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| <b>INSTRUCTIONS INST. OPERATION AND MAINTENANCE</b> |                     |  <b>BVALVE</b> ® Flow, Systems & Controls |                        |
| <b>BV2506X DN15 a DN300</b>                         |                     |  |                        |
| Code<br><b>MAN-2506X-EN</b>                         | Edition<br><b>0</b> | Date and responsible<br><b>14/01/19</b>  | Page<br><b>1 de 15</b> |

# INSTRUCTION MANUAL FOR INSTALLATION, OPERATION, MAINTENANCE AND STORAGE FOR BVALVE BELLOW SEALED GLOBE VALVES model BV2506X

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### 1. General

This document applies to the globe bellowsealed valves delivered by BVALVE FSC, S.L.U.

### 2. Intended use

After their installation in a piping system (either between flanges or by welding) the use of the globe valves is exclusively defined as to stop or control the flow of media for on-off/regulating application within the permissible pressure and temperature limits by manual/actuated operation.

Valves are designed and manufactured as per the specification and inputs given by the customer during enquiry or purchase order. Usage of the valve for application other than specified manufacturers is not responsible.

### 3. Limit conditions for operation

The valves, according essential safety requirements established in the Pressure Equipment Directive is appropriate to work with all media classified as Group I (liquids or gases), as per selected design and construction materials.

During selection phase of the valve, customer is always informed about selected materials for valve construction. In this way, customer can verify suitability of such materials and add any comment or information thereon.

The selection and operation of the valves will never exceed the following pressure/temperature limits.

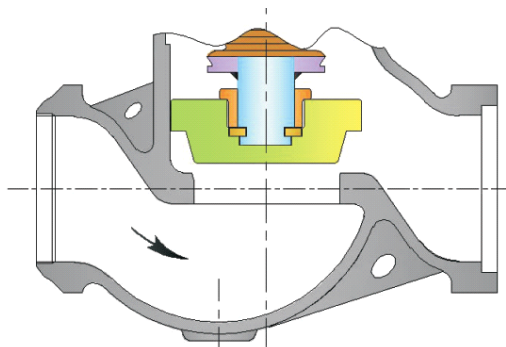
| WORKING CONDITIONS |          |    |                                  |         |         |      |      |      |      |      |      |
|--------------------|----------|----|----------------------------------|---------|---------|------|------|------|------|------|------|
| Model              | DN       | PN | Temperature, °C                  |         |         |      |      |      |      |      |      |
|                    |          |    | -60/-10                          | -10/100 | 100/120 | 150  | 200  | 250  | 300  | 350  | 400  |
|                    |          |    | Maximum admissible pressure, bar |         |         |      |      |      |      |      |      |
| BV25061            | DN15-300 | 16 | -                                | 16,0    | 16,0    | 14,4 | 12,8 | 11,2 | 9,6  | -    | -    |
| BV25063            | DN15-200 | 25 | -                                | 25,0    | 25,0    | 24,3 | 23,0 | 21,8 | 20,0 | 17,5 | -    |
| BV25064            | DN15-300 | 16 | -                                | 16,0    | 16,0    | 15,5 | 14,7 | 13,9 | 12,8 | 11,2 | -    |
| BV25065            | DN15-300 | 40 | -                                | 40,0    | -       | 35,2 | 33,3 | 30,4 | 27,6 | 25,7 | 23,8 |
| BV25065            | DN65-300 | 16 | -                                | 16,0    | -       | 14,0 | 13,3 | 12,1 | 11,0 | 10,2 | 9,5  |
| BV25066            | DN15-300 | 40 | 40,0                             | 40,0    | -       | 36,3 | 33,7 | 31,8 | 29,7 | 28,5 | 27,4 |

**Table 1: working conditions for Bvalve valves model BV2506X**

#### 4. Safety instructions

##### 4.1 General

Las válvulas están sujetas a las mismas reglas de seguridad que la tubería donde se vayan a instalar. Por lo tanto, las indicaciones mencionadas en este manual son unas recomendaciones de seguridad añadidas que deben ser consideradas para las válvulas.








**Figure 1: valve position (fully open) during discharge**

|                      |  |
|----------------------|--|
| <br><b>¡Warning!</b> | In case of pressure above design pressure, do not operate the valve under this circumstance, getting away from the affected area and acting on the sources to reduce pressure.   |
| <br><b>¡Warning!</b> | In case of temperature over/below design temperature, do not operate the valve under this circumstance, getting away from the affected area and acting on the heat sources to reduce temperature.  |
| <br><b>¡Warning!</b> | In case that the selected material for the valve construction is not suitable to the corrosive properties of the media, if high corrosion is found in the internals of the valve, substitute the complete valve into another with suitable material. |
| <br><b>¡Warning!</b> | In case of fire in the process unit, get away from the affected area, evacuate and seal the area. Follow the plant, experts or authorities plans for evacuation and firefighting.  |
| <br><b>¡Warning!</b> | During transport, handling, installation and operation, do not place any external charge on the valve.   |
| <br><b>¡Warning!</b> | Do not install or use the valve in case of evidence of deformation or breakage.  |
| <br><b>¡Warning!</b> | Valve is not designed to support any load coming from external pipe systems. In case of breakage, correct the piping design and substitute the valve into a new one.   |
| <br><b>¡Warning!</b> | In case that surface temperature on the valve is higher than 65 °C, it is recommended to restrict the access to the area close to the valve to avoid direct contact with it or to install a thermal isolation system on the valve.                   |
| <br><b>¡Warning!</b> | Check that the valve operates inside the pressure and temperature limits established in the technical documentation and operating manual.  |

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#### 4.2 Safety instructions for the user


No es responsabilidad del fabricante y debe ser de obligado cumplimiento por el usuario, que la válvula solo se use según lo requerido por el uso definido descrito en este manual.

|  |   |
|--|---|
| <br><b>Danger to life</b>   | When a valve is disassembled from the piping system proper care has to be taken in order to avoid possible damage to the serrations, threading of the connecting parts. Carelessness can lead to leakage through connecting parts alter reassembling and danger to life.  |
| <br><b>Danger to life</b>   | It must be absolutely assured that the selected materials of the 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. |
| <br><b>Danger to life</b>   | It is mandatory to operate the valve with appropriate safety gadgets.   |
| <br><b>Danger to life</b> | Periodic visual, functional inspection of the valve for opening/closing, joint tightness & leak tightness of packing region can avoid possible hazard in operation.   |
| <br><b>Danger to life</b> | In case of leak through the gaskets, substitute them into a suitable ones to the service conditions at the shortest by qualified staff.   |

Only qualified staff shall be permitted to operate and do maintenance of pressure piping systems.

#### 4.3 Special risks

|  |   |
|--|---|
| <br><b>Danger to life</b> | Before 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 depressurized 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. |
| <br><b>Danger to life</b> | 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 shall be completely drained before removing the valve.   |

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4.3.1 Essential safety requirements will be marked / punched or riveted with CE marking as per Pressure Equipment Directive 2014/68/EU.

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


4.4 Leak detection port

Wherever leak detector specified in the contract a leak detector port (Generally ¼" or ½" NPT plug port) will be provided in between the gland packing or in between the packing and the bellow for which a suitable leak detection instrument can be attached. In case of detection of bellow leakage, gland-packing bolt/nut should be tightened to control the leakage to permissible limits.

**5. Instalation, operation and maintenance**

5.1 The Globe valve products supplied by BVALVE FSC, S.L.U. 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.

5.2 Pre-installation inspection

|  |   |
|--|---|
| <br><b>Danger to life</b> | <p>Before installing verify that the valve is suitable for the service in which it is being installed by referring the service tag and nameplate.</p> <p>Disregard of this precautionary measure can lead danger to life for the user and damages in the piping system.</p> |
|--|---|

5.2.1 Check the valve, hand Wheel for possible damage.

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

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

5.2.4 Remove the silica gel bags or moisture absorber from the valve inlet or outlet ports.

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

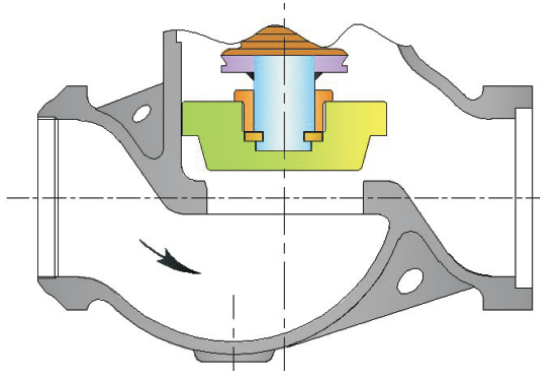
5.2.6 After these points have been checked and approved, the valve is ready for installation.

5.2.7 Before installation please ensure that all pipes and valves are free from impurities or foreign particles, which could impair usability. Sealing system can however be damaged by impurities despite of high degree of hardness.

5.2.8 Threading surfaces, customer should give enough protection like damage or debris. When end caps are not intact seat area and other surfaces should be cleaned.

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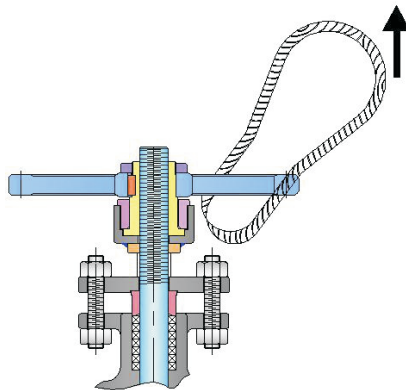
5.2.9 Flush the valve fully by keeping the valve in full open position in order to avoid the bellow damage. It is recommended to use temporary strainer before the valve during initial flushing so as to avoid possible damages to seat and trim parts.



**Figure 2: Valve position (fully open) during flushing**

### 5.3 Installation

- 5.3.1 Small Globe/Bellows sealed globe valves up to and including nominal size 2"NB (DN50), PN16 and PN40 may be lifted or carried by the hand wheel without damage to the valve.
- 5.3.2 Larger Globe/Bellows sealed valves DN65 and above, PN16 and higher should be lifted by using the lifting lugs provided, or by looping a suitable nylon rope around the bonnet.
- 5.3.3 Never lift the larger valves (DN65 and above) 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.



**Figure 3: lifting and handling for valves DN50 and smaller**

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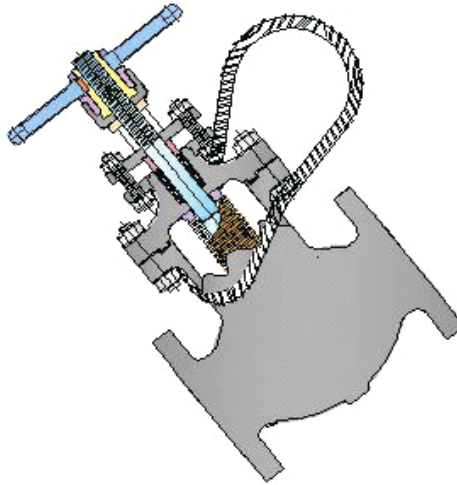



Figure 4: lifting and handling for valves DN65 and bigger

5.3.4. MOUNTING ANGLE: During installation of unidirectional valve, orient the valve so that the inlet end will be toward the higher pressure.

The direction of flow has been marked as “→” or “←” on the body and the preferred pressure end is the inlet of the valve. When possible, Bellow 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.

|  |  |
|--|--|
| <br><b>Danger to life</b> | <p>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.</p> <p>Disregard of this precautionary measure can lead danger to life for the user and damages in the piping system.</p> |
|--|--|

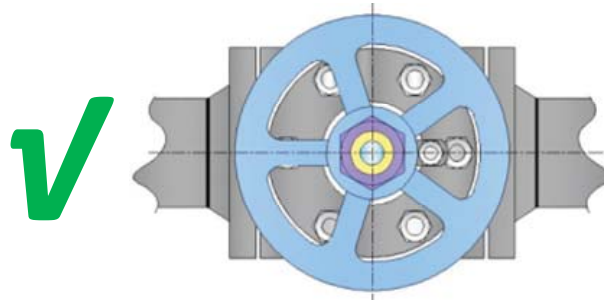
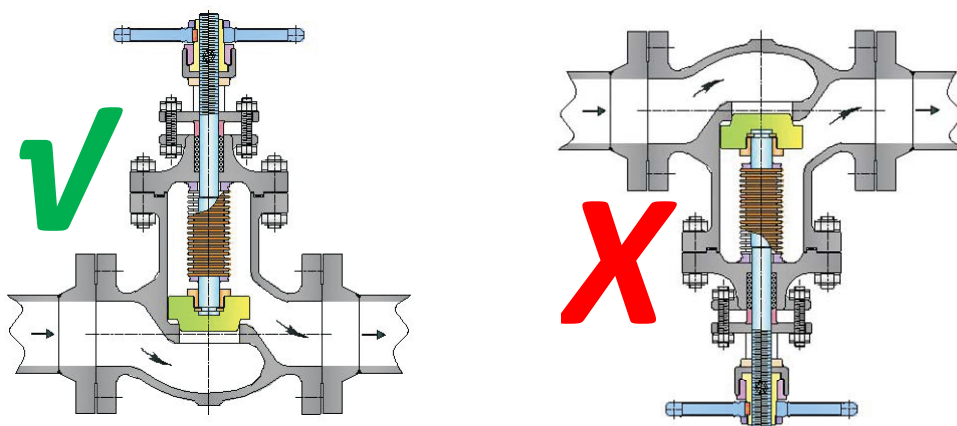
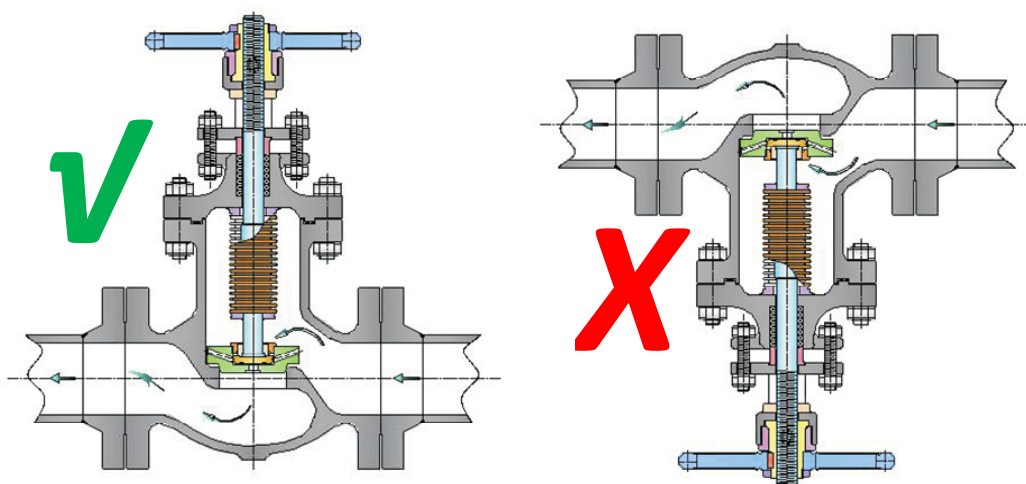


Figure 5: in horizontal pipes, the valve can be installed with horizontal spindle orientation

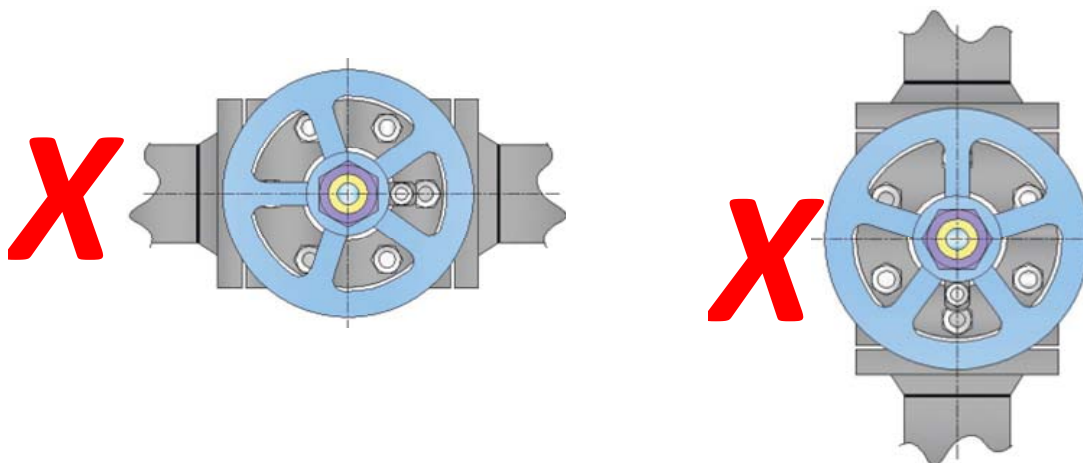




**Figure 6: installation position for globe valves with vertical spindle orientation**



**Figure 7: direction for bellows sealed valves with balanced plug design (only permitted for horizontal pipe lines and vertical spindle orientation)**



**Figure 8: valves with balanced plug design cannot be installed with spindle in horizontal orientation independently of the direction of pipe (horizontal or vertical)**

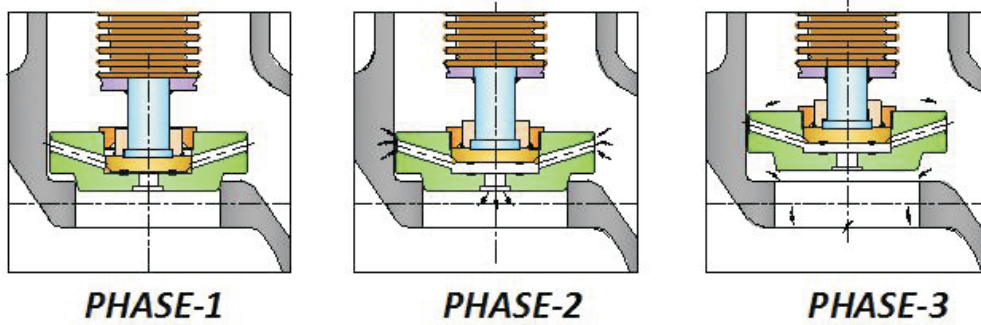


**Warning**

Bellow seal Globe valve with pressure relief plug design (Balancing plug) should not be mounted in Horizontal or Vertical pipe lines runs with Horizontal spindle.

5.3.5 Use of balanced plug

- The use of balanced disc is essential in case of high pressure and bigger size of valve to reduce the effort required to operate the hand wheel.
- At this regard, it is recommended to fit the valve in opposite direction as shown above, i.e., pressure on the disc/plug, obviously balanced plug.
- At phase-1 the valve is completely closed, al phase-2 the pilot plug/first plug opens and the pressure in the valve balanced, al final phase-3 the valve is completely open



**Figure 9: phase of balanced plug design**

5.3.6 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.


5.3.7 Only suitable wrenches/tools shall be used for installation, disassembly, maintenance and reassemble of these valve products.

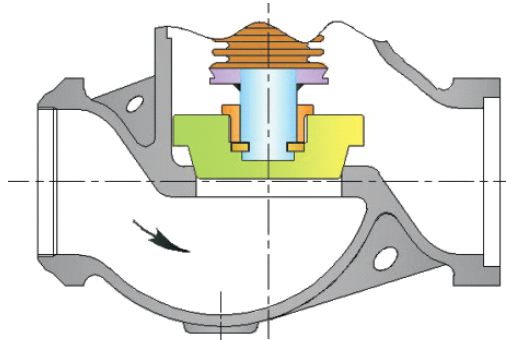
5.3.8 Flanged valves can be bolted into the line using standard stud-nuts and gaskets. When installing flanged valves, tighten the flange bolts which are diametrically opposite to each other and all bolts should fastened gradually to a uniform tightness.

5.3.9 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.

5.3.10 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.

5.3.11 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 close position before applying heat to protect the seat and core face

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**Figure 10: valve in closed position before starting welding tasks**

5.3.12 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.

5.3.13 Selection of proper welding rod and material to be done by qualified welder as per approved WPS/PQR. The root welding to be done by TIG welding process only.

5.3.14 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.


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

5.3.16 Valve with Gear Box and actuated operation type, make sure that proper support to be given for smooth operation.

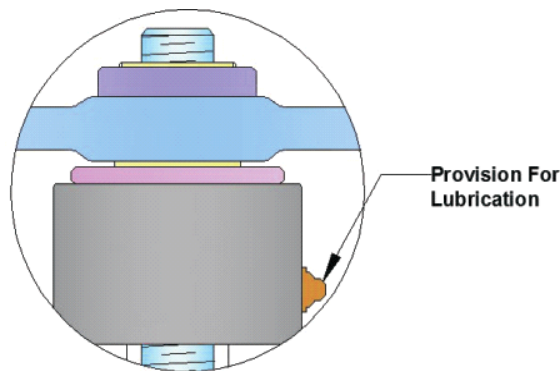
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#### 5.4 Operation

- 5.4.1. Replacement of major components, including stem and plug should not be done under field conditions, but should be done only in a properly equipped workshop.

|  |   |
|--|---|
| <br><b>Danger to life</b> | 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 and is recommended to replace the bellow/bellow assembly. |
|--|---|

- 5.4.2. Stem/Yoke sleeve (Threaded portion) is to be checked regularly for existence of lubricants. The Valve stem to be lubricated with High temperature grease every 2-3 months. Lubrication should be done and valve to be operated at least once in a fifteen days and proper record to be maintained.





Lack of lubrication leads to functional failures of the valve due to accumulation of dirt and contamination by media.

- 5.4.3. When the valve is in operation, stem packing, body, bonnet or cylinder bolting shall be examined for required tightness regularly.
- 5.4.4. If the packing is compressed over a period of time, then the same has to be replaced by new one.
- 5.4.5. We recommend that the bonnet studs on the valve to 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.
- 5.4.6. Turning the hand wheel clockwise closes the valves and anticlockwise operation opens the valve. Normal hand force is sufficient for the operation of the hand wheel. Only for a tight closure or in the opening phase of the valve increased hand force may be necessary.


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- 5.4.7. The use of extension rods, levers, wrenches and similar items for operation of valves is strictly not recommended.
- 5.4.8. The valves with actuators must be properly supported at installation for smooth operation.
- 5.4.9. If the valve is expected to be in open or closed position for a long duration of time (say 3 months), it is recommended that the valves are opened and closed for at least 3-5 cycles to maintain integrity of stem movement. This is essential as the valve is seeing high temperatures in thermal fluid service.
- 5.5. Maintenance
  - 5.5.1. To ensure operational reliability all valves should be operated and checked regularly.
  - 5.5.2. 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.

|  |   |
|--|---|
| <br><b>Danger to life</b> | 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. |
| <br><b>Danger to life</b> | When a valve is removed from the systems conveying dangerous media, shall be carried away from the plant, then the valve must be professionally decontaminated.                             |

## 6. Transport, storage & handling instruction

- 6.1. Valves should be stored with desiccant inside the ports and plastic caps should securely cover both the ports.
- 6.2. Valves should necessarily be stored under covered roof to prevent damage to trims from dust, rain, storm, sand etc.,
- 6.3. It is advisable to cover the valves with polythene sheets to prevent atmospheric hazards during long storage period.
- 6.4. Do not mishandle the valves. Careless handling often results in broken hand wheel and distorted stems.
- 6.5. Do not lift the larger valves by the hand wheel instead lift the valve by looping a rope around the bonnet.
- 6.6. In particular the hand wheel 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.
- 6.7. Valves will be supplied with disc in closed position and shall be stored in the same state.

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## 7. Trouble shooting

7.1. During the remedy of the failure section, safety instructions shall be absolutely considered.

7.2. When repairs are necessary, please contact at following email ID: [ventas@bvalve.es](mailto:ventas@bvalve.es).

| Kind of failures   | Procedure for remedy   | Notes   |
|--|--|---|
| Leak through body/bonnet gasket or inlet and outlet flange connections | <p>Tighten the bolts &amp; nuts while the valve is still leaking.<br/>For spares contact BVALVE FSC S.L.U.</p> <p><b>⚠</b> Remove the valve, considering safety instructions provided above and replace the gaskets.</p>   | Spare parts shall be ordered with all indications of the marking of the valve. See maximum tightening torques in table 2. |
| Leakage found through the stem packing due to bellow damage            | Contact BVALVE FSC S.L.U. for service and repair.  |   |
| Leakage through seats  | <p>Whenever seat leakage is observed, the following should be the first line of action at site of installation/customer.<br/>The valve seats to be properly cleaned so that there are no foreign particles on the seating surface.</p> <p>For balanced plug design, the pilot hole has to be free from any particles. This has to be checked.<br/>The valve installation is as per manufacturer recommendation.<br/>The valve should be operated from full open to full close for at least 10-15 times so that proper metallic sealing is established.</p> <p>The required torque should be applied on the valve so that the plug is completely seated on the body seat. All leakage rates are to be checked as per EN 12266-1.<br/>Contact BVALVE FSC S.L.U for service and repair.</p> |   |
| Functional failures  | <p>Check the stem and Yoke sleeve. When these functional components are ok but not sufficiently lubricated:<br/>Clean the stem threading area from foreign particles and lubricate with grease compatible with the operating temperatures.<br/>When this procedure will not remedy the failure, for any repair: contact BVALVE FSC S.L.U.</p>  |   |

**INSTRUCTIONS INST. OPERATION AND  
MAINTENANCE****BV2506X DN15 a DN300**

Code

**MAN-2506X-EN**

Edition

**0**

Date and responsible

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| DN         | Maximum tightening torque for body/Bonnet bolts<br>[N.m] |
|------------|--|
| <b>125</b> | <b>104</b>   |
| <b>150</b> | <b>127</b>   |
| <b>200</b> | <b>185</b>   |
| <b>250</b> | <b>291</b>   |
| <b>300</b> | <b>352</b>   |

**Table 2: maximum tightening torque for body/Bonnet bolts and nuts****8. List of spare parts**

Only spares supplied by BVALVE FSC S.L.U shall be used. The usage of spares from any other sources is not recommended which in turn ceases the warranty.

Spare parts mentioned below shall be ordered with all indications of the marking of valve, on which they are used:

- Bolt Nuts or fasteners.
- Gaskets.
- Packing.
- Eye Bolts/Cross bolts/Gland Bolts
- Handwheel & Handwheel key etc.