip operation following a circuit breaker overload or fault trip operation when external control power is not available. The battery is a long life lithium type, that is replaceable from the front of the trip unit without removal of the rating plug. The unit contains its own battery check LED and battery check pushbutton.

Trip Unit Cover
All adjustments can be made with a pocket screwdriver by turning high reliability switches. To prevent tampering, once the trip setting adjustments are made and rating plug is in place, a sealable, transparent cover mounts over the face of the trip unit.



Rating Plug



View of Installed Digitrip RMS Trip Unit with Sealed Cover

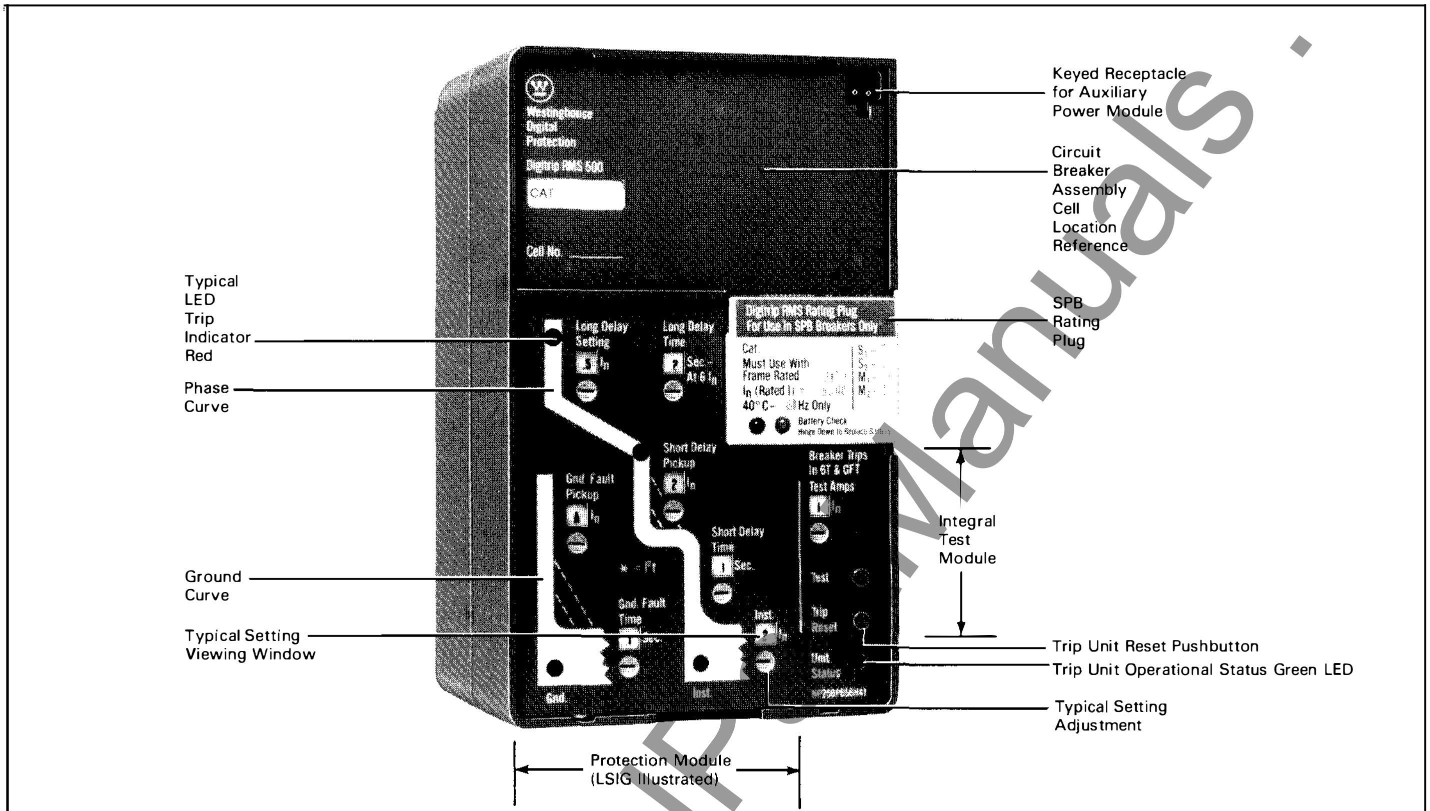
Types of Trip Units

There are four types of Digitrip RMS Trip Units from which to select. Digitrip RMS 500 is the basic model. The 600, 700, and 800 units build upon the 500 and each other, to provide increased function levels with the flexibility to meet specific distribution system requirements. Along with circuit protection, all Digitrip RMS models include information and testing functions. Both remote communications and energy monitoring functions are provided by the Digitrip RMS 700 and 800. The 700 and 800 are also designed to work with the Assemblies Electronic Monitor (AEM). This is a microprocessor-based, door mounted device that acts as a communications center to transmit and receive data from up to 40 monitored units. The AEM can also collect and report information on breaker status to a remote computer. A comparison of the four types of Digitrip RMS is shown in Table 5.

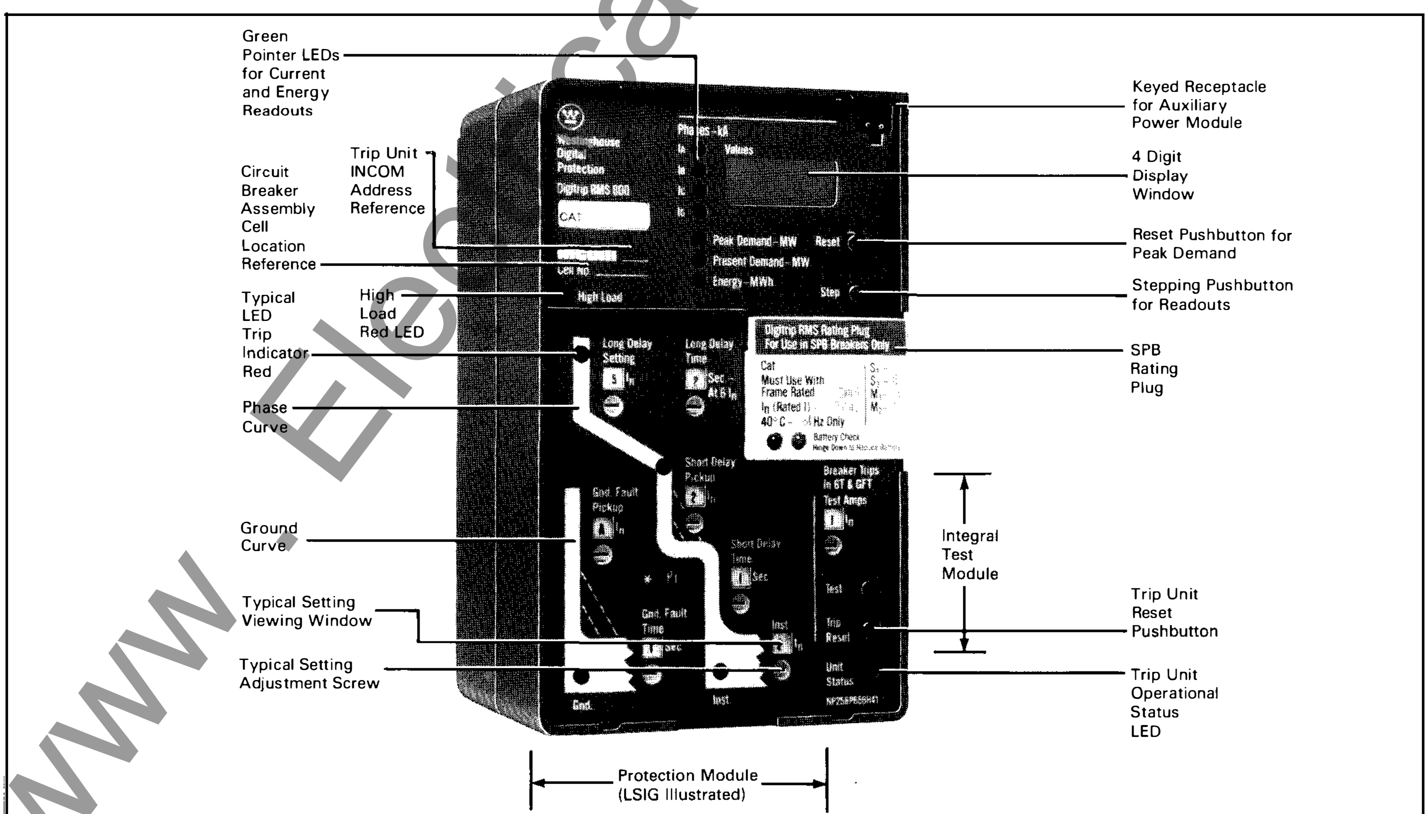
Table 5: Digitrip RMS Trip Unit Characteristics

Digitrip RMS Type		500	600	700	800
	Instruction Leaflet No.	I.L. 29-851	I.L. 29-852	I.L. 29-853	I.L. 29-854
Protection	Long Delay Setting	X	X	X	X
	Long Delay Time	X	X	X	X
	Long Time Memory	X	X	X	X
	Short Delay Pick-up	OPT.	OPT.	OPT.	OPT.
	Short Delay Time	OPT.	OPT.	OPT.	OPT.
	Flat/I^2T Response	X	X	X	X
	Zone Interlocking	①	①	①	①
	Instantaneous Pick-up	OPT.	OPT.	OPT.	OPT.
	Ground Fault Pick-up	OPT.	OPT.	OPT.	OPT.
	Ground Fault Time	OPT.	OPT.	OPT.	OPT.
	Flat/I^2T Response	X	X	X	X
	Ground Time Memory	X	X	X	X
	Zone Interlocking	①	①	①	●
	Interchangeable Rating Plug	X	X	X	X
Local Trip Indication	Mode of Trip LED's	X	X	X	X
	Battery – for Mode of Trip LEDS	X	X	X	X
	Battery Status LED	X	X	X	X
	Battery Test Pushbutton	X	X	X	X
Test	Integral Test Provisions	X	X	X	X
	Trip Unit Status Indication LED	X	X	X	X
	Auxiliary Power Module	OPT.	OPT.	OPT.	OPT.
Local Display On Trip Unit	Power Relay Module		X	X	X
	4 Digit Display		X		X
	øA Current LED		X	②	X
	øB Current LED		X	②	X
	øC Current LED		X	②	X
	Gnd. Current LED		⑥	②⑥	⑥
	Display Stepping Pushbutton		X		X
	High Load LED		X		X
Remote Signals	Remote Signal Contacts:				
	Long Delay Trip		X	X	X
	Short Circuit Trip		X	X	X
	Ground Fault Trip		⑥	⑥	⑤
	High Load Alarm		X	X	X
Energy Monitoring	Potential Transformer Module			X	X
	PTM Disconnect Plug for Dielectric Testing of Circuit Breaker			X	X
	Energy Monitoring: Parameters				
	Peak Demand			④	X
	Peak Demand Reset PB			④	X
	Present Demand			④	X
	Energy Consumption			④	X
Communications	INCOM (Integrated Communications)			X	X
	INCOM Address Register			X	X
Transmittable Data	Transmittable Parameters:				
	Individual Phase Currents			②	③
	Ground Currents			②⑥	③⑤
	Energy			④	③
	Breaker Status:				
	Open/Closed/Tripped			②	③
	Mode of Trip:				
	Override			②	③
	Instantaneous			②	③
	Discriminator			②	③
	Short Delay			②	③
	Ground Fault			②⑥	③⑥
	Long Delay			②	③
	Long Delay Pick-up				③
	Information:				
	External Trip Command (Over INCOM)			②	③
	Data Memory Test Failure (RAM)			②⑤	③
	Program Memory Test Failure (ROM)			②⑤	③
	Missing or Defective Rating Plug			④	③
	Reverse Power Flow			④	③
	Response to Depressing Test Pushbutton			④	③
	Communication Failure			②⑤	②⑤
Control	Breaker Command (Via INCOM):				
	Trip			X	X
	Close			OPT.●	OPT.⑦

NOTES:
OPT = Optional, X = Standard
① Use of zone interlocking is optional with breaker wiring modification.
② Remote location only unless optional AEM local monitor is used.
③ Local (on face of trip unit) or remote via INCOM.
④ Remote only.
⑤ On AEM denoted by absence of response from addressed breaker.
⑥ Supplied only when trip unit is equipped with ground fault protection option.
⑦ Requires spring release or electrical operator option.



Typical DIGITRIP RMS 500 Trip Unit with Rating Plug Installed



Typical DIGITRIP RMS 800 Trip Unit with Rating Plug Installed

Power/Relay Module

The Power/Relay Module, supplied with Digitrip RMS 600, 700 and 800, (Cat. PRTAATR), requires a 120V., 50/60 Hz, 6VA control power supply for operating the Readout Display and internally mounted signal relays. Following automatic trip operation of the circuit breaker, it will maintain the cause of the trip history and the mode of trip LEDs as long as the external control power supply is available. Each signal relay contact (overload, short circuit, ground fault, if included with trip unit, and the high load) is rated 120V, 50/60 Hz, 1.0 amp. It is mounted inside the breaker frame next to the trip unit.

Potential Transformer Module

The Potential Transformer Module, used with Digitrip RMS 700 and 800, is an internally mounted transformer that provides step down voltages to the mini-computer to permit energy monitoring calculations that include peak demand, present demand and energy consumed. The module is suitable for all system voltage ratings up through 600V., 50/60 Hz.

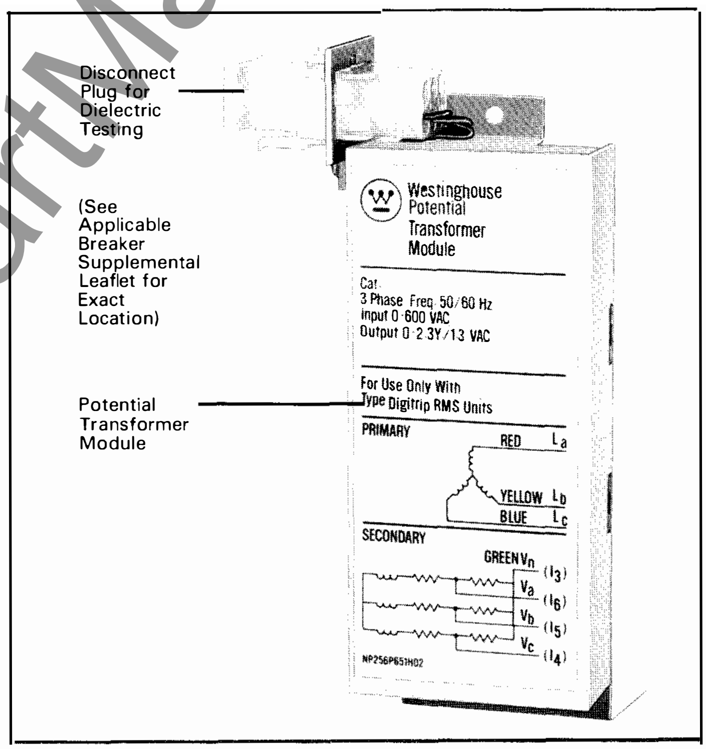
The primary of this transformer is connected internally to the primary phase conductors of the circuit breaker through a dielectric disconnect plug located on the left side of circuit breaker. When this plug is disconnected, the breaker current carrying members may be dielectric tested.

Auxiliary Power Module

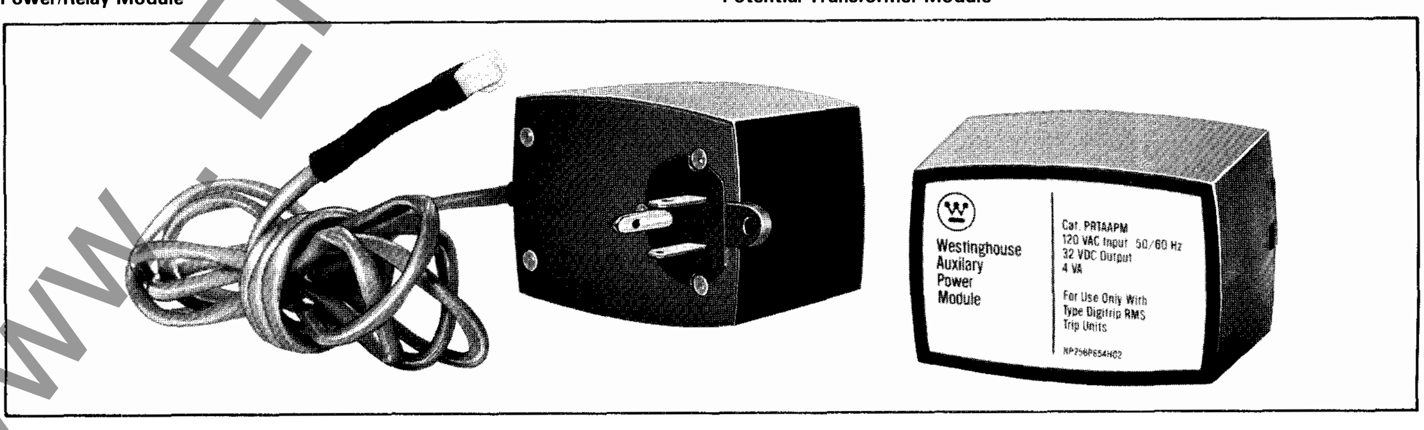
The Auxiliary Power Module, an optional device, (Cat. No. PRTAAPM) is an encapsulated power supply. It requires a 120 Vac, 50/60 Hz input power for a 32 VDC output used for testing the Digitrip RMS trip units. The unit has a unique plug-in connector to prohibit use of incorrect, but similar looking, devices.

This module provides power to permit a draw-out breaker to be tested out of the cell or in the cell in the "Disconnect" or "Withdrawn" position. The Auxiliary Power Module is also used for bench testing of Digitrip RMS trip units.

Power/Relay Module



Potential Transformer Module



Auxiliary Power Module

Available Accessories

Shunt Trip
Used in conjunction with an auxiliary switch to provide for breaker opening from a remote location. In addition to the cut-off function, the auxiliary switch can be used for remote indication of the breaker's open or closed status.

Capacitor Trip Device
For use with a shunt trip. Provides a means of tripping a breaker for a minimum of five (5) seconds after loss of control voltage.

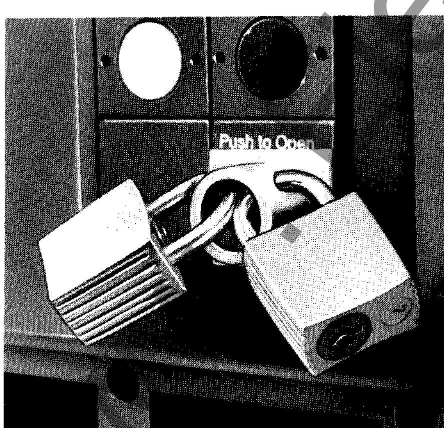
Undervoltage Release Instantaneous
Operates to open the breaker instantaneously when the monitored voltage is less than or equal to the dropout setting.

Undervoltage Release Time Delay Device
Used with an instantaneous undervoltage release accessory to provide the necessary time delay to avoid nuisance breaker openings resulting from momentary dips in the monitored voltage source.

Auxiliary Switches
A maximum of four spare S.P.D.T. contacts may be installed in a single breaker. These may be used for interlocks in remote control circuits, and may also be used to indicate open or closed position of breaker main contacts.

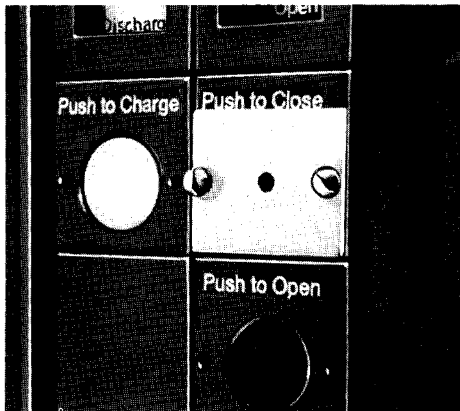
Key Interlocks①
Provide means for mechanical sequencing of breakers as may be required when multiple power sources are available for a common load. Available for either fixed or draw-out mounted breakers.

Push-to-open Padlockable Adaptor Bracket
Installed with non-removable screws over the push-to-open button. It allows the breaker to be padlocked in the open position.



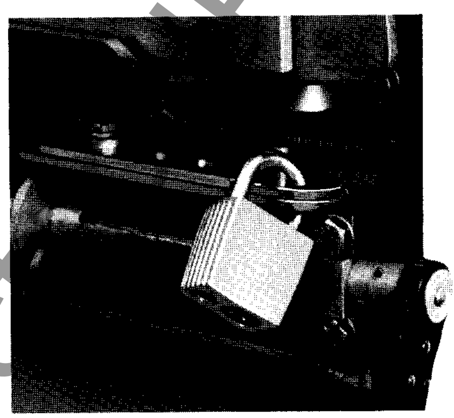
Padlocking Push-to-open Button

Cover for Manual Close Pushbutton
Prevents the breaker from being manually closed under automatic sequencing control conditions.

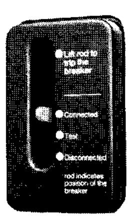


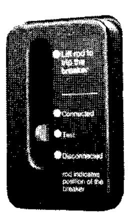
Manual Push-to-close Button Blocked Off

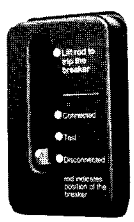
Draw-out Cell Position Padlock Adaptor②
Available for factory installation to padlock the breaker in either the "Connected," "Test," or "Disconnected" positions, preventing the breaker from being moved to any other cell position.


Padlocking of Draw-out Element

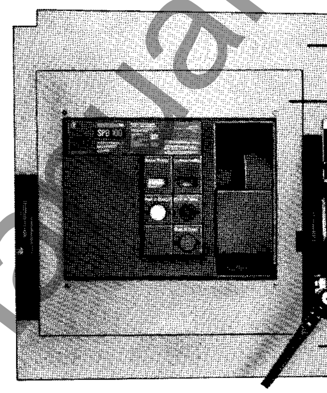
Door Escutcheon②
An external breaker position indicator is available for mounting on the breaker cell door to provide visual indication of the drawout position of the breaker behind the door.


Breaker Connected


Breaker in Test Position


Breaker Disengaged

Dead Front Shield②
A cover that mounts to the front of a breaker mounted in a draw-out mechanism that matches with a fixed shield in the breaker cell to prevent inadvertent contact with live, current-carrying parts.

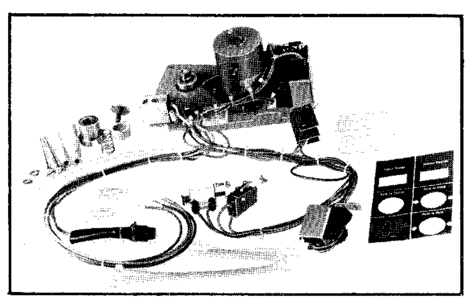


Dead-front Shield in Position

Spring Release Solenoid
For remote closing of a precharged breaker. An auxiliary contact to denote spring charged position remotely is furnished as standard. Spring release is standard on all electrically operated breakers; optional on manually operated breakers.

Anti-Pump Provisions To prevent unwanted closing or reclosing operations when used with a maintained closed contact in the close circuit, an anti-pump provision is provided as standard on electrically operated breakers, and can be supplied on manually operated breakers with spring release solenoid.

Electrical Operation
The electrical operator is mounted internally, with the result that there is no dimensional difference between manually and electrically operated units. Manually operated breakers are easily field convertible to electrical operation by adding a plug-in motor operator. UL Listing is not voided by field installation of motor operator.


Motor Operator

① Availability to be announced on through the door design.
② Behind the door design only.

Optional Systems Coordinating Adjustments

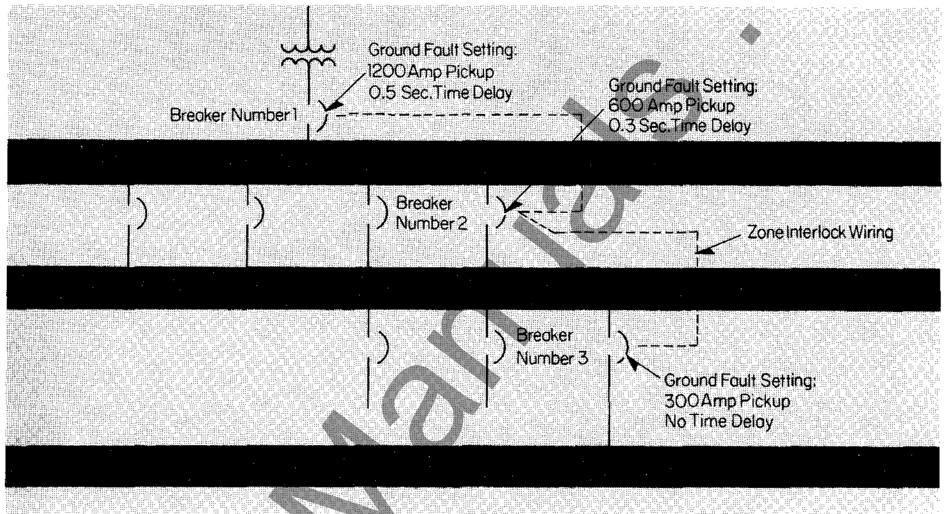
Short-Time Ratings
Short-time ratings are the key to system coordination. The Systems Pow-R Breaker with Digitrip RMS trip short-time ratings vary with the frame rating selected. Values of 25,000, 35,000, 51,000 and 65,000 amps RMS Symmetrical are available (See Table 1). For selective coordination purposes, short-time delay settings up to a maximum of 30 cycles (0.5 seconds) in several discrete steps are available. Flat or I^2t response can be selected.

Instantaneous Override
The selective override circuit in a Systems Pow-R Breaker allows the breaker to trip instantaneous on fault currents exceeding the breaker short time rating.

Built-in Ground Protection
The Digitrip RMS trip unit ground fault function features adjustable current pick-up settings to a maximum of 1200 amperes, in accordance with the National Electrical Code. It also has adjustable time delays in discrete steps with maximum breaker clearing times of 0.1, 0.3 and 0.5 seconds. Flat or I^2t response can be selected.

External terminations that can be reconnected are provided to satisfy the grounding conditions for simple and complex distribution systems. Residual is standard. Source ground connections are applicable, as is zone sequence with external sensors, in various physical configurations to match the system requirements.

Integral Zone Selective interlocking, a standard feature of the Systems Pow-R Breaker with Ground Fault is available for complex ground fault systems, such as hospitals where multiple levels of ground fault protection are required by code.



Multi-Layer Ground Fault Protection Scheme Using Zone Selective Interlocking

With Zone Selective interlocking, proper system coordination is maintained for downstream faults. To minimize damage while providing the greatest degree of system continuity, the Zone Selective interlocking systems locates the fault and opens the nearest upstream breaker at the minimal time setting, regardless of preset settings, without losing coordination with upstream devices. Such a loss of coordination could cause nuisance or unwanted tripping operations on the upstream devices.

Typical Specification for the Systems Pow-R Breaker with Digitrip RMS

Circuit breaker shall be encased Westinghouse Systems Pow-R Breaker with Digitrip RMS.

All breakers shall be U.L. tested for application in their intended enclosure for 100% of their continuous ampere rating. Frame ampere ratings shall be 400, 800, 1200, 1600, 2000-C, 2000, 2500, 3000, 4000 and 5000.

The ampere interrupting capacity (I.C.) and short-time ratings shall be as follows:

SPB-50 (400/800 Amp Frame)
I.C.: 50,000 amps at 480 Volts
Short-Time Rating: 25,000 amps (RMS Sym.)

SPB-65 (1200/1600/2000-C Amp. Frame)
I.C.: 65,000 amps at 480 volts
Short-Time Rating: 35,000 amps (RMS Sym.)

SPB-100 (400/800/1200/1600/2000-C/2000/2500/3000/4000/5000 Amp Frame)
I.C.: 100,000 Amps at 480 Volts Without fuses
Short-Time Rating: 25,000 Amps (RMS Sym.) for 400 and 800 Amp. Frame; 35,000 Amps (RMS Sym.) for 1200, 1600 2000-C, 2000, 2500, and 3000 Amp Frame; 65,000 Amp (RMS Sym.) for 4000 and 5000 Amp Frame.

SPB-150 (400/800/1200/1600/2000-C/2000/2500/3000/4000/5000 Amp Frame)
I.C.: 150,000 Amps at 480 Volts Without fuses
Short-Time Rating: 25,000 Amps (RMS Sym.) for 400 and 800 Amp Frame; 35,000 Amps (RMS Sym.) for 1200 Amp Frame; 51,000 Amps (RMS Sym.) for 1600, 2000C, 2000, 2500, and 3000 Amp Frame; 85,000 Amps (RMS Sym.) for 4000 and 5000 Amp Frame.

Short-time ratings shall be based on a 600 volt, 50/60 Hz system with an X/R ratio of 6.6.

A selective override circuit shall be provided on breakers having short-time adjustments, but without instantaneous adjustments that will allow the breaker to be applied at its maximum interrupting capacity while providing full selectivity up to its RMS Symmetrical short-time rating.

All breakers shall be provided with a true, two-step stored energy mechanism which allows closing in a maximum of 5 cycles whether the breaker is manually or electrically operated. Both manual and motor operated breaker shall have identical physical dimensions. Manually operated breakers shall be field convertible to electrically operated without voiding the U.L. label on it. As a safety feature, anti-pump provisions shall be provided as standard for electrically operated breakers and optional for manual breakers with spring release solenoids. Both manual and electrically operated breakers shall have multiple charge/close provisions providing the following sequences: Charge-Close-Recharge-Open-Close-Open.

The breaker control face plate shall include color coded visual indicators to indicate contact and stored energy status. Local control pushbuttons shall be provided for "opening" and "closing" the breaker. For electrically operated breakers, a local "charge" pushbutton shall be provided standard.

The continuous ampere rating of the breaker shall be determined by the insertion of an interchangeable rating plug that matches the load and cable requirements. The rating plug shall be interlocked with the tripping mechanism to automatically "open" the breaker when the plug is removed. The breaker shall remain "trip free" with the plug removed. In addition, rating plugs shall be keyed to prevent incorrect application between different frame ratings. Complete system selective coordination shall be provided by the addition of the following time/current curve shaping curves:

Long Time/Instantaneous	LI
*Long Time/Short-Time	LS
*Long Time/Short-Time/Instantaneous	LSI
*Long Time/Instantaneous/Ground	LIG
*Long Time/Short-Time/Ground	LSG
*Long Time/Short-Time/Instantaneous/Ground	LSIG

*Short Time and Ground shall have flat and I^2t response.

All curve adjustments shall be made using a pocket size screwdriver to turn highly reliable switches in discrete steps for precise settings. A sealable transparent cover shall be provided over the adjustments to prevent tampering.

Ground fault protection shall be provided as an option. A residual scheme shall be used as standard for detecting ground fault currents. When more complex systems require alternate sensing methods, the trip unit shall be reconnected for either a source ground or zero sequence detection scheme as required.

Zone Selective Interlocking shall be optional with breaker wiring modification. If Zone Selective Interlocking is selected and not used, defeater connections are to be added.

The primary function of the Digitrip RMS Trip Unit shall be circuit protection. All energy to trip the breaker shall come from sensors monitoring the current going through the breaker. The secondary current of the sensors shall go to the trip unit which shall be a micro-computer to perform required numeric and logic functions. The micro-computer shall scan in cyclic fashion the voltages, enter values into its memory, and calculate true RMS current values to be compared to the pre-set protection functions. The mini-computer software program shall, in decision-free fashion, initiate tripping actions through the low energy flux transfer tripping device.

There shall be four models of Digitrip RMS Trip Units to fit the Systems Pow-R Breaker. The basic unit, Digitrip RMS 500, shall be the protection unit for all models. Digitrip RMS 600 shall include a local operation display. Digitrip RMS 700 shall include capability for energy monitoring and remote operations and control, but no local display. Digitrip RMS 800 shall include local operation display and control with capability for remote display and control including energy monitoring.

The protection unit, **Digitrip RMS 500,** shall present under the transparent cover, a representation of the Time/Current curves of the trip unit. Red LEDs placed on these curves shall provide mode of trip indication for overload, short circuit and ground fault (if unit includes ground fault) by turning "On". A long life battery shall be provided to maintain mode of automatic trip after such trip. A battery test pushbutton with a green LED shall be provided to check the status of this battery.

A trip reset pushbutton shall be provided to turn "Off" the LEDs following a trip (actual or test) operation.

A green LED shall indicate the operational status of the trip unit by flashing "On" and "Off" when load current is approximately 20% of sensor rating.

An integral test panel shall be provided. It shall include a test selector switch and a test pushbutton. The breaker may be tested in the "Trip" or "No Trip" test mode. To preserve the primary function of the trip unit, in-service testing shall be limited if there is load current. In-service testing in "Trip" test mode while there is load current shall not be recommended.

The trip unit shall contain a keyed receptacle for use with an optional Auxiliary Power module. The APM when connected to 120V., 50/60 Hz, shall supply power for testing or setting the trip unit while the breaker is out of its cell or in the "Disconnect" or "Withdrawn" positions.

Digitrip RMS 600 shall be similar to the Digitrip RMS 500 Trip Unit with the addition of a four-digit readout display. This display shall serve two purposes: instrumentation and mode of trip or trouble indication. There shall be three phase and one ground (when supplied) current pointer green LEDs that go "On" when selected by a step pushbutton for reading on the display.

A Power/Relay module, requiring 120V., 50/60 Hz, 6 Va, shall supply control power to the readout display. Following an automatic trip operation of the circuit breaker, it shall maintain the cause of the trip history and the mode of trip LEDs as long as its internal power supply is available. This includes its internal relays. Its internal relays shall provide contacts for remote indication of mode of trip and high load.

A red LED shall be provided on the face of the trip unit pre-set to turn "On" when approximately 85% of load level is exceeded (with a 40 second delay to avoid nuisance alarm). This alarm shall be connected to the Power/Relay module relays for remote indication.

Digitrip RMS 700 shall be similar to a Digitrip RMS 600 Trip Unit, but with emphasis on information and communications both local and remote. This trip unit shall not have a readout display with associated pointer LEDs, selection pushbutton switch, and high-load LED on the trip unit.

The trip unit shall include a Potential Transformer module, suitable for voltages through 600V., 50/60 Hz. The primary of the PTM shall be connected internally to the primary phase conductors of the circuit breaker through a dielectric disconnect plug. This shall enable the calculation of energy parameters such as:

(1) Peak Demand	Megawatts
(2) Present Demand	Megawatts
(3) Energy Consumed	Megawatt-Hours

The disconnect plug shall be disconnected during dielectric tests of the circuit breaker.

The trip unit shall include three hexidecimal address wheels for the purpose of setting a unique address on the INCOM local area networks. The device shall also contain the INCOM communications chip developed by Westinghouse Electric Corporation to combine microprocessor-based and other electrical distribution and control products with personal computers into a comprehensive communication and control network known as IMPACC.

IMPACC (Integrated Monitoring Protection and Control Communications) is the new system that ties together multiple devices in an electrical distribution network. From a central location, an operator utilizes a personal computer as a master unit to monitor, control, and communicate with all devices on the system. Both the Digitrip RMS 700 and RMS 800 can be part of an IMPACC system.

The Assemblies Electric Monitor (AEM) can also be added to an IMPACC system. The AEM is a door-mounted, microprocessor-based device designed to monitor up to 40 circuit breakers that are equipped with Digitrip RMS 700 or RMS 800 trip units. The AEM functions as a communications center, transmitting and receiving data from monitored units. It displays status, cause of trip, and current metered values from the breakers. The AEM can also function as an intermediate master-slave and report information on breaker status to a remote computer. For additional information on the AEM refer to SA 11587A or TD 17216.

Where desired, communications may be made by wire with a remote computer, IBM compatible, with a CONI (Computer Operated and Network Interface) card. See I.L. 17-199. Trip and close operations shall be included.

Where desired, communications to both an AEM and the remote computer above may be employed.

For an un-engineered network (using the computer as the focal point) five legs may be served from a computer with each leg up to 250 feet in length (terminated with a 150 ohm, ½ watt resistor). Spurs up to 200 feet with no additional resistor terminations may be included.

Digitrip RMS 800 shall be similar to a Digitrip RMS 700 but includes the readout display with associated pointer LEDs, selector pushbutton switch, and high-load LED on the trip unit. The following shall be transmittable data for remote communications:

1. Individual Phase Currents
2. Ground Currents (when supplied)
3. Energy
   a. Peak Demand
   b. Present Demand
   c. Energy Consumed
4. Breaker Status
   a. Open-Closed-Tripped
   b. Mode of Trip
      I. Override
      II. Instantaneous
      III. Discriminator
      IV. Short Delay
      V. Ground Fault
      VI. Long Delay
      VII. Long Delay Pick-up
5. Information
   a. Internal Trip Command
   b. Data Memory Test
   c. Program Memory Test Failure
   d. Missing or Defective Rating Plug
   e. Reserve Power Flux
   f. Response to Depressing Test
6. Breaker Command (INCOM)
   a. Trip
   b. Close

The breakers shall be capable of interruptions of rated current followed by operations at no load without significant maintenance. Numbers are shown in the following Table 6. The breaker contacts shall be field replaceable.

Table 6: UL Endurance Ratings①

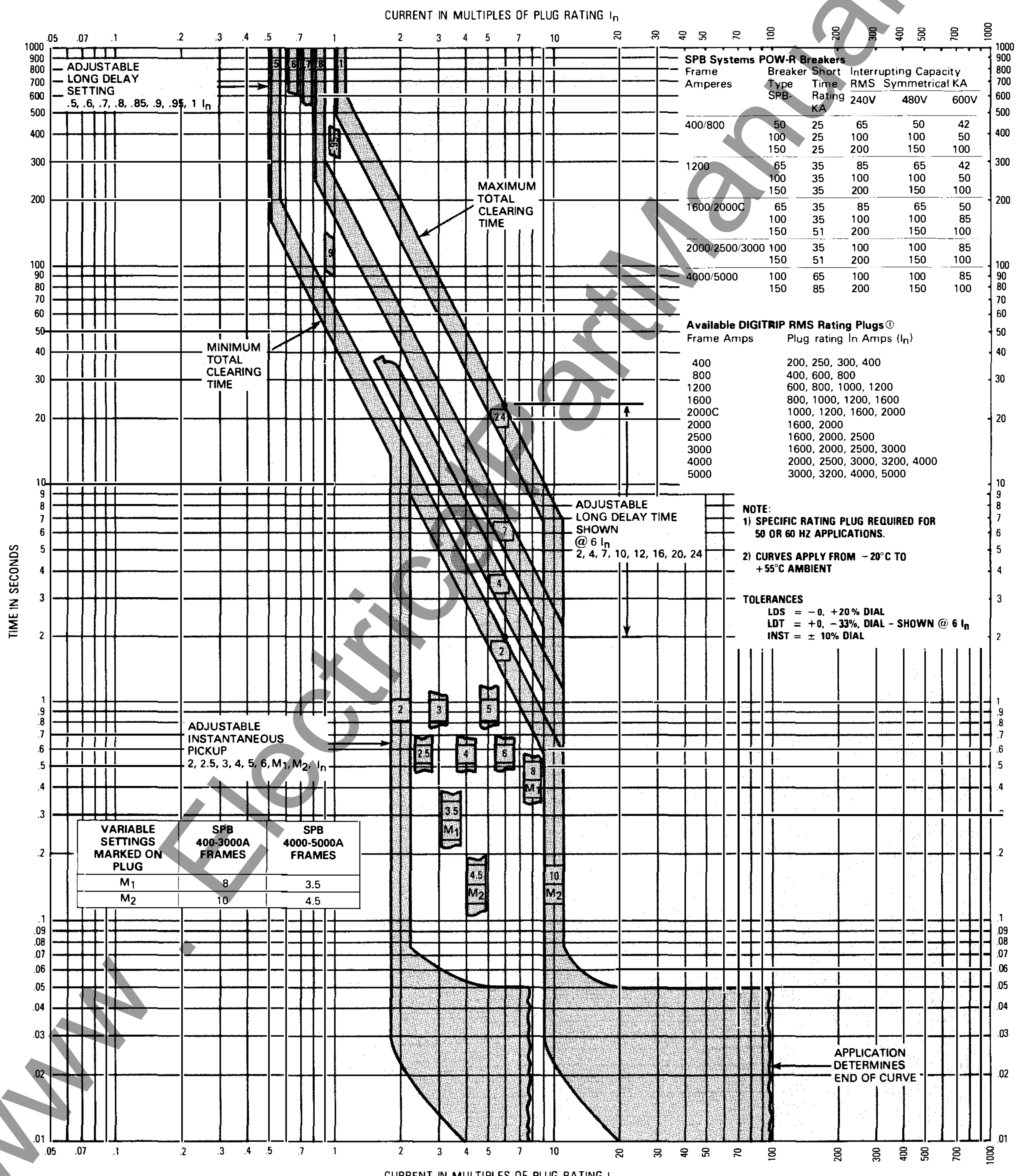
Amperes	Full Load Interruptions	No Load Operations
400	1000	5000
800	500	3000
1200	500	2000
1600	500	2000
2000-C②	500	2000
2000	500	2000
2500	500	2000
3000	400	1100
4000	400	1100
5000	400	1100

① SPB with Digitrip RMS meets or exceeds UL endurance ratings.
② 2000-C designates 2000 amp rating in a 16 inch high frame.

Long-Time/Instantaneous Time-Current Curve SC-4283-87

DIGITRIP RMS 500/600/700/800

Typical Time-Current Characteristic Curve (LI)
for Type SPB Systems Pow-R Breakers



SPB Systems POW-R Breakers

Frame Amperes	Breaker Type SPB-	Short Time Rating KA	Interrupting Capacity RMS Symmetrical KA 240V	480V	600V
400/800	50	25	65	50	42
	100	25	100	100	50
	150	25	200	150	100
1200	65	35	85	65	42
	100	35	100	100	50
	150	35	200	150	100
1600/2000C	65	35	85	65	50
	100	35	100	100	85
	150	51	200	150	100
2000/2500/3000	100	35	100	100	85
	150	51	200	150	100
4000/5000	100	65	100	100	85
	150	85	200	150	100

Available DIGITRIP RMS Rating Plugs ①

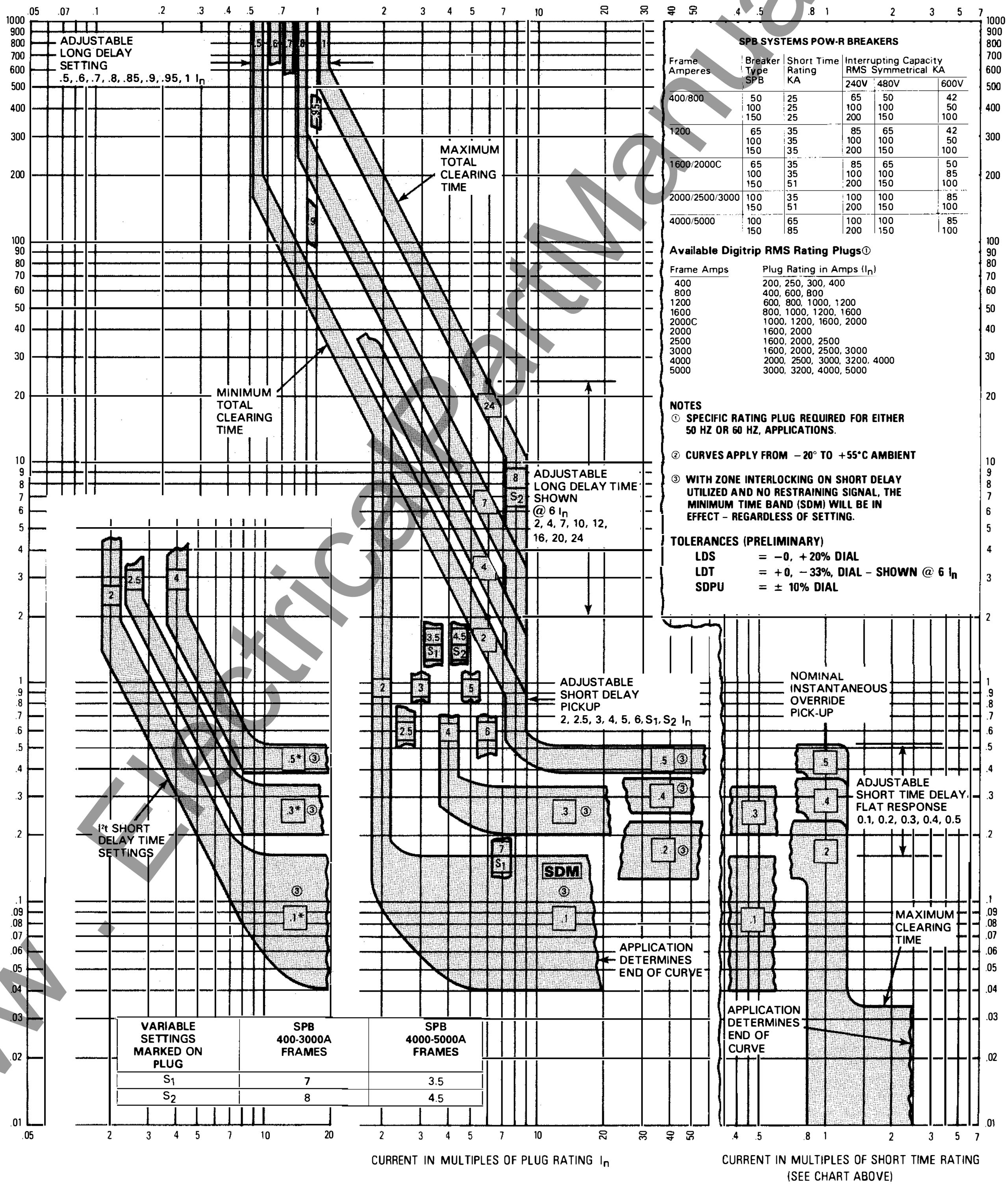
Frame Amps	Plug rating In Amps (I_n)
400	200, 250, 300, 400
800	400, 600, 800
1200	600, 800, 1000, 1200
1600	800, 1000, 1200, 1600
2000C	1000, 1200, 1600, 2000
2000	1600, 2000
2500	1600, 2000, 2500
3000	1600, 2000, 2500, 3000
4000	2000, 2500, 3000, 3200, 4000
5000	3000, 3200, 4000, 5000

VARIABLE SETTINGS MARKED ON PLUG	SPB 400-3000A FRAMES	SPB 4000-5000A FRAMES
M_1	8	3.5
M_2	10	4.5

Long-Time/Short-Time Time-Current Curve SC-4284-87

DIGITRIP RMS 500/600/700/800

Typical Time-Current Characteristic Curve (LS) for Type SPB Systems Pow-R Breakers



SPB SYSTEMS POW-R BREAKERS

Frame Amperes	Breaker Type SPB	Short Time Rating KA	Interrupting Capacity RMS Symmetrical KA 240V	480V	600V
400/800	50	25	65	50	42
	100	25	100	100	50
	150	25	200	150	100
1200	65	35	85	65	42
	100	35	100	100	50
	150	35	200	150	100
1600/2000C	65	35	85	65	50
	100	35	100	100	85
	150	51	200	150	100
2000/2500/3000	100	35	100	100	85
	150	51	200	150	100
4000/5000	100	65	100	100	85
	150	85	200	150	100

Available Digitrip RMS Rating Plugs①

Frame Amps	Plug Rating in Amps (I_n)
400	200, 250, 300, 400
800	400, 600, 800
1200	600, 800, 1000, 1200
1600	800, 1000, 1200, 1600
2000C	1000, 1200, 1600, 2000
2000	1600, 2000
2500	1600, 2000, 2500
3000	1600, 2000, 2500, 3000
4000	2000, 2500, 3000, 3200, 4000
5000	3000, 3200, 4000, 5000

NOTES

① SPECIFIC RATING PLUG REQUIRED FOR EITHER 50 HZ OR 60 HZ, APPLICATIONS.

② CURVES APPLY FROM −20° TO +55°C AMBIENT

③ WITH ZONE INTERLOCKING ON SHORT DELAY UTILIZED AND NO RESTRAINING SIGNAL, THE MINIMUM TIME BAND (SDM) WILL BE IN EFFECT – REGARDLESS OF SETTING.

TOLERANCES (PRELIMINARY)

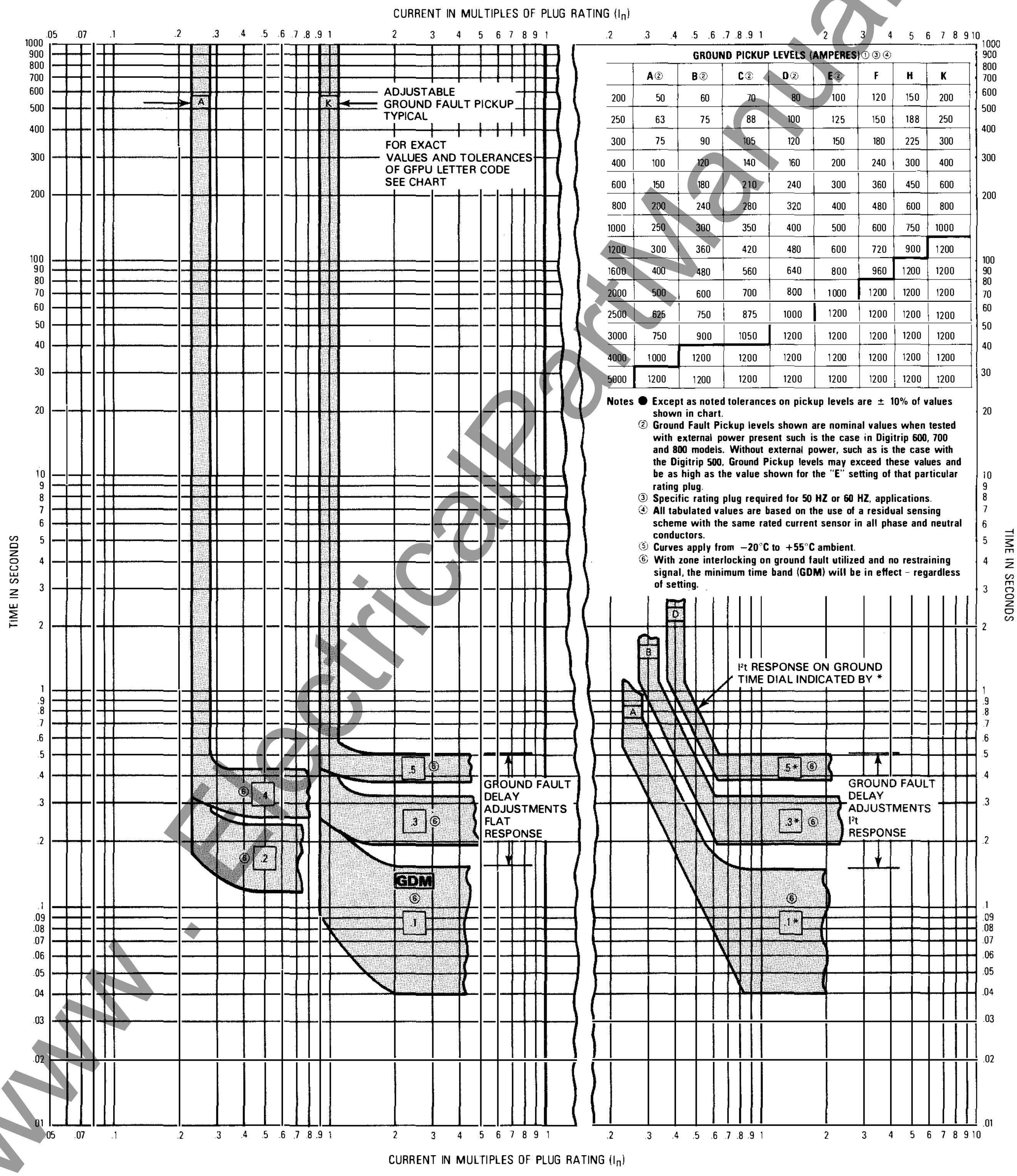
LDS = −0, +20% DIAL
LDT = +0, −33%, DIAL – SHOWN @ 6 I_n
SDPU = ± 10% DIAL

VARIABLE SETTINGS MARKED ON PLUG	SPB 400-3000A FRAMES	SPB 4000-5000A FRAMES
S_1	7	3.5
S_2	8	4.5

Ground Fault Protection Time-Current Curve SC-4282-87

DIGITRIP RMS 500/600/700/800

Typical Time-Current Characteristic Curve (G) for Type SPB Systems Pow-R Breakers



GROUND PICKUP LEVELS (AMPERES) ①③④

	A②	B②	C②	D②	E②	F	H	K
200	50	60	70	80	100	120	150	200
250	63	75	88	100	125	150	188	250
300	75	90	105	120	150	180	225	300
400	100	120	140	160	200	240	300	400
600	150	180	210	240	300	360	450	600
800	200	240	280	320	400	480	600	800
1000	250	300	350	400	500	600	750	1000
1200	300	360	420	480	600	720	900	1200
1600	400	480	560	640	800	960	1200	1200
2000	500	600	700	800	1000	1200	1200	1200
2500	625	750	875	1000	1200	1200	1200	1200
3000	750	900	1050	1200	1200	1200	1200	1200
4000	1000	1200	1200	1200	1200	1200	1200	1200
5000	1200	1200	1200	1200	1200	1200	1200	1200

Notes ● Except as noted tolerances on pickup levels are ± 10% of values shown in chart.

② Ground Fault Pickup levels shown are nominal values when tested with external power present such is the case in Digitrip 600, 700 and 800 models. Without external power, such as is the case with the Digitrip 500, Ground Pickup levels may exceed these values and be as high as the value shown for the "E" setting of that particular rating plug.

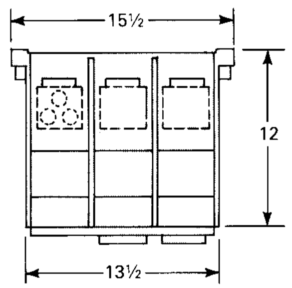
③ Specific rating plug required for 50 HZ or 60 HZ, applications.

④ All tabulated values are based on the use of a residual sensing scheme with the same rated current sensor in all phase and neutral conductors.

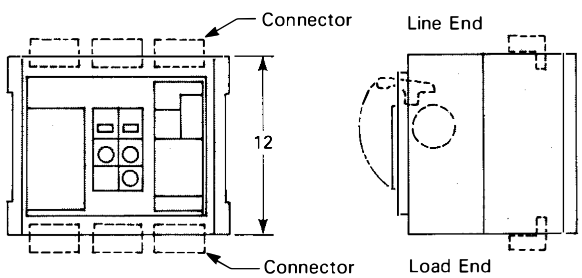
⑤ Curves apply from −20°C to +55°C ambient.

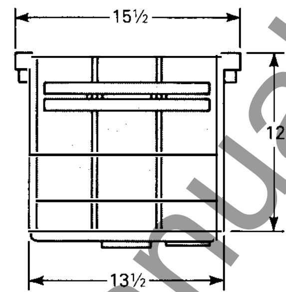
⑥ With zone interlocking on ground fault utilized and no restraining signal, the minimum time band (GDM) will be in effect – regardless of setting.

Dimensions, Inches *Not to be used for construction purposes unless approved.*
Fixed Mounted Breakers *(Front Connected)*

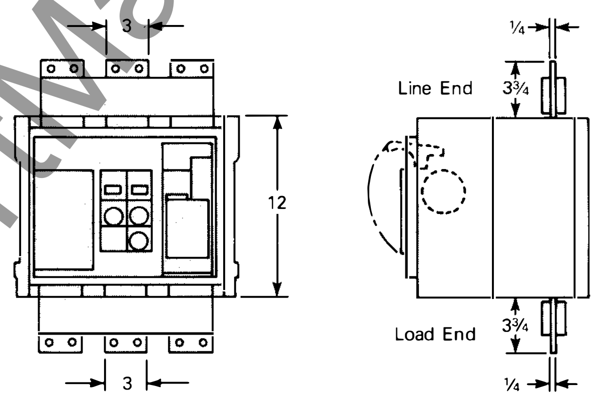


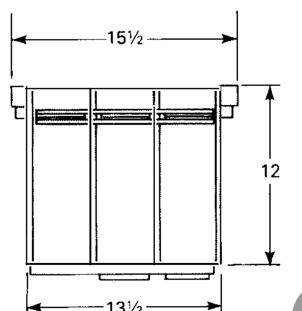
400 Ampere – SPB-50
800 Ampere – SPB-50
1200 Ampere – SPB-65



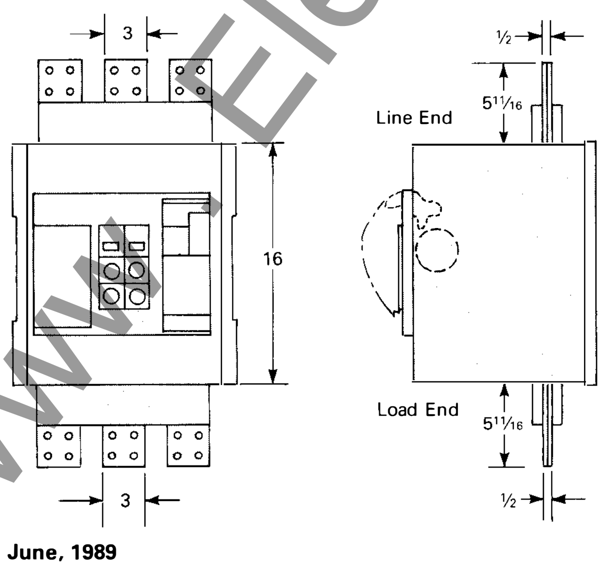


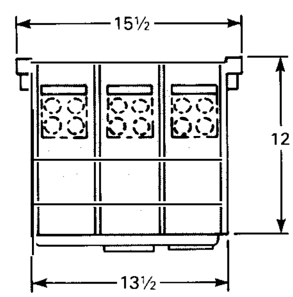
400 Ampere – SPB-100
800 Ampere – SPB-100
1200 Ampere – SPB-100



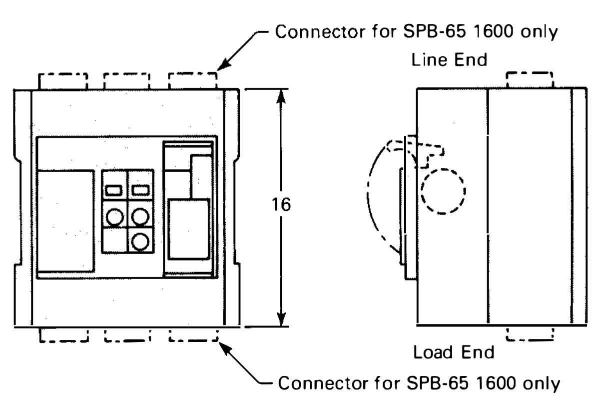


400 Ampere – SPB-150
800 Ampere – SPB-150
1200 Ampere – SPB-150
1600 Ampere – SPB-150
2000-C Ampere – SPB-150

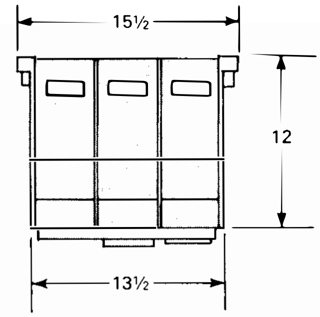




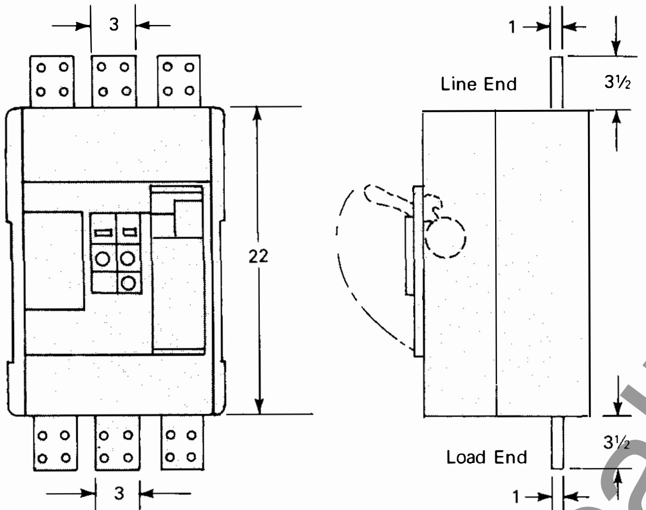
1600 Ampere – SPB-65
1600 Ampere – SPB-100
2000-C Ampere – SPB-65
2000-C Ampere – SPB-100

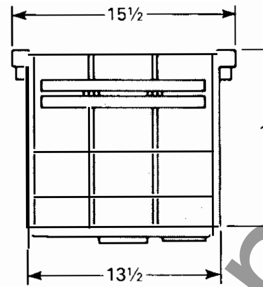


Dimensions, Inches *Not to be used for construction purposes unless approved.*
Fixed Mounted Breakers *(Front Connected)*

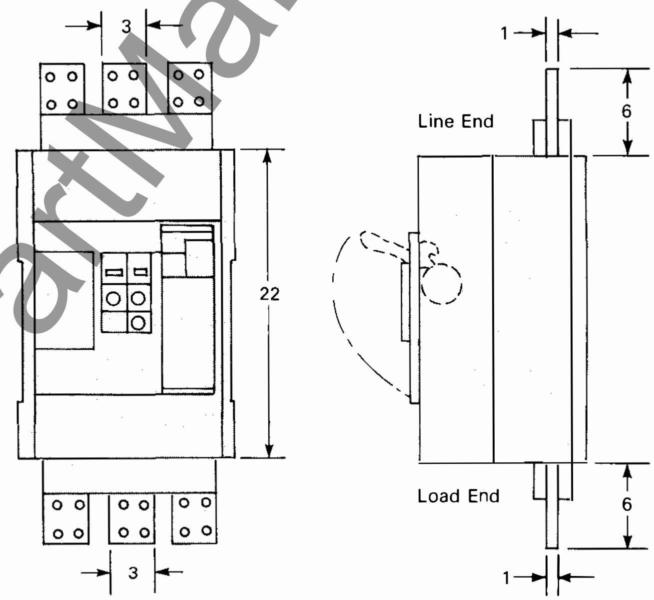


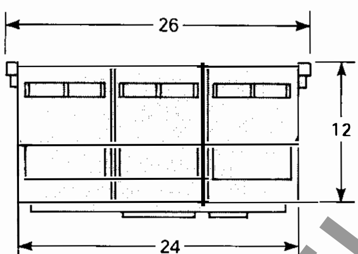
2000 Ampere – SPB-100
2500 Ampere – SPB-100
3000 Ampere – SPB-100



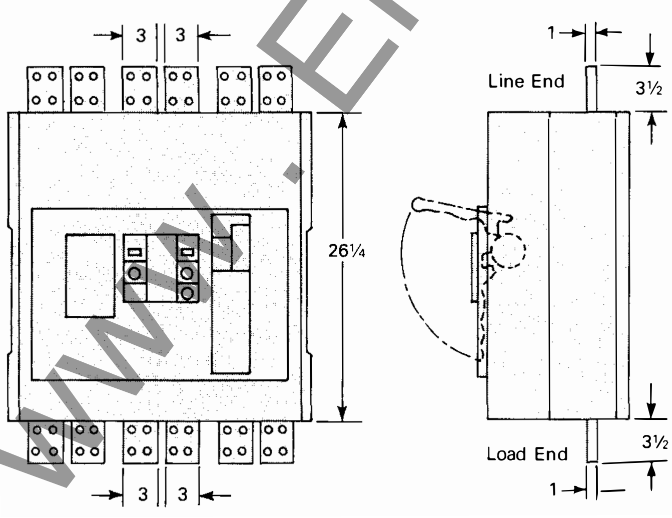


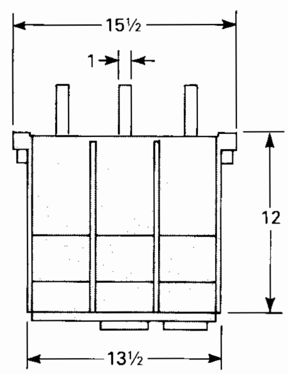
2000 Ampere – SPB-150
2500 Ampere – SPB-150
3000 Ampere – SPB-150



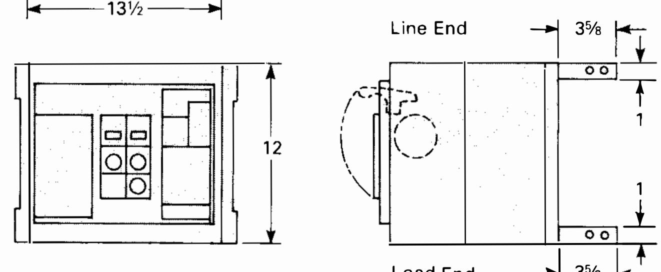


4000 Ampere – SPB-100
4000 Ampere – SPB-150

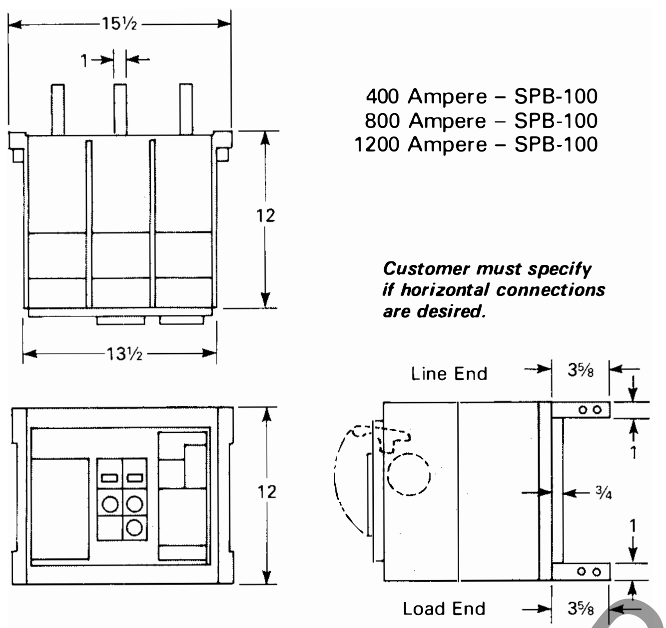


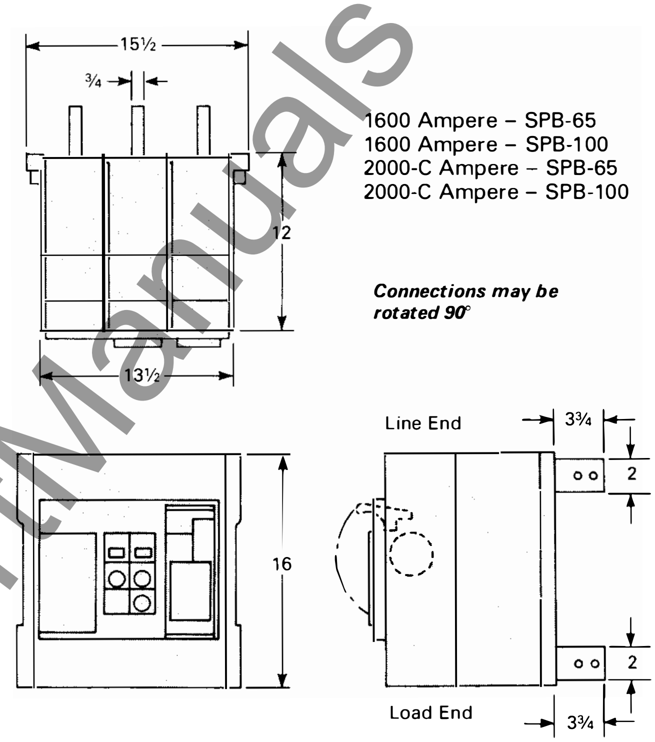


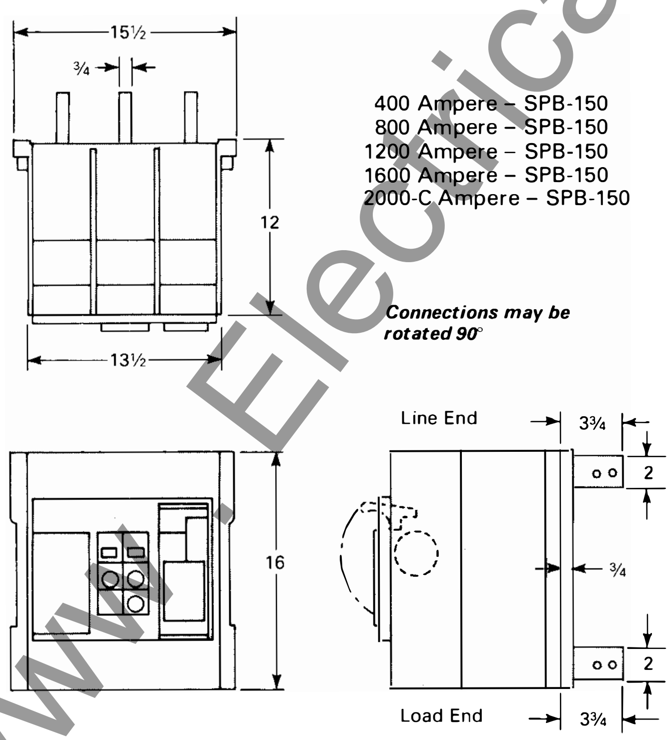
400 Ampere – SPB-50
800 Ampere – SPB-50
1200 Ampere – SPB-65

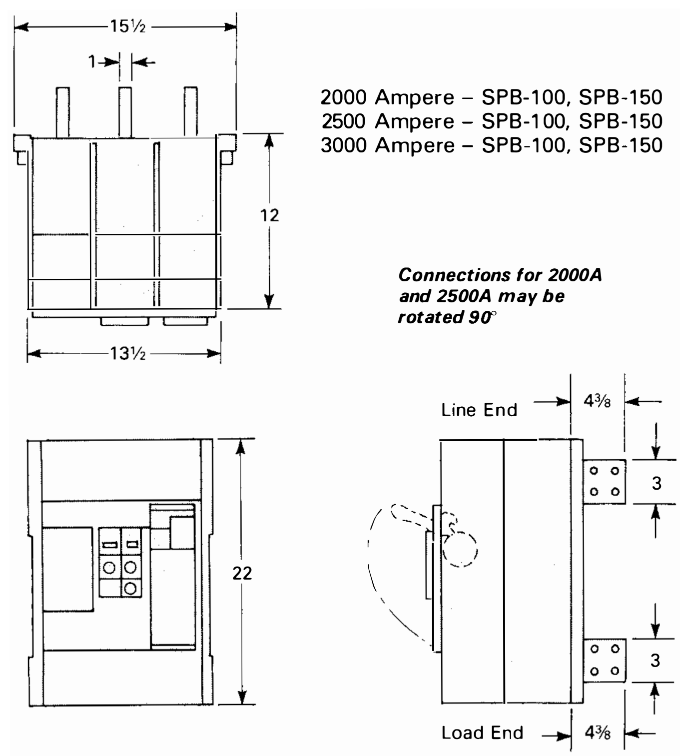


Dimensions, Inches *Not to be used for construction purposes unless approved.*
Fixed Mounted Breakers *(Rear Connected)*

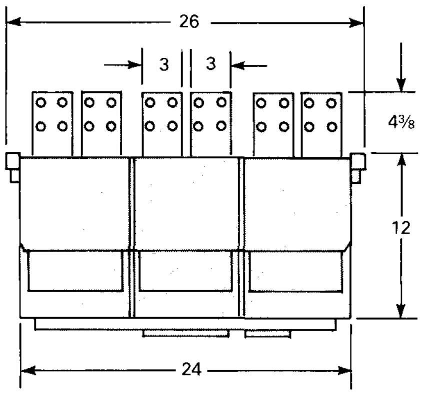


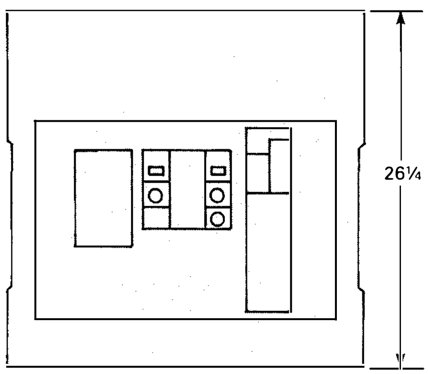






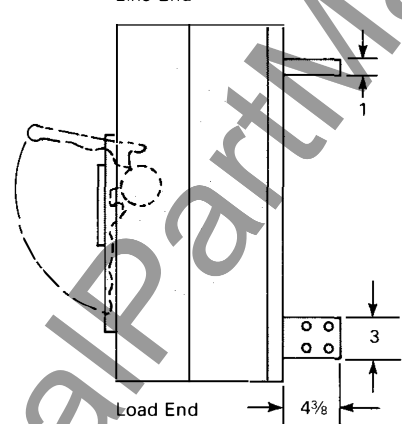
Dimensions, Inches *Not to be used for construction purposes unless approved.*
Fixed Mounted Breakers *(Rear Connected)*

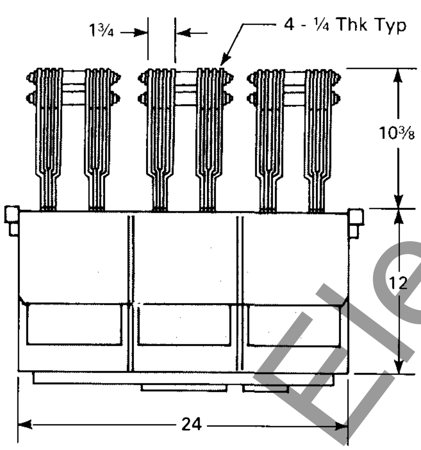


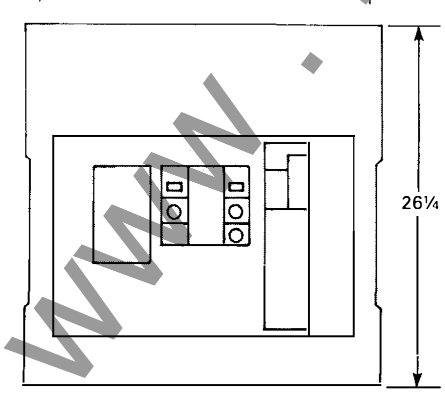


4000 Ampere – SPB-100
4000 Ampere – SPB-150

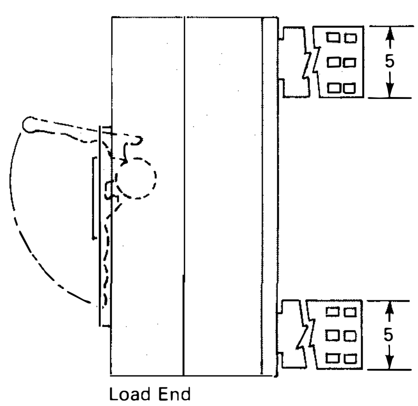
Connections may be rotated 90°





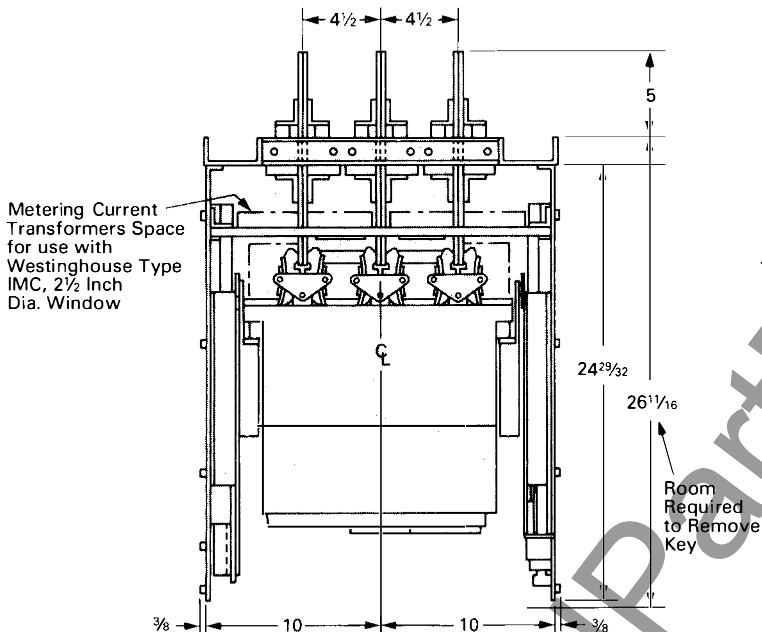


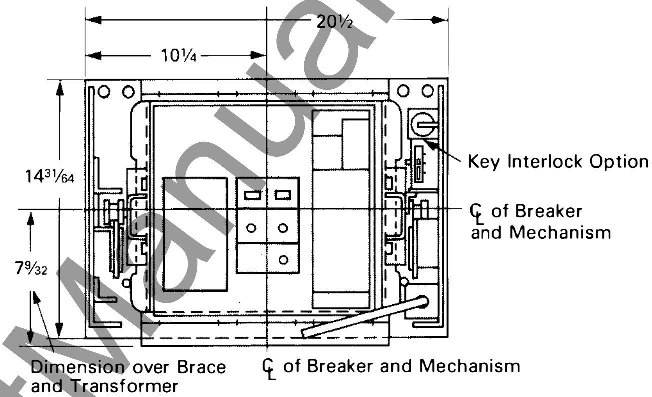
5000 Ampere – SPB-100
5000 Ampere – SPB-150

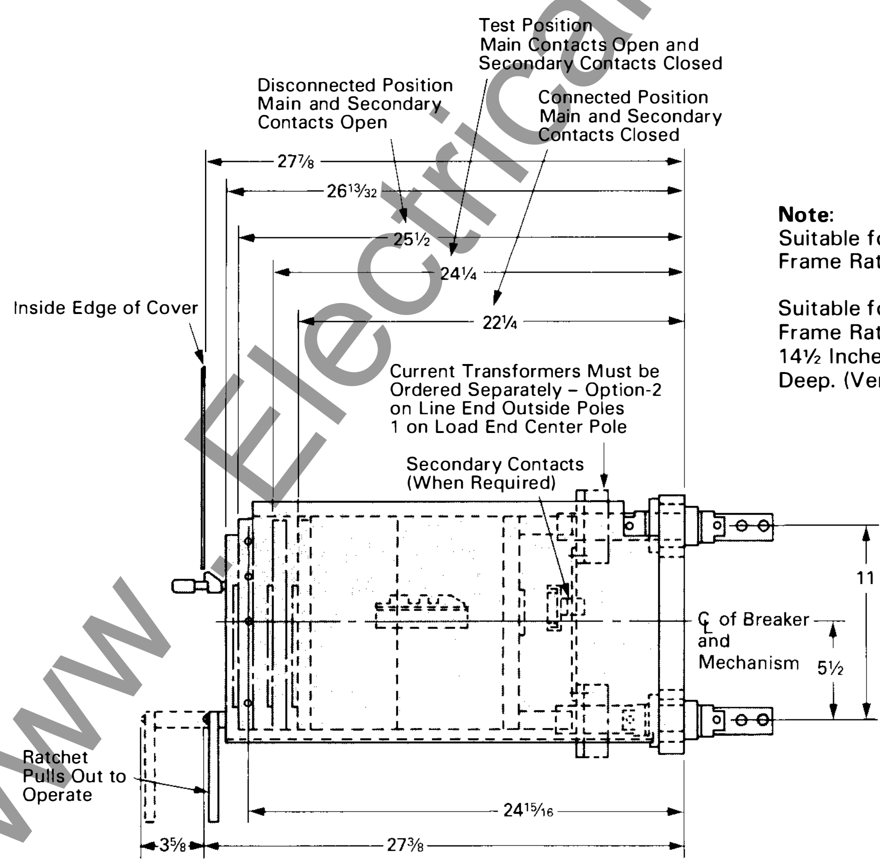


Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Behind the door design

400 Ampere – SPB-50, SPB-100
800 Ampere – SPB-50, SPB-100
1200 Ampere – SPB-65, SPB-100





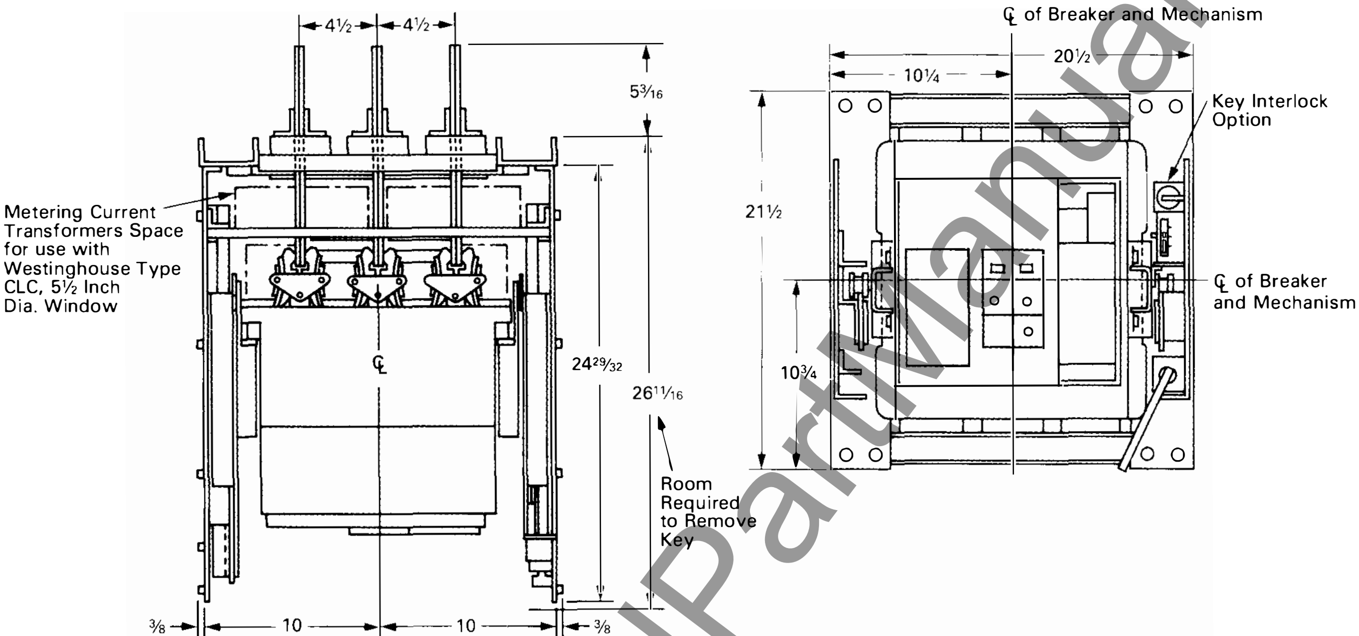


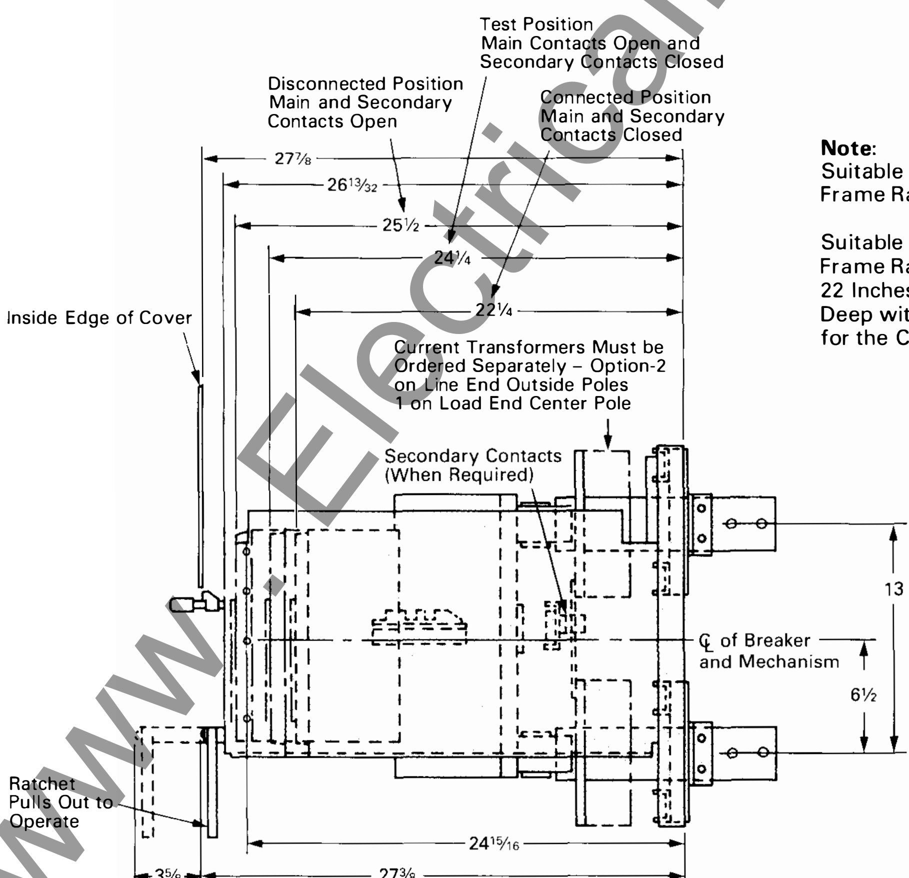
Note:
Suitable for Continuous Operation at 80% of Frame Rating in an Enclosure without Ventilation.

Suitable for Continuous Operation at 100% of Frame Rating if used in a Minimum Enclosure 14½ Inches High × 21 Inches Wide × 33½ Inches Deep. (Ventilation is not Required)

Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Behind the door design

400 Ampere – SPB-150
800 Ampere – SPB-150
1200 Ampere – SPB-150
1600 Ampere – SPB-65, SPB-100, SPB-150
2000-C Ampere – SPB-65, SPB-100, SPB-150



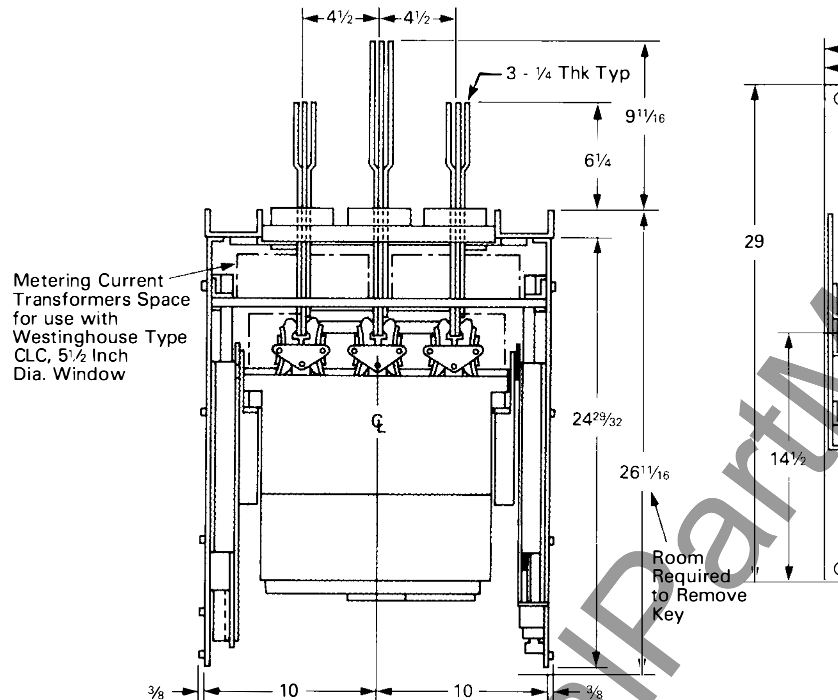


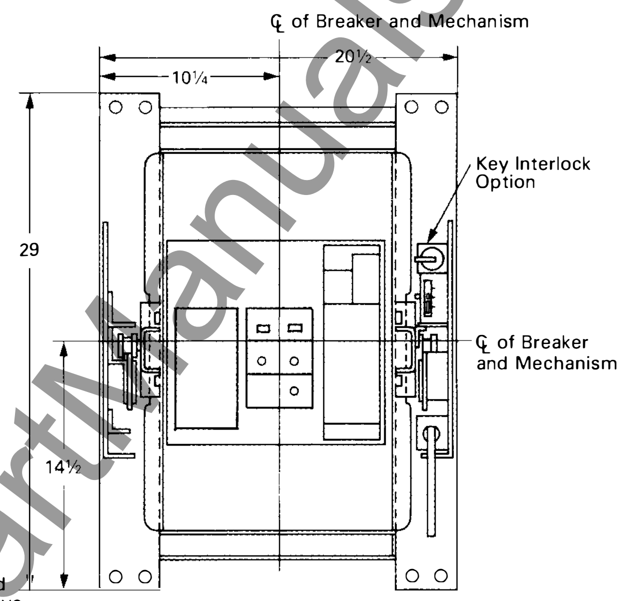
Note:
Suitable for Continuous Operation at 80% of Frame Rating in an Enclosure without Ventilation.

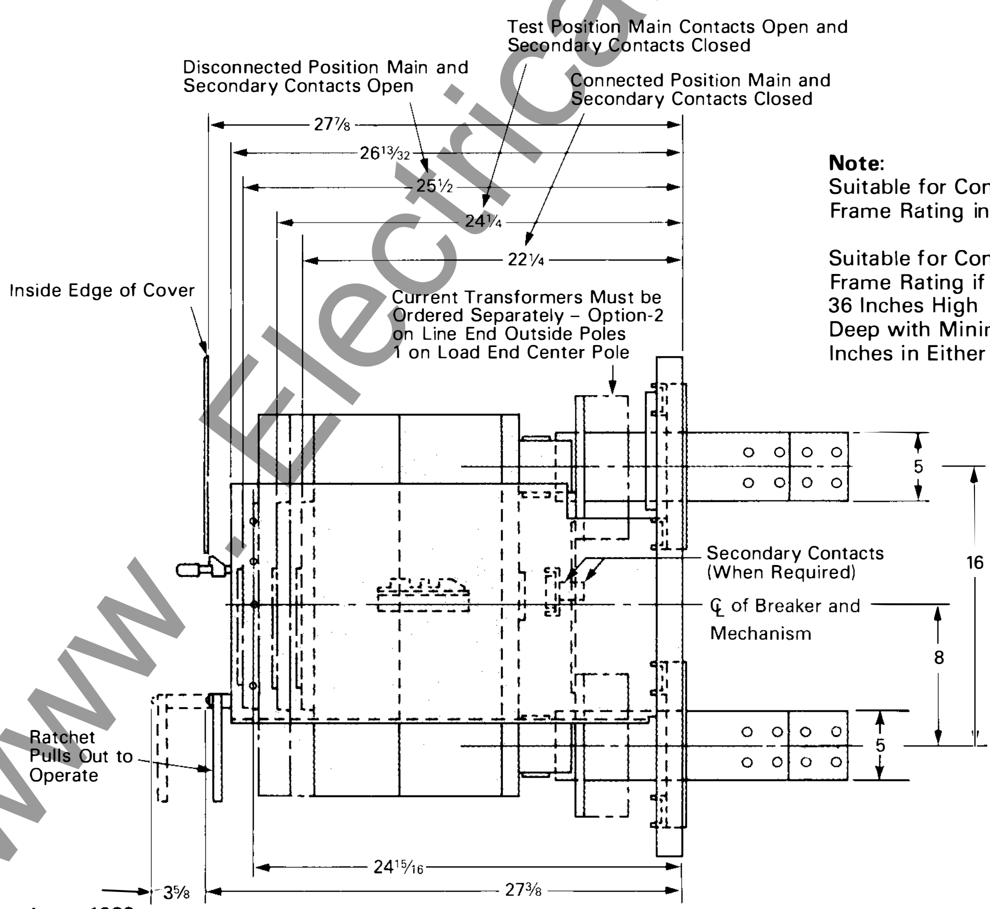
Suitable for Continuous Operation at 100% of Frame Rating if used in a Minimum Enclosure 22 Inches High × 21 Inches Wide × 33½ Inches Deep with Minimum Ventilation of 36 Square Inches for the Compact 2000 Amp Breaker.

Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Behind the door design

2000 Ampere – SPB-100, SPB-150
2500 Ampere – SPB-100, SPB-150
3000 Ampere – SPB-100, SPB-150







Note:
Suitable for Continuous Operation at 80% of Frame Rating in an Enclosure without Ventilation.

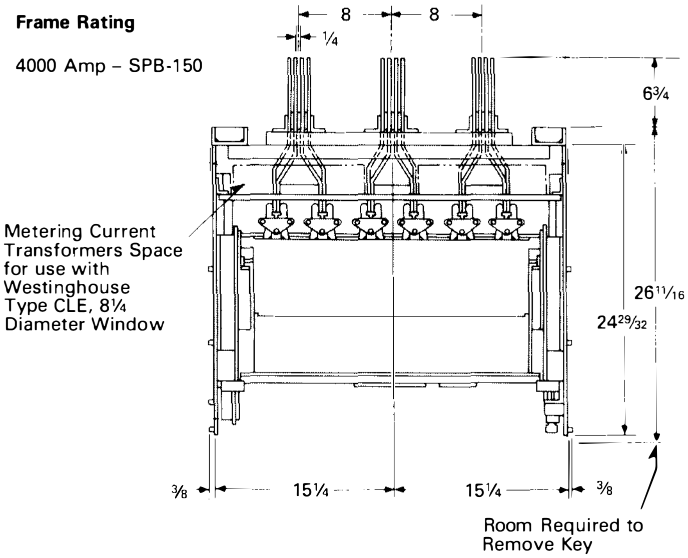
Suitable for Continuous Operation at 100% of Frame Rating if used in a Minimum Enclosure 36 Inches High × 21 Inches Wide × 38 Inches Deep with Minimum Ventilation of 160 Square Inches in Either the Front or Side of the Enclosure.

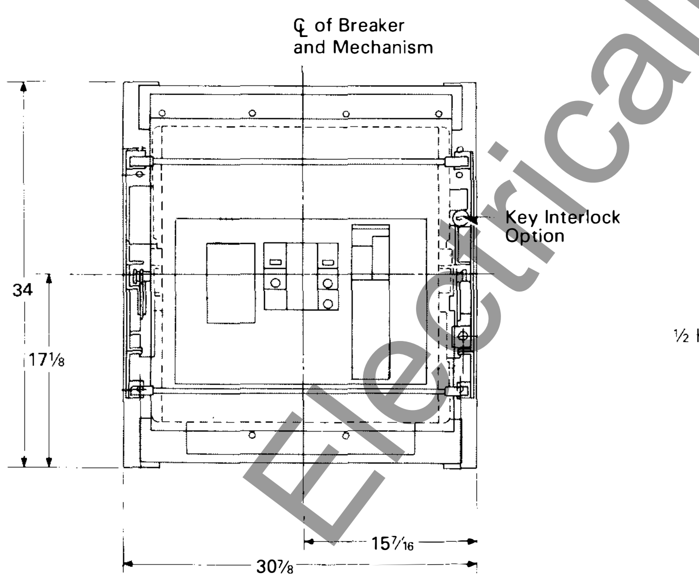
Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Behind the door design

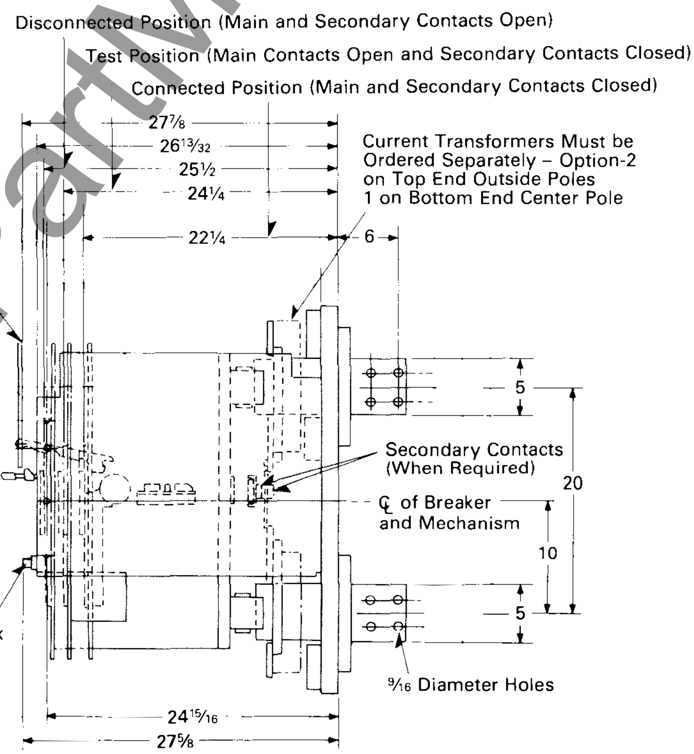
4000 Ampere – SPB-100, SPB-150

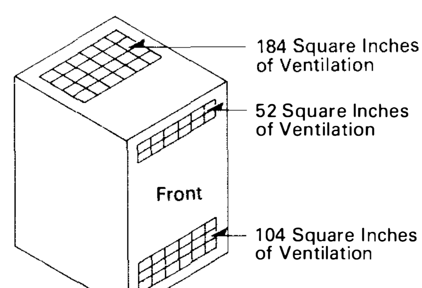
Frame Rating

4000 Amp – SPB-150









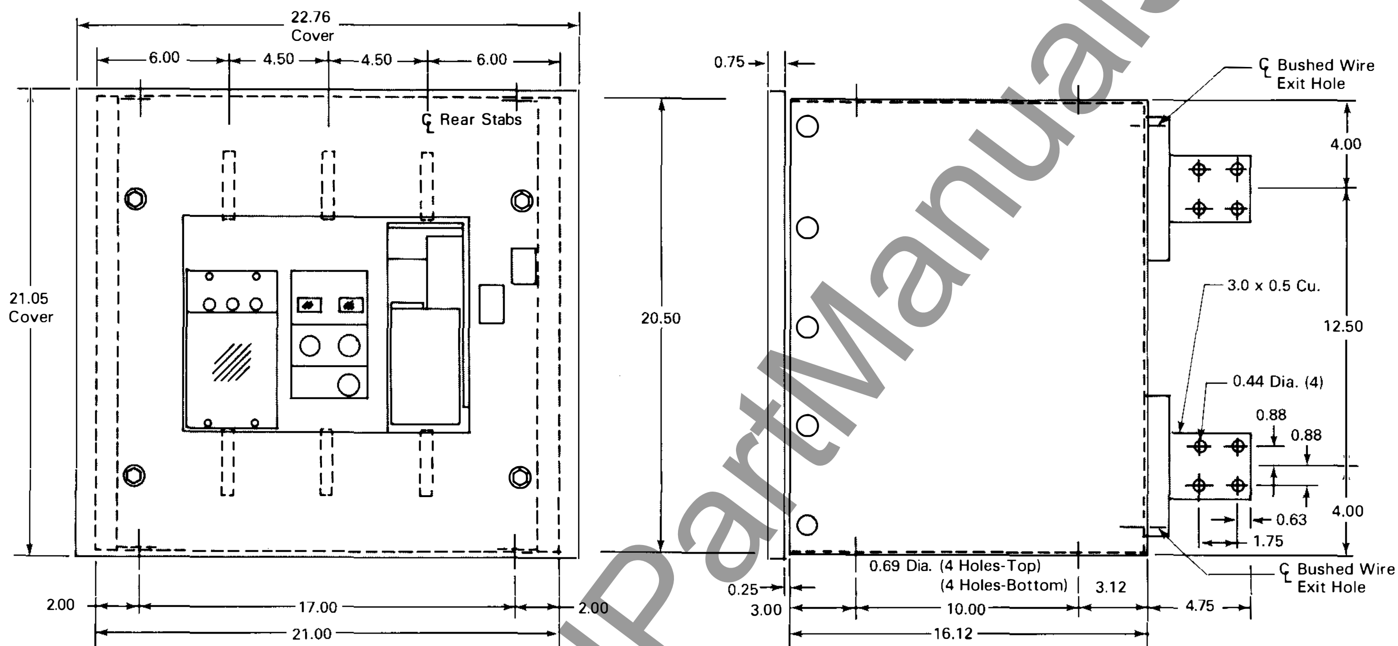
Enclosure Showing Ventilation

Note:
Suitable for Continuous Operation at 80% of Frame Rating in an Enclosure without Ventilation.

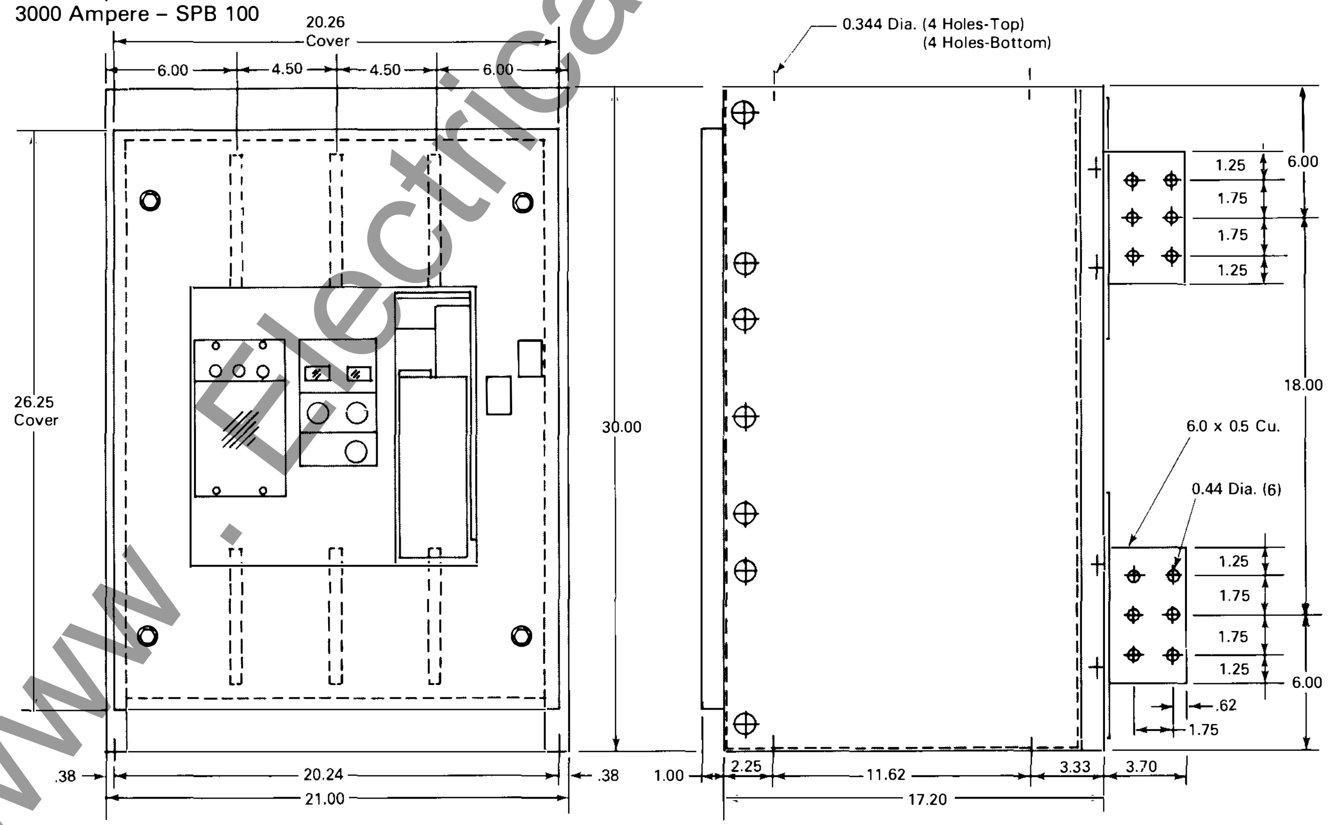
Suitable for Continuous Operation at 100% of Frame Rating if used in a Minimum Enclosure 45 Inches High × 31½ Inches Wide × 36 Inches Deep with Minimum Ventilation of 156 Square Inches in either the Front or Side of the Enclosure and 184 Square Inches in the Top of the Enclosure.

Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Through the door design

250 Ampere – SPB50, SPB65, SPB100
800 Ampere – SPB50, SPB65, SPB100
1200 Ampere – SPB50, SPB65, SPB100
1600 Ampere – SPB50, SPB65, SPB100
2000C Ampere – SPB50, SPB65, SPB100



2000 Ampere – SPB 100
2500 Ampere – SPB 100
3000 Ampere – SPB 100



Approximate Weight, Pounds

Frame Rating Amperes	Fixed Mounted Breakers	Drawout Mounted Breakers			
		Behind the door		Through the door	
		Drawout Element Only	Drawout Stationary Frame	Drawout Element Only	Drawout Stationary Frame
400-800-1200	100	110	85	146	101
1600-2000-C	120	133	95	169	101
2000-2500-3000	185	207	105	294	154
4000-5000	620	655	450	N/A	N/A

Further Information
List Prices: Price List 29-821

Instruction Leaflets:

IB 15082 Instruction for the Systems Pow-R Breaker and Drawout Mechanism 250-3000 Amp. Frames

IL 15094 Instructions for Field Testing of Systems Pow-R Breakers.

IL 15106 Inspection and Maintenance of Systems Pow-R Breakers.

IL 15129 Instructions for Cable Interlocked Behind the Door Drawout Systems Pow-R Breakers.

IL 15141 Instruction for Time Delay Undervoltage Release for Systems Pow-R Breaker.

IL 15146 Instructions for Capacitive Trip Device.

IL 15156 Removal and Replacement of Moving and Stationary Conductor and Operating Mechanism in a Systems Pow-R Breaker.

IL 15158 Instructions for Installing Shunt Trip Devices in Systems Pow-R Breakers.

IL 15159 Instructions for Installing Auxiliary Switches in System Pow-R Breakers.

IL 15160 Instructions for Installing Electrical Operators in System Pow-R Breakers.

IL 15161 Instructions for Installing Spring Release Device in Systems Pow-R Breakers.

IL 15162 Instructions for Installing Undervoltage Release Device in System Pow-R Breaker.

IL 15254 Instructions for Kirk Key Interlock for Behind the Door Drawout Systems Pow-R Breakers.

IL 15377 Instructions for Use of Secondary Contact Assemblies for Behind the Door Drawout Systems Pow-R Breakers.

IL 15494 Instructions for Replacing Handle Hub Assembly on Systems Pow-R Breakers.

IL 15497 Instructions for Fixed Mounted Mechanically Interlocked Systems Pow-R Breaker.

IL 15532 Instructions for Field Installing Push to Open Padlockable and Manual Close Block Adaptors.

IL 29-801 General Instructions for Use of Systems Pow-R Breakers.

IL 29-851 Instructions for Digitrip RMS 500 Trip Unit.

IL 29-852 Instructions for Digitrip RMS 600 Trip Unit.

IL 29-853 Instructions for Digitrip RMS 700 Trip Unit.

IL 29-854 Instructions for Digitrip RMS 800 Trip Unit.

IL 29-855 Digitrip RMS Trip Units Used with Type SPB Systems Pow-R Breakers.

IL 29-856 Instructions for the Systems Pow-R Breaker with Through the Door Drawout.

IL 29-857 Instructions for the Systems Pow-R Breaker with Behind the Door Drawout.

IS 15545 Master Connection Diagram for Systems Pow-R Breaker with Digitrip RMS.

Westinghouse Electric Corporation
Distribution and Control Business Unit
Electrical Components Division
Pittsburgh, Pennsylvania, U.S.A. 15220

Systems Pow-R Breaker
With Digitrip RMS Trip Unit

Introduction

The Westinghouse Systems Pow-R Breaker, the world's first encased power breaker, now includes a new family of Westinghouse microprocessor-based trip units called Digitrip RMS.

The Systems Pow-R Breaker with Digitrip RMS affords the Consulting Engineers, the Switchboard Assemblers, and the users with opportunities to improve systems control, monitoring, testing, and circuit protection while providing for present and future energy monitoring and remote communications requirements.

Application

Systems Pow-R Breakers can be applied as individual breakers in separate enclosures or in switchboards as mains, ties and feeder breakers. They can be applied in low voltage distribution systems through 600 volts AC, 50 or 60 Hertz. Because they combine high interrupting capacity with short-time delay tripping, Systems Pow-R Breakers can be applied in fully rated, selective systems while providing full selectivity through the applied breaker's short-time rating.

Features

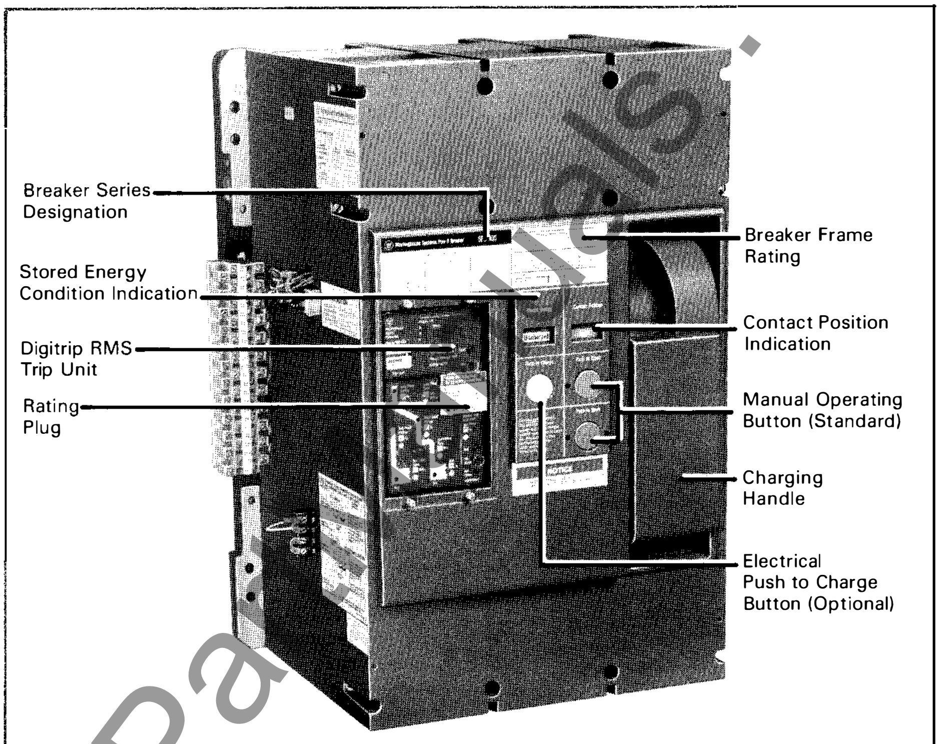
Systems Pow-R Breaker features most beneficial to users:

- Underwriter's Laboratory label
- High interrupting capacity without fuses
- Increased short-time ratings for system continuity
- 100% rated
- Application flexibility of "options oriented" design
- Safety considerations for personnel and equipment
- Maximum five cycle closing
- Selective curves for greater coordination
- Integral testing
- Remote communications and control
- Energy monitoring
- Compact size and layout flexibility
- Compliance with various local and national codes
- I^2t or flat response curves on short-time and ground fault
- True RMS current sensing
- Mode of trip information

Description

The Systems Pow-R Breakers are identified by four series: SPB-50, SPB-65, SPB-100 and SPB-150. The numbers after the SPB refer to the interrupting capacity in thousands of rms symmetrical amps at 480 volts AC without fuses. All are U.L. listed per UL 489. Complete interrupting ratings are shown in Table 1. Non-Automatic ratings are shown in Table 3.

The Systems Pow-R Breaker family consists of fixed breakers — either front connected or rear connected and drawout breakers — either behind the door or through the door design. Four pole breakers are only available in the fixed design — front or rear connected. The available frame size for each of the breaker series are shown in Table 2.



Systems Pow-R Breakers with Digitrip RMS

Table 1: Interrupting Ratings Table for Systems Pow-R Breakers with Digitrip RMS Trip Unit

Series		SPB-50	SPB-65		SPB-100						SPB-150					
Frame Continuous Ampere Rating		400A 800A	1200A	1600A 2000-CA②	400A 800A	1200A	1600A 2000-CA②	2000A 2500A	3000A	4000A 5000A	400A 800A	1200A	1600A 2000-CA②	2000A 2500A	3000A	4000A 5000A
Short-Time Rating with Selective Override①		25KA	35KA	35KA	25KA	35KA	35KA	35KA	35KA	65KA	25KA	35KA	51KA	51KA	51KA	85KA
Maximum Short-Time Delay Setting (Seconds)		0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Interrupting Capacity KA RMS Symmetrical Amps Ⓦ AC Rating Volts	240V	65	85	85	100	100	100	100	100	100	200	200	200	200	200	200
	480V	50	65	65	100	100	100	100	100	100	150	150	150	150	150	150
	600V	42	42	50	50	50	85	85	85	85	100	100	100	100	100	100

Table 2: Frame Size in Amperes for Systems Pow-R Breakers with Digitrip RMS Trip Unit

Breaker Series	Fixed Breakers		Drawout Breakers	
	Front Connected	Rear Connected	Behind Door	Through Door
SPB-50	400 800	400 800	400 800	400 800
SPB-65	1200 1600 2000-C②	1200 1600 2000-C②	1200 1600 2000-C②	1200 1600 2000-C②
SPB-100 and SPB-150 ③	400 800 1200 1600 2000-C② 2000 2500 3000 4000	400 800 1200 1600 2000-C② 2000 2500 3000 4000 5000	400 800 1200 1600 2000-C② 2000 2500 3000 4000	400 800 1200 1600 2000-C② 2000 2500 3000

① Short-time rating (RMS symmetrical amps) in 600V, 50/60 Hz system with X/R ratio of 6.6.
② 2000-C designates 2000 amp rating in a 16 inch high frame.
③ Not available on through door design.
④ Must be protected within this time by some other device.

Table 3: Non-Automatic Switch Application Guide

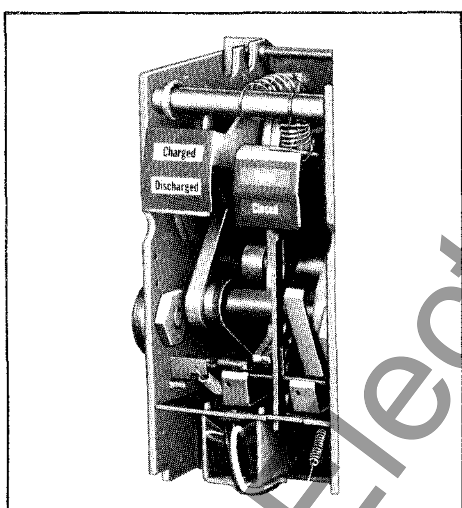
Switch Rating	Application With Fuses			Application Without Fuses
	Max. Fuse Rating	Fuse Class	Maximum Short Circuit RMS Symmetrical	Maximum Short Circuit RMS Symmetrical For a Maximum of 1.0 Seconds④
Standard Withstand (SPBN)				
250	250	K5	200,000-480/600 Volts	35,000-480/600 Volts
800	800	L	200,000-480/600 Volts	35,000-480/600 Volts
1200	1200	L	100,000-480/600 Volts	35,000-480/600 Volts
1600	1600	L	35,000-480/600 Volts	35,000-480/600 Volts
2000C②	2000	L	35,000-480/600 Volts	35,000-480/600 Volts
2000	2000	L	35,000-480/600 Volts	35,000-480/600 Volts
2500	2500	L	35,000-480/600 Volts	35,000-480/600 Volts
3000	3000	L	35,000-480/600 Volts	35,000-480/600 Volts
4000	4000	L	65,000-480/600 Volts	65,000-480/600 Volts
5000	5000	L	65,000-480/600 Volts	65,000-480/600 Volts
High Withstand (SPBNH)				
250	250	K5	200,000-480/600 Volts	50,000-480/600 Volts
800	800	L	200,000-480/600 Volts	50,000-480/600 Volts
1200	1200	L	200,000-480/600 Volts	50,000-480/600 Volts
1600	1600	L	100,000-480/600 Volts	50,000-480/600 Volts
2000C②	2000	L	100,000-480/600 Volts	50,000-480/600 Volts
2000	2000	L	100,000-480/600 Volts	50,000-480/600 Volts
2500	2500	L	50,000-480/600 Volts	50,000-480/600 Volts
3000	3000	L	50,000-480/600 Volts	50,000-480/600 Volts
4000	4000	L	85,000-480/600 Volts	85,000-480/600 Volts
5000	5000	L	85,000-480/600 Volts	85,000-480/600 Volts

Standard Features

U.L. Listing for 100% application All Systems Pow-R Breakers are suitable for continuous operation at 100% of the frame rating. Thus, the Systems Pow-R Breaker, including the load size bus or cable, can be sized to connected load, eliminating need for oversizing as with conventional overcurrent devices.

Uniform Appearance All fixed mounted Systems Pow-R Breaker ratings have the same depth. All drawout mounted Systems Pow-R Breaker ratings have the same depth. Breakers with 400A to 3000A frames have the same width and pole spacings for both manual and electrically operated units. The 4000A and 5000A ratings are larger but both manual and electrically operated units have the same width and pole spacings. These designs permit simplified bus arrangements and assembly layouts.

True Two-Step Stored Energy Mechanism Both mechanical and electrically operated versions feature a true two-step stored energy mechanism with no change in dimensions. This mechanism allows maximum five cycle closing usually required for generator paralleling.

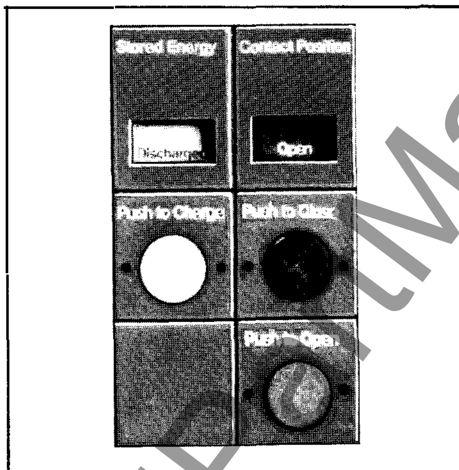


Breaker Mechanism

Solid State Trip Unit The Systems Pow-R Breaker uses the Digitrip RMS solid state trip unit. This technologically advanced microprocessor-based trip unit has four models. They are numbered 500, 600, 700 and 800. The differences are described in Table 5, page 7.

Continuous Rating Plugs Rating plugs establish the nominal maximum continuous ampere rating of the breaker. They plug into the trip unit and are interchangeable between compatible breaker ratings thus eliminating the need to change sensor rating. Rating plugs offer multiple layers of protection interlocking.

Breaker Status Indicators Color coded visual indicators are provided to indicate position of contacts:
Open — White letters on green background
Closed — White letters on red background
And closing spring status:
Charged — Black letters on yellow background
Discharged — Black letters on white background



Operating Panel

Common Wiring Diagram All Systems Pow-R Breakers with Digitrip RMS use the same wiring diagram regardless of the number of attachments requested. This common wiring diagram simplifies the equipment assembler's task of preparing his schematic diagram.

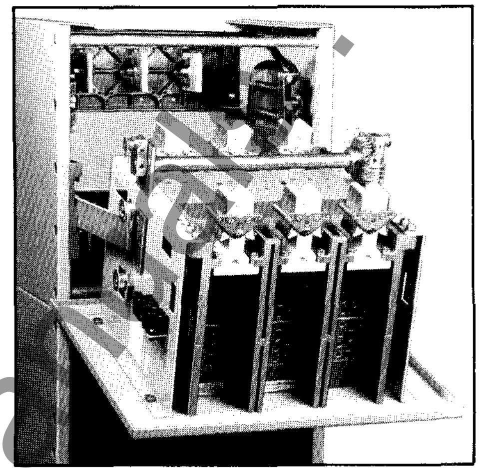
Durability The Systems Pow-R Breaker meets or exceeds UL endurance ratings as listed in Table 4.

Table 4: UL Endurance Ratings

Amperes	Full Load Interruptions	No Load Operations	Total Operations
400	1000	5000	6000
800	500	3000	3500
1200	500	2000	2500
1600	500	2000	2500
2000-C①	500	2000	2500
2000	500	2000	2500
2500	500	2000	2500
3000	400	1100	1500
4000	400	1100	1500
5000	400	1100	1500

① 2000-C designates 2000 amp rating in a 16 inch high frame.

Ease of Maintenance Drawout Systems Pow-R Breakers with Digitrip RMS 400A thru 3000A frame may be rotated 180° in the fully withdrawn position for access to main and secondary disconnects.


Breaker Rotated 90°

Operation

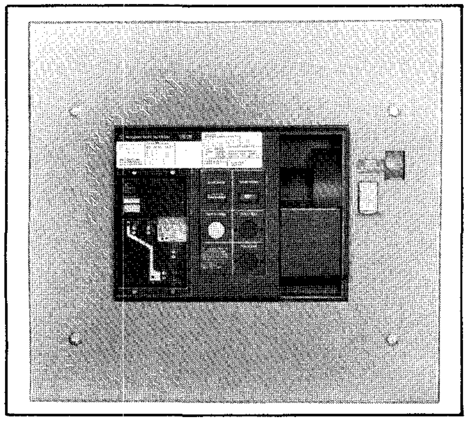
The solid state trip unit is the heart of the Systems Pow-R Breaker. Sensors continuously monitor the load current flow thru each phase and ground (if present). The outputs from the sensors go to the trip unit. The trip unit employs microprocessor-based technology that provides true RMS current values. The primary function of the Digitrip RMS Trip Unit is circuit protection. This is achieved by analyzing the sensor signals, comparing them to pre-set system coordination values and initiating trip signals to a special low-energy flux transfer shunt trip. This shunt trip requires no external control power to trip the breaker.

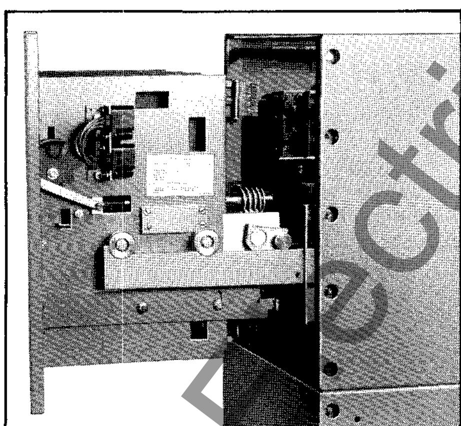
Time/Current System Coordination Adjustments
The standard Digitrip RMS Trip Unit provides adjustable long time and instantaneous settings (LI). Other coordination curves are available as an option:

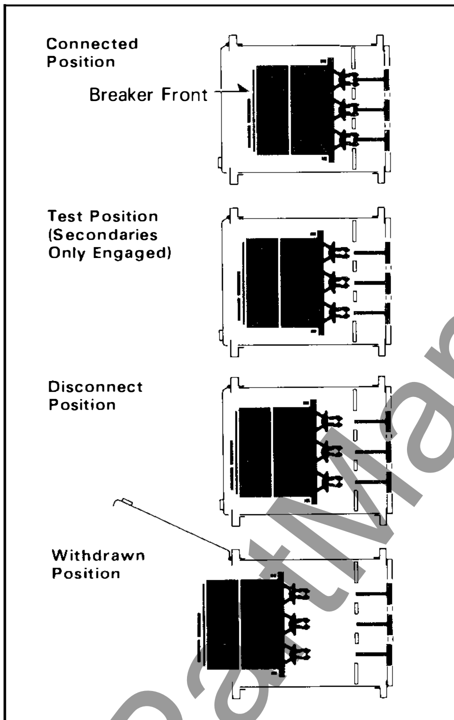
Long Time/Short-Time	LS
Long Time/Short-Time/Instantaneous	LSI
Long Time/Instantaneous/Ground	LIG
Long Time/Short-Time/Ground	LSG
Long Time/Short-Time/Instantaneous/Ground	LSIG

LS and LSG curves are provided with selective over-ride. This is a high set non-adjustable instantaneous value to protect the breaker. Short-time and ground adjustments may be set for a flat or I^2t curve. LEDs placed in the time-current curves depicted on the face of the trip unit provide mode of trip indications.

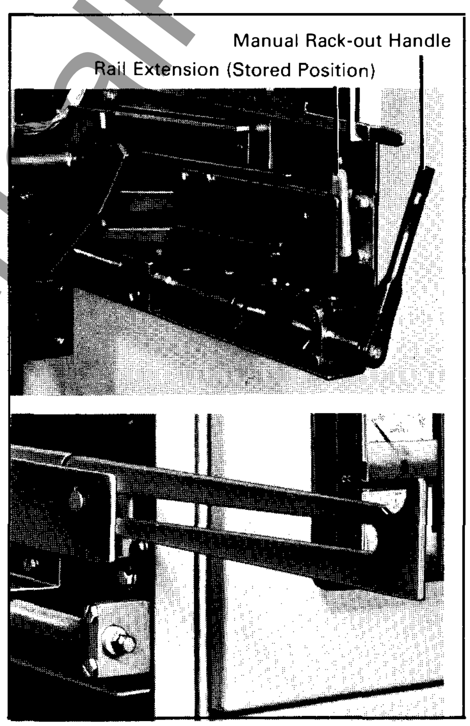
Draw-out Mounting
Systems Pow-R draw-out assemblies consist of a stationary frame and a moving carriage with four positions: Connected, Test, Disconnected and Fully Withdrawn. Extension rails and racking mechanism are part of the draw-out assembly and are self contained. The operating handle is a standard commercially available socket wrench with ratchet. The draw-out mechanism is mechanically interlocked with the breaker draw-out element so that the breaker cannot be racked in or out of the connected position with its main contacts closed. Drawout breakers have two designs: Behind the door design and through the door design.


Behind the Door Design

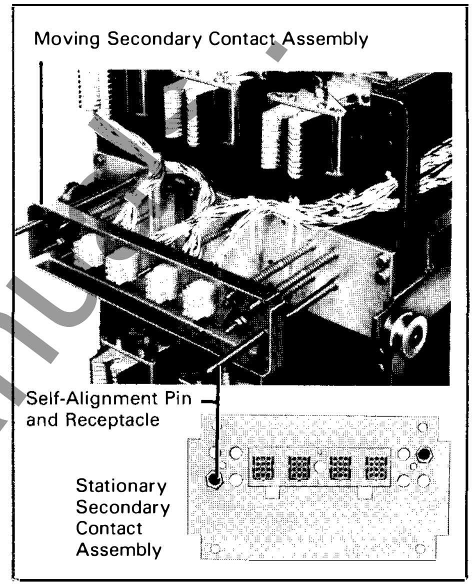

Behind the Door Design in Withdrawn Position



Breaker Positions



Extension rail drawn-out



Secondary contacts having a maximum of 48 points are located at the rear of the draw-out element. Engagement of secondary contacts is assured by automatic self-alignment and positive contact of mating parts.

Charging and Closing of Stored Energy Mechanism
The two-step stored energy system employed by the Systems Pow-R Breaker provides maximum five cycle closing, either manually or electrically operated. The charging and closing actions in the mechanism utilize separate operating shafts, which allow design optimizing of the components in each portion of the mechanism.

Manual charging is accomplished by a constant-force charging handle, using four full strokes or several partial inching strokes as desired. Electrical charging by a motor-driven operator is available as an option.

Both manual and electrically operated breakers have multiple charge-close provisions which makes possible the charge-close-recharge-open-close-open sequence. As a safety feature, the stored energy can be discharged without closing the breaker.

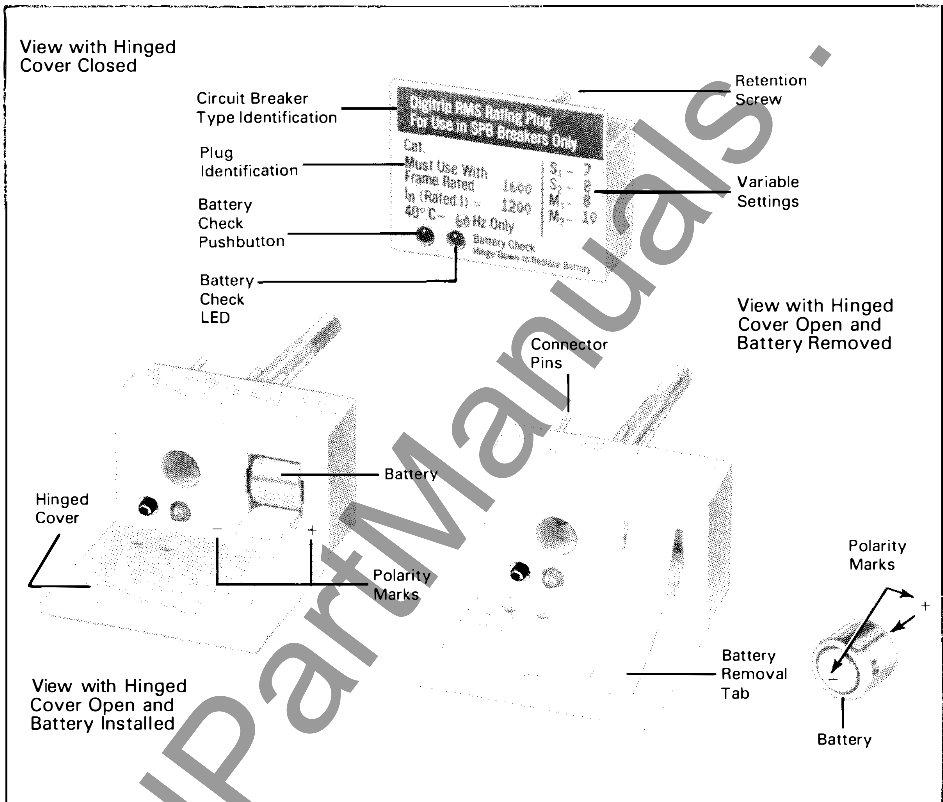
Rating Plug
The continuous ampere rating of Systems Pow-R Breakers is determined by a rating plug which is inserted in the trip unit. Plugs must be selected to match the desired continuous current rating of the circuit breaker as well as the frame rating of the breaker and system frequency. Rating plugs are interchangeable within the same frame size thus eliminating the need to change sensor rating.

Safety Interlocking Systems Pow-R Breaker offer multiple layers of protection interlocking:

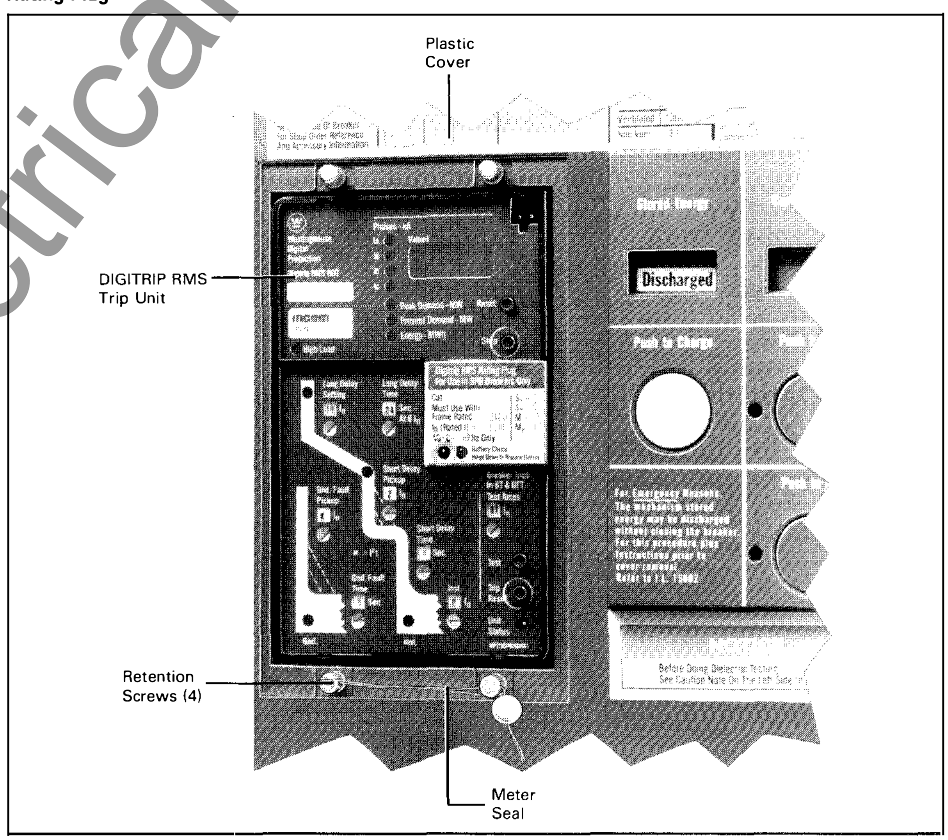
1 Rating plugs are keyed to insure that they cannot be inserted in any frame except the correct one.
2 The rating plug is interlocked with the breaker tripping mechanism to automatically open the breaker when the plug is removed. The breaker remains "trip free" until plug is replaced.
3 A breaker cannot be closed unless a rating plug is installed.

Rating plugs are equipped with a back-up battery to provide power to the LEDs indicating mode of trip operation following a circuit breaker overload or fault trip operation when external control power is not available. The battery is a long life lithium type, that is replaceable from the front of the trip unit without removal of the rating plug. The unit contains its own battery check LED and battery check pushbutton.

Trip Unit Cover
All adjustments can be made with a pocket screwdriver by turning high reliability switches. To prevent tampering, once the trip setting adjustments are made and rating plug is in place, a sealable, transparent cover mounts over the face of the trip unit.



Rating Plug



View of Installed Digitrip RMS Trip Unit with Sealed Cover

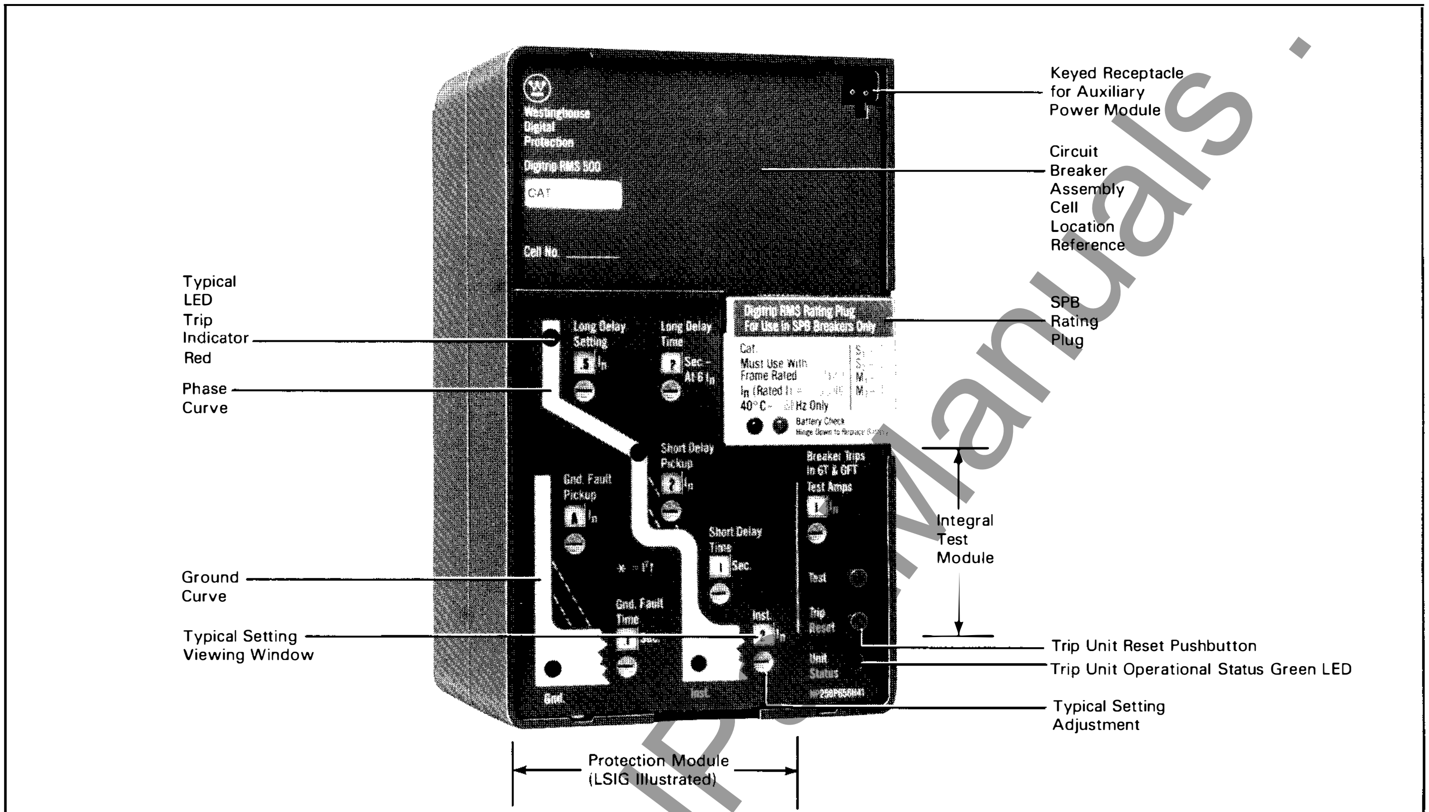
Types of Trip Units

There are four types of Digitrip RMS Trip Units from which to select. Digitrip RMS 500 is the basic model. The 600, 700, and 800 units build upon the 500 and each other, to provide increased function levels with the flexibility to meet specific distribution system requirements. Along with circuit protection, all Digitrip RMS models include information and testing functions. Both remote communications and energy monitoring functions are provided by the Digitrip RMS 700 and 800. The 700 and 800 are also designed to work with the Assemblies Electronic Monitor (AEM). This is a microprocessor-based, door mounted device that acts as a communications center to transmit and receive data from up to 40 monitored units. The AEM can also collect and report information on breaker status to a remote computer. A comparison of the four types of Digitrip RMS is shown in Table 5.

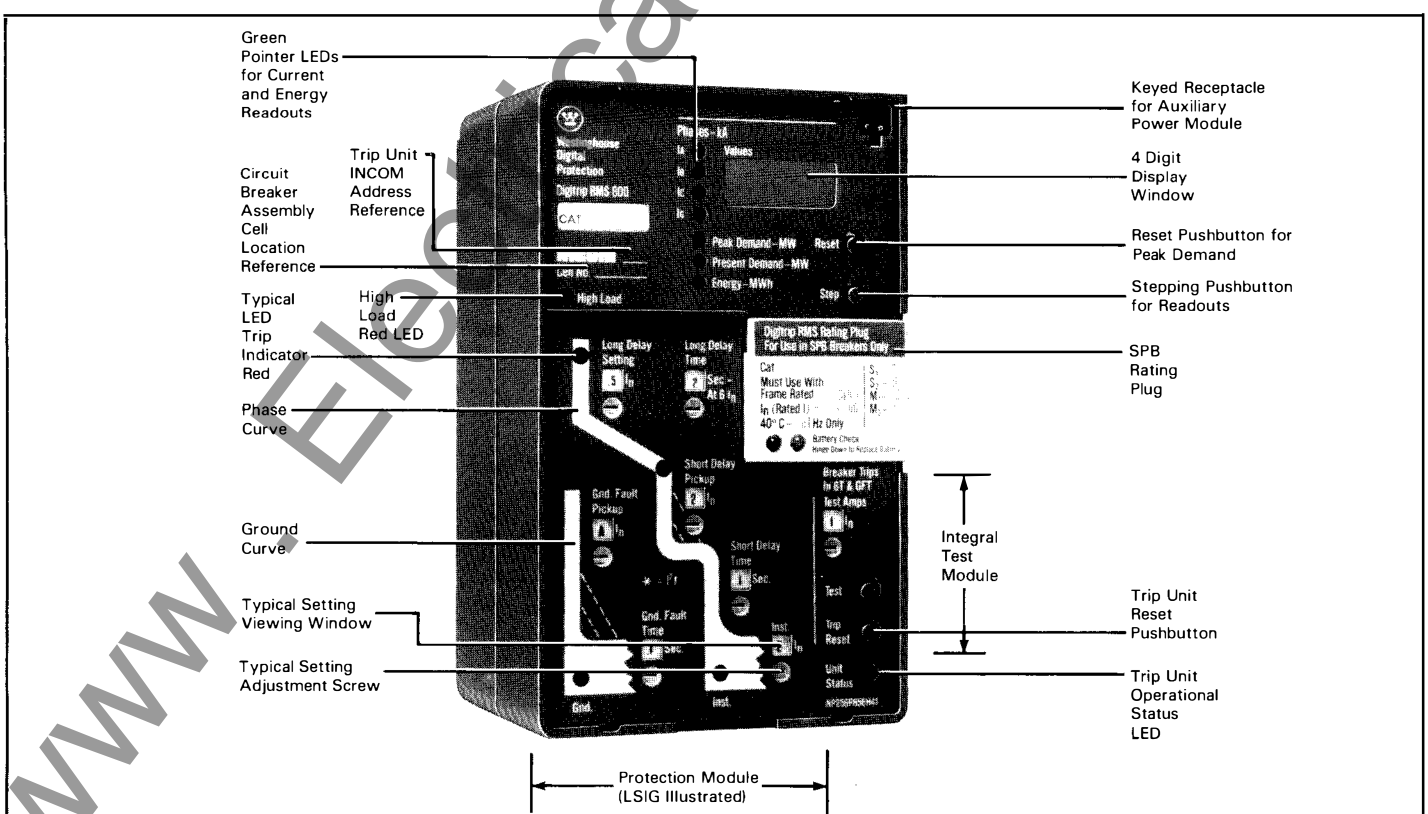
Table 5: Digitrip RMS Trip Unit Characteristics

Digitrip RMS Type		500	600	700	800
	Instruction Leaflet No.	I.L. 29-851	I.L. 29-852	I.L. 29-853	I.L. 29-854
Protection	Long Delay Setting	X	X	X	X
	Long Delay Time	X	X	X	X
	Long Time Memory	X	X	X	X
	Short Delay Pick-up	OPT.	OPT.	OPT.	OPT.
	Short Delay Time	OPT.	OPT.	OPT.	OPT.
	Flat/I^2T Response	X	X	X	X
	Zone Interlocking	①	①	①	①
	Instantaneous Pick-up	OPT.	OPT.	OPT.	OPT.
	Ground Fault Pick-up	OPT.	OPT.	OPT.	OPT.
	Ground Fault Time	OPT.	OPT.	OPT.	OPT.
	Flat/I^2T Response	X	X	X	X
	Ground Time Memory	X	X	X	X
	Zone Interlocking	①	①	●	①
	Interchangeable Rating Plug	X	X	X	X
Local Trip Indication	Mode of Trip LED's	X	X	X	X
	Battery – for Mode of Trip LEDS	X	X	X	X
	Battery Status LED	X	X	X	X
	Battery Test Pushbutton	X	X	X	X
Test	Integral Test Provisions	X	X	X	X
	Trip Unit Status Indication LED	X	X	X	X
	Auxiliary Power Module	OPT.	OPT.	OPT.	OPT.
Local Display On Trip Unit	Power Relay Module		X	X	X
	4 Digit Display		X		X
	øA Current LED		X	②	X
	øB Current LED		X	②	X
	øC Current LED		X	②	X
	Gnd. Current LED		⑥	②⑥	⑥
	Display Stepping Pushbutton		X		X
	High Load LED		X		X
Remote Signals	Remote Signal Contacts:				
	Long Delay Trip		X	X	X
	Short Circuit Trip		X	X	X
	Ground Fault Trip		⑥	⑥	⑥
	High Load Alarm		X	X	X
Energy Monitoring	Potential Transformer Module			X	X
	PTM Disconnect Plug for Dielectric Testing of Circuit Breaker			X	X
	Energy Monitoring: Parameters				
	Peak Demand			④	X
	Peak Demand Reset PB			④	X
	Present Demand			④	X
	Energy Consumption			④	X
Communications	INCOM (Integrated Communications)			X	X
	INCOM Address Register			X	X
Transmittable Data	Transmittable Parameters:				
	Individual Phase Currents			②	③
	Ground Currents			②⑥	③⑥
	Energy			④	③
	Breaker Status:				
	Open/Closed/Tripped			②	③
	Mode of Trip:				
	Override			②	③
	Instantaneous			②	③
	Discriminator			②	③
	Short Delay			②	③
	Ground Fault			②⑥	③⑥
	Long Delay			②	③
	Long Delay Pick-up				③
	Information:				
	External Trip Command (Over INCOM)			②	③
	Data Memory Test Failure (RAM)			②⑤	③
	Program Memory Test Failure (ROM)			②⑤	③
	Missing or Defective Rating Plug			④	③
	Reverse Power Flow			④	③
	Response to Depressing Test Pushbutton			④	③
	Communication Failure			②⑤	②⑤
Control	Breaker Command (Via INCOM):				
	Trip			X	X
	Close			OPT.⑦	OPT.⑦

NOTES:
OPT = Optional, X = Standard
① Use of zone interlocking is optional with breaker wiring modification.
② Remote location only unless optional AEM local monitor is used.
③ Local (on face of trip unit) or remote via INCOM.
④ Remote only.
⑤ On AEM denoted by absence of response from addressed breaker.
⑥ Supplied only when trip unit is equipped with ground fault protection option.
⑦ Requires spring release or electrical operator option.



Typical DIGITRIP RMS 500 Trip Unit with Rating Plug Installed



Typical DIGITRIP RMS 800 Trip Unit with Rating Plug Installed

Power/Relay Module
The Power/Relay Module, supplied with Digitrip RMS 600, 700 and 800, (Cat. PRTAATR), requires a 120V., 50/60 Hz, 6VA control power supply for operating the Readout Display and internally mounted signal relays. Following automatic trip operation of the circuit breaker, it will maintain the cause of the trip history and the mode of trip LEDs as long as the external control power supply is available. Each signal relay contact (overload, short circuit, ground fault, if included with trip unit, and the high load) is rated 120V, 50/60 Hz, 1.0 amp. It is mounted inside the breaker frame next to the trip unit.

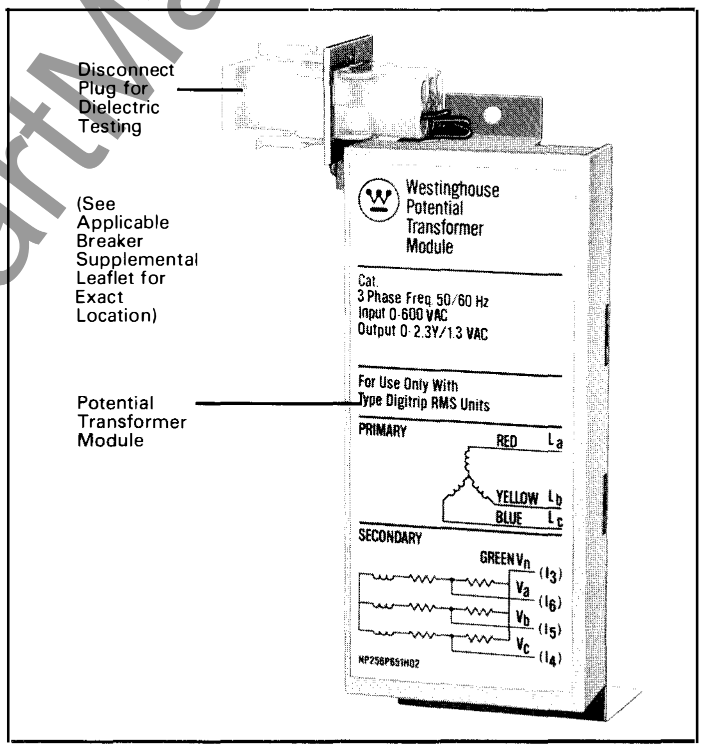
Potential Transformer Module
The Potential Transformer Module, used with Digitrip RMS 700 and 800, is an internally mounted transformer that provides step down voltages to the mini-computer to permit energy monitoring calculations that include peak demand, present demand and energy consumed. The module is suitable for all system voltage ratings up through 600V., 50/60 Hz.

The primary of this transformer is connected internally to the primary phase conductors of the circuit breaker through a dielectric disconnect plug located on the left side of circuit breaker. When this plug is disconnected, the breaker current carrying members may be dielectric tested.

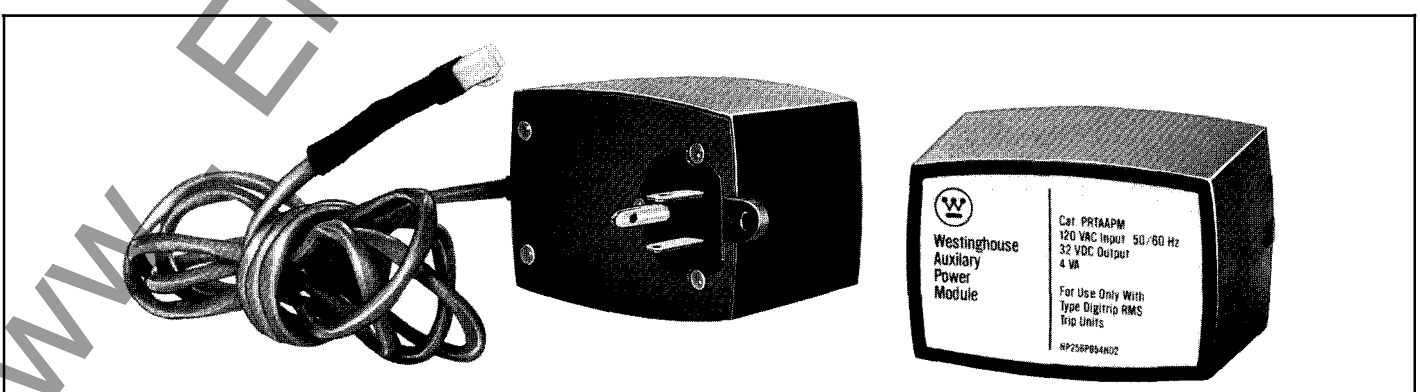
Auxiliary Power Module
The Auxiliary Power Module, an optional device, (Cat. No. PRTAAPM) is an encapsulated power supply. It requires a 120 Vac, 50/60 Hz input power for a 32 VDC output used for testing the Digitrip RMS trip units. The unit has a unique plug-in connector to prohibit use of incorrect, but similar looking, devices.

This module provides power to permit a draw-out breaker to be tested out of the cell or in the cell in the "Disconnect" or "Withdrawn" position. The Auxiliary Power Module is also used for bench testing of Digitrip RMS trip units.

Power/Relay Module



Potential Transformer Module



Auxiliary Power Module

Available Accessories

Shunt Trip
Used in conjunction with an auxiliary switch to provide for breaker opening from a remote location. In addition to the cut-off function, the auxiliary switch can be used for remote indication of the breaker's open or closed status.

Capacitor Trip Device
For use with a shunt trip. Provides a means of tripping a breaker for a minimum of five (5) seconds after loss of control voltage.

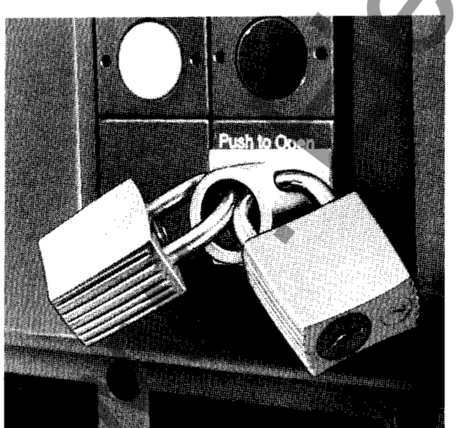
Undervoltage Release Instantaneous
Operates to open the breaker instantaneously when the monitored voltage is less than or equal to the dropout setting.

Undervoltage Release Time Delay Device
Used with an instantaneous undervoltage release accessory to provide the necessary time delay to avoid nuisance breaker openings resulting from momentary dips in the monitored voltage source.

Auxiliary Switches
A maximum of four spare S.P.D.T. contacts may be installed in a single breaker. These may be used for interlocks in remote control circuits, and may also be used to indicate open or closed position of breaker main contacts.

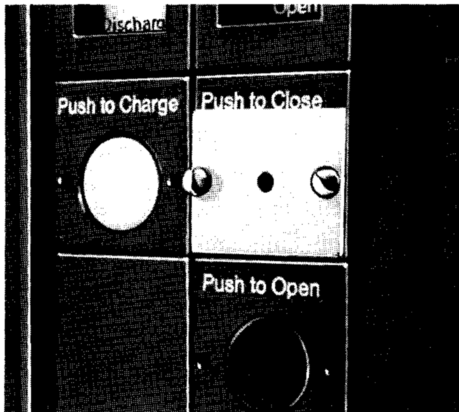
Key Interlocks①
Provide means for mechanical sequencing of breakers as may be required when multiple power sources are available for a common load. Available for either fixed or draw-out mounted breakers.

Push-to-open Padlockable Adaptor Bracket
Installed with non-removable screws over the push-to-open button. It allows the breaker to be padlocked in the open position.



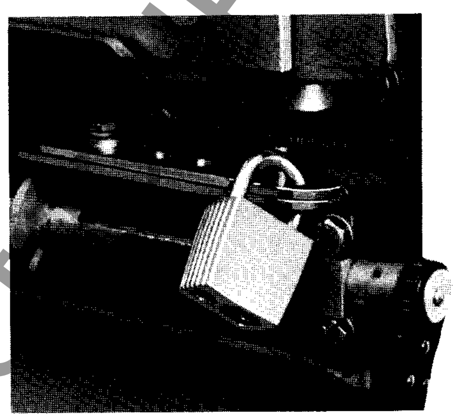
Padlocking Push-to-open Button

Cover for Manual Close Pushbutton
Prevents the breaker from being manually closed under automatic sequencing control conditions.



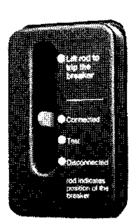
Manual Push-to-close Button Blocked Off

Draw-out Cell Position Padlock Adaptor②
Available for factory installation to padlock the breaker in either the "Connected," "Test," or "Disconnected" positions, preventing the breaker from being moved to any other cell position.



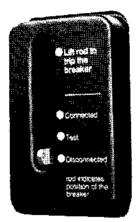
Padlocking of Draw-out Element

Door Escutcheon②
An external breaker position indicator is available for mounting on the breaker cell door to provide visual indication of the drawout position of the breaker behind the door.



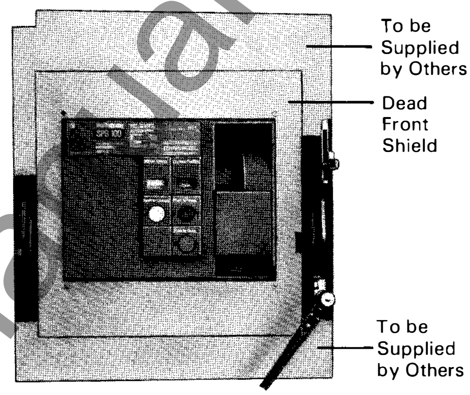
Breaker Connected

Breaker in Test Position



Breaker Disengaged

Dead Front Shield②
A cover that mounts to the front of a breaker mounted in a draw-out mechanism that matches with a fixed shield in the breaker cell to prevent inadvertent contact with live, current-carrying parts.

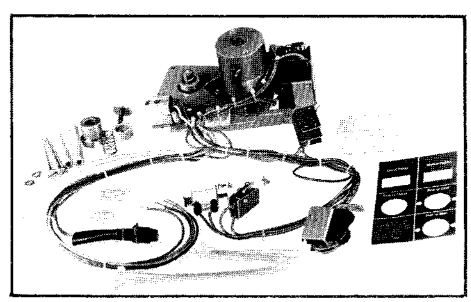


Dead-front Shield in Position

Spring Release Solenoid
For remote closing of a precharged breaker. An auxiliary contact to denote spring charged position remotely is furnished as standard. Spring release is standard on all electrically operated breakers; optional on manually operated breakers.

Anti-Pump Provisions To prevent unwanted closing or reclosing operations when used with a maintained closed contact in the close circuit, an anti-pump provision is provided as standard on electrically operated breakers, and can be supplied on manually operated breakers with spring release solenoid.

Electrical Operation
The electrical operator is mounted internally, with the result that there is no dimensional difference between manually and electrically operated units. Manually operated breakers are easily field convertible to electrical operation by adding a plug-in motor operator. UL Listing is not voided by field installation of motor operator.



Motor Operator

① Availability to be announced on through the door design.
② Behind the door design only.

Optional Systems Coordinating Adjustments

Short-Time Ratings
Short-time ratings are the key to system coordination. The Systems Pow-R Breaker with Digitrip RMS trip short-time ratings vary with the frame rating selected. Values of 25,000, 35,000, 51,000 and 65,000 amps RMS Symmetrical are available (See Table 1). For selective coordination purposes, short-time delay settings up to a maximum of 30 cycles (0.5 seconds) in several discrete steps are available. Flat or I^2t response can be selected.

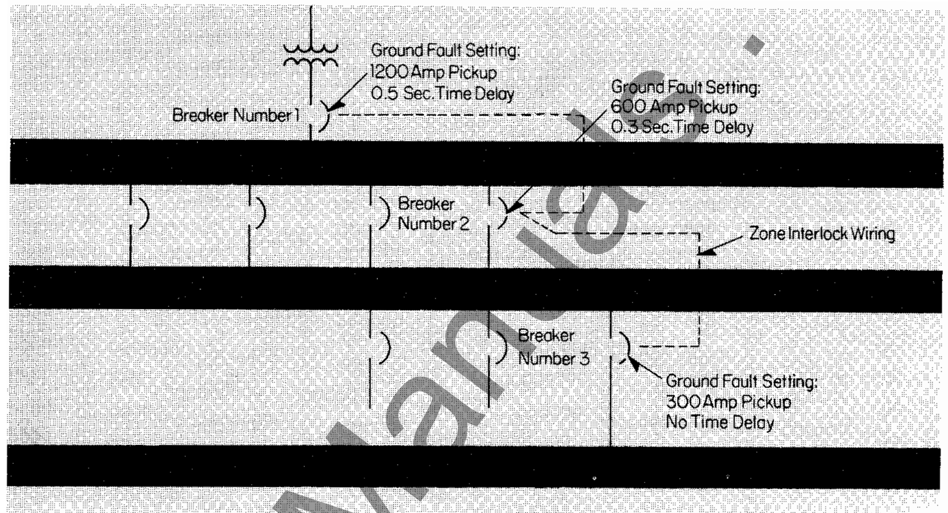
Instantaneous Override
The selective override circuit in a Systems Pow-R Breaker allows the breaker to trip instantaneous on fault currents exceeding the breaker short time rating.

Built-in Ground Protection
The Digitrip RMS trip unit ground fault function features adjustable current pick-up settings to a maximum of 1200 amperes, in accordance with the National Electrical Code. It also has adjustable time delays in discrete steps with maximum breaker clearing times of 0.1, 0.3 and 0.5 seconds. Flat or I^2t response can be selected.

External terminations that can be reconnected are provided to satisfy the grounding conditions for simple and complex distribution systems. Residual is standard. Source ground connections are applicable, as is zone sequence with external sensors, in various physical configurations to match the system requirements.

Integral Zone Selective interlocking, a standard feature of the Systems Pow-R Breaker with Ground Fault is available for complex ground fault systems, such as hospitals where multiple levels of ground fault protection are required by code.

With Zone Selective interlocking, proper system coordination is maintained for downstream faults. To minimize damage while providing the greatest degree of system continuity, the Zone Selective interlocking systems locates the fault and opens the nearest upstream breaker at the minimal time setting, regardless of preset settings, without losing coordination with upstream devices. Such a loss of coordination could cause nuisance or unwanted tripping operations on the upstream devices.



Multi-Layer Ground Fault Protection Scheme Using Zone Selective Interlocking

Typical Specification for the Systems Pow-R Breaker with Digitrip RMS

Circuit breaker shall be encased Westinghouse Systems Pow-R Breaker with Digitrip RMS.

All breakers shall be U.L. tested for application in their intended enclosure for 100% of their continuous ampere rating. Frame ampere ratings shall be 400, 800, 1200, 1600, 2000-C, 2000, 2500, 3000, 4000 and 5000.

The ampere interrupting capacity (I.C.) and short-time ratings shall be as follows:

SPB-50 (400/800 Amp Frame)
I.C.: 50,000 amps at 480 Volts
Short-Time Rating: 25,000 amps (RMS Sym.)

SPB-65 (1200/1600/2000-C Amp. Frame)
I.C.: 65,000 amps at 480 volts
Short-Time Rating: 35,000 amps (RMS Sym.)

SPB-100 (400/800/1200/1600/2000-C/2000/2500/3000/4000/5000 Amp Frame)
I.C.: 100,000 Amps at 480 Volts Without fuses
Short-Time Rating: 25,000 Amps (RMS Sym.) for 400 and 800 Amp. Frame; 35,000 Amps (RMS Sym.) for 1200, 1600 2000-C, 2000, 2500, and 3000 Amp Frame; 65,000 Amp (RMS Sym.) for 4000 and 5000 Amp Frame.

SPB-150 (400/800/1200/1600/2000-C/2000/2500/3000/4000/5000 Amp Frame)
I.C.: 150,000 Amps at 480 Volts Without fuses
Short-Time Rating: 25,000 Amps (RMS Sym.) for 400 and 800 Amp Frame; 35,000 Amps (RMS Sym.) for 1200 Amp Frame; 51,000 Amps (RMS Sym.) for 1600, 2000C, 2000, 2500, and 3000 Amp Frame; 85,000 Amps (RMS Sym.) for 4000 and 5000 Amp Frame.

Short-time ratings shall be based on a 600 volt, 50/60 Hz system with an X/R ratio of 6.6.

A selective override circuit shall be provided on breakers having short-time adjustments, but without instantaneous adjustments that will allow the breaker to be applied at its maximum interrupting capacity while providing full selectivity up to its RMS Symmetrical short-time rating.

All breakers shall be provided with a true, two-step stored energy mechanism which allows closing in a maximum of 5 cycles whether the breaker is manually or electrically operated. Both manual and motor operated breaker shall have identical physical dimensions. Manually operated breakers shall be field convertible to electrically operated without voiding the U.L. label on it. As a safety feature, anti-pump provisions shall be provided as standard for electrically operated breakers and optional for manual breakers with spring release solenoids. Both manual and electrically operated breakers shall have multiple charge/close provisions providing the following sequences: Charge-Close-Recharge-Open-Close-Open.

The breaker control face plate shall include color coded visual indicators to indicate contact and stored energy status. Local control pushbuttons shall be provided for "opening" and "closing" the breaker. For electrically operated breakers, a local "charge" pushbutton shall be provided standard.

The continuous ampere rating of the breaker shall be determined by the insertion of an interchangeable rating plug that matches the load and cable requirements. The rating plug shall be interlocked with the tripping mechanism to automatically "open" the breaker when the plug is removed. The breaker shall remain "trip free" with the plug removed. In addition, rating plugs shall be keyed to prevent incorrect application between different frame ratings. Complete system selective coordination shall be provided by the addition of the following time/current curve shaping curves:

Long Time/Instantaneous	LI
*Long Time/Short-Time	LS
*Long Time/Short-Time/Instantaneous	LSI
*Long Time/Instantaneous/Ground	LIG
*Long Time/Short-Time/Ground	LSG
*Long Time/Short-Time/Instantaneous/Ground	LSIG

*Short Time and Ground shall have flat and I^2t response.

All curve adjustments shall be made using a pocket size screwdriver to turn highly reliable switches in discrete steps for precise settings. A sealable transparent cover shall be provided over the adjustments to prevent tampering.

Ground fault protection shall be provided as an option. A residual scheme shall be used as standard for detecting ground fault currents. When more complex systems require alternate sensing methods, the trip unit shall be reconnected for either a source ground or zero sequence detection scheme as required.

Zone Selective Interlocking shall be optional with breaker wiring modification. If Zone Selective Interlocking is selected and not used, defeater connections are to be added.

The primary function of the Digitrip RMS Trip Unit shall be circuit protection. All energy to trip the breaker shall come from sensors monitoring the current going through the breaker. The secondary current of the sensors shall go to the trip unit which shall be a micro-computer to perform required numeric and logic functions. The micro-computer shall scan in cyclic fashion the voltages, enter values into its memory, and calculate true RMS current values to be compared to the pre-set protection functions. The mini-computer software program shall, in decision-free fashion, initiate tripping actions through the low energy flux transfer tripping device.

There shall be four models of Digitrip RMS Trip Units to fit the Systems Pow-R Breaker. The basic unit, Digitrip RMS 500, shall be the protection unit for all models. Digitrip RMS 600 shall include a local operation display. Digitrip RMS 700 shall include capability for energy monitoring and remote operations and control, but no local display. Digitrip RMS 800 shall include local operation display and control with capability for remote display and control including energy monitoring.

The protection unit, **Digitrip RMS 500,** shall present under the transparent cover, a representation of the Time/Current curves of the trip unit. Red LEDs placed on these curves shall provide mode of trip indication for overload, short circuit and ground fault (if unit includes ground fault) by turning "On". A long life battery shall be provided to maintain mode of automatic trip after such trip. A battery test pushbutton with a green LED shall be provided to check the status of this battery.

A trip reset pushbutton shall be provided to turn "Off" the LEDs following a trip (actual or test) operation.

A green LED shall indicate the operational status of the trip unit by flashing "On" and "Off" when load current is approximately 20% of sensor rating.

An integral test panel shall be provided. It shall include a test selector switch and a test pushbutton. The breaker may be tested in the "Trip" or "No Trip" test mode. To preserve the primary function of the trip unit, in-service testing shall be limited if there is load current. In-service testing in "Trip" test mode while there is load current shall not be recommended.

The trip unit shall contain a keyed receptacle for use with an optional Auxiliary Power module. The APM when connected to 120V., 50/60 Hz, shall supply power for testing or setting the trip unit while the breaker is out of its cell or in the "Disconnect" or "Withdrawn" positions.

Digitrip RMS 600 shall be similar to the Digitrip RMS 500 Trip Unit with the addition of a four-digit readout display. This display shall serve two purposes: instrumentation and mode of trip or trouble indication. There shall be three phase and one ground (when supplied) current pointer green LEDs that go "On" when selected by a step pushbutton for reading on the display.

A Power/Relay module, requiring 120V., 50/60 Hz, 6 Va, shall supply control power to the readout display. Following an automatic trip operation of the circuit breaker, it shall maintain the cause of the trip history and the mode of trip LEDs as long as its internal power supply is available. This includes its internal relays. Its internal relays shall provide contacts for remote indication of mode of trip and high load.

A red LED shall be provided on the face of the trip unit pre-set to turn "On" when approximately 85% of load level is exceeded (with a 40 second delay to avoid nuisance alarm). This alarm shall be connected to the Power/Relay module relays for remote indication.

Digitrip RMS 700 shall be similar to a Digitrip RMS 600 Trip Unit, but with emphasis on information and communications both local and remote. This trip unit shall not have a readout display with associated pointer LEDs, selection pushbutton switch, and high-load LED on the trip unit.

The trip unit shall include a Potential Transformer module, suitable for voltages through 600V., 50/60 Hz. The primary of the PTM shall be connected internally to the primary phase conductors of the circuit breaker through a dielectric disconnect plug. This shall enable the calculation of energy parameters such as:

(1) Peak Demand	Megawatts
(2) Present Demand	Megawatts
(3) Energy Consumed	Megawatt-Hours

The disconnect plug shall be disconnected during dielectric tests of the circuit breaker.

The trip unit shall include three hexidecimal address wheels for the purpose of setting a unique address on the INCOM local area networks. The device shall also contain the INCOM communications chip developed by Westinghouse Electric Corporation to combine microprocessor-based and other electrical distribution and control products with personal computers into a comprehensive communication and control network known as IMPACC.

IMPACC (Integrated Monitoring Protection and Control Communications) is the new system that ties together multiple devices in an electrical distribution network. From a central location, an operator utilizes a personal computer as a master unit to monitor, control, and communicate with all devices on the system. Both the Digitrip RMS 700 and RMS 800 can be part of an IMPACC system.

The Assemblies Electric Monitor (AEM) can also be added to an IMPACC system. The AEM is a door-mounted, microprocessor-based device designed to monitor up to 40 circuit breakers that are equipped with Digitrip RMS 700 or RMS 800 trip units. The AEM functions as a communications center, transmitting and receiving data from monitored units. It displays status, cause of trip, and current metered values from the breakers. The AEM can also function as an intermediate master-slave and report information on breaker status to a remote computer. For additional information on the AEM refer to SA 11587A or TD 17216.

Where desired, communications may be made by wire with a remote computer, IBM compatible, with a CONI (Computer Operated and Network Interface) card. See I.L. 17-199. Trip and close operations shall be included.

Where desired, communications to both an AEM and the remote computer above may be employed.

For an un-engineered network (using the computer as the focal point) five legs may be served from a computer with each leg up to 250 feet in length (terminated with a 150 ohm, ½ watt resistor). Spurs up to 200 feet with no additional resistor terminations may be included.

Digitrip RMS 800 shall be similar to a Digitrip RMS 700 but includes the readout display with associated pointer LEDs, selector pushbutton switch, and high-load LED on the trip unit. The following shall be transmittable data for remote communications:

1. Individual Phase Currents
2. Ground Currents (when supplied)
3. Energy
   a. Peak Demand
   b. Present Demand
   c. Energy Consumed
4. Breaker Status
   a. Open-Closed-Tripped
   b. Mode of Trip
      I. Override
      II. Instantaneous
      III. Discriminator
      IV. Short Delay
      V. Ground Fault
      VI. Long Delay
      VII. Long Delay Pick-up
5. Information
   a. Internal Trip Command
   b. Data Memory Test
   c. Program Memory Test Failure
   d. Missing or Defective Rating Plug
   e. Reserve Power Flux
   f. Response to Depressing Test
6. Breaker Command (INCOM)
   a. Trip
   b. Close

The breakers shall be capable of interruptions of rated current followed by operations at no load without significant maintenance. Numbers are shown in the following Table 6. The breaker contacts shall be field replaceable.

Table 6: UL Endurance Ratings①

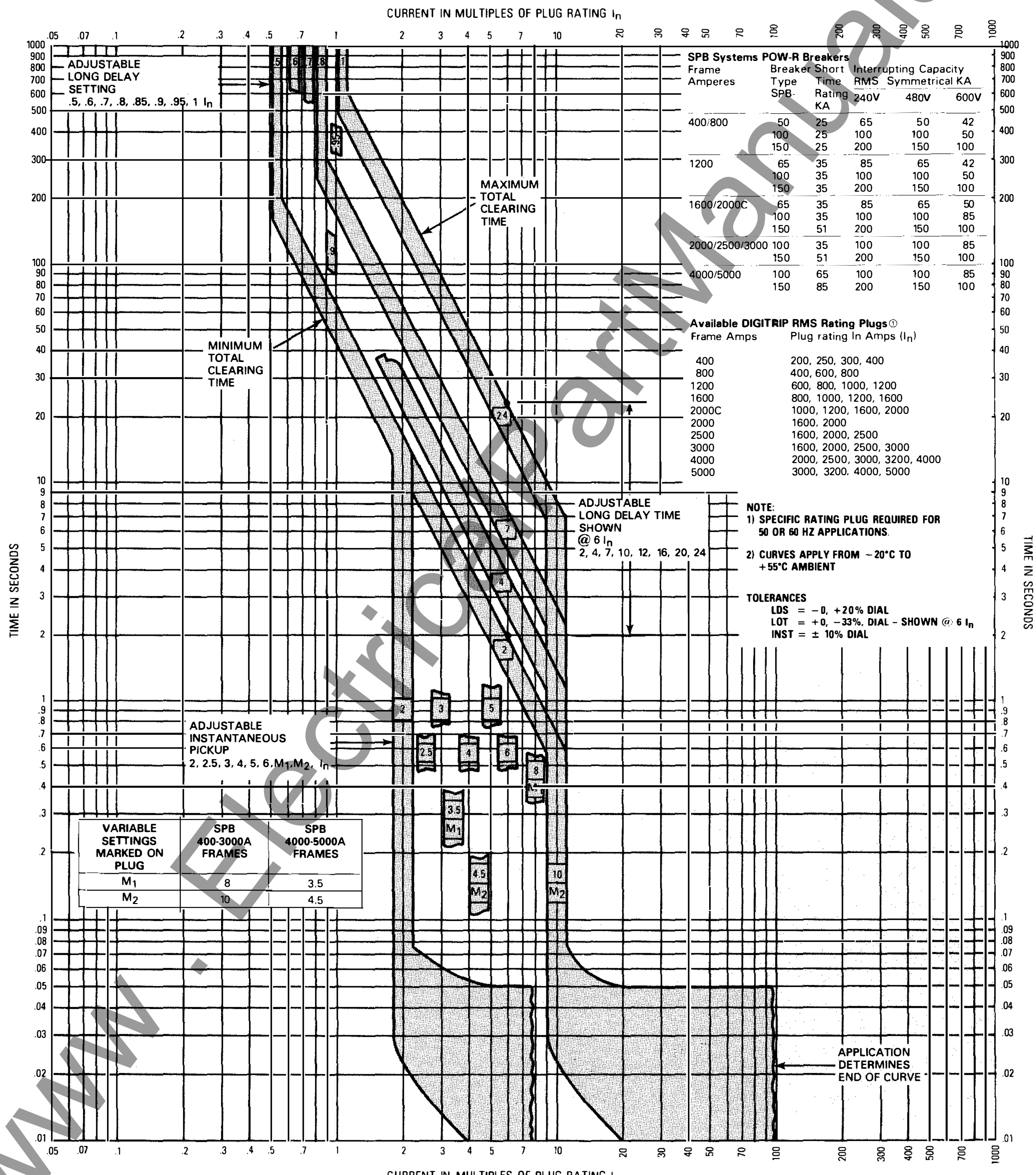
Amperes	Full Load Interruptions	No Load Operations
400	1000	5000
800	500	3000
1200	500	2000
1600	500	2000
2000-C②	500	2000
2000	500	2000
2500	500	2000
3000	400	1100
4000	400	1100
5000	400	1100

① SPB with Digitrip RMS meets or exceeds UL endurance ratings.
② 2000-C designates 2000 amp rating in a 16 inch high frame.

Long-Time/Instantaneous Time-Current Curve SC-4283-87

DIGITRIP RMS 500/600/700/800

Typical Time-Current Characteristic Curve (LI)
for Type SPB Systems Pow-R Breakers



SPB Systems POW-R Breakers

Frame Amperes	Breaker Type SPB-	Short Time Rating KA	Interrupting Capacity RMS Symmetrical KA 240V	480V	600V
400/800	50	25	65	50	42
	100	25	100	100	50
	150	25	200	150	100
1200	65	35	85	65	42
	100	35	100	100	50
	150	35	200	150	100
1600/2000C	65	35	85	65	50
	100	35	100	100	85
	150	51	200	150	100
2000/2500/3000	100	35	100	100	85
	150	51	200	150	100
4000/5000	100	65	100	100	85
	150	85	200	150	100

Available DIGITRIP RMS Rating Plugs ①

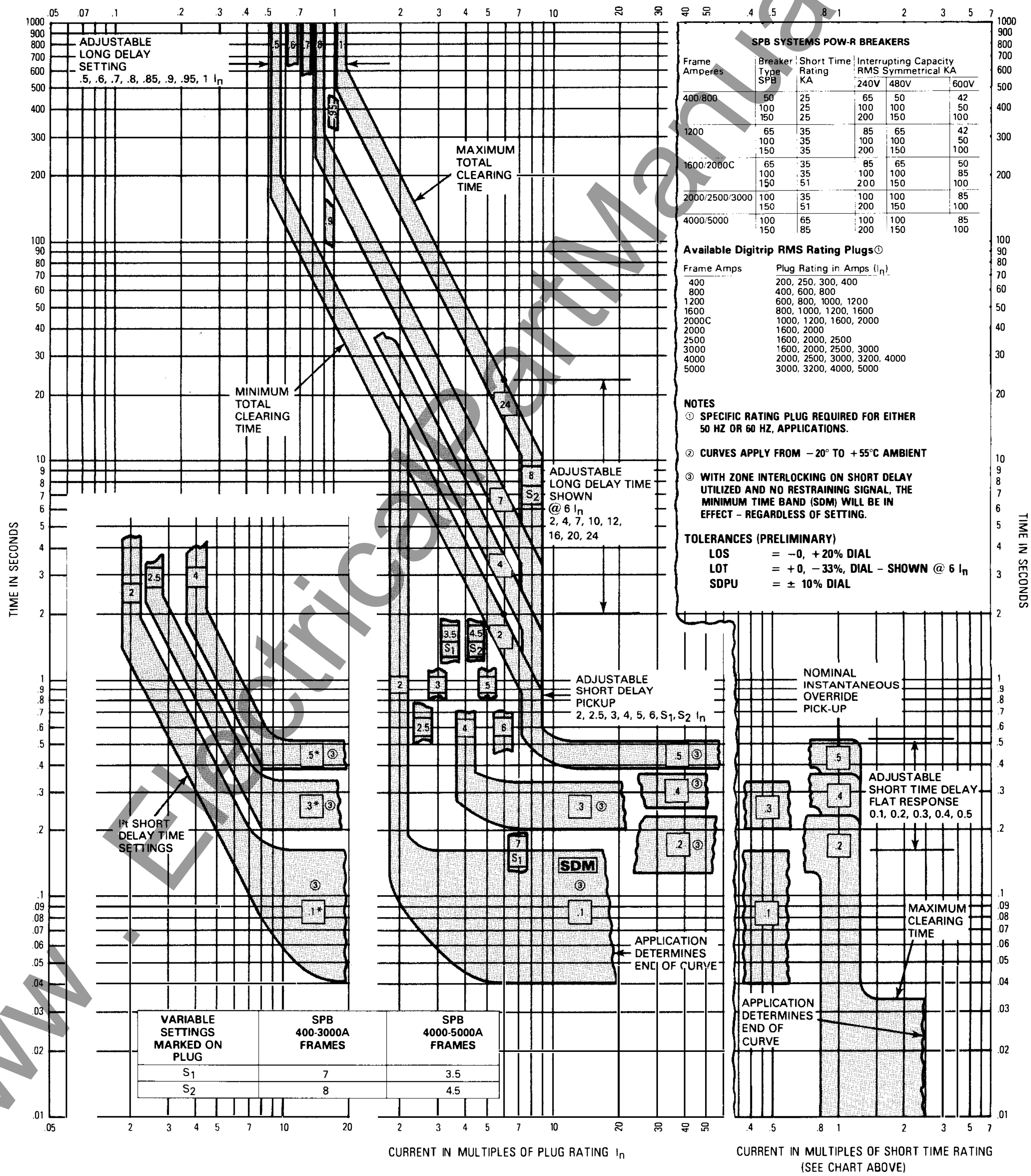
Frame Amps	Plug rating In Amps (I_n)
400	200, 250, 300, 400
800	400, 600, 800
1200	600, 800, 1000, 1200
1600	800, 1000, 1200, 1600
2000C	1000, 1200, 1600, 2000
2000	1600, 2000
2500	1600, 2000, 2500
3000	1600, 2000, 2500, 3000
4000	2000, 2500, 3000, 3200, 4000
5000	3000, 3200, 4000, 5000

VARIABLE SETTINGS MARKED ON PLUG	SPB 400-3000A FRAMES	SPB 4000-5000A FRAMES
M_1	8	3.5
M_2	10	4.5

Long-Time/Short-Time Time-Current Curve SC-4284-87

DIGITRIP RMS 500/600/700/800

Typical Time-Current Characteristic Curve (LS)
for Type SPB Systems Pow-R Breakers



SPB SYSTEMS POW-R BREAKERS

Frame Amperes	Breaker Type SPB	Short Time Rating KA	Interrupting Capacity RMS Symmetrical KA 240V	480V	600V
400/800	50	25	65	50	42
	100	25	100	100	50
	150	25	200	150	100
1200	65	35	85	65	42
	100	35	100	100	50
	150	35	200	150	100
1600/2000C	65	35	85	65	50
	100	35	100	100	85
	150	51	200	150	100
2000/2500/3000	100	35	100	100	85
	150	51	200	150	100
4000/5000	100	65	100	100	85
	150	85	200	150	100

Available Digitrip RMS Rating Plugs①

Frame Amps	Plug Rating in Amps (I_n)
400	200, 250, 300, 400
800	400, 600, 800
1200	600, 800, 1000, 1200
1600	800, 1000, 1200, 1600
2000C	1000, 1200, 1600, 2000
2000	1600, 2000
2500	1600, 2000, 2500
3000	1600, 2000, 2500, 3000
4000	2000, 2500, 3000, 3200, 4000
5000	3000, 3200, 4000, 5000

NOTES

① SPECIFIC RATING PLUG REQUIRED FOR EITHER 50 HZ OR 60 HZ, APPLICATIONS.

② CURVES APPLY FROM −20° TO +55°C AMBIENT

③ WITH ZONE INTERLOCKING ON SHORT DELAY UTILIZED AND NO RESTRAINING SIGNAL, THE MINIMUM TIME BAND (SDM) WILL BE IN EFFECT – REGARDLESS OF SETTING.

TOLERANCES (PRELIMINARY)

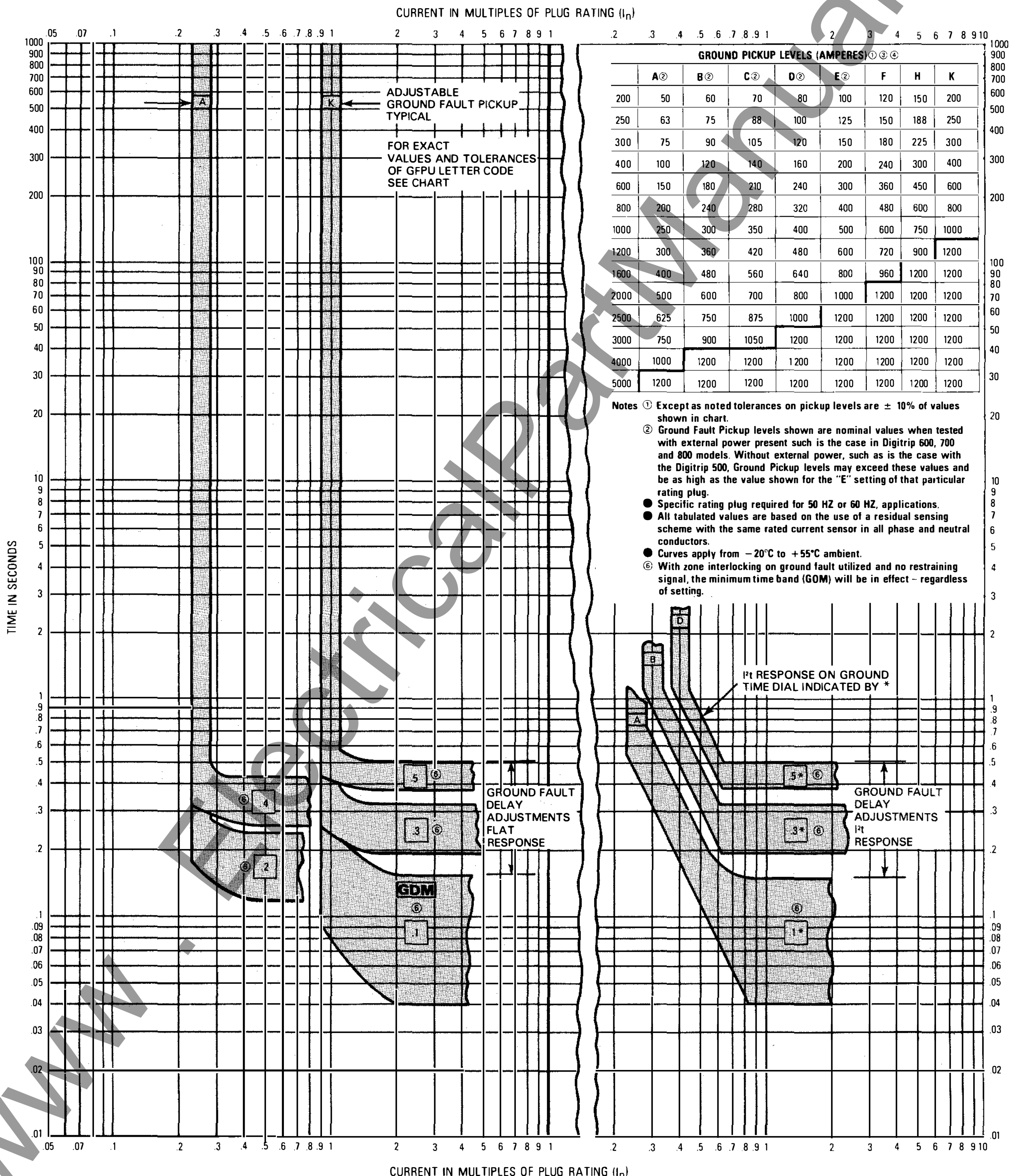
LOS = −0, +20% DIAL
LOT = +0, −33%, DIAL – SHOWN @ 6 I_n
SDPU = ± 10% DIAL

VARIABLE SETTINGS MARKED ON PLUG	SPB 400-3000A FRAMES	SPB 4000-5000A FRAMES
S_1	7	3.5
S_2	8	4.5

Ground Fault Protection Time-Current Curve SC-4282-87

DIGITRIP RMS 500/600/700/800

Typical Time-Current Characteristic Curve (G)
for Type SPB Systems Pow-R Breakers

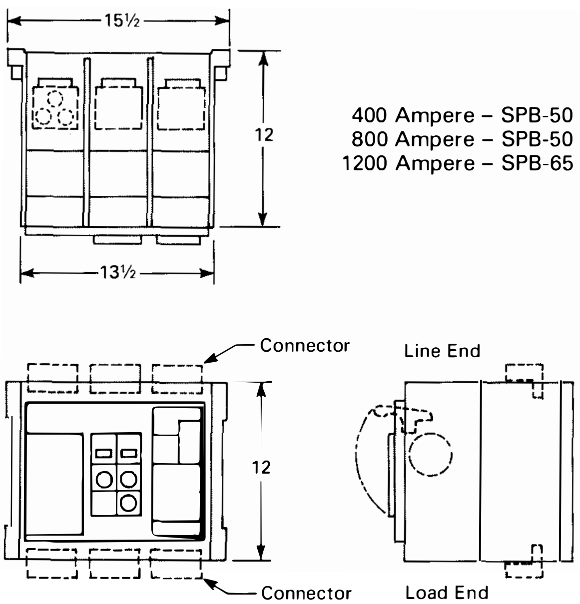


GROUND PICKUP LEVELS (AMPERES) ① ③ ④

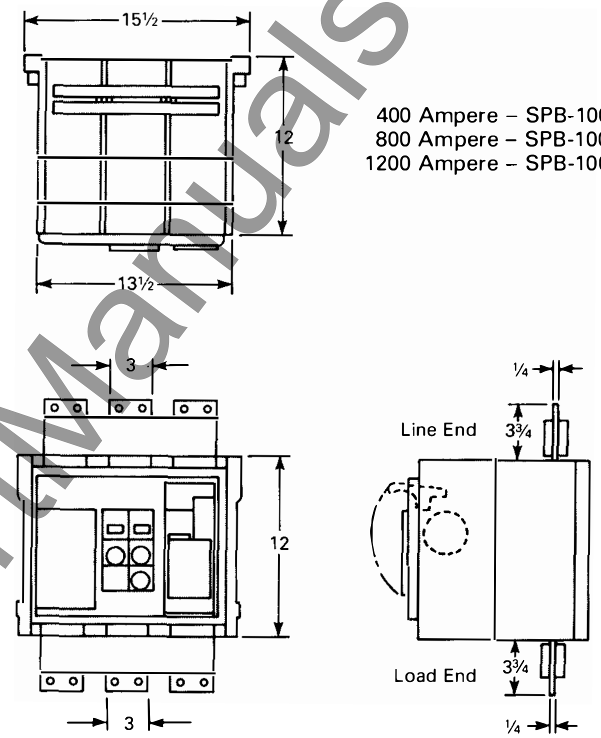
	A②	B②	C②	D②	E②	F	H	K
200	50	60	70	80	100	120	150	200
250	63	75	88	100	125	150	188	250
300	75	90	105	120	150	180	225	300
400	100	120	140	160	200	240	300	400
600	150	180	210	240	300	360	450	600
800	200	240	280	320	400	480	600	800
1000	250	300	350	400	500	600	750	1000
1200	300	360	420	480	600	720	900	1200
1600	400	480	560	640	800	960	1200	1200
2000	500	600	700	800	1000	1200	1200	1200
2500	625	750	875	1000	1200	1200	1200	1200
3000	750	900	1050	1200	1200	1200	1200	1200
4000	1000	1200	1200	1200	1200	1200	1200	1200
5000	1200	1200	1200	1200	1200	1200	1200	1200

Notes ① Except as noted tolerances on pickup levels are ± 10% of values shown in chart.
② Ground Fault Pickup levels shown are nominal values when tested with external power present such is the case in Digitrip 600, 700 and 800 models. Without external power, such as is the case with the Digitrip 500, Ground Pickup levels may exceed these values and be as high as the value shown for the "E" setting of that particular rating plug.
● Specific rating plug required for 50 HZ or 60 HZ, applications.
● All tabulated values are based on the use of a residual sensing scheme with the same rated current sensor in all phase and neutral conductors.
● Curves apply from −20°C to +55°C ambient.
⑥ With zone interlocking on ground fault utilized and no restraining signal, the minimum time band (GOM) will be in effect – regardless of setting.

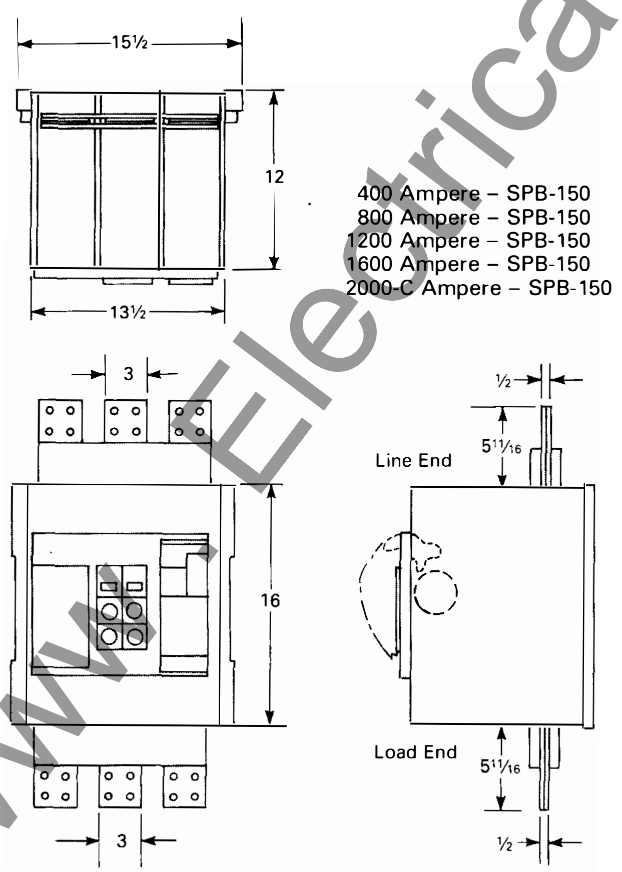
Dimensions, Inches *Not to be used for construction purposes unless approved.*
Fixed Mounted Breakers *(Front Connected)*



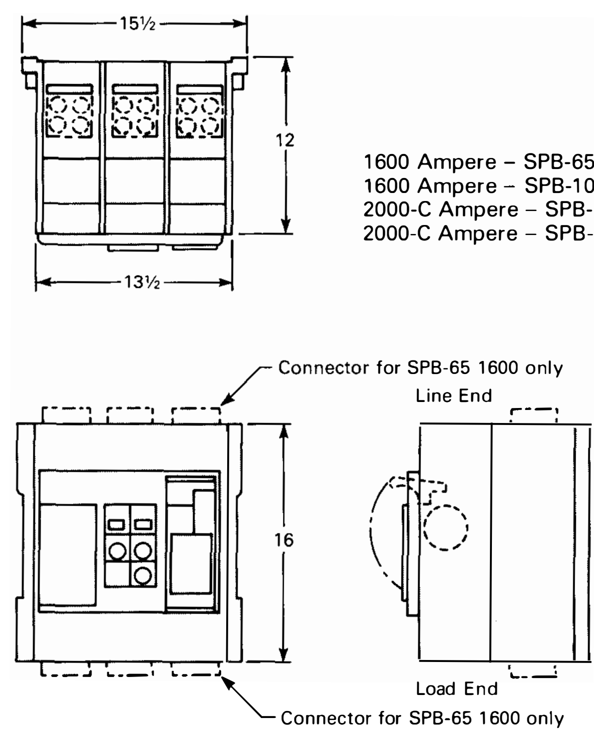
400 Ampere – SPB-50
800 Ampere – SPB-50
1200 Ampere – SPB-65



400 Ampere – SPB-100
800 Ampere – SPB-100
1200 Ampere – SPB-100

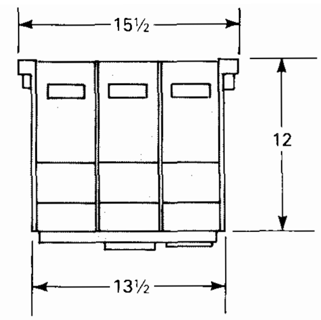


400 Ampere – SPB-150
800 Ampere – SPB-150
1200 Ampere – SPB-150
1600 Ampere – SPB-150
2000-C Ampere – SPB-150

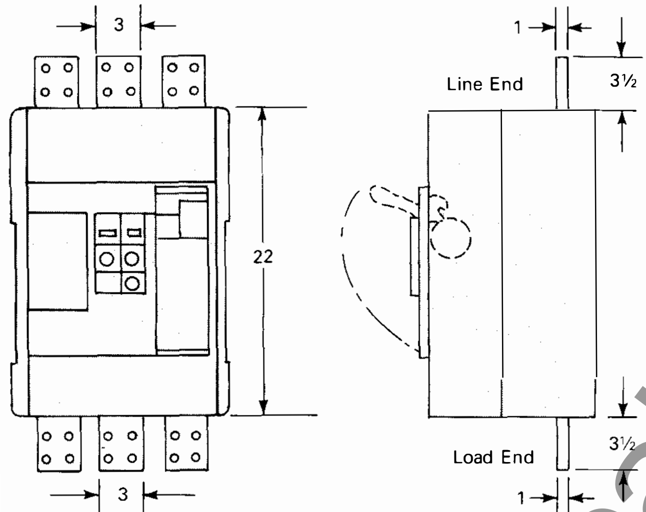


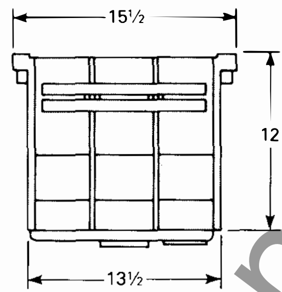
1600 Ampere – SPB-65
1600 Ampere – SPB-100
2000-C Ampere – SPB-65
2000-C Ampere – SPB-100

Dimensions, Inches *Not to be used for construction purposes unless approved.*
Fixed Mounted Breakers *(Front Connected)*

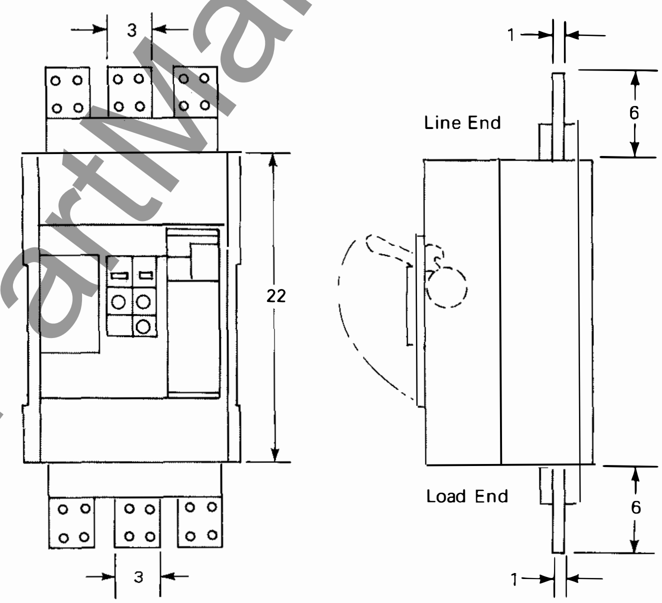


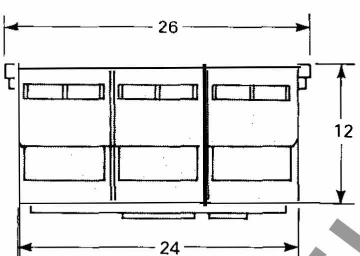
2000 Ampere – SPB-100
2500 Ampere – SPB-100
3000 Ampere – SPB-100



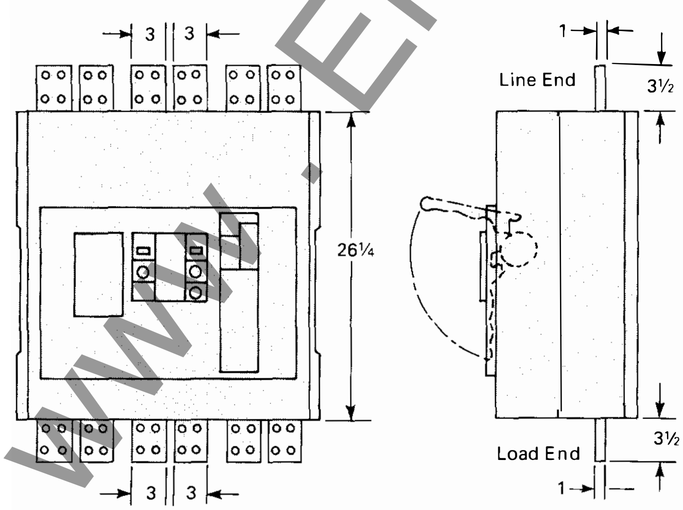


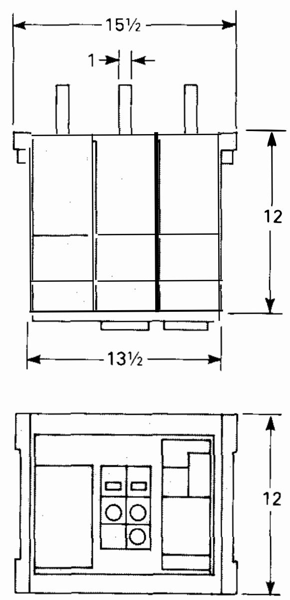
2000 Ampere – SPB-150
2500 Ampere – SPB-150
3000 Ampere – SPB-150



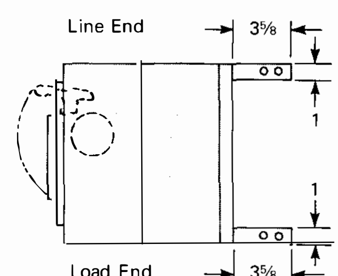


4000 Ampere – SPB-100
4000 Ampere – SPB-150

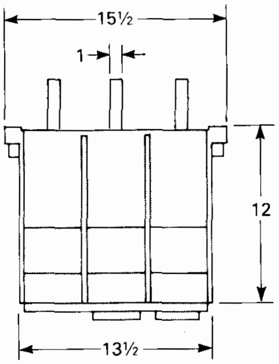




400 Ampere – SPB-50
800 Ampere – SPB-50
1200 Ampere – SPB-65

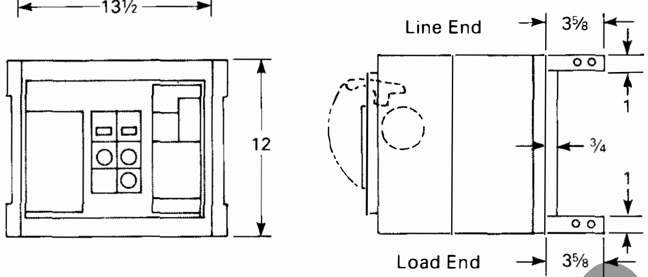


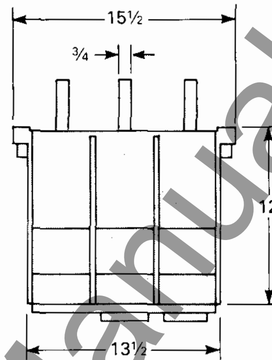
Dimensions, Inches *Not to be used for construction purposes unless approved.*
Fixed Mounted Breakers *(Rear Connected)*



400 Ampere – SPB-100
800 Ampere – SPB-100
1200 Ampere – SPB-100

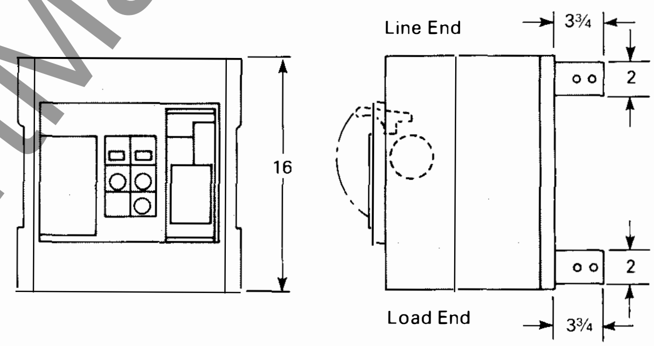
Customer must specify if horizontal connections are desired.

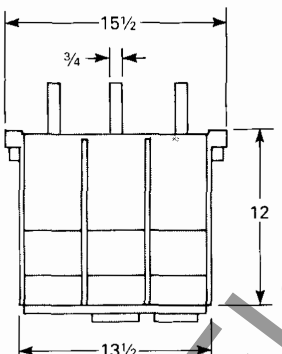




1600 Ampere – SPB-65
1600 Ampere – SPB-100
2000-C Ampere – SPB-65
2000-C Ampere – SPB-100

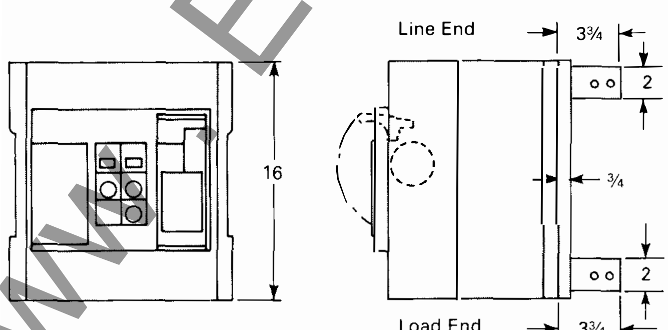
Connections may be rotated 90°

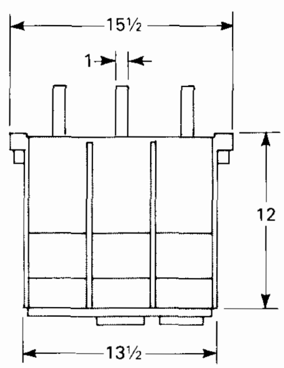




400 Ampere – SPB-150
800 Ampere – SPB-150
1200 Ampere – SPB-150
1600 Ampere – SPB-150
2000-C Ampere – SPB-150

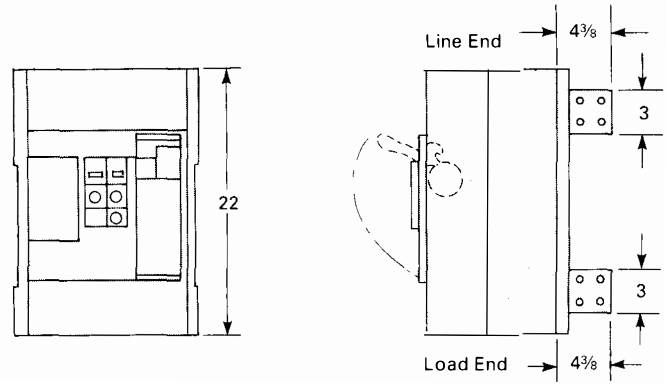
Connections may be rotated 90°



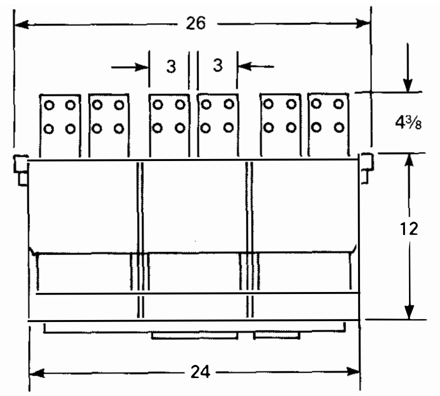


2000 Ampere – SPB-100, SPB-150
2500 Ampere – SPB-100, SPB-150
3000 Ampere – SPB-100, SPB-150

Connections for 2000A and 2500A may be rotated 90°

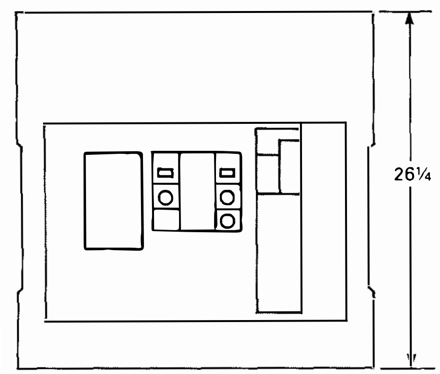


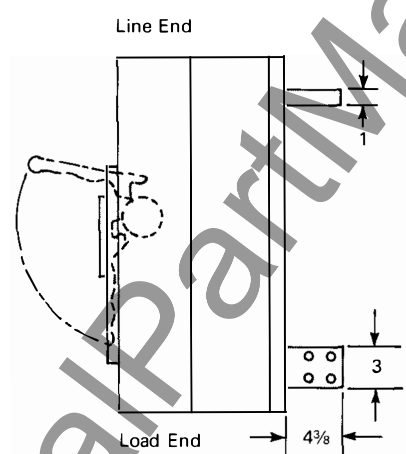
Dimensions, Inches *Not to be used for construction purposes unless approved.*
Fixed Mounted Breakers *(Rear Connected)*

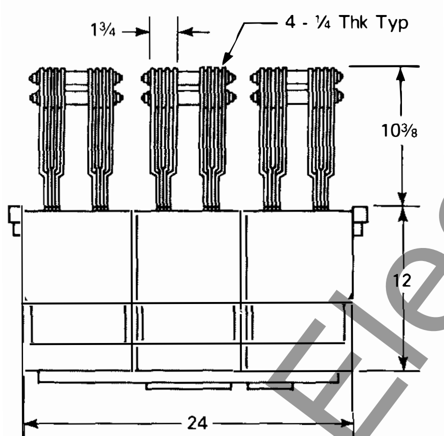


4000 Ampere – SPB-100
4000 Ampere – SPB-150

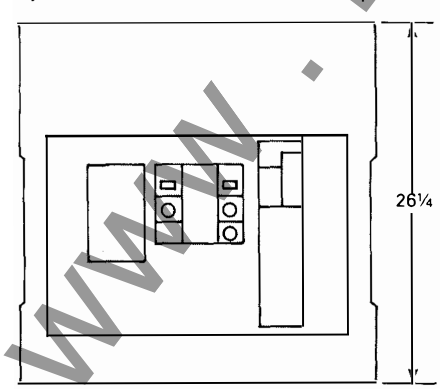
Connections may be rotated 90°

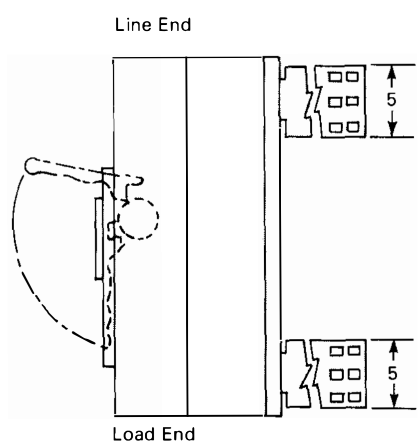






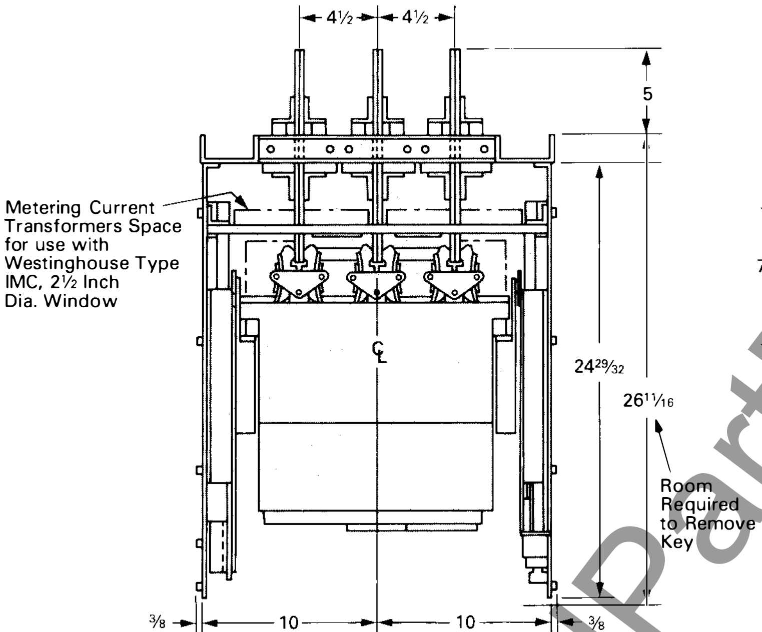
5000 Ampere – SPB-100
5000 Ampere – SPB-150

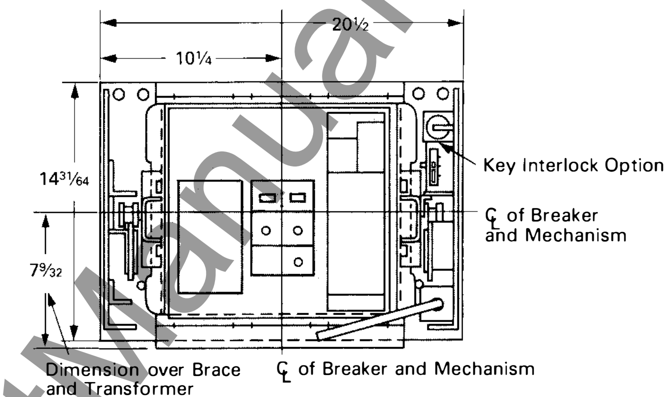


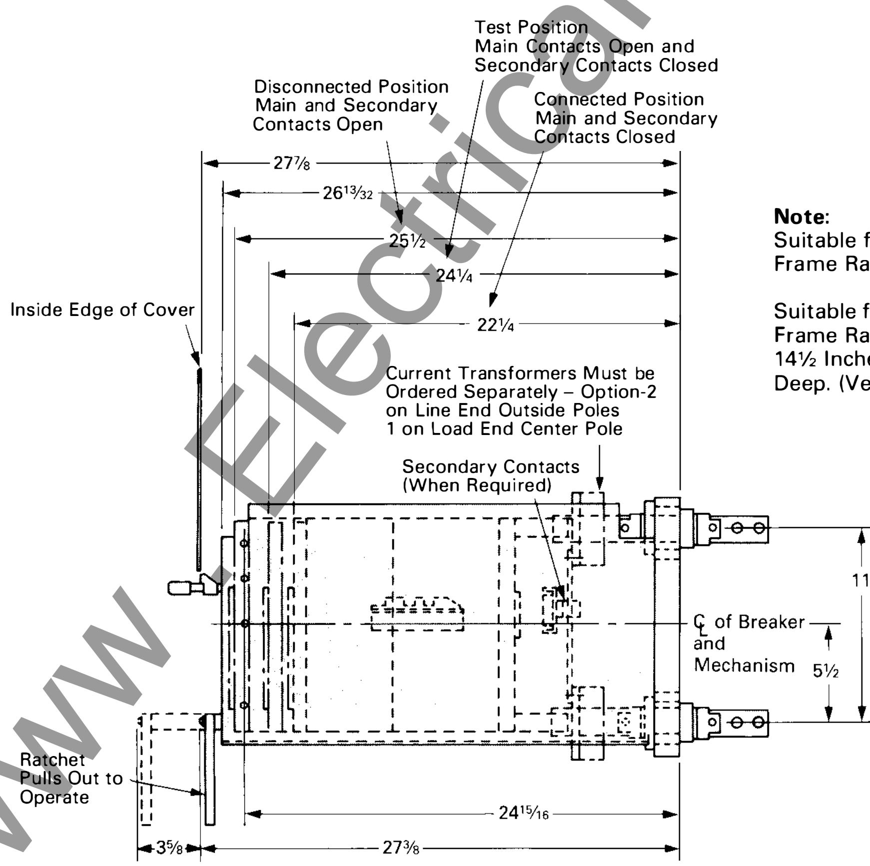


Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Behind the door design

400 Ampere – SPB-50, SPB-100
800 Ampere – SPB-50, SPB-100
1200 Ampere – SPB-65, SPB-100





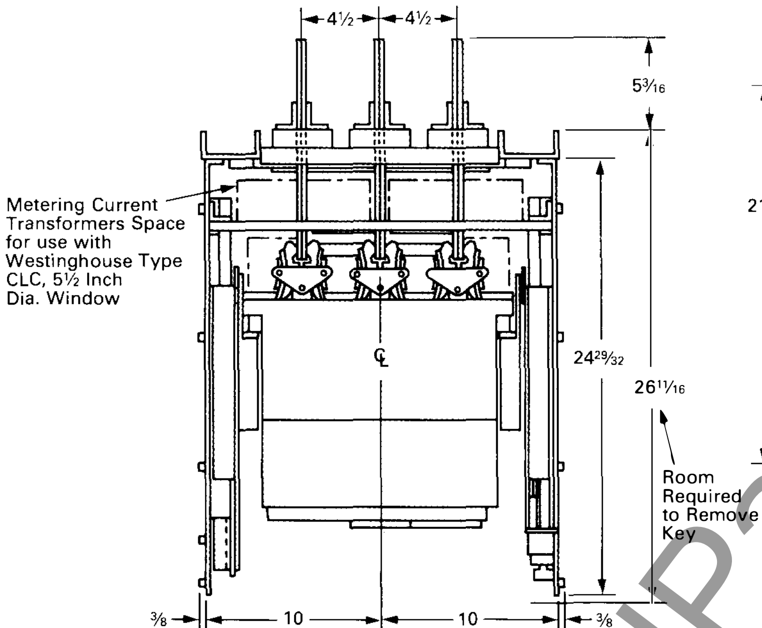


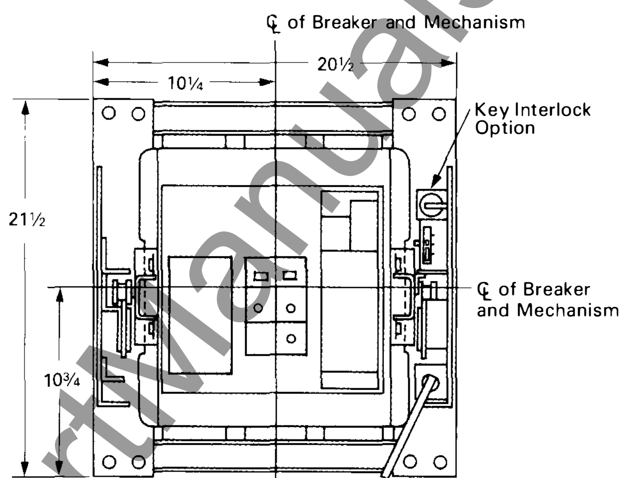
Note:
Suitable for Continuous Operation at 80% of Frame Rating in an Enclosure without Ventilation.

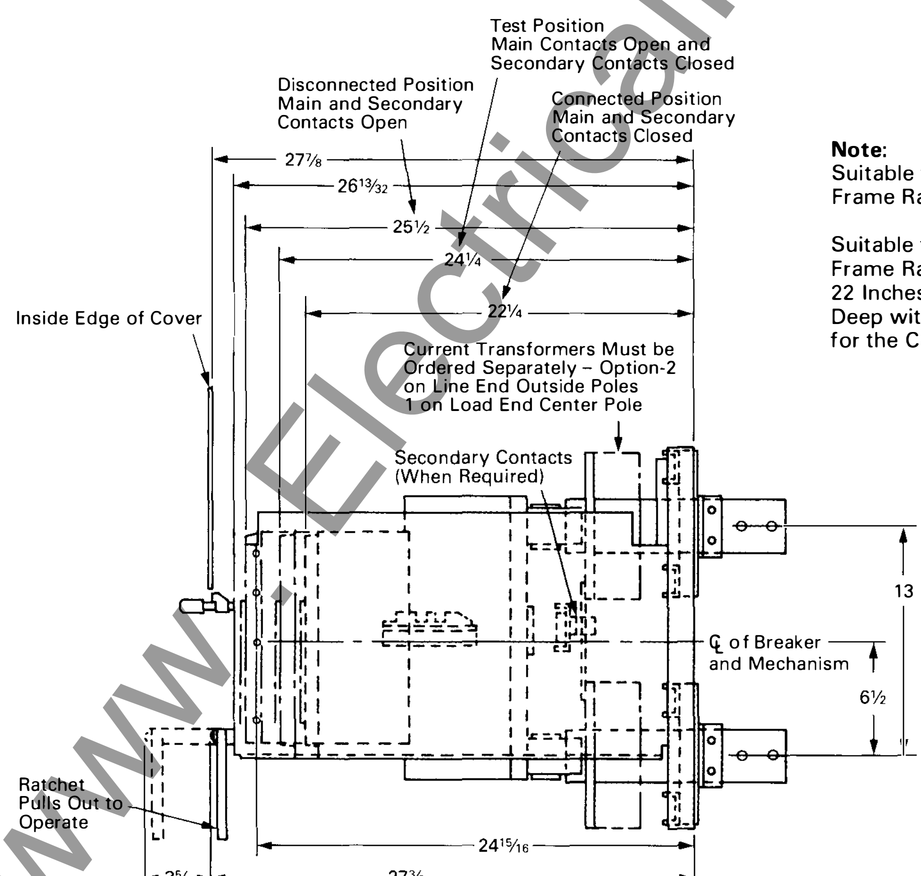
Suitable for Continuous Operation at 100% of Frame Rating if used in a Minimum Enclosure 14½ Inches High × 21 Inches Wide × 33½ Inches Deep. (Ventilation is not Required)

Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Behind the door design

400 Ampere – SPB-150
800 Ampere – SPB-150
1200 Ampere – SPB-150
1600 Ampere – SPB-65, SPB-100, SPB-150
2000-C Ampere – SPB-65, SPB-100, SPB-150





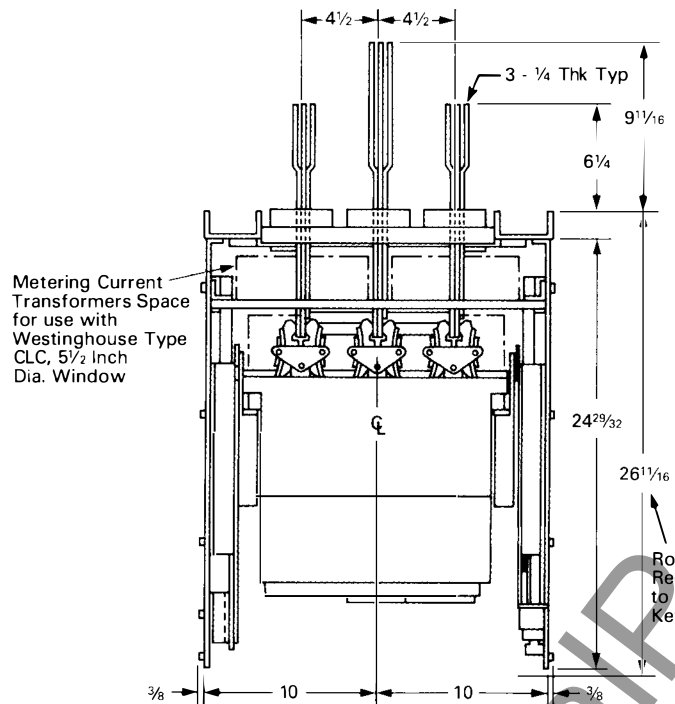


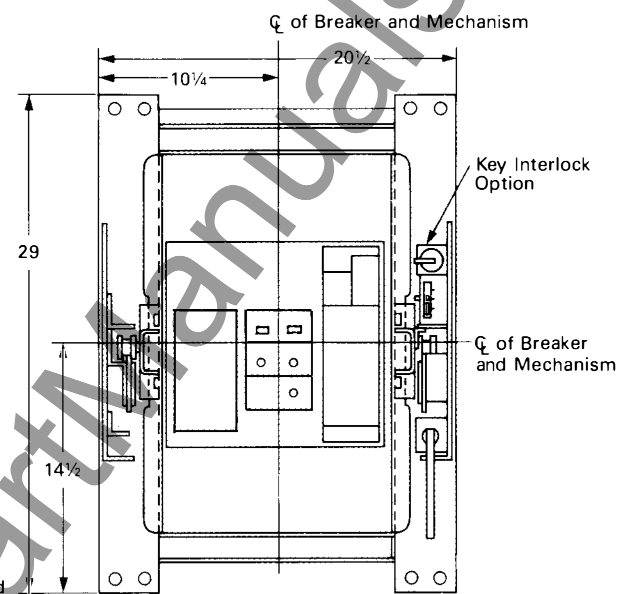
Note:
Suitable for Continuous Operation at 80% of Frame Rating in an Enclosure without Ventilation.

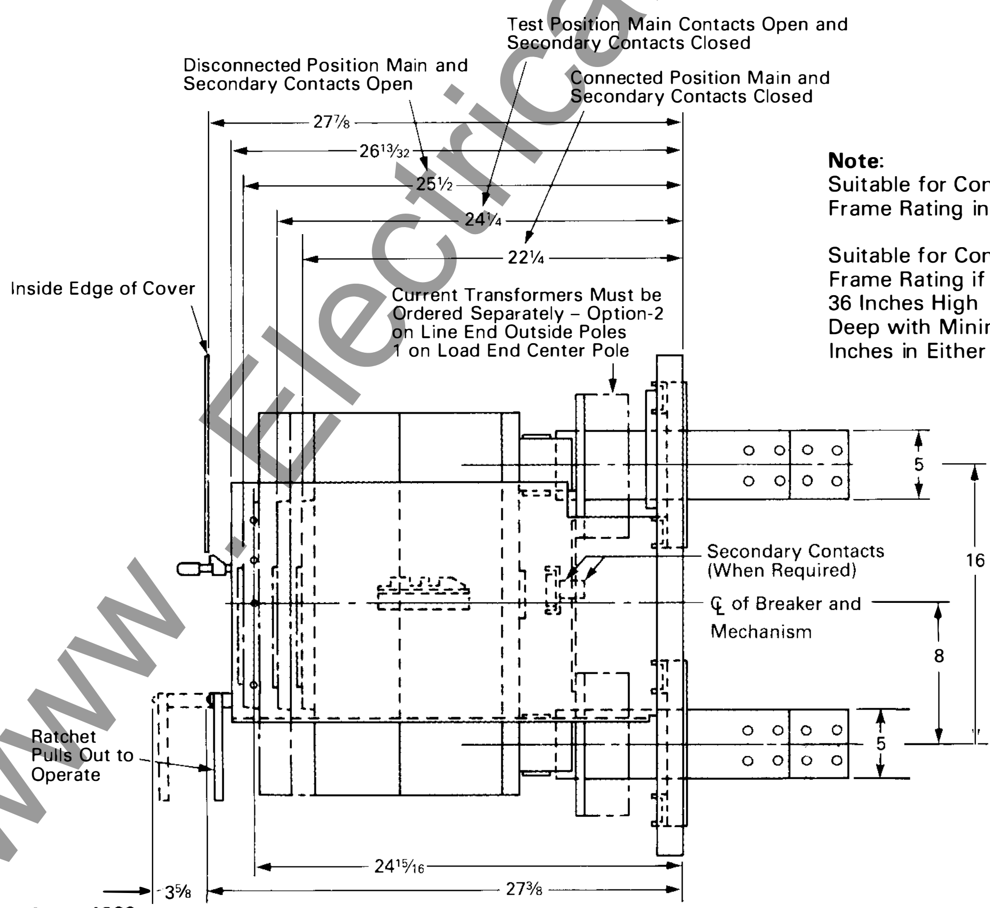
Suitable for Continuous Operation at 100% of Frame Rating if used in a Minimum Enclosure 22 Inches High × 21 Inches Wide × 33½ Inches Deep with Minimum Ventilation of 36 Square Inches for the Compact 2000 Amp Breaker.

Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Behind the door design

2000 Ampere – SPB-100, SPB-150
2500 Ampere – SPB-100, SPB-150
3000 Ampere – SPB-100, SPB-150







Note:
Suitable for Continuous Operation at 80% of Frame Rating in an Enclosure without Ventilation.

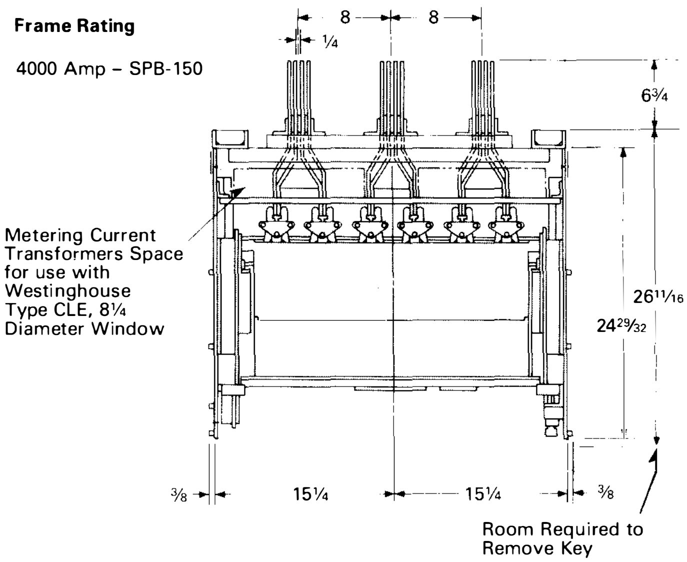
Suitable for Continuous Operation at 100% of Frame Rating if used in a Minimum Enclosure 36 Inches High × 21 Inches Wide × 38 Inches Deep with Minimum Ventilation of 160 Square Inches in Either the Front or Side of the Enclosure.

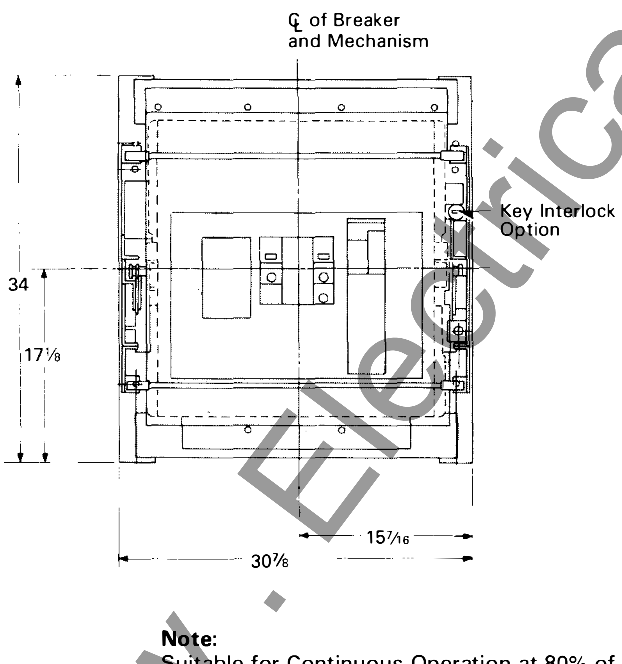
Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Behind the door design

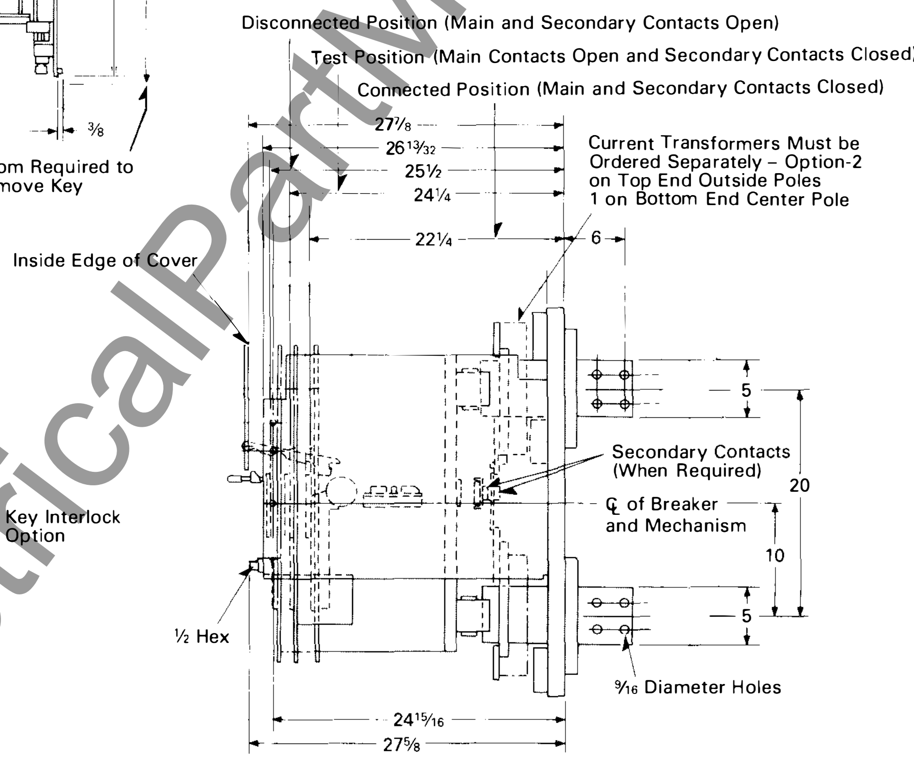
4000 Ampere – SPB-100, SPB-150

Frame Rating

4000 Amp – SPB-150

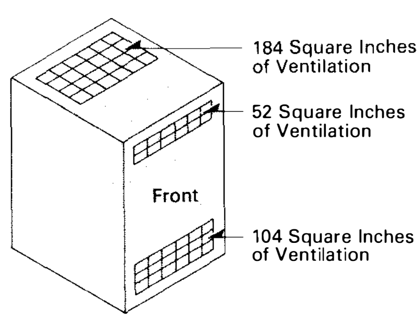






Note:
Suitable for Continuous Operation at 80% of Frame Rating in an Enclosure without Ventilation.

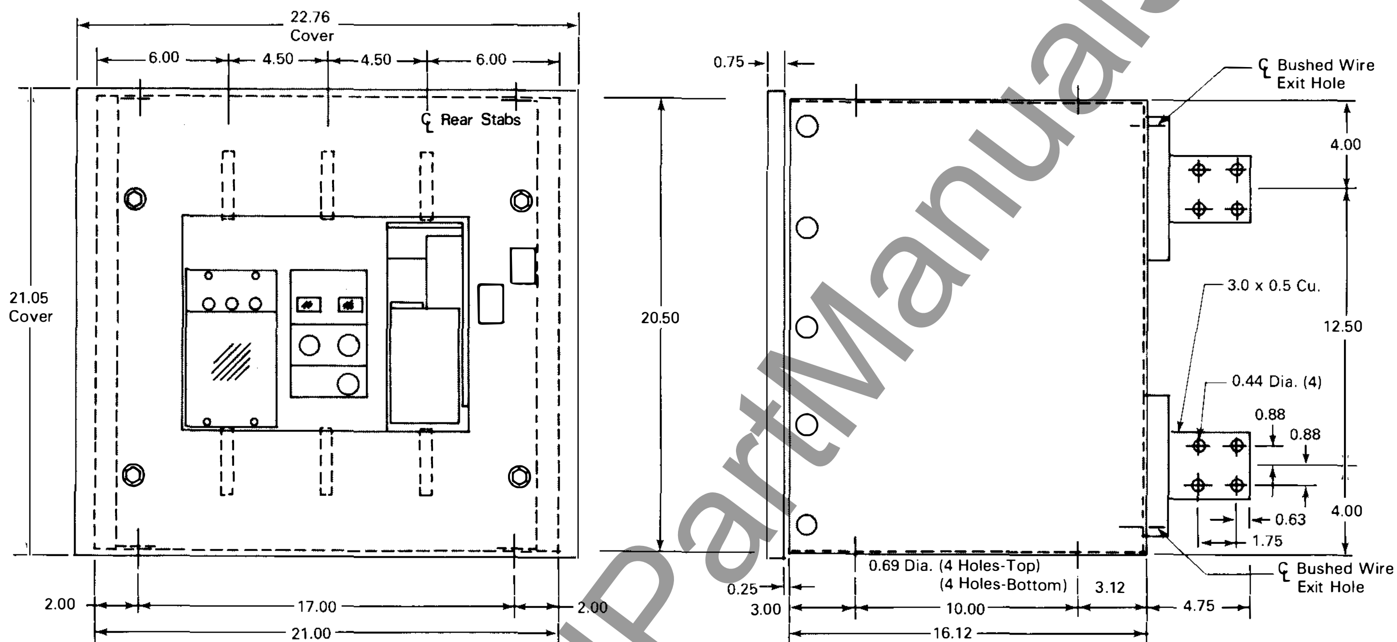
Suitable for Continuous Operation at 100% of Frame Rating if used in a Minimum Enclosure 45 Inches High × 31½ Inches Wide × 36 Inches Deep with Minimum Ventilation of 156 Square Inches in either the Front or Side of the Enclosure and 184 Square Inches in the Top of the Enclosure.



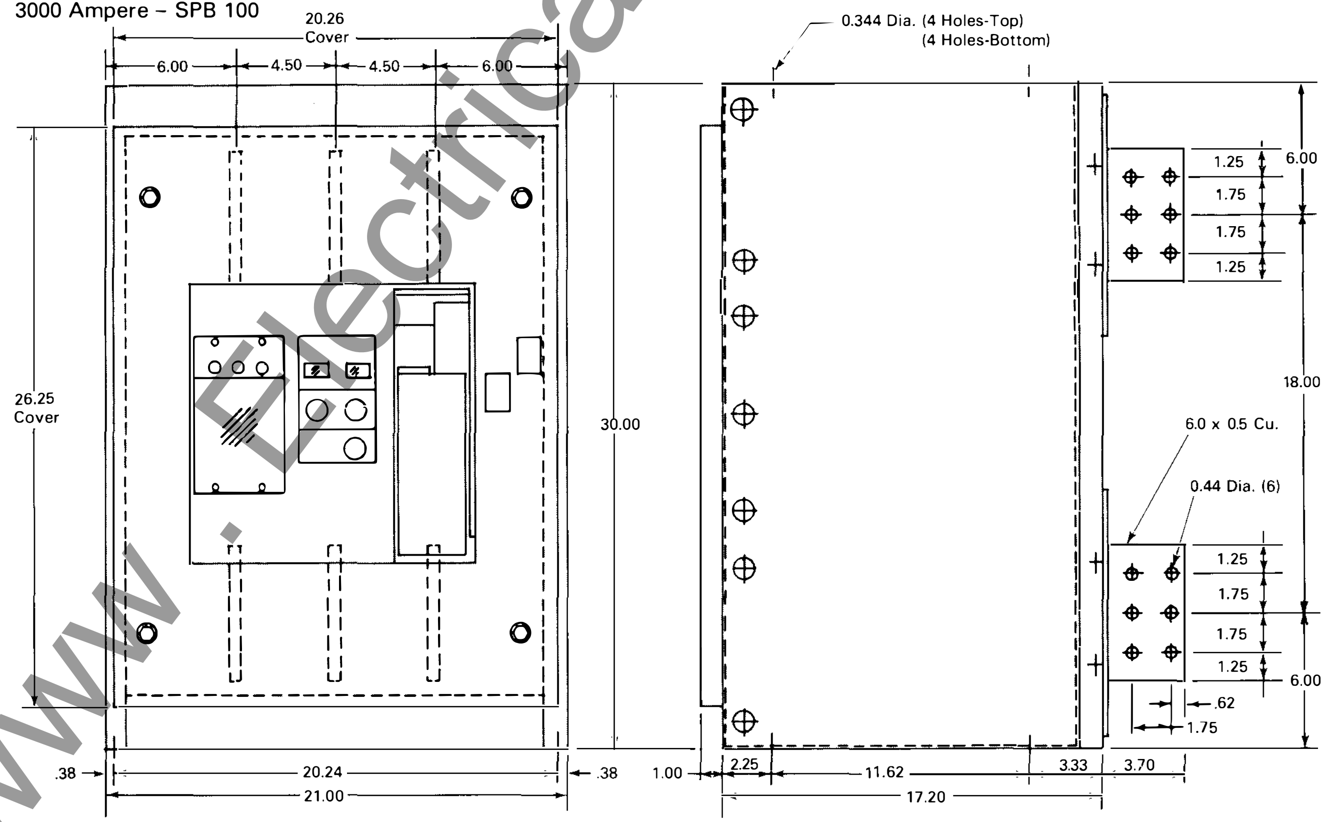
Enclosure Showing Ventilation

Dimensions, Inches *Not to be used for construction purposes unless approved.*
Breakers for Drawout Mounting — Through the door design

250 Ampere – SPB50, SPB65, SPB100
800 Ampere – SPB50, SPB65, SPB100
1200 Ampere – SPB50, SPB65, SPB100
1600 Ampere – SPB50, SPB65, SPB100
2000C Ampere – SPB50, SPB65, SPB100



2000 Ampere – SPB 100
2500 Ampere – SPB 100
3000 Ampere – SPB 100



Approximate Weight, Pounds

Frame Rating Amperes	Fixed Mounted Breakers	Drawout Mounted Breakers			
		Behind the door		Through the door	
		Drawout Element Only	Drawout Stationary Frame	Drawout Element Only	Drawout Stationary Frame
400-800-1200	100	110	85	146	101
1600-2000-C	120	133	95	169	101
2000-2500-3000	185	207	105	294	154
4000-5000	620	655	450	N/A	N/A

Further Information
List Prices: Price List 29-821

Instruction Leaflets:

IB 15082 Instruction for the Systems Pow-R Breaker and Drawout Mechanism 250-3000 Amp. Frames

IL 15094 Instructions for Field Testing of Systems Pow-R Breakers.

IL 15106 Inspection and Maintenance of Systems Pow-R Breakers.

IL 15129 Instructions for Cable Interlocked Behind the Door Drawout Systems Pow-R Breakers.

IL 15141 Instruction for Time Delay Undervoltage Release for Systems Pow-R Breaker.

IL 15146 Instructions for Capacitive Trip Device.

IL 15156 Removal and Replacement of Moving and Stationary Conductor and Operating Mechanism in a Systems Pow-R Breaker.

IL 15158 Instructions for Installing Shunt Trip Devices in Systems Pow-R Breakers.

IL 15159 Instructions for Installing Auxiliary Switches in System Pow-R Breakers.

IL 15160 Instructions for Installing Electrical Operators in System Pow-R Breakers.

IL 15161 Instructions for Installing Spring Release Device in Systems Pow-R Breakers.

IL 15162 Instructions for Installing Undervoltage Release Device in System Pow-R Breaker.

IL 15254 Instructions for Kirk Key Interlock for Behind the Door Drawout Systems Pow-R Breakers.

IL 15377 Instructions for Use of Secondary Contact Assemblies for Behind the Door Drawout Systems Pow-R Breakers.

IL 15494 Instructions for Replacing Handle Hub Assembly on Systems Pow-R Breakers.

IL 15497 Instructions for Fixed Mounted Mechanically Interlocked Systems Pow-R Breaker.

IL 15532 Instructions for Field Installing Push to Open Padlockable and Manual Close Block Adaptors.

IL 29-801 General Instructions for Use of Systems Pow-R Breakers.

IL 29-851 Instructions for Digitrip RMS 500 Trip Unit.

IL 29-852 Instructions for Digitrip RMS 600 Trip Unit.

IL 29-853 Instructions for Digitrip RMS 700 Trip Unit.

IL 29-854 Instructions for Digitrip RMS 800 Trip Unit.

IL 29-855 Digitrip RMS Trip Units Used with Type SPB Systems Pow-R Breakers.

IL 29-856 Instructions for the Systems Pow-R Breaker with Through the Door Drawout.

IL 29-857 Instructions for the Systems Pow-R Breaker with Behind the Door Drawout.

IS 15545 Master Connection Diagram for Systems Pow-R Breaker with Digitrip RMS.

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