PEAKTRONICS

AMC-102

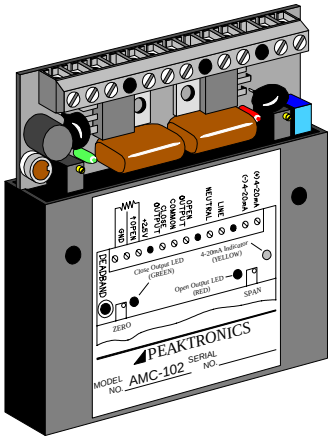
AC Motor Controller, 2A

The Peaktronics AMC-102 AC Motor Controller is a compact module that is intended for controlling small AC actuator motors of up to 2A. The AMC-102 is very well suited for applications where space constraints within the actuator would not allow the mounting of conventional motor controllers.

The AMC-102 is used for proportional positioning of the actuator. An external 4-20mA command signal is compared to a feedback signal from a potentiometer. This in turn will energize one of the AC outputs (*open* or *close*) to power the actuator until the feedback signal matches the command signal, at which time the controller's AC output is turned off and the actuator motor stops. When the command signal is lost or disconnected, the *close* output will turn on.

Non-interactive Zero and Span adjustments allow easy field calibration, and the Deadband adjustment allows control of faster actuators. The unit includes a yellow LED indicator (showing the presence of the 4-20mA command signal), a red LED indicator (for the *open* output), a green LED (for the *close* output), and an on-board fuse.

The unit is available in versions for various power sources: AMC-102 (117VAC), AMC-102A (234VAC), and AMC-102B (24VAC). Its solid construction body makes it rugged and easy to mount (two #6 through holes are provided). Screw terminals and a wiring diagram on the unit allow for easy field installation.



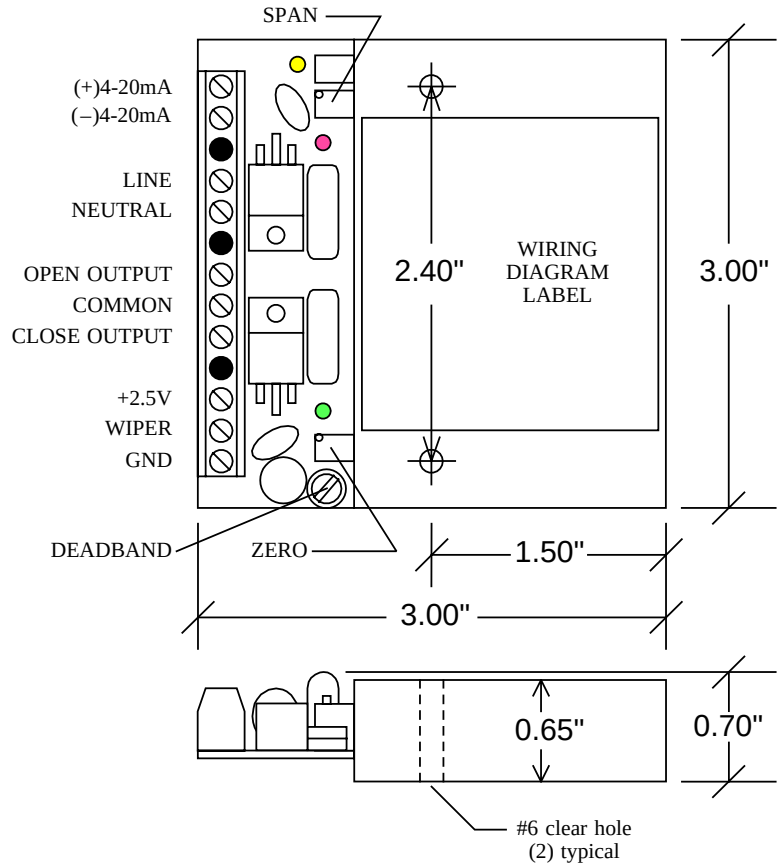
AMC-102
AMC-102A
AMC-102B

ADDITIONAL FEATURES

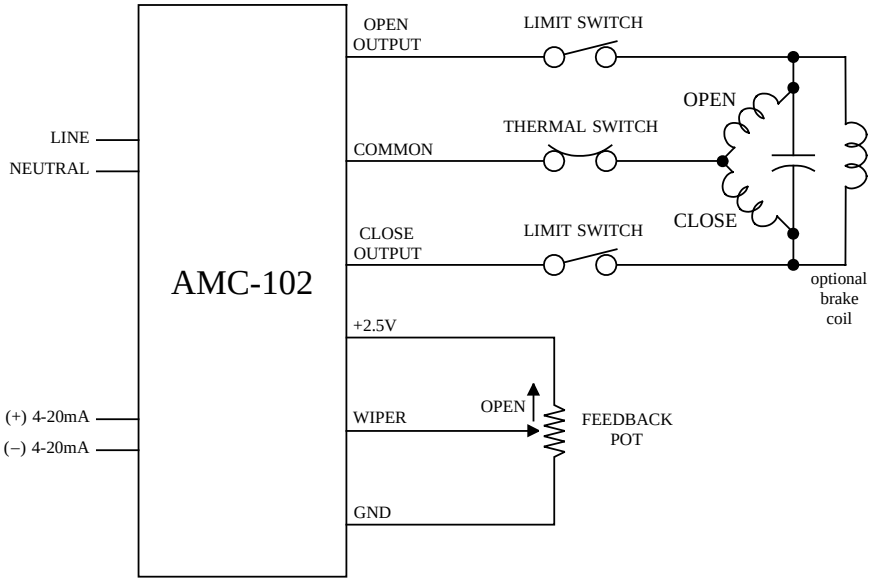
- Capable of using the full range of the feedback potentiometer.
- 4-20mA input has built-in current limiting and reverse polarity protection.
- Optical isolation between the input signal and the AC outputs
- No external motor resistors are required.
- Miniature size fits in the smallest actuators.
- Operating temperature range of 0 to 70 °C

AMC-102 117VAC AMC-102A 234VAC AMC-102B 24VAC

OUTLINE



BLOCK DIAGRAM



DESCRIPTION

The AMC-102 comes in three versions to accommodate different voltage applications. The AMC-102 is rated for 117 VAC ±10%; the AMC-102A is rated for 234 VAC ±10%, and the AMC-102B is rated for 24 VAC ±10%. The unit is equipped with screw terminals, allowing for easy field wiring. The unit also has a label that provides convenient information for wiring and locating the adjustments. Two mounting holes are provided that allow easy mounting with standard #6 screws. See Outline information for more details.

CAUTION ! These units are intended to be mounted in an appropriate enclosure to avoid electrical shocks. High voltages are present on the outside of the unit when power is applied. AC power should be disconnected prior to any wiring of these units. A heater and thermostat should be used where condensation may occur. **Note, the GND terminal used for one end of the feedback potentiometer (see Outline) is internally connected to the NEUTRAL side of the AC input power - do not connect to the feedback potentiometer without an isolated instrument.**

POWER

AC power (117VAC, 234VAC, or 24VAC as appropriate) should be connected to the two terminals identified as LINE and NEUTRAL. Be certain that these two terminals are connected as marked (that is, the neutral side of the line should have zero potential to earth ground). Since the GND terminal of the feedback potentiometer is internally connected to NEUTRAL, **a shock hazard will exist if the hot side of the AC line is mistakenly connected to NEUTRAL**.

MOTOR and FEEDBACK POT

The actuator motor and feedback potentiometer are connected as shown in the block diagram. The OPEN terminal should be connected to the motor winding that moves the actuator toward the *open* position, and conversely, the CLOSED terminal is connected to the winding that moves the actuator toward the *closed* position. The COMMON terminal is the neutral or common wire to the motor windings. The AMC-102 is suitable for powering most dynamic brakes used with electric actuators; however, consult the actuator manufacturer for more information.

The feedback potentiometer wiper must be connected to the WIPER terminal. One end of the potentiometer is connected to the +2.5V terminal, and the other is connected to the GND terminal. The potentiometer should be connected so that when the actuator moves towards the *open* position, the potentiometer's resistance between the WIPER and GND terminals will increase. This can also be measured as a voltage - the voltage between the WIPER and GND terminals should increase when the actuator moves towards the *open* position. If the potentiometer is wired incorrectly, the typical response of the unit will be to run the actuator to the full open or closed position (the appropriate output indicator will remain on) regardless of the command signal input.

The feedback potentiometer should be mounted to provide a proper feedback signal through the entire range between the *open* and *closed* positions. For best results, position the actuator to the midway point between the *open* and *closed* positions; then adjust the feedback potentiometer for approximately 1.25 VDC (or 1/2 of the potentiometer's resistance) between the WIPER and GND terminals.

Since the feedback potentiometer is crucial for proper operation of the AMC-102, the following items should be carefully observed:

1 - Potentiometer resistance should be a value from 1K to 10K ohms.

2 - The potentiometer should be a linear taper type.

3 - The potentiometer must be properly wired to provide the correct feedback signal.

4 - The potentiometer must be properly and securely mounted in order to provide a reliable feedback signal.

COMMAND INPUT and INDICATOR

The AMC-102 is designed to be controlled with a standard 4-20mA signal. The input is optically isolated from the AC power line and includes built-in current limiting and protection against reverse polarity. The input can be connected in series with any part of the current loop (sinking or sourcing outputs).

The unit is equipped with a yellow indicator that will turn on whenever the 4-20mA signal is connected. If the input signal is lost, the indicator will turn off, and the *close* output will turn on (moving the motor to the full closed position).

OUTPUT INDICATORS

The AMC-102 has on-board indicators that identify when one of the motor outputs is turned on. When the open output is turned on, the red LED indicator will turn on, and when the close output is turned on the green LED indicator will turn on.

Many actuators are equipped with limit switches at the *open* and *closed* positions which are intended to disconnect power to the motor to prevent mechanical damage. For this reason, it is possible that the AMC-102 will indicate that one of the motor outputs is turned on when the actuator is not in motion. However, it should be noted that when the indicator is on, power is applied to the motor output.

CALIBRATION

The non-interactive zero and span adjustments of the AMC-102 allows for easy calibration once the unit is installed. After insuring that the feedback potentiometer and motor outputs are wired to provide a proper feedback signal, as described under "MOTOR and FEEDBACK POT", follow these steps to calibrate the unit (see Outline for the location of the adjustments):

1 - Apply AC power to the unit, and set the command input signal to 4 mA.

2 - Adjust the "Zero" adjustment so that the actuator moves to the desired *closed* position. If the desired position cannot be achieved, check that the feedback potentiometer provides a feedback signal as described under "MOTOR and FEEDBACK POT"; also, check the position of the limit switches.

3 - If the actuator is hunting for position, turn the "Deadband" adjustment clockwise until hunting stops. If the actuator is not hunting for position, turn the "Deadband" adjustment counterclockwise until the actuator begins to hunt; then turn the "Deadband" adjustment slightly clockwise until hunting stops.

WARNING! Actuator failure may occur if the "Deadband" adjustment is set to allow continuous hunting. This can cause excessive wear of motor bearings, gear train, dynamic brake, and feedback potentiometer. Hunting can also cause the internal temperature of the actuator housing to rise to a level that exceeds the maximum rating of the AMC-102, 70°C.

4 - Set the command signal input to 20 mA.

5 - Adjust the "Span" adjustment so that the actuator moves to the desired *open* position. If the desired position cannot be achieved, check the position of the limit switch.

NOTE: The "Zero" adjustment is an offset setting rather than an absolute setting. Should the "Zero" adjustment be changed, the "Span" adjustment should be checked for the desired *open* position. Setting of the "Span" adjustment has no affect on the "Zero" adjustment.

6 - To check proper operation and linearity, set the command signal to 12 mA, and verify that the actuator's position is midway between the *open* and *closed* positions.

REVERSE ACTING CALIBRATION

When converting a direct acting actuator to a reverse acting actuator, two changes in wiring must be made:

1 - Reverse the feedback potentiometer wires connected to +2.5V and GND.

2 - Reverse the motor wires connected to OPEN OUTPUT and CLOSE OUTPUT.

NOTE: **DO NOT** reverse the input signal polarity. Also, make sure that both wiring changes are made - if only one is made, the actuator will run to either full open or full closed.

After the wiring changes have been made, refer to **CALIBRATION** for setting the zero and span adjustments.