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BALL VALVES



3 PC SANITARY 400 CWP W/ CLAMP ENDS

This instruction manual includes installation, operation and maintenance information for FNW 3 PC sanitary ball valves with clamp ends. This manual addresses lever operated ball valves only. Please refer to other FNW manuals for other ball valves, actuated valves, modifications or accessories.



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CAUTION:

- Valve pressure ratings are based on many variables, including valve series and size, as well as body, seat and bolt material. Verify that the application does not exceed the pressure or temperature rating of the valves.
- Always depressurize the line with the valve in the open position before disassembly.
- Wear protective equipment and take appropriate precautions to safeguard against injury caused by the discharge of trapped fluids.
- Use only FNW recommended spare parts for maintenance.
- To ensure safety and to maintain warranty, never modify the valve in any way without prior approval from FNW.

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STORAGE:

ATTENTION: If the valves are not destined for immediate use, the following precautions should be taken:

- If possible, leave the valves in their packaging cases during the period of storage.
- Ball valves must remain in the open position while being stored.
- In order to prevent damage, protective plastic covers on valve ends should not be removed until immediately prior to installation.
- It is advisable to store valves in waterproof conditions. Ball valves should be protected to safeguard against humidity, moisture, dust, dirt, sand, mud, salt spray, sea water or other forms of corrosive and erosive environments.
- Valves with actuators are to be stored in dry conditions.
- Valves to be stored for long periods of time should be checked by the quality control personnel or designee every six months; every three months when valves are automated.
- Ball valves should be operated for at least three complete cycles before installing or returning to storage.



WARNING:

To avoid personal injury to yourself, fellow workers or damage to property from release of process fluid, before installation:

- Shut off all operating lines to the valve site.
- Isolate the valve site completely from the process.
- Release process pressure.
- Drain the process fluid from the valve site.

INSTALLATION

Note

- The ball valves may be installed in any position using standard pipe fitting practices.
- Pipe must be free of tension both during and after installation.
- The ball valves are shipped in the full open position to prevent damage of seat and ball surfaces. The valve should be kept in the open position during installation.
- The ball valves are supplied with end caps for protecting the end connections and the interior space of the valves. Remove the protective covers only just prior to installation of the valve.
- If the valve was supplied with an actuator, secondary support may be necessary. Contact FNW for recommendations.
- **ATTENTION: Do not perform welding near an installed valve. Welding in the vicinity of an installed valve can damage the valve and cause leakage.**
- **CAUTION: The rotating ball can cause injury. Keep body parts away from the space between ball and body (valve interior).**

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Before Installation

- Inspect the valve body port and associated equipment for any damage that may have occurred and for any foreign matter that may have collected in shipping or storage. Make certain the body interior is clean.
- Inspect the pipeline and mating clamp ends, making sure the pipe is free of foreign material that could damage the ball or seat and the clamp ends are clean and have no burrs or pits that could cause leakage.
- Cycle the valve at least twice to ensure proper operation.
- Before installing the valve, seal rings should be applied to the clamp ends per ISO 2852. Failure to apply proper seal rings may result in leakage and damage.

Installing

- Prior to mounting the valve, flush the pipeline to remove soiling and weld residue.
- Make sure the protective end caps from the valve are removed.
- With the valve in the open position, insert it along with appropriate flange gaskets (not included) between the pipeline flanges.
- Insert appropriate size bolts and heavy hex nuts (not included) as recommended for the flange size and class.
- Verify proper alignment of all components and then tighten quick clamps according to manufacturer's recommended torque.
ATTENTION: Do not operate the valve before flushing the pipeline. Keep the valve in the open position until flushing is complete. Residue in the line could cause damage to the seats.

OPERATION

Note: This manual only covers the operation of manually operated valves. For operation of automated valves, consult the manufacturer's manual for the actuator.

- Ensure that the valve materials are compatible with the service and that the operating characteristics are below the valve's maximum.
- Fluids containing particles or coagulating agents are not acceptable as they can reduce seat life and cause dramatic increase in torque.
- Throttling (operation in partially open position) is not recommended.
- Open and close the valve by turning the handle one-quarter turn (90°).
- Valve is in the open position when the handle is parallel with the pipeline.
- Valve is in the closed position when the handle is perpendicular to the pipeline.

MAINTENANCE

A long valve life free of maintenance is possible under normal working conditions and in accordance with pressure/temperature and corrosion data chart.

WARNING: Ball valves can trap pressurized fluids in the ball cavity in closed position.

Prior to maintenance, relieve the line pressure and put ball in open position first. If the fluid is toxic, harmful, high-pressure, or dangerous mediums, please follow safe practices when disassembling.

Retighten Packing

- Should a leakage occur at the gland packing, retighten the stem nut (14).
- Take care that the stem nut (14) is not tightened too much. Normally the leakage can be stopped by simply turning the stem nut (14) by 30°–60°.

Replacement of Seats and Seals

- Disassembly
 - Place the valve in half-open position and flush the line to remove any hazardous material from the valve body.
 - Place the valve in close position; remove three body bolts and loosen one remaining. Carefully rotate the center section free of the pipeline.
 - Remove body gasket (7) and seat (4). Examine ball carefully for scratches or damage and replace if necessary.

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- When stem packing needs replacement, disassemble in the following order: Handle nut (17), handle (18), stop lock cap (15), stem nut (14), belleville washer (13), gland (12), bushing (11) and stem packing (10).
- Push stem (5) down into the body cavity and remove, then remove stem O-ring (9), packing (10) from the body.
- **Caution: Do not scratch the surface of ball, stem and packing, and sealing parts during disassembly.**
- Reassembly
 - Reassembly process is reverse sequence of disassembly.
 - Clean and inspect all parts, full replacement of all soft parts (seats and seals) is strongly recommended.
 - Tighten the body bolt (22) crosswise using the stipulated torque. See Table A.
 - Tighten the stem nut (14) using the table stipulated torque. See Table B.
 - Cycle the valve slowly with gentle back and forth motion to build gradually to full quarter turn.
 - If possible, pressure test the valve before placing it back to line for service.

NOTE: Before installing the valve, please check whether the valve material, bolts and nuts are suitable to site work to avoid potential safety hazards caused from corrosion and cracking of the valve body or bolts and nuts.

- After valve is used with its stems repeatedly turned for a long period, the stem packing may wear and cause leakage and pollution.
- Tightening the stem nut (14) to compress the stem packing (10) from time to time to ensure the sealing performance of the valve is recommended.
- The valve is packaged with recyclable cartons, wooden boxes and turnover boxes in environment friendly material. Therefore, the packaging boxes can be reused or recycled according to local regulations.
- When the ball valve is in the close position with pressurized fluid in the valve body, please release the pipeline pressure and keep the valve in the open position before maintenance.
- The noise of valve operation is 85dB(A).

NOTE: To destroy the valve, please refer to local laws and regulations of waste disposal.

TABLE A BODY CAP BOLT TORQUES

Size (Inch)	Stud Size (Inch)	Qty	Torque (In-Lbs)
1/2	5/16-18 UNC	4	62–89
3/4	5/16-18 UNC	4	142–186
1	5/16-18 UNC	4	142–186
1-1/2	3/8-16 UNC	4	248–310
2	3/8-16 UNC	4	248–310
2-1/2	9/16-12 UNC	6	443–665
3	9/16-12 UNC	6	443–665
4	5/8-11 UNC	8	709–1019

TABLE B FIGURE FOR STEM NUT TIGHTEN

Valve Size	Torque
NPS	In-Lbs
1/2	80–106
3/4	80–106
1	106–142
1-1/2	151–195
2	151–195
2-1/2	221–283
3	221–283
4	372–443

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Cleaning Guidelines for Equipment

- **Proper Installation:** Ensure the equipment is installed in the correct orientation, allowing for effective cleaning and draining.
- **Initial Flush:** Before use, flush the equipment with a suitable cleaning agent to eliminate any residue that might be present from shipping. It is essential to avoid cleaning agents that could harm stainless steel or the supplied elastomers in the valve.
- **Safety Precautions:** Always follow the Material Safety Data Sheet (MSDS) instructions for handling and using cleaning agents safely.
- **Thorough Cleaning:** Flush the equipment adequately to remove any contaminants from the product contact components. The level of soil may vary depending on the processed product, so adjust the cleaning time and cleaning agent concentration accordingly. The responsibility for determining and adjusting these cleaning specifications lies with the operator.
- **Immediate Cleaning:** Do not allow the equipment to sit with product residue for extended periods. Clean the equipment promptly after processing is complete.
- **Fluids containing particles or coagulating agents are not acceptable as they can reduce seat life and cause dramatic increase in torque.**

Manual Cleaning Process

Per 3A 68-01 - Ball valves are not suitable for clean in place (CIP). Must be clean out of place (COP).

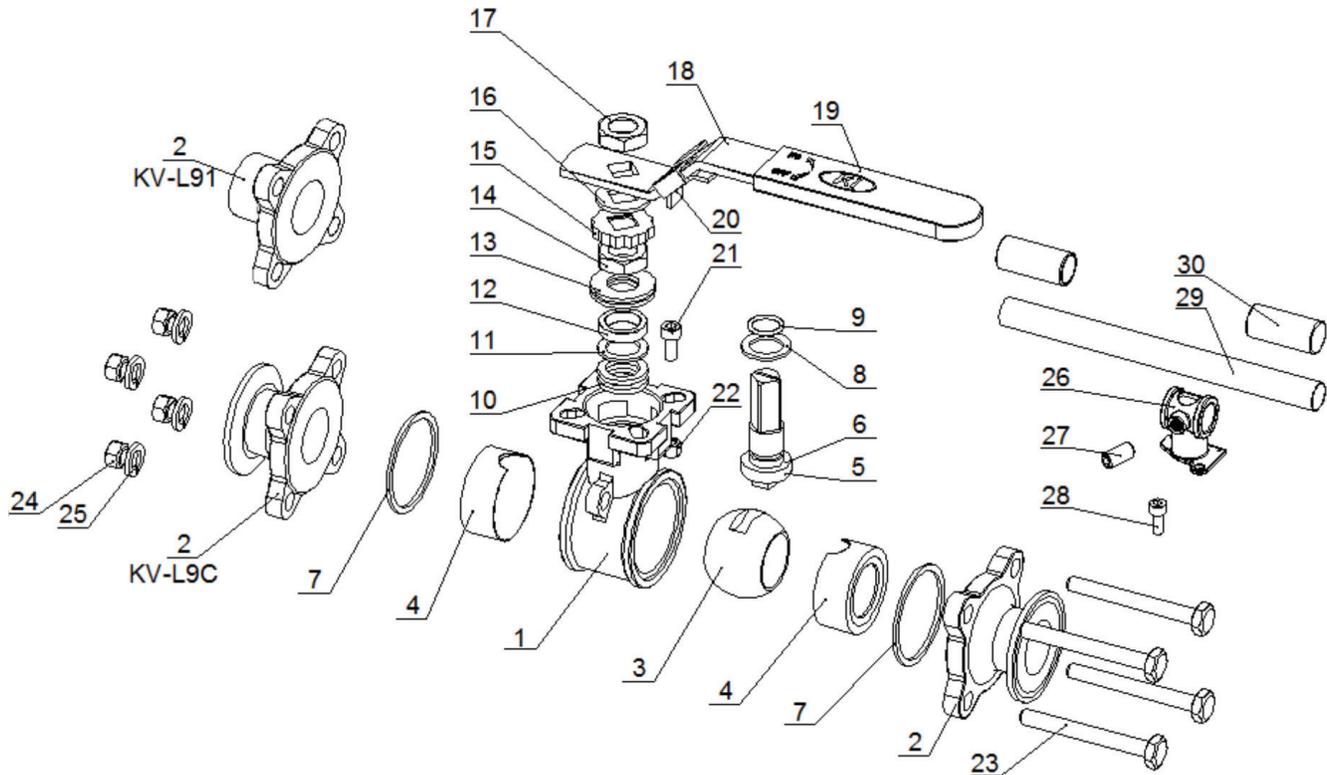
- **Disassembly:** Refer to manual's disassembly section and carefully follow the instructions to remove all product contact components.
- **Inspection:** Inspect the product contact components for any signs of damage. Replace damaged components with new ones, referring to the equipment Bill of Materials (BOM) manual for replacement part numbers.
- **Cleaning Solution Bath:** Clean all surfaces of the product contact components by manually brushing them in a bath of appropriate cleaning solution. Suitable cleaning solutions include acid detergents or simple alkaline soda-type detergents.
- **Rinse:** Thoroughly rinse all components with water after cleaning.
- **Reassembly:** Refer to assembly section of the manual and carefully follow the instructions to reassemble correctly.

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TROUBLESHOOTING

Stem Leakage

- Stem leakage in the packing area may be eliminated by increasing the torque on the stem nut (14) in one-quarter turn increments. Do not overtighten. Doing so can increase valve torque making it difficult to operate. If leakage persists, replace stem packing (10).

Body Seal Leakage

- Check the tightness of the body nuts (24). Tighten per Table A. If leakage persists, replace the body seals (7).

In Line or Seat Leakage

- Verify that the valve is in the fully closed position. If leakage persists, the valve should be disassembled and damaged parts replaced.
- Please see spec sheet for soft good repair kits.

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WARRANTY

- 1.1 **LIMITED WARRANTY:** Subject to the limitations expressed herein, Seller warrants that products manufactured by Seller shall be free from defects in design, material and workmanship under normal use for a period of one (1) year from installation but in no case shall the warranty period extend longer than eighteen months from the date of sale. This warranty is void for any damage caused by misuse, abuse, neglect, acts of God or improper installation. For the purpose of this section, "Normal Use" means in strict accordance with the installation, operation and maintenance manual. The warranty for all other products is provided by the original equipment manufacturer.
- 1.2 **REMEDIES:** Seller shall repair or replace, at its option, any non-conforming or otherwise defective product, upon receipt of notice from Buyer during the Manufacturer's warranty period at no additional charge. SELLER HEREBY DISCLAIMS ALL OTHER EXPRESSED OR IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OR FITNESS FOR A PARTICULAR PURPOSE.
- 1.3 **LIMITATION OF LIABILITY:** UNDER NO CIRCUMSTANCES SHALL EITHER PARTY BE LIABLE TO THE OTHER FOR INCIDENTAL, PUNITIVE, SPECIAL OR CONSEQUENTIAL DAMAGES OF ANY KIND. BUYER HEREBY ACKNOWLEDGES AND AGREES THAT UNDER NO CIRCUMSTANCES, AND IN NO EVENT, SHALL SELLER'S LIABILITY, IF ANY, EXCEED THE NET SALES PRICE OF THE DEFECTIVE PRODUCT(S) PURCHASED DURING THE PREVIOUS CONTRACT YEAR.
- 1.4 **LABOR ALLOWANCE:** Seller makes NO ADDITIONAL ALLOWANCE FOR THE LABOR OR EXPENSE OF REPAIRING OR REPLACING DEFECTIVE PRODUCTS OR WORKMANSHIP OR DAMAGE RESULTING FROM THE SAME.
- 1.5 **RECOMMENDATIONS BY SELLER:** Seller may assist Buyer in selection decisions by providing information regarding products that it manufactures and those manufactured by others. However, Buyer acknowledges that Buyer ultimately chooses the product's suitability for its particular use, as normally signified by the signature of Buyer's technical representative. Any recommendations made by Seller concerning the use, design, application or operation of the products shall not be construed as representations or warranties, expressed or implied. Failure by Seller to make recommendations or give advice to Buyer shall not impose any liability upon Seller.

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