

Installation, Operation, and Maintenance Instructions Cast Steel Gate Valves

Gate valve

1. Range

This instruction is applied to nominal diameters 1" - 36", pressure rating ANSI 150Lb - 2500Lb, connection: end flanged end or butt weld, manual or electric operated wedge gate valve.

2. Utilization

2.1 This type gate valve is assembled on the equipment or pipe, to open or close the flow passage in order to control the flow of fluid.

2.2 Suitable service

2.2.1 The carbon steel and the alloy steel gate valve is suited to water, steam, oil and other non-corrosiveness service.

2.2.2 The stainless steel valve is suited to corrosiveness service.

2.3 Suitable temperature

2.3.1 The suitable temperature of body material as the following

- a. carbon steel -29°C ~ +425°C
- b. alloy steel -29°C ~ +570°C
- c. stainless steel -196°C ~ +550°C

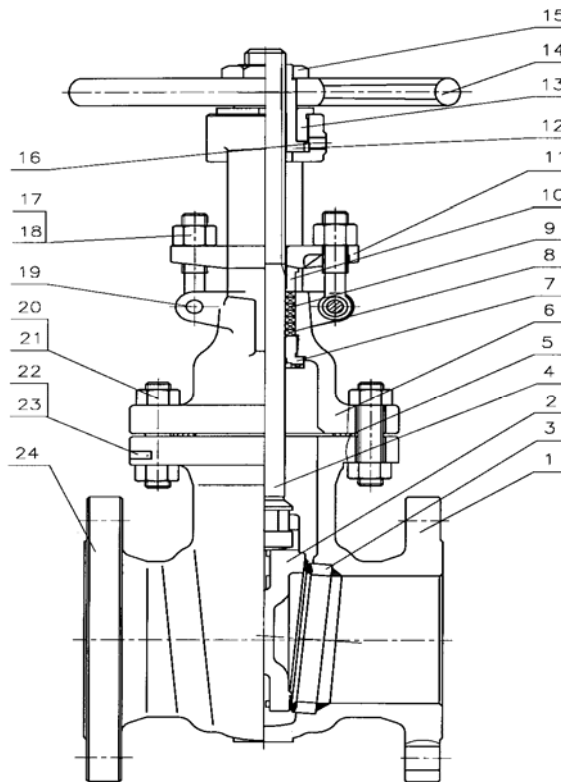
2.3.2 The suitable temperature of gasket and packing as the following:

- a. PTFE -180°C ~ +200°C
- b. asbestos =450°C
- c. flexible graphite -200°C ~ +570°C (oxidable service)
 +800°C (non-oxidable service)
- d. metal seal ring the same as 2.3.1

3. The structure instruction

3.1 The type structure of the gate valve as figure 1, and the structure is met the product specification of the order.

3.2 The face to face, connection and the dimension of the valve is met the specification of the order.



3.4 Part name list

1	Body	7	Seat	13	Gland nut	19	Pin
2	Seat	8	Packing	14	Hand wheel	20	Bolt
3	Wedge	9	Packing	15	Lock nut	21	Nut
4	Stem	10	Gland	16	Grease fitting	22	Name plate
5	Gasket	11	Gland flange	17	Bolt	23	Rivet
6	bonnet	12	Stem nut	18	Nut	24	End cover

4. Work theory and operation instruction

4.1 For the manual operate valve, operate the electrical actuator to open or close the valve. When turn clockwise, the wedge is dropped, and the valve is closed, so the flow passage is shut off; when turn counterclockwise, the wedge is risen, and the valve is opened, so the flow passage is opened.

4.2 For the work theory and operation instruction of the electrical actuator valve, please see the related electrical actuator instruction.

5. Storage, protection, assembly, operation, disassembly and maintenance.

5.1 Storage and protection

5.1.1 Plug up the valve two end to prevent dust and other dirt from being entered.

5.1.2 The valve must be stored in the dry and air warehouse.

5.1.3 For the valve that be stored long, to carry out the examination period, sweep the dirt, paint some antirust oil on machined surface.

5.2 Assembly

5.2.1 Examine the valve carefully before assemble it, the main examination items as the following:

a. check the inside passage, special note whether there is dirt on the seal surface, and check whether the seal surface is damaged.

b. examine whether the stem packing is pressed sufficiently, to assure the packing to seal, but not to prevent the stem from being turned flexible.

5.2.2 When assembly, check the valve mark carefully, and see whether it is conformed with the requirements of utilization.

5.2.3 It mustn't use the hand wheel and deliver device as lifting, meanwhile it mustn't strike each other.

5.2.4 After assembly, check the bolt whether it is tightened evenly.

5.2.5 For assembly, location shall be considered the convenient of the operation and maintenance. The double wedge gate valve shall be assembled on the horizontal pipeline, and the hand wheel is located on the valve.

5.2.6 After assemble, the valve shall be opened fully when its system or pipeline is under the pressure.

5.3 Utilization

5.3.1 When it is working, to open or close the wedge fully it mustn't open the wedge partly to adjust the flow so it can prevent the high speed fluid from damaged the seal surface.

5.3.2 In course of the utilization, shall inject some lubricating oil into the stem, and location of acme thread on stem nut.

5.3.3 The hand wheel of the manual operate valve shall be designed and manufactured according to the open and close torque that can operate the valve, the end customer mustn't enlarge the open and close torque by using other lever or tool.

5.4 Disassemble

5.4.1 Before disassemble, shall remove all the pressure that between the inlet and outlet.

5.4.2 Once confirm there is no pressure on the pipeline, disassemble the bonnet bolt and nut, and lift the bonnet component included the wedge. Care should be taken to avoid damaging backseat.

5.4.3 Take gasket out of bonnet

5.4.4 Turn around stem, take out the stem, then disassemble the bonnet component.

5.5 Maintenance

5.5.1 To check and maintain the valve that it is being used period, the main items as the following:

a. check the wear of the seal surface. Once it is damaged, it shall be repaired or replaced.

b. check the wear of the stem and the stem nut's acme thread.

c. check the bolts and nut, find whether it is connected effectively.

d. check the gasket, packing, find whether it is damaged or invalid. Once it is damaged or invalid, it shall be replaced in time. But is mustn't be replaced under the pressure.

5.5.2 Replace packing

a. turn around hand wheel, lift stem to counter closure, and confirm there is no pressure.

b. to use sharp tool to disassemble packing that need to replace. It mustn't scrape the surface of stem.

c. take out the packing, calculate the specification and ring number of it, then assemble the related new packing until stuffed up the stuffing box.

d. tighten gland, and lock the eye nut .

e. loose hand wheel to make stem dropped and check whether the packing is leakage. If there is leakage. Lock the eye nut continue until there is no leakage.

5.5.3 After the valve is disassembled and repaired, then assembled it. It shall be carried out the seat test. The test shall be carried out according to the related standard, and made the detail record to be checked.

5.6 For the electrical actuator operate valve, its storage, protection, assembly, operation and maintenance, please see the related electrical actuator instruction.

6. Problem, cause and solution

Problem	Cause	Solution
Packing is leakage	1. gland isn't tightened	1. tighten the gland nut evenly, press the packing
	2. packing ring number is not sufficient	2. add the packing ring number
	3. packing is invalid	3. replace packing
Seal surface is leakage	1. some dirt on the seal surface	1. get rid of the dirt on seal surface
	2. seal surface is damage	2. re-repair the seal surface or re-replace the wedge, seat
Leakage between the body and bonnet	1. the connected bolt isn't tightened or it is tightened non-evenly	1. tighten the connected bolt evenly
	2. the flange seal surface or the pressure seal body, bonnet seal surface is damaged	2. repair the flange seal surface or the pressure seal body, bonnet seal surface
	3. gasket is invalid or the seal ring is damaged	3. replace gasket or repair metal seal ring
hand wheel isn't turned flexible or the wedge can't be closed	1. packing is tightened over	1. loose the packing gland nut suitable
	2. gland is aslant	2. check gland
	3. stem nut is damaged or dirty	3. repair the thread of stem nut, and get rid of the dirt
	4. thread of stem nut is worn seriously or cracked	4. replace the stem nut
	5. the stem is winding	5. check stem
Problem of electrical actuator	See the electrical actuator instruction	

appendix: The torque of bonnet bolt/nut
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Diameter of bolt(in)	Torque(N-m)	Diameter of bolt(in)	Torque(N-m)
1/4	4.5	1	362
5/6	9.2	1-1/8	515
3/8	16.6	1-1/4	720
7/16	27.5	1-3/8	990
1/2	39.9	1-1/2	1275
9/16	59.5	1-5/8	1628
5/8	82.4	1-3/4	2058
3/4	152	1-7/8	2523
7/8	243	2	3160

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Diameter of bolt(in)	Torque(N-m)	Diameter of bolt(in)	Torque(N-m)
1/4	1.8	1	147
5/6	3.6	1-1/8	208
3/8	6.5	1-1/4	292
7/16	10.8	1-3/8	398
1/2	15.6	1-1/2	512
9/16	23.8	1-5/8	644
5/8	33.0	1-3/4	836
3/4	61.0	1-7/8	1010
7/8	97.5	2	1266