

MM1400, 1401 AND 1404 RTD INPUT SINGLE LIMIT ALARMS



DESCRIPTION

The MM1400 Series input alarms monitor an RTD input signal and trip a dpdt, 5 A relay when the input exceeds the desired level. Normal operation has the relay energized for the non-alarm condition and de-energized for an alarm condition. This provides a fail-safe alarm condition for loss of power to the module. The alarm has a set of red/green LEDs to indicate alarm status.

A deadband adjustment allows a deadband of 0.5% to 100% of span to be set into the module. The deadband is symmetrical about the setpoint.

With the latching option, the alarm has no deadband control. Once the limit has been reached, the alarm latches and power must be momentarily interrupted to reset the alarm.

The module includes filtering and conditioning to reduce susceptibility to transients and noisy operations.

MODEL NUMBERS

These instructions cover the following setpoint styles:

- MM1400** RTD Input Single Alarm
(25-turn screwdriver adj)
- MM1401** RTD Input Single Alarm
(1-turn dial)
- MM1404** RTD Input Single Alarm
(10-turn precision dial)

OPTIONS

These instructions cover the following options on the MM1400. Options installed are listed on the label attached to the side of the module.

- H** High Alarm:
Alarm occurs on an increasing signal.
- L** Low Alarm:
Alarm occurs on a decreasing signal.
- R** Reverse Sense:
Normal condition for the relay is de-energized. It energizes for alarm conditions.
- U** All circuit boards are conformal coated for protection against moisture.

CONTROLS

The MM1400, MM1401 and MM1404 modules contain setpoint, deadband, zero and span adjustments. The setpoint control in the MM1400 is a 25-turn blind trimpot. MM1401 and MM1404 contain 1-turn and 10-turn calibrated dials, respectively.

CALIBRATION

Modules are shipped with ZERO and SPAN precalibrated. The user needs only adjust the SETPOINT and DEADBAND for the desired response.

Refer to the instrument's label to determine your instrument's supply voltage and input range. Refer to the "Block Diagram and Pin Connections" for connections.

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."

To calibrate the alarm setpoint, set the input to the desired setpoint and turn the DEADBAND control fully ccw. Adjust the SETPOINT control until the LED switches to red (ccw for a high alarm, cw for low).

Adjust the DEADBAND control for the desired amount of deadband. Vary the input up and down to check the level at which the alarm trips and resets. The setpoint will remain centered in the middle of the deadband.

If there is a need to recalibrate ZERO and SPAN, proceed as follows:

Set the input to the low end of the input range. Turn the SETPOINT and DEADBAND controls fully ccw. Adjust the ZERO control until the LED color switches.

Change the input to the high end of the input range. Turn the SETPOINT control fully cw. Adjust the SPAN control until the LED color switches. Repeat until the ZERO and SPAN settings are both correct.

After calibration, the SETPOINT and DEADBAND controls should be reset as described above.

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, $PEAK = 1.414 \times RMS$ voltage. For 115V AC power a 200 volt peak rating is recommended.

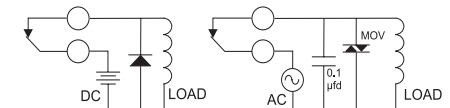


Figure 1
Surge Suppression
Inductive DC Load

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

0 to 100% of span

DEADBAND

0.5% to 100% of span

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 (dpdt)

Resistive Load:

5 A max, 150 W max, 220 VAC max,
30 VDC max

Inductive Load:

(Power Factor ³ 0.4)
2.5 A max, 75 W max,
220 VAC max, 30 VDC max

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%, 50/60 Hz (2.5 W max)
230 VAC ±10%, 50/60 Hz (2.5 W max)

(DC Power Option)

12 or 24 VDC (2.5 W max)

WARRANTY

The Mighty Module Series of products carry a limited warranty of 10 + 5 years. In the event of a failure due to defective material or workmanship, during the 10 year period, the unit will be repaired or replaced at no charge. For a period of 5 years after the initial 10 year warranty, the unit will be repaired, if possible, for a cost of 10% of the original purchase price.

Relays are not covered by the warranty.

MOUNTING

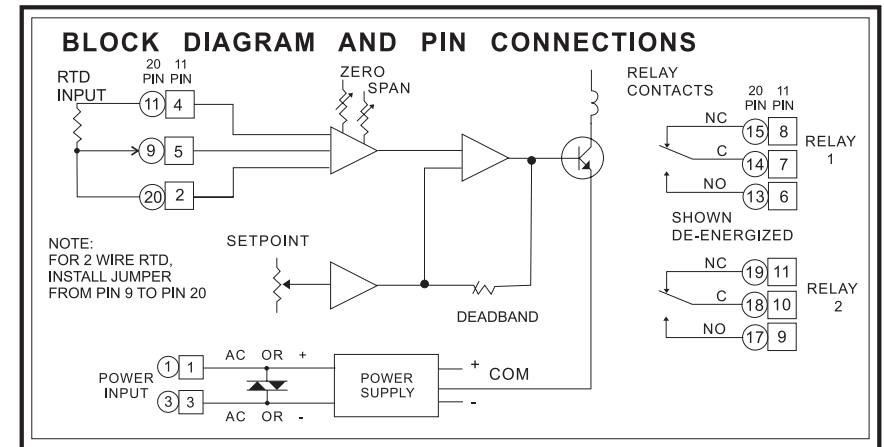
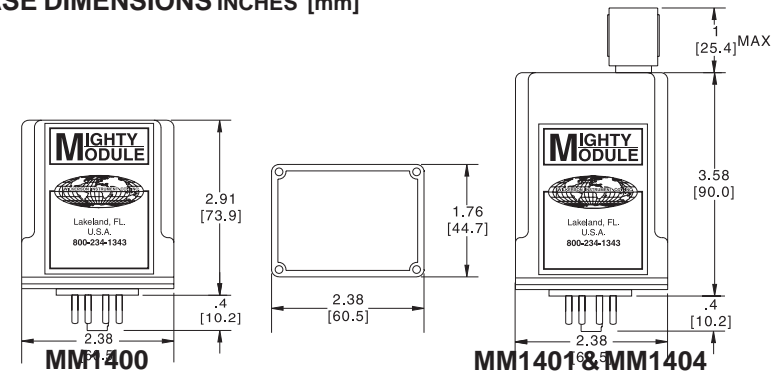
The modules are designed to plug into a standard 20-pin relay socket (MP020). Option E uses an 11-pin socket (MP011). The sockets are molded plastic suitable for mounting on a flat surface. The (MP011) will mount in a 2 3/4 inch wide PVC snap track (TRK48).

A spring hold-down clip is available for installation where vibration may be a problem. Use (CLP1) with MM1400 and (CLP2) with MM1401 and MM1404.

A Killark HK Series explosion-proof housing with dome and 11-pin socket is available (HKB-HK2D-11).

An 11-pin DIN rail mounted socket (DMP011) is available for 35mm symmetrical rail.

CASE DIMENSIONS INCHES [mm]



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