MM1700, MM1701 and MM1704
FREQUENCY INPUT SINGLE ALARMS

DESCRIPTION

The MM1700 monitors a frequency input signal and trips 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 to the module must be momentarily interrupted to reset the alarm.

The wide range of input sensitivity allows the MM1700 Series alarms to be driven from low level magnetic pickups as well as logic level signals. A threshold adjustment sets the minimum input amplitude the module will process. This allows the user to trade off sensitivity versus noise rejection. An optional pullup resistor (Option P) permits use with contact-closure or open-collector inputs.

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

MODEL NUMBERS

These instructions cover the following setpoint styles:

MM1700 Frequency Input Single Alarm (25 turn screwdriver adjust)

MM1701 Frequency Input Single Alarm (Single turn dial)

MM1704 Frequency Input Single Alarm (Ten turn precision dial)

OPTIONS

These instructions cover the following options on the MM1700 Series. Options installed are listed on the label attached to the side of the module.

H/L H = High alarm: Alarm occurs on an increasing signal

L = Low alarm: Alarm occurs on a decreasing signal

R The Normal condition for the relay is energized. It de-energizes for an alarm condition (Failsafe). Option R (Reverse Sense) reverses this logic.

P 10 kilohm pullup resistor for use with open-collector or contact-closure inputs.

U All circuit boards conformal coated for protection against moisture.

CONTROLS

The MM1700, MM1701 and MM1704 modules contain setpoint, deadband, zero, span and threshold adjustments. The setpoint control in the MM1700 is a 25-turn blind trimpot. MM1701 and MM1704 contain 1-turn and 10-turn calibrated dials, respectively.

CALIBRATION

Modules are shipped with ZERO and SPAN precalibrated. The THRESHOLD adjustment also has been set per requirements stated on the initial order. The user needs only adjust the SETPOINT for the desired response.

Connect the input to a precision frequency source covering the desired input range. 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.

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 remainapproximately centered in the middle of the deadband.

The THRESHOLD adjustment allows the module to be made insensitive to line frequency pickup or other noise signals whose levels are below the threshold setting. Turning this control fully clockwise reduces the threshold to zero and makes the input most sensitive. To adjust, set the input at about 25% of its normal amplitude. Set the input frequency to a value slightly above the trip point. This will cause a high alarm to trip, or a low alarm to reset.

Start with the THRESHOLD adjustment fully counterclockwise (minimum sensitivity). Turn the THRESHOLD adjustment cw until the alarm changes state. A HIGH alarm will trip; a LOW alarm will reset.

It is not necessary to recalibrate the setpoint after changing the threshold setting.

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 changes.

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 changes.

Repeat the ZERO and SPAN adjustments until both are 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 lease 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 115 VAC power, a 200 volt peak rating is recommended.

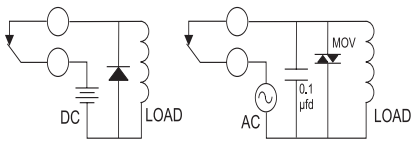


Figure 1
Surge Supression
Inductive DC Load

Figure 2
Surge Supression
Inductive AC Load

SPECIFICATIONS

Input Range
select any range from 0 to 10 Hz min to 0 to 60 kHz min

Input Sensitivity
any voltage from 50 mV to 100 V peak

Input Impedance
100 kilohms

Option P
Pullup resistor to + input 10 kilohms
Open circuit voltage +12 VDC

Setpoint
0 to 100% of span

Deadband
0.5% to 100% of span

Accuracy
±0.1% of span

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 => 0.4)
2.5 A max, 75 W max,
220 VAC max, 30 VDC max

Transistor Output
(Option V)
Relay drive (12 V coil, ±220 ohms) or open collector outputs sink 100 mA, 30 V supply max

Operating Temperature
14°F to 140°F / -10°C to 60°C

Temperature Stability
±0.2% of span/°C max

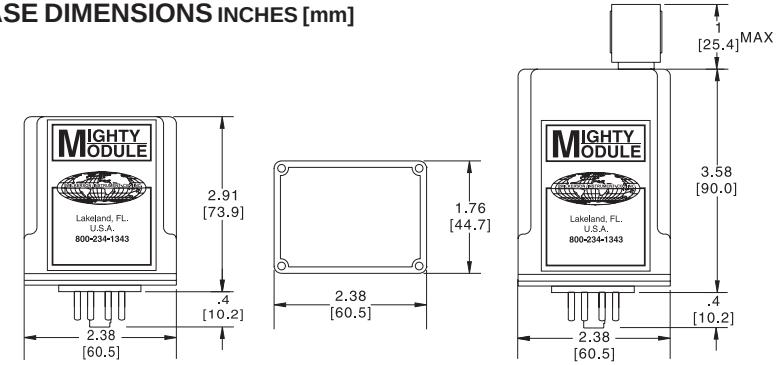
Power
115 VAC ±10%, 50/60 Hz (2.5 W max)
230 VAC ±10%, 50/60 Hz (2.5 W max)
(DC Power Option) (2.5 W max)
12 VDC (limits 10 VDC to 15 VDC)
24 VDC (limits 21 VDC to 32 VDC)
Isolation, DC power supply to input common: 10 megohms

MOUNTING

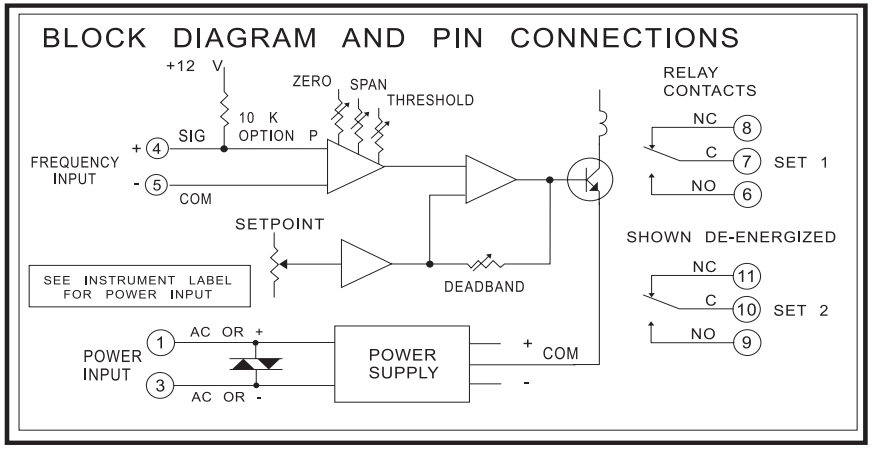
MM1700, MM1701 and MM1704 are designed to plug into a standard 11-pin relay socket. (MP011) is a molded plastic socket suitable for mounting on a flat surface or 2 3/4 inch wide PVC snap track (TRK48). Use (CLP1) hold-down clip if needed.

A Killark HK Series explosion-proof housing with dome and 11-pin socket is available (HKB-HK2D-11). A DIN rail mounted socket (DMP011) is available for 35mm symmetrical rail.

CASE DIMENSIONS INCHES [mm]



MM1700 MM1701 & MM1704



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