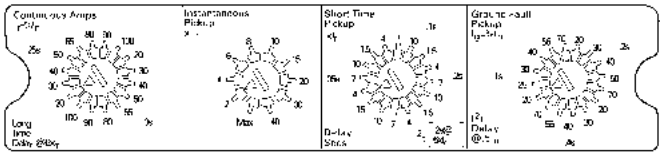
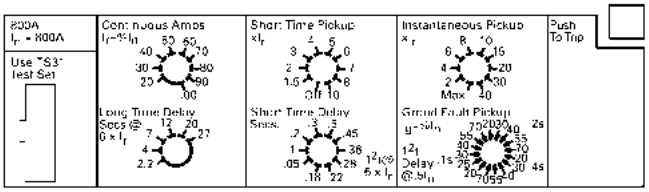
Sensitrip® Type SLD6

Sensitrip® Type SMD6



JD and LD Frames: Types SJD6, SHJDG, SCJDG, SCDG, SHLDG, SCLDG



MD and ND Frames: Types SMDG, SHMDG, SCMDG, SNDG, SHNDG, SCNDG, PD Frame: Types SPDG, SHPDG

Sensitrip® III Circuit Breakers

The Sentron® Sensitrip® III circuit breaker family employs the same blow-open contact design used in Siemens thermal-magnetic breakers. The thermal-magnetic trip unit has been replaced by a microprocessor solid-state trip unit which performs three functions:

- sense the magnitude of current flow in the protected circuit
- determine when current becomes excessive
- send a trip signal to the breaker mechanism.

The current level of the protected circuit is monitored by three current sensing transformers positioned in the circuit breaker frame (and a transformer on the neutral if ground fault protection is implemented). Signals are sent to the solid state circuitry where they are compared to user-determined reference values. When the signal values exceed the reference values, a trip signal is sent to the breaker's magnetic latch.

Sensitrip III uses rotary switches for all adjustable settings. A simple turn of a switch is all that is needed to change any parameter.

Models

Sensitrip III is available in various maximum ampere ratings to cover a continuous current range from 40 through 1600 amperes. These ampere ratings are available in four variations (LI, LIG, LSI, LSIG) to allow the combination of capabilities most needed. The short time delay models allow some selectivity in electrical distribution systems, while the instantaneous trip models provide dependable instantaneous tripping where needed.

Continuous Current

The continuous current (Long Time) adjustment is used to set the maximum current the breaker should pass without tripping. This adjustment is especially useful when system requirements change. This function effectively eliminates the need to purchase an interchangeable trip and manually replace it in the circuit breaker. The function provides a choice of 20 to 100 percent of the continuous current rating of the Sensitrip III. Specific ranges are provided in the chart below. In addition, the portion of the time-current characteristic curve which is affected by changes in this setting is shown on page 329.

Instantaneous Current (I)

The Instantaneous Trip function adjusts the Sensitrip III circuit breaker to trip instantaneously (without any intentional delay) at various points. Instantaneous tripping is designed for protection during high fault conditions and the adjustable setting allows one to accommodate a variety of different circuits with the same circuit breaker.

Between 2 to 40 times the continuous current setting for instantaneous tripping may be selected. Thus, a 200 ampere SJD with a continuous current setting of 20% (or 40A) can be adjusted for tripping instantaneously at 80, 160, 240, 320, 400, 600, 800, 1200, and 1600 amperes.

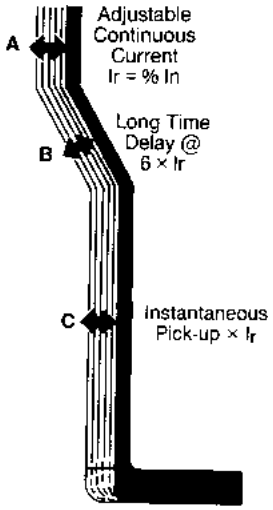
For added safety, each Sensitrip III digital circuit breaker includes a fixed instantaneous override. This automatically prempts the settings and trips the breaker beyond 10.5 times the breaker rating (I_n) for JD and LD frames and up to 10,000 amperes max for MD, ND and PD frames.

Table 17.1

Breaker Frame	Breaker Type	Range of Continuous Current Settings
JD	SJD6, SHJD6, SCJD6	40 – 400A
LD	SLD6, SHLD6, SCLD6	120 – 600A
MD	SMD6, SHMD6, SCMD6	160 – 800A
ND	SND6, SHND6, SCND6	240 – 1200A
PD	SPD6, SHPD6	320 – 1600A

Table 17.2

Breaker Frame	Breaker Type	Range of Instantaneous Trip Settings
JD	SJD6, SHJD6, SCJD6	80 – 4,200A
LD	SLD6, SHLD6, SCLD6	240 – 6,300A
MD	SMD6, SHMD6, SCMD6	520 – 10,000A
ND	SND6, SHND6, SCND6	480 – 10,000A
PD	SPD6, SHPD6	690 – 10,000A

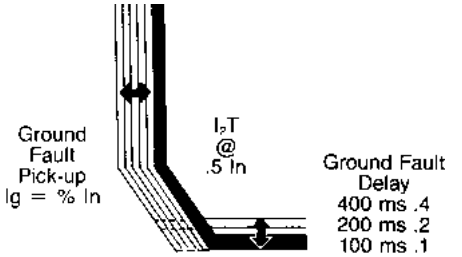


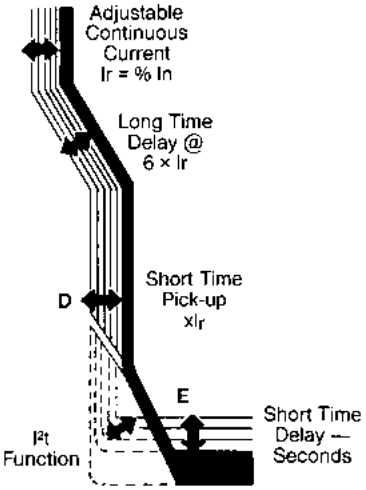
Type "LI"

A. Adjustable "Continuous Amps" Rating Switch
All Sensitrip III solid state molded case circuit breakers have an adjustable ampere rating switch. Adjustments made to this switch change the continuous current rating of the breaker from 20% to 100% of its maximum trip unit rating depending on the circuit breaker frame.

B. Adjustable "Long Time Delay" Switch
All Sensitrip III circuit breakers have an adjustable long time delay switch to allow for selection of long time delays of fixed time intervals at six times the setting of the adjustable "continuous amps" rating switch

C. Adjustable "Instantaneous Pick-Up" Switch
Sensitrip III circuit breakers with an adjustable instantaneous trip switch allow selection of a tripping point from related to the adjusted circuit breaker Rating (Ir)





Type "LSI"

Adjustable"Ground Fault Pick-Up"Switch
Sensitrip III circuit breakers containing the optional equipment ground fault protection cover the ground fault pick-up range of 20% to 70% of the circuit breaker frame rating. The ground fault pick-up settings also allow for one of three time delays based on I^2t curves.
For 3-phase, 4-wire systems, an external neutral transformer is required with an ampere rating equal to the trip unit ampere rating.

D. Adjustable "Short Time Pick-Up" Switch (Optional)
Sensitrip III circuit breakers with an adjustable short time pick-up switch allow for selection of short time pick-up in a range from 1.5 to 10 times the setting of the maximum current rating.

E. Adjustable"ShortTime Delay" Switch (Optional)
Sensitrip III circuit breakers with an adjustable short time pick-up switch also contain a switch for adjustment in time delay. The adjustable short time delay switch allows for either of two modes of short time delays. One range of settings enables the breaker to be set for fixed time delays and the other range of settings enables the breaker to be set for short time delays based on I^2t curves.

I_n = Maximum circuit breaker ampere rating.
I_r = Current Rating — a function of adjustment setting expressed in % of I_n.
I_g = Ground Fault Pick-up — a function of adjustment setting expressed in % of I_n.

Short-Time Function (S)

This function controls the current the circuit breaker carries for short periods of time, effectively permitting downstream protective devices to clear short circuits without tripping the up-stream device (selectivity). Up to .2 seconds of time delay is avaiable.

Since the pickup is adjustable, a wide choice of settings is available to help meet individual application requirements. Choices may be made between fixed trip times or I^2t delay. Table 17.3 illustrates pick-up ranges.

All Sensitrip III circuit breakers employ a magnetic override circuit which limits short-time pickup to 10.5 times I_n for JD and LD frames or 10,000A for MD, ND and PD frames.

Table 17.3

Breaker Frame	Breaker Type	Range of Short-Time Pick Up Settings
JD	SJD6, SHJD6, SCJD6	60 – 4000A
LD	SLD6, SHLD6, SCLD6	180 – 6000A
MD	SMD6, SHMD6, SCMD6	240 – 8000A
ND	SND6, SHND6, SCND6	360 – 10,000A
PD	SPD6, SHPD6	480 – 10,000A

Ground Fault Pick-up Function (G)

This function controls the level of ground fault current at which the Sensitrip breaker will interrupt the circuit. A wide range of settings, from 20% to 70% I_n, allows customizing the circuit breaker to protection requirements.

Table 17.4 provides the ranges for each Sensitrip III circuit breaker for the ground fault pick-up function. Note that Sensitrip III circuit breakers are all adjustable in compliance with the National Electric Code, Article 230, Section 95, covering ground fault protection of service equipment. This function may act on a direct measurement of source ground current or the residual current on 3-phase 3-wire or 4-wire systems.

Table 17.4

Breaker Frame	Breaker Type	Range of Ground Fault Pick Up Settings
JD	SJD6, SHJD6, SCJD6	40 – 280A
LD	SLD6, SHLD6, SCLD6	60 – 420A
MD	SMD6, SHMD6, SCMD6	120 – 560A
ND	SND6, SHND6, SCND6	160 – 840A
PD	SPD6, SHPD6	280 – 1120A

Ground Fault Time Delay Function

This function is designed to add a predetermined amount of time to the trip point when a ground fault occurs. It is a standard feature with the ground fault pick-up function for Sensitrip III digital circuit breakers. The setting range of the ground fault time delay is .10, .20, or .40 seconds. As with the short-time delay pick-up function, selectively is possible using this function.