

SP-120/SP-123

Current Window Comparator
Single Phase
1A/5A AC(RMS)

SLIMLINE

MONITORING RELAYS



ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SP	120	230V	AC	DP

SEE PAGE 32 FOR ORDERING OPTIONS

Application Examples

- Submersible pumps, clogging or running dry.
- Conveyor belts tearing or overloading.
- Jamming or loss of hydraulic fluid in ship steering motors.
- Jamming or shaft breaking on screw conveyors.
- Overload and underload detection on generator sets.
- Detection of mixture densities on a variety of industrial mixers.
- Detection of jammed dampers in either closed or open positions on fans.

Features

- Failsafe feature.
- Direct in-line current sensing.
- Combined overload and underload detection.
- Internal shunt for direct in-line current sensing.
- Adjustable response delay of 0,1 to 10 seconds on SP-123.
- 1A or 5A AC input range (programmable).
- Direct interface with conventional current transformers.
- Separate adjustment of overload and underload thresholds.
- Latching in both modes.
- LED indications for overload, underload and normal load.
- Start-up delay.

Description of Operation

The **SP-120** and **SP-123** are precision current comparators for single phase AC applications. They respond to both under-current as well as over-current conditions. The internal shunt facilitates direct connection into a current loop up to 5A (continuous). The units interface readily with conventional current transformers (1A or 5A secondary rating).

Start-up Delay: When power is applied to the module, the relay energises immediately, ignoring abnormal load conditions experienced during start-up.

Load Sensing: The relay remains energised when the current is maintained between the overload and underload setpoint. If the current rises above the overload setpoint or drops below the underload setpoint, the relay de-energises and the appropriate LED indicates "overload" or "underload" conditions respectively. The relay energises again if the current recovers to within the set overload/underload window.

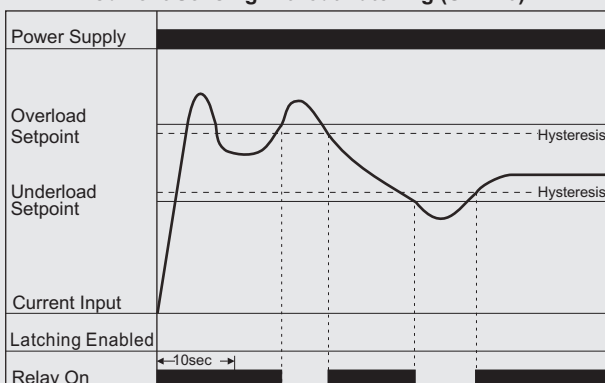
Hysteresis: Hysteresis represents the difference between the tripping point and the recovery point of the unit. The hysteresis is fixed to 2% to prevent relay chatter when the load current fluctuates around the setpoint.

Latching: When latching is armed, the relay will not recover from a tripped condition, but will remain de-energised until reset. The appropriate LED will indicate the type of fault which caused the tripped condition. The unit can be reset by either breaking and re-applying power supply to the unit or by momentarily disabling the latching circuit (e.g. Push-to-open switch). During the start-up delay, the latching circuit is disabled automatically.

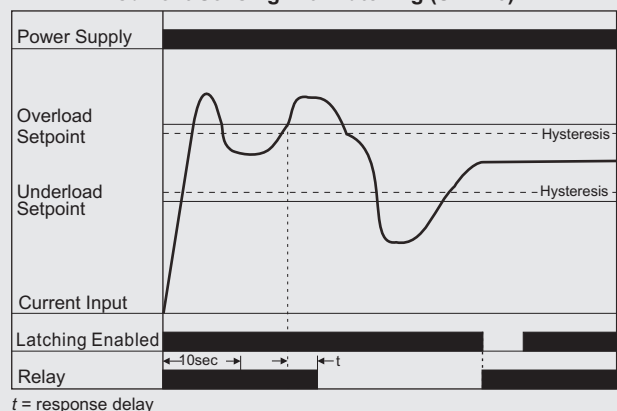
Adjustable Response (SP-123): Reponse delay can be adjusted from 0,1 to 10 seconds. When a trip condition is detected, the relay will only de-energise after the set response time (a delayed an recovery is also available on special order).

Operational Diagrams

Current Sensing without Latching (SP-120)

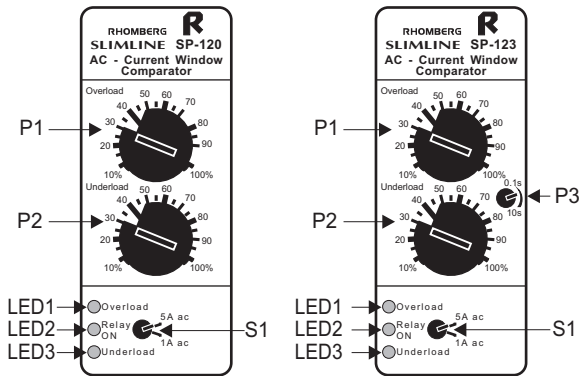


Current Sensing with Latching (SP-123)





Description of Controls



P1: The **Overload Threshold** is adjusted on P1. Maximum setting of 100% corresponds with a current level of 1A or 5A (depending on setting of S1).

P2: The **Underload Threshold** (tripping point) is adjusted on P2. Maximum setting of 100% corresponds with a current level of 1A or 5A (depending on the setting of S1).

Note: P2 should be set to a level below that of P1, i.e. The overload threshold and the underload threshold must not overlap.

P3: **Adjustable Response Delay** from 1 to 10 seconds (SP-123).

S1: The **Current Range** is set for 1A or 5A application on S1 (1A, 5A).

LED 1: The red LED marked "**Overload**" will illuminate whenever the current exceeds the set overload threshold.

LED 2: The green LED marked "**Relay ON**" will illuminate when the relay is energised.

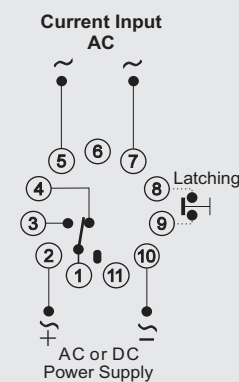
LED 3: The red LED marked "**Underload**" will illuminate whenever the current drops below the set underload threshold.

Wiring and Connection

Power Supply	
Phase/ Positive	Pin 2
Neutral/ Negative	Pin 10

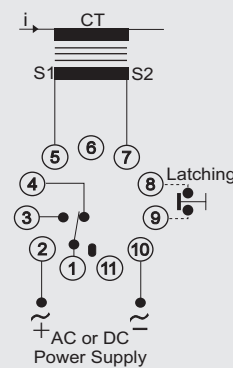
Relay Contacts	
Normally Open	1 + 3
Normally Closed	1 + 4

Latching
Latching to be enabled by interconnecting pin 8 and pin 9 (e.g. Push-to-open reset switch)



APPLICATION 1

Direct In-Line AC Current Sensing: Connect the sensing pin 5 and pin 7 input in series with the AC current loop.



APPLICATION 2

AC Current Sensing with a Current Transformer: Connect the secondary terminals of the current transformer (S1 and S2) to the current input pin 5 and pin 7. Other devices, such as amperemeters, may be connected in series with the current loop, provided the VA rating of the CT is not exceeded. Power supply can be AC or DC.

Note: Do not unplug the unit while the current loop is energised, since this will cause an open circuit of the current loop and may damage the current transformer (see "CT protection" in the general section of the catalogue on page 121.)

Technical Specifications

POWER SUPPLY

AC: Supply voltage: 12, 24, 110, 230, 400, 415, 525V $\pm 15\%$
Isolation (current input to power supply): 2kV
Power consumption: 3VA (approx.)

6VA for 415, 525V (approx.)

DC: Supply voltage: 10-30V, 48, 60, 110V $\pm 15\%$
Isolation: no galvanic isolation.
Power consumption: 100mA (10-30V),
30mA for 48V and higher

CURRENT INPUT

Trip point: 0.1 to 1A or 0.5 to 5AAC (adjustable)

Repetitive accuracy: 1%
Hysteresis: 2% Fixed (relative to trip point setting)
Maximum input current (continuous): 6A
Peak short-term over-current (10 seconds): 20A
Current input impedance: 50 milliohms

RESPONSE

Start-up delay: approximately 10 seconds, standard (1 to 15 seconds also possible on special order)
Response delay: SP-120 - 1 second.
SP-123 - adjustable from 1 to 10 seconds (other ranges on special order).