

# Installation & Maintenance Instructions

2-WAY INTERNAL PILOT-OPERATED SOLENOID VALVES  
NORMALLY CLOSED OPERATION — STEAM OR HOT WATER SERVICE

1", 1¼", 1½", 2" OR 2½" NPT

SERIES

8220

I&M No.V6082R7

**NOTICE:** See separate solenoid installation and maintenance instructions for information on: Wiring, Solenoid Temperature, Cause of Improper Operation, Coil or Solenoid Replacement.

## DESCRIPTION

Series 8220 valves are 2-way normally closed, internal pilot operated solenoid valves designed for steam or hot water service. These valves are made of forged brass with stainless steel internal parts ethylene propylene, TFE/P and/or TEFLON\* elastomers depending upon construction. Series 8220 valves may be provided with a general purpose or explosionproof solenoid enclosure.

## OPERATION

**Normally Closed:** Valve is closed when solenoid is de-energized; open when energized.

**IMPORTANT:** Minimum operating pressure differential required is 5 psi. Valve will remain open down to 3 psi differential once opened at 5 psi or higher.

## INSTALLATION

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible fluids or exceed pressure rating of the valve. Installation and valve maintenance to be performed by qualified personnel.

**CAUTION:** Maximum operating pressure differentials are based on temperature-related material limitations. Therefore, do not use valves with a steam source of higher pressure than the nameplate maximum operating pressure differential. Also do not use a pressure reducing valve to reduce steam source to rated pressure because this would result in superheated steam of excessive temperature entering the valve.

## Temperature Limitations And Pressure Ratings

For maximum valve ambient and fluid temperatures, refer to chart below. Check nameplate for maximum pressure rating.

| Maximum Pressure Rating psi & Service (Maximum Operating Pressure Differential) | Coil Class | Maximum Ambient Temp. °F |       | Maximum Fluid Temp. °F |
|---|------------|--------------------------|-------|------------------------|
| 50 steam  | F or H     | 77                       | 125†  | 300                    |
| 125 steam   | H          | 77                       | 125†  | 353                    |
| 150 hot water   | F or H     | 77                       | 125 † | 210                    |

† Note: Maximum ambient temperature for valves with design change letter G or higher within the catalog number, for example Catalog No. 8220G15.

## Future Service Considerations

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous, noncombustible fluid after disassembly and reassembly.

## Positioning

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertically and upright to reduce the possibility of foreign matter accumulating in the solenoid base sub-assembly area.

## Piping

Connect piping or tubing to valve according to markings on valve body.

**CAUTION:** This valve is equipped with ethylene propylene elastomers which can be attacked by oils and greases. Wipe the pipe threads clean of cutting oils.

Apply pipe compound sparingly to male pipe threads only. If applied to valve threads, the compound may enter the valve and cause operational difficulty. Avoid pipe strain by properly supporting and aligning piping. When tightening the pipe, do not use valve or solenoid as a lever. Locate wrenches applied to valve body or piping as close as possible to connection point.

**CAUTION:** To protect the solenoid valve, install a strainer or filter, suitable for the service involved, in the inlet side as close to the valve as possible. Clean periodically depending on service conditions. See ASCO Series 8600, 8601 and 8602 for strainers.

## MAINTENANCE

**WARNING:** To prevent the possibility of death, serious injury or property damage, turn off electrical power, depressurize valve, and vent fluid to a safe area before servicing the valve.

Note: It is not necessary to remove the valve from the pipeline for repairs.

## Cleaning

All solenoid valves should be cleaned periodically. The time between cleanings will vary depending on the medium and service conditions. In general, if the voltage to the coil is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. In the extreme case, faulty valve operation will occur and the valve may fail to open or close. Clean strainer or filter when cleaning the valve.

\*DuPont Co. Registered Trademark

## Preventive Maintenance

- Keep the medium flowing through the valve as free from dirt and foreign material as possible.
- Periodic exercise of the valve should be considered if ambient or fluid conditions are such that corrosion, elastomer degradation, fluid contamination build up, or other conditions that could impede solenoid valve shifting are possible. The actual frequency of exercise necessary will depend on specific operating conditions. A successful operating history is the best indication of a proper interval between exercise cycles.
- Depending on the medium and service conditions, periodic inspection of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

## Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
- **Excessive Leakage:** Disassemble valve and clean all parts. If parts are worn or damaged, install a complete ASCO Rebuild Kit.

## Valve Disassembly

Note: Check pressure rating on nameplate to determine valve construction. Refer to Figure 1 on page 3 for valves with a pressure rating of 50 psi steam or 150 psi hot water. Refer to Figure 2 on page 4 for valves with a pressure rating of 125 psi steam or 150 psi hot water.

1. Disassemble valve in an orderly fashion using exploded views for identification and placement of parts.

**▲ CAUTION: On 2" and 2½" NPT valves there is a body plug on the outlet side of the valve body. Do not remove this body plug. The body plug has been sealed in place at the factory. Removal is not necessary for valve cleaning or rebuilding.**

2. Remove solenoid, see separate instructions.
3. Unscrew solenoid base sub-assembly and remove core assembly, core spring, core guide, and solenoid base gasket.
4. For normal maintenance (cleaning), it is not necessary to remove the valve seat. However, for valve seat removal use a 7/16" thin wall socket wrench.
5. Remove bonnet screws and valve bonnet from valve body. Then remove the following parts: piston spring, support, lip seal, piston assembly, body passage eyelet or body passage tube, body passage gasket and body gasket (see note).

Note: On some valve constructions, two body gaskets are present. When installing an ASCO Rebuild Kit, one large body gasket is supplied. This replaces the two body gaskets previously used.

6. On valves rated for 50 psi steam or 150 psi hot water remove aspirator tube, disc, disc gasket (on 2" & 2½" NPT valves only) and disc washer (on 1", 1¼" & 1½" NPT valves only) from piston.

7. All parts are now accessible to clean or replace. If parts are worn or damaged, install a complete ASCO Rebuild kit.

## Valve Reassembly

1. Reassemble valve using exploded views for identification and placement of parts.
2. Lubricate the solenoid base gasket, and the surface of the piston which contacts the lip seal with DOW CORNING® 200 Fluid lubricant or an equivalent high-grade silicone fluid.
3. Lubricate body gasket, body passage gasket, disc, and disc gasket (on 2" and 2½" NPT valves only) with DOW CORNING® 111 Compound lubricant or an equivalent high-grade silicone grease.
4. Position the following parts in the valve body: support, body passage gasket, body passage eyelet or body passage tube and body gasket.
5. On valves rated for 50 psi steam or 150 hot water reassemble piston assembly following views provided in Figure 1 on page 3.
6. Position lip seal, flanged end outward, onto piston assembly. Install piston assembly with lip seal into support in valve body cavity.
7. Replace piston spring, valve bonnet, and bonnet screws. Torque bonnet screws in a crisscross manner to  $144 \pm 15$  in-lbs [ $16,3 \pm 1,7$  Nm].
8. If removed, replace valve seat with a small amount of thread compound on male threads to avoid possible leakage. Torque valve seat to  $65 \pm 15$  in-lbs [ $7,3 \pm 1,7$  Nm].
9. Replace solenoid base gasket, core assembly, core spring, core guide, and solenoid base sub-assembly. Torque solenoid base sub-assembly to  $175 \pm 25$  in-lbs [ $19,8 \pm 2,8$  Nm].
10. Install solenoid, see separate instructions and make electrical hookup.

**▲ WARNING: To prevent the possibility of death, serious injury or property damage, check valve for proper operation before returning to service. Also perform internal seat and external leakage tests with a non-hazardous, noncombustible fluid.**

11. Restore line pressure and electrical power supply to valve.
12. After maintenance is completed, operate the valve a few times to be sure of proper operation. A metallic *click* indicates the solenoid is operating.

## ORDERING INFORMATION FOR ASCO REBUILD KITS

Parts marked with an asterisk (\*) in the exploded view are supplied in Rebuild Kits. When Ordering Rebuild Kits for ASCO valves, order the Rebuild Kit number stamped on the valve nameplate. If the number of the kit is not visible, order by indicating the number of kits required, and the Catalog Number and Serial Number of the valve(s) for which they are intended.

Torque Chart

| Part Name             | Torque Value Inch-Pounds | Torque Value Newton-Meters |
|-----------------------|--------------------------|----------------------------|
| Solenoid sub-assembly | 175 ± 25                 | 19,8 ± 2,8                 |
| Valve seat            | 65 ± 15                  | 7,3 ± 1,7                  |
| Bonnet screws         | 144 ± 15                 | 16,3 ± 1,7                 |

1½" NPT Construction Shown

Partial view showing orientation of core guide, core spring and core assembly.

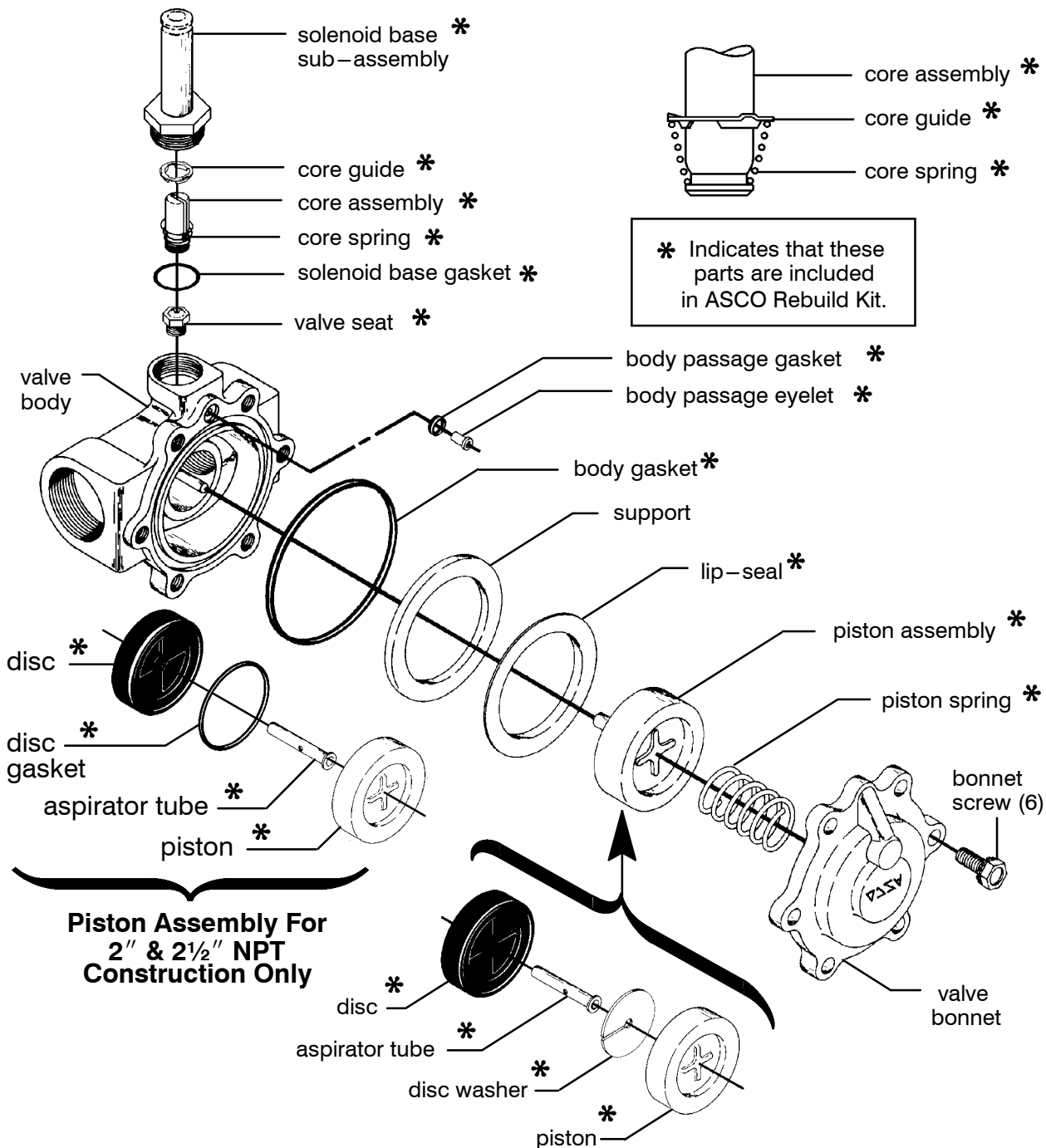


Figure 1. Series 8220 valve without solenoid.  
 (1", 1¼", or 1½" NPT construction typical for 50 psi steam or 150 psi hot water).

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