MM3200
DC INPUT
VALVE/ACTUATOR
CONTROLLER

The MM3200 controller compares a DC input signal to a DC signal from the slide position of a potentiometer in a valve or linear actuator. The module has two spst relays to provide bi-directional (open-close) ON/OFF switches. When the input signals are unequal, the MM3200 provides a contact closure to turn on a motor which drives the valve open or closed. When the signals become equal, the contact opens and the motor stops. The deadband control adjusts the sensitivity of the module and determines the amount of error required before the relay closes. Adjustment of 0.25% to 50% of span is available.

Two relays are used for the open and close switches. Each relay has dpdt contacts. One set is used for motor control. The other set is used to control the supply voltage to the other relay coil. This relay safety interlock feature makes it impossible to have both relays closed (both motors on) at the same time.

The module can also be used with a manual potentiometer and the contact closures to drive a process until the DC input signal matches the potentiometer setting.

The module includes filtering and conditioning to reduce susceptibility to transients and noisy operations. They also utilize a stable -1.23 V power supply to excite the potentiometer.

OPTIONS

Option U provides conformal coating on the circuit boards for protection against moisture.

CONTROLS

The ZERO, SPAN and DEADBAND controls are accessible from the top of the module.

CALIBRATION

Generally, valve controllers are calibrated in a system for proper valve operation. If you are calibrating on a test bench, 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 pin connections.

Set the input signal at approximately mid range and adjust the DEADBAND control for the desired sensitivity. Too high sensitivity (low deadband) will cause the valve to oscillate or "hunt," while too low sensitivity (high deadband) will cause the valve position to lag behind the valve controller's DC input.

Turning the DEADBAND fully clockwise produces maximum sensitivity (minimum deadband). Turn the control to the point where oscillation just ceases, then turn it aout 1/2 turn counterclockwise.

Set the input at its low end value and adjust the ZERO control for proper valve position. Increase the input to full scale and adjust the SPAN control for proper valve position. Repeat until both settings are correct.

If valve oscillation occurs in use, turn the DEADBAND control counterclockwise until it stops. It will not be necessary to recalibrate zero and span.

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.

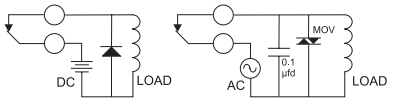
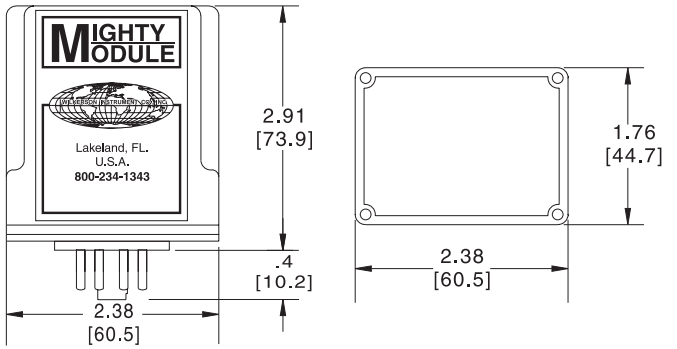


Figure 1
Surge Supression
Inductive DC Load

Figure 2
Surge Supression
Inductive AC Load

CASE DIMENSION INCHES [mm]



SPECIFICATIONS

INPUT RANGE

Voltage
Select any range from
0 to 1 VDC to 0 to 10 VDC max

Current
4/20 mA (others available)

INPUT IMPEDANCE

Voltage
100 kilohms

Current
62 ohms

POTENTIOMETER FEEDBACK
70% or greater rotation
required to match full scale input

POTENTIOMETER RESISTANCE
Select any value from 120 ohms
to 100 kilohms

EXCITATION
-1.23 V, 10 mA max load

DEADBAND
0.25% to 50% of span

RESPONSE TIME
120 ms typical

ACCURACY
±0.1% of span

COMMON MODE REJECTION
120 dB, DC to 60 Hz

RELAY CONTACT
(2 each spst)

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

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)

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 s where vibration may be a problem.

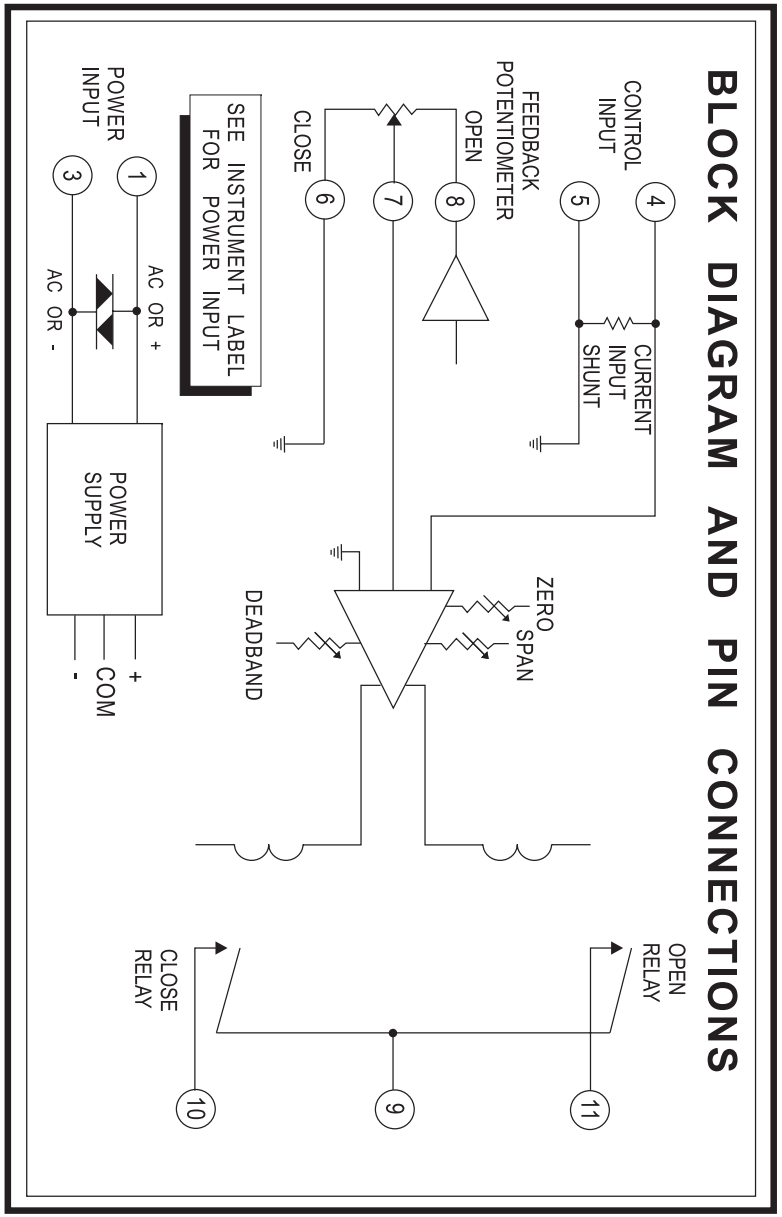
A DIN rail mounted socket (DMP011) is available for 35mm symmetrical rail.

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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WILKERSON INSTRUMENT CO., INC.
www.wici.com
2915 Parkway Street
Lakeland, FL 33811-1391 · USA
800-234-1343
Tel: 863-647-2000 · Fax: 863-644-5318
www.wici.com · E-mail: sales@wici.com