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**Secure System Generates
Smart Energy Conservation**



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VMV Bellows Seal Globe Valve Operation Instruction

Versions and technologies are constantly being upgraded without prior notice!

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Secure System Generates Smart Energy Conservation

VMV Newton is globally committed to providing overall solutions for steam and thermal energy systems, - complete sets of high quality system products.

Effective control and utilization of steam,thermal oil ,hot water,highly corrosive and highly toxic media,compressed air,etc. Service for various industrial fluids and special working conditions,we are one of the powerful brand manufactures in the filed of steam and thermal engineering systems.



VMV was established in 1998,the headquarters covers 75000 square meters and realizes digital intelligence integration workshop.

Our products have applied to steam system,thermal oil system,petroleum industry,natural gas industry,chemical industry etc.

We have aslo qualified with CE,ISO,TS A1,API,CCS and EAC certificates.

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Dear users

Thank you very much for choosing VMV's Bellows Sealed Valves. As a type of pressure equipment, valves have potential pressure hazards and hidden dangers of medium leakage.

For safety reasons, please read the manual carefully before use to ensure correct installation and use.

If you have any problems, please call us free.

User Notice:

- 1.First of all to ensure the safety of personnel in any case.
- 2.The valve should be used according to the temperature and pressure grade requirements of the pressure pipeline.
3. It should be ensured that the selected material can resist the corrosion and wear of the medium.
- 4.The working temperature should be limited when the medium is flammable and explosive.
- 5.It should be ensured that the valve is always in a depressurized, vented and drained state during the repair/maintenance process.
- 6.Appropriate protection should be used, and there should be no unauthorized open flames on site during the repair/maintenance process.
7. Valves must be inspected regularly.
 - a. Bolt/nut connection tightening (body/bonnet, gland, flange connection)
 - b. Corrosion/wear hazards (impact, pitting, thickness reduction);
 - c. Make sure that the valve is in the fully open/fully closed position.



Spare Parts Reserve



Emergency Maintenance Response

If you need any help,please call VMV After sales department or leave message to email.

Tel:86 - 577 - 67978268

E - mail:vmv9@vmv - valve.com

1.1 Application

VMV bellows valves are widely used, especially suitable for flammable, explosive, toxic, high temperature and other dangerous media and occasions with strict environmental protection requirements; This series of valves is suitable for chemical, petroleum, fertilizer, new energy, paper, pharmaceutical, tobacco and other industries, cutting or connecting pipelines to ensure the safe operation of the system.



Application the safe operation of the system.

1.2 Technical Performance

Design standard: EN12516, ASME B16.34

Flange size: EN1092, ASME B16.5

Welding end standard: EN12627, ASME B16.25, ASME B16.11

Face to face: EN558, ASME B16.10

Inspection standard: EN12266, API598

Nominal size: DN15 ~ DN400 (1/2" ~ 16")

Nominal pressure: PN10 ~ PN63 (Class150 ~ Class300)

Suitable temperature: -29 ~ 425 °C

Bellows Test: MSS SP-117



Technical
performance

Structure & Principle

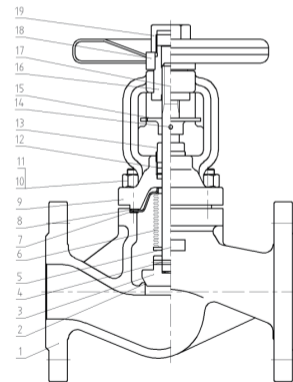
2.1 The structure of DIN

standard bellow seal globe valve

DN15~ DN50 / PN10~ PN40 See picture

Components name

1-Body	7-Sealing member	13-Gland
2-Seat	8-Gasket	14-Pin
3-Disc	9-Bonnet	15-Locator
4-Pin	10-Bolt	16-Stem nut
5-Stem	11-Nut	17-Oil cup
6-Bellows	12-Packing	18-Hand wheel
		19-Cap



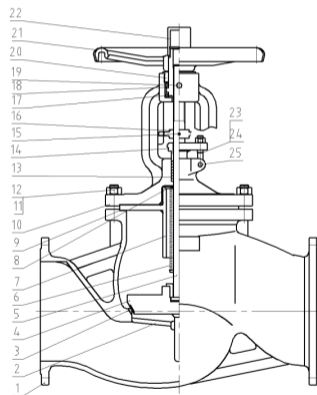
2.2 The structure of DIN standard

large diameter bellow seal globe valve

DN200~ DN400 / PN10~ PN40 See picture

Components name

1-Body	9-Gasket	18-Bearing
2-Guide bracket	10-Bonnet	19-Oil cup
3-Seat	11-Bolt	20-Cap
4-Disc	12-Nut	21-Hand wheel
5-Stem	13-Packing	22-Cap
6-Bellows	14-Gland	23-Eye bolt
7-Sealing member	15-Pin	24-Nut
	16-Locator	25-Pin
8-Weld piece	17-Stem nut	



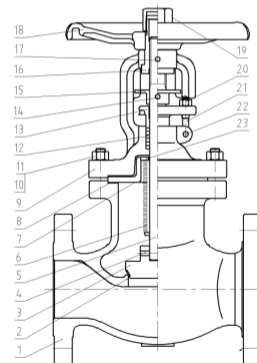
2.3 The structure of ANSI

standard bellow seal globe valve

2"~8" / 150~300LB See picture

Components name

1-Body	8-Gasket	16-Stem nut
2-Seat	9-Bonnet	17-Oil cup
3-Disc	10-Bolt	18-Hand wheel
4-Pin	11-Nut	19-Cap
5-Stem	12-Packing	20-Eye bolt
6-Bellows	13-Packing gland	21-Nut
7-Sealing member	14-Pin	22-Pin
	15-Locator	23-Weld piece

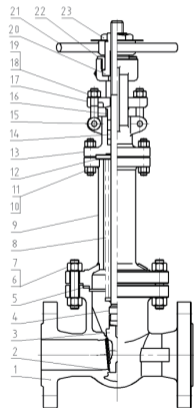


2.4 The structure of ANSI standard bellow seal gate valve

2"~8" / 150~300LB See picture

Components name

1-Body	9-Bonnet	17-Gland
2-Seat	10-Nut	18-Nut
3-Wedge	11-Bolt	19-Eye bolt
4-Stem	12-Gasket	20-Stem nut
5-Gasket	13-Bracket	21-Hand wheel
6-Nut	14-Packing	22-Cap
7-Bolt	15-Pin	23-Lock nut
8-Bellows	16-Gland	



2.5 Material of main parts

The user should select the material and valve pressure according to the working temperature, working pressure and medium type based on the corresponding pressure grade table.

The manufacturer is only responsible for the material, valve pressure rating specified on the order. It is not responsible for inconsistencies with the conditions of use due to the user's selection of incorrect materials or pressure ratings.

No.	Main parts	Material		
1	Body, Bonnet, Wedge, Bracket, Packing gland	GS-C25/WCB	CF8	CF8M
2	Stem, Packing gland	2Cr13	304	316
3	Flange gasket, Flexible graphite	304+Flexible graphite	304+Flexible graphite	316+Flexible graphite
4	Packing	Flexible graphite	Flexible graphite	Flexible graphite
5	Bolt, Eye bolt	A193-B7	A193-B8	A193-B8M
6	Nut	A194-2H	A194-8	A194-8M
7	Stem nut, Steel/Copper	steel/copper	copper	copper
8	Bellows	304	316L	316L
9	Disc	A105	304	316
10	Sealing member	A105/304	304	316

Valves with special materials can be customized, such as 316Ti, Hastelloy, Monel, etc.

2.6 Working principle

The working principle of the series of bellows seal valves:
When the handwheel is rotated clockwise, the valve disc/gate will drop to cut off the channel, and it is closed; when the handwheel is rotated counterclockwise, the valve disc/gate will rise, and it is opened.



Working principle

2.7 Structure description

The conventional operation of this series of bellows seal valves is hand wheel. The middle cavity seal adopts stainless steel clamp flexible graphite gasket. The valve stem adopts the double sealing structure of bellows seal and packing seal. The bellows are provided by well-known domestic and international manufacturers. Materials including 304, 321, 316L, 316Ti, Hastelloy276, INCONEL625 etc. The valve can be in the form of conical, flat, throttle type sealing, and the sealing surface material can be selected according to the API600 internal parts table or according to user requirements.



Structure description

Shipping & Storage

3.1 Valve shipping As a metal product, the valve should avoid being damaged during shipping. Ropes, lifting equipment and shipping tools should be prepared, and the valve packaging should be checked. If the packaging is damaged, it should be fixed; The packaging should meet the standard requirements, and it is not allowed to rotate the packaged valve handwheel at will; the valve should be in a fully closed state. For the valve that has been opened by mistake, the sealing surface should be wiped clean and then closed tightly to close the passages at both ends.

When the valve is lifted to moving, the rope should be tied to the valve bracket, and not allowed to be tied to the handwheel or valve stem. The valve should be lifted and placed gently, do not hit other objects, and should be placed stably.

The paint, nameplate and flange sealing surface of the valve should be protected during the shipping, it is not allowed to drag the valve on the ground and it is not allowed to touch the sealing surface at both ends of the valve to the ground and move.



Valve shipping

3.1 Valve shipping Valve that will not be installed temporarily at the construction site should not be unpacked, and should be protected from rain, dust and rust.

3.2 Valve storage The valve should be stored in a dry and ventilated room and placed neatly. The valve stem should not be stressed, and the valve channel and flange surface should be closed by covers. For valve that need to be stored for a long time, the valve stem and machined surface should be coated with rust inhibitor. It should be re-checked to remove the dirt before using. Please notice the cleaning of the sealing surface to prevent damage to the sealing surface, and have a pressure test once more before using.



Valve storage

4.1 Valve installation

Before installation, please carefully check if the model, pressure and diameter of the valve meet the requirements. The direction indicated by the arrow should be consistent with the flow direction of the pipeline medium, and the installation can be performed after confirmation. Before installation, please ensure that the inner cavity and sealing surface are clean, and check the sealing surface, bolt connection, packing compression, and whether the valve stem rotates freely. For the valve on the horizontal pipeline, the valve stem is recommended to be vertically upward, and it is not suitable to install the valve stem downward; the valve stem downward is not only inconvenient to operate and maintain, but also easy to make the valve corrode.



Valve
installation

4.1 Valve installation

For valves with flange end, the user should select suitable studs and gaskets according to the operating temperature, operating pressure and operating medium, and tighten the connecting bolts and nuts evenly and symmetrically. For valves with butt-welded end, the user should carry out welding and heat treatment according to the standard requirements, and the welding should be carried out by qualified personnel, and only after the process qualification is qualified. When the valve is opened or closed, please notice the stroke of the positioning piece. Do not open or close it roughly. Excessive force with the wrench will easily lead to distortion and damage to the valve internals. The valve installed on the pipeline should have space for operation, maintenance, and disassembly, and the reserved space for the handwheel should not be less than 100mm.



Valve
installation

4.2 Valve use

After the valve is installed, if the temperature of the medium is higher than 100°C, the packing gland should be gently opened to fully evaporate the water in the cavity formed by the bellows and the packing, and then the packing gland should be tightened. The valve must be in the fully closed or fully opened position when the system or pipeline is pressure tested, and must not be partially opened for flow regulation or emergency discharge. The manufacturer is not responsible for any harm caused by such cases. In general, the bellows globe valve has no insulation part. When the medium is high temperature or low temperature fluid, do not touch the surface of the valve to prevent burns or frostbite.



Valve use

4.2 Valve use

The surface and moving parts of the valve, such as the trapezoidal thread of the valve stem and the valve stem nut, the sliding parts of the valve nut and the bracket, are prone to accumulation of dust, oil and medium residues, which are easy to wear and corrode the valve and even generate frictional heat. This is very dangerous for flammable gases and should be cleaned frequently according to the working conditions. If there is water in the valve cavity, in the case of low temperature (such as medium is liquid nitrogen), Opening and closing valve will easily cause damage to the bellows. The water should be drained before installation to avoid freezing in the valve cavity.



Valve use

5.1 Valve maintenance

After the valve is used, regular in-service inspections should be carried out, and the sealing and wear of the sealing surface should be checked frequently; whether the packing is failing; whether the valve body is corroded, if the above conditions are found, it should be repaired or replaced in time. It is recommended to overhaul every 3 months for water and oil media, and every 1 month for corrosive media, or according to local regulations.

When the valve is overhauled and reassembled and adjusted, be careful not to let the welding slag splash on the surface of the bellows or cause other mechanical damage to the bellows; in addition, it is not allowed to adjust the installation deviation of the pipeline by deforming the bellows.



Valve maintenance

5.1 Valve maintenance

It will affect the normal function of the bellows and reduce the service life. After assembly, carry out the sealing performance test and make relevant records.

The user can choose the appropriate size to replace the valve packing, gasket, bolt and nut. However, it is forbidden to open the bonnet or gland to replace them when the valve is under pressure.

After replacement, it should be used after passing the pressure test.

The user can repair the sealing surface of the valve by himself, but the sealing should be ensured and used after passing the pressure test. Valve internals are generally recommended to be replaced, not repaired.

The pressure-bearing parts of the valve are not recommended to be repaired. If the pressure-bearing parts are found to be defective due to the long use time, which affects the safety, the user should replace the new valve in time.



Valve maintenance

Faults & Solutions

6.1 Valve faults and solutions

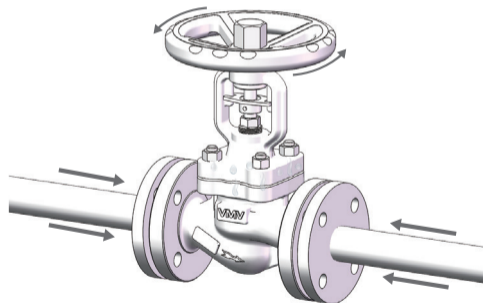
Fault conditions	Reason of fault caused	Solutions
Stuck during operation	<ol style="list-style-type: none"> 1. The packing is too tight 2. The thread of the stem nut is severely worn 3. There are between the valve stem nut, gland, pressure sleeve and the valve stem 4. The valve stem is bent 	<ol style="list-style-type: none"> 1. Loosen the gland nut properly 2. Replace the stem nut 3. Remove foreign objects 4. Correct or replace the valve stem
Bellows leak	<ol style="list-style-type: none"> 1. Incorrect welding between the two ends of the bellows and the sealing member or valve stem, incomplete penetration, stress crack defects, etc. 2. The bellows fail due to long-term use. 	<ol style="list-style-type: none"> 1. The welding seam at both ends of the bellows should be carried out according to the relevant welding regulations, and the welding quality inspection should be carried out after welding. 2. Replace the bellows
Leakage at the connection between the valve body and the bonnet	<ol style="list-style-type: none"> 1. Uneven tightening of connecting bolts 2. Damaged flange sealing surface 3. Cracked or failed gasket 	<ol style="list-style-type: none"> 1. Tighten the bolts evenly 2. Repair 3. Replace the gasket
Leakage between sealing surfaces	<ol style="list-style-type: none"> 1. The sealing surface has contaminants attached 2. The sealing surface is damaged 3. The sealing surface is worn out after long-term use 	<ol style="list-style-type: none"> 1. Remove dirt 2. Repair and maintenance 3. Repair and maintenance
Leakage at packing	<ol style="list-style-type: none"> 1. The bellows is broken 2. The packing gland nut is loose 3. The number of packing turns is not enough 	<ol style="list-style-type: none"> 1. In an emergency, the packing gland can be tightened first, and the bellows can be replaced later 2. Tighten the packing gland nut 3. Increase the number of packing turns
Leakage due to body and bonnet damage	<ol style="list-style-type: none"> 1. Water hammer damaged valve 2. Fatigue damage 3. Freeze crack 	<ol style="list-style-type: none"> 1. To be stable, avoid to stop pump suddenly and close the valve rapidly . 2. If it exceeds the service life and has early fatigue defects, it should be replaced. 3. Valves not used in winter should exclude water medium.

If you have any questions, please feel free to contact with VMV After sales department, Tel:86-577-679782 68.

6.2 How to solve the problem that the valve is difficult to open for the first time?

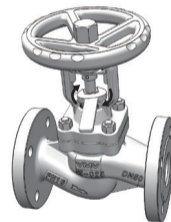
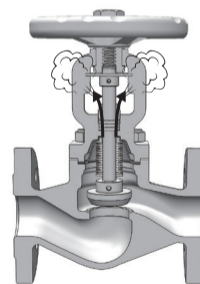
The valve has passed the sealing test of 1.1 times from the nominal pressure when it leaves the factory. When it is opened for the first time, the end flanges on both sides of the valve should be fixed by the correct method (such as clamping with a tool or installing it on the pipeline), and be careful not to damage the flange sealing.

At this time, the valve should be opened counterclockwise, and the action will be light and flexible after first opening.



6.2 Do not think that the product is leaking when steam is emitted from the packing for the first use.

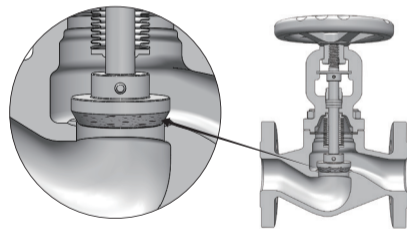
When the bellows valve is subjected to a hydraulic test before leaving the factory, the loose packing will absorb water. After the product is installed on the pipeline and running, if the internal medium temperature is higher than 100 °C, the water vapor in the inner cavity of the bellows will be converted into steam and emerging from the packing. At this time, it is not the leakage of the product, just loosen the packing sleeve, let the water evaporate completely naturally, and then tighten it. Generally, after 5-10 minutes, there will be no steam coming out.



At this point, the tool can be used to lock the packing gland clockwise.

6.3 The valve cannot be closed tightly

When the valve cannot be closed tightly when operating, most likely due to the debris stuck on the sealing surface of the valve. At this time, do not use brute force to close, you can open the handwheel for half a turn, open and close it several times, use the medium to wash away the sundries on the sealing surface, and then close at a constant speed. (Notice: it is recommended that a strainer should be installed at the front end of the valve to keep the medium clean, reducing the damage to the sealing surface and prolong the service life).



Good Service Achieve Customer's Success , Exert All One's Energies
Walk The Walk, Take Responsibility