

FLUID CONTROL DIVISION

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IOM BANJ01
(Rev 0810)



Installation, Operating & Maintenance Instructions

3-Way Normally Closed Direct Acting Solenoid Valves 1/8" & 1/4"

Valve Types: U131B01, U131B02, 131B03, 131B04



GENERAL SAFETY INSTRUCTIONS BEFORE INSTALLATION

FAILURE OR IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

The conduit coil contains a green "grounding" wire that must be secured to a proper ground location. **DO NOT** cut off the green ground wire. Doing so could negate a proper ground path and leave the valve assembly unprotected or "hot".

This document and other information from Parker Hannifin Corporation, its subsidiaries and authorized distributors provide product and/or system options for further investigation by users having technical expertise. It is important that you analyze all aspects of your application, including consequences of any failure, and review the information concerning the product or system in the current product catalog. Due to the variety of operating conditions and applications for these products or systems, the user, through its own analysis and testing, is solely responsible for making the final selection of the products and systems and assuring that all performance, safety and warning requirements of the application are met. Usage of the device in a manner that is contrary to these Operating Instructions or the application conditions and specification provided in the Catalog is improper and will void your warranty.

The products described herein, including without limitation, product features, specifications, designs, availability and pricing, are subject to change by Parker Hannifin Corporation and its subsidiaries at any time without notice.

Carefully read installation, operation and maintenance procedures prior to installing or servicing valve.

Do not use valve as a safety shut-off valve when making repairs.

Do not install a valve or attempt to repair a valve before depressurizing system down to atmospheric pressure and removing electrical voltage.

Care must be taken to ensure the proper use of the valve and that the valve materials selected are suitable for the media being handled. Parker assumes no liability for damage caused by improper material selection in the case of corrosion from aggressive media.

Caution: Do not, at any time, make any alteration or modifications to any valve without the express and written approval of Parker's Fluid Control Division.

Description

These valves are direct operated 3-way normally closed solenoid models. The valves mount directly to a piston or diaphragm actuator enclosure including process control valves and angle seat valves.

The 3-way valves are offered in anodized aluminum body construction. Valves may be ordered with either DIN or Conduit integrated coils for ordinary locations. DIN coils with cable gland or conduit connector meet NEMA 4, 4X.

Product Features

The valves comprise a standard locking manual override providing operation without electrical supply.

The valves are offered with the following standard features:

- Direct mounting to valve actuator enclosure without extra fittings.
- AC and DC voltage compatibility for easy coil interchange.
- Small size for a low profile.
- 22mm DIN coil for direct mounting in non-explosive environments.
- DIN coils UL Recognized, CSA Approved.
- Standard Fluid temperature 14°F (-10°C) to 122°F (50°C).
- Standard Class F DIN or Conduit coils to meet application needs.

Principles of Operation

3-Way Normally Closed Valves

Solenoid de-energized: Pressure is connected to inlet port (#1) and is blocked by the plunger seal pressing against the body orifice allowing the actuator to exhaust through the valve exhaust port (#3).

Solenoid Energized: The plunger is lifted off the orifice allowing flow through the valve for actuator functioning.

NOTE: No minimum operating pressure is required. Energizing the coil creates a magnetic force sufficient to move the plunger within the sleeve assembly allowing flow from the inlet port to the outlet port.

MANUAL OVERRIDE

Manual override - The unit is shipped with a standard latching manual override. To engage the manual stem, turn the slotted stem clockwise 1/4 turn for continuous flow through the valve (to the #1 position stamped on valve). The valve will remain in the position as when the solenoid is energized. To disengage the manual stem and return the valve to the de-energized position, turn the stem counterclockwise 1/4 turn (to the #0 position) allowing the override stem to disengage and return to its original position thereby stopping flow through the valve. The manual override operator allows manual operation when desired or during an electrical power outage.

WARNING: For valve to operate electrically, the manual override stem must be fully disengaged.

Fluid Codes

Listed below are the common fluid codes. The codes for the approved fluids for use with each valve are printed on the outside of the individual packaging.

<u>CODE</u>	<u>FLUID</u>
A	- Air or non-toxic, nonflammable gases

For the maximum fluid temperatures, as well as valve ambient temperature limitations, check the valve part number on the nameplate and refer to the Banjo Valve bulletin.

Installation Instructions

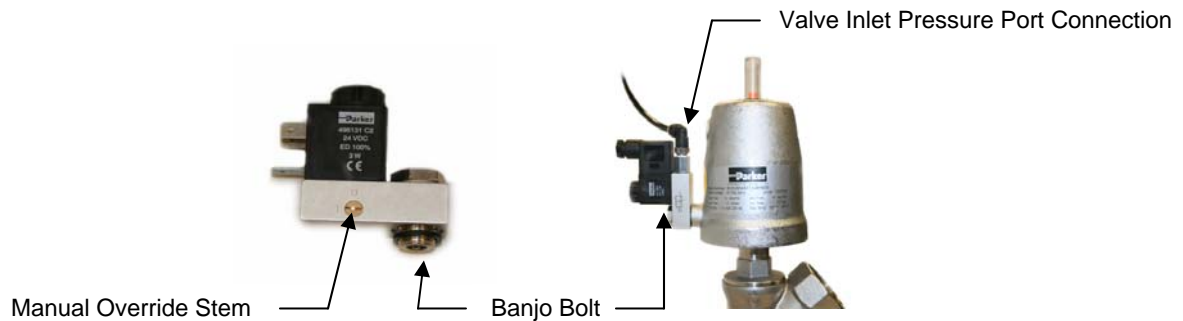
⚠ Prior to installing the solenoid valve, depressurize the pipes and clean them internally to avoid particles entering the system (tape sealant, thread compound). The valves may be mounted in any position.

Mounting position and pressure limits:

Valve with DIN or Conduit Coil:

The valve is mounted directly to the actuator by screwing the banjo bolt directly into actuator inlet port and is designed to operate in any position. Torque banjo bolt to 35 to 45 in-lbs (4 to 5 Nm). ***Do not use the sleeve or enclosure as a lever when applying torque.***

Line pressure, voltage and frequency must conform to nameplate rating. Allow adequate clearance above valve for removal of coil.



Valve Piping: Correctly support and align pipes to prevent mechanical strain on the valve. Connect line pressure to the inlet port (see dimensional drawing, port 1). Use of tape sealant, thread compound or sealants is permissible, but should be applied sparingly to male pipe threads only. To avoid damage to the equipment, DO NOT OVERTIGHTEN pipe connections.

Media filtration: Normally, filtration is not required, but dirt or foreign material in the media may cause excessive leakage, wear, or in exceptional cases, malfunction. If filtration is used, install the filter on the inlet side as close to the valve as possible. Clean the filter periodically depending on service conditions.

Lubrication: Lubrication is not required although line lubrication will increase valve life.

ELECTRICAL CONNECTIONS

⚠ General Recommendations and Safety Precautions

- Electrical connection must be made by qualified personnel using standard electrical practices in compliance with local authorities and the National Electrical Code.
- Depending on the voltage, electrical components must be grounded according to local standards and regulations
- The valves are designed for continuous duty operation. To prevent the risk of personal injury, do not touch the solenoid operator which can become hot under normal operating conditions.
- The solenoid coil **must** be assembled to the valve sleeve operator for proper valve operation. Failure to assemble the coil to the valve before applying system voltage will permanently damage the coil within a short period of time.
- The electrical supply must conform to the nameplate rating.

ELECTRICAL CONNECTIONS (continued)

WARNING: Turn off electrical power before connecting the valve to the power source.

If the coil assembly is located in an inconvenient orientation, it may be reoriented to facilitate installation. Loosen coil assembly nut, rotate coil assembly to the desired position, and then retighten the nut with an input torque of 4.0 to 5.0 in-lbs. [0,5 Nm].

DIN Coil (ND1) and various cable option terminations: Electrical connection is made with detachable DIN 43650 B plug connector for cable diameters of 6-8mm (Pg9), rotatable by 180° increments (3 pins: 2 + earth ground pin). Loosen connector screw and remove plastic connector from DIN coil. Do not remove the gasket from the DIN spades on the coil. Separate the plastic block from the connector housing with a small screwdriver to expose the electrical terminations. Feed the lead wires through the plastic connector and attach them to the appropriate screw terminal. Snap the plastic block back into place inside the connector housing. Place the gasket over the DIN spades on the coil and press the DIN connector and coil together. Secure the DIN connector to the coil using the mounting screw provided.


Slide o-ring over and down the sleeve assembly until the o-ring rests on the valve body. Slide the DIN coil over the valve sleeve. Affix nut to sleeve and tighten between 4.0 to 5.0 in-lbs. [0,5 Nm] torque.

Conduit Coil (NC1) with 1/2" NPT connection: Integrated conduit coils for ordinary locations. Use suitable electrical cabling and conduit materials and components meeting applicable NEMA recommendations.

Coil / enclosure temperature: Standard valves are supplied with coils designed for continuous duty service. Normal free space must be provided for proper ventilation. When the coil is energized continuously for long periods of time, the coil assembly will become hot. The coil is designed to operate permanently under these conditions. Any excessive heating will be indicated by smoking and/or odor of burning coil insulation.

For the maximum valve ambient conditions, as well as the fluid temperatures, check the valve part number on the nameplate and refer to the Banjo Valve bulletin to determine the maximum temperatures.

MAINTENANCE

 Prior to any maintenance work, switch off power supply and de-pressurize system to prevent the risk of personal injury or damage to equipment.

- **Preventive maintenance**

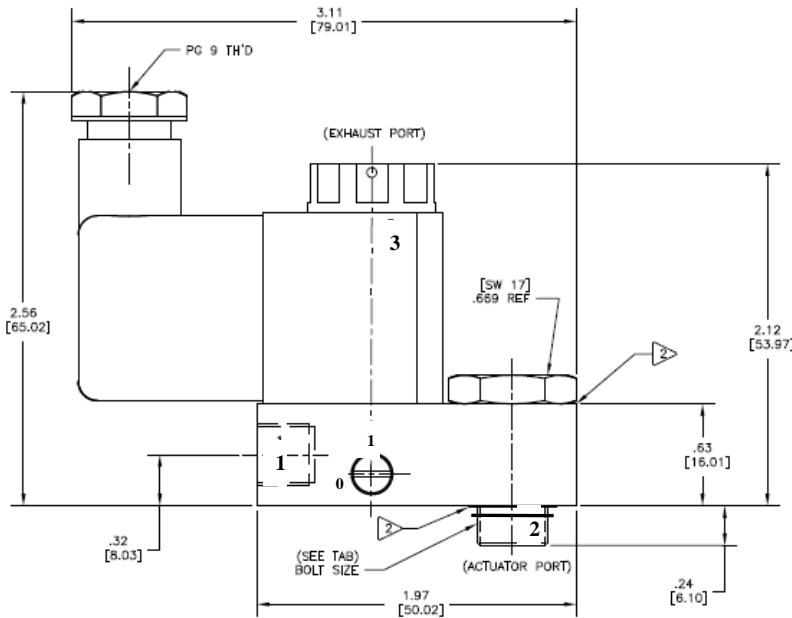
Avoid obstruction of exhaust port when it is not connected or protect it with a cap.

- **Cleaning**

Maintenance of the valve depends on the operating conditions. Depending on service conditions, filtration may be required to prevent or minimize dirt or foreign material in the media that could cause excessive leakage, wear, or in exceptional cases, malfunction.

The valve operator assembly (valve tube) is staked into the valve body and cannot be removed without damaging the valve. Therefore, **valve disassembly should not be attempted**.

Banjo Valve Dimensional Drawing



Part Number Shown with DIN Coil	Actuator Enclosure Port 2	Valve Pressure Port 1
U131B01NDAx	G 1/8"	1/8" NPT
U131B02NDAx	G 1/4"	1/8" NPT
131B03NDAx	G 1/8"	G 1/8"
131B04NDAx	G 1/4"	G 1/8"

x = Voltage Code (see table below)

BANJO COIL ELECTRICAL CURRENT RATINGS

Voltage Code	Voltage	DIN COILS, ND1x				CONDUIT COILS, NC1x			
		Wattage	Nominal (AMPS)	VA Holding	VA Inrush	Wattage	Nominal (AMPS)	VA Holding	VA Inrush
A	12VDC	4.8	0.400	-	-	4.8	0.400	-	-
B	24VDC	4.8	0.200	-	-	4.8	0.200	-	-
E	24/60	-	-	5.8	9.9	-	-	5.8	9.9
F	120 / 50-60	-	-	6.9	11.7	-	-	6.9	11.7
G	240 / 50-60	-	-	6.9	11.7	-	-	6.9	11.7

X = Voltage Code

DECLARATION

Parker Hannifin Corporation - Fluid Control Division certifies its valve appliance products complies with the essential requirements of the applicable European Community Directives. We hereby confirm that the appliance has been manufactured in compliance with the applicable standards and is intended for installation in a machine or application where commissioning is prohibited until evidence has been provided that the machine or application is also in compliance with EC directives.

The data supplied in the Parker catalogs and general Installation, Operating & Maintenance Instructions are to be consulted and pertinent accident prevention regulations followed during product installation and use. Any unauthorized work performed on the product by the purchaser or by third parties can impair its function and relieves Parker Hannifin of all warranty claims and liability for any misuse and resulting damage.

A separate Declaration of Conformity or Manufacturer's declaration is available upon request. Please provide valve identification numbers and order serial numbers of products concerned.

TROUBLE SHOOTING	
Symptom	Procedure
1. Valve fails to operate or is sluggish.	<ol style="list-style-type: none"> 1. Check electrical supply with voltmeter. Voltage must agree with coil rating. 2. If supply voltage too low, locate and correct cause of low voltage. Should exceed 85% of rated voltage. 3. Check coil with ohmmeter for shorted or open coil. Replace coil if defective. 4. Clean out extraneous matter in valve ports. 5. Replace valve if steps 1 to 4 do not solve faulty condition.
2. Valve coil burn-out.	<ol style="list-style-type: none"> 1. Continuous high voltage greater than 10% of rated voltage could result in coil failure. Locate and correct cause of high voltage. 2. Check electrical wiring installation. 3. Valve located in high ambient temperature. Ventilate or isolate area from high temperatures. May require valve relocation to lower temperature area. 4. Replace coil if defective.
3. Valve fails to close (normally closed valve) or internal fluid leakage occurs when valve should be closed.	<ol style="list-style-type: none"> 1. Make sure manual override stem is not engaged by turning counter clockwise direction ¼ turn to the #0 position. 2. Apply air to ports to clean out potential extraneous matter. 3. With coil de-energized, check power at coil wires. Power should be off. If power is present, correct faulty contacts or wiring. 4. Replace valve if steps 1 to 3 do not solve faulty condition.
4. External leakage at sleeve flange to body joint.	<ol style="list-style-type: none"> 1. Through repeated high cycling use, if the valve develops an external leakage point at the sleeve flange to body interface, replace valve.