

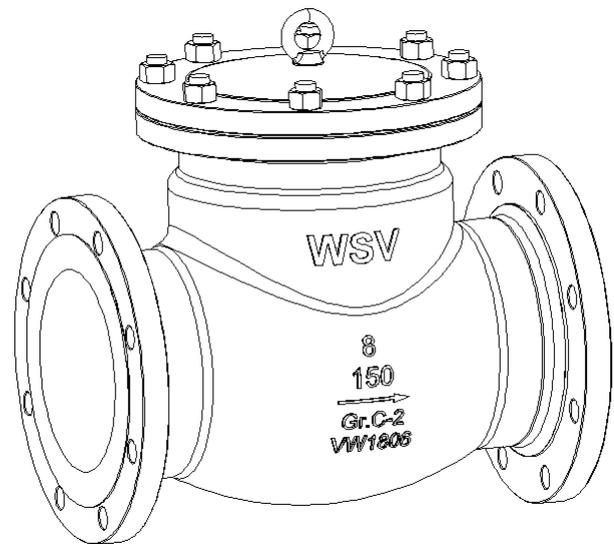


# CHECK VALVES

## INSTALLATION,OPERATION,MAINTENANCE MANUAL

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

- a) 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.
- b) 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.
- c) 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 can 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 installation site.

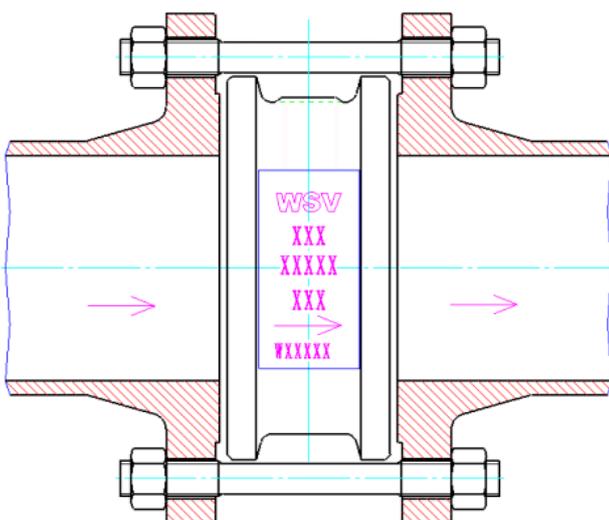
#### 1.2 Storage

- a) **IMPORTANT:** End-cap protectors should always be left in place until the valve is actually being installed in the pipeline.
- b) Flanged check valve 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:** Check valves are unidirectional, and should be installed in such a way that the actual flow direction of the medium matches the arrow on the body.



2.2 Swing check, Nozzle check and Dual check may be installed in horizontal lines or vertical lines where the direction of flow as indicated on the valve body is upwards.

2.3 Thoroughly clean adjacent piping system to remove any foreign material that could cause damage to seating surfaces during valve operation. Verify that the space available for installation is adequate to allow the valve to be installed and to be operated..

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 Flanged valve installation**

- a) Remove the plastic flange protectors and other packing materials from package
- b) Orientate the flow arrow in the direction of the pipeline flow. In the correct position, the valve disc will move away from the valve seat, in the direction of the pipeline flow.
- c) Use correct size counter flanges, gaskets and fasteners, these parts should be suitable for the operating conditions
- d) Align the bolt holes of the valve end flange and pipe flange. Insert the gasket(not supplied with valve) and tighten the bolts.
- e) Wafer or lug end valve installation refer to the flanged type, as per above mentioned.

### **2.6 Threaded ends 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.

### **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 depressurized 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 check valves with short butt-weld ends, Dismount the valve body. 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 sealing.

## **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 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.

3.4 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.

3.5 Once proper installation has been successfully completed, gradually increase system pressure until working pressure is reached. This eliminates sudden shock to the check valve and other equipment in the line.

## **4.0 MAINTENANCE**

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4.1 Before removing the valve from the pipeline, the pressure inside the vessel must be reduced to atmospheric via suction or venting. Failure to do that may cause body injury.

Ensure the fluiding medium is known and any special handling precautions are understood.

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

4.3 The bolts on the flange must be screwed down in a symmetric, successive and uniform manner during the assembly.

4.4 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

4.5 Remove the valve from the pipeline and place on the ground. Inspect internal components for wear or damage.

4.6 To ensure reliable operation and to reduce repair costs, all valves especially those which are seldom operated or where access is difficult

should be checked periodically.

4.7 Don't use unauthorized spares.

4.8 New parts should also be cleaned before assembly.

4.9 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.

## 5.0 TROUBLESHOOTING

| <b>Faults</b>                        | <b>Probable cause</b>   | <b>Solution</b>   |
|--------------------------------------|---|---|
| Seat Leakage                         | Impurities in medium damage seat  | Disassemble, clean and replace seat 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   |
| Disc can't be fully opened or closed | Foreign exist between arm and pin<br>Foreign exist inside the body cavity   | Eliminate the foreign   |
| Leakage through end joints           | End flange bolting loose<br>Gasket damage   | Tighten the bolting<br>Replace the gasket   |
| Leakage from the body/bonnet joint   | Uniformity tighten on the bolts<br>Flange sealing surface damaged<br>Gasket destroyed                                     | Tighten the bolt evenly<br>Repair the flange sealing surface<br>Replace the gasket                                  |
| Vibration                            | Not stabilized flow<br>Valve installed very closed to turbulence producing devices(elbows, pumps, tees, expansion, etc.,) | Verify the flow rate is<br>Verify that the check valve is 5-10 pipe diameters from any turbulence producing devices |
| Working condition over limit         | Fluid temperature is too high   | Check designed applicability of material;   |
|                                      | Fluid viscosity is too high   | Check designed applicability of material;   |
| If have                              | Damages are caused during transportation.   | Replace damaged part and make a record;   |