

Installation & Maintenance Instructions

2-WAY INTERNAL PILOT-OPERATED SOLENOID VALVES
 NORMALLY CLOSED OPERATION – 3/8", 1/2", OR 3/4" NPT
 FUEL GAS SERVICE

SERIES

8214

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

DESCRIPTION

Series 8214 valves are 2-way normally closed diaphragm-type solenoid valves designed for fuel gas service. Valve bodies are made of rugged aluminum with trim and internal parts made of steel and stainless steel. Series 8214 valves may be provided with a general purpose or watertight/explosionproof solenoid.

Provisions for Pressure and Seat Leakage Testing

(See Figure 2)

Series 8214 valves are provided with two 1/8" tapped and plugged holes. One upstream for pressure testing; one down stream for seat leakage testing. Leakage testing frequency shall be at least annually in accordance with NFPA-86 or original equipment manufacturer recommendations. Testing is also required after valve disassembly and reassembly for inspection, cleaning or rebuilding.

OPERATION

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

Operating Pressure Differential

- Minimum 0 psig
- Maximum 5 psig

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.

Temperature Limitations

For valve ambient and fluid temperatures, refer to chart below.

Catalog Numbers †	Service AC or DC	Catalog Number Prefix	Minimum and Maximum Ambient and Fluid Temperatures
8214G10 8214G20 8214G30	AC	None, KF, SF or SC	-40°F (-40°C) to 125°F (52°C)
		HT, KH, ST or SU	-40°F (-40°C) to 140°F (60°C)
	DC	None, KF SF or SU	-20°F (-29°C) to 104°F (39°C)

† Includes catalog numbers with prefix "EF"

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.

Mounting

For mounting bracket (optional feature) dimensions, see Figure 1.

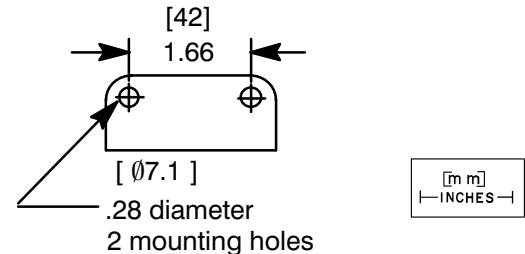


Figure 1. Mounting bracket dimension (inches)

Piping

CAUTION: Piping must comply with applicable local and national codes and ordinances, including the National Fuel Gas Code ANSI Z223.1/NFPA No. 54.

Connect piping to valve according to markings on valve body. 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. Valves should be checked for external leakage at piping connections after installation, see *Testing for External Leakage* section.

CAUTION: To avoid damage to the valve body, DO NOT OVERTIGHTEN PIPE CONNECTIONS. If Teflon* tape, paste, spray, or similar lubricant is used, use extra care when tightening due to reduced friction.

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.

Testing for External Leakage

WARNING: To prevent the possibility of severe personal injury or property damage, extinguish all open flames and avoid any type of sparking or ignition.

1. Block gas flow on downstream side of valve.
2. Apply pressure to valve within nameplate rating and energize solenoid.

*DuPont's Registered Trademark

3. Apply a soapy solution or a commercially available leak detecting solution to the pipe connections and check for bubbles. If the valve has been tested for seat leakage or disassembled and reassembled for inspecting, cleaning, or rebuilding apply the solution around solenoid base sub-assembly, bonnet/body joint and pipe plugs.
4. If leakage exists, depressurize valve and turn off electrical power supply. Tighten connections as required and retest following the above steps.

MAINTENANCE

⚠ WARNING: To prevent the possibility of severe personal injury or property damage, turn off electrical power, depressurize valve, extinguish all open flames and avoid any type of sparking or ignition. Vent hazardous or combustible 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.

Preventive Maintenance

- Keep the medium flowing through the valve as free from dirt and foreign material as possible.
- While in service, the valve should be operated at least once a month to insure proper opening and closing.
- 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 (Refer to Figure 4)

1. Disassemble valve in an orderly fashion using exploded view for identification of parts.
2. Remove solenoid, see separate instructions.
3. Unscrew solenoid base sub-assembly from valve bonnet.
4. Remove bonnet screws, valve bonnet, solenoid base gasket, core/diaphragm sub-assembly and body gasket.
5. 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 using exploded view for identification and placement of parts.
2. Lubricate solenoid base gasket and body gasket with DOW CORNING® 200 Fluid lubricant or an equivalent high-grade silicone fluid.

3. Install body gasket and core/diaphragm sub-assembly in valve body. Locate the two bleed holes in the diaphragm assembly approximately 90° from valve *outlet*. The core/diaphragm sub-assembly is comprised of a rider ring, core spring, core guide, hanger spring, core assembly and diaphragm assembly.

⚠ CAUTION: Do not distort hanger spring between core assembly and diaphragm assembly.

4. Replace valve bonnet and bonnet screw on valve body. Hand thread screws a few turns into valve body, then torque bonnet screws in a crisscross manner to 70 ± 8 in-lbs [8,0 ± 0,9 Nm].
5. Install solenoid base gasket and solenoid base sub-assembly. Compress rider ring slightly to prevent damage when installing solenoid base sub-assembly. Torque solenoid base sub-assembly to 175 ± 25 in-lbs [19,8 ± 2,8 Nm].
6. Install solenoid, see separate instructions and make electrical hookup.

⚠ WARNING: To prevent the possibility of severe personal injury or property damage, check valve for proper operation before returning to service. Also perform internal seat and external leakage tests (with a nonhazardous, noncombustible fluid if practical).

7. Check valve for external leakage as indicated under the *Piping* section, and for internal (seat) leakage as follows.

Testing for Internal (Seat) Leakage (Refer to Figure 3)

⚠ CAUTION: Be sure valve can be tested without affecting other equipment.

1. Shut off both the upstream and downstream manual gas cocks. The downstream manual gas cock should remain closed throughout the entire test procedure.
2. Program the control system to operate the valve through five cycles. Listen carefully for the solenoid coil to *click* indicating proper operation.
3. Open the upstream manual gas cock. Program the control system to energize and maintain the valve in the open (energized) position. Check all valve and piping connections for external leaks with rich soap and water solution or a commercially available leak detecting solution.
4. Shut off the upstream manual gas cock and de-energize valve. Remove the plug from the leak test tap or downstream pressure tap in the valve body. Connect leak test equipment with the test petcock in the closed position, see Figure 3.

⚠ WARNING: Some gas will be released to the atmosphere when the 1/8" NPT pipe plug is removed.

5. Open the upstream manual gas cock. Program the control system to energize the valve to the full open position, then immediately de-energize it to seat the valve operationally.
6. Immerse the 1/4" leak test tubing vertically into a jar of water to a depth of about 1/2". Slowly open the test petcock. Bubbles may appear in the water as the pressure equalizes.
7. After the rate of bubbles coming through the water stabilizes, count the number of bubbles appearing in a 10 second period. The allowable leakage in 10 seconds for an orifice diameter of 1 inch (25.4 mm) or less is 6 bubbles (3 cc/min). If leakage exceeds this rate, replace valve.

NOTE: The leakage rate above recognizes that some wear and contamination from use can result in a slight amount of leakage. The allowable leakage rate is well within the leakage limits as recognized by applicable approval agencies.

8. Close the upstream manual gas cock and the test petcock. Then remove the test equipment. Apply a small amount of Loctite Corporation's PST® Pipe Sealant 567 (or equivalent) to the pipe plug threads. Reinstall the pipe plug and tighten securely.

11. De-energize the valve. Open the downstream manual gas cock.
12. Restore the system to normal operation.

⚠ WARNING: Some gas will be released to the atmosphere when the test equipment is removed.

9. Turn on the gas supply at the upstream manual gas cock and energize the valve.
10. Open the upstream manual gas cock. Program the control system to energize and maintain the valve in the open (energized) position. Check the 1/8" NPT pipe plug connection for external leaks with rich soap and water solution or a commercially available leak detecting solution.

**ORDERING INFORMATION FOR
ASC0 REBUILD KITS**

Parts marked with an asterisk(*) in the exploded view are supplied in Rebuild Kits. When Ordering Rebuild Kits for ASC0 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.

Partial side view of valve body showing location of tapped and plugged holes for pressure and seat leakage testing.

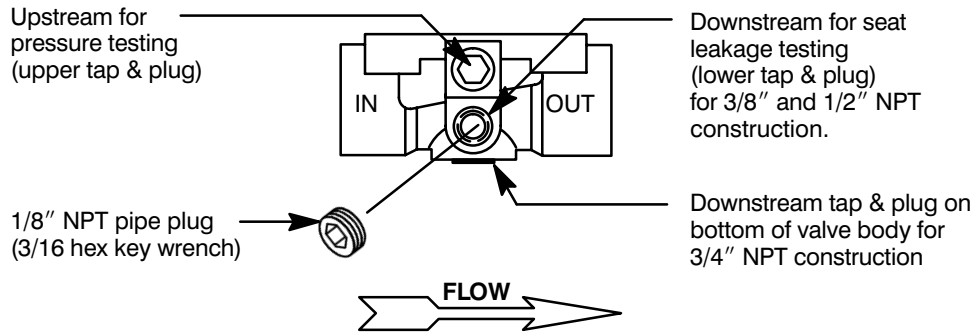


Figure 2. Provisions for pressure and seat leakage testing.

**To illustrate leakage testing only.
Not for system layout.**

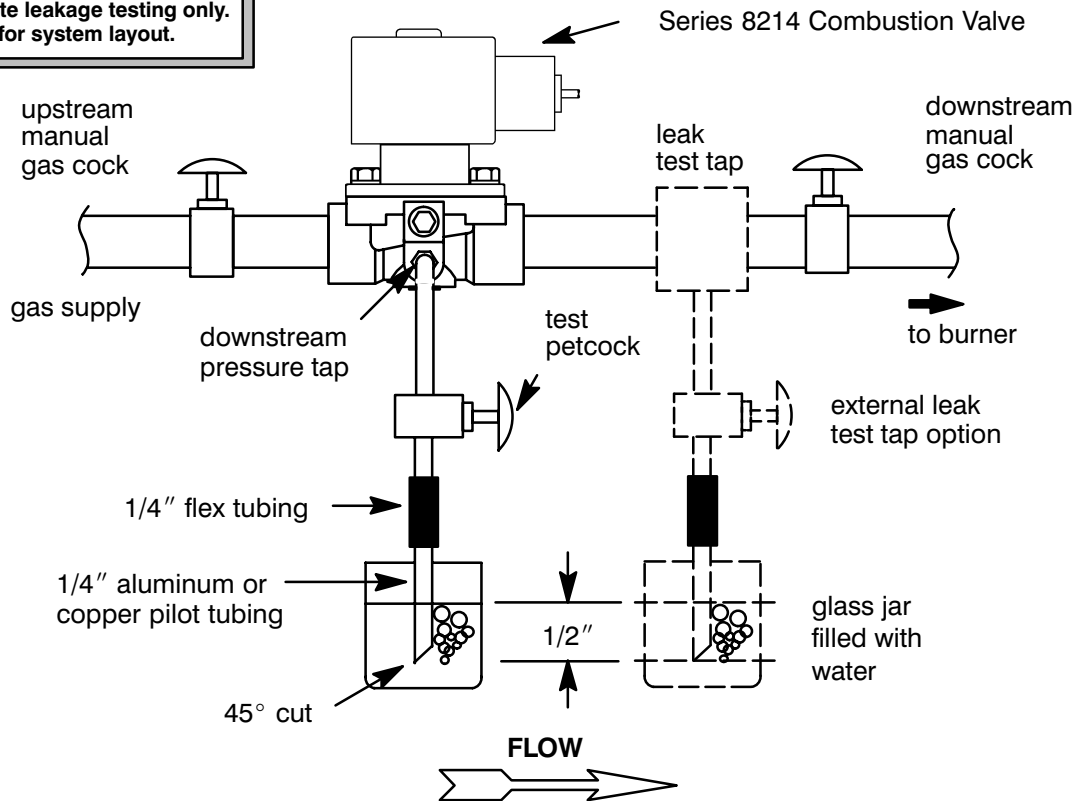


Figure 3. Testing for internal seat leakage.

Torque Chart

Part Name	Torque Value In-lbs	Torque Value Nm
Solenoid base sub-assembly	175 ± 25	19,8 ± 2,8
Bonnet screws	70 ± 8	8,0 ± 0,9

