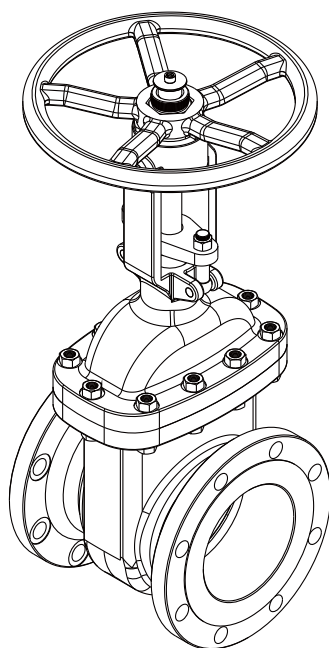


# Cast Steel OS&Y Gate Valve

KSD-GTF

Installation, Operation,  
& Maintenance Manual



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# Chapter I

## Introduction

The manual is provided to ensure proper installation, operation & maintenance for KSD-GTF Cast Steel OS&Y Gate Valve, manufactured and supplied by KLINGER DIE ERSTE INDUSTRY CO., LTD. The valves are identified by marking on the body or on a name plate or both.

### 1.1 Contact Information

For information concerning warranties, or for questions pertaining to installation, operation or maintenance of KLINGER Die Erste products, contact:

KLINGER DIE ERSTE INDUSTRY CO., LTD.  
5F-1, No.936, Sec. 4, Wen-Xin Road,  
Taichung City, Taiwan 406

Phone: +886 4 22310059  
Fax: +886 4 22360236  
Email: sales@die-erste.com

To order replacement parts, contact KLINGER Die Erste sales at address listed above.

### 1.2 General Notes

The following instructions refer to KLINGER Die Erste's KSD-GTF OS&Y Cast Steel Gate Valve, as described in the KLINGER Die Erste current catalog.

Keep the protective covers in place until the valve is ready for installation. Valve performance depends upon prevention of damage to the wedge and seat surfaces. After removing the cover make sure that the valve can be completely open and free of obstructions, dirt, particles or any materials that may cause seat or seal damage.

Valves may contain a silicon-based lubricant for transportation, which aids in the assembly of the valve. Lubricant may be removed with a solvent if found objectionable. Alternatively valves can be ordered free of lubricants upon request.

Certain ferrous valves contain phosphate material, and are oil dipped during the course of manufacture. However, the processes used are completely non-toxic.

### 1.3 Precautions and Warnings

Choose the correct material of valve for different applications before obtaining the valve. The user should be aware of the operating situation, fluid properties, and the possible outcomes when implementing valves into the pipeline system. KLINGER Die Erste suggests that the user should make estimation beforehand.

Exceeding the pressure or temperature limitations marked on the name plate may cause damage and lead to uncontrolled pressure release. The practical and safe use of the valve is determined by both the body and seat ratings due to variety of seat and body materials. Please check both rating before installing to prevent valve damage and possible injury of personals.

For safety concern, unstable fluid should not be used in the pipeline system, unless otherwise specified with the category III in Declaration of conformity.

#### CAUTION:

Before removing valve from pipeline, operator should be aware of that: media flowing through the valve may be corrosive, toxic, flammable, or of a contaminant nature. Where there is evidence of harmful fluids having flowed through the valve, the utmost care must be taken. It is suggested that the following safety precautions should be taken when handling valves.

- 1) Always wear eye shields.
- 2) Always wear gloves and footwear.
- 3) Wear protective headgear.
- 4) Ensure that running water is readily accessible.
- 5) Fire extinguisher must be obtainable if media is flammable.

Check the line gauge to ensure that no pressure is present at the valve. Ensuring media is released by operating valve slowly to the half open position. Ideally, the valve should be decontaminated when the wedge is in the half open position.

### 1.4 Storage

If the valves are not to be installed immediately, please store the valve carefully before installation, preferably indoors in a dry and clean place.

Also, the valve ports should be sealed by caps or plastic paper to prevent dirt from entering and damaging inner parts.

It is the purchaser's responsibility to take the necessary precautions for the protection of valves in storage.

All KLINGER Die Erste cast carbon steel and alloy steel cast valves are shipped from the factory with painting on un-machined surfaces and with a rust preventative sprayed on machined surfaces. In addition, plastic end protectors are installed on both end connections for protection from damage and to prevent entrance of foreign materials into the valve. Valves received in the above condition and in their original shipping containers may be stored for up to one (1) year with no additional protection; provided they are stored indoors, above floor level, and in a low humidity atmosphere.

If valves are to be stored indoors for a longer period of time in a high humidity atmosphere, it is suggested that each item be periodically inspected every four to six (4-6) month, inside and out, for rust and/or corrosion.

#### Note:

Remove the rust on the valve stem by cleaning the stem periodically. Rust on the stem may cause binding of operation.

## Chapter II

# Installation

Flush the pipeline carefully before installing the valve. The particles of dirt or debris or welding may damage the wedge sealing surface and seats. Also, before installing, check all valve and mating flanges to ensure gasket surfaces are free from defects.

Re-torque all bolting to factory specifications to compensate for possible bolt relaxation, which may occur during long storage.

**⚠ CAUTION:**  
Do not exceed the valve performance limitation.

**⚠ CAUTION:**  
Before installing, make sure the line pressure has been relieved, and any hazardous fluids have been drained or purged from the system.

### 2.1 General Notes

#### 1) Direction

Standard KSD-GTF gate valves are bi-directionally sealed unless otherwise specified.

#### 2) Position

Be sure to install the valve so that pressure enters the upstream side of the valve and flows downstream side of the valve. Install the valve so that the higher pressure is pushing the wedge against the seat. Failure to install the valve properly can lead to excessive seat leakage and/or damage the valve.

The standard KSD-GTF gate valve is designed for horizontal installation. For non-horizontal installation, please ensure to consult with KLINGER Die Erste separately, as special request must be generated to ensure proper function. Note that installation upside down is not recommended.

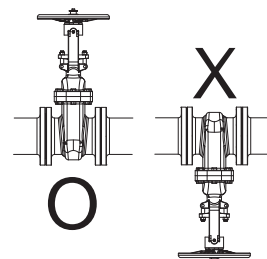


Figure 2.1 Recommended installation

### 3) Fittings

Select the correct size of fittings according to the pipeline specification. Tighten the flanges to the pipeline adequately with appropriate bolts. Do not attempt to correct pipeline misalignment by means of flanged bolting.

### 4) Systems hydrostatic test

Before delivery, valves are tested 1.5 times the allowable pressure at ambient temperature in OPEN position. However, after installation, the piping system may be subject to system tests, as condition not to exceed the marking pressure.

### 5) Pre-Installation Wash

Before the valve installation, clean the pipeline system to remove any foreign deposits by water. Clean the connecting flanged end surfaces as well to ensure tight sealing.

**Note:**

The wedge of gate valves should be lightly closed during welding of the pipeline.

## 2.2 Installation of Flanged Ends

1. Before installing the valves, make sure the flanges and the pipe are free from grit, dirt or burrs.
2. The flanges must be aligned and parallel with the correct distance to allow the valve face-to-face dimension and gaskets to fit between.
3. Tighten the flange bolts in a crossover pattern, with a torque values determined by the gasket manufacturer, other variables like gasket type and material, bolt, flange and lubricant affect the tightening torque values.
4. Note that the bolts tightening must be uniform in order to create a parallel movement of the two flanges and uniform deformation of the gasket in between them.

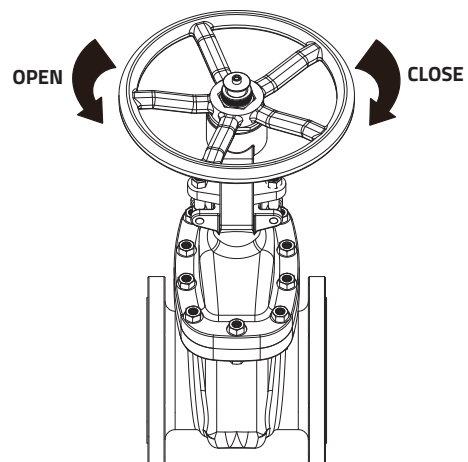
**Note:**

For flanged gate valves, we usually recommend to leave the valves in a slightly open to fully open position when installing.

## Chapter III Operation

KSD-GTF Gate valves are designed to close off or open up the flow in a pipeline. The wedge is designed to completely stop flow and form a tight seal against pressure in either direction. In the open position, the wedge is completely out of the flow stream. Gate valves are not recommended for throttling use.

The gate valves are designed for simplicity and ease of operation. To open this gate valve, turn the handwheel in a counterclockwise direction and continue turning until interference is felt. At this point, the valve will be fully OPEN. To close the valve, turn the handwheel in a clockwise direction and continue turning until interference is felt. At this point, the valve will be fully CLOSED.



**Figure 3.1** Rotation Direction of handwheel top view for CLOSED and OPEN position

### 3.1 Handling

Only qualified riggers should handle the valves. The pick-up point for all KSD-GTF gate valves is by the use of a strap or chain around the neck area of the valve body. Do not pick up KSD-GTF valves by use of straps or chains on or around the handwheels, yoke, gear box, motor or cylinder operator, or any override attachment. Do not pick up a valve by the packing bolting or other interior connections. After the weight of the valve is supported by a strap or chain around the neck of the valve body, other lines may

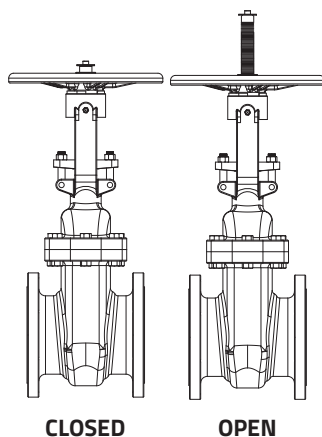
be attached for steadying the valve in place during installation.

### 3.2 Cleaning

Even though the valves were transported under a clean environment, operator must check if there is any foreign body or dusts inside the bore. If present, clean the valve before installation. Operator may clean the valves by water, compression air, or steam. For cleaning operation, first step is put the valve bore perpendicular to the ground and clean, ensure all the dusts are removed from the bore. The second step is to check and clean all the connecting pipe bore and connection area. No flush, rust and foreign bodies are allowed to avoid the blocking and leakage.

### 3.3 Manual Operation

KLINGER Die Erste KSD-GTF gate valve has multi-turn operation to open in the counterclockwise direction. When the top of valve stem protrudes vertically from the hand wheel surface, the valve is OPEN. When the top of valve stem is at the same height as the handwheel surface, the valve is CLOSED.



**Figure 3.2 Stem indication for CLOSED and OPEN position**

### 3.4 Remote Control

The standard KSD-GTF gate valve is designed for manual use instead of pneumatic or electric actuation without notification. If requests, please consult your KLINGER Die Erste representative for more information.

## Chapter IV: Maintenance

#### **⚠ CAUTION:**

Do not dismantle the valve or remove it from the pipeline while the valve is pressurized.

#### 4.1 Maintenance Frequency

The maintenance frequency is determined based upon the application of the valve. User should consider the following factors when determining the maintenance time internally: fluid type, flow velocity, operation frequency, pressure and temperature.

#### **Note:**

For the KSD-GTF Cast Steel OS&Y Gate Valve, KLINGER Die Erste recommends inspecting the valve at least every (1) year.

#### 4.2 Disassembly

1. Open the valve to the intermediate position.
2. Loosen the LOCK NUT (20).
3. Loosen the GLAND NUTS (13) and BONNET NUTS (5).
4. Remove the BONNET BOLTS (6) and NUTS (5).
5. Remove the BONNET (8) upwards from the BODY (1) slowly. The STEM (4) and WEDGE (3) come up together with the BONNET (8). Note and mark the orientation of the WEDGE (3) to the valve BODY (1) and SEAT RINGS (2).
6. Remove the GASKET (7) from the BODY (1).
7. Remove the WEDGE (3) from the STEM (4).
8. While holding the STEM (4), turn the HANDWHEEL (19) in a clockwise direction to draw out the STEM (4) from the BONNET (8).
9. Remove the GLAND NUTS (13), GLAND FLANGE (15) and GLAND (14). STEM PACKING (10) and other auxiliary parts may be removed by using a packing hook or similar tool. Ensure not to damage the surface of stuffing box.
10. Remove the LOCK NUT (20), HANDWHEEL (19) and STEM NUT (17) and other auxiliary parts.

#### 4.3 Reassembly

1. Mount the STEM NUT (17), HANDWHEEL (19) and other auxiliary parts on the BONNET (8), and

tighten the LOCK NUT (20).

2. Assemble the STEM PACKING (10), GLAND (14) and other auxiliary parts with BONNET (8). Tighten GLAND EYEBOLTS (12) and GLAND NUTS (13) temporarily.
3. Assemble the STEM (4) with BONNET (8), and engage the STEM threads with STEM NUT (17). Turn the HANDWHEEL (19) counterclockwise to the intermediate position.
4. Mount the GASKET (7) on the bonnet/body flange.
5. Assemble the WEDGE (3) with STEM (4), and place them into the BODY (1) according to the wedge guide. Make sure the original position of WEDGE (3) is aligned according to the corresponding matchmarks provided before disassembly.
6. Tighten BONNET BOLTS (6) and BONNET NUTS (5) evenly, gradually and alternately on the diagonal line.
7. Tighten GLAND NUTS (13) adequately. Over tightening may cause un-smooth operation.
8. Check each bolting portion and re-tighten them.

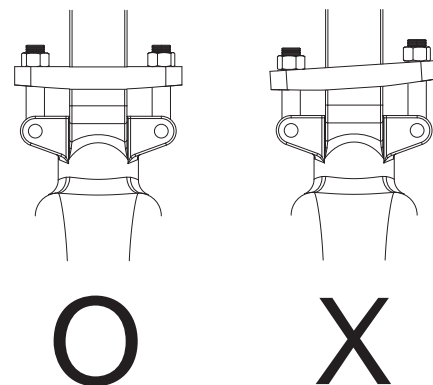
#### 4.4 Troubleshooting

The following table lists the possible malfunctions.

**Table 4.1 Troubleshooting Table**

Symptom	Possible fault	Actions
Irregular wedge movement	Valve stem is stuck due to long time without operation	Apply lubricant to the stem nut and the stem screw engagement part by injecting grease through the grease nipple.
	Foreign particles in on the outside screw of stem	Clean the screw of stem
	Gland bolts/nuts are overtightened	Loose gland bolts/nuts and re-tighten them adequately

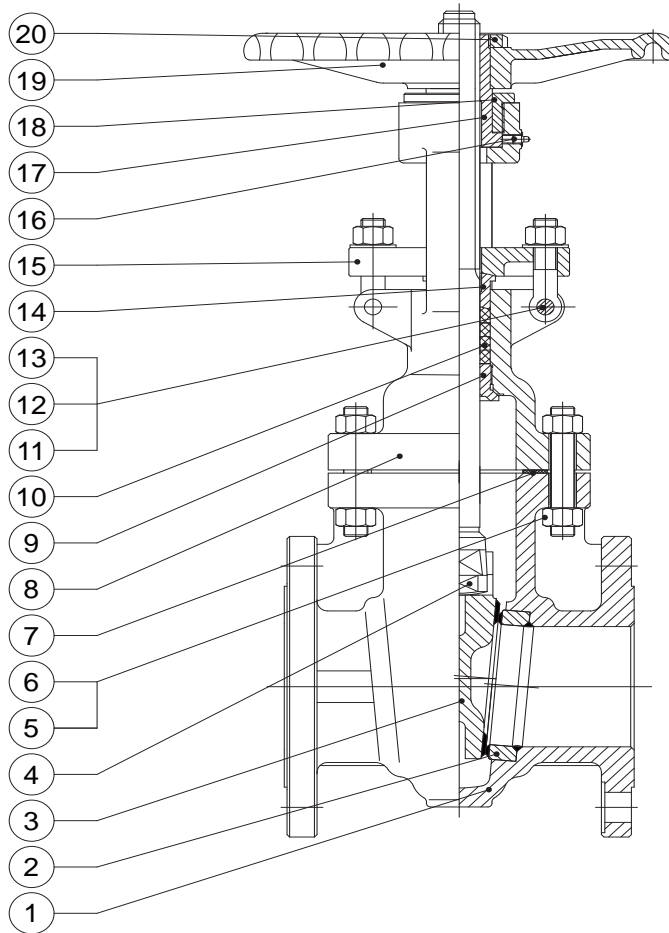
Symptom	Possible fault	Actions
Valve leaking from stem (External Leakage)	Gland bolts/nuts are loosened	Retighten gland bolts/nuts
	Gland bolts/nuts are tightened unevenly. See Fig. 4.1	Tighten bolts/nuts evenly
	Stem Packing is damaged	Replace the stem packing
	Stem is damaged	Replace the stem
Valve leaking from body and bonnet (External Leakage)	Damaged or breakage of gasket	Replace the gasket
	Relaxation of studs due to gasket creep	Replace the gasket and retighten the studs evenly
Leakage through a closed valve (Internal Leakage)	Damaged wedge surface	Replace the wedge
	Damaged seats	Consult the piping engineer
	Wedge might not be fully closed	Flush and clean the residue of bottom cavity for wedge



**Figure 4.1 Gland bolts/nuts are tightened evenly**

### 4.5 Technical Data and Product Information

#### KSD-GTF



NO	PART NAME	MATERIAL
1	BODY	ASTM A216 WCB
2	SEAT RING	ASTM A105 + 13Cr
3	WEDGE	ASTM A216 WCB + 13Cr
4	STEM	ASTM A182 F6a
5	BONNET NUT	ASTM A194 2H
6	BONNET STUD	ASTM A193 B7
7	GASKET	SS304 + Flexible Graphite
8	BONNET	ASTM A216 WCB
9	BACKSEAT BUSHING	ASTM A182 F6a
10	STEM PACKING	Flexible Graphite

NO	PART NAME	MATERIAL
11	PIN	AISI 1025
12	GLAND EYEBOLT	ASTM A193 B7
13	GLAND NUT	ASTM A194 2H
14	GLAND	ASTM A182 F6a
15	GLAND FLANGE	ASTM A216 WCB
16	NIPPLE	Copper Alloy
17	STEM NUT	ASTM A439 D2
18	RETAINING NUT	AISI 1025
19	HANDWHEEL	Ductile Iron
20	LOCK NUT	AISI 1025