Installation, Operation

&

Maintenance Manual

for

ZOLOTO® VALVES

ZOLOTO INDUSTRIES, Zoloto House, 11th Mile Stone, Lambra, Nakodar Road, Jalandhar – 144 026 Punjab [India]
Tel: 0181- 4676666 (100 Lines), 2792700, 2792800 & 2792900 Facsimile: 91-181-2792500 & 2251600
Grams : **ZOLOTO** E-Mail : zoloto@vsnl.com Website: www.zolotovalves.com

TABLE OF CONTENTS

1.0 - GENERAL

2.0 - INSTALLATION

3.0 - OPERATION

4.0 - MAINTENANCE

5.0 - BODY-BONNET / COVER BOLTINGS

6.0 - MAINTENANCE OF BOLTED BONNET GATE VALVES

7.0 - MAINTENANCE OF BOLTED BONNET GLOBE VALVES

8.0 - MAINTENANCE OF BOLTED CAP CHECK VALVES

9.0 - STRAINERS

10.0 -PRV's

1.0 GENERAL

The majority of this information is common knowledge to the experienced ZOLOTO valve users. This information applies to all types of ZOLOTO valves. When installed in applications for which these are designed, ZOLOTO valves will give long, uninterrupted and trouble free service.

We however recommend that this entire document may please be consulted prior to proceeding with any installation or repair, whatsoever.

1.1 Responsibility For Valve Application

The end user is requested to choose correct valve looking at one's own service conditions before ordering for ZOLOTO Valves. Prior to installation, the valves and name plates should be checked to ensure the identification of the valve i.e. type, material, pressure class and maximum temperature suitability.

Please do not use any valve in application (s) where either the pressure or temperature is higher than the allowable working values. Also valves should not be used in any not compatible service media, as this vis a vis may cause chemical reaction or may erode the inner surface of valve..

> WARNING ! **Personal injury or property damage may result if the valve is installed where service conditions could exceed the valve ratings.**

1.2 Receiving Inspection and Handling

Valves should be inspected upon receipt to determine compliance to your requirements. In respect of its correct type, pressure class, size, body and trim materials and end connections or in the unlikely event of any kind of damage caused during transportation and handling to end connections, handwheel or stem.

The end user is advised that wrong application of the product may result in injuries or property damage. A selection consistent with the particular performance requirement is important for proper application.

2.0 INSTALLATION

Piping should be properly aligned and supported to reduce undue mechanical loading on the end connections.

2.1 Installation Positions

Gate valves are usually bi-directional, and therefore may be installed in either direction.

Globe and Check valves are unidirectional, and have the sign for direction of flow indicated on the valve body by an arrow [→].

ZOLOTO Horizontal Check Valves are recommended for use only in Horizontal lines with the Cover / Bonnet facing upwards.

ZOLOTO Vertical Check Valves are recommended for use in Vertical lines only.

ZOLOTO Bronze Multi-Utility & C.I. Swing check valves may be installed in Horizontal lines or Vertical lines where the sign for direction of flow [→].
as indicated on the valve body is facing upwards.

2.2 Preparation for Installation

Remove protective end caps or plugs, and inspect valve ends for damage to threads, socket weld bores or flange faces.

Thoroughly clean or flush out adjacent piping system to remove any foreign material etc. otherwise it could cause damage to seating surfaces during valve operations.

Verify that the space available is adequate to allow the valve to be installed and to be operated, comfortably.

Insufficient clearance for the stem in the fully open position may cause the valve to be rendered inoperatable. Inadequate clearance for valves may add undue mechanical loading to the valve ends. Sufficient clearance should be allowed for threaded valves to rotate on it's axis during installation.

2.3 End Connections

2.3.1 Threaded Ends

Check condition of threads on mating pipe. Apply compound for fixing valve to the male end of joint (usually the pipe) only. This will prevent compound from entering the valve flow-path.

ZOLOTO valves have Hexagonal body ends. Wrenches should be used on the valve end closest to the joint being tightened.

2.3.2 Flanged Ends

Verify that companion flanges are dimensionally compatible with the flanges on the valve body and make sure sealing surfaces are free of grease, dirt etc.
Use proper sized bolts and nuts for the application and place the flange gasket between the flange facings.

Nuts & Bolts should be tightened in a criss-cross pattern across the now joined flanges in equal increments to ensure proper gasket compression.

2.3.3 For installation of Socket weld Ends valves, Remove all grease, oil, dirt or paint from the pipe & valve ends.
Insert the pipe into the valve end connection until it touches the bottom surface of the socket weld bore.
Withdraw the pipe 1/16" so that a minor gap remains between the pipe and the bottom of the socket-weld bore to prevent cracks form pipe's expansion from welding heat. Tack the pipe into the valve and complete the fillet weld, afterwards.

Gate and Globe valves should be tightly closed before welding or installation to prevent damage to the seating surfaces and stem caused by thermal expansion during the socket welding process.

2.4 Post-Installation Procedures
After installation, the line should be cleaned by flushing to remove any foreign material. When caustics are used to flush the line, additional flushing with clean water is required. The valve should be opened and closed after installation to ensure proper operational function.

With the line pressurized, check the valve end connections, body to bonnet/cover joints and stem packing area for any leaks. The packing may have to be tightened to stop packing leakage / sweating at the system pressure.

3.0 Operation
Gate valves should essentially be used only in the fully opened or fully closed position.

Globe valves should not be used continuously at the disc having opened less than 25% (¼ th of full lift).

Gate and Globe valves should not be left in the fully back seated position for long duration under normal operating conditions. The packing may dry out under these conditions and may leak upon the valve being closed, afterwards.

A normal temperature valve may leak through the gland when applied on to hot fluid. Please wait before tightening the packing as the problem may disappear on its own after persisting for some time.
Metal seated check valves are not zero leak devices and may "seep" in service. This type of valve should always be backed up with an isolation valve (either gate or globe valve).

4.0 MAINTENANCE

Proper Protective Equipment should be worn when preparing to service a valve. Please observe the following general warnings:

- ***A valve is a pressurized device containing energized fluids and should be handled with appropriate care at all times.***
- ***Valve surface temperature may be dangerously too hot or too cold to the human skin.***
- ***Upon disassembly of valves, attention should be paid to the possibility of releasing dangerous and or ignitable accumulated fluids.***
- ***Adequate ventilation should be available during service of the valves.***

Tools Required

Aside from standard wrenches (for bonnet cap screws and packing gland nuts) the only tool needed for ZOLOTO valve maintenance is a packing hook.

Packing

Special care is to be taken for tightening of gland nuts during installation, in order to get the proper packing adjustment and functioning.

The packing gland should be checked periodically in valves running and tightened as necessary to stop leakage around the stem. Please tighten in a manner so as to develop a uniform load on the gland.

Tighten only enough to stop the leak.

Over tightening will cause the packing to fail prematurely as well as unnecessarily increasing the force required to comfortably operate the valve.

If the leak cannot be stopped by tightening the gland nuts, it is advisable to add additional packing rings or completely repack the valve. While ZOLOTO gate and globe valves are equipped with a backseat feature, it is Not Recommended to repack them under pressure when backseating feature is not in operation.

If ***Backseating of the valve is not operative then attempting to repack under pressure is hazardous and is not recommended. Rather than attempting to repack under pressure, it is preferable to use backseat to control the stem leakage until this shutdown provides safe repacking conditions.***

The end rings (top and bottom) of the standard ZOLOTO graphite packing set have a diagonal cut that will allow them to be installed around the stem of an assembled valve. However, the factory assembled intermediate graphite packing rings are die formed and have no end cut. As a result, these rings cannot be replaced without removing the Gland & Gland Nut.

Where it is necessary to repack the valve in a running line, a compatible ribbon packing system or equivalent braided packing stock should be used. The joints in the packing rings should be diagonally cut. When re-packing the rings, proper care should be taken to stagger the ring joints so that al the cuts in the rings should NOT align.

4.1 Repairs

Due to the relatively low replacement cost of standard carbon steel valves, it is usually less expensive to replace the complete valve than to have maintenance personnel effect repairs. While minimizing the shut down period of plant.

Always replace the bonnet gasket whenever a valve is disassembled. Gasket seating surfaces should be scraped clean (while avoiding radial marks). Bonnet bolts should be tightened in a criss-cross pattern across the flange faces, at several different increasing torque settings until the final recommended torque value is attained.

5.0 BODY-BONNET/COVER BOLTINGS

Only proceed to this operation, changing one bolt at a time to prevent losses of pressure on the gasket. If this is not possible, replace the body-bonnet gasket locking bolts in a criss-crossed way across the face of the flange, until torque is uniform for all bolts.

6.0 MAINTENANCE OF GATE VALVES

6.1 WEDGE

a. Proceed opening completely the valve while ensuring that the stem is brought to the backseat position.
b. Loosen the body-bonnet bolting or unscrew the body-bonnet.
c. Remove the bonnet-stem assembly. Take note of wedge sealing surfaces relative to the valve seats. Faces of the wedge should be matched during re-assembling. Extract wedge from the stem T-head or unscrew from the stem.
d. Check that no incisions or marks are on sealing surfaces. If found any, use fine sand paper or emery cloth to clean the surface, assuring that the original planarity of these surfaces is not modified.
e. Replace the gasket between body and bonnet, insert wedge in the stem T-head or screwed on the wedge, to the stem making sure that the faces are matched as noted above.
f. Bring the bonnet-stem assembly to its original position and tighten the body-bonnet bolts as described in section 5.0.

6.2 STEM

a) Proceed opening completely the valve assuring that the stem is brought to the backseat position.
b) Loosen the body-bonnet bolting.
c) Remove the bonnet-stem assembly. Take note of wedge sealing surfaces relative to the valve seats. Faces of the wedge should be matched during re-assembly. Extract wedge from the stem T-head.
d) Disassemble the stem by turning it in the counter-clockwise direction.
e) Make sure that the stem surface in contact with the packing is not damaged. If the stem is damaged beyond repair, call for a stem replacement or consider replacing the entire valve.
f) Replace the stem by screwing it clockwise in the bonnet.
g) Replace the gasket between body and bonnet, insert wedge in the stem T-head making sure that the faces of the wedge are matched as noted above.
h) Bring the bonnet-stem assembly to its original position and tighten the body-bonnet bolts as described in section 5.0.

6.3 SEATS

No repairs are possible on seats of gate valves. Replacement of seat is possible, provided the appropriate tools are available.
Blunt chisels and a hammer should be used to remove the old seats after removal of the bonnet stem and wedge assembly. New seats must be assembled by expanding the ends.
We recommend that this process be carried out preferably in our factory where proper tooling is available, or call us for a replacement valve.

7.0 MAINTENANCE OF BOLTED BONNET & SCREWED IN GLOBE VALVES

7.1 DISC and SEAT

The seating surface is integral to the body. To check the seal characteristics between the disc and body seating area, may we suggest the “BLUEING TEST”, as stated below:-
Steps ->

a) Proceed opening the valve completely; assuring that the stem is brought to the backseat position.
b) Loosen the body-bonnet bolting & the body by unscrewing the bonnet from the body.
c) Remove the bonnet-stem and disc assembly. Apply some prussic-Blue / Vermilion (Sindoor) on the body seating surface.
d) Place the bonnet-stem and disc assembly in the original position, and tighten the bolts as described in section 5.0.
e) Bring the valve in the close position, wait for about 15 / 20 seconds for the colour to dry up and repeat steps “a” and “b” above.
f) Remove the bonnet again, and check that the blue trace on the disc and the body is uniformly present on the contact surfaces. If this has not occurred there are two possibilities:

- There are incisions or marks on sealing surfaces, either the disc or the body. Check and, if any, use fine emery paste to eliminate them by lapping while taking care that the original planarity of these surfaces is not modified.
- Repair is not possible because great damage has occurred. Contact our sales department giving details as described later to receive a new disc and replace it.

g) Replace the body-bonnet gasket.
h) Reassemble the bonnet-stem and disc assembly and tighten bolts as described in section 5.0.

7.2 STEM

a) Proceed opening the valve completely; assuring that the stem is brought to the backseat position.
b) Loosen the body-bonnet bolting.
c) Remove the bonnet-stem and disc assembly. Extract the disc from the stem end.
d) Disassemble the stem by turning it in the counter-clockwise direction.
e) Make sure that the stem surfaces in contact with the packing & is not damaged. If the stem is damaged beyond repair, call for a stem replacement or consider replacing the entire valve.
f) Replace the stem by screwing it clockwise in the bonnet.
g) Replace the gasket between body and bonnet, insert disc into the stem end.
h) Bring the bonnet-stem assembly to its original position, and tighten the body-bonnet bolts as described in section 5.0.

8.0 MAINTENANCE ON BOLTED BONNET & SCREWED IN BONNET CHECK VALVES

There are three types of check valves: Horizontal, Vertical, Swing Type & Multi-Utility.

8.1 HORIZONTAL Check Valves and their SEATS

a) Seats are integral to the body.
b) Unscrew the body-cover.
c) Remove all parts, taking note of the order of disassembly.
d) Visually check all the sealing surfaces.
e) No incisions or marks should be on sealing surfaces.
f) If any on the Disc or the body, use emery cloth to remove them, assuring that the original planarity of the surface is not modified.
g) If there are any incisions or marks on the Disc, or the above step is not successful, contact our sales department giving details as described later to purchase a new Disc or a replacement valve.
h) Replace the body-bonnet gasket.
i) Reassemble the valve in the reverse order of the disassembly.

8.2 VERTICAL CHECK VALVES

a) Remove the split pin and unscrew the nut.
b) Remove all the parts taking note of the order of disassembly.
c) Visually check all seating surfaces.
d) If any incisions or marks are found on the body or Disc, try to remove by emery cloth to eliminate them.
e) Reassemble the Valve in reverse order of the disassembly.

8.3 SWING TYPE VALVE

a) Loosen the body-cover bolting.
b) Remove the cover.
c) Visually check all sealing surfaces.
d) No incisions or marks must be on sealing surfaces.
e) If there is any damage, proceed with the aid of a hinge pin extractor to disassemble the swing. Note the order of disassembly.
f) If possible, use fine sand paper or emery cloth to eliminate incisions or marks, assuring that the original planarity of the surface is not modified. If results are not satisfactory, contact our sales department giving details as described later to purchase new parts or replace the entire valve.
g) Replace the body-bonnet gasket.
h) Reassemble the valve in the reverse order of disassembly, and tighten the bolts as described in section 5.0.

9.0 STRAINERS

a) Loosen the body cover.
b) Remove all parts taking note of the order of disassembly.
c) Visually check the Strainer screen.
d) Wash & remove the dirt and accumulated foreign matter.
e) Replace the body cover gasket.
f) Reassemble the Valve in reverse order of disassembly.

10.0 PRVs

10.1 Pressure Reducing Valve (Metallic diaphragm type).

a) Unscrew the pressure adjusting screw by loosening the check nut.
b) Remove the flange bolts and nuts to disassemble.
c) Unscrew the bottom cover to remove the main Valve stem.
d) Visually check the Valve stem and the seat.
e) If any cut marks are visible on the seat and the Valve stem, lap the valve stem with fine Valve lapping emery paste till the marks on the seat and Valve stem disappear.
f) Replace the bottom cover gasket as well as top flange gasket.
g) Check the condition of the diaphragm, only if required, replace it with a new one.

h) Reassemble the Valve in the reverse order of assembly.

10.2 Compact type PRVs

a) Loosen the adjusting screw check nut.
b) Remove the adjusting screw and spring chamber.
c) Remove the bottom bonnet.
d) Visually check the piston and seat and “O” Rings.
e) If the rubber “O” Rings of piston are worn out, remove the Disc holder by unscrewing of piston while taking note of disassembly.
f) Remove the piston from the body and worn out “O” Rings from the piston.
g) Replace the worn out “O” Rings.
h) Reassemble the Valve in reverse order of disassembly.