Flanged Resilient NRS Gate Valve

Installation and Operation Manual

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一、Product introduction

1. Flat Bottom Seat: Traditional gate valves are prone to the accumulation of debris—such as stones, wood chips, mud, and fragments—in the recessed area at the valve bottom. This can prevent the gate from fully lowering during closure, resulting in water leakage. Our resilient seated gate valves feature a flat bottom design, identical to the water pipe's inner diameter, which minimizes debris accumulation and ensures reliable sealing.

2. Fully Rubber-Encapsulated Gate: The gate is fully encapsulated in high-quality rubber, creating a seamless bond with the ductile iron core. This process ensures precise dimensional accuracy and optimizes the gate's elasticity for superior sealing.

3. Corrosion Resistance: The valve's internal and external surfaces are coated with non-toxic epoxy resin, which provides protection against corrosion and rust, making it suitable for sewage systems.

4. Triple O-Ring Seal: The valve stem features a triple O-ring seal design. This configuration reduces friction resistance during operation, significantly minimizes water leakage, and allows for in-line maintenance and seal replacement without shutting off the water supply.

5. Low Flow Resistance: The valve body features a straight-through flow passage, allowing

media to flow in a straight line with minimal flow resistance.

二、Working Principle

The flanged resilient seated gate valve operates through a rising stem with trapezoidal threads. These threads, engaging with a nut in the gate and guided by slots in the valve body, convert the rotational torque of the handwheel into linear motion, translating operating torque into thrust. When the valve is opened, the fluid passage becomes fully unobstructed once the gate is lifted to a height equal to the nominal diameter of the valve. In practice, the fully open position is initially set at the point where the stem can no longer be turned. However, to prevent binding due to thermal expansion, it is standard practice to lower the gate slightly from this top position by reversing the handwheel 1/2 to 1 turn, and this adjusted position is considered the operational full-open position. Consequently, the true full-open position is determined by the travel of the gate. This valve should generally be installed horizontally in the pipeline. Closing the valve is achieved by turning the handwheel to the right (clockwise), while opening is achieved by turning it to the left (counter-clockwise).

三、Main Technical Performance and Standards

Design Standard		CJ/T 216
Connection Standard		GB/T 17241.6
Nominal Pressure (PN)		1.0/1.6MPa
Nominal Diameter (DN)		50~800mm
Test Pressure	Strength Test	1.5/2.4Mpa
	Seal Test	1.1/1.76Mpa
Durability (Optional)(Cycles)	50~300 , Manual	1000 cycles
	50~300 , Actuated	—
Operating Temperature		0～80℃
Application Field		Water Field
Applicable medium		Water

四、Structural design and dimensions

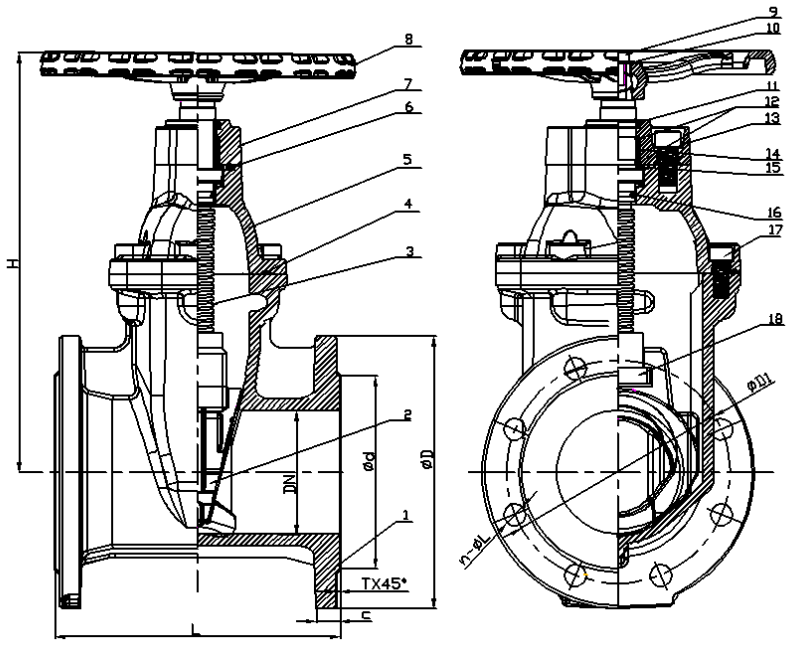


Figure 1 Product Structure

Table1 Product Dimensions

Nominal Diameter DN		Nominal Pressure PN	Dimensions							
Inch	mm		L	H	D	D1	d	C	T	n-ΦL
2"	50	10/16	178	218	165	125	99	19	3	4-Φ19
2.5"	65	10/16	190	232	185	145	118	19	3	4-Φ19
3"	80	10/16	203	281	200	160	132	19	3	8-Φ19
4"	100	10/16	229	316	220	180	156	19	3	8-Φ19
5"	125	10/16	254	393	250	210	184	19	3	8-Φ19
6"	150	10/16	267	420	285	240	211	19	3	8-Φ23
8"	200	10	292	490	340	295	266	20	3	8-Φ23
		16								12-Φ23
10"	250	10	330	626	405	350	319	22	3	12-Φ23
		16				355				12-Φ28
12"	300	10	356	722	460	400	370	24.5	4	12-Φ23
		16				410				12-Φ28
14"	350	10	381	800	516	460	428	26.5	4	16-Φ23
		16				470				16-Φ28
16"	400	10	406	870	575	515	480	28	4	16-Φ28
		16				525				16-Φ31
18"	450	10	432	1108	635	565	530	30	4	20-Φ28
		16				585	548			20-Φ31

20"	500	10	457	1130	710	620	582	31.5	4	20-Φ28
		16				650	609			20-Φ34
24"	600	10	508	1311	836	725	682	36	5	20-Φ31
		16				770	720			20-Φ37
28"	700	10	610	1311	895	840	794	32.5	5	24-Φ31
32"	800	10	660	1750	1015	950	901	35	5	24-Φ34

Table 2 Material List

Item	Part Name	Standard Material	Optional Material
1	Valve Body	Ductile Iron QT450-10	
2	Resilient Wedge Gate	Ductile Iron QT450-10+EPDM	
3	Stem	Stainless Steel 420	SS 304/316/431, Aluminum Bronze
4	Bonnet Gasket	EPDM	NBR
5	Bonnet	Ductile Iron QT450-10	
6	O-Ring	NBR	EPDM
7	Gland	Ductile Iron QT450-10	
8	Handwheel	Ductile Iron QT450-10	Stamped Steel Plate
9	Bolts	Carbon Steel Zinc Plated	SS 304/316
10	Flat Washer	Carbon Steel Zinc Plated	SS 304/316
11	Dust Ring	EPDM	NBR
12	O-Ring	NBR	EPDM
13	Hex Socket Bolts	Carbon Steel Zinc Plated	SS 304/316
14	Spacer Sleeve	Brass HPb59-1	
15	Washer	Brass HPb59-1	
16	O-Ring	NBR	EPDM
17	Hex Socket Bolts	Stainless Steel 304	SS 316
18	Gate Nut	Brass HPb59-1	Tin Bronze ZQSn5-5-5

五、Installation and Application

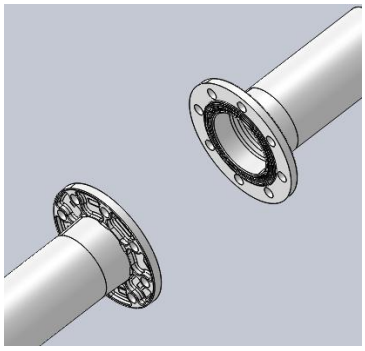
1. Pre-Installation Preparation

1.1Remove the valve from its packaging and carefully verify that its specifications match the nameplate data. Inspect the valve to ensure it operates normally and check for any damage, such as scratches on the sealing surfaces.

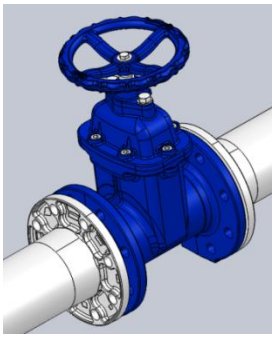
1.2Prepare the necessary components and tools for installation, including gaskets, bolts, nuts, flat washers, spring washers, and other accessories corresponding to the pipeline

diameter.

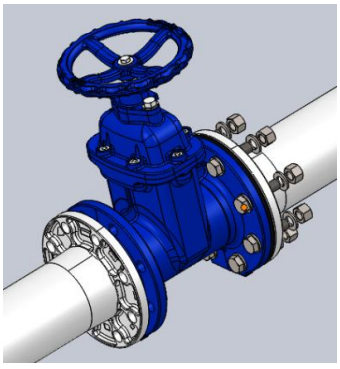
2. Installation Steps and Precautions：



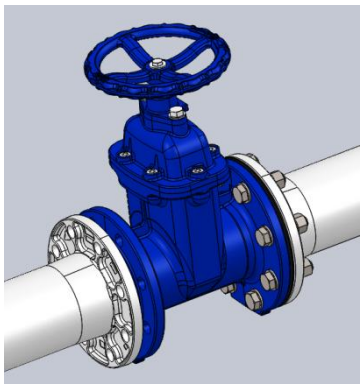
2.1 Reserve an appropriate distance between the pipe ends.



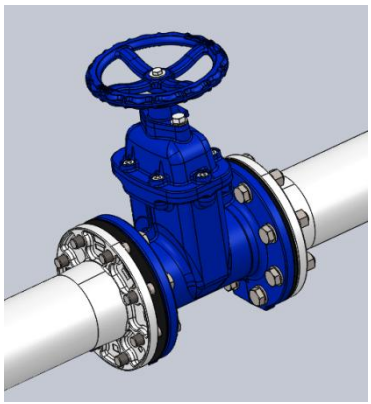
2.2. Position the valve between the pipe ends and align it with one pipeline end. Align the bolt holes of the pipeline flange with those of the valve flange.



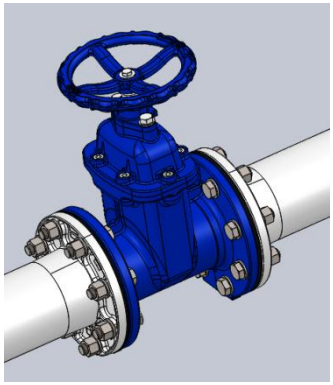
2.3. Place a gasket between the valve and the aligned pipeline end. Install the pre-prepared bolts, nuts, and washers of the correct specification through the flange holes.



2.4. Tighten all nuts evenly and in a crisscross pattern.



2.5. Place a gasket between the valve and the other pipeline end. Install the pre-prepared bolts of the correct specification through the flange holes.



2.6. Tighten all nuts evenly and in a crisscross pattern.

3. Installation and Commissioning Precautions

1) The valve must be positioned prior to pipeline installation (on horizontal pipes, the handwheel should face upward). Piping must align naturally with the valve; never force connections into misaligned positions to avoid inducing pre-stress;

2) The perpendicularity of the pipeline flange face to the pipe centerline and the tolerance of the flange bolt holes must remain within allowable limits. After aligning the valve with the pipeline centerline, insert the gasket between the two flanges, ensuring it is centered without misalignment. Insert bolts through both flanges, then sequentially add flat washers, spring washers, and nuts (hand-tightened initially). Install all bolts and nuts following this procedure;

3) Mechanical Nut Tightening: When tightening the bolts, use a wrench matching the nut size. If using hydraulic or pneumatic tools, ensure the torque does not exceed the specified value. Flange bolts must be tightened evenly and in a crisscross pattern to prevent uneven sealing pressure. After flange installation, verify that all nuts have been uniformly tightened.

六、Transportation and Storage

1. Valves must not be damaged during transportation. Prior to shipment, secure all slings, hoists, and transport vehicles. Inspect the valve packaging; if damage is found, the valve must be repackaged.

2. Valves must not be dragged along the ground or moved against rough surfaces to prevent damage to coatings, metal surfaces, and sealing faces.

3. Valves should not be disassembled for installation. Store valves in a secure location, protected from water and dust.

4. Gate valves in storage must be kept in the fully open position.

七、Common Problems and Solutions

1. Valve Leakage (Failure to Seal).

1.1 Debris between gate and seat: Flush the valve to remove foreign material.

1.2 Damaged or worn sealing surfaces: Replace the gate assembly.

1.3 insufficient closing torque: Appropriately increase the closing torque.

2. Leakage at Body-Bonnet Joint

2.1Tighten the bolts

2.2 Damaged gasket or sealing surface: Replace the gasket or resurface the damaged flange face.

2.3Damaged Gasket: Replace with a new gasket.

3. Stiff or Sticky Valve Stem Operation

3.1Damaged Threads: Repair or re-machine the stem and stem nut threads.

3.2 Wound around the threaded pair, Disassemble and thoroughly clean the thread pair

3.3 OXQ Damaged, Replace OXQ

八、Maintenance and Servicing

1. Periodically inspect all fasteners on the valve for looseness or damage. If any issues are found, carry out repairs promptly.

2. For applications with varying temperatures and pipeline pressures, it is recommended to re-tighten the bolts 24 hours after commissioning to compensate for any potential loosening.

3. During valve repair and maintenance, the user must use replacement parts identical in size and material to the original components. These can also be ordered as spares at the time of purchase for future replacement needs.

4. For valves that are not operated frequently, turn the handwheel periodically to prevent seizing between the stem and the stem nut.

5. If the lubricant on the valve stem threads becomes contaminated with dirt, clean it off and reapply fresh lubricant. This prevents abrasive particles in the dirt from wearing down the threads and stem surface, thereby affecting service life.

6. For valves in service, perform comprehensive maintenance before winter each year. Conduct monthly operational checks for flexibility and timely drain any sediment. Keep the valve clean.

7. In cold weather, if a valve is normally closed, drain any accumulated water and take precautions against freezing. It is prohibited to strike, stand on, or support heavy objects on a valve in operation.

8. Upon completion of maintenance, record all relevant operations in the "Valve Maintenance and Service Record". The operator and responsible person must sign off upon completion.

Important Notes:：

1. Due to continuous product improvement, the physical product may differ from illustrations. Specifications are subject to the actual product.

2. The customer must install and use the product correctly within its specified application fields and operating conditions. The purchaser or user assumes all responsibility for issues arising from use outside the designated scope.

3. Before installation, carefully verify that the product specifications match the intended service conditions. Consult us if any discrepancies exist. Special conditions such as high-salinity, high-humidity, or corrosive environments must be explicitly stated, as products may require customization.

4. Valves in service require regular maintenance. Perform operational checks for flexibility, general inspection, and sediment drainage at least monthly.

5. In cold weather, drain accumulated water from normally closed valves and protect against freezing. Do not strike, stand on, or support heavy objects on operating valves.

6. During installation, operate the valve smoothly and steadily. For threaded stem valves, reverse the handwheel slightly after full opening to prevent thread loosening or damage.

7. Use the product strictly in accordance with this manual or consult us in advance. We are not liable for any losses or responsibilities resulting from non-compliance.