

# Installation & Maintenance Instructions

3-WAY OR 4-WAY, 2 POSITION SINGLE OR DUAL SOLENOID VALVES  
FOR NAMUR ACTUATORS – 1/4 NPT PRESSURE & 1/8 NPT EXHAUST CONNECTIONS  
AIR OR INERT GAS SERVICE – ANODIZED ALUMINUM CONSTRUCTION

**SERIES**

**8551**

Form No.V7416

## Service Notices

Except for coil replacement, the Series 8551 are not repairable. When any performance problems are detected during routine inspection, replace valve immediately.

See separate solenoid installation and maintenance instructions for information on: **Wiring, Solenoid Temperature, Cause of Improper Operation, and Solenoid Replacement.** Separate instructions are also provided to convert Series 8551 to an *External Pilot Pressure Supply Configuration.*

## DESCRIPTION

Series 8551 valves are 3-way or 4-way, 5 ported 2 position piloted spool type single or dual solenoid valves designed for air or inert gas service. Valves are made of rugged anodized aluminum. A built-in manual operator allows manual operation when desired or during an electrical power outage. Each valve may be used for 3-way (normally closed) or 4-way operation by using the appropriate flow plate provided. Flow plates are marked (3/2) for 3 Ports, 2 Positions (3-way operation) or (5/2) for 5 Ports, 2 Positions (4-way operation). These valves are supplied with all necessary hardware for a NAMUR direct mount installation i.e. flow plates, gaskets, mounting screws and a locating set screw. See *Flow Selection And Mounting section.*

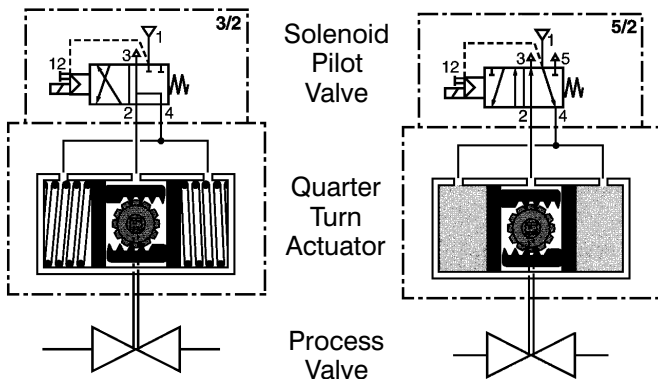
These Series 8551 valves are supplied with either low power or intrinsically safe solenoids.

## APPLICATIONS

Typically, the 3-way (3/2) normally closed mode is used for a single acting (spring return) actuator; 4-way (5/2) mode for a double acting actuator.

**Single-acting actuator**  
solenoid spool-valve control adapted for 3/2 operation

**Double-acting actuator**  
solenoid spool-valve control adapted for 5/2 operation



**Port Markings:** 1 = Pressure, 2 & 4 = Cylinder  
3 & 5 = Exhaust

## OPERATION

**IMPORTANT: Minimum operating pressure differential 30 psi; maximum 150 psi.**

**Breather Function 3-way (3/2) mode only:** Allows for spring side of a spring return actuator to vent at all times through valve exhaust port 3.

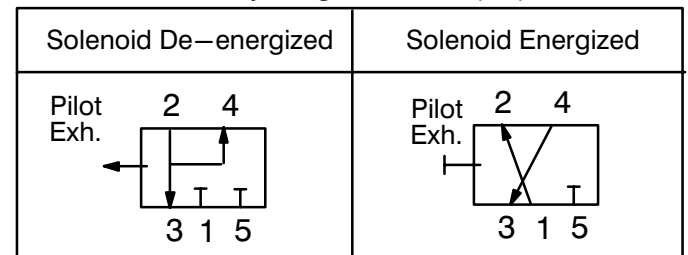
**Single Solenoid:** This type of operation is used where automatic return of the valve on electrical power failure or loss of main line pressure is required.

### 3-Way NC Single Solenoid Operation

**Solenoid De-energized:** Flow is from port 2 to port 3. Port 4 is open to exhaust port 3 (breather function); pressure port 1 is closed. Slight pilot exhaust is also apparent. Port 5 is not used.

**Solenoid Energized:** Flow is from pressure port 1 to port 2. Port 4 is open to exhaust port 3 (breather function); pilot exhaust is closed.

### 3-Way Single Solenoid (3/2)

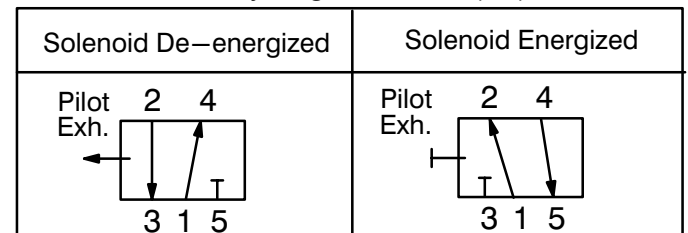


### 4-Way Single Solenoid Operation

**Solenoid De-energized:** Flow is from pressure port 1 to port 4 and from port 2 to port 3. Port 5 is closed. Slight pilot exhaust is also apparent.

**Solenoid Energized:** Flow is from pressure port 1 to port 2 and from port 4 to port 5. Port 3 and pilot exhaust are closed.

### 4-Way Single Solenoid (5/2)



**Dual Solenoids:** Solenoid may be energized momentarily or continuously depending upon application. Dual solenoid valves are used where equipment must not change position when electrical power fails. Valve operates when one solenoid is energized and returns when the other solenoid is energized.

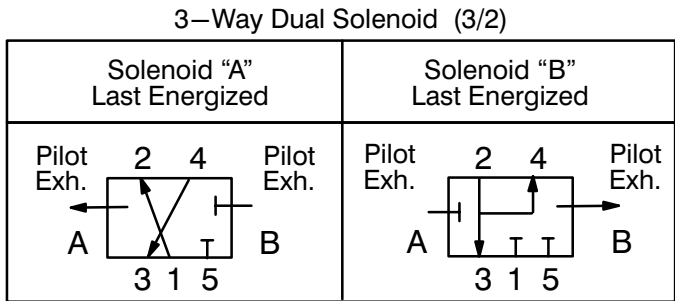
**⚠ CAUTION: Do not energize solenoids A and B simultaneously, as this will cause valve to malfunction.**

**IMPORTANT: Minimum on time for each solenoid is 0.3 seconds. Intrinsically safe constructions must be energized for 1 to 2 seconds, depending on circuit resistance.**

**3-Way NC Dual Solenoid Operation**

**Solenoid A Last Energized:** Flow is from pressure port 1 to port 2. Port 4 is open to exhaust port 3 (breather function). Slight pilot exhaust is apparent when solenoid A is de-energized. Port 5 is not used.

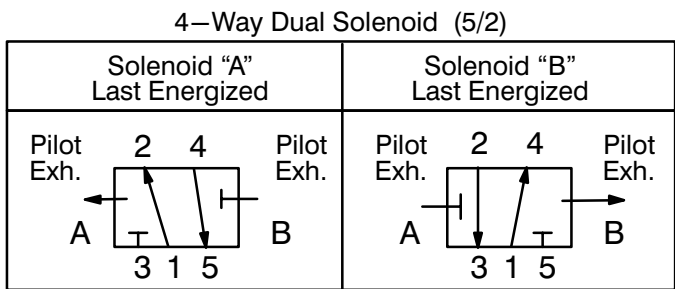
**Solenoid B Last Energized:** Flow is from pressure 2 to port 3. Port 4 is open to exhaust 3 (breather function); pressure port 1 is closed. Slight pilot exhaust is apparent when solenoid B is de-energized.



**4-Way Dual Solenoid Operation**

**Solenoid A Last Energized:** Flow is from pressure port 1 to port 2 and from port 4 to port 5. Port 3 is closed. Slight pilot exhaust apparent when solenoid A is de-energized.

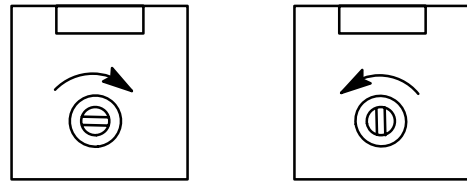
**Solenoid B Last Energized:** Flow is from pressure port 1 to port 4 and from port 2 to port 3. Port 5 is closed. Slight pilot exhaust apparent when solenoid B is de-energized.



**Manual Operation**

Manual operator allows manual operation when desired or during an electrical power outage. To engage manual operator, insert a screwdriver in slot, push in and rotate 90° clockwise. Valve will now be in the same position as when the solenoid is energized. To disengage manual operator, rotate stem 90° counterclockwise.

**⚠ CAUTION: To prevent malfunction, rotate stem counterclockwise 90° before operating valve electrically.**



**To engage, push stem in and rotate 90° clockwise.**

**To disengage, rotate stem 90° counterclockwise.**

Figure 1. Manual Operator (partial view).

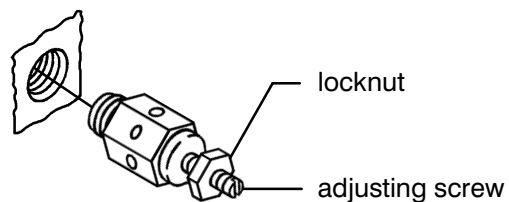
**Metering Device with Filter for 1/8 NPT Connections (Optional Feature)**

These metering devices can be used to vary the operating speed of the actuator/cylinder this valve is piloting. Install metering devices in 1/8 NPT exhaust connection and tighten securely. Install a metering device in port 3 and port 5 of 4-way (5/2) valves only. Because of the breather function, the use of a metering device is not recommended for the 3-way (3/2) mode.

**Metering Device Adjustment:**

- A. Loosen Locknut on adjusting screw.
- B. Turn adjusting screw clockwise (to reduce flow) as far as possible.
- C. Turn adjusting screw counterclockwise (to increase flow) no more than two turns.
- D. Tighten locknut using 13 mm wrench.

**IMPORTANT: The steps above provide only a rough adjustment of the metering device. Final adjustments must be made with valve fully pressurized in the line of final application.**



Turn clockwise to reduce flow and speed of actuator/cylinder this valve is piloting; counterclockwise to increase flow and speed.

Figure 2. Metering Device (partial view).

## 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.

### Future Service Considerations

Provision should be made for performing seat leakage, external leakage, and operational tests on the valve with a nonhazardous, noncombustible fluid.

### Temperature Limitations

Valve ambient and fluid temperature range: 5°F to 140°F (−15°C to 60°C).

### Positioning

Valve may be mounted in any position.

### Flow Selection and Mounting (Refer to Figure 3)

Two flow plates are provided with each valve. Flow plates are marked (3/2) for 3-way or (5/2) for 4-way. For proper orientation of the flow plate, the marking (3/2) or (5/2) must be opposite series number 8551 flow diagram label on valve body or facing solenoid “B” for dual solenoid construction. See Figure 3. for proper orientation of flow plate, gaskets, mounting screws and locating set screw. Then proceed as follows:

1. If required, install locating set screw using a 2 mm hex key wrench.
2. Install Port 2 and Port 4 gaskets and flow gasket on flow plate.
3. Position flow plate and solenoid valve on actuator. Then install two socket head cap screws in offset center holes on either side. Hand thread screws a few turns into actuator. Then tighten screws evenly using a 4 mm hex key wrench.

NOTE: Three sets of mounting screws are provided, sizes: M5, .190–24 UNC–2A and .190–32 UNF–2A.

### Piping

There is pilot exhaust from the top of the solenoid when the solenoid is de-energized. The pilot exhaust may be connected to the main exhaust if the air or inert gas cannot be exhausted directly to the atmosphere.

**▲ CAUTION: Debris entering 1/8 NPT connection at top of cartridge assembly may cause valve malfunction. Use exhaust protector provided when venting to atmosphere or connect to an exhaust system.**

Connect piping or tubing to valve according to markings on valve body. Refer to flow diagrams in *OPERATION* section.

**▲ CAUTION: To avoid damage or accidental disengagement of cartridge assembly from valve body, hold cartridge assembly securely by wrenching flats when installing or removing piping at 1/8 NPT connection on top of the solenoid.**

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.

**▲ 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.**

NOTE: The exhaust and/or pressure lines may be restricted to control cylinder speed on 4-way (5/2) mode only.

**▲ CAUTION: These solenoid valves are intended for use on clean dry air or inert gas, filtered to 50 micrometres or better. The dew point of the media should be at least 10° C (18° F) below the minimum temperature to which any portion of the clean air/inert gas system could be exposed to prevent freezing. If lubricated air is used, the lubricants must be compatible with Buna N elastomers. Diester oils may cause operational problems. Instrument air in compliance with ANSI/ISA Standard S7.3–1975 (R1981) exceeds the above requirements and is, therefore, an acceptable media for these valves.**

## MAINTENANCE

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

### Preventive Maintenance

- Prepare and follow a routine inspection schedule based on the media, environment, and frequency of use.
- Keep the medium flowing through the valve as free from dirt and foreign material as possible. Depending on medium and service conditions, clean valve strainer or filter as required to keep the valve free of contamination. In the extreme case, contamination will cause faulty valve operation and the valve may fail to shift.
- While in service, the valve should be operated at least once a month to ensure proper operation.

### Causes of Improper Operation

- **Incorrect Pressure:** Check valve pressure. Pressure to valve must be within range specified on nameplate.

## ORDERING INFORMATION FOR

### ASCO SOLENOIDS OR REPLACEMENT VALVES

When ordering ASCO Solenoids or Replacement Valves, specify catalog number, voltage, frequency and solenoid number, if possible.

\*DuPont Co. Registered Trademark

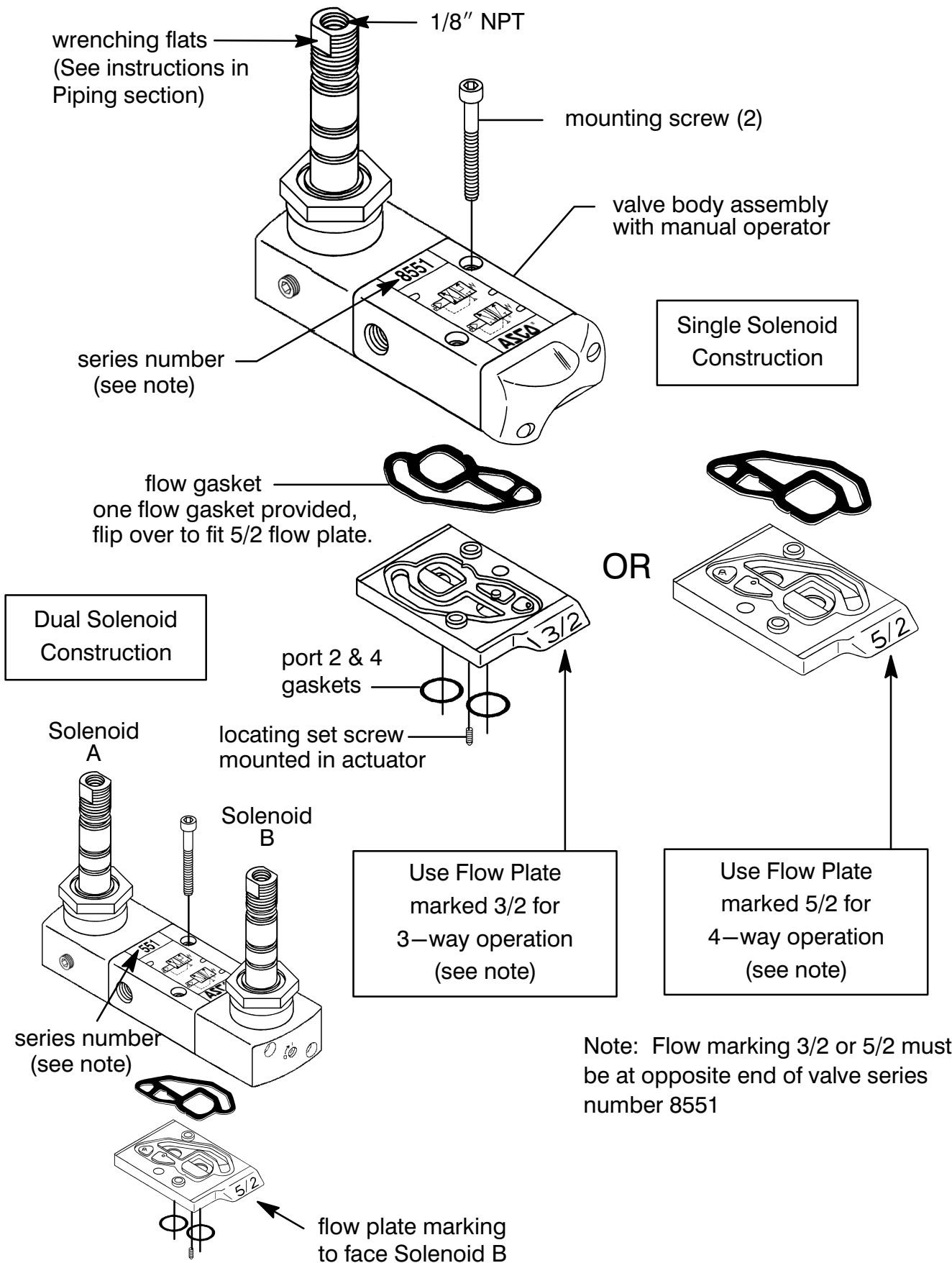


Figure 3. Series 8551