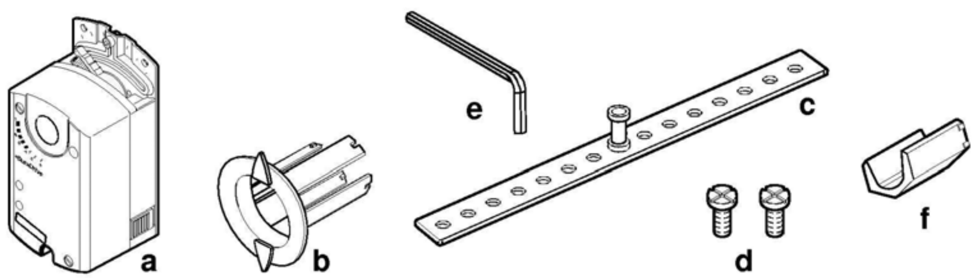
MF41-6043 Series
MS41-6043 Series

DuraDrive Non-Spring Return Direct Coupled Actuator General Instructions



a. Actuator
b. Position indicator
c. Mounting bracket
d. Mounting screws
e. 3 mm hex key
f. Shaft insert for use with 3/8-inch (8-10 mm) shafts

Figure-1 Parts of the DuraDrive Rotary Actuator.

Product Description

These installation instructions describe the steps for direct-coupled mounting of the DuraDrive™ 35 lb-in MF41-6043 series and MS41-6043 series non-spring return rotary electronic damper actuator.

Product Numbers

3-position control: MF41-6043, MF41-6043-502, and MF41-6043-510

Modulating control: MS41-6043, MS41-6043-502, MS41-6043-520, and MS41-6043-522

Required Tools

- 3 mm hex wrench
- 4 mm (5/32-inch) drill bit and drill
- Phillips small flat-blade screwdrivers
- Marker or pencil

Warning/Caution Notations

Warning: Personal injury/loss of life may occur if a procedure is not performed as specified.

Caution: Equipment damage or loss of data may occur if the user does not follow a procedure as specified.

Estimated Installation Time

30 minutes

Instructions

Warning:
Do not open the actuator.

Note: Place the actuator on the damper shaft so that the front of the actuator is accessible. The label is on the front side.

1. Determine whether the damper blades will rotate clockwise or counterclockwise to open. See Figure 7.
2. If the blades will rotate counterclockwise, slide the manual override switch to manual, and move the adjustment lever to the right. Return the switch to automatic. See Figure 10.

Note: To wire an MF41-6043 Series actuator (three-position) for counterclockwise rotation, follow the Counterclockwise Damper Rotation instructions located in the Wiring Diagrams section when wiring the actuator to the controller.

3. If the actuator model has any switches or adjustments, set them with the following instructions.

DIP Switch Settings

For MS41-6043 Series only

1. To access the Dual In-line Package (DIP) switches, raise the tab on the lower left side of the actuator. See Figure 7.

   Self-Adapt Switch (Factory setting = 0 or OFF)

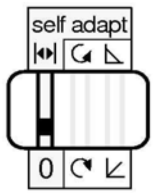
   

   Figure-2 Self-Adapt Switch.

   When using the mechanical range stop screw to limit the angle of damper blade rotation (see the Mechanical Range Adjustment section for details), turn the self-adapt switch ON so that the adjusted range will become the new 0 to 100% for the actuator logic. In this case, 0 to 100% is not equal to 1.

   The position output signal U is not influenced by the self-adapt function. The 0 to 10V feedback signal U is always proportional to 0 to 1 (or 1 to 0).

   Direction of Rotation Switch (Factory setting = Clockwise)

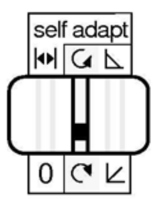
   

   Figure-3 Direction of Rotation Switch.

   The direction of rotation switch should match the damper rotation movement.

   Output Signal Switch (Factory setting = Direct Acting)

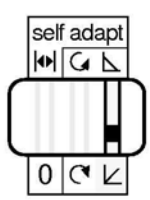
   

   Figure-4 Output Signal Switch.

   As the clockwise angle of rotation increases, the output voltage increases.

   If the direction of rotation is counterclockwise, the output signal switch should be set at reverse acting to match the direction of the rotation switch.

2. Close the tab over the DIP switches.

Span (slope) and Start Point (offset) Adjustment

For MS41-6043-520 and MS41-6043-522 only

Factory setting:
Span (slope) ΔU ≈10
Start Point (offset) Uo = 0

Use a flat-blade screwdriver to make adjustments. The long arm of the X points to the setting.

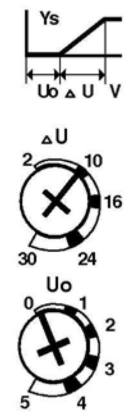


Figure-5 Span and Start Point Adjustments.

Dual Auxiliary Switch Setting

For MF41-6043-502, MS41-6043-502, and MS41-6043-522 only

Factory setting:
A = .05
B = .95

Use a flat-blade screwdriver to adjust the A switch. The long arm of the X points to the setting. Manually turn the red ring of the B switch. The narrower tab on the ring points to the setting.

The auxiliary switch setting shafts rotate with the actuator. The scale is valid only when the actuator is in the "0" position on clockwise motion.

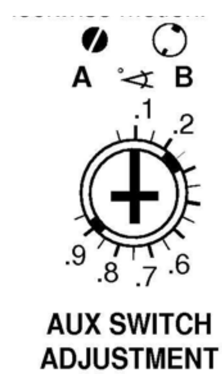


Figure-6 Auxiliary Switches.

Mounting

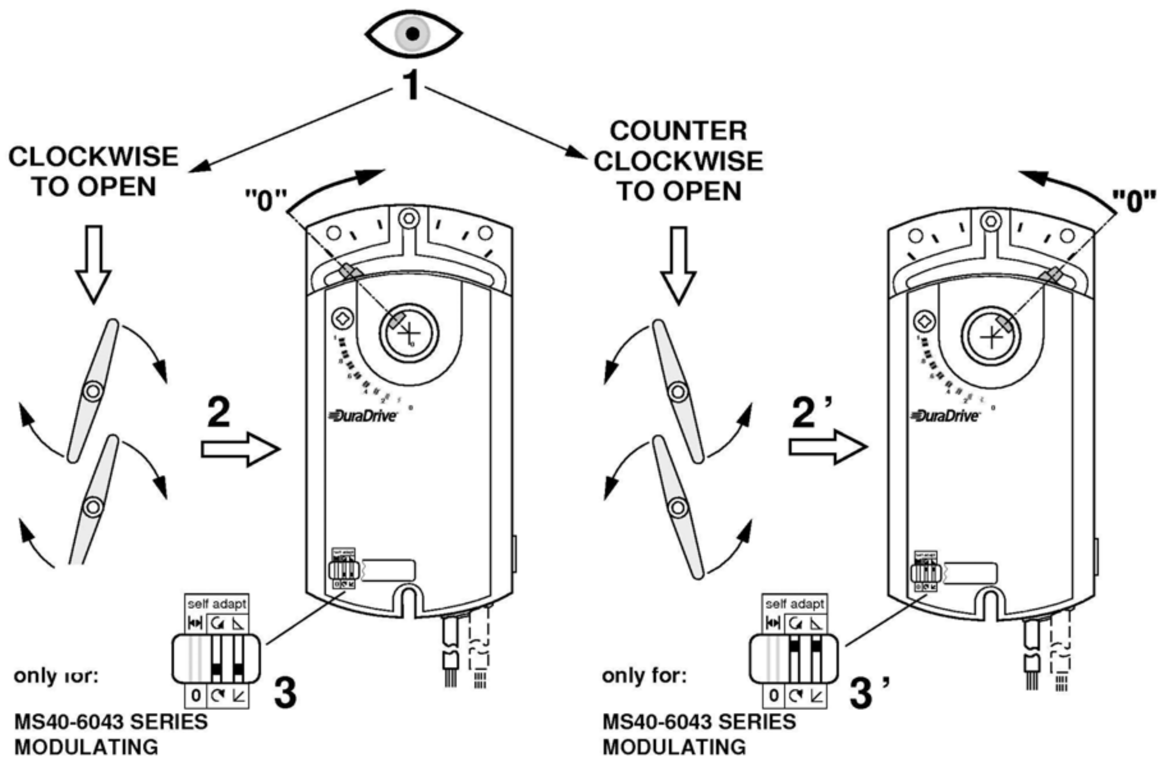


Figure-7 Setting the Direction of Rotation.

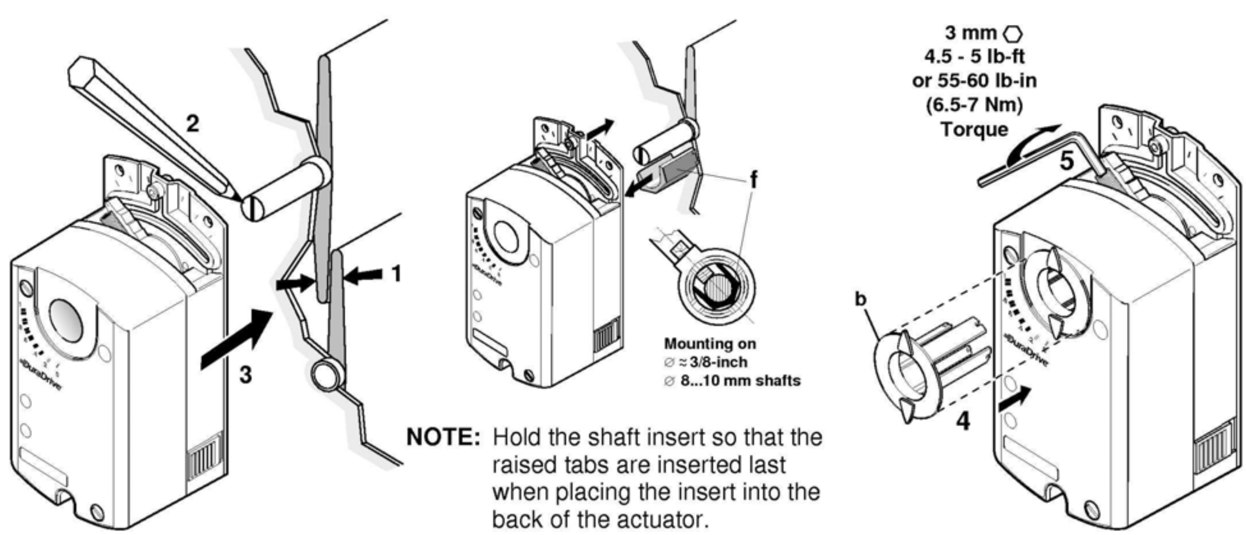


Figure-8 Mounting the Actuator to the Damper Shaft.

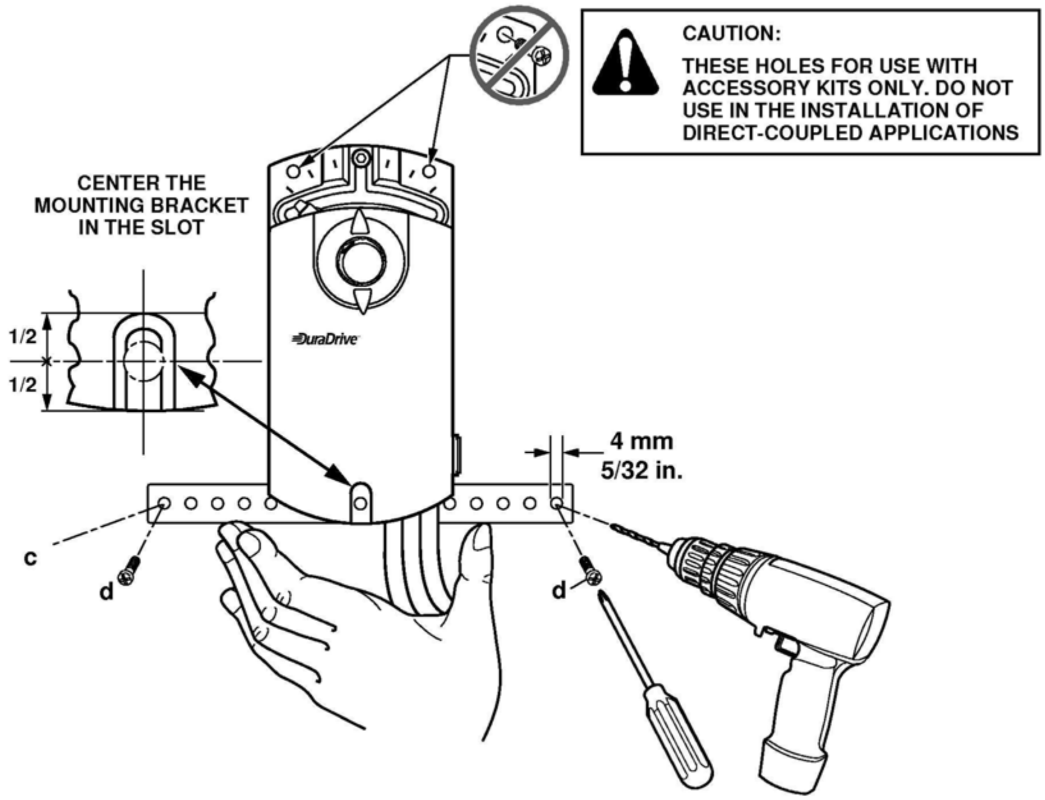


Figure-9 Attaching the Mounting Bracket.

Manual Override

To move the damper blades and lock the position with no power present, do the following:

1. Slide the red manual override knob toward the back of the actuator.
2. Make adjustments to the damper position.
3. Slide the red manual override knob toward the front of the actuator.

Once power is restored, the actuator returns to automated control.

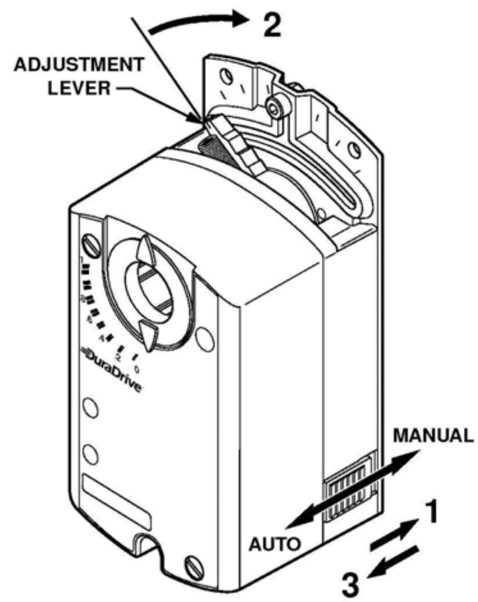


Figure-10 Manual Override.

Mechanical Range Adjustment

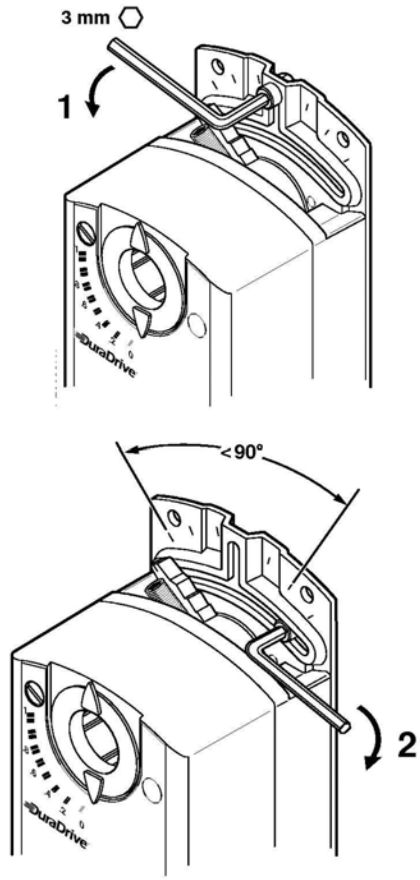


Figure-11 Moving the Mechanical Range Stop.

1. Loosen the stop set screw.
2. Move it along the track to the desired position, and fasten it in place.

For MS41-6043 Series only

Mechanical range limitation and self-adapt feature

1. To use the entire 0 to 10V input signal to control the adjusted range, raise the tab located on the lower left-hand side of the actuator and locate the DIP switches. See Figure 7.
2. Set the self-adapt DIP switch to (ON). See Figure 12.
3. Close the tab over the DIP switches.

Note: With the self-adapt feature ON, the actuator runs a calibration check every 24 hours.

Keep the self-adapt feature OFF if the daily, up to five-minute calibration routine causes interference in the control loop.

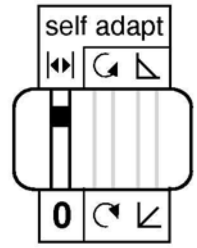


Figure-12 Self-Adapt Switch in the On Position,.

Wiring

All wiring must conform to NEC and local codes and regulations.

Use earth ground isolating step-down Class 2 transformers. Do not use auto transformers.

Determine the supply transformer rating by summing total VA of all actuators used. It is recommended that one transformer power no more than 10 actuators.

***Warning:* Installations Requiring CE Conformance**

- All wiring for CE rated actuators must only be separated extra low voltage (SELV) or protective extra low voltage (PELV) per HD384-4-41.
- Use safety isolating transformers (Class III transformer) per EN 61558. They must be rated for 100% duty cycle.
- Overcurrent protection for supply lines is maximum 10A.

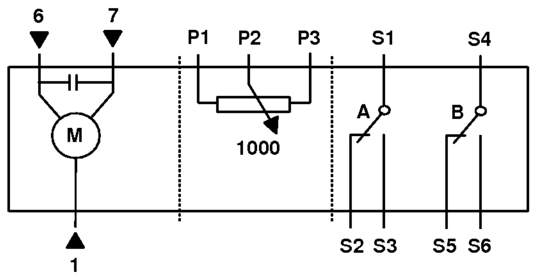
Wiring Diagrams

MF41-6043 Series

24 Vac power supply

Three-position control 24 Vac

Each wire has the standard symbol printed on it. See Table 1.



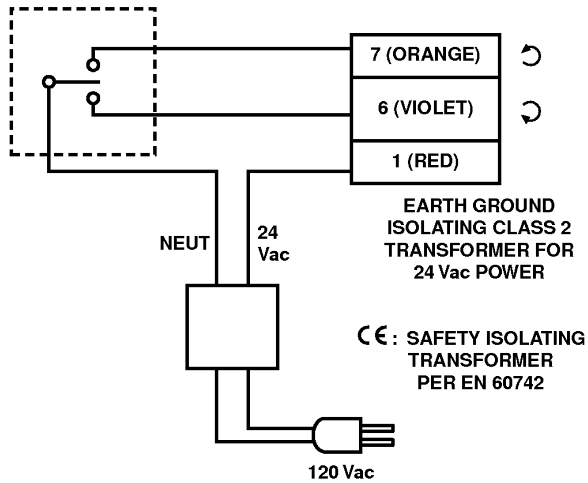


Figure-13 Typical Three-Position Control.

Table-1 Three-Position Control 24 Vac.

Standard Symbol	Function	Color Plenum
1	Supply (SP)	Red
6	Control signal clockwise	Violet
7	Control signal counterclockwise	Orange
S1	Switch A Common	Black
S2	Switch A N.C.	Black
S3	Switch A N.O.	Black
S4	Switch B Common	Black
S5	Switch B N.C.	Black
S6	Switch B N.O.	Black
P1	Feedback Potentiometer 0 to 100% P1 - P2	Black
P2	Feedback Potentiometer Common	Black
P3	Feedback Potentiometer 100 to 0% P3 - P2	Black

Counterclockwise Damper Rotation

If the damper blades turn counterclockwise to open (CCW), reverse the 6 (violet) and 7 (orange) wires at the controller.

MS41-6043 Series

24 Vac power supply

0 to 10V modulating control

Each wire has the standard symbol printed on it. See Table 2.

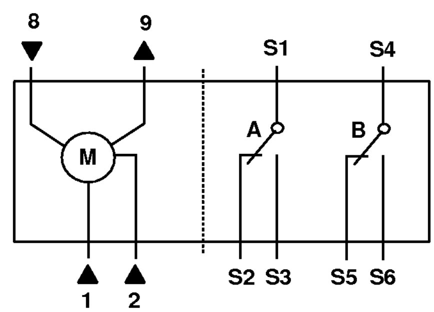


Table-2 Modulating Control.

Standard Symbol	Function	Color Plenum
1	Supply (SP)	Red
2	Neutral (SN)	Black
8	0 to 10V input signal	Gray
9	Output for 0 to 10 Vdc position indication	Pink
S1	Switch A Common	Black
S2	Switch A N.C.	Black
S3	Switch A N.O.	Black
S4	Switch B Common	Black
S5	Switch B N.C.	Black
S6	Switch B N.O.	Black

Dimensions

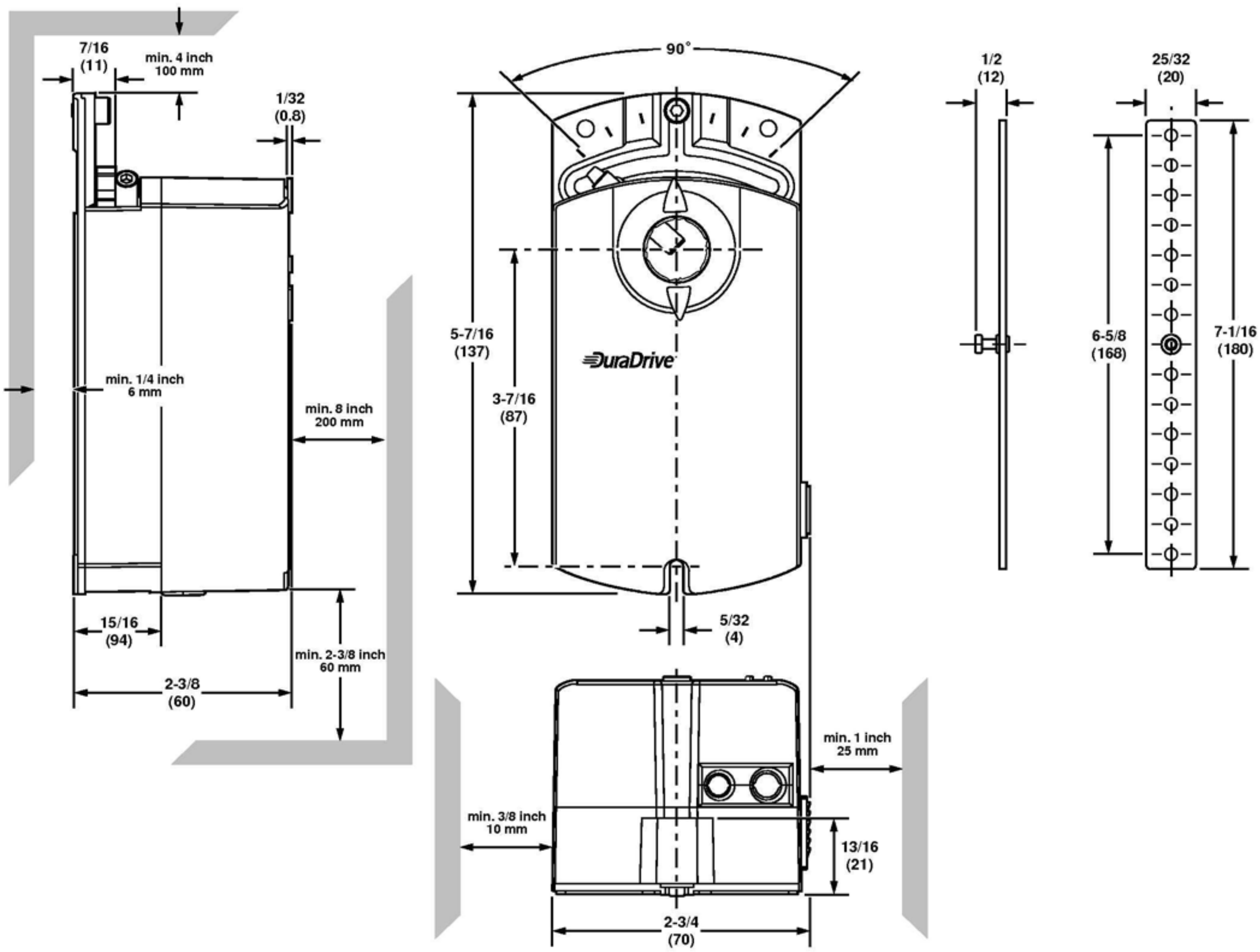


Figure-14 Dimensions of the DuraDrive Actuator and Mounting Bracket. Dimensions in inches, (mm in parentheses).

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