



INDUSTRIAL VALVES MANUFACTURER

**SHANGHAI YUANGAO VALVES INDUSTRY CO., LTD**

# Plug Valves Installation, Operation & Maintenance Manual



API 600



API 6D



API 624



API 607



CE 1155



2014/68/EU



ISO 9001

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# **Plug Valve**

## **Installation, Operation, & Maintenance Manual**

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## 1. Introduction

The purpose of this manual is to ensure that the valves supplied are properly installed and maintained to give trouble free performance.

## 2. Transportation, Reception, and Storage

While unpacking the valve, check that the valves and all accessories have not been damaged during transportation.

Note: If the valve or any of its accessories is damaged or missing during transportation, inform the same to the factory office where the valve was ordered.

### Caution!

Placing the valves directly on the ground or on a concrete floor should be avoided.

Valve open or close position is indicated on the handle sleeves for lever operated valves.

All valves are delivered with the plug port in the full open position and ends protected with the protective end caps to avoid the entry of debris, solid particles, or damage to serrations during transportation.

All wrapping and protection on the valves should not be removed until the valve is ready for installation. If protective end caps are removed for examination of the internal components, they should be refitted immediately.

We recommend storing the valves indoors, in a dry and dust free atmosphere. All care should be taken to avoid accidental damage to the valve during storage.

If the valves are stored for a sustained length of time, then all of the valves should be cleaned and hydrostatic/pneumatic tested before installation in consultation with the factory office where the valve was purchased from.

### Caution!

When handling the valve or package, keep in mind the weight distribution of the valve. Ropes should be placed securely around the valve body or lift hooks (as applicable) while handling the valves. Special care should be taken not to damage the lever.

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### 3. Do's and Don'ts

Note: User should ensure that he has read and understands the do's and don'ts before installation. In case of any required clarification, please contact the factory where the valve was purchased.

#### Do's:

- Use the valve for the specified application as agreed to between the manufacturer and the purchaser.
- Read the installation, operation, and maintenance manual before installing, operating, or maintaining the valve.
- The purchaser / end user should train their employees for safe use of the valve.
- Ensure that nuts and bolts are tightened to the specified torque values.
- Open or close the valve slowly to avoid hammering on the valve and the pipeline.
- Always replace damaged parts with genuine and recommended LEAD Factory parts.
- Be aware of the type of media and the environment (explosive, highly flammable, toxic, oxidizing, etc.) in which the valve is to be used. Protect the people and the environment from any harmful or poisonous substances.
- Carefully read the Cautions/Warning plates on the valve.
- The valve body may become very hot or cold during use. The end user is responsible for protection of their employees against burns or other types of injuries resulting from valve temperatures.

#### Don'ts:

- Specifications of the valve are marked on the body or nameplate prior to shipment. Users are responsible for ensuring that the maximum operating conditions are never exceeded.
- Do not keep the valve open at any intermediate position.
- Do not try to rectify the valve leakage by re-working of seats.
- The threaded connections of the valve body for the plug adjustments and the threaded lines are sealed by threaded plugs. These plugs should not be removed as long as the valve is under pressure.
- Modification of the valve should not be carried out.

### 4. Installation

Before installing a new valve in line, make sure that the valve is checked for identification purposes. Also, ensure that the characteristics of the valve matches those specified for in the agreed specifications. Nameplate instructions and nametag plates will give the necessary information. If any information is missing, please immediately contact the factory where the material was purchased.

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When taking a valve from storage, a careful check should be made to ensure that the valve has not been damaged during the storage period.

Before installation of the valves, remove the end protectors and check that the serrations on the flange face are not damaged and the bore is clean. Clean the valve, if necessary.

**Caution!**

Ensure the pipeline is fully cleaned before installation of the valve into the pipeline. Pipeline debris, scaling, etc. will damage the seal of the valve and cause seat leakage during commissioning.

During commissioning and pipeline flushing, the valve should be kept fully open to prevent damage to internal parts.

Notes: One way to prevent damage to the valve during flushing and testing of pipelines is to substitute them by spool pieces. If use of a spool piece is not possible, it is essential that the valve is kept fully open. It is also advisable to install temporary strainers at critical places to protect sealing area of the valves from solid particles.

Plug valves are designed for b-directional flow unless noted differently.

Valves can be mounted in a horizontal (with the stem pointed upward only) or vertical position depending on the pipeline routing. However, we do not recommend installing the valve with an actuator underneath. The design does not allow for dirt and water to run off.

It may be necessary to firmly support the pipeline in order to protect the valve from excess stress and to reduce the pipeline vibrations. To facilitate servicing, it is preferable that the valve should be supported by the body, using pipe clamps and supports. Do not fasten supports to the flange bolting or to the actuator.

No not attempt to correct misalignment, by means of flange bolts. During the tightening operation, ensure that the piping stresses are not transferred to the valve. Excessive over-tightening of the flange studs can cause damage and/or leakage at the end flanges.

For weld end valves, a qualified welder must perform the operations in accordance with ASME Boiler and Pressure Vessel Code Section IX.

**Caution!**

Do not allow the temperature of the body seat area to exceed 200°F to prevent seat and seal damage during welding operation. It is recommended that thermal chalks are used to check the temperature.

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Note: Any damage to the seats due to the temperature exceeding 200°F can cause the valve leakage. It is recommended that the customer keeps spares kits.

**Caution!**

Ensure that weld splatter does not fall over plug body seals. This may damage the sealing surfaces.

After welding, flush the pipeline when the valve is in the open position to remove weld splatter formed during welding and then operate the valve once fully in order to ensure the proper operation of the valve.

On butt weld end valves, ensure a gap of .08" to .12" between the valve ends and pipeline as per ASME welding standard and tack weld the pipeline and valve ends. After ensuring the proper alignment between the pipeline and the valve, weld the valve end.

## 5. Operation

For lever operated valves, the hand lever is either assembled with the valve or shipped loose depending upon the size of the valve.

For gear operated valves, the gearbox open/close adjustment must not be disturbed after shipment. Rotation of hand wheel in the clockwise direction closes the valve and counter clockwise rotation opens it. The internal details and construction of the gearbox may vary as per the manufacturer's standard.

**Caution!**

Ensure that the force applied on the hand wheel of the gearbox or lever does not exceed 360Nm.

Note: Do not apply extra leverage with use of pipe or an extension. When the end stops of the gearbox are reached, it is in its final position.

LEAD plug valves always close in the counter clockwise direction. The plug should always be rotated through 90 degrees to the fully open or fully closed position.

**Caution!**

Keeping the valve at any intermediate position should especially be avoided, as high fluid velocity through the narrow opening will produce erosion of the body and plug over time.

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## 6. Maintenance

### **SEALANT IS ESSENTIAL FOR PROPER VALVE OPERATION!**

**Note: Maximum valve performance is achieved with the proper selection of sealant and sealant injection program.**

Caution!

Observe the caution and safety precautions before carrying out any maintenance on the valve.

Routine checks to be performed by the end user:

- Check the tightness of nuts/bolts between the body/bonnet area as well as the bracket and stem housing.
- Ensure that the performance of the valve is satisfactory.
- Ensure that no leakage is being observed from the valve.
- Frequent observation is recommended under extreme applications and conditions.
- Periodically flushing the sealant with suitable valve cleaner to flush debris from the sealant system is recommended.
- Mounting studs and nuts of the gearbox are to be checked occasionally for tightness and re-tightened as necessary.

#### Preventative Maintenance:

In order to avoid valve failure during operation, all valves in the process plant should be periodically inspected thoroughly to detect the wear of plug/seals and even the body. It is recommended that on such occasions, gaskets, seals, and packing should be replaced.

The type of process, fluids involved, working conditions, and the location of the valves in the process plants will determine the frequency of the required periodic inspection. Preventative maintenance is absolutely essential as the failure due to lack of the same may cause an emergency shutdown of the plant.

#### Frequency of Sealant Injections:

- Severe service valves (hot fluid/gas, corrosive fluid/gas, high pressure fluid/gas, valves infrequently used, blow-down applications, bypass applications, venting applications, gas distribution systems, etc.) should be lubricated with proper sealant after each operation.
- Valves installed in refineries, gasoline plants, compressor plants, and processing plants should be lubricated with proper sealant on a weekly basis.
- Valves on gas, crude, and product transmission lines should be



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lubricated on a monthly basis.

- Valves on crude, lube oil, or vegetable oil require less frequent service.

#### Sealant Injection Procedure:

- Pipeline valves of sizes 6" NB and above are provided with sealant injection ports of the body for seat port or the stem housing. Each port provided on the body provides sealant entry to the valve seat. The port provided on the stem housing provides sealant entry to the stem sealing to the body.
- Injecting handgun sealant is injected by connecting the outlet fitting of the handgun to the sealant injection port.
- Sealant should not be injected unless the valve is in the closed position.

### 7. Trouble Shooting

The following table lists the possible malfunctions that might occur after prolonged use:

| Symptom                      | Possible Fault  | Action  |
|------------------------------|---|---|
| Leakage though a close valve | Damaged plug surface                                      | Replace the plug                                  |
|                              | Damaged seat  | Lap plug to seat                                  |
|                              | Plug not closed fully                                     | Check plug open/close settings                    |
| Irregular plug movement      | Impurities between the plug and seat or plug/body cavity  | Flush the plug from inside                        |
|                              |   | Clean the sealing surface by injecting solvent    |
| Valve hard to operate        | Damaged seal  | Inject sealant                                    |
|                              | High application pressure or temperature                  | Confirm application pressure / temperature ratios |
|                              | Out of lubricant  | Inject lubricant                                  |
| Noisy Operation              | Error in valve sizing or flow of fluid with high velocity | Confirm valve sizing                              |
| Leakage through stem         | Gland nut loose   | Tighten gland nut                                 |
|                              | Damaged stem, stem sealing surface                        | Replace the seal                                  |
|                              | Damaged stem seal   | Replace the stem seal                             |



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