34-636-2405, Rev. A

M9104-IUA-2S Electric Non-Spring Return Actuators

Installation Instructions

M9104-IUA-2S

Part No. 34-636-2405, Rev. A
Issued March 2016

Refer to the QuickLIT website for the most up-to-date version of this document.

Applications

The M9104-IUA-2S Actuators are direct-mount, non-spring return electric actuators that operate on AC 100 to 240 V power. Employing a stepper motor, these actuators provide floating control with automatic shutoff.

All models are compact in size and are easily installed on 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 M9104 Electric Non-Spring Return Actuators provide a running torque of 35 lb·in (4 N·m), and the nominal travel time is 60 seconds for 90° of rotation.

IMPORTANT: Use this M9104-IUA-2S Electric Non-Spring Return Damper Actuator only to control equipment under normal operating conditions. Where failure or malfunction of the M9104 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 : Utiliser ce M9104-IUA-2S Electric Non-Spring Return Damper Actuator uniquement pour commander des équipements dans des conditions normales de fonctionnement. Lorsqu'une défaillance ou un dysfonctionnement du M9104 actuator risque de provoquer des blessures ou d'endommager l'équipement contrôlé ou un autre équipement, la conception du système de contrôle doit intégrer des dispositifs de protection supplémentaires. Veiller dans ce cas à intégrer de façon permanente d'autres dispositifs, tels que des systèmes de supervision ou d'alarme, ou des dispositifs de sécurité ou de limitation, ayant une fonction d'avertissement ou de protection en cas de défaillance ou de dysfonctionnement du actuator.

Installation

The M9104 Electric Non-Spring Return Actuators mount directly to the surface in any convenient orientation using a single No. 10 standard sheet metal screw (included with the actuator). No additional linkages or couplers are required. Electrical connections on the actuator are clearly labeled to simplify installation.

IMPORTANT: Before specifying M9104 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.

IMPORTANT: Do not install or use this M9104 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.

Parts Included

- one electric non-spring return actuator with an integrated 48 in. (1.2 m) long cable
- one No. 10 standard sheet metal screw

Special Tools Needed

- 5/16 in. (8 mm) square socket
- pliers
- 3/8 in. (10 mm) 12-point socket
- drill with a 5/16 in. (8 mm) hex nut driver
- digital voltmeter

Johnson Controls

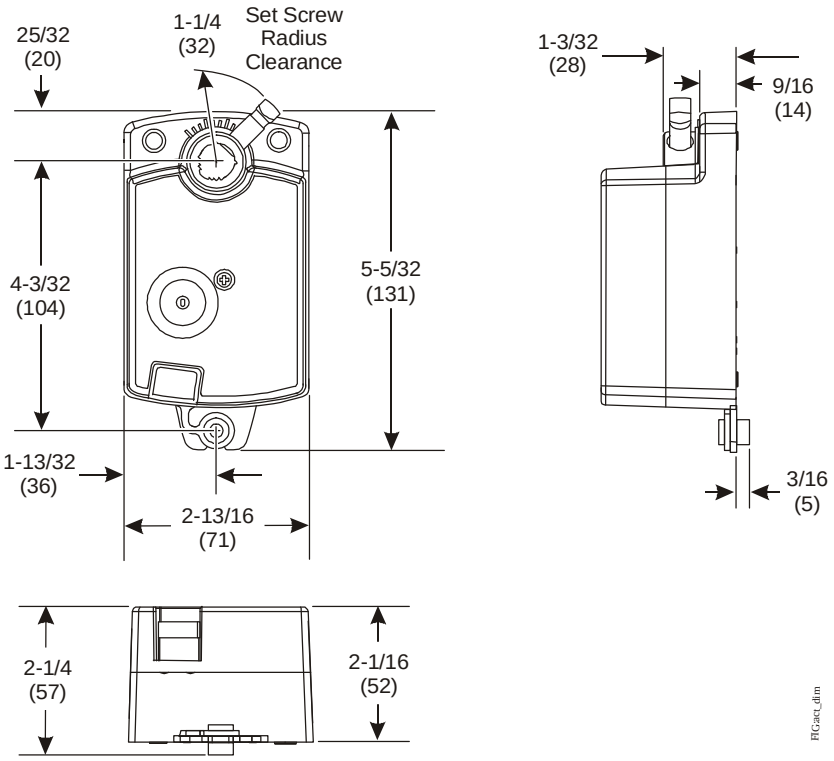

Figure 1: M9104 Series Electric Non-Spring Return Actuator Dimensions, in. (mm)

Accessories

Table 1: Accessories (Order Separately)

Code Number	Description
DMPR-KC003	7 in. (178 mm) Blade Pin Extension without Bracket for Johnson Controls® Direct-Mount Damper Applications
DMPR-KR003	Sleeve Pin Kit for Johnson Controls Round Dampers with a 5/16 in. (8 mm) Diameter Shaft
M9104-100	Connector for 3/8 in. (10 mm) flexible metal conduit

Mounting

To mount the actuator to a damper:

1. Check that the damper blade is visually accessible, or its position is permanently marked on the end of the damper shaft, as illustrated in Figure 2.

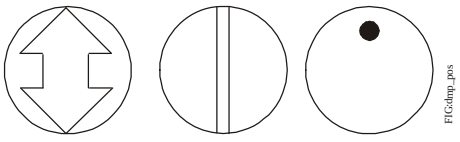

Figure 2: Damper Position Icons

2. Grasp the damper shaft firmly with pliers and rotate the damper fully closed, as illustrated in Figure 3.

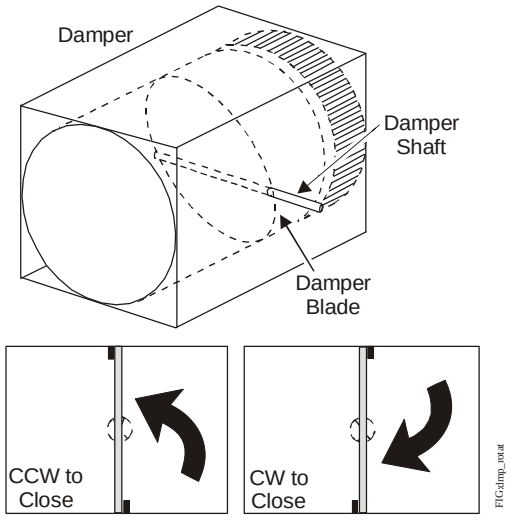

Figure 3: Damper Rotation

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 4.

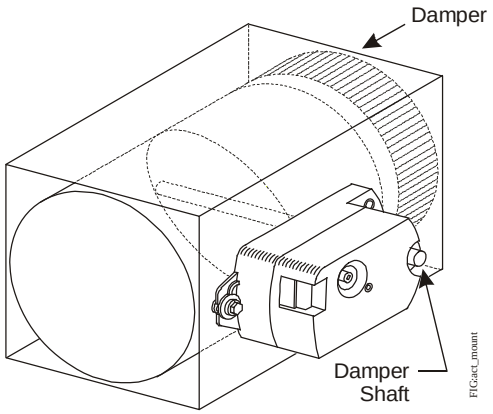

Figure 4: Mounting the Actuator onto the Damper Shaft

6. Be certain that the actuator is in the desired mounting position parallel to the mounting surface, as illustrated in Figure 5.

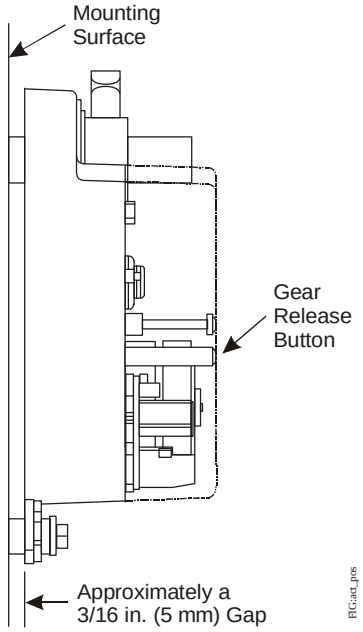

Figure 5: Positioning the Actuator

7. Hold the actuator in place on the damper shaft, and insert the No. 10 standard sheet metal screw through the shoulder washer, as illustrated in Figure 6.

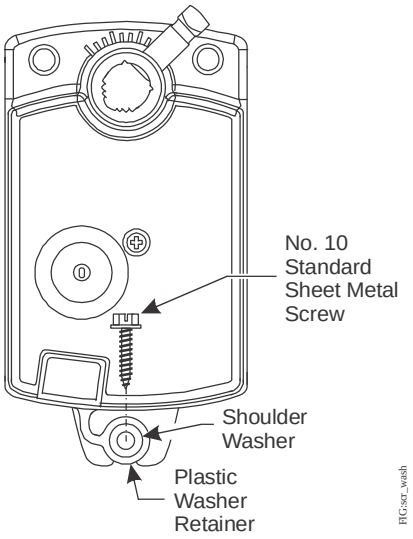

Figure 6: Inserting the Screw into the Shoulder Washer

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.

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

9. Tighten the square coupler bolt to the shaft using an 5/16 in. (8 mm) wrench or 3/8 in. (10 mm) 12-point socket. Tighten to 10.5 to 11.5 N·m (95 to 105 lb·in).

Wiring

M9104-IUA-2S

The M9104-IUA Electric Non-Spring Return damper actuators require an AC 100 to 240 V input signal and work with a variety of controllers. These electric actuators include an integrated 48 in. (1.2 m) long cable and have an auto-shutoff feature to prevent excessive wear or drive time on the motor. See Figure 7 and Figure 8 for proper wiring options.

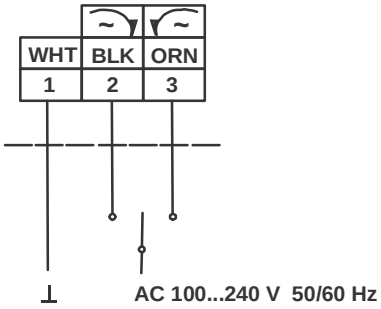

Figure 7: M9104-IUA-2S Control Wiring Diagram

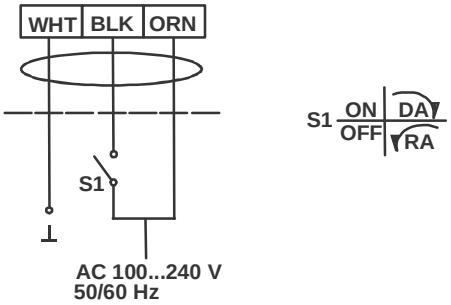

Figure 8: M9104-IUA-2S On/Off Control Wiring Diagram

CAUTION: Risk of Electric Shock.
Disconnect the power supply before making electrical connections to avoid electric shock.

MISE EN GARDE : Risque de décharge électrique.
Débrancher l'alimentation avant de réaliser tout raccordement électrique afin d'éviter tout risque de décharge électrique.

CAUTION: Risk of Property Damage.
Do not apply power to the system before checking all wiring connections. Short circuited or improperly connected wires may result in permanent damage to the equipment.

MISE EN GARDE : Risque de dégâts matériels.
Ne pas mettre le système sous tension avant d'avoir vérifié tous les raccords de câblage. Des fils formant un court-circuit ou connectés de façon incorrecte risquent d'endommager irrémédiablement l'équipement.

IMPORTANT: Make all wiring connections in accordance with local, national, and regional regulations. Do not exceed the electrical ratings of the M9104 Electric Non-Spring Return Damper Actuator.

Setup and Adjustments

Commissioning

After wiring is completed, apply power to provide input signals to the actuator to drive it at least one complete cycle open and closed.

Troubleshooting

If the M9104 Series Electric Non-Spring Return Actuator is not responding or working properly:

- verify that the actuator assembly is properly secured to the duct
- check that all electrical connections are complete and that power is applied
- verify that the damper fully opens and closes, using the gear release button on the actuator

Repair Information

If the M9104 Series Electric Non-Spring Return Actuator fails to operate within its specifications, replace the unit. For a replacement electric actuator, contact the nearest Johnson Controls representative.

Technical Specifications

M9104-IUA-2S Series Electric Non-Spring Return Actuators

Power Requirements		AC 100 to 240 V (-15%/+10%) at 50/60 Hz, 0.07 A Running
Control Type		Floating or On/Off Control with Timeout
Input Signal		AC 100 to 240 V (-15%/+10%) at 50/60 Hz with Timeout
Running Torque		35 lb·in (4 N·m)
Travel Time		60 seconds for 90° of rotation
Rotation Range		93° ±3°, CW or CCW
Cycles		100,000 Full Stroke Cycles; 2,500,000 Repositions at Rated Running Torque
Audible Noise Rating		35 dBA Maximum at 39-13/32 in. (1 m)
Electrical Connections		48 in. (1.2 m) with 18 AWG (1.02mm) conductors and connector for 3/8 in. (10 mm) flexible metal conduit
Mechanical Connections		Up to 1/2 in. (13 mm) Diameter Round Damper Shaft or 3/8 in. (10 mm) Square Damper Shaft
Enclosure		NEMA1, IP42
Ambient Conditions	**Operating**	-4 to 140°F (-20 to 60°C); 90% RH Maximum, Noncondensing
	Storage	-20 to 185°F (-40 to 85°C); 90 RH Maximum, Noncondensing
Compliance	**United States**	UL Listed, to UL 60730-1: 2009-10-19, Ed. 4.0, Automatic Electrical Controls for Household and Similar Use; and UL 60730-2-14: 2013-02-27, Ed. 2, Part 2 Particular Requirements for Electric Actuators Plenum Rated (UL 2043). Suitable for use in Other Environmental Air Space (Plenums) in accordance with section 300.22 (c) of the National Electric Code
	Canada	UL Listed, CCN XAPX7, File E27734; to UL 60730-1:02-CAN/CSA: July 2002, 3rd Ed., Automatic Electrical Controls for Household and Similar Use; and CSA C22.2 No. 24-93 Temperature Indicating and Regulating Equipment Actuator Housing is Plenum Rated per CSA C22.2 No. 236/UL 1995, Heating and Cooling Equipment
CE	**Europe**	IEC 60730-1: Automatic Electrical Controls for Household and Similar Use, Part 1: General Requirements: 2010-03, Edition 4; IEC 60730-1-14, Automatic Electrical Controls for Household and Similar Use; Part 2: Particular Requirements for Electric Actuators CE Mark – Johnson Controls, Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of the EMC Directive and the Low Voltage Directive
	Australia and New Zealand	RCM Mark, Australia/NZ Emissions Compliant
Shipping Weight		1.0 lb (0.45 kg)

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

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