M9000-156 and M9000-165 Mounting Kit for M920x Series Actuators

Application

The M9000-156 and M9000-165 mounting kit provides for remote-mount, linkage-driven application of the M9204 Series Electric Spring Return Economizer Damper Actuator or the M9206 Series Electric Spring Return Actuator (Table 1). The mounting kit provides the ability to retrofit a number of Honeywell® economizer damper actuator installations with an M9204 or M9206 actuator, using the existing linkages. See Table 1 to find the kit with the correctly-sized bracket for the actuator used.

When mounted in the mounting kit, the M9204 or M9206 actuator drives a blade, jackshaft, or crank arm. The mounting kit enables internal or external mounting on a duct, damper, or air handling unit.

Installation

See the appropriate installation instructions listed in Table 1 for complete actuator mounting and adjustment information.

Table 1: Actuator Mounting Kit Applications and Corresponding Documentation

Mounting Kit	Actuator	Installation Instruction
M9000-156	M9204	*M9204-CNx Series Electric Spring Return Economizer Damper Actuators Installation Instructions (Part No. 34-1280-41)*
	M9206-xGx-2	*M9206 Series Electric Spring Return Actuators Installation Instructions (Part No. 34-1280-9)*
M9000-165	M9206-Bxx-2S	*M9206-Bxx-2S Series On/Off Electric Spring Return Actuators Installation Instructions (Part No. 34-1280-122)*
	M9206-DNx-3S	*M9206-DNx Series Electric Spring Return Economizer Damper Actuators Installation Instructions (Part No. 34-1280-130)*
	M9206-Bxx-1S	*M9206-Bxx-1S Series On/Off Electric Spring Return Actuators Installation Instructions (Part No. 34-1280-149)*

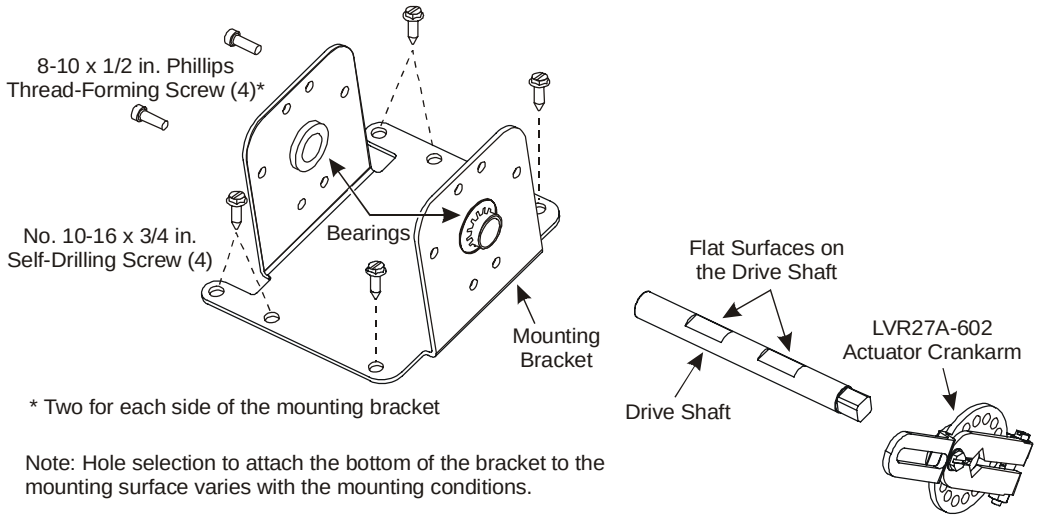


Figure 1: Components of the Mounting Kit

Parts Included

See Figure 1 for a depiction of the mounting kit parts:

- mounting bracket
- drive shaft
- LVR27A-602 actuator crankarm
- 8-10 x 1/2 in. Phillips thread-forming screws (4)
- No. 10-16 x 3/4 in. self-drilling screws (4)

Mounting

Location Considerations

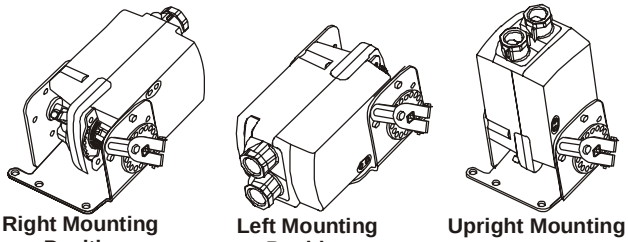
Both the existing linkage components and configuration apply to the mounting kit and the actuator assembly. Prior to installation, make note of the existing conditions for the following:

- mounting position of the actuator: internal or external to the damper frame or duct
- mounting position of the actuator crankarm
- operation of the damper: normally open or normally closed
- direction of rotation for the damper
- direction of action for the actuator: direct or reverse
- direction of spring return for the actuator: Clockwise (CW) or Counterclockwise (CCW)

The actuator assembly has three basic mounting positions (Figure 2). Select the appropriate mounting position for the application requirements. Figure 2 illustrates the preferred actuator crankarm location with respect to the mounting bracket.

Set the spring return to any of the three basic positions by rotating the actuator 180°.

Note: The laser markings on the M9204 or M9206 actuator indicate the spring return direction.



Right Mounting Position | **Left Mounting Position** | **Upright Mounting Position**

Note: The actuator and LVR27A-602 crankarm are shown in the CCW spring return position in all views.

Figure 2: Mounting Positions for the Actuator and Bracket Assembly

Removing the Existing Assembly

Note the existing conditions outlined in the *Location Considerations* section before proceeding with the removal. To remove an existing actuator:

1. Remove the power or drive the actuator to the spring return position.
2. Confirm that the power is off, then disconnect all wiring to the actuator.
3. Remove all linkages and retain for reuse.
4. Remove the actuator from the duct or air handling unit.

Mounting the Actuator into the Bracket

Note: If selecting the left or right mounting position shown in Figure 2, fasten the bracket to the mounting surface before installing the actuator into the bracket.

To install the actuator into the mounting bracket:

1. Insert the actuator into the mounting bracket (Figure 2).
2. Insert the drive shaft through the bearings (Figure 1) and the actuator coupler.
3. Rotate the drive shaft so that one of the flat surfaces on the shaft (Figure 1) aligns with the bottom of the coupler set screw.

   Note: Position the junction (where the square section meets the round portion of the drive shaft) flush with the bearing in the mounting bracket.
4. Tighten the coupler set screw onto the drive shaft using a 5/16 in. (8 mm) combination or 3/8 in. (10 mm) 12-point box-end wrench. Recommended torque is 150 to 180 lb·in. (17 to 20 N·m).
5. Fasten the actuator to the mounting bracket with four 8-10 x 1/2 in. Phillips thread-forming screws, using a No. 2 Phillips-Head screwdriver.
6. Tighten the screws to the recommended torque: 20 to 25 lb·in. (2.3 to 2.8 N·m).
7. Position the LVR27A-602 actuator crankarm on the square end of the drive shaft with the crankarm offset away from the mounting bracket (Figure 2).
8. Tighten the retaining nut on the crankarm (Figure 3) with an 11/32 in. combination wrench.

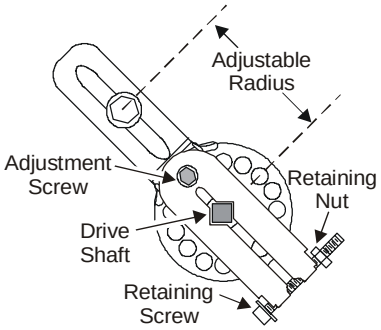


Figure 3: LVR27A-602 Actuator Crankarm

Installing the Mounting Bracket and Actuator Assembly

IMPORTANT: Before drilling the holes for the mounting bracket, build in the rotation clearance needed to operate the LVR27A-602 actuator crankarm.

The hole pattern on the mounting bracket matches the mounting pattern of the Honeywell economizer damper actuator. To install the mounting bracket and actuator assembly:

1. Match the existing hole pattern in the application to the hole pattern on the bottom of the mounting bracket.

   Note: Orient the actuator and the mounting bracket assembly as closely as possible to the original configuration.

2. Fasten the mounting kit to the mounting surface with four No. 10-16 x 3/4 in. self-drilling screws, using a 5/16 in. hex nut driver.

3. Make the proper wiring connections to the actuator. (Refer to the *Wiring* section of the applicable actuator installation instructions listed in Table 1).

Setup and Adjustments

Crankarm Adjustment

When retrofitting a mounting kit and an M9204 or M9206 actuator assembly to an existing Honeywell economizer damper actuator configuration, match the ball joint radius to that in the original configuration.

If both actuator and damper rotation are 90°, the crankarm radii for both damper and actuator must be equal. Set actuator and damper crankarms parallel to each other (Figure 4).

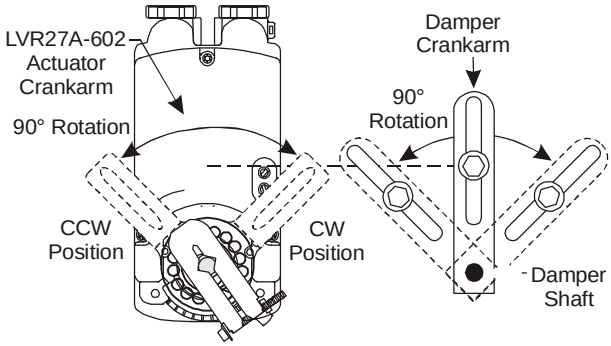


Figure 4: Actuator and Damper Crankarm Positions

Note: For applications where the crankarm ratio between the actuator and damper exceeds 1:1, the crankarms align parallel to each other only at mid stroke (Table 2).

Table 2: Damper and Actuator Rotation vs. Crankarm Radii and Torque

Damper Rotation Degrees	Damper Crankarm Radius in. (mm)	Actuator Rotation Degrees	Actuator Crankarm Radius in.(mm)	Damper and Actuator Torque Ratio
90	1-5/8 (41)	90	1-5/8 (41)	1:1
60	2 (51)	90	1-5/8 (41)	1.2:1
45	4 (102)	90	2-3/8 (60)	1.6:1

Note: Other combinations are acceptable. A greater sum of both crankarm radii decreases the force on the ball joint swivel and reduces bending of the linkage rod.

To adjust the LVR27A-602 actuator crankarm:

1. Remove the adjustment screw on the actuator crankarm with a 1/4 in. (7 mm) flat-blade screwdriver or 5/16 in. (8 mm) hex nut driver.

2. Rotate the actuator crankarm to the desired position.

   Note: The LVR27A-602 has adjustment holes that allow it to travel in 22.5° increments.

3. Reinstall and tighten the adjustment screw on the actuator crankarm.

4. Connect the damper linkage, which was previously removed and saved in Step 3 of the *Removing the Existing Assembly* section, to the LVR27A-602 actuator crankarm. Use Table 2 to help determine the correct actuator crankarm radius.

Checkout

Before powering the actuator, make sure the M9000 actuator assembly components function properly and that the actuator operates freely from one rotation limit to the other:

1. Remove the LVR27A-602 adjustment screw with the flat-blade screwdriver or a 5/16 in. (8 mm) hex nut driver.

   Note: This allows the linkage to rotate through the selected drive angle while connected to the actuator without risking damage during powered operation.

2. Return the linkage to the spring return position and replace the adjustment screw.
3. Connect all control wires to the actuator.
4. Supply power to the actuator.
5. Cycle the actuator fully in both CW and CCW directions.

Note: If the actuator is not operating properly, refer to the appropriate installation instructions for either the M9204 or the M9206 Series Electric Spring Return Actuator (Table 1).

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