

P607 Trip Amplifier

Description

The P607 range of DIN rail mounting Trip Amplifiers provides a compact selection of instruments suitable for many industrial applications. The units are of the plug-in type to facilitate fast replacement in the unlikely event of unit failure.

The P607 is basically a voltage comparator which compares the value of an incoming signal with the value of one or two internal user adjustable preset values. The instrument is capable of being configured to work on other inputs directly from any transducer which provides changes of voltage, current or resistance. The instrument can be set to detect whether the incoming signal is above or below either of the internal adjustable references.

A green LED on the front panel indicates "power on". The tripped state is indicated by red LED's on the front and a change of state of a relay or relays in the unit.

Externally accessible switches in the base of the enclosure permit selection of Trip Hi or Trip Lo to be made. Each channel of the two channel unit can be configured independently.

As well as the volt-free contacts, the units can be supplied with either a 0-10V or 4-20mA analogue output representing 0-100% of span, this makes the instrument suitable as a signal converter with or without trips.

Installation

The P607 Trip Amplifier can be surface mounted directly or DIN-rail mounted using the clip and screw provided with each unit. The unit should be fused externally using a 250mA A/S fuse. Cables connected to the P607 should be kept separate from high voltage or high current carrying cables.

RTD connection

If using a standard RTD manufactured BS1904 or DIN43760 then connect one of the red leads to RTD FEED (terminal 8), the other red lead to the +ve SIGNAL IN (terminal 9) and the white lead to -ve SIGNAL IN (terminal 10). When a 2 wire RTD is used connect RTD FEED (terminal 8) and +ve SIGNAL IN (terminal 9) together.

Current Loop Input

If the trip Amplifier is a current input version and it is necessary to maintain the current loop when the unit is removed from its base then simply add a standard signal diode (e.g. 1N4148) across terminals 9 and 10 with the anode on terminal 9.

Connection Details

- 1 – Live (+ve)
- 2 – Neutral (-ve)
- 3 – Spare
- 4 – Relay trip 1
- 5 – Relay trip 1
- 6 – Relay trip 2
- 7 – Relay trip 2
- 8 – RTD feed
- 9 – Signal in (+ve)
- 10 – Signal in (-ve)
- 11 – Analogue out (+ve)
- 12 – Analogue out (-ve)

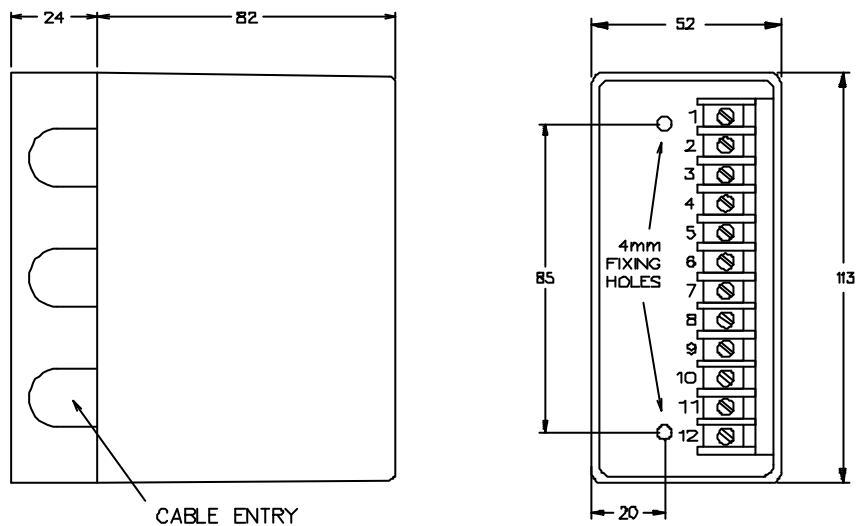


Figure 1

Specification

INPUTS

DC Ranges

Voltage	Current
0-10mV	0-1mA
0-100mV	0-10mA
0-1V	4-20mA
0-10V	0-100mA
0-100V	0-1A

Temperature ranges

Platinum RTD (Pt100), resistance thermometer 100Ω at 0°C (DIN43760 and BS1904) 2 or 3 wire.

0-100°C
0-150°C
0-200°C

Thermocouples

Type J to BS4937 part 3
Type K to BS4937 part 4
Type T to BS4937 part 5
Automatic cold junction compensation
0-200°C
0-250°C
0-500°C
0-1000°C

OUTPUTS

Trip Outputs

Two sets of contacts, selectable as normally open or normally closed. Relays de-energise on trip.
Contact rating 240VAC 3A resistive, 24VDC 3A resistive
Trips are user configurable to trip on rising or falling input.

Analogue output

Factory set as 0-10VDC (5mA max) or 4-20mA (max 250Ω load)
Accuracy ±0.05% of span

Indication

By light emitting diodes
Power on - Green, flashes on probe failure
Trip 1 - Red, on when tripped
Trip 2 - Red, on when tripped

SUPPLY

Mains version

110VAC ±10%
240VDC +10% -15%
50/60Hz
Power consumption 8VA

DC version

Nominally 24VDC (19-28VDC) at approx. 130mA

GENERAL

Trip Adjustment

Either screwdriver adjust multi-turn potentiometer or lockable 10 turn dial. Adjustable over the range of 0% to 100% of span.

Set Point Resolution

Better than 0.1% of full scale.

Repeatability

Typically 0.1% of span.

Trip Level Hysteresis

Normally set at approximately 1%. Other values to special order.

Probe failure

In the event of a probe failure (open circuit thermocouple, open or short circuit RTD) the "power on" LED will flash until the fault has been rectified.

Temperature coefficient

±0.02% /°C of full scale.

Temperature range

Operating 0 to +50°C
Storage -20 to +80°C

Isolation

Relay outputs totally isolated. Analogue output isolated from the supply. The input is not isolated from the analogue output.

Protection

IP40

Input impedance

Voltage input	100kΩ/V
Current input	0-1mA 100Ω
	0-10mA 10Ω
	4-20mA 5Ω
	0-100mA 1Ω
	0-1A 0.1Ω

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Alarm Annunciators and Systems | Sequential Event Recorders | Display Facias | Hazardous Area Interface, Alarm and Display Products | Signal Conditioning & Trip Amplifiers | Process Instrumentation



Operating Instructions

Relay Contact Selection

Each trip relay has a change-over contact from which a normally open or a normally closed output can be obtained by selection of a jumper link.

As standard, the relay is energised in it's non-tripped state (failsafe operation) and the output is configured as normally open (This means the N/O contacts are closed in the non-tripped state, relay energised, and open on a trip condition)

To change from N/O to N/C operation firstly release the circuit boards from the enclosure by levering out the plastic retaining plate.

Move LK6 (and LK7 if twin trip version) (See Figure 2) from N/O position to N/C position.

LK6 relates to trip 1 output on terminals 4 and 5

LK7 relates to trip 2 output on terminals 6 and 7

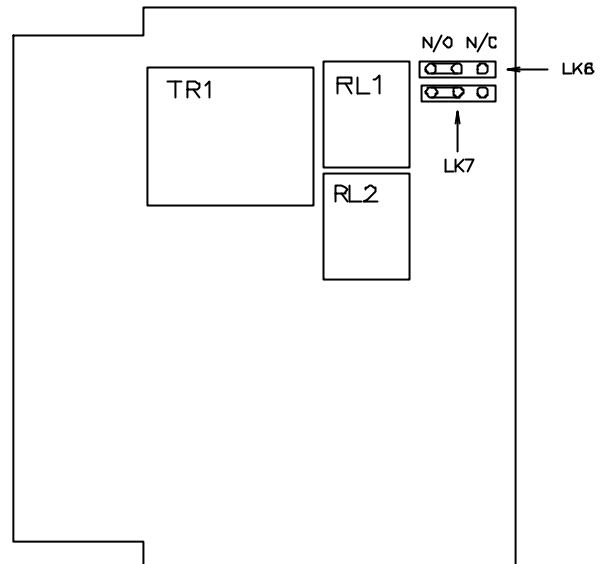


Figure 2

Hi/Lo Trip Selection

When the P607 Trip Amplifier is released from it's base a selector switch (two switches on the twin trip version) are visible on the underside of the unit (see Figure 3). If a high trip is required (i.e. one that will trip as the incoming signal rises) then move the switch position to HI. If a low trip is required then move the switch to position LO. Each trip point can be configured separately.

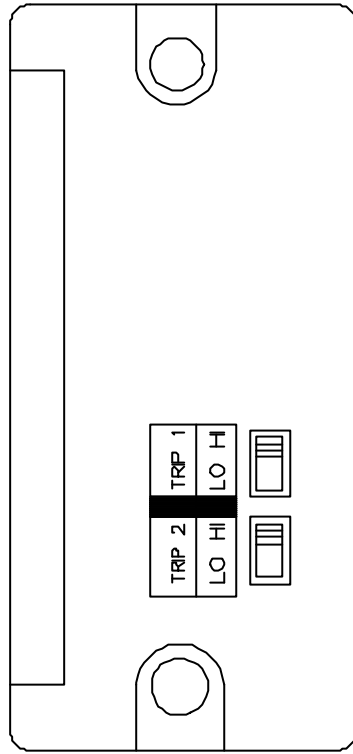


Figure 3

Trip Level Setting

High Trip

Input a signal equivalent to the signal necessary to trip the unit. Adjust the trip level using the pot on the front from the maximum setting down until the trip LED comes on and the relay de-energises. The trip point is now set.

On the ten turn dial version ensure the locking lever is released before attempting to adjust the dial.

Low Trip

Input a signal equivalent to the signal necessary to trip the unit. Adjust the trip level using the pot on the front from the minimum setting up until the trip LED comes on and the relay de-energises. The trip point is now set.

On the ten turn dial version ensure the locking lever is released before attempting to adjust the dial.

Calibration

The P607 Trip Amplifiers are factory set using equipment traceable to national standards. Recalibration should not be attempted unless absolutely necessary and suitable calibration equipment is available.

Current / Voltage / RTD inputs

Remove the circuit boards from the enclosure and connect to the supply using the base.

WARNING: LIVE TERMINALS WILL BE EXPOSED AT THIS POINT – ENSURE WORK IS CARRIED OUT BY A QUALIFIED ELECTRICIAN

- Apply minimum input signal and adjust VR1 to give 0V at TP1 with respect to 0V test point (See Figure 4)
- Set the trip level pots VR5 and VR6 to the maximum (clockwise) positions.
- Apply maximum input signal and adjust VR2 until both trips just operate. (LED(s) come on).
- Apply minimum input signal again and adjust VR3 to give minimum putput signals on terminals 11 and 12.
- Apply maximum input signal again and adjust VR4 to give maximum output signal on terminals 11 and 12.
- It may be necessary to repeat steps 5 and 6 until the analogue output is accurately set.

Thermocouple Inputs

Follow the previous instructions but ensure that a voltage equivalent to the ambient temperature is subtracted from the input signal. The equivalent voltage can be obtained from reference tables for the different types of thermocouples available.

Sensor Fail

On both RTD (Pt100) and Thermocouple inputs the unit will sense if the sensor fails short-circuit or open-circuit and will trip the output relay and flash the "Power On" LED. If the relay trip facility is not required this can be disabled by linking LK8 on the small PCB shown in Figure 4

Due to our policy of continuous product development, we reserve the right to amend these specifications without notice.

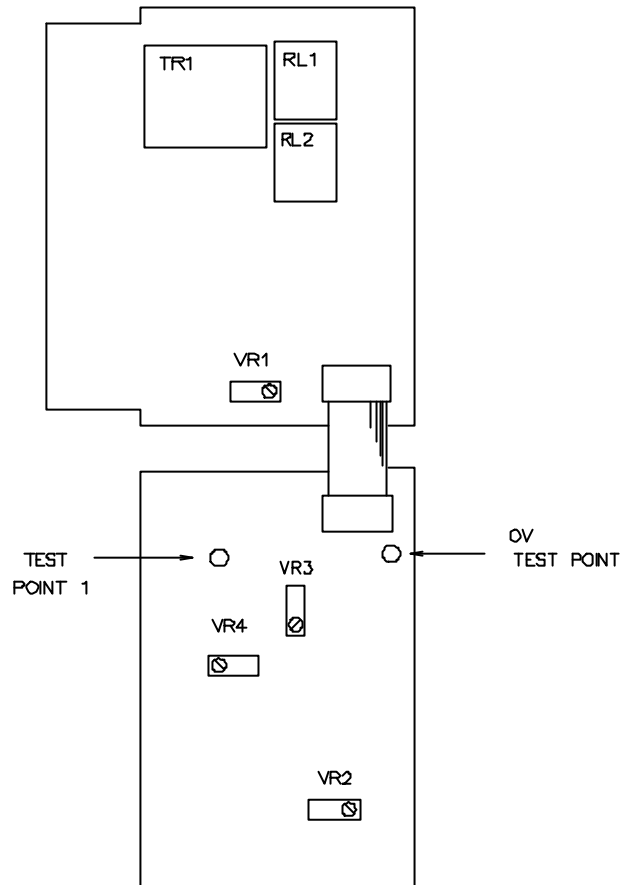


Figure 4