

Sleeved Plug Valve

KPD-PVF

Installation, Operation,
& Maintenance Manual

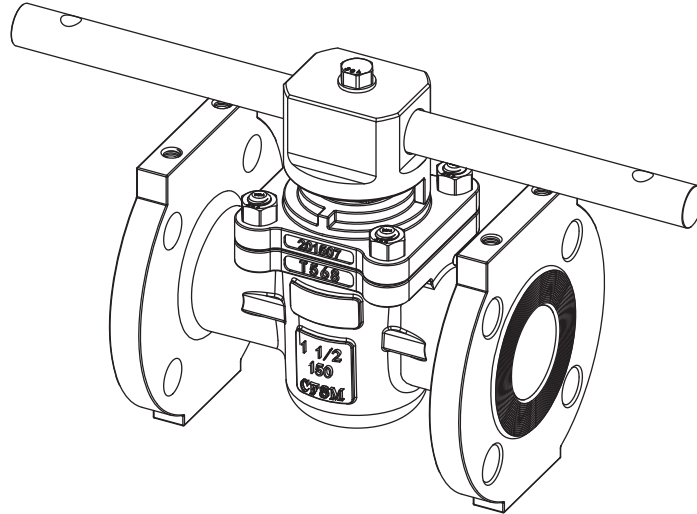


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Chapter I

Introduction

The manual is provided to ensure proper installation, operation & maintenance for KPD-PVF, the Sleeved Plug 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 KPD-PVF Sleeved Plug Valve with soft seat and metal seat 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 plug surface. After removing the cover make sure that the valve is 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.

Fluid undergoes property changes with respect to outside factors, particularly fluid left inside the sealed cavity. When temperature and pressure exceed allowable value, valve failure may occur. User should be aware of that excessive pressure and temperature at nearby pipeline system can also cause valve failure as well.

KPD-PVF Sleeved Plug Valves are generally recommended for throttling services as well as on-off functions.

Do not touch the valve surface when high temperature fluid is flowing through the valve.

Do not attempt to open the bonnet and the cap during operation, especially with the presence of high pressure in the pipeline system.

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 eye shields.
- 3) Always wear gloves and footwear.
- 4) Wear protective headgear.
- 5) Ensure that running water is readily accessible.
- 6) 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 plug is in the half open position.

These valves, when installed, have body connectors which form an integral part of the pipeline and the valve cannot be removed from the pipeline without being dismantled- see DISMANTLING section for reference.

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 sleeve sealing surface and seats. Also, before installing, check all valve and mating flanges to ensure gasket surfaces are free from defects.

⚠ 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 KPD-PVF sleeved plug valves are bi-directionally sealed unless otherwise specified.

In the case of valve automation with actuators, install the valves with the actuator at or above the centerline of the horizontal piping, as shown in Figure 2.1.

⚠ CAUTION:

Do not fasten supports to the flange bolting or the actuator.

NOTE:

User should avoid installing the valve so that the shaft point downwards because impurities traveling in the pipeline may enter the body cavity and damage the gland packing.

NOTE:

When installing horizontally, the support of the actuator must be strengthened to avoid valve leakage caused by valve stem deflection.

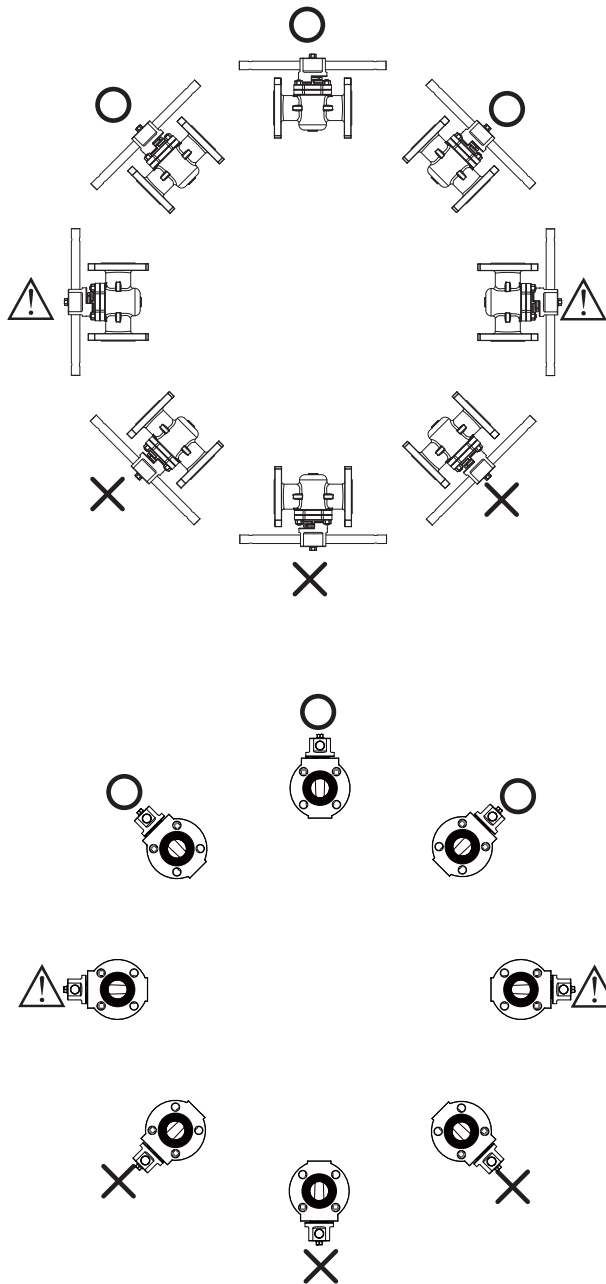


Figure 2.1 Proper position while piping

2) Position

The body, cap and gasket are in the connection area of plug valve and pipeline. The bear weight ability and gradient are very important to the pipe installation. Do not make the pressure from the pipeline, and stress to concentrate on the connecting area of body and cap. Plug, sleeve, and stem will be damaged. Consequently, deformation and leakage may occur.

Note:

Over tightening of any side may cause leakage.

3) Fittings

Select the correct size of fittings according to the pipeline specification. Tighten the plug valve 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 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 wafer 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.

2.3 Pneumatic and Electrical Connections

When installing the actuator, make sure that the valve-actuator combination functions properly. The valve OPEN and CLOSED position are indicated by a groove at the top of valve shaft.

If possible, install the valve so that the actuator can be disconnected without removing the valve from the piping.

Please refer to the appropriate instruction manual shipped with the automation devices for the installed actuator, positioner, filter/regulator, solenoid, and/or limit switches.

When making pneumatic connections, it is recommended that PTFE tape or paste is used on threaded joints, unless otherwise specified by the components instruction manual. The pneumatic supply, such as dry air or nitrogen, should be clean. When making electrical connections, wiring of components should be in accordance with any and all applicable local and national codes and standards.

Before installing the actuator, use an adjustable wrench to manually rotate the valve stem several times. This rotation breaks the torque that may have built up during long-term storage.

Chapter III

Operation

For manual operation, shift the handle in clockwise direction for CLOSED and counter-clockwise for OPEN. If the handle is in parallel position with the flow direction, the valve is OPEN. If the handle is in right angle position with the flow direction, the valve is CLOSED.

When installing actuator or the valve is operated with removable handle, the user should ensure the position of the valve whether open or close. The line on the top of the stem indicates whether the valve is in OPEN or in CLOSED position.

3.1 Handling

During the plug valve installation, it must follow the procedure to handle at the both side of the bodies. If using cable for big size valve, make sure the cable must be strong enough to ensure the safety during the installation.

Never lift the valve package by the actuator, positioner, limit switch or their piping. The Valve damage or personal injury may occur from falling parts.

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 yes, clean the valve before installation. Operator may clean the valves by water, compression air, or steam. However, valve automation devices shall be cleaned only with water or steam, using compression air to clean the valve automation devices is strictly prohibited. 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 Sleeved Plug Valves have $\frac{1}{4}$ turn operation opening in a counter-clockwise direction. When the handle is positioned across the pipeline,

this indicates that the valve is closed. When the handle is positioned parallel with the pipeline, this indicates the valve is open.

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.

The hand wheel on the gear box indicates the opening and closing direction of the valve. Generally speaking, the clockwise direction of the handwheel is the closing direction, and the counterclockwise direction is the valve opening direction.

3.4 Remote Operation

Where manual operation is not required valves may be automated for remote operation, instrument controls etc. KLINGER Die Erste offers a wide range of pneumatic and electric actuators for different working conditions.

When an actuator is used, no stop plate is fitted to the valve since end stops are an integral part of the actuator. Operation will be in accordance with KLINGER Die Erste Installation, Operation and Maintenance Instructions for the relevant actuator.

 **CAUTION:**

Keep hands, other parts of the body, tool and other objects out of the open flow port. Leave no foreign object inside the pipeline. When the valve is actuated, the plug act as a cutting device. Also, the plug position may change when the valve is moved. The failure may result in damage or personal injury.

Chapter IV: Maintenance

4.1 General Notes

Due to the structural design of plug valve, replacement of parts may be difficult without professional expertise and necessary tools. When equipped professionally and with the right tooling, valves may be refurbished using a minimal number of components, and none of which require machining. KLINGER Die Erste valves are designed for easy service and assembly in the field.

The following aspects should, however, help to extend valve life.

⚠ CAUTION:

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

4.2 Maintenance Frequency

KLINGER Die Erste Sleeved Valves must undergo a scheduled inspection based on the application. The maintenance frequency is determined based upon the application of the valve. User should consider the following factors when determining the maintenance time interval: fluid type, flow velocity, operation frequency, pressure, and temperature. If the application requires intensive valve opening, closing, and fine adjusting, then the valve should be inspected frequently.

Note:

KLINGER Die Erste recommends inspecting the valve at least every one (1) year.

Note:

Please use the original spare parts to ensure the valve functions well.

Note:

When sending back the valve to KLINGER Die Erste for investigation, do not disassemble it. Clean the valve carefully and flush the valve internals. If possible, inform us about the medium used in the valve.

4.3 Disassembly

1. Valve shall be positioned vertically by resting body side flanges on clean ground surface (preferably covered with rubber sheet).
2. Turn the valve to CLOSED position.
3. Remove the handle, lever or gear box if applicable.
4. Loosen GLAND NUTS evenly, remove GLAND, and remove GLAND STUDS from mounting pad of the valve.
5. Put the downstream end of the valve upward and lay it flat on the desktop.
6. Remove all the COVER BOLTS and then the COVER.
7. Lift the PLUG with the COVER from the BODY by a twisting motion.

⚠ CAUTION:

For the soft-seal sleeve, it should be noted that when the lower shaft is removed, the plug may pop out of the valve body and cause personal injury.

Note:

Please make sure that the PLUG is not going to fall out of the valve and been damaged.

8. Inspect the PLUG for any damages.
9. Discard all of the PTFE components and metal diaphragm from the PLUG STEM.
10. Clean carefully and inspect the SLEEVE and all parts for wear and damage. Make sure all gaskets and packing residue is thoroughly cleaned before valve is reassembled. KLINGER Die Erste recommends all sort parts should be replaced.

4.4 Reassembly

Before reassembly, inspect all the valve for any damage on body and all internals.

1. Put the downstream end of the valve upward and lay it flat on the desktop.
2. Put the SLEEVE into the valve cavity and push it toward the upstream end for positioning.
3. Combination PTFE diaphragm and stem seal collar.
4. Place the COVER over the PLUG STEM.
5. Carefully insert the PLUG into the valve cavity

with the valve closed. At the same time, push the STEM with KEY from the stuffing box to match the valve stem with PLUG.

6. Tap the top of the STEM to align the bottom end with the upper hole plane inside the PLUG, as shown in the figure.

Note:

If the PLUG has been disassembled by drilling before, please confirm the size of the pin hole and use the corresponding PIN.

7. Put the inverted PACKING into the stuffing box.
8. Screw the GLAND STUDS into the valve mounting flange. Install the GLAND and fasten the GLAND NUT.
9. Check that it is assembled correctly and in the CLOSED position.
10. Install the BRACKET to the valve with BOLTS and WASHER. Install the handle or automation devices if applicable.

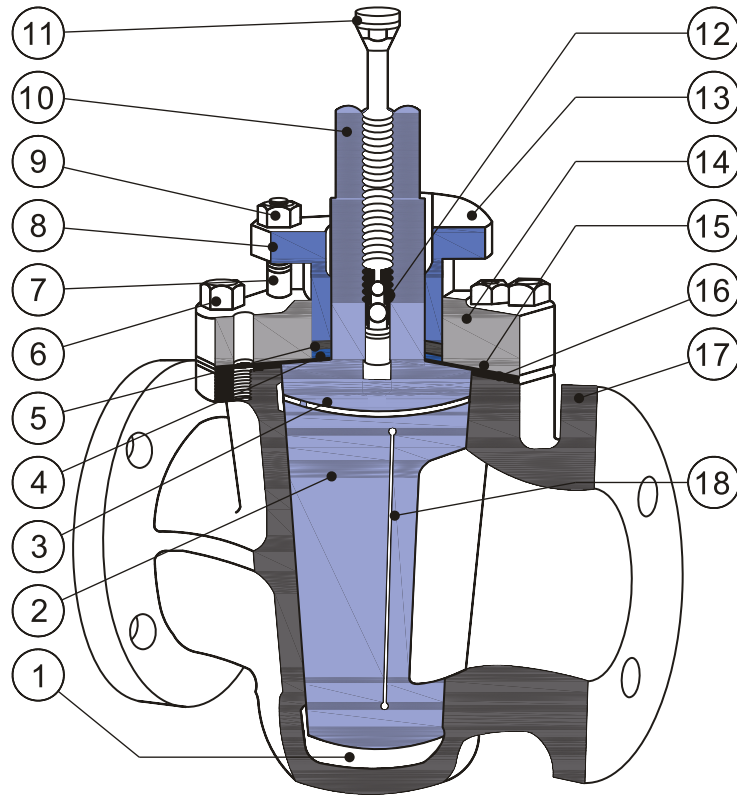
4.5 Troubleshooting

The following table lists the possible malfunctions

Table 4.1 Troubleshooting Table

| Symptom | Possible fault | Actions |
|---|-----------------------------------|-------------------------------------|
| Leakage through a closed Valve (Internal Leakage) | Damaged Plug surface | Replace the Plug |
| | Damaged the sleeve | Replace the sleeve |
| | Plug is not aligned | Realign the Plug |
| Irregular plug movement | Fluid accumulated on the surface. | Flush the Plug from inside |
| | Plug or Sleeve damaged | Clean or replace the Plug or Sleeve |
| Valve leaking from stem (External Leakage) | Gland bolts are loosened | Tighten the gland bolts |
| | Parts are worn or damaged | Replace the necessary parts |

4.6 Technical Data and Product Information



| NO | PART NAME | MATERIAL |
|----|-----------------|---------------|
| 1 | SEALANT CHAMBER | - |
| 2 | PLUG | WCB/CF8/CF8M |
| 3 | SEALANT DUCT | - |
| 4 | PACKING RING | F6/F304/F316 |
| 5 | PACKING | PTFE/GRAPHITE |
| 6 | COVER BOLTS | B7/B8M |
| 7 | BOLTS | B7/B8M |
| 8 | GLAND | WCB/CF8/CF8M |
| 9 | GLAND NUTS | A194 H/8 |

| NO | PART NAME | MATERIAL |
|----|------------------|----------------|
| 10 | INDICATOR | WCB/A105 |
| 11 | SEALANT INJECTOR | A105/F316 |
| 12 | CHECK VALVE | A105/F316 |
| 13 | STOP | A105 |
| 14 | COVER | WCB/CF8/CF8M |
| 15 | WASHER | SS |
| 16 | GASKET | PTFE/Non-metal |
| 17 | BODY | WCB/CF8/CF8M |
| 18 | SEALANT GROOVES | - |