

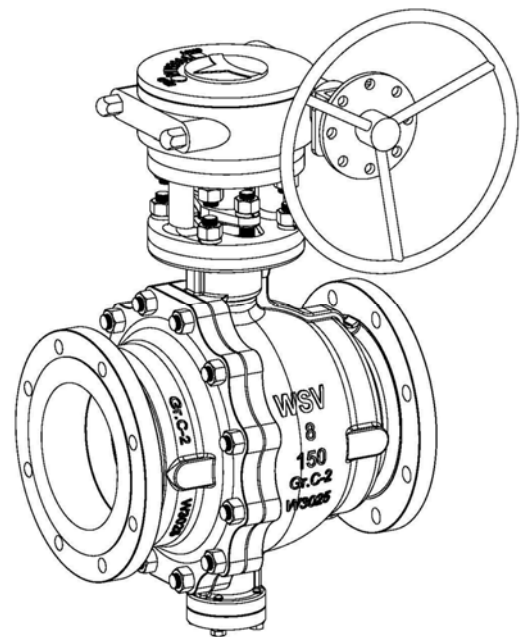


# BALL VALVES

## INSTALLATION,OPERATION,MAINTENANCE MANUAL

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The manual provides customers with all information on Weidouli ball valves storage, installation, operation and maintenance.

- This manual being applied substantially, it is essential to table proper measure that comes from the experience and common idea the operator. Employ skilled and experienced personnel to handle valves.
- Such information as technical data on relevant dimensions, spare parts, part material, tools, fixtures are not covered in this manual. Details refer to each purchase order and Weidouli GA drawings.
- If have any additional doubt or questions please contact Weidouli office.

## 1.0 PRIOR TO INSTALLATION

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### Transportation and Storage

#### 1.1 Transportation.

- a) The valve and the actuator can be integrated or separated to be placed in the plywood case(s) suitable for transportation. Each plywood case is marked with gross weight, net weight, case number and other related mark.
- b) While loading or unloading, check for and adhere to any markings or arrows on the box which may be present to indicate upward orientation.
- c) The user should select proper tools and lifting equipment to transport the goods to avoid damages to it after transported to the

warehouse or outdoor storage of the installation site.

#### 1.2 Storage

- a) **IMPORTANT:** End-cap protectors should always be left in place until the valve is actually being installed in the pipeline.
- b) Ball valves should be stored with protective end caps in place and be stored free from dust and humidity environment.
- c) Factory grease and end cap protectors should be adequate for storage up to six months if properly protected. Longer term storage should include a suitable inspection process and are suitably maintained in good condition.

## 2.0 INSTALLATION

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2.1 **IMPORTANT:** the ball should be on the full-open position before valve installation.

2.2 Before installation, remove the end protectors and clean the valve ends and bore. Check that the valve and its accessories have not been damaged during transportation.

2.3 The valve body when marked with an arrow indicating the flow direction, the valves should be installed in such a way that the actual flow direction of the medium matches the arrow on the body.

2.4 The valve after the long term storage, should be cleaned and tested prior to installation make sure

the valve is flexible, to ensure the reliability of operation.

2.5 Before installing the valves, the pipes must be flushed clean of all debris, weld slag, dirt etc. to prevent damage to the seats and ball surface. Failure to do so may result in damage to the soft seat, metal seat and other parts during operation.

#### 2.6 Threaded ends ball valve installation

- a) Valve should be installed onto a suitable sized mating male threaded connection. Use the appropriate thread sealant compound to minimize the risk of galling.

b) Use correct size wrenches with flat jaws on the hexagon ends. DO NOT apply wrench to the body section or opposite side when making up pipe as this may result in damage to the body or breaking loose the threaded adapter to body connection.

### 2.7 Weld ends installation

a) All welding operations must be done by a qualified welder and according to related ASME welding procedure.

b) Let valve in full open position while welding. Use tempil stick or other method to assure that the temperature in the seat and seal areas DO NOT exceed 250°F (120°C) during welding.

c) In case ball valves with short butt-weld ends, proceed with next steps

Dismount the valve body. Secure seats from falling with tape. Finish welding both end caps on the pipe.

d) Clean all weld slag from bore before close

valve. Failure to do so may result in damage to the soft seats.

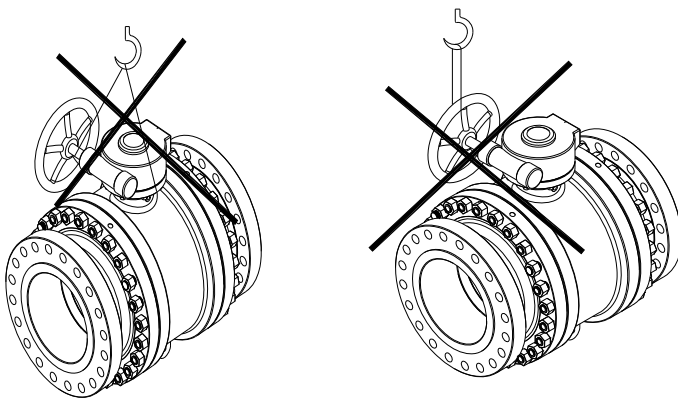
### 2.8 Flanged ends installation

a) Use correct size counter flanges, gaskets and fasteners, these parts should be suitable for the operating conditions.

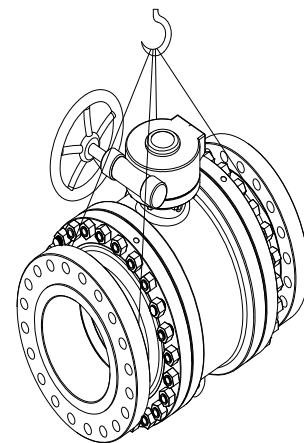
b) Tighten all bolts to finger tight. Before flushing valve should remain in fully open position.

### 2.9 Big size valves lift

Select proper tools and lifting equipment to transport the goods. To hoist the valve, the actuator should not be the pick-up point. It can be carried through the lifting plate specially designed on the valve or by referring to the hoisting method indicated in Drawing 1. It should be noted to avoid knocks.



Wrong methods for Hoisting Ball Valve



Correct method for hosting ball valve

### **3.0 OPERATION**

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3.1 Prior to commissioning the valve, the pressure, temperature and material data sheet on the valve should be compared to the actual operating conditions in the piping system to check whether the valve can withstand the loads occurring in the system.

3.2 The valves must not be operated beyond the limits. the using temperature and pressure conditions of valve should not exceed the maximum limited temperature and pressure. Nonobservance of this warning may lead to personal injury or property damage.

3.3 When the valve is used in the pipeline ,it should be fully open or fully closed, to avoid it is in the semi-closed or half-open state for long term and cause sealing ring cold flow changed.

3.4 Valves should be opened and closed slowly to avoid hammering effect on the valve.

3.5 Handling a valve requires skilled and experienced personnel. Operator's errors concerning the valve may have serious consequences for the entire plant, such as fluid escape, downtime of the plant.

3.6 Before operation, the gland packing should be checked when it is subjected to the full operating pressure and temperature for the first time, if necessary, re-tighten the nuts at the gland flange evenly.

3.7 The counter flanges connection and gasket should be checked for tightness after pressure rise at the valves. In case of leakage at the gasket, the connection should be tightened crosswise evenly and in clockwise direction.

3.8 Once proper installation has been successfully completed, gradually increase system pressure until working pressure is reached.

### **4.0 MAINTENANCE**

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4.11 Before the disassembly operation, it's necessary to make sure the pressure of pipeline sections in the upper and lower reaches of the ball valve has been relieved.

4.12 It's necessary to be careful not to damage the sealing surface of parts during disassembly and reassembly. In particular, it's better to use special tools to unload the O-ring from non-metal parts.

4.13 The bolts on the flange must be screwed down in a symmetric, successive and uniform

manner during the assembly.

4.14 Before removing the valve from pipe, valve must be unpressurized, opening pressurized valves will cause danger to life. And must have cooled down sufficiently to prevent injuring and scalding.

4.15 It's necessary to be careful not to damage the sealing surface of parts during disassembly and reassembly.

4.16 Depending on the installation position,

any liquid remaining in the valve may have to be removed. Prior to transport, the valves must be flushed and drained carefully

4.17 Depending on the working situation, if necessary, wear clothing and a face mask.

4.18 If actuators powered by an external source energy such as electric, pneumatic, hydraulic which need to be removed or dismantled from valves, the energy supply must be shut down prior to starting any maintenance work.

4.19 To ensure reliable operation and to reduce

#### 4.21 On-line Maintenance

The replacement of the stem packing, fire-protection ring, o-rings external parts and the like can be conducted on the pipeline, unnecessary to disassemble the valve from the pipeline. The disassembly order is different in accordance with different actuator types.

##### 4.21.1 Floating ball valve -replacing packing

- 1) Shut off the cut-off valves in the upper and lower reaches of the ball valve. Vent the air to relieve the pressure in the pipeline sections before and after the ball valve.
- 2) Make the ball valve fully closed.
- 3) Release the screw to unload the packing gland.
- 4) Remove the packing with the hooked iron wire.
- 5) Check the unloaded parts. Repair or replace them in case of damages. Then clean them.

repair costs, all valves especially those which are seldom operated or where access is difficult should be checked periodically.

4.19 Don't use unauthorized spares.

4.20 New parts should also be cleaned before assembly.

4.20 During the assembly, no metal scraps, fibers, grease (except those stated), dust or any other impurities are allowed to pollute, adhere to or stay on the part surfaces or enter into the inner chamber.

- 6) Wipe and lubricate the sealing surface of the packing gland.
- 7) Load the new packing.
- 8) Load the packing gland in the opposite order of unloading and then tightening the screw
- 9) Then load the first clip ring , the locking block,the handle and the second clip ring.
- 10) Operate the handle to check the on-off flexibility of the ball valve.
- 11) Carry out the pressure test.

#### 4.3 Off-line Maintenance---Replacing Seat, Gasket Ring, O-ring, Fire-protection Ring and So on

It's very important to take the following measures to conduct any disassembly operations for the valve in the working state to ensure your safety.

##### 4.3.1 How to unload valve from pipeline

1) To unload a valve with an actuator, close

the valve first and then separate auxiliary jackets, pneumatic or electric connecting wires and the like of all pipelines. 2) As for working when the medium still remains in the pipeline, the working clothes must be worn properly.

3) Relieve the pressure of all pipelines, empty

the fluid medium in the system, and open and close the valve for many times to exhaust any remaining pressure.

4) Keep the valve full-open to disassemble and place it on the platform.

**Caution!**

**The valve should not be disassembled in a closed state**

## 5.0 TROUBLESHOOTING

Faults	Probable cause	Solution
Internal and external leakage	over-pressure and temperature	Keep attention on maximum allowed operating pressure and temperature.
	demands and requirements by aggressive medium	Use applicability material for related service.
Seat leakage	Impurities in medium damage seat	Disassemble, clean and replace seat with a new one.
	O-ring on seat is damaged	Disassemble, clean and replace O-ring with a new one.
	No proper measures are taken for valve with welding ends, thus resulting in damages to seat	Weld butt welding ends in accordance with the operating manual.
	Too high medium temperature causes damages to seat	Check applicability of seat material and medium temperature
	Closing position of actuator is improper	Adjust limit screw of actuator
Leakage from Stem	Fixing nut or locking bolt is loose	Tighten nut or bolt
	Stem or top gasket is damaged	Replace stem or top gasket
	End face of support to mount actuator is not vertical to axial line of stem.	Calibrate verticality of support end face to stem axial line.
Middle flange seal leakage	Middle flange bolt and nut are loose	Tighten middle flange bolt and nut;
	No protective measures are taken for valve with welding ends	Control as per the operating manual;
	Flange end face of valve is unparallel with that of pipeline.	Correct position between flanges until they are parallel.
Working condition over limit	Fluid temperature is too high	Check designed applicability of material;
	Fluid viscosity is too high	Check designed applicability of material;
	Air supply of pneumatic valve is under-pressure	Supplement pressure of air supply to normal value;
If have	Damages are caused during transportation.	Replace damaged part and make a record;