

Installation & Maintenance Instructions



GENERAL PURPOSE—WATERTIGHT SOLENOIDS

SERIES

8003P

8007P

8202P

I&M No.V7501R5

— SERVICE NOTICE —

ASCO solenoid valves with change letter “P” in the middle of the catalog number (ex. 8210P001) are thermoplastic encapsulated ASCO RedHat Next Generation Electronic Solenoids. They are fully encapsulated using Dupont™ Zenite® Liquid Crystal Polymer Resin (LCP). Zenite® LCP is a thermoplastic polyester resin which exhibits several advantages over other thermoplastic encapsulants.*

* Chemical resistance of Zenite® LCP is not recommended for all applications. Zenite® LCP is not suitable for long term, repeated exposure to high concentrations of caustic solutions. Consult factory for further information.

Follow these installation and maintenance instructions if your valve or operator uses this solenoid.

The RedHat Next Generation electronic solenoid has an integrated management circuit to provide:

- Momentary inrush current for high ratings.
- Low power consumption (2 watts holding).
- Low temperature rise.
- Voltage ranging and AC/DC performance.
- Built in surge suppression.

See separate instructions for basic valve.

DESCRIPTION

Catalog numbers 8003P and 8007P are plastic encapsulated pull-type solenoids. The green solenoid with lead wires and 1/2” conduit connection is designed to meet Enclosure Type 1—General Purpose, Type 2—Dripproof, Types 3 and 3S—Raintight, and Types 4 and 4X—Watertight. The gray solenoid valves with catalog numbers prefixed “EE” is designed to meet Enclosure Types 3 and 3S—Raintight, Types 4 and 4X—Watertight, Explosionproof Class I, Division 2 Groups A, B, C, & D and Class II, Division 2 Groups F & G. Operating Temperature Code T4A (120°C).

ASCO Solenoid Valves with “P” in the middle of the catalog number are not suitable for steam service.

See *Temperature Limitations* section for solenoid identification and see nameplate for service. When installed just as a solenoid and not attached to an ASCO valve, the core has a 0.250–28 UNF–2B tapped hole, with 0.63 in[16,0 mm] minimum full thread.

Catalog number 8202P, is a plastic encapsulated push-type, reverse-acting solenoid having the same enclosure type as previously stated for Catalog numbers 8003P and 8007P.

OPERATION

Voltage Ranges: All coils are designed for industrial operating voltages and can be used on the following voltage ranges only:

Voltage Range *	Minimum Voltage	Maximum Voltage
100–240V/50 or 60Hz/DC (1)	85	264
24–99V/50 or 60Hz/DC (1)	20.4	109
12–24/DC only (2)	10.4	26.4

(1) = Not polarity sensitive

(2) = Polarity sensitive / Protected: Red wire for Positive (+) and Black wire for Negative (–). If wired incorrectly, valve will not operate properly.

* = As marked on coil

Note: The 100–240 voltage range is also suitable for battery charging circuits designed around a 125/DC nominal voltage range. For wider voltage ranges than shown here or for operating voltage ranges for specific catalog numbers, please consult your local ASCO sales office.

Series 8003P, 8007P— Solenoid assemblies not supplied as part of a valve. When the solenoid is energized, the core is drawn into the solenoid base sub-assembly. **IMPORTANT: When the solenoid is de-energized, the initial return force for the core, whether developed by spring, pressure, or weight, must exert a minimum force to overcome residual magnetism created by the solenoid. Minimum return force is 0.69lbf [3.06 N].**

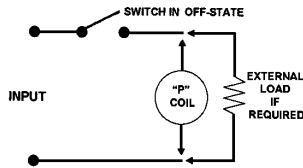
Series 8202P – When the solenoid is energized, the disc holder assembly seats against the orifice. When the solenoid is de-energized, the disc holder assembly returns. **IMPORTANT: Initial return force for the disc or disc holder assembly, whether developed by spring, pressure, or weight, must exert a minimum force to overcome residual magnetism created by the solenoid. Minimum return force is 1.30 lbf [5.78 N].**

INSTALLATION

Check nameplate for correct catalog number, service, and wattage. Check side of solenoid for voltage and frequency.

⚠ WARNING: Electrical hazard from the accessibility of live parts. To prevent the possibility of death, serious injury or property damage, install the open – frame solenoid in an enclosure.

⚠ WARNING: Leakage current from solid state controls can cause improper operation. Check for current in the OFF–STATE from the switch with the solenoid disconnected. Leakage current for solid state outputs greater than 3 mA must use additional external loads. Do not use supervisory circuits with this solenoid.



ASCO SOLENOID VALVES WITH CHANGE LETTER "P" IN THE CATALOG NUMBER WITH GRAY SOLENOID ENCLOSURE

▲ CAUTION: To prevent fire or explosion, do not install solenoid and/or valve where ignition temperature of hazardous atmosphere is less than 200°C. See nameplate for service.

NOTE: These solenoids have an internal thermal fuse, which cannot be reset, to limit solenoid temperature in the event that extraordinary conditions occur which could cause excessive temperatures. These conditions include high input voltage, a jammed core, excessive ambient temperature or a shorted solenoid, etc.

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

Valve Electrical Input Requirements

1. **Inrush Current:** The power source, wiring and output device used, need to have surge ratings equal to or greater than the **inrush current** value (appropriate to the voltage range) specified in the table below.

Table of Inrush Current	
Voltage Range	Peak Inrush Current Amps.
12–24 volt	3.2
24–100 volt	1.4
100–240 volt	0.32
Maximum Inrush Duration	72 ms

2. **Holding Current:** The power source, wiring and output device used, need to have continuous current ratings equal to or greater than the **holding current** value (appropriate to the voltage range) specified in the table below.

Table of Holding Currents, VA			
Voltage Range	Volts	Avg. Holding Current Amps.	Holding VA
12–24 volt	12	0.340	4
	24	0.250	6
24–100 volt	24	0.170	4
	100	0.100	10
100–240 volt	100	0.040	4
	240	0.032	7.5

Temperature Limitations

For maximum valve ambient temperatures, refer to chart. Check catalog number prefix and watt rating on nameplate to determine maximum ambient temperature. See valve installation and maintenance instructions for maximum fluid temperature.

Temperature Limitations For Series 8003P, 8007P or 8202P Solenoids for use on Valves Rated at 2 Watts		
Watt Rating	Class of Insulation	Maximum UL Ambient Temp.
2.0	H	60°C (140°F)

†Minimum ambient temperature –40°C (–40°F).

Positioning

This solenoid 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.

Wiring Section

Wiring must comply with local codes and the National Electrical Code. All conduit solenoids are provided with 24" [0.61m] lead wires and a ground wire which is green or green with a yellow stripe and a 1/2" conduit connection. To facilitate wiring, the solenoid may be rotated 360°. For the gray watertight and explosionproof solenoid, electrical fittings must be approved for use in the approved hazardous locations. The external boss on the conduit connection marked "GND ⚡" is for supplementary bonding connection where local codes or authorities permit or require such connection.

▲ CAUTION: Cryogenic Applications – Solenoid lead wire insulation should not be subjected to cryogenic temperatures. Adequate lead wire protection and routing must be provided.

Installation of Solenoid

Solenoids may be assembled as a complete unit. Tightening is accomplished by means of a hex flange at the base of the solenoid.

Solenoid Temperature

Standard solenoids are designed for continuous duty service. When the solenoid is energized for a long period, the solenoid becomes hot and can be touched by hand only for an instant. This is a safe operating temperature.

MAINTENANCE

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

Cleaning

All solenoid operators and valves should be cleaned periodically. The time between cleaning will vary depending on medium and service conditions. In general, if the voltage to the solenoid is correct, sluggish valve operation, excessive noise or leakage will indicate that cleaning is required. Clean strainer or filter when cleaning the valve.

Preventive Maintenance

- Keep the medium flowing through the solenoid operator or 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. In many cases, solenoid valves are periodically exercised during normal system use or as part of routine maintenance or surveillance activities and no additional exercise is necessary. 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. Replace any worn or damaged parts.

Causes of Improper Operation

- **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic *click* signifies that the solenoid is operating. Absence of the *click* indicates loss of power supply. Check for loose or blown fuses, open-circuited or grounded solenoid, broken lead wires or splice connections.
- **Burned-Out Solenoid:** Check for open-circuited solenoid. Replace if necessary. Check supply voltage; it must be the same as specified on nameplate/retainer and marked on the solenoid. Check ambient temperature and check that the core is not jammed.
- **Low Voltage:** Check voltage across the solenoid leads. Voltage must be at least 85% of rated voltage.

Solenoid Replacement

1. Disconnect conduit, coil leads, and grounding wire or cable/lead connector

NOTE: Any optional parts attached to the old solenoid must be reinstalled on the new solenoid. For 3-way construction, piping or tubing must be removed from pipe adapter.

2. Remove retaining clip from top of solenoid base sub-assembly by pushing down on both sides where the clip is bent and raised by the solenoid base sub-assembly. While pushing down, slide the clip out toward the nameplate.
3. Remove solenoid from solenoid base sub-assembly.
4. Reassembly in reverse order of disassembly. Use exploded views for identification and placement of parts.

Disassembly and Reassembly of Solenoids

1. Remove solenoid, see *Solenoid Replacement*.
2. Unscrew solenoid base sub-assembly from valve body.
3. Remove internal solenoid parts for cleaning or replacement. Use exploded views for identification and placement of parts.
4. If the solenoid is part of a valve, refer to basic valve installation and maintenance instructions for further disassembly.
5. Torque solenoid base sub-assembly and adapter. See valve Installation and Maintenance Instruction for recommended torque. If solenoid is not part of a valve assembly, recommended torque is 175 ± 25 in-lbs [$19,8 \pm 2,8$ Nm].

ORDERING INFORMATION FOR ASCO SOLENOIDS

When Ordering Solenoids for ASCO Solenoid Operators or Valves, order the number stamped on the solenoid. Also specify voltage and frequency.

Torque Chart

Part Name	Torque Value Inch–Pounds	Torque Value Newton–Meters
solenoid base sub–assembly & adapter	175 ± 25	19,8 ± 2,8

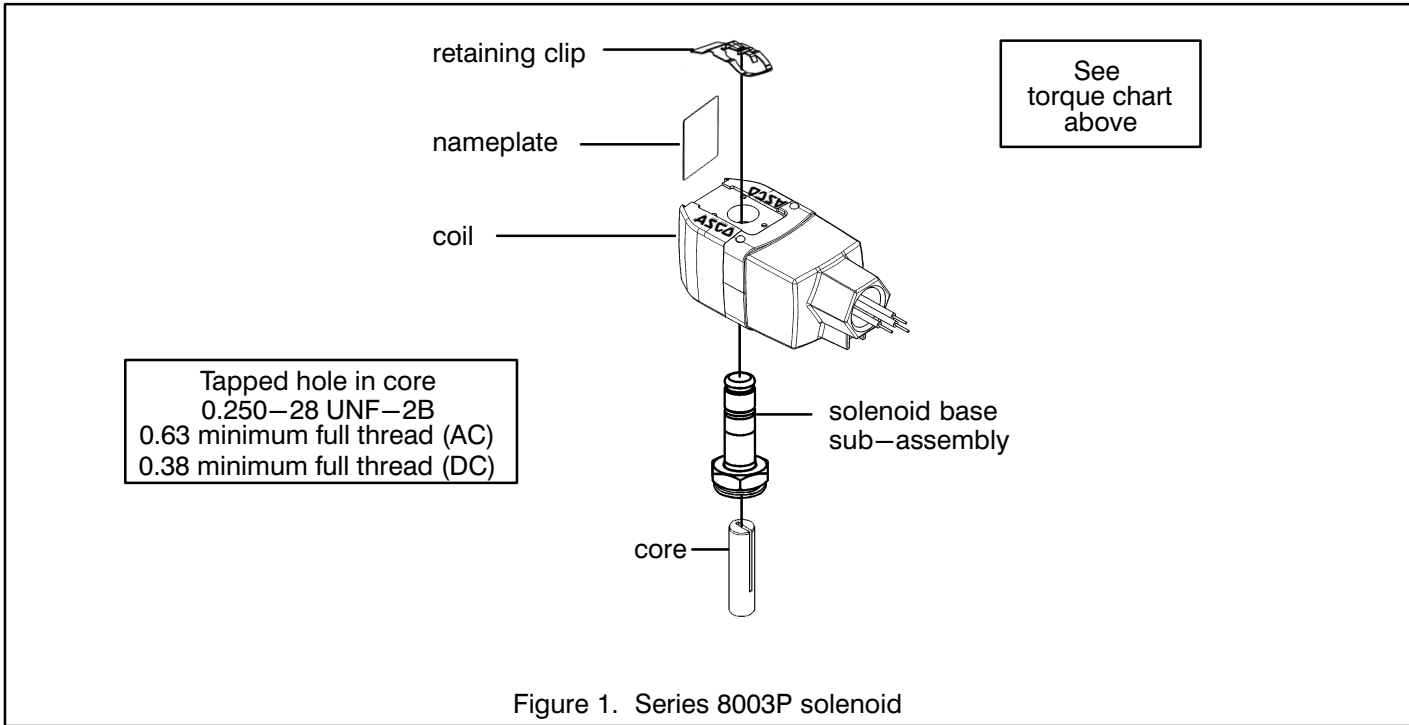


Figure 1. Series 8003P solenoid

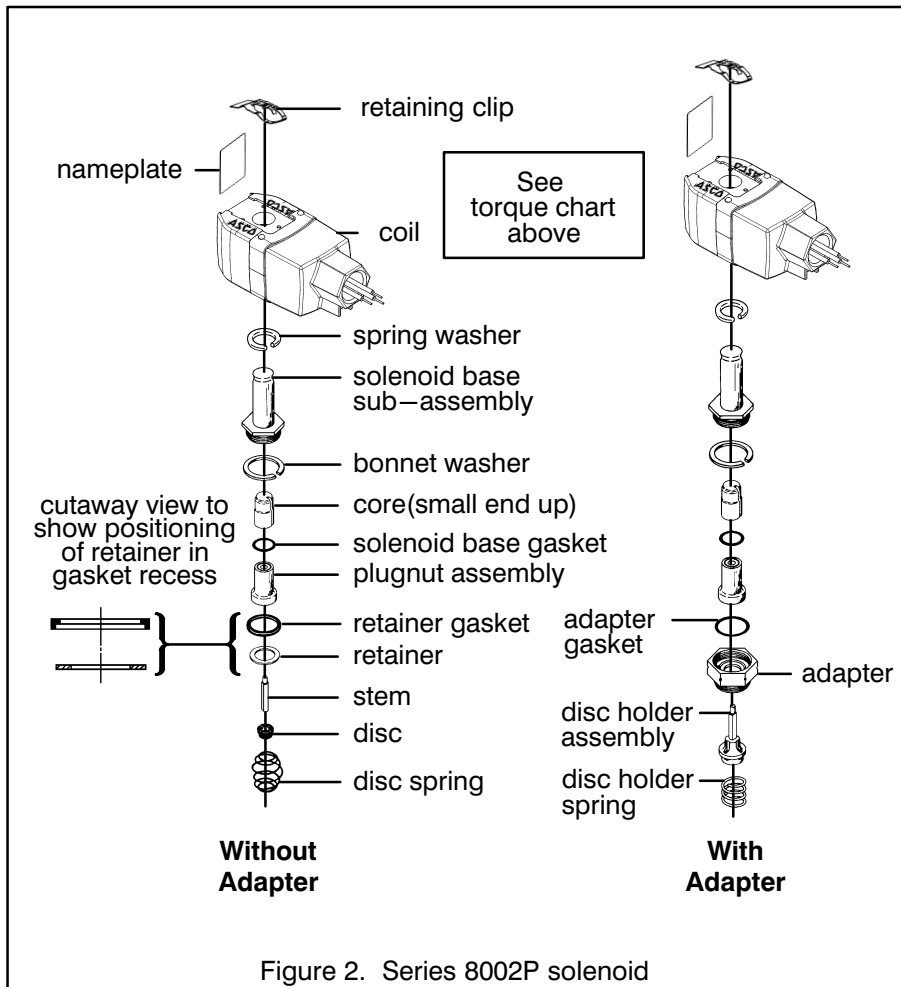


Figure 2. Series 8002P solenoid

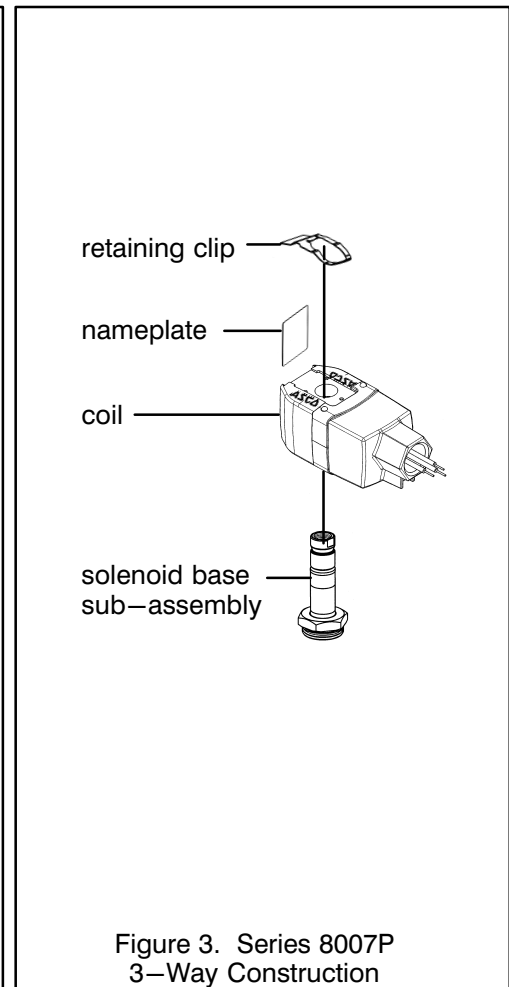


Figure 3. Series 8007P
3–Way Construction