# M9000-170 and M9000-171 Remote Mounting Kits

## Installation Instructions

M9000-17x



**Part No. 34-636-1824, Rev. —**
**Issued September 26, 2005**

## Applications

The M9000-170 and M9000-171 Remote Mounting Kits enable remotely-mounted, linkage-driven applications of the M9210 and M9220 Series Electric Spring Return Actuators.

The M9000-170 Remote Mounting Kit is intended for applications that require displacement perpendicular to the mounting surface. The M9000-171 Remote Mounting Kit is intended for applications that require displacement parallel to the mounting surface.

Mount the M9000-17x Series Kits internally or externally on a duct, damper, or air handling unit. The M9000-17x Series Kits enable new or retrofit damper and actuator installations.

## Installation

### *Parts Included*

See Figure 1 for the parts included in the M9000-17x Series Kits.

**Note:** The M9000-17x Series Kits do not make provisions for the coupling of the actuator crankarm to the blade, jackshaft, or crankarm of the intended application. The hardware required to complete the installation must be supplied by the installer.

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

**Table 1: Mounting Kits, Actuators, and Corresponding Documentation**

| Mounting Kit | Actuator | Installation Instruction |
|---|---|---|
| **M9000-170/ M9000-171** | M9210 | *M9210-Bxx-3 Series On/Off Electric Spring Return Actuators Installation Instructions (Part No. 34-636-1638)* |
| | M9220 | *M9220-Bxx-3 Series On/Off Electric Spring Return Actuators Installation Instructions (Part No. 34-636-1239)* |

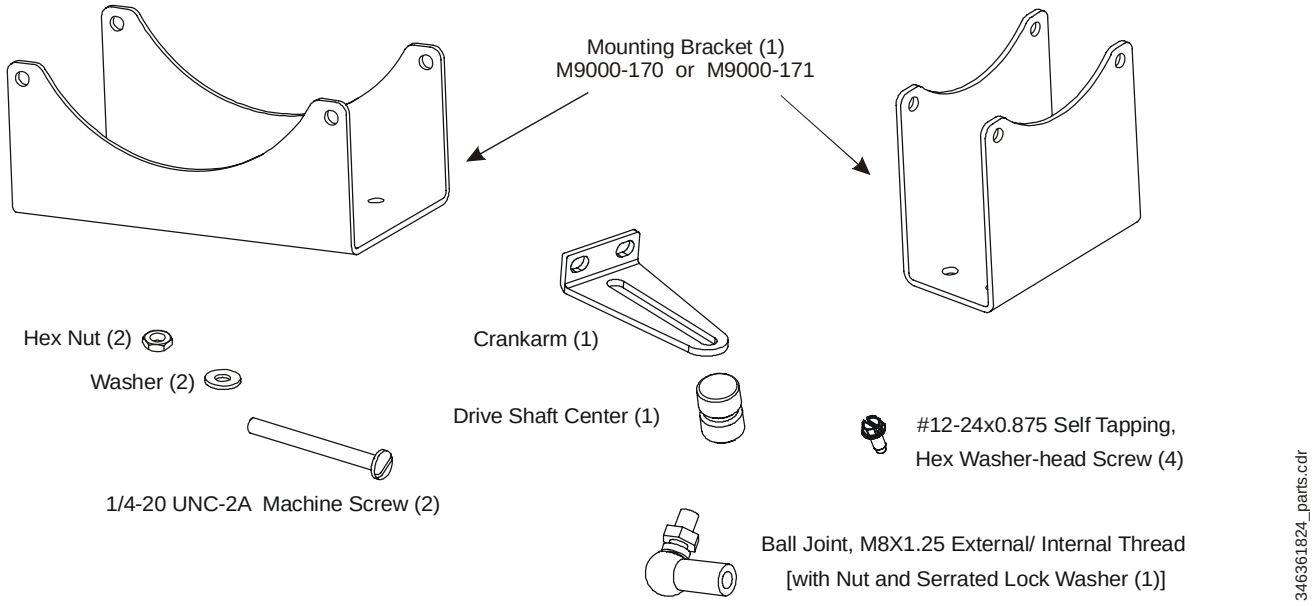


**Figure 1: Parts Included in M9000-170 and M9000-171 Remote Mounting Kits**

### *Dimensions*

See Figure 2 and Figure 3 for overall dimensions and proper mounting orientation. These actuators are shown in the spring-return position.

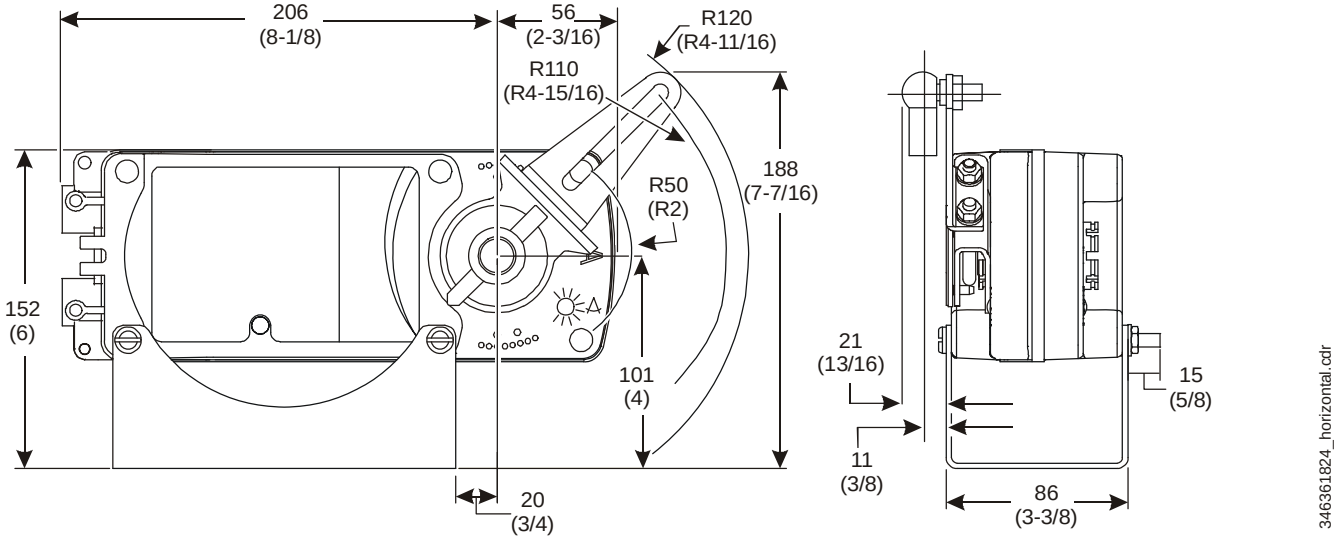


**Figure 2: M9000-170 Remote Mounting Kit (with Actuator) Overall Dimensions, mm (in.)**

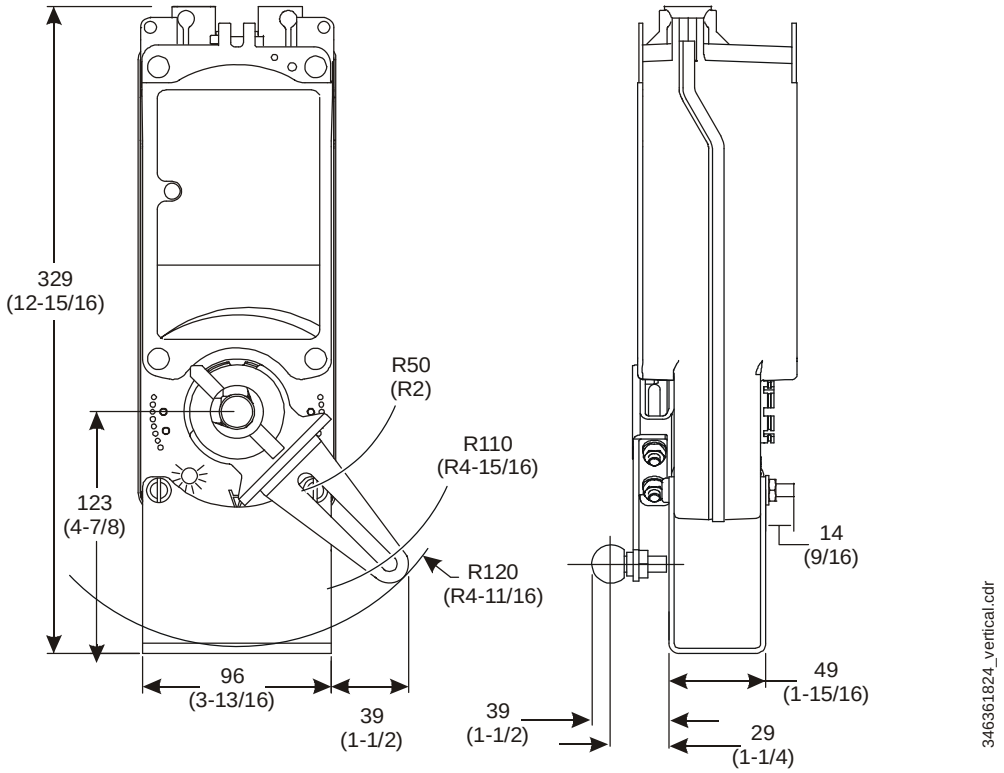


**Figure 3: M9000-171 Remote Mounting Kit (with Actuator) Overall Dimensions, mm (in.)**

## Accessories

See Table 2 for accessories.

**Table 2: Accessories (Order Separately**

| Product Code Number | Description |
|---|---|
| **M9220-603** | Adjustable Stop Kit for the M9220-Bxx-3 Series Electric Actuators |

## Mounting

### *Location Considerations*

Prior to installation, decide the following items:

- 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
- actuator spring return direction: Clockwise (CW) or Counterclockwise (CCW)

**Note:** If the actuator is in a difficult-to-reach location, adjust the auxiliary switches and adjustable stroke settings before continuing with the installation.

### *Mounting Positions*

The M9000-17x Series 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. Choose CW or CCW spring-return direction by flipping the actuator over.

### *Installing the Remote Mounting Kit*

See Figure 4 for the hole mounting pattern of the mounting bracket. The hole pattern locates the actuator crankarm assembly with respect to the drive blade, jackshaft, or crankarm to be driven.

**IMPORTANT:** Remotely mounted M9210 or M9220 Series actuators can develop high linear and rotational forces. Confirm that mounting surfaces are sufficiently rigid and strong before installing the remote mounting kit.

To install the mounting bracket:

1. Locate the mounting bracket in the desired position.
2. Use a center punch to mark the hole locations for the bracket in the duct or damper frame. See Figure 4.

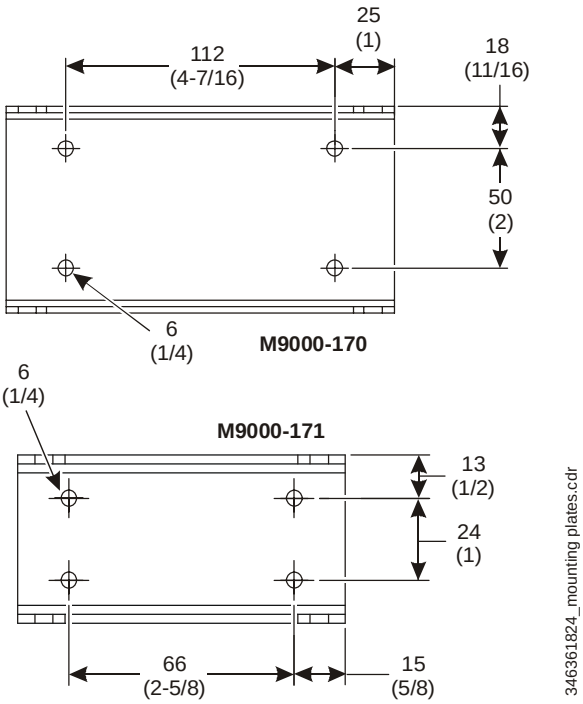


**Figure 4: Hole Patterns in Mounting Brackets with Dimensions, mm (in.)**

3. Fasten the mounting bracket by drilling the No. 12-24 x 0.875 in. self-tapping screws through the holes in the mounting bracket and into the duct or damper frame.
4. Before installing the actuator to the mounting bracket, assemble the drive shaft center and crankarm to the actuator coupler.
5. Tighten the actuator u-bolt hex nuts using the recommended torque of 11.3 to 16.9 N·m (100 to 150 lb·in.). See Figure 5.

**Note:** Position the actuator U-bolt inside the groove of the drive shaft center before tightening.

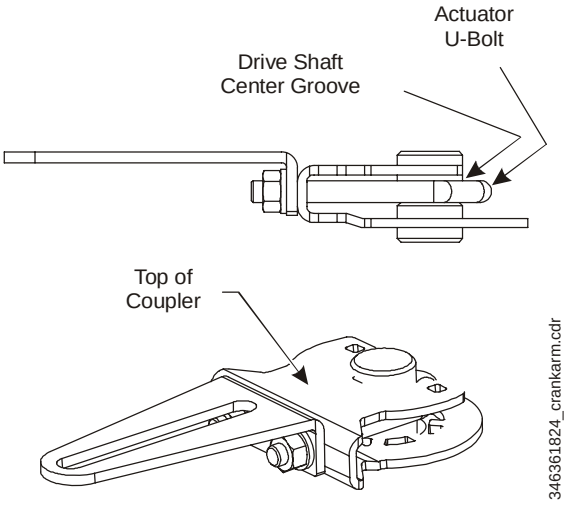


**Figure 5: Actuator Crankarm Assembly (Actuator not shown)**

6. Align the actuator mounting holes with the bracket mounting holes, as shown in Figure 2 and Figure 3.

   **Note:** Ensure that the orientation of the actuator and crankarm are correct with respect to the application. Observe the spring return direction of the actuator during the installation.

7. Using two 1/4-20 UNC-2A machine screws, secure the actuator to the mounting bracket as shown in Figure 2 and Figure 3. Install the washer, and tighten the hex nut using the recommended torque of 1.7 to 2.3 N·m (15 to 20 lb·in.).

**IMPORTANT:** Ensure that the fastener head is located on the same side as the crankarm assembly from Step 4 and Step 5. Failure to do this results in interference between the mounting fastener and the crankarm assembly.

8. Assemble the ball joint to the actuator crankarm:
   a. Remove the hex nut from the ball joint.
   b. Insert the ball joint through the slot in the crankarm.
   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.).
9. Proceed with the installation of the remaining hardware required to connect the actuator crankarm to the drive blade, jackshaft, or crankarm to be driven.

## 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 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 field-supplied linkage components to use the actuator's internal end-stops for stroke control whenever practical.
- Apply the M9220-603 External Adjustable End Stop Kit if linkage adjustment is not practical.

  **Note:** The M9000-17x Series Kits enable the remote mounting of actuators, but do not make provisions for the coupling of the actuator crankarm to the application. Additional hardware is required and is not furnished in this kit.

### *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 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 controlled by the actuator internal or external end-stops.
4. Ensure that the crankarm drives the drive blade, jackshaft, or crankarm as required by the application.

If the actuator is not operating properly, refer to the literature indicated in Table 1.

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