

Bray Series 63-N4 Installation & Maintenance Instructions

3-Way, or 4-Way, 2 Position Single or Dual Solenoid Valves

For NAMUR Actuators – ¼ NPT Supply & ¼ NPT Exhaust Connections

Air or Inert Gas Service – Anodized Aluminum Construction

Service Notice:

- **The Series 63-N4 is not repairable. When any performance problems are detected during routine inspection, replace valve immediately.**
- **For S63-N4/N7 Solenoids, see O&M Instructions for information on: Wiring, Solenoid Temperature, Cause of Improper Operation, and Coil Replacement.**

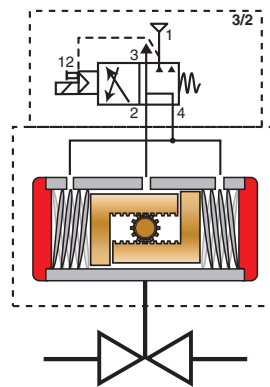
DESCRIPTION

Series 63 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.

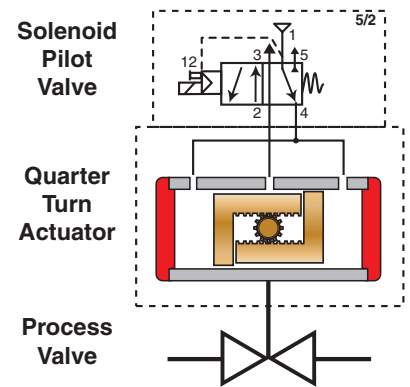
APPLICATIONS

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 = Supply, 2 & 4 = Open/Close Actuator ports 3 & 5 = Exhaust

OPERATION

NOTE: Minimum operating supply pressure, differential 30 psi; maximum 150 psi.

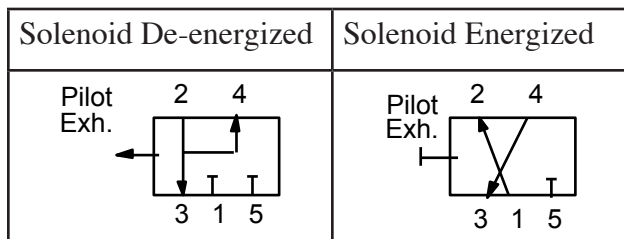
Breather Function 3-way (3/2) mode only: Allows for spring side of a spring return actuator to vent at all times through valve exhaust port 3.

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 Normally Closed 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.

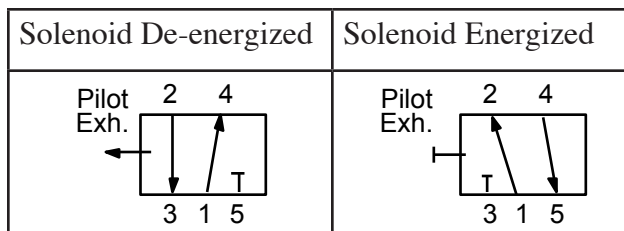
3-Way Single Solenoid (3/2)



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.



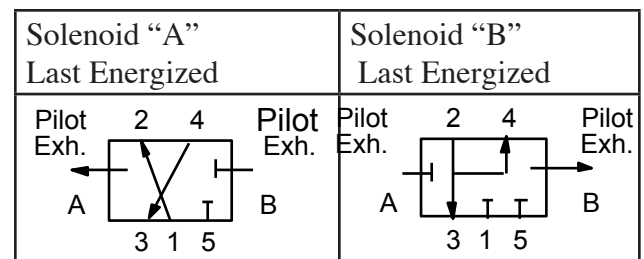
Do not energize solenoids A and B simultaneously, as this will cause valve to malfunction.

NOTE: Minimum on time for each solenoid is 0.3 seconds.

3-Way Normally Closed 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.

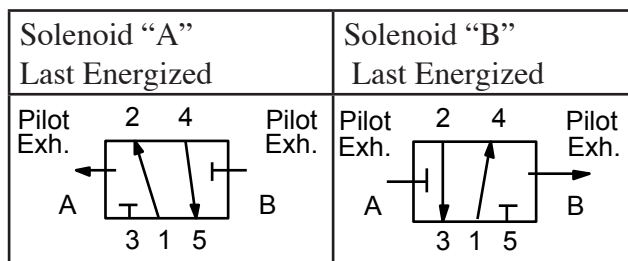
3-Way Dual Solenoid (3/2)



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.

4-Way Dual Solenoid (5/2)



Manual Operator (See Figure 1)

Manual operator provides manual operation when desired or during an electrical power outage. To engage manual operator, rotate screw clockwise as far as possible to "1". Valve will now be in the same position as when the solenoid is energized. To disengage manual operator, rotate screw counterclockwise as far as possible to "0".



CAUTION

To prevent malfunction be sure to turn screw counterclockwise to "0" before operating valve electrically.



Figure 1. Manual Operator (partial view)

Installation



WARNING

Check nameplate for correct catalog number, pressure, voltage, frequency, and service. Never apply incompatible medium 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.

NOTE: For temperatures below 32°F (0°C) moisture-free air must be used.

Positioning

Valve may be mounted in any position.

Flow Selection and Mounting (See Figure 2)

Two flow plates are provided with each valve. Flow plates are marked (3/2) for 3-way or (5/2) for 4-way. See Figure 2 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.

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. An exhaust protector is provided in the top of the plugnut/core tube assembly to prevent debris from entering pilot exhaust.

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

*DuPont's Registered Trademark

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

Wiring

Wiring must comply with local codes and the National Electrical Code. The open-frame solenoid may be rotated 360°. The open-frame solenoid is provided with ¼ inch spade terminals and a grounding spade terminal connection.

NOTE: Valves can be converted from alternating current (AC) to direct current (DC), or vice-versa, by changing the coil.

**CAUTION**

Temperature of external casing of coil can burn skin.

Solenoid Temperature

Series 63 valves are supplied with coils designed for continuous duty service. When the solenoid is energized for a long period, the solenoid coil 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**

To prevent the possibility of death, serious injury or property damage, turn off electrical power and depressurize valve 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.
- **Faulty Control Circuits:** 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 coil, broken lead wires or splice connections.
- **Burned-Out Coil:** Check for open-circuited coil. Replace coil as necessary. Check supply voltage; it must be the same as specified on nameplate.
- **Low Voltage:** Check voltage across the coil terminals. Voltage must be at least 85% of nameplate rating
- **Coil Replacement**
 1. Disconnect grounding and supply wires from coil.
 2. If the solenoid is a DIN65 model, remove the retaining clip and slip coil off the plugnut/core tube assembly.
If the solenoid is a NEMA 4 model, unscrew the four (4) retaining screws and pull off the coil
 3. Install new coil and re-secure to the solenoid body in reverse order of step 2.
 4. Reconnect grounding and supply wires to coil.