

# Installation & Maintenance Instructions

BULLETIN

3-WAY MINIATURE SIZE 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

8320

Form No.V6055R2

## DESCRIPTION

Bulletin 8320 valves are 3-way, direct-acting, miniature size 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 I, Groups C or D and NEMA Type 9 (E, F or G) Hazardous Locations — Class II, Groups E, F or G. Installation and Maintenance Instructions for the Explosion-Proof/Watertight Solenoid Enclosure are shown on Form No. V5391.

## OPERATION

**Normally Closed:** Applies pressure when solenoid is energized; exhausts pressure when solenoid is de-energized. When solenoid is energized, flow is from Connection "2" to Connection "1." Connection "3" is closed. When solenoid is de-energized, flow is from Connection "1" to Connection "3." Connection "2" is closed.

**Normally Open:** Applies pressure when solenoid is de-energized; exhausts pressure when solenoid is energized. When solenoid is energized, flow is from Connection "1" to Connection "2." Connection "3" is closed. When solenoid is de-energized, flow is from Connection "3" to Connection "1." Connection "2" is closed.

**Universal:** For normally closed or normally open operation, selection or diversion of pressure can be applied to Connection "1," "2" or "3."

**NOTE:** To change from normally closed to normally open or universal operation, consult factory.

pipe threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by the proper support and alignment of piping. When tightening the connections, do not use the valve body or solenoid as a lever. Wrenches applied to valve body or piping are to be located as close as possible to connection point.

**IMPORTANT:** For the protection of the solenoid valve, install a strainer or filter suitable for the service involved in the inlet side as close to the valve as possible. Periodic cleaning is required depending on service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

## WIRING

Wiring must comply with Local and National Electrical Codes. 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 solenoid enclosure to desired position. Replace retaining cap or clip before operating.

**NOTE:** Alternating current (A-C) and direct current (D-C) 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 odor of burning coil insulation.

## MAINTENANCE

**WARNING:** Turn off electrical power supply and depressurize valve before making repairs. It is not necessary to remove the valve from the pipe line for repairs.

## CLEANING

A periodic cleaning of all solenoid valves is desirable. The time between cleanings will vary depending on 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. Clean valve strainer or filter when cleaning solenoid valve.

## PREVENTIVE MAINTENANCE

1. Keep the medium flowing through the valve as free from dirt and foreign material as possible.
2. While in service, operate the valve at least once a month to insure proper opening and closing.
3. Periodic inspection (depending on medium and service conditions) of internal valve parts for damage or excessive wear is recommended. Thoroughly clean all parts. Replace any parts that are worn or damaged.

## IMPROPER OPERATION

1. **Faulty Control Circuit:** Check the electrical system by energizing the solenoid. A metallic click signifies the solenoid is operating. Absence of the click indicates loss of power supply. Check for loose or blown-out fuses, open-circuited or grounded coil, broken lead wires or splice connections.
2. **Burned-Out Coil:** Check for open-circuited coil. Replace coil, if necessary.
3. **Low Voltage:** Check voltage across the coil leads. Voltage must be at least 85% of nameplate rating.
4. **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.
5. **Excessive Leakage:** Disassemble valve and clean all parts. Replace worn or damaged parts with a complete Spare Parts Kit for best results.

## COIL REPLACEMENT (Refer to Figure 1)

Turn off electrical power supply and disconnect coil lead wires. Proceed in the following manner:

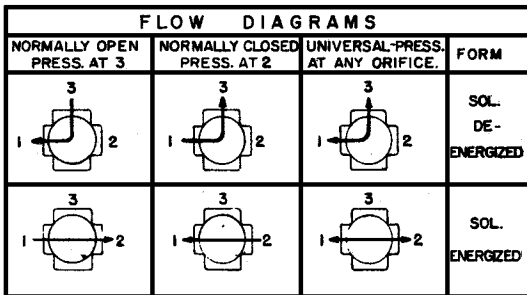
1. Remove retaining cap or clip and slip the entire solenoid enclosure off the plugnut/core tube sub-assembly. **CAUTION:** When metal retaining clip disengages, it will spring upward.
2. Slip the yoke containing the coil, sleeves and insulating washers off the plugnut/core tube sub-assembly. Insulating washers (2) are omitted when a molded coil is used.
3. Slip coil, sleeves and insulating washers from yoke.
4. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.

**CAUTION:** 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 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 valve with an Explosion-Proof/Watertight Solenoid Enclosure, the solenoid may be removed as a complete unit by unscrewing the solenoid base sub-assembly.
2. Unscrew valve bonnet with 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.



## MANUAL OPERATOR (Optional)

Manual operator allows manual operation during an interruption of electrical power or when otherwise desired. Two types of manual operators are available — push type (Suffix MO) and screw type (Suffix MS). To operate valve manually with push type operator, push stem at base of valve body as far upward as possible. Valve will now be in the same position as when the solenoid is energized. Removing pressure from stem will release manual operator to original position. To operate valve with a screw type manual operator, rotate manual operator stem at base of valve body clockwise until it hits a stop. Valve will now be in the same position as when the solenoid is energized. Rotate manual operator stem fully counterclockwise before operating valve electrically.

## INSTALLATION

Check nameplate for correct catalog number, pressure, voltage and service.

## TEMPERATURE LIMITATIONS

For maximum valve ambient and fluid temperatures, refer to chart below. 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	Catalog Number Prefix	Coil Class	Maximum Ambient Temp. °F	Maximum Fluid Temp. °F
A-C Construction (Alternating Current)	6	None, DA or S	A	77	180
		DB, LB, SB, DF, FT or SF	H or F	122	200
	9*	None, DP or SP	F	77	180
		HT	H	140	200
D-C Construction (Direct Current)	9.7	None, FT, HT, LB, S or SF	A, F or H	77	120

\*Catalog Nos. 8320B130, 8320B131, 8320B134, 8320B135, 8320B138, 8320B139, 8320A140, 8320A141, 8320A144, 8320A145, 8320A148 and 8320A149 are limited to a fluid temperature of 140°F.

## POSITIONING

This valve is designed to perform properly when mounted in any position. However, for optimum life and performance, the solenoid should be mounted vertical and upright so as to reduce the possibility of foreign matter accumulating in the core tube 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. Refer to flow diagrams provided. Apply pipe compound sparingly to male

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**VALVE REASSEMBLY**

1. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.
2. Lubricate all gaskets with Dow Corning Corporation's MOLYKOTE® 111 compound 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 conical point on disc faces orifice in valve body. Torque end cap (or manual operator assembly) to  $90 \pm 10$  inch-pounds [ $10,2 \pm 1,1$  newton meters].
4. Replace body gasket and install core spring into 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-pounds [ $10,2 \pm 1,1$  newton meters].

6. Replace solenoid enclosure and retaining cap or clip. **NOTE:** For valves with an Explosion-Proof/Watertight Solenoid Enclosure, the solenoid may be assembled as a complete unit.
7. After maintenance, operate the valve a few times to be sure of proper operation.

**SPARE PARTS KITS**

Spare Parts Kits and Coils are available for ASCO valves. Parts marked with an asterisk (\*) are supplied in Spare Parts Kits.

**ORDERING INFORMATION FOR SPARE PARTS KITS**  
When Ordering Spare Parts Kits or Coils, Specify Valve Catalog Number, Serial Number and Voltage.

