

APPLICATION

For proportional pneumatic actuator with 3 in.² (19 cm²) effective area used to control small damper and mixing boxes.

SPECIFICATIONS

Construction:

Housing, Rynite® and Ultem® UL-94-5V flame rated plastic material to meet UL-465 requirements for air plenum mounting.

Diaphragm, Beaded molded neoprene.

Stroke: 1" (25.4 mm) and 2" (50.8 mm). See Table 1.

Spring: Retracts actuator shaft on loss of air pressure.

Maximum Air Pressure: 30 psig (207 kPa).

Ambient Temperature Limits:

Shipping, -40 to 180°F (-40 to 82°C).

Operating, -20 to 150°F (-29 to 66°C).

Air Connections: Barb for 1/4" and 5/32" [for runs up to 20' (6 m)] O.D. plastic tube.

Mounting: In any position. Mounting bracket and ball joint connector for 5/16" diameter push rod assembled to actuator.

Dimensions:

MK-111XX, 4-1/4" high x 3-9/16" wide x 3-5/16" deep (108 mm x 90 mm x 84 mm).

MK-121XX, 5-5/8" high x 3-9/16" wide x 3-5/16" deep (143 mm x 90 mm x 84 mm).

TABLE 1. NOMINAL DAMPER AREA

| Damper Type | Proportional Control* | | Two-Position Control at 20 psi* | |
|----------------|-----------------------|---------------------|---------------------------------|---------------------|
| | MK-111XX | MK-121XX | MK-11120 | MK-12120 |
| Parallel Blade | 1.25 ft ² | 2.5 ft ² | 3.75 ft ² | 7.5 ft ² |
| Opposed Blade | 1.6 ft ² | 3.2 ft ² | 4.8 ft ² | 9.6 ft ² |

*Damper ratings are nominal and based on standard (not low leakage) dampers at 1" (25.4 mm) static pressure and 2000 fpm (10 m/s) velocity.

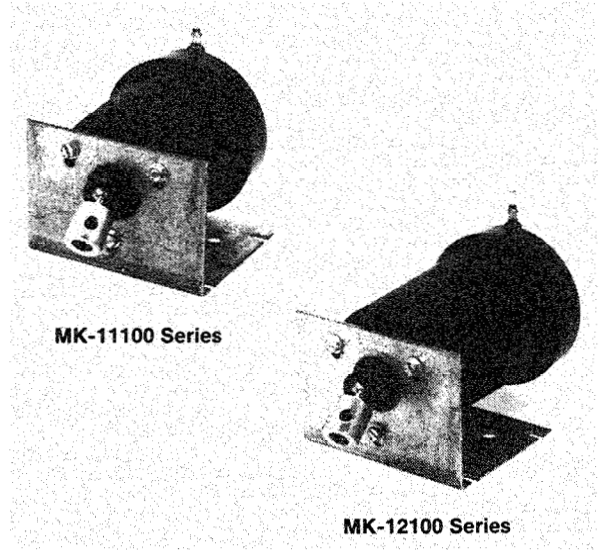
TABLE 2. SPECIFICATIONS

| Part Number | Nominal Operating Range | Stroke | Starting Pressure Non-Adjustable | Maximum Force†† | | | | Nominal Torque** Proportional Control†† | | |
|-------------|-------------------------|--------|----------------------------------|-----------------|---------------------------------------|----------------------------------|-------------------------------------|---|----------------------------------|-------------------------------------|
| | | | | Return Stroke | Power Stroke | | | | | |
| | | | | | Based on 1.5 psi Pressure to Actuator | 15 psi Supply Dual Press. System | 15 psi Supply Single Press. System† | 20 psi Supply Single or Dual Press. System† | 15 psi Supply Dual Press. System | 15 psi Supply Single Press. System† |
| | | | | lb. | lb. | lb. | lb. | lb-in. | lb-in. | lb-in. |
| MK-11100 | 3-8 | 1 | 3 | 4.5 | 16.5 | 21 | 36 | 2.25 | 2.25 | 2.25 |
| MK-11110 | 5-10 | 1 | 5 | 10.5 | 10.5 | 15 | 30 | 2.25 | 2.25 | 2.25 |
| MK-11120 | 8-13 | 1 | 8 | 19.5 | 1.5 | 6 | 21 | .75 | 2.25 | 2.25 |
| MK-11140 | 3-13 | 1 | 3 | 4.5 | 1.5 | 6 | 21 | .75 | 2.25 | 2.25 |
| MK-12100 | 3-8 | 2 | 3 | 4.5 | 16.5 | 21 | 36 | 4.5 | 4.5 | 4.5 |
| MK-12110 | 5-10 | 2 | 5 | 10.5 | 10.5 | 15 | 30 | 4.5 | 4.5 | 4.5 |
| MK-12120 | 8-13 | 2 | 8 | 19.5 | 1.5 | 6 | 21 | 1.5 | 4.5 | 4.5 |
| MK-12140 | 3-13 | 2 | 3 | 4.5 | 1.5 | 6 | 21 | 1.5 | 4.5 | 4.5 |

**Nominal torque for actuators is based on 1.5 psi (10 kPa) pressure change at the actuator.

†Force and torques based on factory set stroke, starting pressure and 90° rotation of driven damper shaft.

††Adjust pressure reducing valve so that listed pressures are available at the actuator.



ACCESSORIES

- 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 1/2" diameter damper shaft
- AM-115 Crank arm for 7/16" diameter damper shaft
- AM-122 Linkage connector straight type
- AM-123 Damper clip
- AM-125 5/16" x 20" damper rod
- AM-125-048 5/16" x 48" damper rod
- AM-132 Ball joint connector
- AM-161-3 Damper linkage kit
- TOOL-95 Pneumatic calibration tool kit

METRIC CONVERSION

- 1" = 25.4 mm
- 1 psig = 6.895 kPa
- 1 sq. ft. = .09 sq. m
- 1 lb-in. = 0.113 Nm

PRE-INSTALLATION

Inspection

Visually inspect the carton for damage. If damaged, notify the appropriate carrier immediately. If undamaged, open the carton and visually inspect the device for obvious defects. Return damaged or defective products.

Required Installation Items

- Piping diagrams
- Tools (not provided):
 - Appropriate screwdriver for mounting screws
 - Appropriate drill and drill bit for mounting screws
- Appropriate accessories
- Mounting screws #10 (not provided)
- Tubing clamp provided for connecting 5/32" tubing to actuator

INSTALLATION

CAUTION

1. Installer must be a qualified, experienced technician.
2. Disconnect air supply before installation to prevent equipment damage.
3. Make all connections in accordance with the piping diagram, and in accordance with national and local codes.
4. Do not exceed ratings of the device.

Mounting

LOCATION

See Figures 1 through 4 for mounting dimensions and damper linkage.

Actuator may be mounted in any position by means of (3) three or (4) four #10 screws (not provided) through the mounting bracket.

CONNECTION OF AIR LINE

Use 5/32" [for runs up to 20' (6 m)] or 1/4" O.D. plastic tubing to connect actuator to the controller. Use of 5/32" tubing requires attachment of tubing clamp to secure tubing to actuator connector. Push 1/4" O.D. tubing over barb on connector for proper fitting.

Linkage

See Figures 3 and 4.

1. Assemble linkage by attaching a straight or ball joint connector to the crank arm on damper shaft.
2. Insert a 5/16" push rod in the actuator ball joint connector and tighten the 1/8" Allen screw.
3. Insert push rod from the actuator connector into the damper crank arm connector. (Do not tighten clamp on damper connector.)
4. Swing damper shaft through entire rotation to insure the proper damper action.

NORMALLY CLOSED DAMPER

1. Return the damper to closed position.
2. Pull damper rod through the damper crank arm connector until the damper is tightly closed.
3. Tighten connector clamp on the damper crank arm.
4. Check linkage assembly by stroking actuator between limits of travel. If required damper travel is not achieved, reset the connecting linkage.

NORMALLY OPEN

1. Move damper to approximately 85° of full open position and tighten connector to damper crank arm.
2. Check linkage assembly by stroking actuator between limits of travel. If required damper travel is not achieved, reset the connecting linkage.

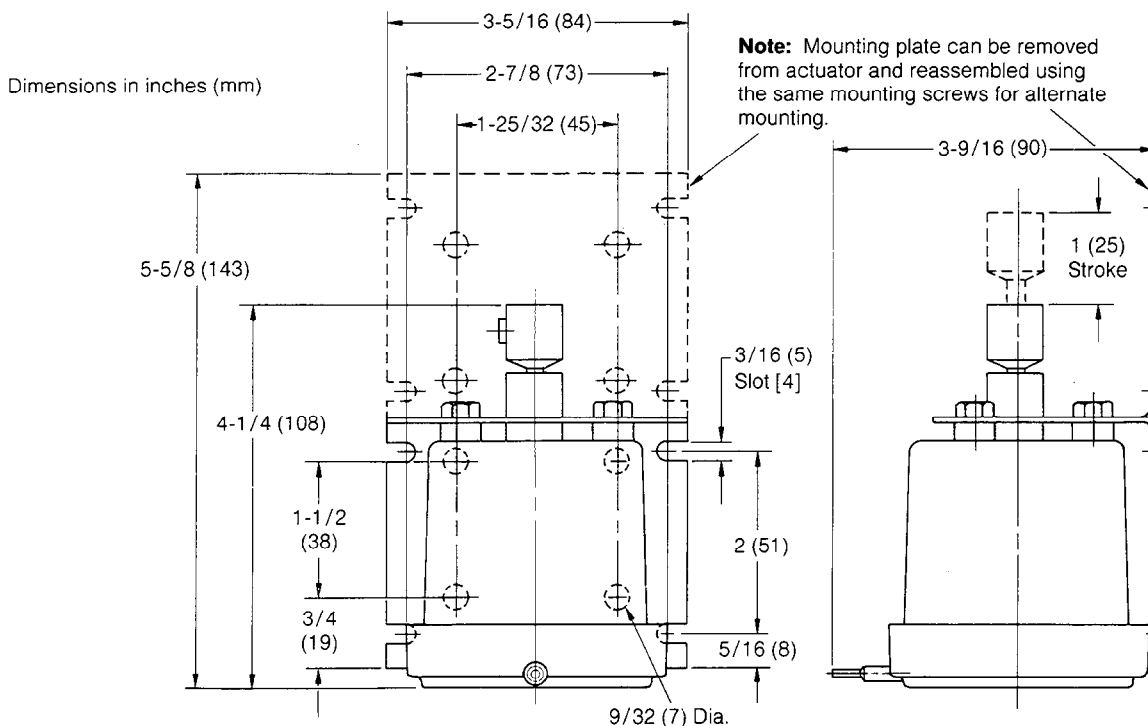


Figure 1. MK-11100 Series Mounting Dimensions

Dimensions in inches (mm)

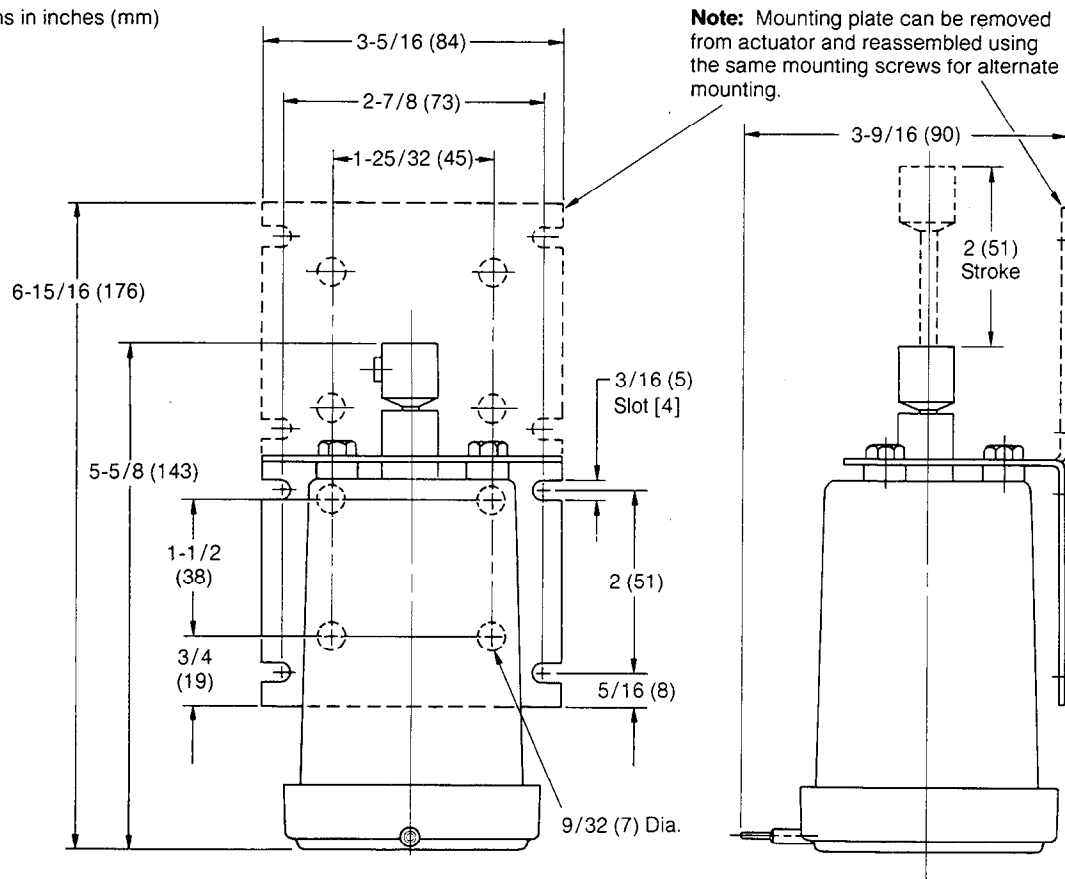
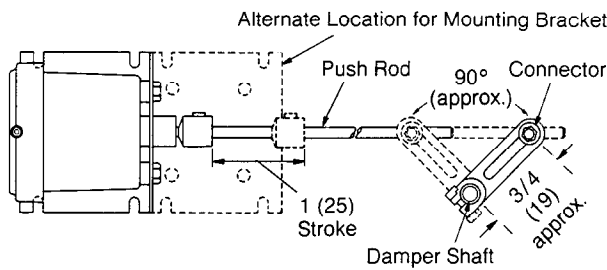
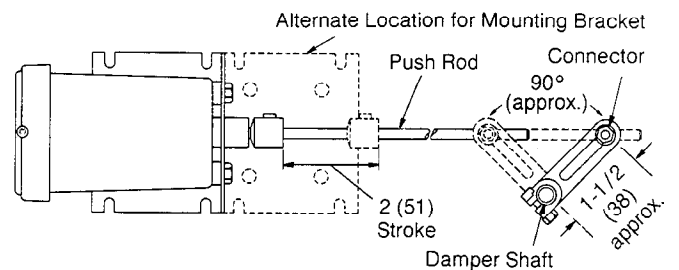


Figure 2. MK-12100 Series Mounting Dimensions



**Figure 3.
MK-11100 Series Actuator
Linked to 90° Rotation Damper**



**Figure 4.
MK-12100 Series Actuator
Linked to 90° Rotation Damper**

PIPING

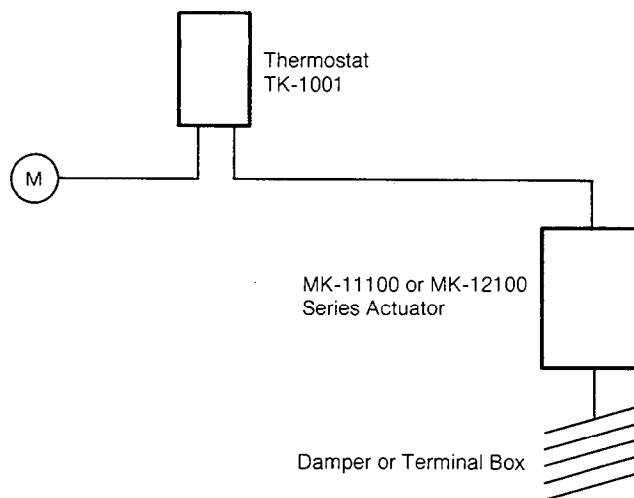


Figure 5. Typical Piping Diagram

FIELD ADJUSTMENTS

No adjustments on actuator. Linkage is field adjustable.

CHECKOUT

Apply air pressure to the actuator that will rotate the damper through the limits of travel. If required damper travel is not achieved, reset the connecting linkage (see Linkage instructions on page 2).

MAINTENANCE

Regular maintenance of the total system is recommended to assure sustained optimum performance.

REPAIR

Do not field repair a defective actuator. A defective actuator must be replaced with a functional unit.