

## **D(M)-35 Series —35 lb-in (4 Nm) Electric Actuator**

### **IOM Manual**



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Technical Specifications - D(M)24-35 Series Actuator					
Type	Actuator Models	D24-35-TP	D24-35-T-TS	DM24-35	DM24-35-TS
		Non-Spring Return - Floating & On/Off (relay required)		Non-Spring Return - Modulating	
Electrical	Torque	35 lb-in. (4 Nm)			
	Operating Voltage	24 VAC +25%/-20% at 50/60 Hz			
	Power Consumption	2.1 VA		2.9 VA	
	Input Signal	24 VAC +25%/-20% at 50/60 Hz		0(2) to 10 VDC or 0(4) to 20 mA with field-furnished 500 ohm resistor	
	Input Impedance	N/A		200k Ohms	
	Equipment Rating	Class 2 or Safety Extra-Low Voltage (SELV)			
	Feedback Signal	N/A		0 to 10 VDC or 2 to 10 VDC for 90° (10 VDC at 1 mA), Corresponds to input signal span selection	
Operation	Electrical Connection	36 in. (0.9 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm2) conductors and 1/4 in. (6 mm) ferrule ends	Exposed Terminal Block - M3 Terminal Screws	36 in. (0.9 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm2) conductors and 1/4 in. (6 mm) ferrule ends	Exposed Terminal Block - M3 Terminal Screws
	Manual Override	External Push Button			
	Runtime for 90° of Rotation	60 Seconds at 60 Hz / 72 Seconds at 50 Hz for 90° rotation			
	Rotation Range	93° ±3°, CW or CCW			
	Cycle Life	100,000 Full Stroke Cycles; 2,500,000 repositions at rated running torque			
Environmental	Mechanical Connections	Round Shafts - Up to 1/2 in. (13 mm) Square Shafts - Up to 3/8 in. (10 mm)			
	Enclosure	NEMA 2 (IP42)	NEMA 2 (IP40)	NEMA 2 (IP42)	NEMA 2 (IP40)
	Ambient Conditions (Non-Condensing)	Operating — -4 to 140°F (-20 to 60°C); 90% RH Max. Storage — -20 to 150°F (-29 to 66°C); 90% RH Max.			
	Audible Noise Rating	35 dBA Nominal at 39-13/32 in. (1 meter)			
	Dimensions	5.16 x 2.81 x 2.06 in. (131 x 71 x 52 mm)			
Conditions	Weight	1.0 lb (0.5 kg)			
	Agency Certifications	United States/Canada - United States UL Listed, File E27734, CCN XAPX (United States) and XAPX7 (Canada) Actuator Housing is Plenum Rated per CSA C22.2 No. 236/UL 1995, Heating and Cooling Equipment			
		Europe - CE Mark - Product is in compliance with the essential requirements and other relevant provisions of the EMC Directive 2004/108/EC and the Low Voltage Directive 2006/95/EC			
		Australia/New Zealand - C-Tick Mark Australia/NZ Emissions Compliant			
Warranty	5 Years limited from time of shipment.				

Warning - These actuators are designed for use only in conjunction with operating controls. Where an operating control failure would result in personal injury and/or loss of property, it is the responsibility of the installer to add safety devices or alarm systems that protect against, and/or warn of, control failure.

To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

Disclaimer - The performance specifications are nominal and conform to acceptable industry standards. For application at conditions beyond these specifications, consult the nearest Bray office. Bray controls shall not be liable for damages resulting from misapplication or misuse of its products.

## Applications

The D(M)24-35 Series Actuators are Non-Spring Return Electric Actuators that operate on AC 24 V power and use M3 screw terminals for field wiring. Employing a synchronous motor, these actuators provide floating control (-T), and modulating control with selectable 0-10 or 2-10 VDC (M).

All models are compact in size, and are easily installed on Variable Air Volume (VAV) boxes, Variable Air Volume and Temperature (VVT) two-position zone applications, or small to medium-sized dampers with a round shaft up to 1/2 in. (13 mm) in diameter, or a 3/8 in. (10 mm) square shaft.

The D(M)24-35 Series Electric Non-Spring Return Actuators provide a running torque of 35 lb·in (4 N·m), and the nominal travel time is 60 seconds at 60 Hz (72 seconds at 50 Hz) for 90° of rotation.

## Installation

For damper applications the D(M)24-35 Series Electric Non-Spring Return Actuators mount directly to the surface in any convenient orientation using a single No. 10 self-drilling sheet metal screw. No additional linkages or couplers are required. Electrical connections on the actuator are clearly labeled to simplify installation.

## Parts Included

- One electric non-spring return actuator with 36 in. (0.9 m) UL 444 Type CMP Plenum Rated cable with 19 AWG (0.75 mm<sup>2</sup>) conductors and 1/4 in. (6 mm) ferrule ends

or

- (TS) model one electric non-spring return actuator Exposed Terminal Block - M3 Terminal Screws

## Special Tools Needed

- 5/16 in. (8 mm) square socket
- #2 Phillips screwdriver
- 3/8 in. (10 mm) 12-point socket
- Drill with a 5/16 in. (8 mm) hex nut driver
- Digital voltmeter or Commissioning Tool

## IMPORTANT:

Use this D(M)24-35 Series Electric Non-Spring Return Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the actuator could lead to personal injury or property damage to the controlled equipment or other property, additional precautions must be designed into the control system. Incorporate and maintain other devices, such as supervisory or alarm systems or safety or limit controls, intended to warn of or protect against failure or malfunction of the actuator.

## IMPORTANT:

Before specifying D(M)24-35 Series Electric Non-Spring Return Actuators for plenum applications, verify acceptance of exposed plastic materials in plenum areas with the local building authority. Building codes for plenum requirements vary by location. Some local building authorities accept compliance to UL 1995, Heating and Cooling Equipment, while others use different acceptance criteria.

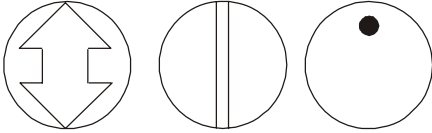
## IMPORTANT:

Do not install or use this D(M)24-35 Series Electric Non-Spring Return Actuator in or near environments where corrosive substances or vapors could be present. Exposure of the electric actuator to corrosive environments may damage the internal components of the device, and will void the warranty.

## Mounting

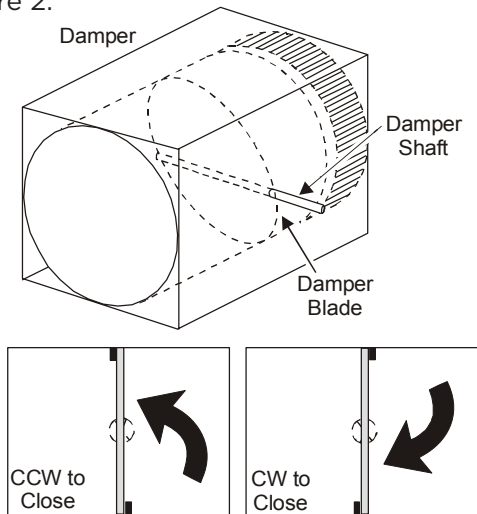
To mount the actuator to a damper:

1. Check that the damper blade is visible, or its position is permanently marked on the end of the damper shaft, as illustrated in Figure 1.



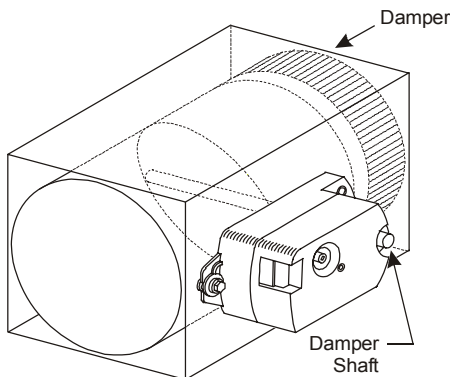
**Figure 1: Damper Position Icons**

2. Grasp the damper shaft firmly with pliers and rotate the damper fully closed, as illustrated in Figure 2.



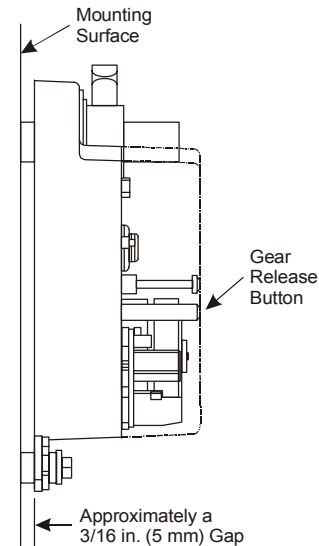
**Figure 2: Damper Rotation**

3. Make a note of the rotation range and direction, either Clockwise (CW) or Counterclockwise (CCW), required to close the damper.
4. Press and hold the gear release lever, and rotate the actuator coupler to the fully closed position, as determined in Step 2.
5. Position the actuator onto the damper shaft so that the damper shaft protrudes through the actuator coupler, as illustrated in Figure 3.



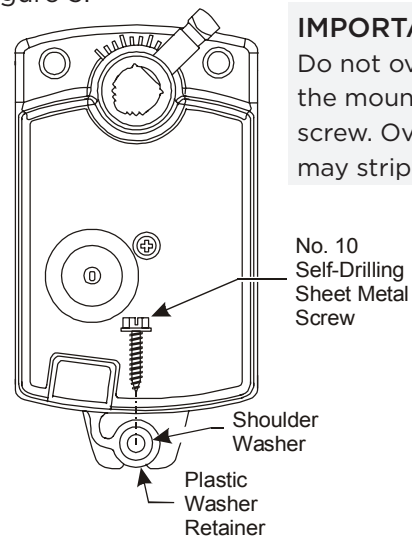
**Figure 3: Mounting the Actuator onto the Damper Shaft**

6. Be certain that the actuator is in the desired mounting position parallel to the mounting surface, as illustrated in Figure 4.



**Figure 4: Positioning the Actuator**

7. Hold the actuator in place on the damper shaft, and insert the No. 10 self-drilling sheet metal screw through the shoulder washer, as illustrated in Figure 5.



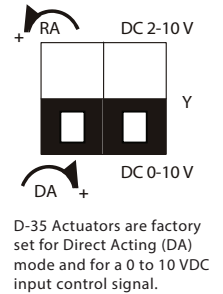
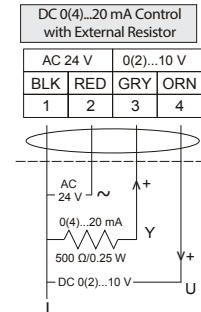
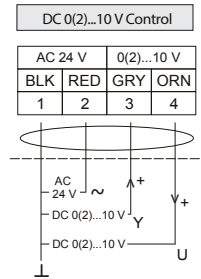
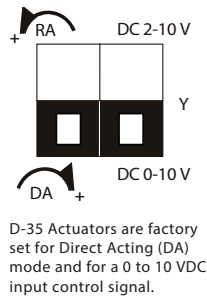
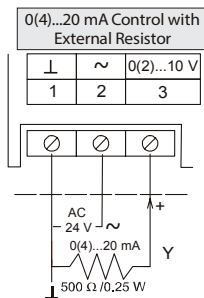
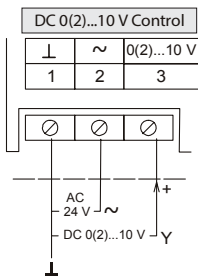
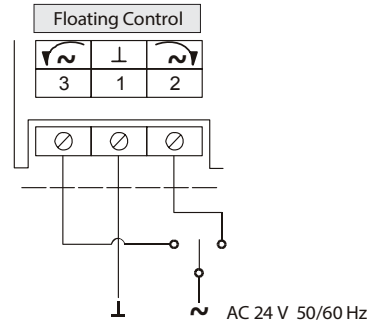
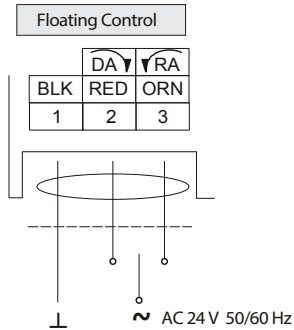
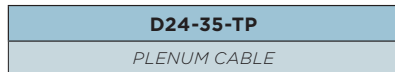
### IMPORTANT:

Do not overtighten the mounting screw. Overtightening may strip the threads.

**Figure 5: Inserting the Screw into the Shoulder Washer**

8. Place a 5/16 in. (8 mm) socket on the screw and use a drill and extension to drill the screw into the mounting surface. Drive the screw until it is tight against the washer.
9. Tighten the square coupler bolt to the shaft using an 8 mm (5/16 in.) wrench or 10 mm (3/8 in.) 12-point socket. Tighten to 11 to 15 N·m (100 to 130 lb-in.).

## Wiring



NOTE - To avoid excessive wear or drive time on the motor, use a controller and/or software that provides a time-out function to remove the signal at the end of rotation (stall).

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## Dimensions

