

INSTALLATION, OPERATING & MAINTENANCE INSTRUCTIONS
2-WAY N.O. AND N.C. HIGH PRESSURE STEAM SOLENOID VALVES
3/8", 1/2", 3/4", 1" 1-1/4", AND 1-1/2" NPT
VALVE TYPES: 73218, 73228



DESCRIPTION

These valves are 2-way, pilot operated models requiring a minimum operating pressure differential to insure valve operation. They are available in both normally open (N.O.) and normally closed (N.C.) versions and are offered in brass body construction. Valves may be ordered with either NEMA 2, 4, 4X integrated coils for ordinary locations or NEMA 4, 4X, and 7 for hazardous locations: Divisions I and II; Class I, Groups A, B, C, and D; Class II, Groups E. Additional solenoid coils and enclosures are offered as described in our catalog.

PRINCIPLES OF OPERATION

The inlet ports of the 73218 and 73228 valves are stamped "P" on the valve body. The outlet ports are not marked.

Normally open type: 73218

De-energized: Pressure is connected to the "P" inlet port. Fluid is free to flow through the valve.

Energized: The seal retainer closes off the pilot orifice and causes the pressure to build up behind the piston. The increased pressure causes the piston to close the main orifice, stopping flow through the valve.

Normally closed type: 73228

De-energized: Pressure is connected to the "P" inlet port and is trapped by the plunger on the pilot orifice and by the piston on the main orifice. The fluid pressure and piston spring keep the main orifice sealed. There is no flow through the valve.

Energized: The plunger moves, opening the pilot orifice and venting the pressure behind the piston. The venting causes the piston to open the main orifice, allowing flow through the valve.

CAUTION: A minimum operating pressure differential of 3 or 5 psi is required for proper valve operation, depending on the model. Consult nameplate rating.

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 or the outside of the shipping package.

INSTALLATION INSTRUCTIONS

Mounting position and pressure limits: Valves can be mounted directly on piping.

The 73218 and 73228 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 "P" inlet port. An arrow on the valve body also indicates the direction of flow. 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:

Only wrench flats provided on the body should be used when applying torque. Do not use sleeve or enclosure as a lever.

Media filtration: Dirt or foreign material in the media may cause excessive leakage, wear, or in exceptional cases, malfunction. For protection of the valve, install a suitable

strainer or filter on the inlet side as close to the valve as possible. Clean periodically depending on service conditions.

Lubrication: Lubrication is not applicable to steam applications.

CAUTION: Valves which have seals or other components made from ethylene propylene rubber 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 D100, D200 or D300; Option Code TB):

Loosen cover screws and swing cover 90° 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 flat head 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 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 boss 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 90° 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 or the outside of the shipping package.

MAINTENANCE

Note: Depending on service conditions, fluid being used, and filtration, 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 valves need not be removed from the line.

To remove the coil assembly:

Normally Open and Normally Closed Valves - 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:

CAUTION: If the sleeve assembly does not have a hex style flange, do not use a pipe wrench directly on the sleeve. Instead, use a Skinner U99-011 wrench nut to remove the sleeve assembly.

Normally Open Valves - Slide the Skinner U99-011 wrench nut over the sleeve tube. To unscrew the sleeve assembly, mate the wrench nut to the sleeve flange and turn the wrench nut. The snubber, plunger, wave washer, stop, seal retainer, spring, and flange seal may now be removed.

Normally Closed Valves - Slide the Skinner U99-011 wrench nut over the sleeve tube. To unscrew the sleeve assembly, mate the wrench nut to the sleeve flange and turn the wrench nut. The plunger, spring, and flange seal may now be removed.

Unscrew the cover screws. If the cover cannot be easily lifted off the body, laterally tap the cover or gently pry the cover from the body with a screwdriver. The spring, piston assembly, and O-rings can now be removed.

To disassemble the piston assembly, remove the piston bearing(s) and piston ring. Unscrew the lock nut. Valves having port sizes 3/8" through 3/4" NPT, the metal washer, piston seal, rubber washer, O-ring, and bolt can now be removed from the piston. For larger valves, 1" through 1-1/2" port sizes, after removing the lock nut, the metal washer, piston seal, and rubber washer can be removed.

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: When replacing coils, 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. When assembling the piston seal, do not nick or scratch the sealing surface.

For the 1" through 1-1/2" NPT port size valves, assemble the bolt and rubber washer to the piston. Press the rubber washer firmly to the bottom of the piston cavity. Place the piston seal over the bolt.

For the 3/8" through 3/4" NPT port size valves, assemble the bolt, O-ring, and rubber washer to the piston. Press the O-ring and rubber washer firmly to the bottom of the piston cavity. Place the piston seal over the bolt.

Place the metal washer over the bolt, making sure the side with the edge radius rests against the piston seal. Ensure that the metal washer is centered on the centering shoulder of the bolt. Install the lock nut on the bolt and torque to 25-30 in-lbs. on the 3/8" through 3/4" NPT port sizes, and 35-55 in-lbs. on the 1" through 1-1/2" NPT port size valves. Also apply one (1) drop of Loctite 290 to the nut/bolt thread. Install piston and bearing rings on the piston. Do not over stretch the rings.

Insert the piston spring in the piston. For the 3/8" through 3/4" NPT valves, install the piston spring with the larger diameter inserted in the piston.

Now assemble the piston into the cover, ensuring that all springs are seated properly in or on their spring seats.

When assembling the cover to the body, properly position the O-ring on the body. Make sure that the piston and bearing ring(s) are not damaged. Avoid damaging the body seat radius with the metal parts of the piston assembly. Install and tighten cover screw with a torque of 65-85 in-lbs. on the 3/8" through 3/4" NPT valves and 110-150 in-lbs. on the 1" through 1-1/2" NPT valves.

For N.C. valves, install the plunger and spring in the sleeve. Avoid damaging the pilot orifice surface when installing the sleeve onto the cover. Tighten sleeve assembly with an input torque of 170-190 in-lbs.

For N.O. valves, install the snubber, plunger, wave washer, stop seal retainer and spring into the sleeve. Avoid damaging the pilot orifice surface when installing the sleeve onto the cover. Tighten sleeve assembly with an input torque of 170-190 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"> 1. Check electrical supply with voltmeter. Voltage must agree with nameplate rating. 2. Check coil with ohmmeter for shorted or open coil. 3. Make sure that pressure complies with nameplate rating.
Valve is sluggish or inoperative - electrical supply and pressure check out	<ol style="list-style-type: none"> 1. Disassemble valve as per the Disassembly Instructions. Clean out all extraneous matter ensuring passages are clear. 2. The plunger must be free to move without binding. The plunger spring must not be broken. Replace spring if necessary. 3. Piston must be free to move inside cover without binding. 4. Piston bearing and sealing rings must be free to rotate. They should also have a slight interference with the cover bore. 5. Check all springs. Replace if broken.
External leakage at sleeve flange to cover joint	<ol style="list-style-type: none"> 1. Check that sleeve is torqued to 170 -190 in-lbs. 2. If leakage persists, remove sleeve and check flange seal for damage. Replace if defective.
External leakage at flange joint between body and cover	<ol style="list-style-type: none"> 1. Retighten cover screws with an input torque of 65-85 in-lbs. For the 3/8" through 3/4" NPT port size valves, and 110 - 150 in-lbs. For the 1" through 1-1/2" NPT port size valves. 2. If leakage persists, replacement of flange O-ring or bypass passage O-ring may be required and/or body or cover with damaged sealing surfaces may have to be repaired or replaced.
Internal leakage	<ol style="list-style-type: none"> 1. Disassemble valve as per the Disassembly Instructions. Remove extraneous matter. Clean parts in a mild soap and water solution. 2. Examine plunger seal, retainer seals, and main orifice piston seal for damage and/or imbedded dirt. Clean or replace as required. 3. Inspect all orifices for nicks or pitting. If orifices are excessively worn or damaged they must be replaced. 4. Check all springs. If broken, replace.

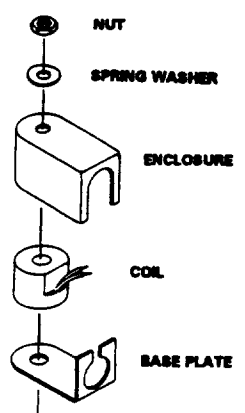
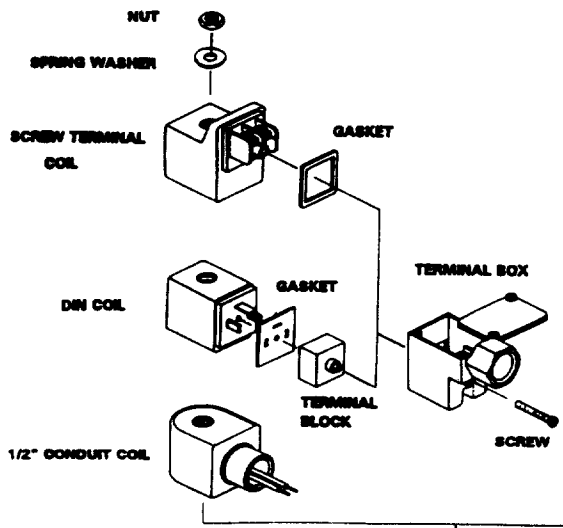
DECLARATION

Parker's Skinner Valve 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.

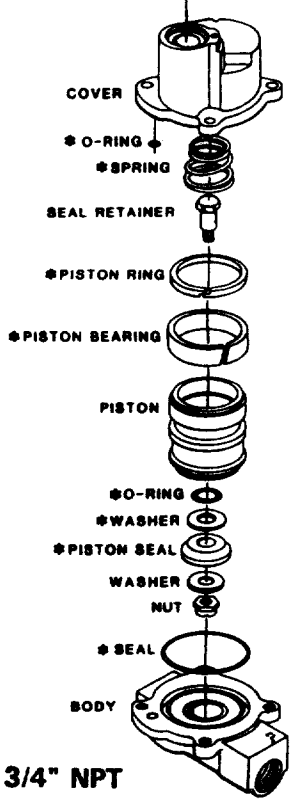
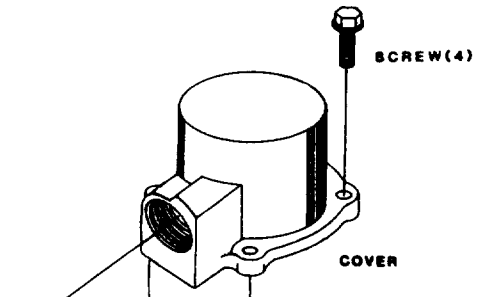
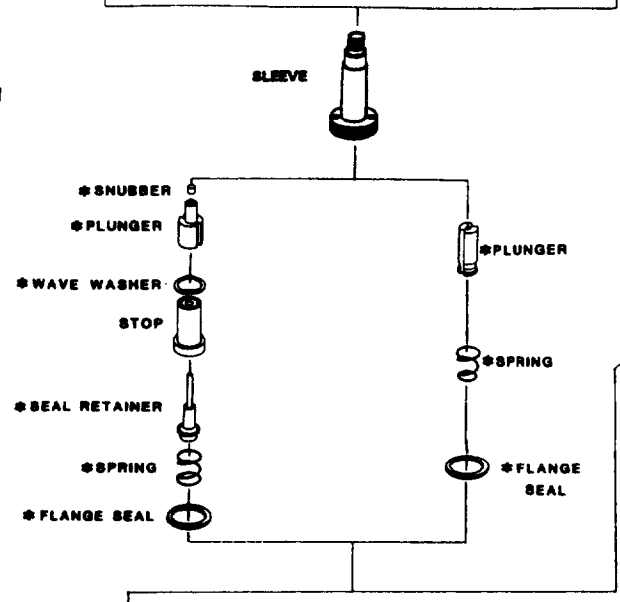
The data supplied in the Skinner valve catalogs and general Installation, Operating & Maintenance Instructions are to be consulted and pertinent accident prevention regulations followed

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 of all warranty claims and liability for any misuse and resulting damage.

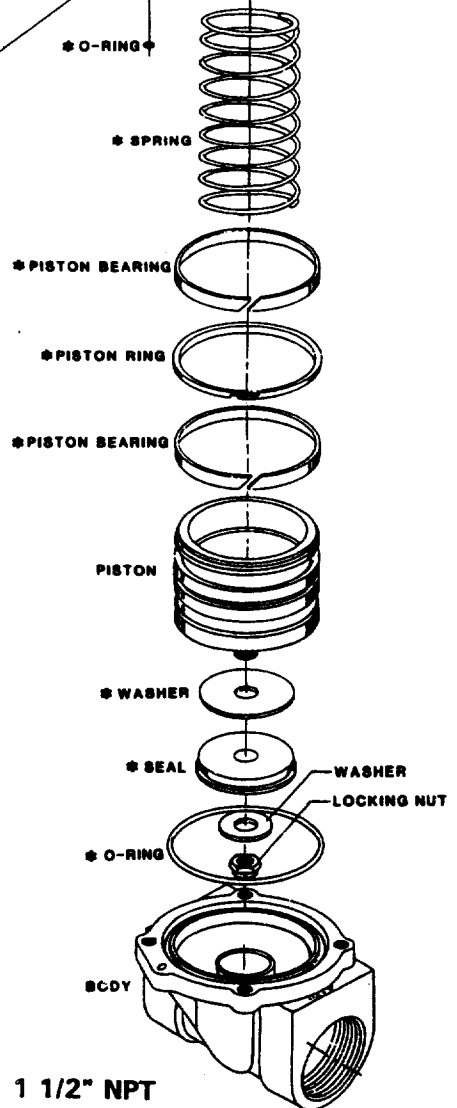
A separate Declaration of Conformity or Manufacturer's declaration is available upon request. Please provide valve identification numbers and order serial numbers of products concerned.



*WRENCH NUT U99-011
REQUIRED FOR SLEEVE
REMOVAL



3/8" - 3/4" NPT



1" - 1 1/2" NPT