

M9203-250 Remote Mounting Kit

Installation Instructions

M9203-250

Part No. 34-636-2324, Rev. —
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Refer to the [QuickLIT Web site](#) for the most up-to-date version of this document.

Applications

The M9203-250 Remote Mounting Kit enables the M9203 Series Electric Spring Return Actuators to drive damper blades through a linkage from a remote mounted position inside the duct. The kit is specially configured for Johnson Controls® D1300 Series Dampers, but suitable for use with a wide variety of dampers.

The M9203-250 Remote Mounting Kit is intended for applications that require displacement perpendicular or parallel to the mounting surface.

Mount the M9203-250 Remote Mounting Kit internally on a duct, damper, or air handling unit. The factory installed actuator gripper and retaining ring must be discarded when the M9203-250 Remote Mounting Kit is used.

Installation

Parts Included

See Figure 1 for the parts included in the M9203-250 Remote Mounting Kit.

Note: Refer to the appropriate installation instructions listed in Table 1 for complete actuator mounting and adjustments.

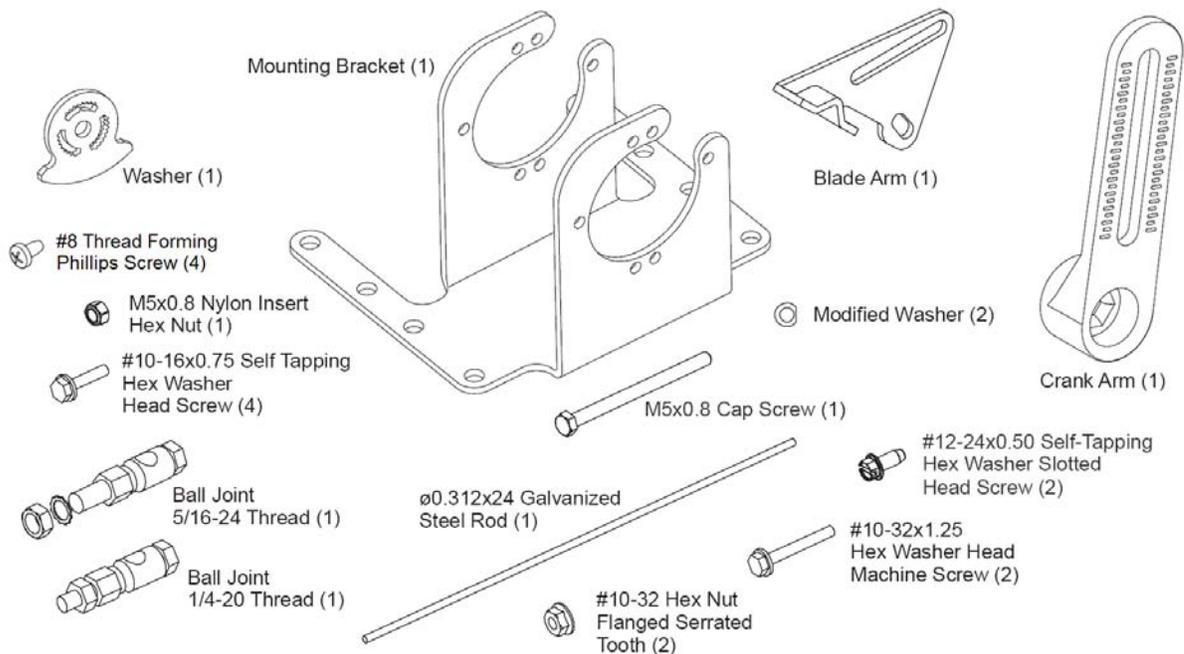


Figure 1: Parts Included in M9203-250 Remote Mounting Kit

Table 1: Mounting Kit, Actuators, and Corresponding Documentation

Mounting Kit	Actuator	Installation Instructions
M9203-250	M9203-Bxx-2(Z)	M9203-Bxx-2(Z) Series On/Off Electric Spring Return Actuators Installation Instructions (Part No. 34-1791-24)
	M9203-AGx-2(Z)	M9203-AGx-2(Z) Series On/Off and Floating Point Electric Spring Return Actuators (Part No. 34-1791-8)
	M9203-GGx-2(Z)	M9203-GGx-2(Z) Series Proportional Electric Spring Return Actuators Installation Instructions (Part No. 34-1791-16)

Dimensions

See Figure 2 and Figure 3 for overall dimensions and proper mounting orientations.

The actuator has two general mounting positions, horizontal and vertical, but can be mounted in six different ways: horizontal left, vertical, and horizontal right (each with the option of side A or side B direction). See Figure 2 and Figure 3.

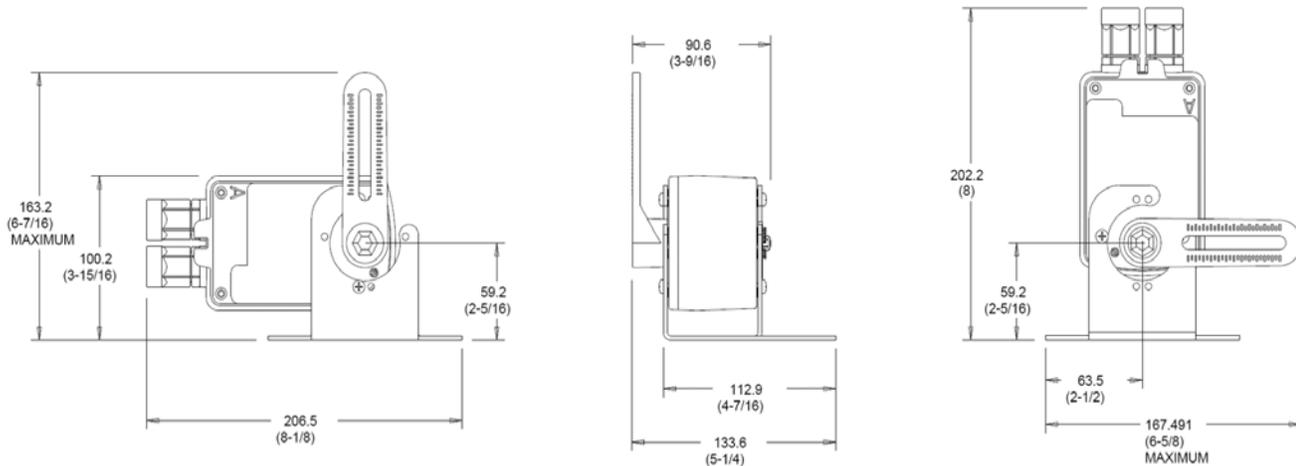


Figure 2: M9203-250 Remote Mounting Kit Overall Dimensions, mm (in.)

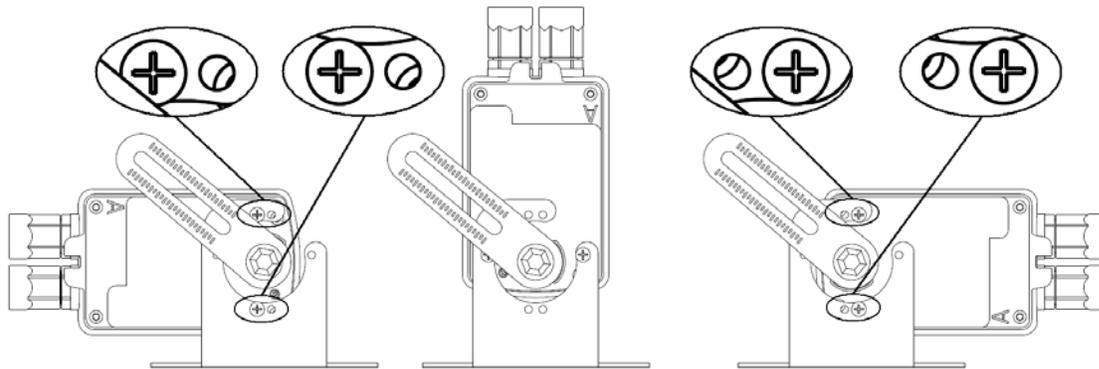


Figure 3: M9203-250 Remote Mounting Kit with Actuator Horizontal Left, Vertical, and Horizontal Right

Mounting

Location Considerations

The linkage rod must be oriented perpendicular to the damper face to provide clearance from rotating damper blades. Consider these additional factors to determine the best location:

- mounting position of the actuator crankarm
- operation of the damper: normally open or normally closed
- direction of rotation for the damper
- actuator spring return direction: Clockwise (CW) or Counterclockwise (CCW)

Note: If the actuator is in a difficult-to-reach location, adjust the auxiliary switch and stroke settings before continuing with the installation. See the [Setup and Adjustments](#) section for adjustable stroke instructions.

Mounting Positions

The M9203-250 Remote Mounting Kits allow the installer to select spring return direction as required by the application. The label on the actuator indicates the spring-return direction.

To set the spring-return direction of the actuator when mounted in a bracket, rotate the actuator as required. Flip the actuator over to choose CW or CCW spring-return direction.

Installing the Remote Mounting Kit

See Figure 5 for the hole mounting pattern of the mounting brackets. The hole pattern locates the actuator crankarm assembly with respect to the drive blade, jackshaft, or crankarm to be driven.

IMPORTANT: Remotely mounted M9203 Series actuators can develop high linear and rotational forces. Confirm that mounting surfaces are sufficiently rigid and strong before installing the remote mounting kit.

Consider the length of the linkage rod and attachment point of the damper blade arm when choosing the mounting location. To install the mounting bracket:

1. Locate the mounting bracket so that the linkage rod is approximately perpendicular to the face of the damper when attached to the driven blade. Johnson Controls® D1300 Series Dampers should be driven from the No. 1 blade as illustrated in Figure 4.

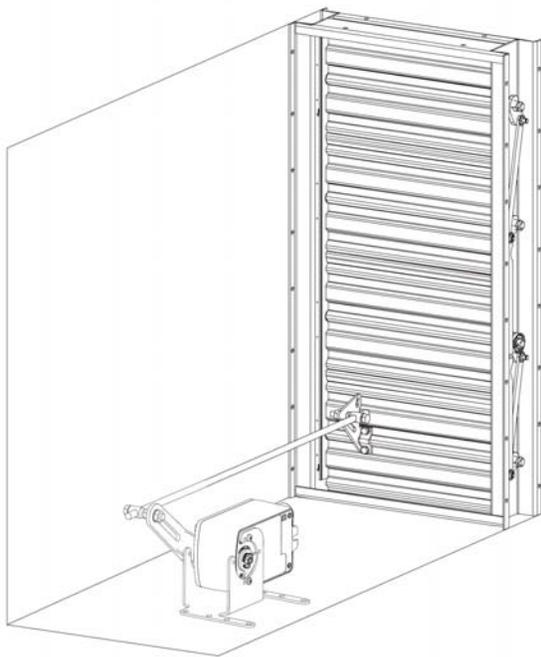


Figure 4: Typical Mounting Configuration

2. Use a center punch to mark the hole locations for the bracket in the duct or damper frame. See Figure 5.

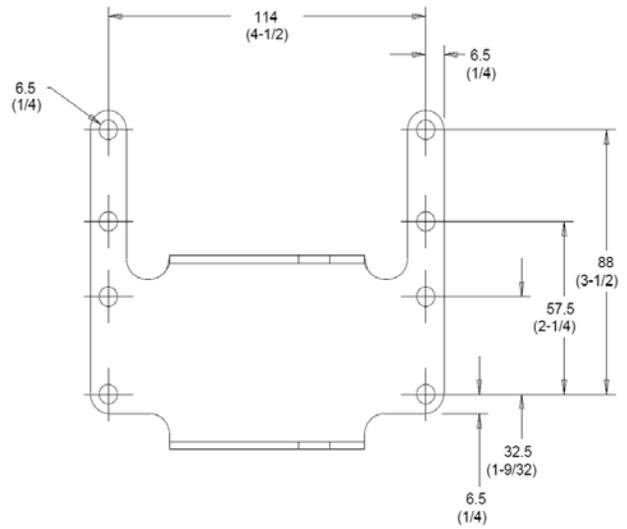


Figure 5: Hole Patterns in Mounting Brackets with Dimensions, mm (in.)

3. Fasten the mounting bracket by drilling the #10-16 x 0.75 in. self-drilling screws through the holes in the mounting bracket and into the duct or damper frame.

IMPORTANT: All user adjustable features of the actuator are accessible when mounted in the bracket.

4. Locate the actuator mounting holes that are located under the label at the \oplus symbol printed on the label, shown in Figure 5. Puncture the label with a sharp object to help start the thread forming screws.

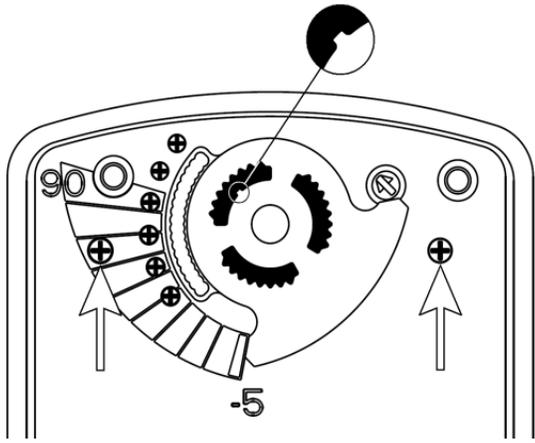


Figure 6: Washer Orientation on Actuator and Location of Mounting Holes

5. Using the four #8 Thread Forming Phillips Screws, secure the actuator to the mounting bracket as shown in Figure 3. Use the recommended torque of 1.7 to 2.3 N·m (15 to 20 lb·in). Note the location in horizontal mounting; the output hub of the actuator must be in the center of the bracket.
6. Install the crankarm and washer using the M5 cap screw and nylon insert hex nut (Figure 4). The washer only fits in one direction from the tab shown in Figure 7. Install the M5 nylon insert hex nut using the recommended torque of 1.7 to 2.3 N·m (15 to 20 lb·in).

Note: You may install an adjustable end-stop on the washer side to limit the stroke.

7. Assemble the 5/16-24 ball joint in the crankarm:
 - a. Remove the hex nut from the ball joint.
 - b. Insert the ball joint through the slot in the crankarm. A 2.56 in. (65 mm) crank radius matches the maximum radius of the damper blade arm and is preferred for installations that require a 90° actuator and damper blade rotation. Figure 7 shows the crankarm slot dimensions.

- c. Add the serrated lock washer and tighten the ball joint hex nut using the recommended torque of 2.3 to 2.8 N·m (20 to 25 lb·in.).

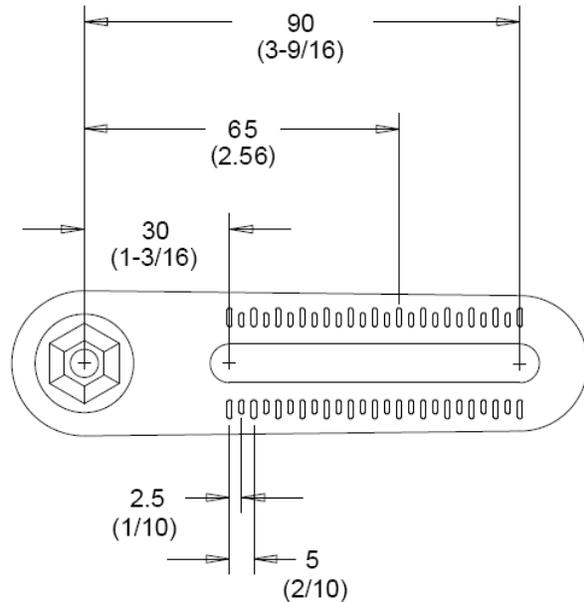


Figure 7: Crankarm Dimensions, mm (in.)

8. Using a 3/16 in. (or equivalent) bit, drill two holes for the blade arm. For best results on Johnson Controls D1300 Series Dampers, use the following drilling guidelines:
 - 16-gauge blades: drill out the first punch marks from the end channel.

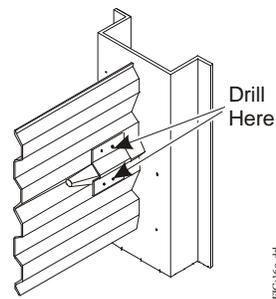


Figure 8: 16-Gauge Blades

- Double-piece blades: drill out the second set of nuggets from the end channel.

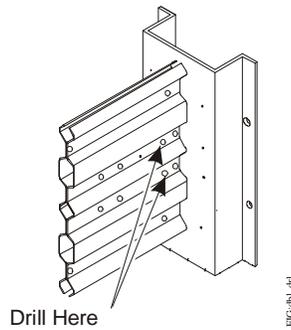


Figure 9: Double-Piece Blades

- Airfoil blades: measure 1-1/8 inches from the end channel and drill on the lines etched in the blade.

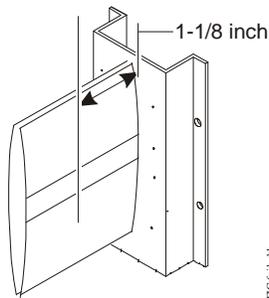


Figure 10: Airfoil Blades

9. Secure the blade arm to the driven blade.

- 16-gauge blade: Use the two #12-24 x 1/2 in. hex-head, self-tapping screws, and the modified washers. See Figure 11.

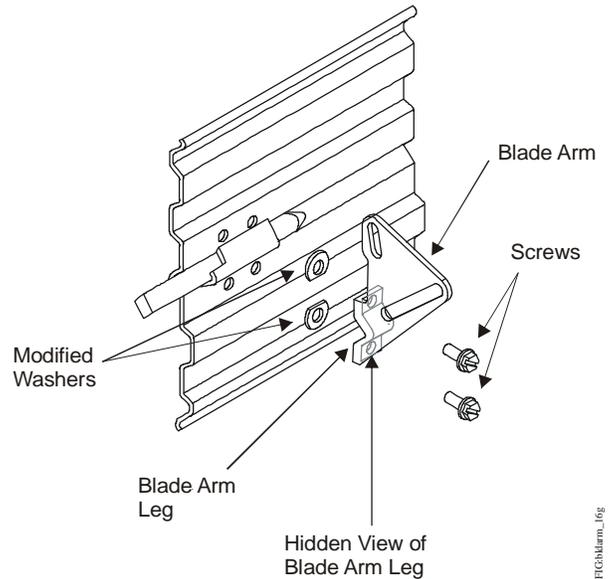


Figure 11: Attaching to 16-Gauge Blades

- Double-piece blade: Use the two #12-24 x 1/2 in. hex-head, self-tapping screws.
- Airfoil blade: Use the two #10-32 x 1-1/4 in. hex-head screws and two #10-32 hex nuts.

10. Assemble the 1/4-20 ball joint in the blade arm:
 - a. Remove the hex nut from the ball joint.
 - b. Insert the ball joint through the long slot in the blade arm. A ball joint placement at the furthest end of the slot results in a 2.56 in. (65 mm) radius and is preferred for installations that require a 90° actuator and damper blade rotation.
 - c. Add the serrated lock washer and tighten the ball joint hex nut using the recommended torque of 2.3 to 2.8 N-m (20 to 25 lb-in.).
11. With the M9203 Series actuator and damper blades in the spring return position, attach the linkage rod to the ball joints. The recommended torque for the ball joint set screws is 4 to 4.5 N-m (35 to 40 lb-in.).

IMPORTANT: Do not stress the crankarm or actuator when tightening the ball joints. Avoid stressing the crankarm or actuator by supporting the linkage rod.

Setup and Adjustments

Adjusting the Linkage



CAUTION: Risk of Property Damage.

Before applying power to an electric actuator that is installed in a damper application using a remote-mount linkage kit, confirm that the actuator end-stops are used to control the stroke applied to the damper linkage. Failure to use actuator end-stops to control the stroke can lead to premature equipment failure and/or property damage.

Make the necessary adjustments to fit the actuator's stroke limit to the application:

- Adjust the position of the ball joints in the slots at either end of the linkage rod to achieve the desired motion of the damper blade while using the actuator's internal end-stops for stroke control, whenever practical.
- Apply the external adjustable end-stop if linkage adjustment is not practical. An end-stop kit is available separately for the M9203 Series Actuators (M9203-603 Adjustable Stop Kit). Refer to the *Rotation Range Using Optional M9203-603 Adjustable Stop Kit* section of the actuator installation instructions, listed in Table 1, for limiting the stroke of the actuator.

Note: When you use the M9203-250 Remote mounting kit, the washer is used to limit the stroke in place of the gripper.

Checkout

Use the following steps to ensure that the actuator assembly components function properly, and that the actuator operates freely from one rotation limit to the other.

1. Connect all control wires to the actuator.

Note: Refer to the *Wiring* section of the actuator installation instructions listed in Table 1.

2. Apply power to the actuator.
3. Cycle the actuator fully in both CW and CCW directions. Ensure that the mechanism's stroke is limited by the actuator internal or external end-stops.
4. Ensure that the crankarm properly exercises the full range of the drive blade, jackshaft, or crankarm as required by the application without over-driving the linkage hardware.

If the actuator is not operating properly, refer to the appropriate actuator installation instructions indicated in Table 1.



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