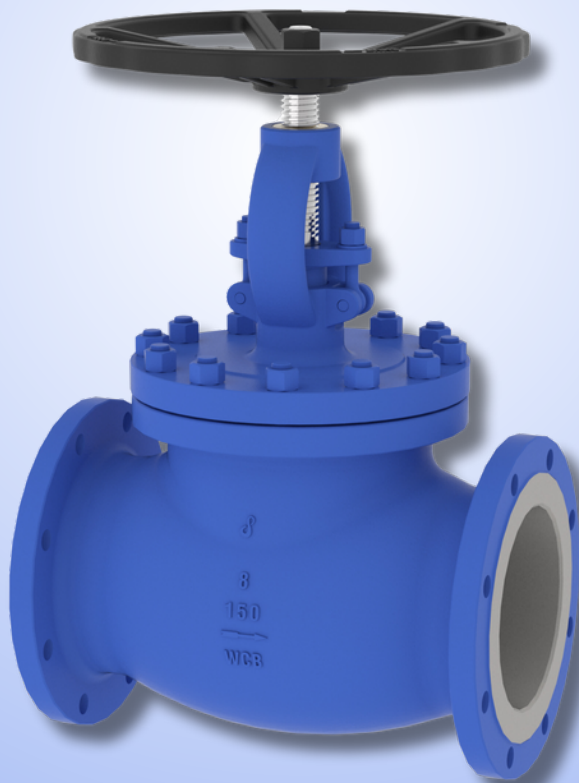
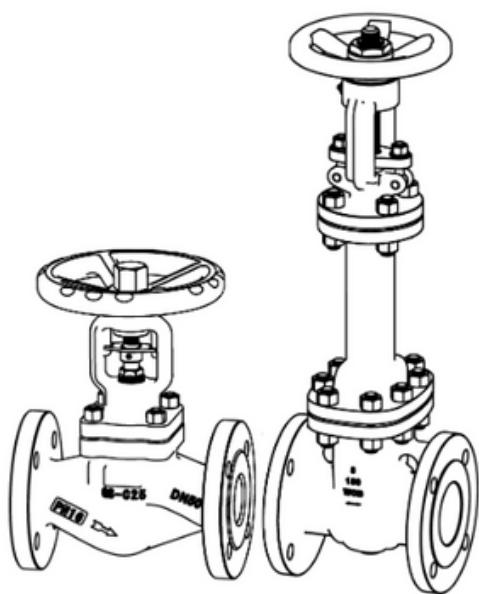


INSTALLATION AND MAINTENANCE INSTRUCTIONS



BELLOW SEAL VALVE



- Preface
- Purpose and performance
- Structure and principle
- Transportation and storage
- Installation and use
- Maintenance and diagnosis
- Product display

1. Preface

User Precautions

1. In any case, the safety of personnel should be guaranteed first;
2. This valve shall be used according to the temperature and pressure class of the pressure pipe;
3. The selected material should be able to resist the corrosion and wear of the medium;
4. When the medium is flammable and explosive, the working temperature should be limited;
5. During the maintenance, the valve should be kept in the state of pressure relief, venting and draining;
6. During maintenance/repair, appropriate protection should be adopted, and there should be no open fire without proper work permit on site;
7. Valves must be checked regularly;
 - Whether the bolt/ nut connection (body/gate, plate, flange connection) is tight;
 - Corrosion/wear hazard (impact, pitting, reduction of thickness);
 - Make sure the valve is in the fully open / fully closed position.

BELLOW SEAL VALVE

2. Purpose and performance

2.1 Purpose:

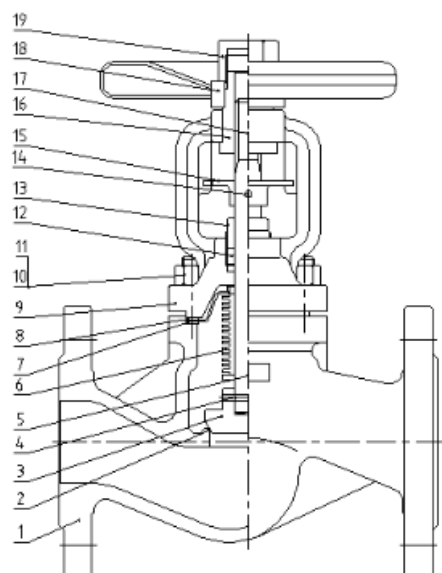
The bellows sealed valve is a new and emerging technology in the valve industry its emergence has expanded the application scope of valves especially suitable for pipelines conveying flammable explosive and toxic media as well as environments with stricter environmental protection requirements; this series of valves is mainly used in industries such as chemical petroleum metallurgy papermaking and pharmaceuticals to cut off or connect pipelines thereby ensuring the normal operation of systems; with the development of the nuclear industry bellows sealed valves are also the preferred choice for handling radioactive materials offering significant social benefits.

2.2 Technical performance:

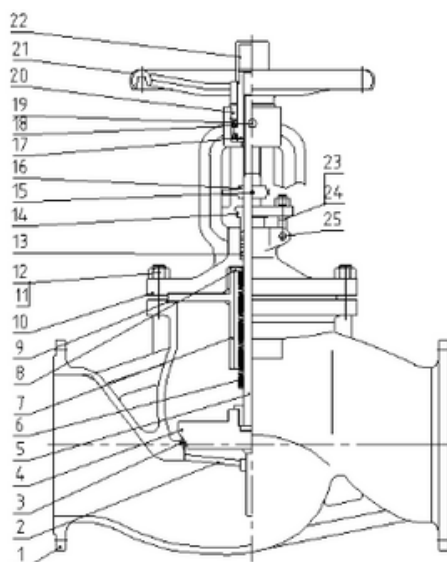
Design standards: EN12516, ASME B16.34, GB/T12224
Flange size: EN1092, ASME B16.5, GB9112, HG/T20592
Welding end standard: EN 12627, ASME B16.25, GB/T12224
Structural length: EN558, ASME B16.10, GB/T12221
Test standards: EN12266, API598, GB26480
Nominal diameter: DN15~DN400 (1/2"~16")
Nominal pressure: PN10~ PN64 (Class150~ Class300)
Applicable temperature: -29~425°C
Bellows test: MSS SP-117

BELLOW SEAL VALVE

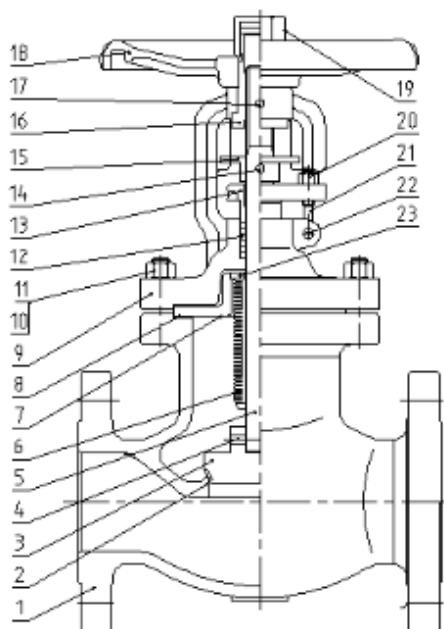
3. Structure and principle



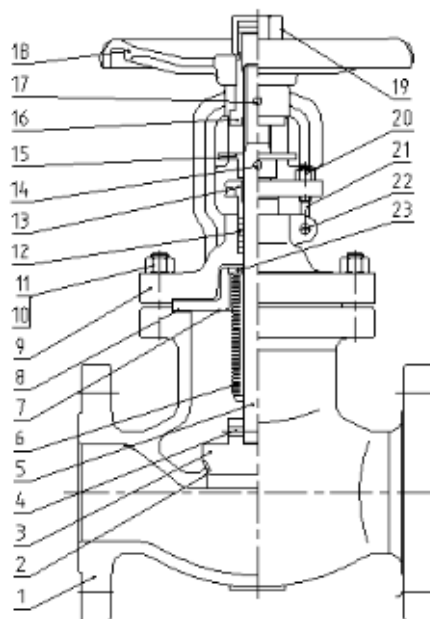
Structure of German standard bellows stop valve-see figure below (DN15~DN50, PN10~PN40):



Structure of German standard bellows large diameter globe valve-see figure below (DN 200~DN 400, PN10~PN40):



Structure of American Standard bellows stop valve-see figure (2~8, 150~300LB) below:



Structure of American Standard Bellows Gate Valve-see figure (2 ~ 8, 300LB):

BELLOW SEAL VALVE

3. Structure and principle

order number	Name of major parts	material		
1	Valve body, valve cover, gate, bracket, stuffing box gland	GS-C25/ WCB	CF8	CF8M
2	Valve stem, packing sleeve	2Cr13	304	316
3	Central flange gasket	304+ flexible graphite	304 + flexible graphite	316 + flexible graphite
4	filling	flexible graphite	flexible graphite	flexible graphite
5	Double head bolt, live joint bolt	A193-B7	A193-B8	A193-B8
6	hex nut	A194-2H	A194-8	A194-8
7	valve-stem nut	Steel/copper	copper	copper
8	syphon bellows	304	316L	316L
9	Stop valve disc	A 105	304	316
10	Sealed bowl	A105/304	304	316

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

3.1. Working Principle

The working principle of this series of bellows sealing valve: when the handwheel is rotated clockwise, the valve disc/gate drops down to cut off the passage, which is closed; when the handwheel is rotated counterclockwise, the valve disc/gate rises up, which is open.

3.2. Structural Description

The conventional operating method for this series of bellows sealing valves is manual wheel; the mid-chamber sealing uses stainless steel clamped flexible graphite gasket; the valve stem adopts a dual sealing structure of bellows sealing + packing sealing; the bellows are selected from well-known manufacturers at home and abroad, with materials mainly including 304, 321, 316L, 316Ti, Hastelloy 276, INCONEL 625, etc.; the valve can adopt conical, flat, or throttling sealing forms, and the sealing surface material can be selected according to the API 600 internal components list or based on user requirements.

BELLOW SEAL VALVE

4. Transportation and storage

4.1 Transportation of valves:

This valve, as a heavy metal product, should be protected from damage during transportation and should be prepared with ropes, lifting equipment, and transportation tools. The valve packaging should be inspected, and any damaged packaging should be repaired; the packaging should meet standard requirements, and it is not allowed to rotate the valve handle that has been packaged arbitrarily; the valve should be in a fully closed state, and for valves that have been mistakenly opened, the sealing surface should be wiped clean before closing tightly to seal both ends of the passage.

When the valve is lifted for shipment, the rope should be fastened on the bracket, and it is strictly prohibited to fasten it on the hand wheel or valve stem. The valve should be lifted and placed gently without hitting other objects, and the placement should be stable.

Valves should be protected from paint, nameplate and flange sealing surface during transportation; valves should not be dragged on the ground, let alone move the sealing surface at both ends of the valve.

Do not open the packaging of the valves temporarily installed at the construction site, and place them in a safe place. Take measures to prevent rain, dust and rust.

4.2 Storage of valves

The valve should be stored in a dry and ventilated indoor place, neatly placed, and the valve stem should not be pressed; the valve passage and flange water line should be sealed with a cover.

Valves, valve stems and machined surfaces that have been stored for a long time should be coated with rust inhibitors that are easy to remove. Before use, they should be rechecked and cleaned of dirt, paying special attention to the cleanliness of the sealing surface to prevent damage to the sealing surface. They should be retested for pressure and used only after passing the test.

BELLOW SEAL VALVE

5. Installation and use

5.1 Installation of valves

Before installation, the valve model, pressure and diameter should be carefully checked to meet the requirements. The arrow should be consistent with the flow direction of the pipeline medium. Only after confirming that there is no error can the installation be carried out.

Before installation, ensure that the inner cavity and sealing surface are clean, check the sealing surface, bolt connection, packing compression, valve stem rotation is not free of movement, etc.

The valve stem of the horizontal pipeline is best vertical upward, it is not suitable to install the valve stem downward; the valve stem downward not only inconvenient operation and maintenance, but also easy to corrode the valve.

The valve installed on the pipeline shall have the space for operation, maintenance and disassembly, and the reserved space for the handwheel shall not be less than 100mm.

For valves with flange end structure, users should select appropriate bolts 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 welding end structure, users should carry out welding and heat treatment according to the requirements of the standard. Welding should be carried out by qualified personnel, and welding can only be carried out after the process evaluation is qualified.

When opening or closing the valve, pay attention to the travel of the positioning plate. Do not simply and crudely open or close the valve. Excessive force using an "F" wrench can easily cause the internal parts of the valve to twist and damage.

5.2 Use of valves:

After the valve is installed, if the medium temperature is greater than 100°C, the packing gland should be opened slightly to fully evaporate the water in the cavity formed by the bellows and packing, and then tighten the packing gland.

The valve must be fully open during the test of the system or pipeline. It shall not be partially open for the purpose of regulating flow or emergency discharge, and the manufacturer shall not be liable for any damage caused by such use.

BELLOW SEAL VALVE

Usually the bellows 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.

The surface of the valve and the moving parts 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 easy to accumulate dust, oil and medium residue, which is easy to wear and corrode the valve and even produce friction heat. This is very dangerous for combustion gas, so it should be cleaned frequently according to the working conditions.

If there is water in the valve cavity, it is easy to damage the bellows when opening and closing under low temperature (such as liquid nitrogen). The water should be drained before installation to avoid the occurrence of ice in the valve cavity.

6. Maintenance and diagnosis

6.1 Maintenance of valves:

After the valve is used, regular in-service inspections should be conducted to frequently check the sealing of the sealing surfaces and wear conditions; whether the packing has aged or failed; and whether the valve body has developed corrosion. If any of these conditions are found, timely repairs or replacements should be made. For water and oil media, it is recommended to inspect every three months; for corrosive media, inspections are recommended every month or according to local regulations.

After the valve has been overhauled and reassembled and readjusted, welding slag must not splatter onto the surface of the bellows or cause any other mechanical damage to the bellows; additionally, it is strictly prohibited to use methods that deform the bellows to adjust the installation deviation of the pipeline, as this can affect the normal function of the bellows and reduce its service life. After assembly, a seal performance test must be conducted and relevant records must be kept.

Users can choose the appropriate size to replace valve packing, gasket, bolt, and nut. However, it is prohibited to open the valve cover or pressure cover to replace the bolt, nut and packing when the valve is under pressure. After replacement, it should be tested and qualified before use.

Users can repair the valve sealing surface by themselves, but they should ensure its sealing, and use it after the test pressure is qualified.

Valve internals are generally replaced, not recommended for maintenance.

It is not recommended to repair the pressure-bearing parts of the valve. If the pressure-bearing parts are found to have defects affecting safety due to long service time, the user should replace the new valve in time.

BELLOW SEAL VALVE

6.2 Fault diagnosis and troubleshooting of valves:

Possible Faults	Cause Of The Fault	Exclusion method
The operation is stuck	1. The packing is too tight 2. The thread of the valve stem nut is severely worn 3. Valve stem bending 4. Foreign objects between the valve stem nut, pressure cover and pressure sleeve and the valve stem	1. Loosen the pressure nut properly 2. Replace valve stem nut 3. Correct or replace the valve stem 4. Remove foreign bodies
Bellows leakage	1. The ends of the bellows are poorly welded to the sealing bowl or valve stem, with defects such as inclusions, incomplete welding and stress cracks 2. The bellows have failed due to excessive use	1. The welds at both ends of the bellows shall be carried out in accordance with the relevant welding regulations, and the welding quality shall be tested after welding 2. Replace the bellows
The valve body and valve cover connection leakage	1. The connecting bolts are not tightened evenly 2. Flange sealing surface damage 3. Diaphragm rupture or failure	1. Tighten the bolts evenly 2. reshaping 3. Replace the gasket
Seal face leakage	1. The sealing surface is contaminated with pollutants 2. The sealing surface is damaged 3. The sealing surface is worn out after long use	1. Remove the contaminants 2. Reprocessing and renovation 3. Reprocessing and renovation
The packing leaks	1. The bellows burst 2. The packing gland nut is loose 3. The number of packing rings is insufficient	1. In case of emergency, the packing gland can be tightly filled first, and the bellows can be replaced later 2. Tighten the packing gland nut 3. Increase the number of packing rings
Valve body and valve cover damage leakage	1. Water strikes break valves 2. fatigue failure 3. frost crack	1. To be smooth, prevent sudden stop pump and quick shut valve 2. Replace when the service life expires or early fatigue defects occur 3. Water media should be drained from valves not in use in winter

If you have any difficult problems in valve use, please contact our after-sales service department.