



IOM7204  
(Rev0325)

## INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS

### 2-WAY N.C.PILOT OPERATED DIAPHRAGM SOLENOID VALVES

#### 1/4", 3/8" AND 1/2" NPT

#### VALVE TYPE: 7321K



#### DESCRIPTION

These valves are 2-way pilot operated diaphragm valves requiring a minimum operating pressure differential to insure valve opening. The 7321K are available for general service and they are also available for Timer Drain and Anti-Water Hammer service. They are offered in a combination of brass and stainless steel construction. Valves may be ordered with either NEMA 2, NEMA 4, 4X integrated coils for ordinary locations or NEMA 4, 4X, 7, and 9 for hazardous locations: Divisions I and II; Class I, Groups A, B, C, and D; Class II, Groups E, F, and G. Additional solenoid coils and enclosures are offered as described in our catalog.

#### PRINCIPLES OF OPERATION

**De-energized:** Pressure is applied to the inlet port. An arrow on the valve body indicates direction of flow. With the valve de-energized flow thru the valve is prevented by the plunger seal pressing on the diaphragm pilot orifice and on the diaphragm which seals the valve main body orifice.

**Energized:** The plunger is lifted off the diaphragm pilot orifice which vents the pressure behind the diaphragm. This venting will allow the pressure under the diaphragm to lift the diaphragm off the main body orifice allowing flow thru the valve.

**CAUTION:** A minimum pressure differential of 3 psi is required for proper valve operation.

#### FLUID CODES

Listed below are the codes utilized by Underwriters Laboratories (UL) and the Canadian Standards Association (CSA) for various common fluids. The codes for those fluids that are approved or certified by the agencies for use with each valve are printed on the outside of the individual packaging.

#### CODE

#### FLUID

A	-	Air or nontoxic, nonflammable gases
AC	-	Acetylene
F	-	Common refrigerants except ammonia
G	-	City gas supplied by public utilities
GA	-	Gasoline
HO	-	Petroleum based hydraulic oils having viscosities of up from 125 to 400 SSU at 38°C
02	-	Nos. 1 and 2 fuel oils. oils having viscosities not more than 40 SSU at 38°C
02 - 06	-	No. 2 through No. 6 oil
OX	-	Oxygen
S	-	Steam
W	-	Water or other aqueous nonflammable liquids

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

#### INSTALLATION INSTRUCTIONS

**Mounting position and pressure limits:** Valves can be mounted directly on piping or by using the two (2) #10-24 UNC threaded holes in the bottom of the valve body.

The 7321K valves are designed to be multi-poised and so will perform properly when mounted in any position. However, for optimum life and performance the valves should be mounted vertically upright so as to minimize wear and reduce the possibility of foreign matter accumulating inside the sleeve area.

Line pressure must conform to nameplate rating.

**Piping:** Remove protective closures from the ports. Connect line pressure to the inlet port. Use of Teflon tape, thread compound or sealants is permissible, but should be applied sparingly to male pipe threads only.

**CAUTION:** Do not allow foreign particles, Teflon tape, or thread compound to enter valve. Tightening torque should not exceed the following values for each port size: 1/4" NPT - 175 in-lbs., 3/8" NPT - 225 in-lbs., 1/2" NPT - 300 in-lbs. Do not use the sleeve or enclosure as a lever when applying torque.

**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 periodically depending on service conditions.

**Lubrication:** Lubrication is not required although airline lubrication will substantially increase valve life.

**CAUTION:** Valves which have an "E " in the 10th position of the valve part number have seals or other components made from ethylene propylene rubber and must not be exposed to petroleum based lubricants or other hydrocarbons.

**Electrical connection:** Electrical supply must conform to nameplate rating. Connect coil leads or terminals to the electrical circuit using standard electrical practices in compliance with local authorities and the National Electrical Code.

**WARNING:** Valves to be installed in **Hazardous Locations**, must be outfitted with Hazardous Location coils only. Verify nameplate data and coil part number before installing the valve.

**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 desired position, then retighten the nut with an input torque of 43-53 in-lbs.

**DIN Coil and Terminal Box Assembly (Coil Code D200 or D300; Option Code TB):** Loosen cover screws and swing cover 90°C toward the conduit hub in order to access the interior space. Separate the plastic block containing the screw terminals from the metal enclosure using a small Flathead screwdriver. Feed the lead wires through the conduit hub and attach them to the appropriate screw terminal. For electrical connection within the terminal box, use field wire that is rated for 90°C or greater. Snap the plastic block back into place inside the metal enclosure. Replace the cover and hand-tighten the cover screws. Place the gasket over the DIN spades on the coil and press the terminal box and coil together. Secure the terminal box to the coil using the mounting screw provided. Apply 20 to 30 in-lbs. torque to the mounting screw.

**Screw Terminal Coil and Terminal Box Assembly (Coil Code S100, S200, or S300; Option Code TB):** Loosen cover screws and swing cover 90° toward the conduit hub in order to access the interior space. Feed the lead wires through the conduit hub and attach them to the appropriate screw terminal. For electrical connection within the terminal box, use field wire that is rated for 90°C C or greater. Replace the cover and hand-tighten the cover screws. Press the terminal box and coil together. Secure the terminal box to the coil using the mounting screw provided. Apply 20 to 30 in-lbs. torque to the mounting screw.

**CAUTION:** When the DIN or Screw Terminal coils are used with the Terminal Box Assembly, be sure to apply a wrench to the wrench flats on the conduit hub when installing electrical conduit.

**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 catalog to determine the maximum temperatures.

## **MAINTENANCE**

Note: Depending on service conditions, fluid being used, filtration, and lubrication, it may be required to periodically clean and/or replace worn components. See Disassembly Instructions.

**CAUTION:** Do not expose plastic or elastomeric materials to any type of commercial cleaning fluid. Parts should be cleaned with a mild soap and water solution.

## **DISASSEMBLY INSTRUCTIONS**

**WARNING:** Depressurize system and turn off electrical power to the valve before attempting repair.

The valve need not be removed from the line.

### **To remove the coil assembly:**

For both ordinary and hazardous location constructions, unscrew the nut on the top of the coil assembly. The wave washer and coil assembly can now be removed.

### **To disassemble the pressure vessel:**

Unscrew body adapter from body. The plunger, plunger spring, adapter O-ring and diaphragm assembly can now be removed. The diaphragm can be removed from the brass retainer by peeling it from the internal groove machined in the brass retainer. The sleeve can also be unscrewed from the adapter if desired.

**Replacement Parts:** When ordering replacement parts kits, specify valve number and voltage from nameplate. Parts kits are available for each valve. Parts included in each kit are marked with an **asterisk (\*)**. See exploded views.

## **REASSEMBLY INSTRUCTIONS**

**WARNING:** Valves equipped with **Hazardous Location** coils must use Hazardous Location replacement coils only. Verify nameplate data and coil part number before installing the replacement coil.

### To reassemble the pressure vessel:

Refer to exploded view drawings. Parts must be replaced in the order shown.

Assemble the new diaphragm to the brass retainer. A special tool is available to aid in assembling the diaphragm to the brass retainer. This is not needed on the anti-water hammer version. Position the diaphragm assembly in the body. Assemble the O-ring to the body

adapter. Place the plunger and spring in the sleeve assembly. Assemble the sleeve and body adapter to the body with an input torque of 260-270 in-lbs.

With coil assembly repositioned on the sleeve, slide the wave washer over the sleeve and tighten coil assembly nut with an input torque of 43-53 in-lbs.

Refer to the Installation Instructions for remaining installation procedures.

TROUBLE SHOOTING	
PROBLEM	PROCEDURE
Valve fails to operate	<ol style="list-style-type: none"><li>1. Check electrical supply with voltmeter. Voltage must agree with nameplate rating.</li><li>2. Check coil with ohmmeter for shorted or open coil.</li><li>3. Make sure that pressure complies with nameplate rating.</li></ol>
Valve is sluggish or inoperative - electrical supply and pressure check out	<ol style="list-style-type: none"><li>1. Disassemble valve as per the Disassembly Instructions. Clean out extraneous matter. The plunger must be free to move without binding.</li><li>2. The plunger spring must not be broken. Replace spring if necessary.</li><li>3. The diaphragm must be free to move without binding. Check diaphragm bleed hold and pilot orifice for clogging or tearing. Note valve with the anti-water hammer feature will have a pin in the diaphragm bleed hole. Damaged bleed hold may require replacing the diaphragm.</li></ol>
External leakage at sleeve flange to body adapter joint.	<ol style="list-style-type: none"><li>1. Check that sleeve is torqued to 260-270 in-lbs.</li></ol>
External leakage at body adaptor to body joint.	<ol style="list-style-type: none"><li>1. Check that adaptor is firmly bottomed on the body.</li><li>2. If leakage persists, remove body adaptor and check adaptor seal for damage. Replace seal if necessary.</li></ol>
Internal leakage at body part	<ol style="list-style-type: none"><li>1. Disassemble valve as per the Disassembly Instructions. Remove extraneous matter. Clean parts in a mild soap and water solution.</li><li>2. Examine surface of the plunger seal and diaphragm. If damaged, replace plunger or diaphragm.</li><li>3. Inspect diaphragm pilot orifice and main body orifice for nicks. Damage may require a new valve or replacement.</li><li>4. Check plunger spring. Replace if broken.</li></ol>

### DECLARATION

Parker's 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 valve 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

