

Cast Steel Swing Check Valve KRD-SCF

Installation, Operation,
& Maintenance Manual

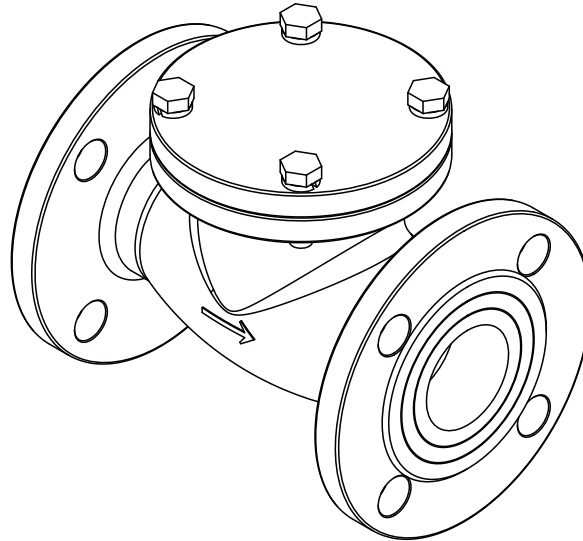


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Chapter I

Introduction

The manual is provided to ensure proper installation, operation & maintenance for KRD-SCF Cast Steel Swing Check 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:

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Phone: +886 4 22310059
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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 KRD-SCF Cast Steel Swing Check 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 disc 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 disc 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.

Chapter II

Installation

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

The check valve should not be used as a primary means of isolation for any application due to its inherent incapability of providing as tight of seal (no through leakage) as gate or globe valves.

Positioning check valves close to upstream flow disturbances can lead to valve cycling (i.e. trim chatter). This may cause rapid wear of seats and trim which can ultimately lead to valve malfunction. Therefore, we recommend valve be installed at least five (5) pipe diameters downstream from a pump discharge and/or other pipe fittings for maximum service life.

⚠ 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

The valves are designed with a preferred flow direction. Install the valve according to the direction marked on the valve body. Valve installed with reversed flow direction will not seal properly.

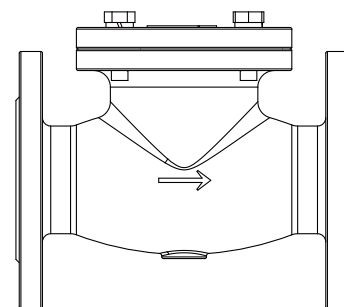


Figure 2.1 Direction arrow on valve body

2) Position

For a check valve, the disc closing force is provided inside the valve by gravity and back flow or a combination of these forces.

Due to the weight of discs, the preferred orientation is vertical upward flow or horizontal. The valve may be installed in other orientations, but any deviation from vertical or horizontal is a compromise to the design of the valve. Vertical flow down is not recommended. If installed horizontal, the Cover must be horizontal to ground.

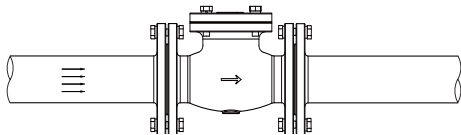


Fig.2.2(a) Correct horizontal installation.

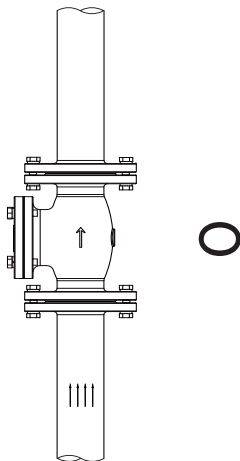


Fig. 2.2 (b) Correct vertical installation.

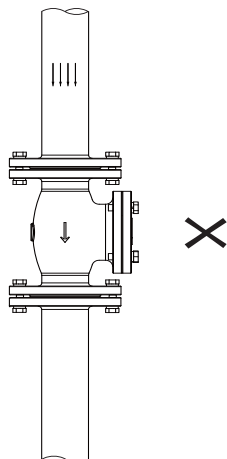


Fig. 2.2(c) Vertical pipe flow down is not recommended.

Note:

The upside down position may cause the discs to open due to gravity, and the valve may leak from the back flow. The spring may also be damaged as a result.

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 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.

Chapter III

Operation

The principle parts of a swing check valve are the body, cover, disc and hinge assembly. The body and cover contain the fluid within the system. The disc is mounted on a hinge arm which swings about a shaft positioned above the seat in the body neck. Flow in the normal direction creates a force on the disc which causes it and the hinge to swing about the shaft. With increasing flow the disc assembly is rotated further from the seat up into the body neck. In the full open position a stop on the back of the hinge contacts the body. This positions the major portion of the assembly out of the flow stream and permits unobstructed fluid flow through the valve. Upon the cessation of forward flow or reversal of flow direction, the force holding the disc assembly open is no longer present, whereupon the weight of the assembly combined with the reverse flow causes the disc to return to the seat. Any seal obtained between the disc and the seat results solely from the difference in pressure across the disc. Note that there is the limitation in maintaining a tight seal at low pressures.

3.1 Handling

During the check valve installation, it must follow the step to carry at the both side of body. If using cable for big size valve, make sure the cable must be strong enough to ensure the safety during the 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

This valve is an automatic opening/closing valve. No human control is required.

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 KRD-SCF Cast Steel Swing Check Valve, KLINGER Die Erste recommends inspecting the valve at least every (1) year.

4.2 Valve Disassembly

1. Isolate and depressurize the system.
2. Match mark the BODY (1) and COVER (9) to maintain their relation.
3. Remove the body-to-cover STUDS (11) in a crossover pattern to prevent cocking of the cover which could cause the remaining nuts to jam.
4. Lift up the entire COVER (9).
5. Examine the COVER GASKET (8) surface for evidence of wear, damage, or deterioration. Discard the old gasket. Be careful not to damage the gasket sealing surface.
6. Removal of the disc assembly necessitates withdrawing the HINGE PIN (7) after removing GASKET (12) and PLUG (13) from side of body. Prior to withdrawing the HINGE PIN (7) in this configuration, make sure the hinge/disc assembly is properly supported either by hand or with slings and that the weight of the assembly is not on the HINGE PIN (7).

4.3 Valve Assembly

1. Inspect the Cover STUDS (11) and NUT (10) to ensure that they are not damaged. Any damaged bolting should be immediately replaced.

2. Make sure both the body and COVER GASKET (8) faces are smooth and clean. Insert a new gasket onto the body gasket seating surface.
3. The HINGE (4) assembly should be lowered into the body and supported either by hand. With the HINGE Pin (7) partially inserted through the body wall, align the hinge assembly with the pin and push the pin through the hinge, into the journal on the opposite body wall. Then insert the GASKET (12) and PLUG (13) into the hinge pin hole.
4. Place the entire COVER (9) assembly onto the valve BODY (1).
5. Re-tighten the STUDS (11) on the BODY (1). Install the Cover STUDS (11), initially tightening by hand to ensure threads are properly engaged.
6. Slightly torque all nuts uniformly using a crossover sequence to prevent uneven gasket loading, bolt damage, and to facilitate smoother assembly.
7. Test the valve as required, and place the valve back into service.

4.4 Troubleshooting

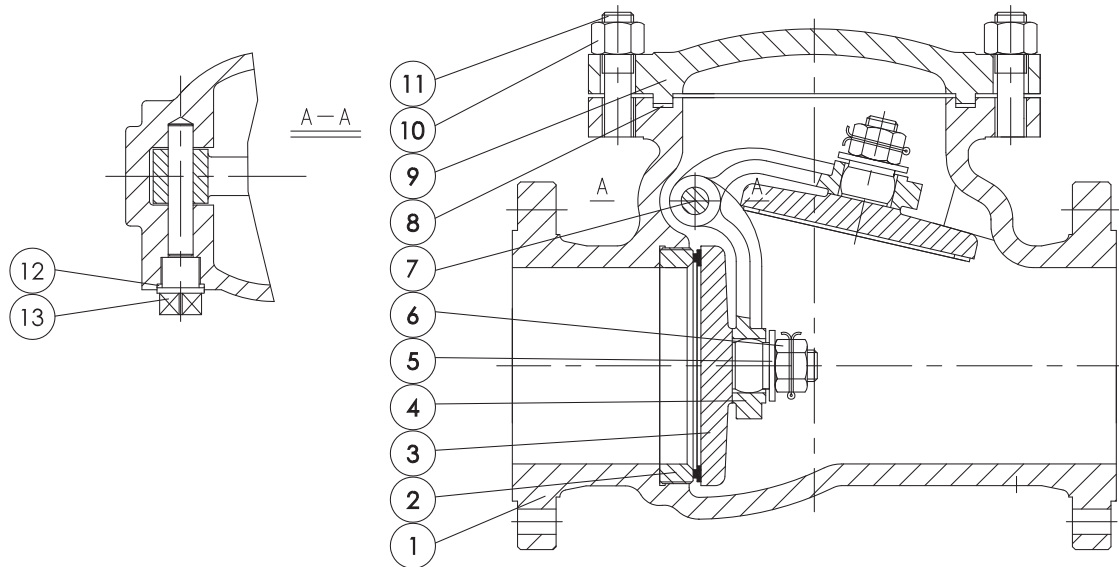
The following table lists the possible malfunctions.

Table 4.1 Troubleshooting Table

Symptom	Possible fault	Actions
Leakage through a closed Valve (Internal Leakage)	Disc edge wear or damage	Clean and/or repair disc edge
	Seat wear or damage	Repair valve seat

4.5 Technical Data and Product Information

KRD-SCF



NO	PART NAME	MATERIAL
1	BODY	ASTM A216 WCB
2	SEAT RING	ASTM A105 + 13Cr
3	DISC	ASTM A216 WCB + 13Cr
4	HINGE	ASTM A216 WCB
5	DISC WASHER	AISI 1025
6	DISC NUT	ASTM A194 2H
7	HINGE PIN	ASTM A276 410
8	GASKET	SS304 + Flexible Graphite
9	COVER	ASTM A216 WCB
10	NUT	ASTM A194 2H
11	STUD	ASTM A193 B7
12	GASKET	COPPER ALLOYS
13	PLUG	CARBON STEEL