

# Installation & Maintenance Instructions

**3 - WAY MINIATURE SIZED SOLENOID VALVES  
 NORMALLY CLOSED, NORMALLY OPEN AND UNIVERSAL OPERATION  
 1/8 NPT - 3/64, 1/16, 3/32 AND 1/8 ORIFICE  
 BRASS AND STAINLESS STEEL CONSTRUCTION**

**SERIES**

**8320**

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

## DESCRIPTION

Series 8320 valves are 3--way, direct--acting, miniature sized solenoid valves with all three pipe connections located in the valve body. Valves are of rugged brass or stainless steel construction. Standard valves have a General Purpose NEMA Type 1 Solenoid Enclosure. Valves may also be equipped with a solenoid enclosure which is designed to meet NEMA Type 4 -- Watertight, NEMA Type 7 (C or D) Hazardous Locations - Class II, Groups E, F or G. See Installation and Maintenance Instructions, V9531 for Explosionproof/Watertight Solenoid Enclosures.

## OPERATION

**Normally Closed:** Applies pressure when solenoid is energized; exhausts pressure when solenoid is de--energized. Flow is Connection "2" to "1" when solenoid is energized. Connection "3" is closed. Flow is from Connection "1" to "3" when solenoid is de--energized. Connection "2" is closed. Pressure is applied at Connection "2".

**Normally Open:** Applies pressure when solenoid is de--energized; exhausts pressure when solenoid is energized. Flow is Connection "1" to "2" when solenoid is energized. Connection "3" is closed. Flow is from Connection "3" to "1" when solenoid is de--energized. Connection "2" is closed. Pressure is applied at Connection "3".

**Universal:** For normally closed or normally open operation, selection or diversion of pressure can be applied at Connections "1", "2" or "3". Flow is between Connection "1" to "2" when solenoid is energized.

Connection "3" is closed. Flow is between Connection "1" to "3" when solenoid is de--energized. Connection "2" is closed. Pressure may be applied at Connection "1", "2" or "3".

**Manual Operation (Valves with Suffix MS):** Manual operator allows manual operation when desired or during an electrical power outage. The screw type manual operator is in the "off position" when screwdriver slot is in the horizontal position. To engage manual operator, rotate stem on the side of the body clockwise 90°. Valve will now be in the same position as when the solenoid is energized. To disengage, rotate the stem counterclockwise back to 0° in its original horizontal position.

## 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 maximum valve ambient and fluid temperatures, refer to the following table. For higher ambient and fluid temperatures, consult factory. Check catalog number prefix and watt rating on nameplate to determine the maximum temperatures.

Construction	Watt Rating	Prefix	Coil Class	Max Ambient Temp		Max Fluid Temp	
				°C	°F	°C	°F
AC	6	None, DA or S	A	25	77	82	180
		DB, LB, SB, DF, FT or SF	H or F	50	122	93	200
		HT	H	60	140	93	200
	9†	None, DP or SP	F	25	77	82	180
DC	9.7	None, FT, HT, LB, S or SF	A, F or H	25	77	49	120

8320B138, 8320B139, 8320A140, 8320A141, 8320A144, 8320A145, 8320A148 and 8320A149 are limited to a fluid temperature of 60°C (140°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 cartridge assembly area.

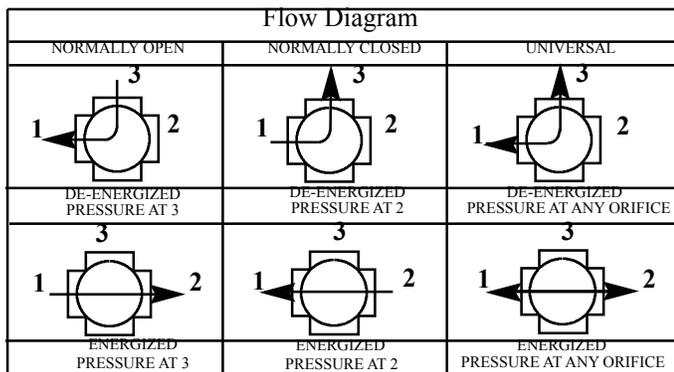
### Mounting

For mounting dimensions of mounting bracket, refer to Figure 1.

### Piping

Connect piping or tubing 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.

**IMPORTANT: 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.**



## Wiring

Wiring must comply with local codes and the National Electrical Code. Housings for all solenoids are provided with accommodations or connections for 1/2 inch conduit. The general purpose solenoid enclosure may be rotated to facilitate wiring by removing the retaining cap or clip.

**⚠ CAUTION: When metal retaining clip disengages, it will spring upward. Rotate coil to desired position. Replace retaining clip before operating.**

NOTE: AC and DC solenoids are built differently. To convert from one to the other, it is necessary to change the complete solenoid, including the plugnut/core tube sub-assembly and core assembly.

## Solenoid Temperature

Standard catalog valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid enclosure becomes hot and can be touched with the hand only for an instant. This is a safe operating temperature. Any excessive heating will be indicated by the smoke and odour of a burning coil insulation.

## MAINTENANCE

**⚠ WARNING: To prevent the possibility of death, personal 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 valve strainer or filter when cleaning the valve.

## Preventive Maintenance

- Keep 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 rebuild kit.

## 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 the 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.

- **Low Voltage:** Check voltage across the solenoid leads. Voltage must be at least 85% of rated voltage.
- **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.

## Coil Replacement (Refer to Figure 1)

Turn off electrical power supply and disconnect coil lead wires then proceed in the following manner:

1. Remove retaining cap or clip, nameplate and cover.

**⚠ CAUTION: When the metal retaining clip disengages, it will spring upward.**

2. Slip the yokes containing the coil, sleeves and insulating washers off the plugnut/core tube sub-assembly. Insulating washers (2) are omitted when a molded coil is used.
3. Slip coil, sleeves and insulating washers from the yoke.
4. Reassemble in reverse order of disassembly paying careful attention to the exploded view provided for identification and placement of parts.

**⚠ CAUTION: The solenoid must be fully reassembled as the housing and internal parts are part of and complete the magnetic circuit. Place an insulating washer at each end of the coil, if required.**

## Valve Disassembly

Depressurize valve and turn off electrical power supply. Proceed in the following manner:

1. Remove retaining cap or clip and slip the entire solenoid enclosure off the plugnut/core tube sub-assembly.

**⚠ CAUTION: When metal retaining clip disengages, it will spring upward.**

NOTE: For valves with an Explosionproof/Watertight Solenoid enclosure, the solenoid may be removed as a complete unit by unscrewing the solenoid base sub-assembly.

2. Unscrew the valve bonnet with a special wrench adapter provided in the Spare Parts Kit (special wrench adapter Order No. 158-477-1).
3. Remove plugnut/core tube sub-assembly with valve bonnet and bonnet gasket attached.
4. Remove core spring, core assembly and body gasket.
5. Unscrew end cap or manual operator assembly and remove disc spring, disc, disc holder and body gasket.
6. All parts are now accessible for cleaning or replacement. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

## Valve Reassembly

1. Reassemble in reverse order of disassembly using exploded views for identification and placement of parts.
2. Lubricate all gaskets with DOW CORNING® 111 Compound lubricant or an equivalent high-—grade silicone grease.
3. Replace disc holder, disc, disc spring, body gasket and end cap.

**IMPORTANT: Some valves have a disc with a conical point on one side. Be sure that the conical point on the disc faces the orifice in the valve body. Torque end cap(or manual operator assembly) to 90±10 inch--lbs (10,2±1 , 1 N - m ) .**

4. Replace body gasket and install core spring into the core assembly. Install wide end of core spring into core assembly first, closed end protrudes from top of core assembly.
5. Position core assembly and core spring into plugnut/core tube sub-assembly. Install plugnut/core tube sub-assembly with core assembly and core spring in valve body. Torque valve bonnet to  $90 \pm 10$  inch-lbs ( $10,2 \pm 1, 1$  Nm).
6. Replace solenoid enclosure and retaining cap or clip.

7. After maintenance, operate the valve a few times to be sure of proper operation.

### 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.

NOTE: For valves with an Explosionproof/Watertight Solenoid enclosure, the solenoid may be assembled as a complete unit.

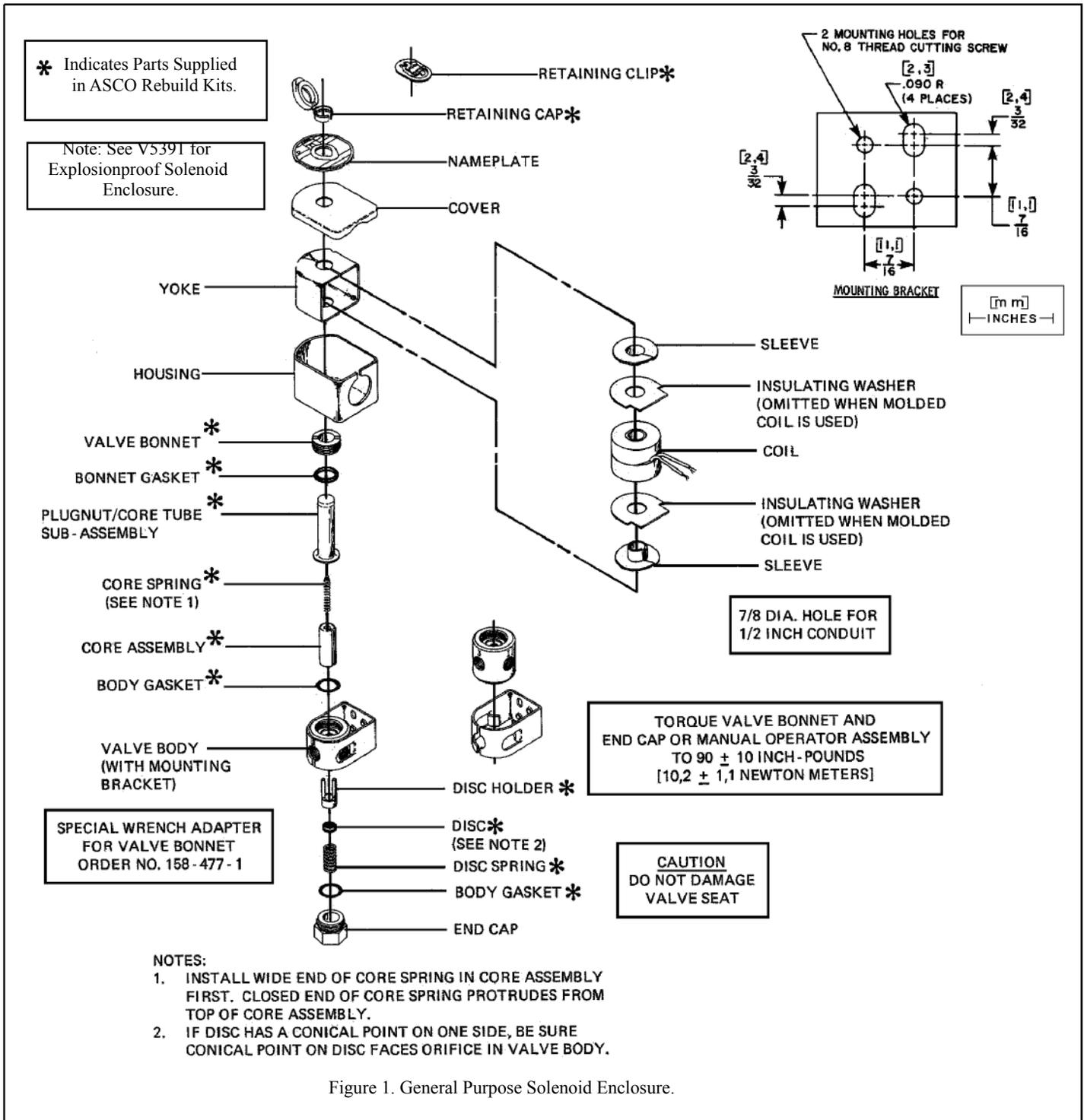


Figure 1. General Purpose Solenoid Enclosure.