

HOT SPOT 3 TEMPERATURE RELAY PRA, PRB, PRC

Introduction


Hot spot 3 temperature trip relays (Models PRA, PRB, PRC) monitor three temperature zones, using Resistance Temperature Detectors. The highest of three temperatures is automatically selected and a 0 to 1mA signal produced for indication or record purposes.

The temperature trip point, common to all channels, is user adjustable. The outputs are volt free contacts from a single pole changeover relay, with LED indication of normal (green) or tripped (red) conditions. Additional red LED's are fitted to show which of the inputs are exceeding the trip point.

Model differentiation

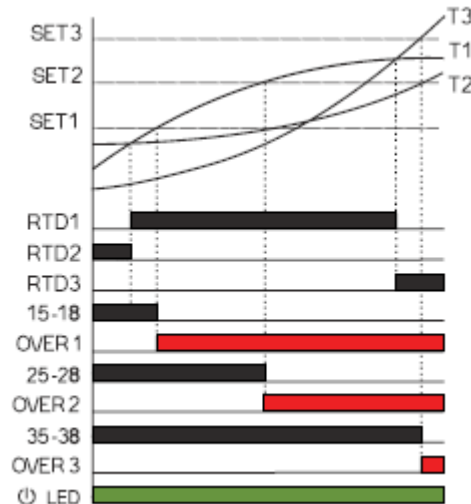
Part number	Type	Protection
PRA	3 RTD input	3 set points
PRB	3 RTD input	2 set points
PRC	3 RTD input	1 set point

Specification

Parameter	PRB-12/24-100	PRB-24/240-100
Supply Voltage:	12-24	24-240
Auxiliary voltage burden (max)	1.2W	3VA/1.2W
AC supply frequency:	45-65 Hz	45-65 Hz
Supply voltage tolerance	±10%	±10%
Relay type:	3 RTD inputs, 2 set points	
Temperature Sensor:	Platinum PT100	
Temperature range:	0 to +250 °C	
Analogue out:	0...1mA (Fixed to 0 to +250 °C)	
Set point range:	0 to +250 °C	
Differential:	Fixed 2% of range	
Relay reset:	Automatic	
Relay contacts:	1...3 x changeover, volt free, for general switching operations	
Load capacity – AC:	250 V @ 8A, 2kVA	
Load capacity – DC:	30V 8 A	
Insulation:	4kV/1 min	
Mechanical endurance:	30x10 ⁶ operations	
Other Data:		
Dimensions	90- x 105 x 64 mm	
Weight	208g	
Maximum conductor size	2 x 1.5 mm ² or 1 x 2.5 mm ²	
Operating temperature	-20 to +55 °C	
Storage temperature	-30 to +70 °C	
Overshoot category	III	
Pollution degree	2	
Environmental protection	IP40 for front panel IP20 for terminals.	
Standards	EN 60255-6, EN 60255-27, EN 61000-2, EN 61000-4	
	Insulation Class 2: Ensure any external circuits connected to the relay are provided with double or reinforced insulation.	

Operation

- Controls on the front panel set the trip points between temperature range 0-250°C
- LEDs indicate power on, highest temperature and trip status. Up to three relay with changeover volt-free contact are fitted
- Analogue output fixed to 250°C

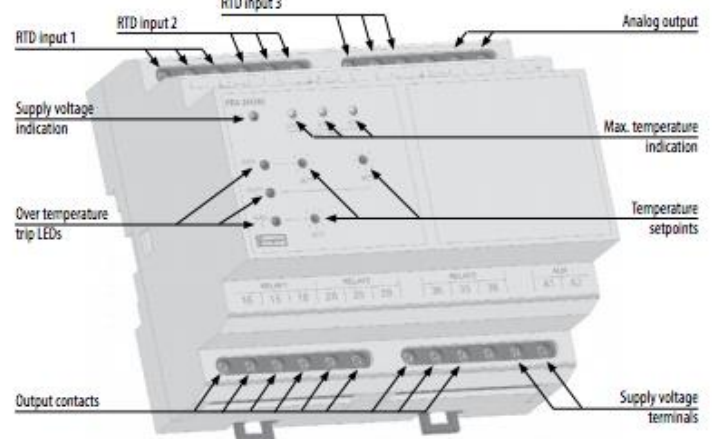


The unit obtains its power from the separate auxiliary supply. The green LED lights to show when this supply is present. The Hot Spot 3 Temperature Relay continuously monitors the three RTD temperature sensors, and offers up to three user adjustable setpoints and relay contacts. The highest temperature is indicated with a yellow LED, and can be accurately measured or remotely displayed using the 0/1mA analog output signal. The temperature is compared with the user adjustable setpoints. When the measured temperature exceeds the set point, the relay will de-energise, and a red LED will light and indicates the trip condition. When the temperature drops below the setpoint, the relay will reset to the energised condition, and the LED will go off.

Sensor failure monitoring:

If the RTD resistance is higher or lower than measuring range (short circuit or sensor disconnection), yellow LED will flash and all relays will de-energise.

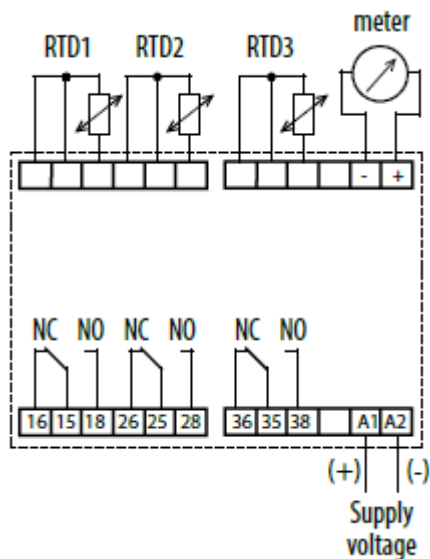
Layout



Installation

The unit is intended for mounting on a standard DIN rail. Hook the unit onto the top of the rail and press the bottom of the unit until it locks in place. To remove the unit from the rail, lever down the black tabs at the bottom of the unit to release it from the rail.

The unit is intended for use in a reasonably stable ambient temperature within the range -10 to +55°C. Do not mount the unit where there is excessive vibration or in excessive direct sunlight.



NC = Normally closed. Contact closed when relay de-energised.
NO = Normally open. Contact open when relay de-energised.

Warnings:



Caution: Risk of Electric Shock

- During normal operation, voltages hazardous to life may be present at some of the terminals of this unit. Installation and servicing should be performed only by qualified, properly trained personnel abiding by local regulations. Ensure all supplies are de-energised before attempting connection or other procedures.
- It is recommended adjustments be made with the supplies de-energised, but if this is not possible, then extreme caution should be exercised.
- Terminals should not be user accessible after installation and external installation provisions must be sufficient to prevent hazards under fault conditions.
- This unit is not intended to function as part of a system providing the sole means of fault protection - good engineering practice dictates that any critical function be protected by at least two independent and diverse means.
- The unit does not have internal fuses therefore external fuses must be used for protection and safety under fault conditions.
- If this equipment is used in a manner not specified by the manufacturer, protection provided by the equipment may be impaired.

Safety

The unit was designed in accordance with BS EN 600255-6 and -27 – Permanently connected use, Normal condition. Insulation category III, pollution degree 2, basic insulation for rated voltage. Measurement Category III.

EMC Installation Requirements

This unit has been designed in accordance with to provide protection against EM (electro-magnetic) interference in line BS EN 61000-6-2 and -

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6-4. Precautions necessary to provide proper operation of this and adjacent equipment will be installation dependent and so the following can only be general guidance:

- Avoid routing wiring to this unit alongside cables and products that are, or could be, a source of interference.
- The auxiliary supply to the unit should not be subject to excessive interference. In some cases, a supply line filter may be required.
- To protect the product against incorrect operation or permanent damage, surge transients must be controlled. It is good EMC practice to suppress differential surges to 2kV or less at the source. The unit has been designed to automatically recover from typical transients, however in extreme circumstances it may be necessary to temporarily disconnect the auxiliary supply for a period of greater than 5 seconds to restore correct operation.
- Screened communication leads are recommended and may be required. These and other connecting leads may require the fitting of RF suppression components, such as ferrite absorbers, line filters etc., if RF fields cause problems.
- It is good practice to install sensitive electronic instruments that are performing critical functions in EMC enclosures that protect against electrical interference causing a disturbance in function.

Wiring

All connections are made to screw clamp terminals. Terminals are suitable for copper wires only and will accept one stranded 0.05 - 2.5mm² (30 - 12 AWG) stranded or solid core cables. Terminal screws should be tightened to 0.5 Nm. Choice of cable should meet local regulations.

Instrument transformers used for connection to the meter must be of approved type, compliant with ANSI/IEEE C57.13 / IEC 60044-1 to provide isolation from measuring inputs.

For UL approved installation, use National Electrical Code (NEC) Class 1 wiring, rated at 600V for main terminals, 300V auxiliary / 60°C min rating.

Auxiliary Supply

The unit should ideally be powered from a dedicated supply. However it may be powered from the signal source, providing the source will always be within tolerance for the auxiliary supply.

24 to 250V AC or DC \pm 10% 1.22W 3VA. 45-65 Hz for AC

Fusing

A suitable switch or circuit breaker conforming to the relevant parts of IEC 60947-1 and IEC 60947-3 should be included in the building installation. It should be positioned so as to be easy to operate, in close proximity to the equipment, and clearly identified as the disconnecting device.

This unit must be fitted with external fuses in voltage and auxiliary supply lines. Voltage input lines must be fused with a quick blow fuse 1A maximum. Auxiliary supply lines must be fused with a slow blow fuse rated 1A maximum. Choose fuses of a type and with a breaking capacity appropriate to the supply and in accordance with local regulations.

For UL approved installations:

UL listed branch circuit fuses, suitable for the installation voltage, shall be provided and installed in accordance with national installation code – 1A slow blow AC or DC rated for auxiliary supply lines. 1A fast acting AC rated for the voltage measuring inputs.

Maintenance

In normal use, little or no maintenance is needed. Where used, ensure any CT secondary circuits are short circuited prior to carrying out installation or maintenance of the unit. As appropriate for service conditions, isolate electrical power, inspect the unit and remove any dust or other foreign material present. Periodically check all connections for freedom from corrosion and screw tightness, particularly if vibration is present.