The SERIES WE08 incorporates a full port 2-piece brass ball valve for great flow rates with minimal pressure drop. The valve features a blowout proof stem for added safety, reinforced PTFE seats and seals for longer life, and a brass ball for better performance. Actuators are direct mounted creating a compact assembly for tight spaces.

The Series WE08 can be configured with either an electric or pneumatic actuator. Electric actuators are available in weatherproof or explosion-proof, a variety of supply voltages, and two-position or modulating control. Two-position actuators use the supply voltage to drive the valve open or closed, while the modulating actuator accepts a 4 to 20 mA input for valve positioning. Actuators feature thermal overload protection and permanently lubricated gear train.

The pneumatic double acting actuator uses an air supply to drive the valve open and closed. The actuator has two supply ports, with one driving the valve open and the other driving the valve closed. Spring return pneumatic actuators use the air supply to open the valve and internally loaded springs return the valve to the closed position. Also, between the air supply ports for opening and closing the valve, actuators are constructed of anodized and epoxy coated aluminum for years of corrosion free service.

**SPECIFICATIONS**

**VALVE**
- **Service:** Compatible liquids and gases.
- **Body:** 2-piece.
- **Line Sizes:** 1/2 to 2”.
- **End Connections:** Female NPT.
- **Pressure Limits:** 600 psi (41 bar) WOG.
- **Wetted Materials:** Body, ball, and stem: Brass; Seat, seal, and packing: PTFE.
- **Temperature Limits:** -20 to 425°F (-30 to 220°C).
- **Other Materials:** O-ring: NBR; Handle, stem nut, ferrule: SS; Handle Sleeve: Vinyl; Body and cap: Nickle plated.

**ACTUATORS**
- **Pneumatic “DA” and “SR” Series**
  - **Type:** DA series is a double acting and SR series is a spring return (rack and pinion).
  - **Normal Supply Pressure:** DA: 40 to 115 psi (2.7 to 7.9 bar), SR: 80 psi (5.5 bar).
  - **Maximum Supply Pressure:** 120 psi (8.6 bar).
  - **Air Connections:** DA02 to DA03: 1/4” female NPT, SR02 to SR04: 1/4” female NPT.
  - **Housing Material:** Anodized aluminum body and epoxy coated aluminum end caps.
  - **Temperature Limits:** -40 to 176°F (-40 to 80°C).
  - **Accessory Mounting:** NAMUR standard.

- **Electric “TD” and “MD” Series**
  - **Power Requirements:** 110 VAC, 220 VAC, 24 VAC, or 24 VDC (MD models not available in 24 VDC).
  - **Power Consumption:** See instruction manual.
  - **Cycle Time (per 90°):** TD01 4 s; MD01: 10 s; TD02: 20 s.
  - **Duty Rating:** 85%.

- **Electric “TI” and “MI” Series**
  - **Power Requirements:** 110 VAC, 220 VAC, 24 VAC, 24 VDC.
  - **Power Consumption:** See instruction manual.
  - **Cycle Time (per 90°):** See instruction manual.
  - **Duty Rating:** See instruction manual.

- **Enclosure Rating:** NEMA 7, designed to meet hazardous locations: Class I, Group C & D; Class II, Group E, F & G; Division I & II.
- **Housing Material:** Powder coated aluminum.
- **Temperature Limits:** -40 to 140°F (-40 to 60°C).
- **Electrical Connection:** 1/2” female NPT.
- **Modulating Input:** 4 to 20 mA.
- **Standard Features:** Manual override, position indicator, and TD models come with two limit switches.

- **Electric “TI” and “MI” Series**
  - **Power Requirements:** 110 VAC, 220 VAC, 24 VAC, 24 VDC.
  - **Power Consumption:** See instruction manual.
  - **Cycle Time (per 90°):** See instruction manual.
  - **Duty Rating:** See instruction manual.

- **Enclosure Rating:** NEMA 4X (IP67).
- **Housing Material:** Powder coated aluminum.
- **Temperature Limits:** -22 to 140°F (-30 to 60°C).
- **Electrical Connection:** 1/2” female NPT.
- **Modulating Input:** 4 to 20 mA.
- **Standard Features:** Position indicator and two limit switches.
**Disassembling Pneumatic Actuators**

**WARNING** Before beginning disassembly, ensure that the air supply to the actuator has been disconnected, all accessories have been removed, and that the actuator has been disassembled from the valve.

1. Loosen the end cap fasteners (23) with a wrench (size varies depending on actuator model). On the spring return actuator, alternate 3 to 5 turns on each fastener until the springs are completely decompressed. Use caution when removing the cap since the springs are under load until the fasteners are fully extended.

2. Remove the pinion snap ring (13) with a lock ring tool. The indicator (12) may now be removed.

3. Turn the pinion shaft (2) counter clockwise until the pistons are at the full end of travel. Disengage the pistons (15) from the pinion. **(Note: Low pressure air- -3 to 5 psi MAXIMUM–might be required to force the pistons completely from the body.)** Note the position of the pistons before removing them from the actuator body.

4. Remove the pinion through the bottom of the actuator. The actuator is now completely disassembled.

**Spring Return Actuator Operation**

Air to PORT 2 (the left hand port) causes the actuator to turn counterclockwise (CCW). Loss of air to PORT 2 causes air to exhaust and the actuator turns clockwise (CW). This is the FAIL CLOSE operation.

**Double Acting Actuators Operation**

Air to PORT 2 (the left hand port) causes the actuator to turn counterclockwise (CCW). Air to PORT 1 (the right hand port) causes the actuator to turn clockwise (CW).

**Pneumatic Actuator Maintenance**

Routine maintenance of pneumatic actuator:

- Keep the air supply dry and clean
- Keep the actuator surface clean and free from dust
- Periodic checks should be done to make sure all fittings are tight
- Pneumatic actuators are supplied with lubrication to last the entire life span of the actuator under normal operating conditions.

The outer surface of the pneumatic actuator should be clean to avoid friction or corrosion. All fittings and connections should be tight to prevent leaks during operation. Check the bolts mounting the valve to the actuator to make sure they have not come loose during shipping or installation. Make sure the valve and actuator are not rubbing or jamming against other components during operation. The actuator should be inspected annually to make sure all fittings and bolts are tight and nothing has come loose during operation.

**Disassembling Pneumatic Actuators**

1. Loosen the end cap fasteners (23) with a wrench (size varies depending on actuator model). On the spring return actuator, alternate 3 to 5 turns on each fastener until the springs are completely decompressed. Use caution when removing the cap since the springs are under load until the fasteners are fully extended.

2. Remove the pinion snap ring (13) with a lock ring tool. The indicator (12) may now be removed.

3. Turn the pinion shaft (2) counter clockwise until the pistons are at the full end of travel. Disengage the pistons (15) from the pinion. **(Note: Low pressure air- -3 to 5 psi MAXIMUM–might be required to force the pistons completely from the body.)** Note the position of the pistons before removing them from the actuator body.

4. Remove the pinion through the bottom of the actuator. The actuator is now completely disassembled.

**WARNING** For optimal operation, pneumatic actuators should be run with a supply of clean, lubricated air.

**PNEUMATIC ACTUATOR BILL OF MATERIALS**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Quantity</th>
<th>Part Name</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>Cylinder</td>
<td>Extruded aluminum alloy</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>Output shaft</td>
<td>Stainless steel</td>
</tr>
<tr>
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<tr>
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<td>5 to 12</td>
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**Pneumatic Actuator Maintenance**

Routine maintenance of pneumatic actuator:

- Keep the air supply dry and clean
- Keep the actuator surface clean and free from dust
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- Pneumatic actuators are supplied with lubrication to last the entire life span of the actuator under normal operating conditions.

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1. Loosen the end cap fasteners (23) with a wrench (size varies depending on actuator model). On the spring return actuator, alternate 3 to 5 turns on each fastener until the springs are completely decompressed. Use caution when removing the cap since the springs are under load until the fasteners are fully extended.

2. Remove the pinion snap ring (13) with a lock ring tool. The indicator (12) may now be removed.

3. Turn the pinion shaft (2) counter clockwise until the pistons are at the full end of travel. Disengage the pistons (15) from the pinion. **(Note: Low pressure air- -3 to 5 psi MAXIMUM–might be required to force the pistons completely from the body.)** Note the position of the pistons before removing them from the actuator body.

4. Remove the pinion through the bottom of the actuator. The actuator is now completely disassembled.

**WARNING** Be sure the actuator surfaces are free of debris and scratches before reassembling.

1. Apply a light film of grease to all O-rings and the pinion before replacing.
2. Put the pinion (2) back through the actuator with the flats of the pinion shaft running parallel with the body.
3. When reassembling the actuator, make sure that the piston racks are square to the actuator body and returned to their original orientation. **(Note: The normal operation of all spring return pneumatic actuators is FAIL CLOSED. To change the orientation to FAIL OPEN, rotate the racks 180° to create a reverse operation.)**
4. When replacing springs in a spring return actuator, ensure that the springs are replaced in their identical position in the end cap from which they were removed. **(Note: In some circumstances, you might want to change the standard 80 pound spring set to fit your application and available air pressure.)**
5. Seal the end caps with a petroleum lubricant and bolt to actuator body.
6. Check the seal of the actuator by covering seal areas (pinion, end caps) with soapy water and using low pressure air to the actuator to ensure that no bubbles are produced.

**WARNING** Be sure the actuator surfaces are free of debris and scratches before reassembling.

1. Increase the air supply pressure and look for leaks in the supply pressure pipeline.
2. Increase the air supply or reduce the number of devices operating at the same time.
3. Replace the actuator with a larger actuator.

**Pneumatic Actuator Bill of Materials**

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</tbody>
</table>
To Set The Open Position
1. Cycle the valve to the open position by applying power to terminals. The top cam and switch control this position. In the open position, the set screw in the top cam will be accessible.
2. If the valve is not open completely:
   a. Slightly loosen the set screw on the bottom cam.
   b. Rotate the cam clockwise (CW) by hand until the switch makes contact. Contact is made when a slight click can be heard. By making incremental CW movements of the bottom cam, the valve can be positioned precisely in the desired position.
   c. When the top cam is set, tighten the set screw securely.
3. If the valve opens too far:
   a. Apply power to terminals. This will begin to rotate valve CW. When valve is fully open and in the exact position desired, remove power from actuator.
   b. Loosen the set screw in the top cam.
   c. Rotate the top cam counterclockwise (CCW) until the switch arm drops off the round portion of the cam onto the flat section. A slight click can be heard as the switch changes state.
   d. Continue applying power to terminals until valve is in the desired position.

To Set The Closed Position
1. Apply power to terminals to move the valve toward the closed position. The bottom cam and switch control the closed position. In the closed position, the set screw in the bottom cam will be accessible.
2. If the valve is not closed completely:
   a. Slightly loosen the set screw on the bottom cam.
   b. Rotate the cam counterclockwise (CCW) by hand until the switch makes contact. Contact is made when a slight click can be heard. By making incremental CCW movements of the bottom cam, the valve can be positioned precisely in the desired position.
   c. When the top cam is set, tighten the set screw securely.
3. If the valve closes too far:
   a. Apply power to terminals. This will begin to rotate valve CCW. When valve is fully closed and in the exact position desired, remove power from actuator.
   b. Loosen the set screw in the top cam.
   c. Rotate the top cam clockwise (CW) until the switch arm drops off the round portion of the cam onto the flat section. A slight click can be heard as the switch is no longer making contact with the round part of the cam.
   d. Continue applying power to terminals until valve is in the desired position.
Electric Actuators Wiring Diagram: ACT-TI & ACT-MI

Wiring Diagrams for
TI01-A to TI06-A1: 110 VAC, TI01-B to TI06-B: 220 VAC, TI01-C to TI06-C: 24 VAC

- PSC MOTOR
- OPTIONAL HEATER & THERMOSTAT
- GROUND SCREW
- FIELD WIRING
- LIGHTS FOR REMOTE POSITION INDICATION
- ARTIFICAL LIGHTS FOR REMOTE POSITION INDICATION
- DC VOLTAGE
- SPDT SWITCH SHOWN FOR ILLUSTRATION ONLY
- SW. #1 OPEN SWITCH
- SW. #2 CLOSE SWITCH
- REVERSING RELAY SUPPLIED BY CUSTOMER

NOTES:
- POWER TO TERMINALS ONE & TWO OPENS THE VALVE (CCW ROTATION)
- POWER TO TERMINALS ONE & THREE CLOSES THE VALVE (CW ROTATION)
- TERMINALS 4 & 5 ARE FOR LIGHT INDICATION
- WIRING DIAGRAM ILLUSTRATES THE ACTUATOR IN THE OPEN POSITION

Wiring Diagrams for
TI01-D to TI06-D: 24 VDC

- ACTUATOR SHOWN IN OPEN POSITION
- REVERSING RELAY SUPPLIED BY CUSTOMER
Wiring Diagrams for
MI01-A to MI06-A1: 110 VAC, MI01-B to MI06-B: 220 VAC, MI01-C to MI06-C: 24 VAC

NOTE:
ACTUATOR SHIPPED IN OPEN
POSITION. 20mA REPRESENTS OPEN
POSITION. DO NOT ADJUST FEEDBACK
POTENTIOMETER OR LIMIT SWITCHES
THEY ARE FACTORY SET AND DO NOT
REQUIRE CALIBRATION. TO
CALIBRATE THE OPEN AND CLOSE
POSITION, USE THE ZERO (4mA) AND
SPAN (20mA) TRIM POTENTIOMETERS.

TO CALIBRATE, OPERATE ACTUATOR
TO CLOSE POSITION AND ADJUST WITH
ZERO TRIM POT THEN OPERATE TO
OPEN POSITION AND SET USING SPAN
TRIM POT. NO FURTHER CALIBRATION IS
NECESSARY.

Wiring Diagrams for
MI01-D to MI06-D: 24 VDC

NOTE:
ACTUATOR SHIPPED IN OPEN
POSITION. 20mA REPRESENTS OPEN
POSITION. DO NOT ADJUST FEEDBACK
POTENTIOMETER OR LIMIT SWITCHES
THEY ARE FACTORY SET AND DO NOT
REQUIRE CALIBRATION. TO
CALIBRATE THE OPEN AND CLOSE
POSITION, USE THE ZERO (4mA) AND
SPAN (20mA) TRIM POTENTIOMETERS.

TO CALIBRATE, OPERATE ACTUATOR
TO CLOSE POSITION AND ADJUST WITH
ZERO TRIM POT THEN OPERATE TO
OPEN POSITION AND SET USING SPAN
TRIM POT. NO FURTHER CALIBRATION IS
NECESSARY.
Electric Actuators Wiring Diagram: ACT-TD & ACT-MD

Wiring Diagrams for TD01-A to TD06-A: 110 VAC, TD01-B to TD06-B: 220 VAC, TD01-C to TD06-C: 24 VAC

Note: To speed up installation of the control wires to the ACT-MDXX modulating actuator, it is recommended to remove the control module from the actuator. The control module can be removed by removing the two mounting screws on the left and right of the control module. Install the control wires to the correct terminal points and then reinstall the control module.

Electric Actuator Maintenance

Once the actuator has been properly installed, it requires no maintenance. The gear train has been lubricated and in most cases will never be opened.

Duty Cycle Definition

“Duty Cycle” means the starting frequency.

Formula: Running Time ÷ (Running Time + Rest Time) x 100% = duty cycle

→ Rest Time = Running Time x (1 - duty cycle) ÷ duty cycle

For example: The running time is 15 seconds

30% duty cycle 15 x [(1 - 30%) / 30%] = 35 → The rest time will be 35 seconds

75% duty cycle 15 x [(1 - 75%) / 75%] = 5 → The rest time will be 5 seconds

If the duty cycle is higher, the rest time will be shortened, which means the starting frequency will be higher.

Thermal Overload

All actuators are equipped with thermal overload protection to guard the motor against damage due to overheating.

Mechanical Overload

All actuators are designed to withstand stall conditions. It is not recommended to subject the unit to repeated stall conditions.

Explosion-Proof Electric Actuators

WARNING

1. DO NOT under any circumstances remove the cover of the actuator while in a hazardous location. Removal of the cover while in a hazardous location could cause ignition of hazardous atmospheres.

2. DO NOT under any circumstances use an explosion-proof electric actuator in a hazardous location that does not meet the specifications for which the actuator was designed.

3. Always verify that all electrical circuits are de-energized before opening the actuator.

4. Always mount and cycle test the actuator on the valve in a non-hazardous location.

5. When removing the cover, care must be taken not to scratch, scar, deform the flame path of the cover and base of the actuator, since this will negate the NEMA rating of the enclosure.

6. When replacing the cover, take care that the gasket is in place to assure proper clearance after the cover is secured.

7. All electrical connections must be in accordance with the specifications for which the unit is being used.

8. Should the unit ever require maintenance, remove from the hazardous location before attempting to work on the unit.

If the actuator is in a critical application, it is advisable to have a standby unit in stock.
### Electric Actuators Performance Rating

#### TD01
- **Voltage**
  - TI02 and MI01, MI02: 110 VAC
  - TD06 and MD06 (MD Not Available in 24 VDC): 220 VAC
  - TD05 and MD05 (MD Not Available in 24 VDC): 24 VAC
  - TD04 and MD04 (MD Not Available in 24 VDC): 24 VDC
- **Cycle Time (Two-Position)**
  - TD02 and MD02 (MD Not Available in 24 VDC): 10 s
  - TD03 and MD03 (MD Not Available in 24 VDC): 30 s
  - TD04 and MD04 (MD Not Available in 24 VDC): 30 s
- **Duty Cycle (Modulating)**
  - TD01: 85%
  - TD02 and TD03: 85%
  - TD04 and TD05: 85%
  - TD06: 85%
- **Duty Cycle (Two-Position)**
  - TD01: 25%
  - TD02 and TD03: 25%
  - TD04 and TD05: 25%
  - TD06: 25%
- **AMP Draw**
  - TD01: 0.24 A
  - TD02 and TD03: 0.24 A
  - TD04 and TD05: 0.24 A
  - TD06: 0.24 A
- **Torque (in-lb)**
  - TD01: 200
  - TD02 and TD03: 200
  - TD04 and TD05: 200
  - TD06: 200

#### TD02 and MD02 (MD Not Available in 24 VDC)
- **Voltage**
  - 110 VAC
  - 220 VAC
  - 24 VAC
  - 24 VDC
- **Cycle Time (Two-Position)**
  - 10 s
  - 10 s
  - 10 s
- **Duty Cycle (Modulating)**
  - 85%
  - 85%
  - 85%
  - 85%
- **Duty Cycle (Two-Position)**
  - 25%
  - 25%
  - 25%
  - 25%
- **AMP Draw**
  - 0.24 A
  - 0.16 A
  - 1.28 A
- **Torque (in-lb)**
  - 265
  - 265
- **Cycle Time (Modulating)**
  - 10 s
  - 10 s
  - 10 s
  - 10 s
- **Duty Cycle (Two-Position)**
  - 25%
  - 25%
  - 25%
  - 25%
- **AMP Draw**
  - 0.16 A
  - 1.28 A
- **Torque (in-lb)**
  - 265

#### TD03 and MD03 (MD Not Available in 24 VDC)
- **Voltage**
  - 110 VAC
  - 220 VAC
  - 24 VAC
  - 24 VDC
- **Cycle Time (Two-Position)**
  - 30 s
  - 30 s
  - 30 s
  - 30 s
- **Duty Cycle (Modulating)**
  - 85%
  - 85%
  - 85%
  - 85%
- **Duty Cycle (Two-Position)**
  - 25%
  - 25%
  - 25%
  - 25%
- **AMP Draw**
  - 0.57 A
  - 0.35 A
  - 2.03 A
  - 2.03 A
- **Torque (in-lb)**
  - 885
  - 885
  - 885
  - 885

#### TD04 and MD04 (MD Not Available in 24 VDC)
- **Voltage**
  - 110 VAC
  - 220 VAC
  - 24 VAC
  - 24 VDC
- **Cycle Time (Two-Position)**
  - 30 s
  - 30 s
  - 30 s
  - 30 s
- **Duty Cycle (Modulating)**
  - 85%
  - 85%
  - 85%
  - 85%
- **Duty Cycle (Two-Position)**
  - 25%
  - 25%
  - 25%
  - 25%
- **AMP Draw**
  - 0.65 A
  - 0.37 A
  - 3.57 A
  - 3.57 A
- **Torque (in-lb)**
  - 1770
  - 1770
  - 1770
  - 1770

#### TD05 and MD05 (MD Not Available in 24 VDC)
- **Voltage**
  - 110 VAC
  - 220 VAC
  - 24 VAC
  - 24 VDC
- **Cycle Time (Two-Position)**
  - 30 s
  - 30 s
  - 30 s
  - 30 s
- **Duty Cycle (Modulating)**
  - 85%
  - 85%
  - 85%
  - 85%
- **Duty Cycle (Two-Position)**
  - 25%
  - 25%
  - 25%
  - 25%
- **AMP Draw**
  - 1.12 A
  - 0.57 A
  - 5.13 A
  - 5.13 A
- **Torque (in-lb)**
  - 3540
  - 3540
  - 3540
  - 3540

#### TD06 and MD06 (MD Not Available in 24 VDC)
- **Voltage**
  - 110 VAC
  - 220 VAC
  - 24 VAC
  - 24 VDC
- **Cycle Time (Two-Position)**
  - 45 s
  - 45 s
  - 45 s
  - 45 s
- **Duty Cycle (Modulating)**
  - 85%
  - 85%
  - 85%
  - 85%
- **Duty Cycle (Two-Position)**
  - 25%
  - 25%
  - 25%
  - 25%
- **AMP Draw**
  - 1.18 A
  - 0.60 A
  - 6.04 A
  - 6.04 A
- **Torque (in-lb)**
  - 5210
  - 5210
  - 5210
  - 5210

#### T01
- **Voltage**
  - 110 VAC
  - 220 VAC
  - 24 VAC
  - 24 VDC
- **Cycle Time (Two-Position)**
  - 2.5 s
  - 2.5 s
  - 2.5 s
  - 2.5 s
- **Duty Cycle (Modulating)**
  - 85%
  - 85%
  - 85%
  - 85%
- **Duty Cycle (Two-Position)**
  - 25%
  - 25%
  - 25%
  - 25%
- **Full Load AMP Draw**
  - 0.64
  - 0.32
  - 0.4
  - 0.4
- **Torque (in-lb)**
  - 100
  - 100
  - 100
  - 100

#### TI02 and MI01, MI02
- **Voltage**
  - 110 VAC
  - 220 VAC
  - 24 VAC
  - 24 VDC
- **Cycle Time (Two-Position)**
  - 5 s
  - 5 s
  - 5 s
  - 5 s
- **Duty Cycle (Modulating)**
  - 10 s
  - 10 s
  - 10 s
  - 10 s
- **Duty Cycle (Two-Position)**
  - 25%
  - 25%
  - 25%
  - 25%
- **Full Load AMP Draw**
  - 0.38
  - 0.18
  - 0.7
  - 0.7
- **Torque (in-lb)**
  - 200
  - 200
  - 200
  - 200

**Warranty/Return**
Upon final installation of the Series WE, only routine maintenance is required. If the Series WE is not field serviceable and should be returned if repair is needed. Field repair should not be attempted and may void warranty.

**Maintenance/Repair**
Refer to "Terms and Conditions of Sale" in our catalog and on our website. Contact customer service to receive a Return Goods Authorization number before shipping the product back for repair. Be sure to include a brief description of the problem plus any additional application notes.