



# MA-305 & MA-318 Series MA-405 thru MA-419 Series

Oil Submerged Actuators, Two-Position  
General Instructions

## APPLICATION

For Two-position operation of damper, valves, and other equipment which require the return to normal position upon power interruption.

### WARNING

Specifications do not apply to MZ-31X-15X or MA-41X-15X which are not listed in this document.

## SPECIFICATIONS

**Control Circuit:** Two-wire.

**Shaft Rotation:**

MA-305, MA-405, CW 180° when power is applied.

MA-31X, MA-41X, CW 170° when power is applied.

**Spring Return:** CCW to original position when actuator is de-energized.

**Auxiliary Switch (-500 Models):** SPDT makes (or breaks) circuit at powered end of stroke.

**Environment:**

**Ambient Temperature Limits,**

**Shipping & Storage** -40 to 136°F (-40 to 58°C).

**Humidity,** 5 to 95% R.H., non-condensing.

**Locations,** NEMA Type 4 with gasket (provided) and water-tight conduit connectors (not provided) installed.

**Connections:** Coded screw terminals.

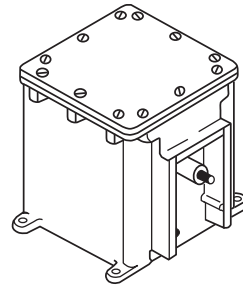
**Case:** Die cast aluminum with two 1/2" conduit openings.

**Mounting:** Allow 6" (152 mm) clearance behind the actuator wiring compartment. See Table 1 for additional data.

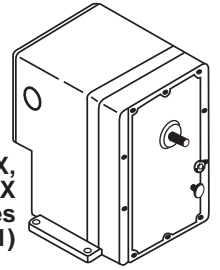
**Dimensions:**

**Base Actuators,** 5-3/4" high x 5-3/8" wide x 6-9/16" deep (146 mm x 136 mm x 167 mm).

**Hazardous Location Actuators,** 8-7/8" high x 8-1/2" wide x 10-5/8" deep (225 mm x 216 mm x 167 mm).



MA6, MA7, MA8-XXX Series (See Table 2)



MA-3XX, MA-4XX Series (See Table 1)



### Damper Linkage:

- AM-111 Crank arm for 5/16" diameter damper shaft
- AM-112 Crank arm for 3/8" diameter damper shaft
- AM-113 Crank arm for actuator or 1/2" diameter damper shaft
- AM-115 Crank arm for 7/16" diameter damper shaft
- AM-116 Splined crank arm for actuator
- AM-122 Linkage connector straight type
- AM-123 Damper Clip
- AM-125 5/16" diameter x 20" damper rod
- AM-125-048 5/16" diameter x 48" damper rod
- AM-132 Ball joint connector
- AM-161 Damper linkage kit
- AM-161-1 Damper linkage kit
- AM-301 90° mounting bracket (except MA6, MA7, MA8-XXX)

### Valve Linkage for 60 lb-in. (6.8 N-m) actuators only (except MA7, MA8-XXX):

- AV-29 & AV-300 2-1/2" & 3" VB-9323
- AV-391 1/2" to 1-1/4" VB-92XX or VB-93XX
- AV-392 1-1/2" & 2" VB-92XX or VB-93XX
- AV-395 2-1/2" to 4" VB-92XX or VB-931X

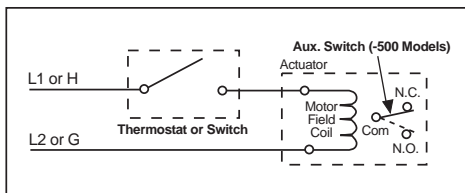
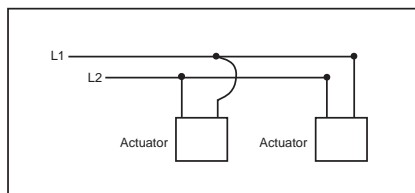


Figure 1. Wiring for MA-305 and 405 Series



Multiple Actuator Field Wiring / Pneumatic Piping

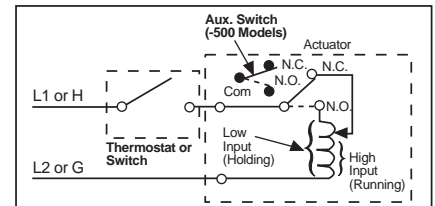


Figure 2. Wiring for MA-318, 416, 418 and 419 Series

TABLE 1. SPECIFICATIONS

Actuator Part Number	Power Supply		Aux. * Switch	Input (Watts)	VA Running	Holding	Rated Torque lb-in. (N-m)	No Load Timing † at 75°F (24°C)	Nominal Damper Area** sq. ft. (m <sup>2</sup> )		Mounting	Application	
	Vac	Hz							Parallel	Opposed			
MA-305	24	60	No	25	56	56	16 (1.8)	20	9 (0.8)	11 (1)	Upright Position Preferred	Damper Actuators	
MA-305-500	24		Yes		56	56							
MA-405	120		No		48	48							
MA-405-500	120		Yes		48	48							
MA-318	24		No	70	92	32	60 (6.8)	20	33 (3.1)	43 (4)	Outright Shaft Horizontal	Damper and Valve Actuators	
MA-318-500	24		Yes		92	32							
MA-416	208		No		104	38							
MA-416-500	208		Yes		104	38							
MA-418	120		No		Running	108							42
MA-418-500	120		Yes		25	108							42
MA-419	240		No		Holding	120							39
MA-419-500	240		Yes		120	39							
MA5-419	240	50	No	120	39								
MA5-419-500	240		Yes	120	39								

\*2 FLA, 12 LRA @ 240 / 120 Vac, 1 FLA, 6 LRA @ 240 Vac.

\*\*Damper ratings are nominal and based on standard (not low leakage) dampers at 1" (25.4 mm) W.C. pressure and 2000 FPM (10 m/s).

† Spring return timing with full load opposing spring approximately 60 sec.

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**TABLE 2. PART NUMBERS FOR HAZARDOUS LOCATION APPLICATIONS\***  
(Class 1, Groups C & D, and Class 2, Groups E, F & G hazardous locations; ref. EN-56-2)

Standard Part Numbers	Damper Actuator Part Numbers for Hazardous Locations	Valve Actuator Part Numbers for Hazardous Locations
MA-305	MA6-305	---
MA-305-500	MA6-305-500	---
MA-405	MA6-405	---
MA-405-500	MA6-405-500	---
MA-318	MA6-318	MA8-318
MA318-500	MA6-318-500	MA8-318-500
MA-416	MA6-416	MA8-416
MA-416-500	MA6-416-500	MA8-416-500
MA-418	MA6-418	MA8-418
MA-418-500	MA6-418-500	MA8-418-500
MA-419	MA6-419	MA8-419
MA-419-500	MA6-419-500	MA8-419-500
MA6-419	MA7-419	MA7-419
MA5-419-500	MA7-419-500	MA7-419-500

\* Models for hazardous locations are only available as factory enclosure / actuator assemblies.

### THEORY OF OPERATION

MA-305 or MA-405 series actuator output shaft rotates 180° clockwise (CW) when energized and spring returns counterclockwise (CCW) to 0° when de-energized.

MA-31X and MA-41X series actuator output shaft rotates 170° clockwise (CW) when energized and spring returns counterclockwise (CCW) to 0° when de-energized.

MA-305 and MA-405 series actuator motors are assembled to a gear train and stall at the end of the power stroke.

MA-318, MA-416, MA-418 and MA-419 series actuators have an end of travel switch which reduces the running input from 70 watts to 25 watts at the end of the CW rotation.

### PRE-INSTALLATION

#### Inspection

Inspect the carton for damage. If damaged notify the appropriate carrier immediately. Inspect the device for obvious damage. Return damaged products.

#### Required Installation Items

- Wiring diagram
- Tools (not provided)
  - Volt-ohm meter
  - Appropriate screwdriver for mounting screws
  - Appropriate drill and drill bit for mounting screws
- Appropriate accessories
- Mounting screws (not provided)

### INSTALLATION

Always link the actuator to the load to allow the actuator to reach full end of travel.

#### CAUTION

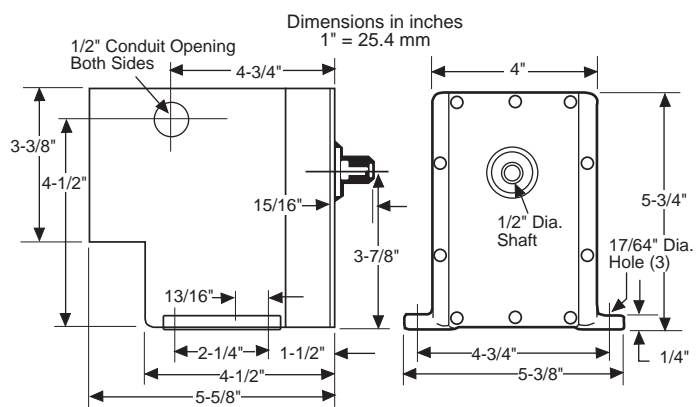
1. Installer must be a qualified experienced technician.
2. Disconnect power supply before installation to prevent electrical shock and equipment damage.
3. Make all connections in accordance with the wiring diagram and in accordance with national and local electrical codes.
4. Do not exceed ratings of the device
5. Avoid locations where excessive vibration or corrosive fumes are present. The case of the actuator is intended for use primarily to provide a degree of protection against windblown dust, rain, sleet, and external ice formation (NEMA Type 4).

### Mounting Location

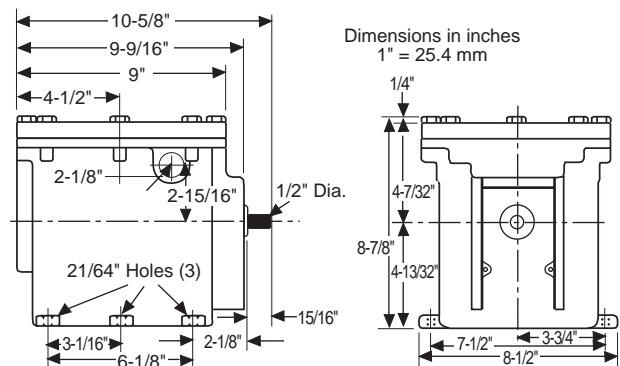
Allow 6" (152 mm) clearance behind the actuator wiring compartment. Locate actuator in a weather protected area. Three mounting holes are provided in the base of the actuator. (See Figures 3 through 5 for mounting dimensions.)

MA-305 and MA-405 series actuators can be mounted in any position. The MA-318, MA-416, MA-418 and MA-419 series actuators must be mounted so that the output shaft lies in a horizontal position.

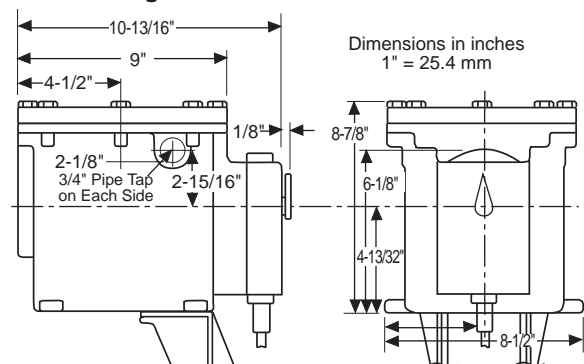
To ensure water and weather resistance, install the cover gasket (provided) and water-tight conduit fittings.



**Figure 3. Mounting Dimensions**



**Figure 4. Hazardous Location Housing Mounting Dimensions for Control Actuators**



**Figure 5. Hazardous Location Housing Mounting Dimensions for Valve Actuators (See Valve Data for Valve Dimensions)**