MODEL AR24F ELECTRIC ROTARY ACTUATOR

Specifications - Installation and Operating Instructions

The Model AR24F Electric Actuator provides reliable operation for applications such as dampers, shutters, and valves in ventilation and air conditioning systems when power is temporarily interrupted. This low cost unit is designed to return to its normal position upon temporary loss of power by use of an internal capacitor which when charged is capable of operating the actuator. The unique manual override switch feature allows positioning of the actuator without power. Unit mounts directly to a 1/2" diameter shaft eliminating the need for expensive and complicated linkage. For remote indication of damper position or for master-slave actuator applications, an output voltage signal is provided which matches the input voltage.

Specify A-614 for an optional auxiliary limit switch. This low cost, field adjustable cam switch allows for a trip point anywhere within the angular rotation of the actuator.

PHYSICAL DATA
ELECTRIC ACTUATOR
Power Supply: 21 to 28 VAC, 50/60 Hz, 22 to 35 VDC
Maximum Power: 6 VA operating; 19 VA peak inrush, initial charge
Control Input Voltage: 0 to 10 VDC (adjustable); factory set 2 to 10 VDC
Auxiliary Output Voltage: 18 VDC @ 10 mA
Feedback: 0 to 10 VDC (matches adjustable control input voltage)
Torque: 50 inch lbs. max.
Motor Timing: 45 to 60 seconds for 95° rotation; 2½ minute charge time required for fail-safe operation
Angular Rotation: 0 to 95°, both end stops adjustable
Connections: Wire clamp type;
14 to 22 AWG
Temperature: 0°F(-18°C) to 120°F (49°C)
Weight: 2.5 lbs. (1.1 kg.)

ROTARY CAM SWITCH
Switch Action: SPDT
Switch Rating: 15A; 1/2 hp @ 125/250 VAC
1/2A @ 125 VDC; 1/4A @ 250 VDC
Materials: Polycarbonate
Adjustability: 120° Rise per cam
ELECTRIC ACTUATOR INSTRUCTIONS

INSTALLATION

Slide drive collar over shaft. Position actuator in desired position for mounting.
Position valve to fail-safe position. Determine if rotation must be CW or CCW to fail-safe. If rotation is CW to fail-safe, depress gear disengagement button and position the drive collar with indicator at "0". Tighten the two allen screws.
If rotation is CCW to fail-safe, depress the gear disengagement button. Then position drive collar with indicator at "90°" mark and tighten the allen screws. If angular rotation other than 90° (factory setting) is desired, loosen adjustable stop screws 1/2 turn, depress gear disengagement push button and slide stroke travel stops to desired start and stop stroke positions. Retighten the end stop screws (9 in-lb max.).

CALIBRATION

Before proceeding with calibration, "Fail-safe" direction must be selected. Per the following, this will determine the actuator drive direction with an increasing input signal, and which set point pot is used for start and stop voltages.
Move "TB3" and "TB4" jumpers to correspond to the drive direction when input signal is increasing (opposite from desired fail-safe direction).
Pots P2 and P3 must be calibrated to yield the desired input operating range. The input signal range calibrated on P2 and P3 applies to the entire operating range.

A) 90° Rotation Valve:
P2 and P3 Calibration: (Using pot calibration terminals)
1) If "CW" to fail, first set "Low" end of input range on P2. Then set "High" end of input range on P3.
2) If "CCW" to fail, first set "Low" end of input range on P3. Then set "High" end of input range on P2.

B) Less Than 90° Rotation Valve:
The actual calibration point for the end of the operating range must be determined using the following formula:

\[
\frac{(\text{Span in VDC}) \times (90°)}{\text{Desired Degrees of Rotation}} + \text{Start Point VDC} = \text{"End Point" VDC}
\]

Example: Assume you have a 45° VAV box that you want to drive from 2VDC to 10VDC:

\[
\left(\frac{(8)(90°)}{45°}\right) + 2 = 18 \text{VDC} \text{ "End Point"}
\]

P2 and P3 Calibration: (Using pot calibration terminals)
1) If "CW" to Fail; first set "Low" end of input range on P2; then set "end point" on P3. In example, this would be 2VDC on P2; 18VDC on P3.
2) If "CCW" to Fail; first set "Low" end of input range on P3; then set "END POINT" on P2. In example, this would be 2VDC on P3; 18VDC on P2.

The "Example" unit would be calibrated to drive over a 45° range as the input signal goes from 2 to 10VDC.

Note "A": Move jumper to "delay" position if desired. In "delay," fail-safe circuit will fully charge before actuator operation resumes following a power loss. (See "Detail" above.)

DETAIL VIEW

Dwyer INSTRUMENTS, INC.
PO. Box 373, Michigan City, Indiana 46361, U.S.A.
Phone: 219/879-6000 Fax: 219/872-9057