

Bell-O-Seal Valves P. Limited

Subramanya Nagar, Puttur Village, PO: Santhekatte-576 105, Udupi Dist., KARNATAKA

Tel: 91-820-2581730, 2581157 **Fax:** 91-820-2581355 / 0091-22-56791172/26246040

Email: valves@vsnl.com **www:** bellowseal.com

OPERATION, INSTALLATION, MAINTENANCE, STORAGE, INFORMATION FOR BELLOW SEALED & NON BELLOW SEALED GATE AND GLOBE VALVES

1. General

*This manual applies to all standard Bellows sealed & non-bellows sealed Gate and Globe valve products supplied by **BELL-O-SEAL VALVES P LTD.**,*

2. Defined use: -

After their installation in a piping system (either between flanges or by welding) the use of the Globe valves and Gate valves is exclusively defined as to stop or convey the flow of media within the admitted pressure and temperature limits by manual operation.

3. Safety instruction: -

3.1 General: -

Valves are subject to the same safety impositions, which are valid for the piping system where the valves shall be installed. Therefore, the present instruction mentions only such kind of safety notes, which must additionally be considered for valves.

3.2 Safety instructions for the user: -

It is not within the responsibility of the manufacturer and must be safeguarded by the user of the valve that the valve is only used as required by the defined use as described above.

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**Danger
to life**

When a valve shall be disassembled from the piping system proper care has to be taken in order to avoid possible damage to the serrations, threadings of the connecting parts. Carelessness can lead to leakage through connecting parts after reassembling & danger to life.



**Danger
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It must be absolutely assured that the selected materials of the wetted parts of the valve are suitable for the handled media. The manufacturer is not responsible for damages of the valve caused by corrosive agents.

The disregard of this ordinance can lead danger to life and cause damages in the piping system.



**Danger
to life**

Valves whose admitted pressure temperature range is not sufficient for the operating conditions shall not be used.

The disregard of this ordinance can lead danger to life and cause damages in the piping system.



**Danger
to life**


When a valve part is labeled as “Do not touch – Hot portion” it means avoid touching while valve is in use. The disregard of this ordinance can lead danger to life.

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 Danger to life	<p style="color: red; font-weight: bold; margin: 0;"><i>Periodic visual, functional inspection of the valve for opening/closing, joint tightness & leak tightness of packing region can avoid possible hazard due to misuse, external loadings & variations in internal conditions etc.</i></p>
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3.3. Max.Allowable Working Pressure (bar): -

Sl.No.	ANSI CLASS	Max.Allowable Working Pressure (in bar)at temp -29 t o 38°c	Remarks
1	150	19.6	REFER ANSI CLASS MENTIONED ON THE VALVE NAME PLATE
2	300	51.1	
3	400	85.1	
4	600	102.1	
5	800	136.1	
6	900	153.2	
7	1500	255.3	
8	2500	425.5	
9	4500	765.9	

3.4. Bellows cycle life: -

Sl.No.	Valve size	Class	Minimum cycle life	
			Gate	Globe
1	= 2"	Up to & including class 800	2000	5000
2	2 1/2" - 4"		2000	5000
3	> 4"		1000	2000
4	= 2"	Above class 800	2000	2000
5	2 1/2" - 4"		1000	2000
6	> 4"		1000	1000

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A cycle is defined as fully open to fully closed to fully open.

Unless otherwise specified by the customer Bellows cycle life will be as mentioned in 3.4

Only qualified staff is used for the operation and maintenance of pressure bearing piping systems.

3.5. Special risks: -

 <p>Danger to life</p>	<p><i>Before the disassembling of the valve out of the piping system and / or before the loosening of the bolts and nuts of the bonnet system shall be completely depressurised to avoid an uncontrollable fugitive emission of the media. It must be assured that the valve is completely open to enable that the pressure can escape on both sides of the valve.</i></p>
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 <p>Danger to life</p>	<p><i>When a valve shall be disassembled from the piping system there exists the risk that the media can flow out off the piping or the valve. In case of liquids that are harmful for the health or dangerous the piping system can be completely drained before the valve can be removed from the system. Caution of residues coming out off the valve or the piping system itself.</i></p>
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3.6. Marking of Valve

3.6.1 Each valve is normally marked as follows:

Marking	Description	Remarks
BOS	<i>Logo for Bell-O-Seal Valves</i>	<i>Shall be marked on Body & Bonnet</i>
2"NB or DN 50		
300	<i>Class of Valve (will change with requirement)</i>	
WCB	<i>Material of Construction of Body & Bonnet (will change with requirement)</i>	
J4890	<i>Heat number of casting</i>	
XX	<i>Foundry code</i>	
	<i>Preferred flow direction</i>	
U-XXXXX	<i>Manufacturer code</i>	
/AA	<i>Valve serial number</i>	
	<i>Year of manufacture</i>	
Closed	<i>Clockwise to close the valve</i>	<i>Marked on Hand wheel</i>

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3.6.2 Each valve also contains the following information's punched on nameplate / identification plate:

Marking	Description	Remarks
STEM	Material of Construction of Stem	Shall be marked on Name plate along with BELL-O-SEAL VALVES PVT.LTD -INDIA
DISC	Material of Construction of Disc	
SEAT	Material of Construction of Seat	
B.M	Material of Construction of Bellow (if applicable)	
TYPE / MODEL	eg. GLOBE, GATE etc or Model number if any	
MAX / MIN	Maximum allowable working temperature in degree Celsius.	
MAX	Maximum allowable working pressure in bar.	

3.6.3 In addition to 3.6.1 & 3.6.2, valves meeting essential safety requirements will be marked / punched or riveted with CE marking as per Annexure VI of PED 97/23/EC.

3.6.4 On customer requirement valves will be tagged with TAG numbers as specified by customer.

3.7. Leak detector port

In some valves (if required) a leak detector port (Generally 1/4" NPT plug port) shall be provided below the gland packing to which a suitable leak detection instrument can be attached. In case of detection of bellow leakage, gland-packing bolt should be tightened to prevent the leakage of fluid to atmosphere.

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4. INSTALLATION, OPERATION AND MAINTENANCE

4.1 The Gate and Globe valve products supplied by BELL-O-SEAL VALVES P LTD., may be installed and operated in service conditions suitable to their design and construction and only in accordance with all applicable codes, standards and generally accepted good construction and operation practice.

4.2 Pre-installation inspection: -

 <p>Danger to life</p>	<p><i>Before installing verify that the valve is suitable for the service in which it is being installed by referring the service tag and nameplate.</i></p> <p><i>Disregard of this precautionary measure can lead danger to life for the user and damages in the piping system.</i></p>
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4.2.1 Check the valve, hand wheel for possible damage.

4.2.2 Intrusion of foreign materials into the valve during the transportation, mounting and operation must be avoided. The valves are transported and installed in closed position for this reason.

4.2.3 On flanged valves, remove the flange protectors and inspect the flange facings for deep nicks and scratches.

4.2.4 Remove the silica gel bags from the valve inlet or outlet ports.

4.2.5 On hand wheel valves cycle fully open and fully closed to check for ease of operation.

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4.2.6 Flush the valve fully by keeping the valve in fully open position in order to avoid the bellow damage.

4.2.7 After these points have been checked and approved, the valve is ready for installation.

4.2.8 Before installation please ensures that all pipes and valves are free from impurities, which could impair usability.

4.3 INSTALLATION:

4.3.1 Small Globe/Gate/Bellows sealed globe valves up to & including nominal size 2", 300 classes and Bellows sealed Gate valves up to and including nominal size 1 1/4", 300 classes may be lifted or carried by the hand wheel without damage to the valve.

4.3.2 Larger globe/gate/Bellows sealed globe valves (2.5" & above, classes 150 & higher,) Bellows sealed gate valves (1 1/2" & above, classes 150 & higher) should be lifted by using the lifting lugs provided, or by looping a chain around the bonnet.

4.3.3 Never lift the larger valves (2.5" & above, classes 300) by the hand wheel. Attempts to lift a large or heavy valve in this fashion can result in injury to personnel and damage to valve and property.

4.3.4 During installation, orient the valve so that the preferred pressure end will be toward the higher pressure, when the valve is closed. This will provide longer valve life and easier operation.

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4.3.5 *The direction of flow have been marked as “  ” (Arrow) on the body and the preferred pressure end is the inlet of the valve. When possible Bell-O-Seal Valves should be installed with the bonnet in a vertical position. It is recommended, not to install bellow sealed valves with the stem upside down in order to prevent the accumulation of debris in the bellow area.*



**Danger
to life**

It is necessary to ensure that the flow indication on the Globe valve body should be observed and valve should be installed with correct side upstream.

Disregard of this precautionary measure can lead danger to life for the user and damages in the piping system.

4.3.6 *Connecting pipes are to be positioned in such a way, that no undue stresses act on the valve housing. Valve and pipe should be supported during welding process, and must not be strained while cooling.*

4.3.7 *Only wrenches are required for installation, disassembly, maintenance and reassemble of these valve products.*

4.3.8 *Bell-O-Seal flanged valves can be bolted into the line using standard stud-nuts and gaskets. When installing flanged valves, tighten the flange bolts by pulling down the nuts diametrically opposite to each other and all bolts should be pulled down gradually to a uniform tightness.*

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4.3.9 On threaded valves, inspect the threads in both ends of the valve to verify no damage occurred during shipment. Be sure there is no dirt, grit, or chips in the valve bore or threads.

4.3.10 Securely tighten with a pipe wrench. For safety, threaded piping requires secure anchoring of all components that are screwed into threaded valves. Always use the correct size wrenches on the pipe side of the valve to minimize the chances of distorting the valve body.

4.3.11 For weld end valves the temperature required to weld the valve into the line will exceed the rated working temperature of the valve. While installing Socket weld or Butt weld end valves, make sure that the valve is in open position before applying heat to protect the seat and core face.

4.3.12 We suggest selecting the size of the weld rod so as not to increase the temperature of welding more than the body-bonnet allowable temperature.

4.3.13 When insulating valves, avoid insulation above the bonnet packing area. Insulating above this may result in injury to personnel and damage to valve and property, as gland leakage cannot be detected.

4.3.14 When installing rising stem valves, be sure to allow sufficient clearance for operation and for removal of the stem and bonnet if necessary.

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4.4 OPERATION:

4.4.1 Replacement of major components, including stem and wedge/disc should not be done under field conditions, but should be done only in a properly equipped workshop.

 <p>Danger to life</p>	<p><i>Whenever a leakage is found through the Stem Packing area, it is understood that the bellow/bellow assembly has damaged, hence as temporary solution tighten the gland packing to control the leakage & it is recommended to replace the bellow/bellow assembly.</i></p>
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4.4.2 Lubrication parts like Stem/Yoke sleeve is to be checked regularly for existence of lubricants.

4.4.3 When the valve is in operation, Stem packing, Body, Bonnet or Cylinder bolting tightness should be reexamined regularly.

4.4.4 If the packing has been compressed over a period of time, then the old packing has to be removed and should be replaced by new one.

4.4.5 We recommend that the bonnet studs on the valve be checked for tightness prior to pressurizing and also after a short period of service. This is particularly important if the valve has been subjected to severe changes in temperature. Tightening should be done by pulling down the nuts diametrically opposite to each other.

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4.4.6 *Turning the hand wheel clockwise closes the valves and an anticlockwise operation opens the valve. Normal hand force is sufficient for the operation of the handwheel. Only for a tight closure or in the opening phase of the valve increased handforce may be necessary.*

4.4.7 *The use of extension rods, levers. Wrenches and similar items for operation of valves is strictly not recommended.*

4.5 MAINTENANCE:-

4.5.1 *All components of the valve are designed to be maintenance free, as the materials used for the mating surfaces have been selected in such a way, that wear is minimum.*

4.5.2 *To ensure operational reliability all valves should be operated and checked regularly.*

4.5.3 *If valves are provided with the auxiliary connections, before starting the maintenance work remove all the media collected inside the cavities using the draining/venting ports*



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It is recommended to replace the bellow/bellow assembly after the specified life cycles or the specified time period whichever is earlier to eliminate the possible hazards due to leakage.

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**Danger
to life**

*When a valve is removed from the systems conveying dangerous media and shall be carried away from the plant, **then the valve must be professionally decontaminated.***

5. TRANSPORT, STORAGE & HANDLING INSTRUCTION

- 5.1 Valves should be stored with silica gel bags inside the ports and plastic caps should securely cover both the ports.
- 5.2 Valves should necessarily be stored under covered roof to prevent damage to trims from dust, rain, storm, sand etc.,
- 5.3 It is advisable to cover the valves with polythene sheets to prevent atmospheric hazards during long storage period.
- 5.4 Do not mishandle the valves. Careless handling often results in broken handwheel & distorted stems.
- 5.5 Do not lift the larger valves by the handwheel instead lift the valve by looping a chain around the bonnet.
- 5.6 In particular the handwheel and the end orifices of the globe valves for the connection with the piping system shall not be damaged neither by mechanical nor other influences.
- 5.7 Valves will be supplied with disc in closed position and shall be stored in this state.

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5.8 *Hand wheel shall not be charged with heavy loads, this can damage or distract both the handwheel and/or the valve.*

 Attention	<p><i>To protect the valves against damages</i> <i>Ropes and belts shall only be fixed on the bonnet but never on the handwheel!</i></p>
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6. TROUBLE SHOOTING

6.1 *During the remedy of the failure section, Safety instructions shall be absolutely considered.*

6.2 *When repairs are necessary, consult your Bell-O-Seal representative for details on how to repair a Bell-O-Seal Valve without removing it from the line.*

 Danger to life	<p><i>When a valve is removed from the systems conveying dangerous media and shall be carried away from the plant:</i> <i>Then the valve must be professionally decontaminated.</i></p>
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Kind of failures	Procedure for remedy	Note
1) Leakage found through Body-Bonnet, Inlet, Outlet flanged connections.	Tighten the bolts & nuts. <i>When the valve is still leaking:</i> Remove the valve, considering always the notes given under 'Special risks' and ask for spare gaskets.	<i>Spare parts shall be ordered with all indications of the marking of the valve.</i>

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<p>2)Leakage found through the Stem packing.</p>	<p>The bellows is damaged and shall be replaced as soon as possible, especially when used with hazardous /corrosive media.</p>	<p><i>Spare parts shall be ordered with all indications of the marking of the valve. Only original Bell-O-Seal spare parts shall be used for repairs and</i></p>
<p>3)Leakage in the closed position</p>	<p>Remove the valve by considering the notes given under Special Risks and check the valve. <i>In case of damaged seats:</i> Repair necessary: remove the valve by considering the notes given under the Special Risks and send the valve back to Bell-O-Seal for repair.</p>	<p><i>replacements.</i></p>
<p>4)Leakage through Pressurized parts Due to accumulation of corrosive media, Active media/Abrasive particles/Inconsistent velocity of the flow</p>	<p>Flush the valves Periodically depending on the type/nature of the fluid or provide drain whenever necessary</p>	<p><u>Note:</u> <i>Keep the valve in fully open condition while flushing</i></p>

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5)Functional failures	<p>Check the stem and Yoke sleeve.</p> <p><i>When these functional components are ok but not sufficiently lubricated:</i></p> <p>Clean the stem from dirt and contamination's and lubricate with grease compatible with the operating temperatures.</p> <p><i>When this procedure will not remedy the failure:</i></p> <p>Repair necessary: remove the valve and inspect by considering the notes given under 'Special Risks'. Ask Bell-O-Seal for corresponding spares and required instructions.</p>	<p><u>Note:</u></p> <p>When it is noted after the disassembling of the valve that the body and/or trim is not sufficiently resistant against attacks of the media opt for more suitable materials of design.</p>
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7 List of spare parts: -

Spare parts mentioned below shall be ordered with all indications of the marking of valve.

- ✍ Bolt Nuts or fasteners*
- ✍ Gaskets*
- ✍ Packing*
- ✍ Eye Bolts/ Cross bolts*
- ✍ Hand wheel*
- ✍ Hand wheel key etc..*

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