MM1720
FREQUENCY INPUT
DUAL ALARM

DESCRIPTION

The MM1720 monitors a frequency input signal and provides two sets of spdt, 5 A alarm relays with two independently adjustable setpoints. Each setpoint has a set of red/green LEDs to indicate alarm status. When the input is between the setpoints, the relays are normally de-energized. When the signal exceeds a particular setpoint, the relays become energized. To provide a fail-safe operation (loss of power resulting in an alarm state), select Option R. The module can be supplied as a HI/HI, HI/LO, or LO/LO alarm (HI/LO supplied if not specified).

Standard deadband on both alarms is fixed at 0.5% of span (Option A provides adjustable deadband of 0.5% to 100% of 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 wide range of input sensitivity allows the MM1720 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.

OPTIONS

These instructions cover the following options on the MM1720. Options installed are listed on the label attached to the side of the module.

H/H, H/L, L/L

H = High alarm.
Alarm occurs on an increasing signal.

L = Low alarm.
Alarm occurs on a decreasing signal.

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.

P Pullup resistor: 10 kilohm resistor, +12 VDC open-circuit voltage.

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 MM1720 contains two setpoint controls, plus zero and span adjustments. The setpoint controls are 25-turn blind trimpots.

CALIBRATION

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

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

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 pin connections.

Connect a calibrated frequency source to the input of the instrument. (Option P, if noted on label, indicates a pullup resistor has been added for use with switch-closure or open-collector input - see "Block Diagram and Pin Connections".)

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 half-scale frequency and at about 25% of its normal amplitude. Turn the threshold control fully clockwise. If SETPOINT 1 is a high alarm, turn the SETPOINT 1 control counterclockwise until its LED switches to red. If SETPOINT 1 is a low alarm, turn the SETPOINT 1 control counterclockwise until its LED switches to green. Now, turn the THRESHOLD adjustment until the LED color switches, and leave it there.

(If the LED color does not switch, your signal is higher than the module's maximum threshold. Leave the THRESHOLD adjustment fully ccw.)

To calibrate the alarm setpoints, adjust the input frequency 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 frequency to the desired alarm 2 setpoint and similarly adjust the SETPOINT 2 control.

Adjust the optional DEADBAND controls for the desired amount of deadband. Vary the input frequency up and down to check the levels at which the relay trips and resets. The setpoint will remain 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 input frequency to the low end of the input range (usually zero). Turn the SETPOINT 1 control fully ccw. Adjust the ZERO control until the SETPOINT 1 LED just changes color.

Change the frequency 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 are both correct.

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

ALARM TYPE	HI/LO	HI/HI	LO/LO
SETPOINT1	HI	HI	LO
SETPOINT2	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 115 VAC power a 200 volt peak rating is recommended.

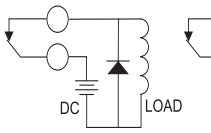


Figure 1
Surge Supression
Inductive DC Load

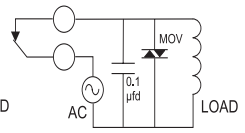


Figure 2
Surge Supression
Inductive AC Load

SPECIFICATIONS

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

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
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.

Accuracy
±0.1% of span

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

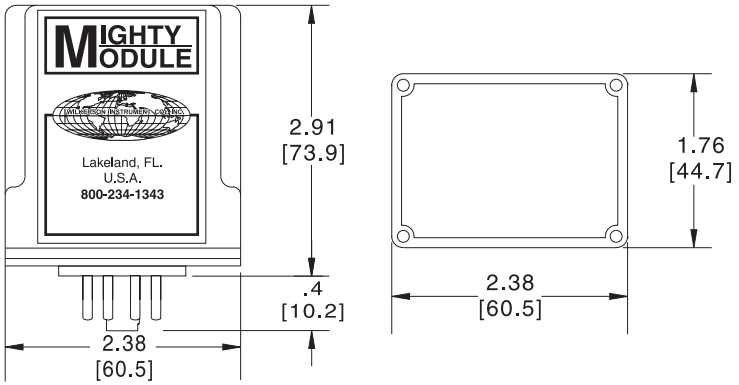
Transistor Output (Option V)
relay driver (12 V coil ±220 ohms)
or open-collector outputs sink 100 mA,
30 V supply max

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

Temperature Stability
±0.02% 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)
24 VDC (limits 21 VDC to 32 VDC)
(2.5 W max)
Isolation, DC power supply to input common: 10 megohms

CASE DIMENSIONS INCHES [mm]



MOUNTING

The module is designed to plug into a standard 11-pin relay socket. (MP011) is a molded plastic socket suitable for mounting on a flat surface or snap into a 2 3/4 inch wide PVC track (TRK48). A spring hold-down clip (CLP1) is available for installation where vibration may be a problem. A DIN rail mounted socket (DMP011) is available for 35mm symmetrical DIN rail.

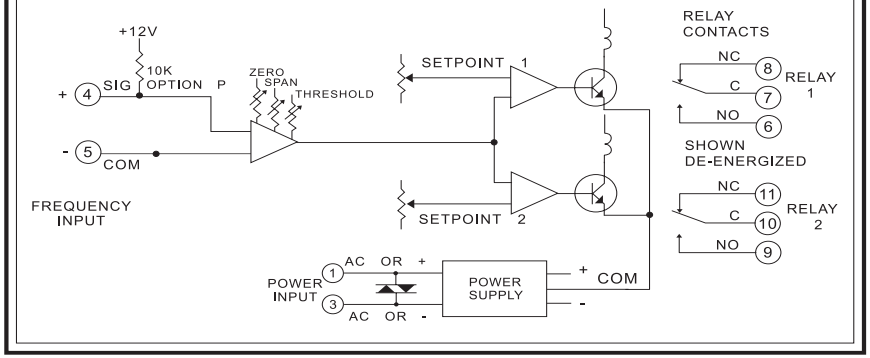
A Killark HK Series explosion-proof housing with dome and 11-pin socket is available (HKB-HK2D-11).

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.

BLOCK DIAGRAM AND PIN CONNECTIONS



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