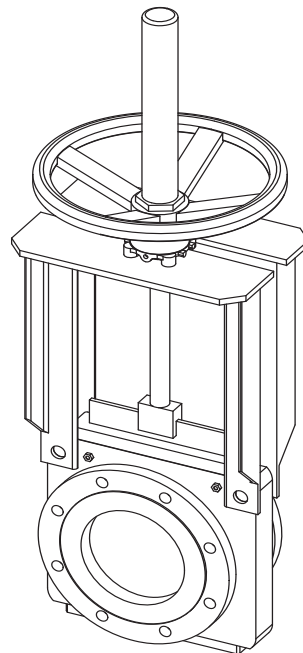


# Slurry Knife Gate Valve

## KSD-SKG

Installation, Operation,  
& Maintenance Manual



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# Chapter I

## Introduction

The manual is provided to ensure proper installation, operation & maintenance for KSD-SKG Slurry Knife 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 KSD-SKG Slurry Knife 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 gate 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.

#### Note:

In the standard packaging, the valve is open OPEN shipped, and it is also the recommended gate position for storage.

### 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 gate 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 Outer 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.

Since the valve seat of this valve is made of natural rubber, the rubber parts are protected from direct sunlight, high temperature, and ozone environment. The sleeves of this valve must be regularly lubricated. Before use the valve taken from the stock, the sealing of the valve should be lubricated by applied lubricant directly onto the exposed gate surface.

The rubber products have a practical recommended shelf-life.

- Natural rubber - 2 years
- EPDM - 4 years
- NBR - 4 years

**Note:**

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

**Note:**

The packaging material of the valve is not enough for outdoor storage.

## Chapter II

# Installation

Flush the pipeline carefully before installing the valve. The particles of dirt or debris or welding may damage the gate 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.

Due to the sleeve structure of the valve, the connection between the valve and the pipeline flange can be installed without additional gaskets.

**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.

**CAUTION:**

Pay attention to the electrical or critical safety around the valve installation; since the medium that may jam the valve can be discharged from the valve, splashing impurities will cause safety problems.

### 2.1 General Notes

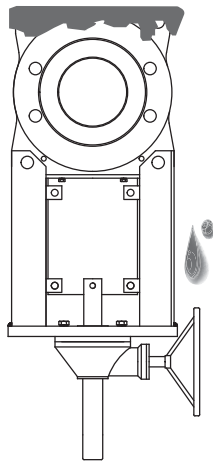
#### 1) Direction

Standard KSD-SKG Slurry Knife Gate valves are bi-directionally sealed unless otherwise specified.

#### 2) Position

The valve can be installed in any position in a vertical or horizontal pipeline. For non-horizontal piping installation, the construction of suitable supports is always required, as special request must be generated to ensure proper function.

However, since the valve may discharge fluid media, we recommend that the actuator be installed in an upper horizontal direction to prevent the discharge of media from being discharged onto the actuator.



**Fig.2.1 Venting of media from being discharged onto the actuator when upside down installation**

**Note:**

When installing this valve in a vertical pipeline, pay attention to the pressure caused by the gravity of the medium on the gate must be within the pressure rating of the valve when the valve is completely CLOSED.

### 3) Fittings

Select the correct size of fittings according to the pipeline specification. Mating 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.

## 2.2 Installation of Ends

**Note:**

The installation of the valve is no additional gaskets required.

1. Before installing the valves, make sure the lug and the pipe flange 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:**

In order to make the sleeve and the mating flange evenly pressured, the gate should be fully OPEN when the valve is installed, and the sleeve is inserted into the valve body.

**Note:**

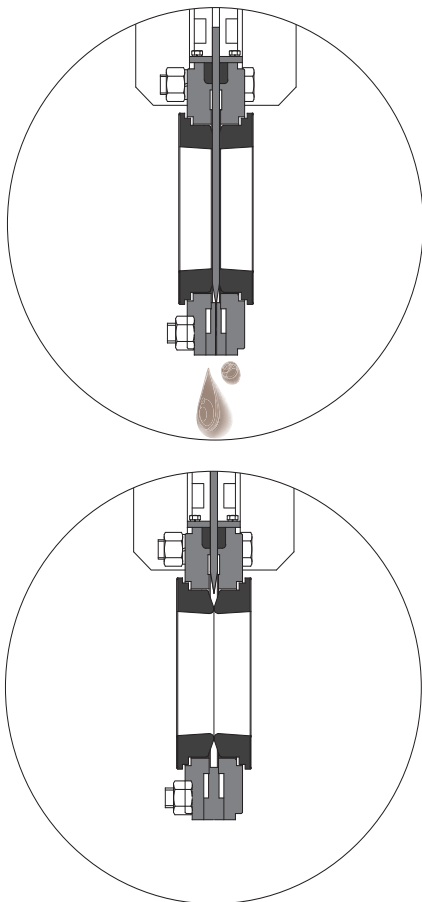
Excessive flange connection torque may reduce the sealing effect of the valve. It is recommended to use a manual wrench to install the valve and flange.

## Chapter III

# Operation

KSD-SKG Slurry Knife Gate Valves are designed to assure shut-off with discharging solids. The gate is designed to completely stop flow and form a tight seal against pressure in bi-direction allowing any media that could clog or jam the valve potentially purged out from the valve. In the open position, the gate is completely out of the flow. Please that this knife gate valve is not applied to throttling use.

KSD-SKG Slurry Knife Gate Valves are designed for simplicity and ease of operation. To open this 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.



**Fig.3.1 Valve gate with opening and closing, and discharge**

### ⚠ CAUTION:

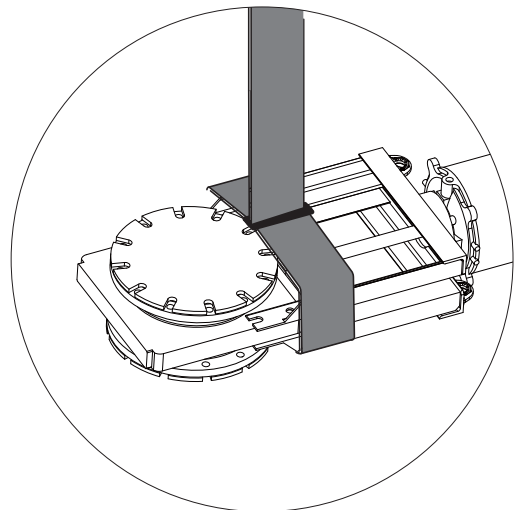
Do not exceed 100% of the maximum pressure rating of the valve at any time during its operation.

### 3.1 Handling

Only qualified riggers should handle the valves. The pick-up point for all KSD-SKG Slurry Knife Gate Valves is by the use of a strap or chain between the gland area and bore such that the valve is balanced. Do not pick up KSD-SKG 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 above-mentioned area, other lines may be attached for steadying the valve in place during installation.

### Note:

Do not lift the valve through the flow bore. Damage to the surface of the valve seat may cause the valve to leak.



**Fig.3.2 For horizontal movement, the valve shall be lifted mainly from the body and the yoke.**

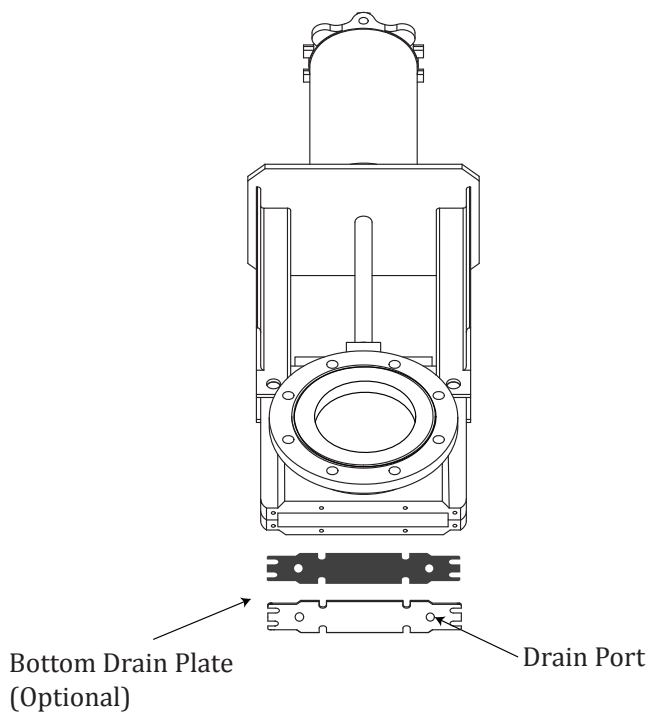
### 3.2 Cleaning

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.

### 3.4 Remote Control

For remote control, the valve can be provided with a double-acting cylinder actuator. It is recommended to use dry, filtered and lubricated air to be supplied to the actuator to ensure an automated life cycle.



**Fig.3.3 Bottom Drain Plate**

### 3.3 Manual Operation

KSD-SKG Slurry Knife Gate Valve has multi-turn operation to open in the counterclockwise direction. When 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.

In cases where it is difficult to operate a manual valve due to large torque requirements, it is recommended to provide a gear operator for the valve.

Position Indicator indicates the CLOSED and OPEN status without removing the STEM PROTECTOR for HANDWHEEL type or SAFETY COVER for CYLINDER type.

## 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 KSD-SKG Slurry Knife Gate Valve, KLINGER Die Erste recommends inspecting the valve at least every 60 days.

### 4.2 Valve Disassembly

1. Remove the valve from the pipeline and place the valve in the OPEN position.
2. Mark the dimension of depth from top of valve BODY (1) on the GATE (2) in full OPEN position.
3. Use a putty knife, screwdriver or pry bar to remove these two elastomer SLEEVES (3).
4. Remove the PIN (7) from the GATE (2).
5. Remove the YOKE (6) subassembly by removing the the top BOLTS (11) and NUTS (12) and pulling it away from the BODY(1) assembly.
6. Loosen the bolts of GLAND FOLLOWER (5).
7. Remove the GATE (2) by lifting it out of the PACKING (4).
8. Remove all the bolts and washers that retain the PACKING FOLLOWER (5) in position, and then remove the PACKING FOLLOWER (5).
9. Remove the PACKING (4) by inserting a flat blade screwdriver along the outside of the PACKING (4), between the PACKING (4) and the valve BODY (1). Pry the PACKING (4) up and remove.
10. Remove the all BOLTS (11) and NUT (12), and pull BODY (1) halves apart.

### 4.3 Valve Reassembly

1. Place the one half of the BODY (1) with end-face down on a flat and soft surface.
2. Take the other half of BODY (1) into position on the first body half, and properly align bolt holes in place.
3. Insert BOLTS (11) except the top bolts which hold the YOKE assembly, and loosely tighten them with NUTS (12).
4. Insert the lubricated PACKING (4) into the valve body assembly. Please pay attention to adjust the tightness of the body BOLTS (11) so that the packing will not fall into the bore.
5. Place the PACKING FOLLOWER (5) into position and fix it to the BODY (1) with fasteners and washers loosely.
6. Press the GATE (2) firmly through the PACKING FOLLOWER (5) and PACKING (4) into the BODY (1) assembly until the mark drawn on the GATE (2) reaches it reaches previously recorded dimension of depth.
7. Fully tighten all PACKING FOLLOWER (5) fasteners.
8. Reinstall the YOKE (6) assembly with the BOLTS (11) and NUTS (12) loosely.
9. Reconnect the GATE (2) to the shaft with PIN (7).
10. Apply lubricant to the sealing surface and a thin film on the outside diameter of each SLEEVE (3).
11. Press SLEEVE (3) into the valve bore of BODY (1), one from each side.
12. Full tighten all the BOLTS (1) and NUTS (2).
13. Cycle the valve with fully CLOSED and OPEN position.

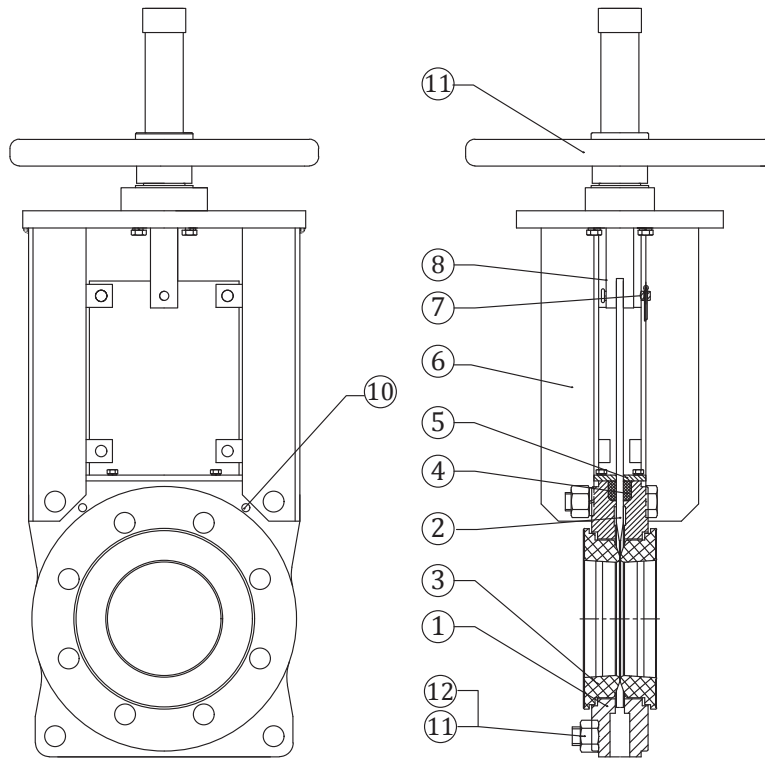
### 4.4 Troubleshooting

Symptom	Possible fault	Actions
Irregular gate movement	Valve stem is stuck due to long time without operation	Apply lubricant to 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



### 4.5 Technical Data and Product Information

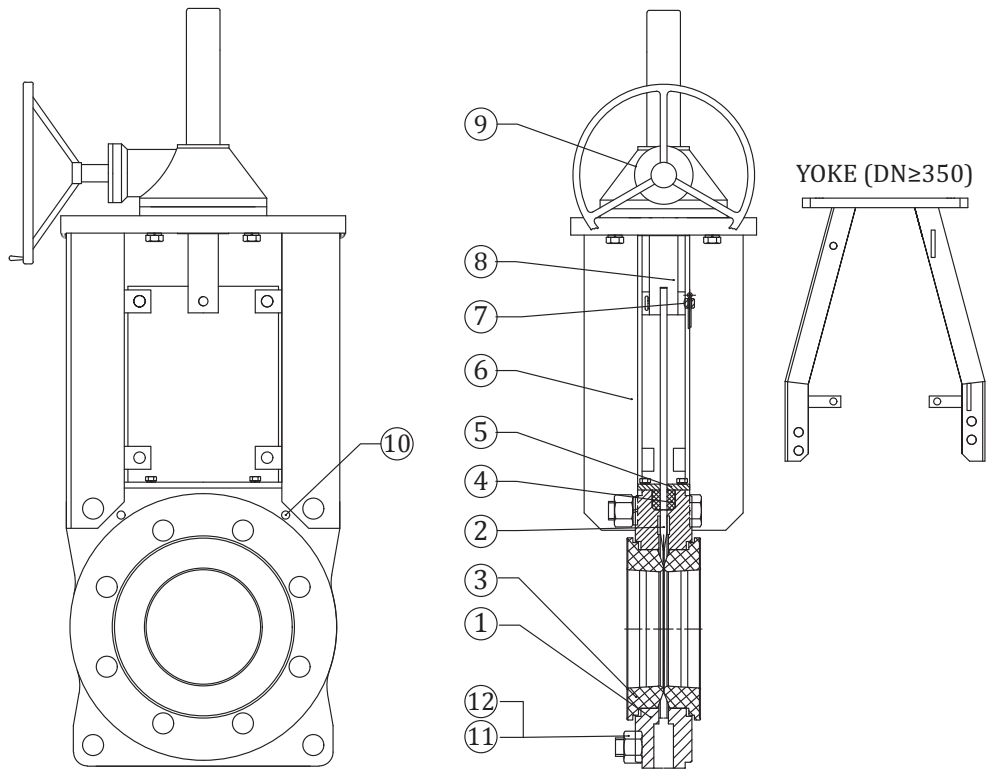
#### KSD-SKG with HANDWHEEL



NO	PART NAME	MATERIAL
1	BODY	ASTM A536 65-45-12
2	GATE	SS316
3	SLEEVE	Natural Gum Rubber
4	PACKING	EPDM
5	GLAND FOLLOWER	AISI 1045
6	YOKE	ASTM A36
7	PIN	ASTM A276 410

NO	PART NAME	MATERIAL
8	STEM	ASTM A182 F6a
9	HANDWHEEL	CS/DI
10	PLUG	AISI 1035+ Ni
11	BOLT	ASTM A193 B8
12	NUT	ASTM A194 8
13	STEM PROTECTOR	ASTM A36/AL

**KSD-SKG with BEVEL GEAR**



NO	PART NAME	MATERIAL
1	BODY	ASTM A536 65-45-12
2	GATE	SS316
3	SLEEVE	Natural Gum Rubber
4	PACKING	EPDM
5	GLAND FOLLOWER	AISI 1045
6	YOKE	ASTM A36

NO	PART NAME	MATERIAL
7	PIN	ASTM A276 410
8	STEM	ASTM A182 F6a
9	BEVEL GEAR	COMBINATION
10	PLUG	AISI 1035+ Ni
11	BOLT	ASTM A193 B8
12	NUT	ASTM A194 8