

MM1420, MM1421 & MM1424 RTD INPUT DUAL ALARMS



DESCRIPTION

The MM1420 Series RTD input alarms monitor an RTD (resistance thermometer) input and provide two sets of SPDT, 5A alarm relays with two independently adjustable setpoints. Each setpoint has a set of red/green LEDs to indicate alarms status. When the input is between the setpoints, the relays are normally de-energized. When the signal exceeds a particular setpoint, the relay becomes energized.

Each module can be supplied as a HI/HI, HI/LO, or LO/LO alarm (HI/LO supplied if not specified). To provide a "fail-safe" operation (loss of power resulting in an alarm state), select Option R.

Standard deadband on both alarms is fixed at 0.5% of span. (Option A provides adjustable deadband of 0.5% to 100% span.) Option D, latching alarms, has no deadband control. Once the limit has been reached the alarm latches and power to the module must be momentarily interrupted to reset the alarm.

The modules include filtering and conditioning to reduce susceptibility to transients and noisy operations.

MODEL NUMBERS

These instructions cover the following setpoint styles:

- MM1420** RTD Input Dual Alarm (25 turn screwdriver adj)
- MM1421** RTD Input Dual Alarm (Single turn dials)
- MM1424** RTD Input Dual Alarm (Ten turn precision dials)

OPTIONS

These instructions cover the following options on the MM1420. Options installed are listed on the label attached to the side of the module.

- A** Provides top accessed screwdriver adjustable deadbands from 0.5% to 100% of span, instead of the normal fixed 0.5% deadbands.
- D** Latching alarms. Reset by momentary interruption of line power.
- DC Power** Inverter isolated 12 or 24 VDC power.
- E** 11-pin header instead of standard 20-pin. Available only on MM1420, MM1421 and MM1424 without Option T.
- R** The Normal condition for the relays is de-energized. They energize for alarm conditions. Option R (Reverse sense) reverses this logic (Failsafe).
- U** All circuit boards conformal coated for protection against moisture.

CONTROLS

The MM1420, MM1421 and MM1424 modules contain two setpoint controls, plus zero and span adjustments. The setpoint controls in the MM1420 are 25-turn blind trimpots. MM1421 and MM1424 contain 1-turn and 10-turn calibrated dials, respectively. Option A, adjustable deadband, adds two deadband trimpots.

CALIBRATION

Modules are shipped with ZERO and SPAN precalibrated. The user needs only adjust the SETPOINTS and optional DEADBANDS for the desired levels.

Refer to the instrument's label to determine your instrument's supply voltage and input and output ranges. Refer to the "Block Diagram and Pin Connections" for connections. 20-pin and 11-pin styles both are shown.

Connect a precision decade resistance, potentiometer or RTD simulator to the input. To avoid errors due to the resistances of the connecting wires, use a three-wire connection as shown in the "Block Diagram and Pin Connections".

(Note: When calibrating latching alarms, Option D, it will be necessary to momentarily interrupt power to reset the alarm after each trip.)

To calibrate the alarm setpoints, begin with the optional DEADBAND controls turned fully ccw. Adjust the input resistance to the desired alarm 1 setpoint. Adjust the SETPOINT 1 control until its LED just turns red (ccw for a high alarm, cw for low).

Change the input resistance to the desired alarm 2 setpoint and similarly adjust the SETPOINT 2 control.

The MM1421 (single turn dial) and MM1424 (10-turn dial) may be set using their 0-100% dials.

Adjust the optional DEADBAND controls for the desired amount of deadband. Vary the input signal up and down to check the levels at which the relay trips and resets. The setpoint will remain approximately centered in the middle of the deadband.

If there is a need to recalibrate ZERO and SPAN, turn the optional DEADBAND controls fully ccw and proceed as follows:

Set the resistance to the low end of the input range. Turn the SETPOINT 1 control fully ccw. Adjust the ZERO control until the SETPOINT 1 LED just changes color.

Change the resistance to the high end of the input range. Turn the SETPOINT 2 control fully cw. Adjust the SPAN control until the SETPOINT 2 LED just changes color.

Repeat until the ZERO and SPAN settings both are correct.

After adjusting the ZERO and SPAN controls, the SETPOINT and DEADBAND controls should be reset as described above.

ALARM TYPE	HI/LO	HI/HI	LO/LO
SETPOINT 1	HI	HI	LO
SETPOINT 2	LO	HI	LO

RELAY CONTACT PROTECTION

When inductive loads such as motors, relays or transformers are switched, voltage transients may be generated which exceed the ratings of the relay contacts. The resulting arcing can quickly destroy the contacts. (Refer to the SPECIFICATIONS below for the relay contact ratings.)

Surge suppression is required across inductive loads to guard against premature relay failure. Figure 1 illustrates diode surge suppression for a DC load. The diode's operating (peak inverse) voltage should exceed the load's supply voltage by at least 50% and should have a current rating of at least one ampere.

Figure 2 shows surge suppression for an AC load, using an MOV (Metal Oxide Varistor) and a capacitor. The breakdown voltage ratings of both the MOV and the capacitor must exceed the peak AC voltage.

With normal sine-wave power, PEAK = 1.414 x RMS voltage. For 115V AC power a 200 volt peak rating is recommended.

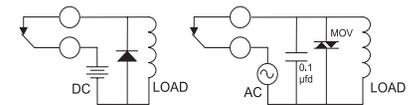


Figure 1
Surge Suppression
Inductive DC Load

Figure 2
Surge Suppression
Inductive AC Load

SPECIFICATIONS

RTD INPUT

3-Wire or 2-Wire,
10 ohms to 2000 ohms

INPUT RANGE

select **any** range within RTD limit
[min span 25°F/14°C
(100°F/55°C with 10 ohms RTD)]

EXCITATION CURRENT

10 ohms	10 mA
100 ohms	5 mA
1000 ohms	0.5 mA
2000 ohms	0.2 mA

SETPOINT

each alarm 0 to 100% of span

DEADBAND

Standard
fixed 0.5% of span
(Option A)
0.5% to 100% of span
(Option D)
Latching. Interrupt power to reset.

OPEN SENSOR OUTPUT

³ full scale

ACCURACY

±0.1% of span or 0.02 ohms,
whichever is greater

COMMON MODE REJECTION

120 dB, DC to 60 Hz

RELAY CONTACTS (spdt)

Resistive Load:
5 A max, 150 W max, 240 VAC max,
30 VDC max

Inductive Load:
1/8 HP max at 120/240 VAC

OPERATING TEMPERATURE

14°F to 140°F/-10°C to 60°C

TEMPERATURE STABILITY

±0.02% of span or 0.025°C/°C,
whichever is greater

POWER

115 VAC ±10%, 50 or 60 Hz
(2.5 W max)
230 VAC ±10%, 50 or 60 Hz
(2.5 W max)
(DC Power Option)
12 VDC (limits 10 VDC to 15 VDC)
(2.5 W max)
24 VDC (limits 21 VDC to 32 VDC)
(2.5 W max)

Isolation, DC power supply to input
common: 10 megohms

* Within specified range limits.

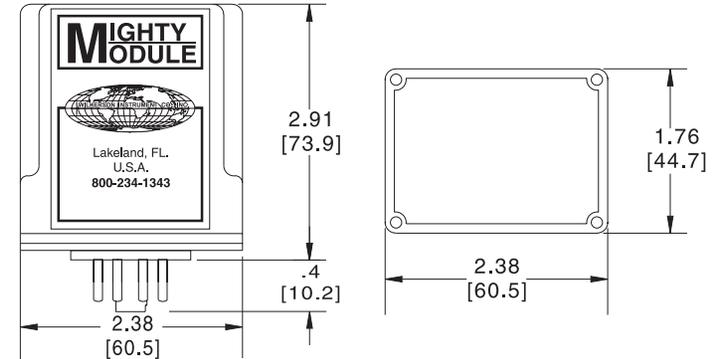
WARRANTY

Contact the factory 1-800-234-1343.

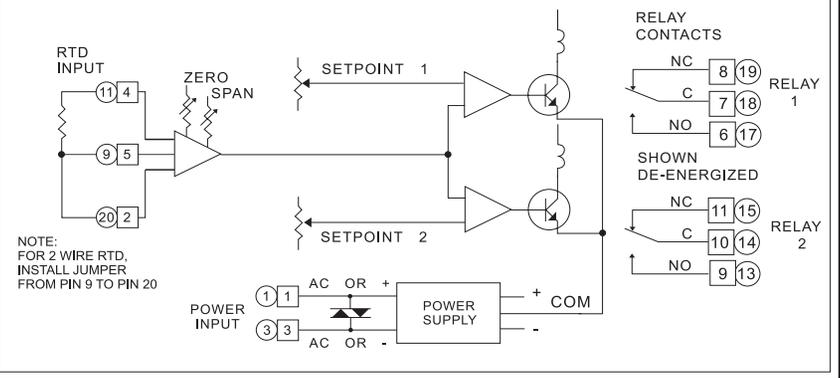
MOUNTING

MM1420, MM1421 and MM1424 are designed to plug into a standard 20-pin relay socket. (Option E requires an 11-pin socket.) **MP020** and **MP011** are 20-pin and 11-pin sockets suitable for mounting on a flat surface. **MP011** may also be mounted in a piece of PVC track. A DIN-rail mounted socket, **DMP011**, is available for 35mm symmetrical rail.

CASE DIMENSIONS INCHES (mm)



BLOCK DIAGRAM AND PIN CONNECTIONS



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