

# INSTALLATION AND MAINTENANCE INSTRUCTIONS

## MIDGET 3-WAY SOLENOID VALVES NORMALLY CLOSED, NORMALLY OPEN AND UNIVERSAL OPERATION 3/64, 3/32 AND 1/8 ORIFICES — 1/8 AND 1/4 NPT

BULLETIN

8314



FORM NO. V-6006

### DESCRIPTION

Bulletin 8314's are midget 3-way solenoid valves with bodies of brass 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.

### OPERATION

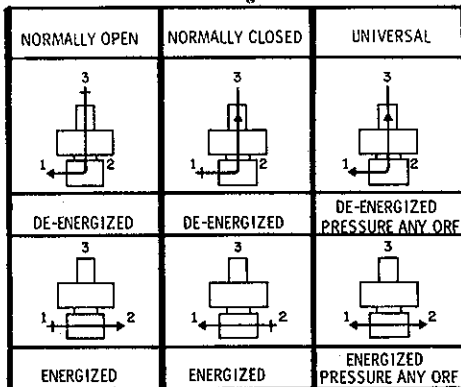
**Normally Closed:** Applies pressure when solenoid is energized; exhausts pressure when solenoid is de-energized. Flow is from Connection "2" to "1" when solenoid is energized. Connection "3" is closed. Flow is from Connection "1" to "3" when solenoid is de-energized. Connection "2" is closed. Pressure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

**Normally Open:** Applies pressure when solenoid is de-energized; exhausts pressure when solenoid is energized. Flow is from 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" and "2" when solenoid is energized. Connection "3" is closed. Flow is between Connection "1" and "3" when solenoid is de-energized. Connection "2" is closed. Pressure may be applied at Connections "1," "2" or "3."

**IMPORTANT:** No minimum operating pressure differential required.

Flow Diagrams



### 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 on nameplate to determine the maximum temperatures.

Construction	Coil Class	Catalog Number Prefix	Maximum Ambient Temp. °F	Maximum Fluid Temp. °F
A-C Construction (Alternating Current)	A	None or S	104	200
	F	FT or SF	125	200
	H	HT	140	200
D-C Construction (Direct Current)	A, F or H	None, FT, SF or HT	77	104

### 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 1/8 NPT valve body mounting dimensions, refer to Figure 1. For 1/4 NPT valve body mounting dimensions, refer to Figure 2. For mounting bracket (1/4 NPT only) mounting dimensions, refer to Figure 3.

### PIPING

Connect piping to valve according to markings on valve body. Refer to flow diagrams provided. Apply pipe compound sparingly to male pipe threads only; if applied to valve threads, it may enter the valve and cause operational difficulty. Pipe strain should be avoided by proper support and alignment of piping. When tightening the pipe, do not use valve 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 the service conditions. See Bulletins 8600, 8601 and 8602 for strainers.

### WIRING

Wiring must comply with local and National Electrical Codes. For explosion-proof/watertight solenoid enclosures, the electrical fittings must be approved for use in the approved hazardous locations. Solenoid housings are provided with accommodations or connections for 1/2 inch conduit. The general purpose solenoid enclosure may be rotated to facilitate wiring by loosening the pipe adapter. For the explosion-proof/watertight solenoid enclosure, the pipe adapter and the cover must be loosened. Rotate solenoid enclosure to desired position and tighten pipe adapter and cover. **IMPORTANT:** Maximum torque for pipe adapter is 90 inch-pounds [10.2 newton meters]. For the explosion-proof/watertight solenoid enclosure, torque cover to 135 ± 10 inch-pounds [15.3 ± 1.1 newton meters].

**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 core assembly and core spring.

### 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 body from the pipe line for repairs. However, the piping must be removed from Connection "3" unless the valve is a vent to atmosphere construction.

### 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

Depressurize valve and turn off electrical power supply. Disconnect coil lead wires and piping from Connection "3." Proceed in the following manner:

#### General Purpose (Refer to Figure 4)

1. Unscrew pipe adapter or remove retaining cap (vent to atmosphere construction) from top of solenoid.
2. Remove spring washer (heavy), nameplate and housing. Spring washer (heavy) not present in vent to atmosphere construction.
3. Slip spring washer (light), insulating washer, coil and insulating washer off the solenoid base sub-assembly. Insulating washers (2) are omitted when a molded coil is used.
4. Reassemble in reverse order of disassembly paying careful attention to exploded view provided with identification and placement of parts.
5. Maximum torque for pipe adapter 90 inch-pounds [10.2 newton meters].

**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.

#### Explosion-Proof/Watertight Enclosure (Refer to Figure 5)

1. Unscrew pipe adapter from top of solenoid.
2. Unscrew housing cover with nameplate and retaining ring attached. Two wrenching flats are provided on the housing to hold it securely in place while housing cover is being removed or replaced.
3. Remove fluxwasher, insulating washer, coil and insulating washer. Insulating washers (2) are omitted when a molded coil is used.
4. Before reassembly, refer to note below for greasing requirements.
5. Reassemble in reverse order of disassembly paying careful attention to exploded view provided for identification and placement of parts.
6. Torque solenoid cover to 135 ± 10 inch-pounds [15.3 ± 1.1 newton meters].
7. Maximum torque for pipe adapter 90 inch-pounds [10.2 newton meters].

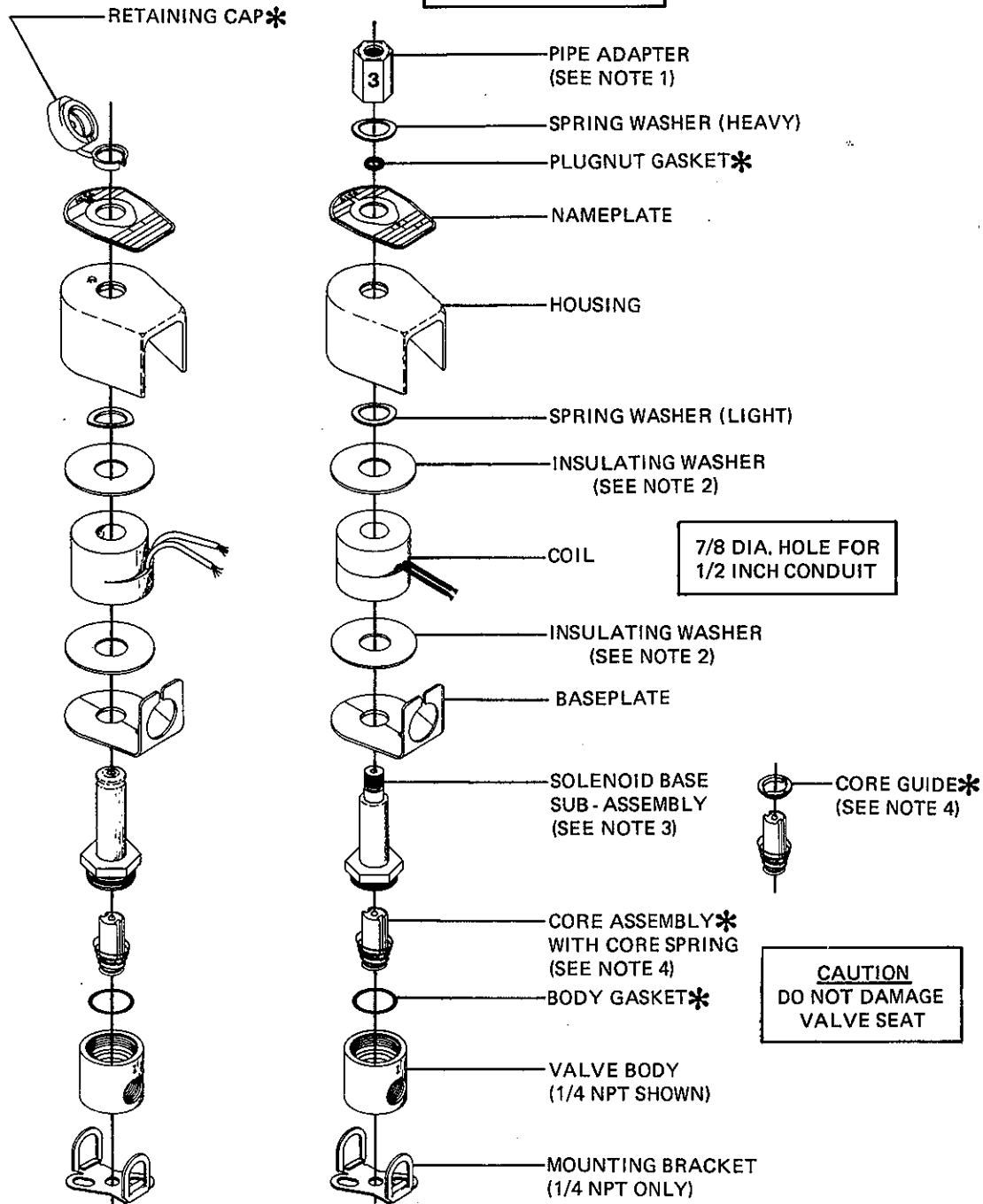
ASCO Valves





AIR ONLY CONSTRUCTION  
VENTS TO ATMOSPHERE

PARTS INCLUDED IN  
SPARE PARTS KITS\*

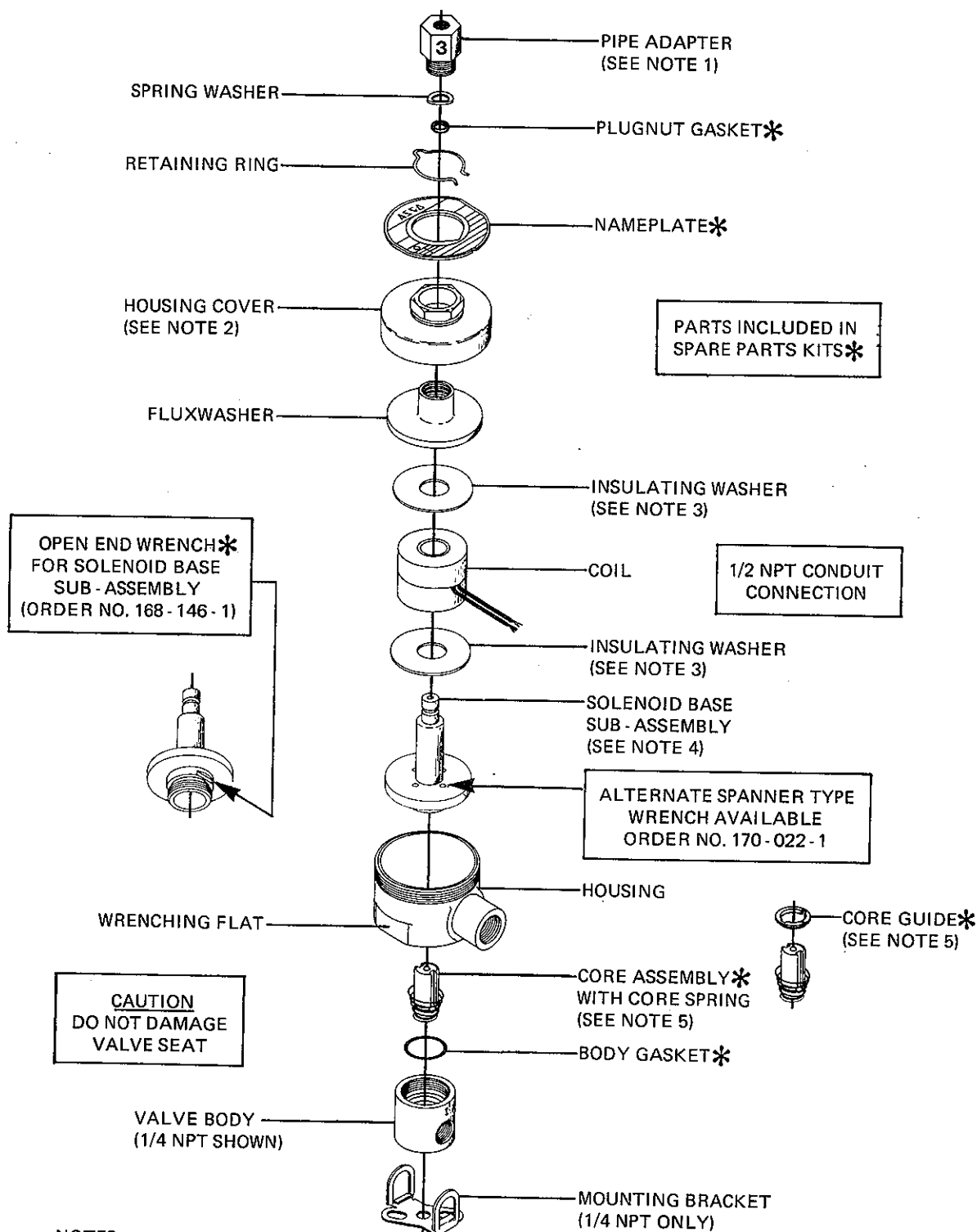


NOTES:

1. MAXIMUM TORQUE FOR PIPE ADAPTER 90 INCH - POUNDS [10.2 NEWTON METERS].
2. INSULATING WASHERS (2) ARE OMITTED WHEN A MOLDED COIL IS USED.
3. TORQUE SOLENOID BASE SUB - ASSEMBLY TO 175 ± 25 INCH - POUNDS [19.8 ± 2.8 NEWTON METERS].
4. CORE GUIDE USED IN ALL A - C VALVES AND 1/8 ORIFICE D - C VALVES. NOT PRESENT IN ALL CONSTRUCTIONS.

Figure 4.

Bulletin 8314  
General Purpose Solenoid Enclosure



**NOTES:**

1. MAXIMUM TORQUE FOR PIPE ADAPTER 90 INCH - POUNDS [10.2 NEWTON METERS].
2. TORQUE HOUSING COVER TO  $135 \pm 10$  INCH - POUNDS [ $10.7 \pm 1.1$  NEWTON METERS].
3. INSULATING WASHERS (2) ARE OMITTED WHEN A MOLDED COIL IS USED.
4. TORQUE SOLENOID BASE SUB-ASSEMBLY TO  $175 \pm 25$  INCH - POUNDS [ $19.8 \pm 2.8$  NEWTON METERS].
5. CORE GUIDE USED IN ALL A - C VALVES AND 1/8 ORIFICE D - C VALVES. NOT PRESENT IN ALL CONSTRUCTIONS.

Figure 5.

Bulletin 8314  
Explosion-Proof/Watertight Solenoid Enclosure