

## Thermistor Motor Protection Module



## ORDERING CODE

TYPE	MODEL	VOLTAGE	POWER SUPPLY	RELAY CONTACTS
SC	510	230V	AC	SP

**SEE PAGE 94 FOR ORDERING OPTIONS**

# SLIMLINE

### ■ Application Example

- Detects overheating of equipment such as motors, alternators and transformers, using a PTC sensor as a measuring device.

## ■ Features

- Failsafe feature.
- Interfaces with PTC sensors as per DIN 44081.
- The SC-511 has a fault latching feature, can be reset via an external open via the reset button on the unit.
- Test button to simulate fault condition on the SC-511.
- Sensor or cable fault detection and indication with an automatic relay de-energisation for failsafe operation.
- 10A SPDT relay output.

## ■ Description of Operation

The **SC-510** and **SC-511** are thermistor motor protection modules, interfacing with PTC sensors as per DIN 44081 for the protection of motors, alternators, transformers, etc. The modules monitor the variation in resistance of the sensors and cause their relays to de-energise as soon as the nominal trip temperature (TNF) of the sensors is exceeded.

Both modules also feature sensor fault and cable fault detection which means that if either a short circuit or an open circuit is detected the relay is de-energised.

**Module Triggering:** The relay of each module will de-energise as soon as the equipment monitored is subjected to a thermal overload, short circuit or break in the sensor measuring circuit. The green relay indication LED will also go off in such an event.

**Module Reset:** The SC-510 will automatically reset once the temperature falls below the set threshold, or restoration of either sensor fault or cable fault. When the latching feature on the SC-511 is enabled, the module will not reset once the temperature falls below the reset threshold, or

restoration of either sensor fault or cable fault.

The SC-511 can then only be reset by:

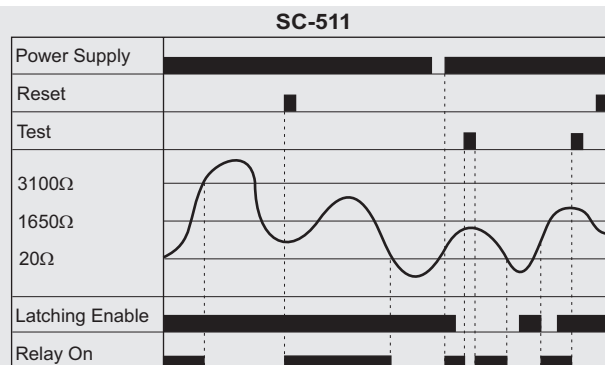
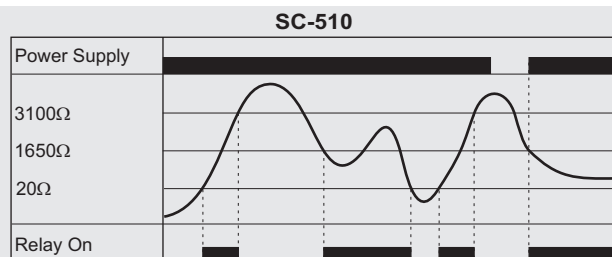
- Pressing the reset push button on the unit,
- Opening the external contact,
- Interrupting the power supply to the module.

**Note:** If the power supply to the module is interrupted, the relay will subsequently be re-energised if the sensor detects a normal temperature when the power supply voltage is restored.

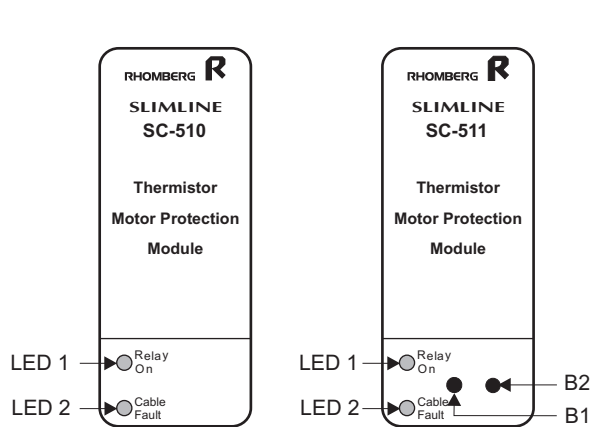
**Test:** The TEST button on the SC-511 can be used to simulate a fault condition. The relay will subsequently de-energise and the red cable fault LED will illuminate. The module must be reset if the latching feature is enabled.

**Temperature pre-warning:** In the event of the equipment being monitored having a second PTC sensor whose nominal trip temperature is lower than the first, then a second module may be used to give an early warning and thus prevent a major shut-down.

## ■ Operational Diagrams



## Description of Controls



LED1: The LED marked **“Relay ON”** illuminates when the relay is energised.

LED 2: The LED marked **“Cable Fault”** illuminates when:

- $\leq 20\text{ohms}$  occurs at the sensor input, or
- An open circuit occurs on the sensor input.

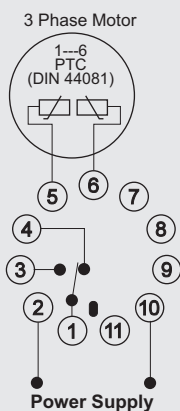
B1: The push-button marked **“Test”** may be used to simulate a fault condition.

B2: The push-button marked **“Reset”** may be used to restore the module to normal operation once it has triggered due to some fault condition when using the latching feature.

## Wiring and Connection

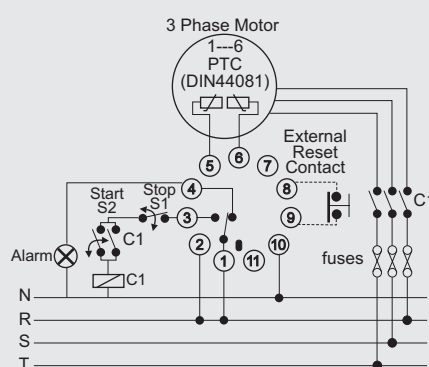
Power Supply	
Phase/Positive	2
Neutral/Negative	10

Relay Contacts	
Normally open	1+3
Normally closed	1+4



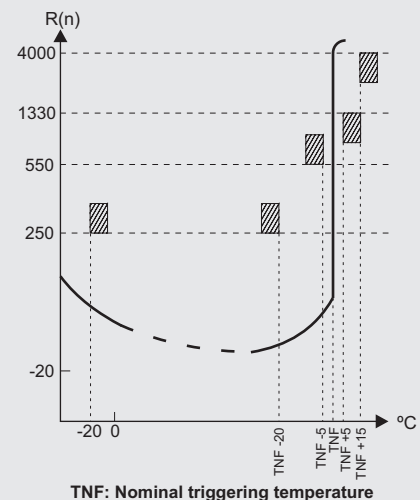
**APPLICATION 1**  
Three phase motor with PTC  
(DIN 44081)(SC-510)

Sensing Input
Connect the 2-wires from the machine to pins 5 and 6.



**APPLICATION 2**  
Three phase motor with PTC  
(DIN 44081)(SC-511)

Reset
Connect link or normally closed contact to pins 8 and 9 to enable latching facility.



Characteristics of PTC thermistor probe as per standard DIN 44081 (or IEC 34-11)

## Technical Specifications

POWER SUPPLY	
AC:	Supply voltage: 12, 24, 110, 230, 400, 415, 525V $\pm 15\%$ 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 for 10-30V 30mA for 48V and higher
SENSOR INPUT	
Type: PTC sensor as per DIN 44081	
Input impedance: 2200 Ohms	
Open-circuit voltage: $\leq 2.5\text{V}$	
Short circuit current: 1mA (max)	

MEASURING CHARACTERISTICS OF THE SENSOR	
Maximum cold resistance of PTC sensor: 1500ohms (i.e. 1 to 6 sensors can be connected)	
Triggering threshold:	3100ohms $\pm 10\%$
Recovery threshold:	1650ohms $\pm 10\%$
Short-circuit detection:	$< 20\text{ohms}$
Open-circuit detection:	10k $\pm 10\%$
Repetitive accuracy:	0,5%
Response Time:	50 milliseconds

Additional information in Section J, page 131.