

ROTATING DISK VALVES – INSTALLATION AND MAINTENANCE

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**INSTALLATION, OPERATION, MAINTENANCE AND REPAIR INSTRUCTIONS**

(Refer to specific valve drawing supplied for your order).

**1. SCOPE**

This manual covers the general operation, installation and maintenance of Mitech Rotating Disc Valves. These valves are designed to handle liquids, slurries or dry powders. Please contact your Mitech Valve representative or our factory for any clarification of this manual.

**2. INFORMATION ON USAGE**

Proper Installation and Maintenance will insure trouble free valve operation. Misuse of this valve may result in damage or injury. The Manufacturer provides the following instructions for use and relies upon the purchaser to see to it that these instructions are given to the person who will actually be using these valves. It is important to inspect the valves for any damage that may have occurred in shipment. Notify carrier and factory of any such damages as early as possible.

**3. VALVE TYPES**

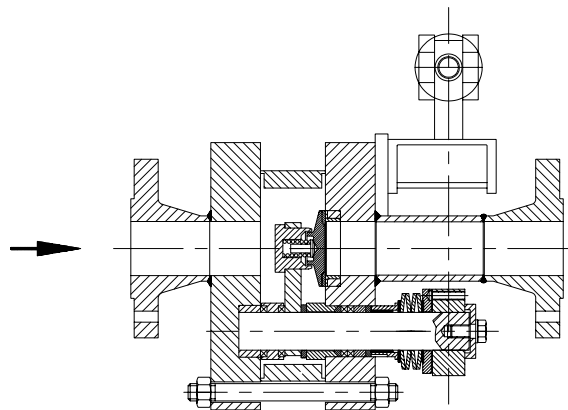
There are six basic valve configurations:

- Single disc
- Double disc
- Lens disc
- Half valve
- Lockbar
- Diverters

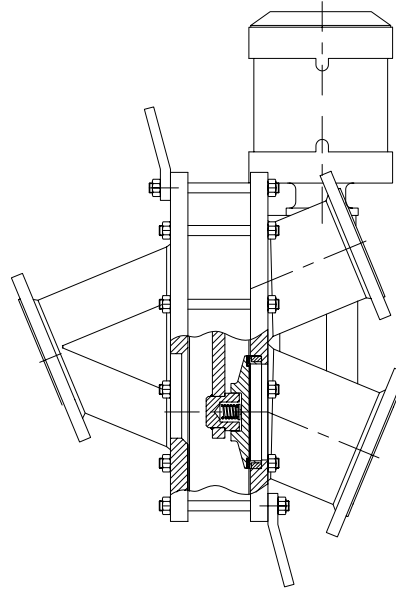
All valve types are designed for open or close applications and not for throttling applications. Each valve type suits particular applications as listed below.

- **Single Disc Valve.**

Single Disk and Diverter valves will seal in one direction only. The higher pressure must always acts on the back of the disc when the valve is closed.



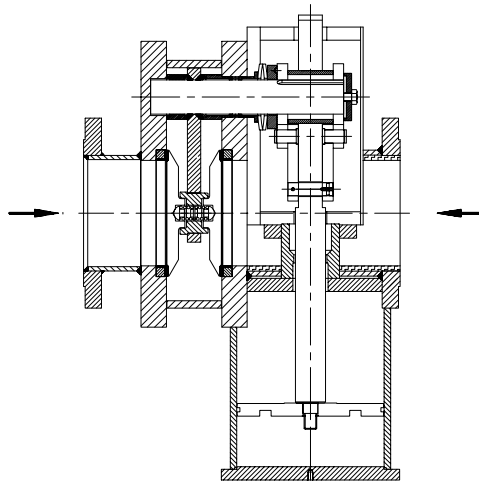
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***Diverter***

- **Double Disc Valve.**

The Double Disk valves are designed to seal against pressure from either direction.



***Double Disk***

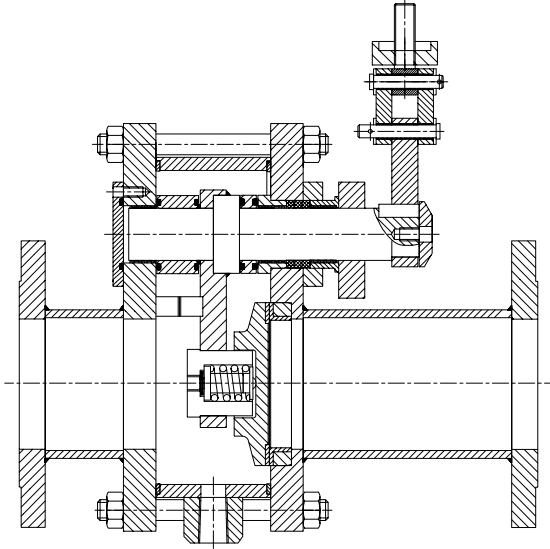
- **Lens Disc Valve.**

The lens disc valves are designed to handle pressure and flow vertically downwards onto the back of the disc. The lens disc stops material from entering the valve body when the valve is in the closed position. This allows more room inside the valve body for easier valve action.

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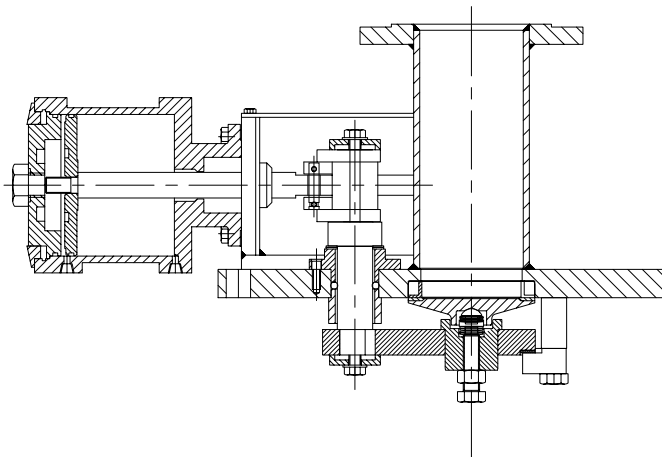
- **Lockbar Valve and Half Valve.**

For conditions when the other three valves may be less suitable, the Lockbar valves come into their own. In some vertical pipelines the force on the disc face, due to the weight of the material in the pipeline, are too big for a normal valve to handle when the valve is closed. In all circumstances Lockbar valves are factory set to individual application requirements.



***Lockbar Valve***

- **The Half Valve**
- 
- The Half valve only has an inlet flange and on the outlet side is open to atmosphere. The material in the pipeline is usually dropped straight onto a conveyor line, or into a Hopper .



***Half Valve.***

#### **4. OPERATORS**

Operators may be, Air or Hydraulic cylinder , Handwheel or Lever type .

#### **5. VALVE CONSTRUCTION**

The valves are designed and tested in accordance with the following specifications:

- ASME / ANSI B16.34
- ANSI B16.1
- ANSI B16.5
- ANSI B16.24

Valve pressure and temperature limits generally follow ANSI B16.34 guidelines or in accordance with ASME section VIII of the "Boiler & Pressure Vessel" Code that is also stamped on the ID plate.

The valve body is Carbon Steel or Stainless Steel with a trim suitable for the fluids being handled. The Slurry Valves have purge connections on the distance ring that prevent clogging up in the valve chamber.

#### **6. INSTALLATION AND OPERATION**

All the valves are carefully inspected and tested before leaving the factory. Valves should be inspected for any damaged that may have occurred during shipment. Valves should be checked to see that they meet the ANSI and flange ratings required.

##### **6.1 Flow direction.**

##### **6.1.1 All valves.**

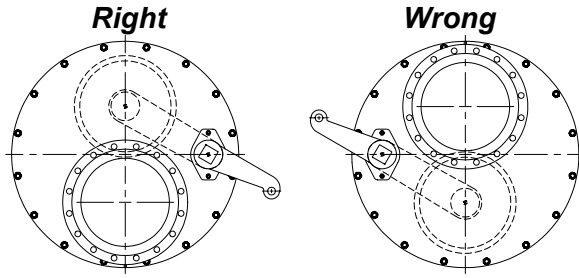
The valves should be installed in accordance with the tag showing the flow direction. The Double disc valve can be installed in the pipeline facing either way. The Single disc valves will seal in one direction only and should be installed with the disk upstream of the seat ring.

##### **6.1.2 Horizontal and Inclined pipelines.**

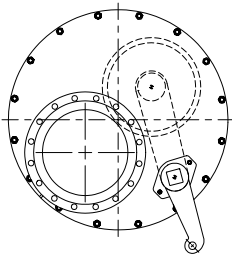
##### **6.2 All valves.**

When installing a valve in a horizontal line, the valve chamber must be located at the top. In slurry applications this arrangement allows the slurry to flow back into the pipeline. If this is impractical other orientations as shown in next figure are acceptable.

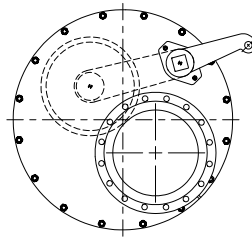
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**Acceptable**



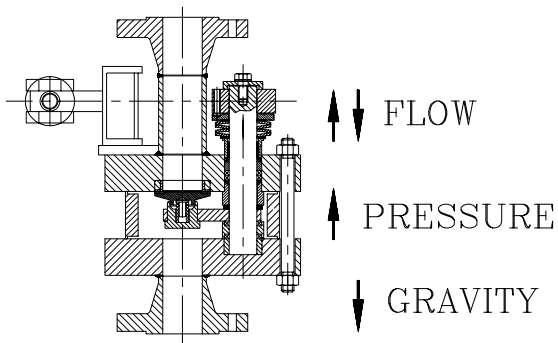
**Acceptable**



### 6.3 Vertical pipelines.

#### 6.3.1 Single Disc, Lockbar and Lens Disc Valves.

When a single disc valve is installed in a vertical pipeline, the normal flow direction is downwards and the pressure on the back of the disc against gravity as shown in next figure.



In the case of a Lockbar valve, the pressure can be downwards with gravity on the face of the disc. The Lens disc is designed to handle pressure on the face of the lens disc and the back of the disc with the flow downwards with gravity.

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### **6.4 Screw End Valves.**

- 6.4.1 For screwed end valves, the pipe threads must be tightened up using a suitable compound to seal the thread. Do not use Teflon tape. Please note the temperature rating of the sealant. Tighten up all threads fully. If a thread is not tight enough, a lever operated valve may become free to turn the valve during operation and cause the joint to leak.
- 6.4.2 The wrench or operating lever may be removed to provide a smaller swing clearance when tightening up pipe threads. Use a pipe wrench not the valve handle when tightening up pipe thread. If the lever is removed, it is very important to replace the lever and washer and pull up the gland adjusting stud, before putting the system on-stream.

### **6.5 Weld End Valves.**

For weld end valves, a ground wire should be connected to the body half being welded so as not to pass current through the seal faces. This could possibly destroy the faces.

### **6.6 Flange End Valves.**

On making up flanged connections, care should be taken to select the correct gasket and use a suitable sealing compound or lubricant. Carbon steel bolts may be used for ANSI #150 and #300 flanges, provided the temperature does not exceed 200°C. Alloy steel ASTM A193-B7 bolts or equal should be used for higher pressure or temperature applications. Pipe line flanges should be correctly aligned and the flange bolts tightened up evenly to the correct torque to prevent leakage.

### **6.7 Purge Connections.**

- 6.7.1 The purge connection is supplied to provide a means of removing unwanted media or fluidizing de-watered slurries on an intermittent basis. The purging fluid depends on the application, but cold fluids should generally not be used on hot valves. Examples of purging fluids are steam, hot or cold water, carbon dioxide and nitrogen.
- 6.7.2 Use the purge connections only when media stagnation causes difficulties in normal valve operation. The purge connection is not to be used to introduce air for conveyance or pressurising. Constant use of the purge may adversely effect valve maintenance requirements.
- 6.7.3 These purge connections are only supplied on request.

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### 6.8 Valve Operation.

Always shut the valve fully; this will provide tight closure of seats for the longest possible life of the valve. Leaving the valve in the mid-stroke position will reduce the disc and seat life considerably. Do not over tighten handwheel.

### 6.9 Note.

REVIEW Maintenance notes after installation.

## 7. MAINTENANCE

Before performing any maintenance checks on the valve, be aware of the potential dangers inherent in the sealing and shearing action of the disc as it closes off the port area. NEVER reach inside the valve when any air supply is available to the actuator. This could result in serious injury.

### 7.1 Body Leakage.

When system is on-stream and has reached maximum operating temperature, inspect the valve for possible leaks at the body gasket and the post packing. Torque up body bolts evenly if a leak appears at body gasket, DO NOT OVER-TIGHTEN.

### 7.2 Packing Adjustment.

7.2.1 The packing gland is either manually adjusted or self adjusting. After being in service for some time, it may be necessary to adjust the packing gland flange if leakage appears at stuffing box. Take care not to over-tighten gland flange nuts.

7.2.2 When the packing gland has been adjusted all the way down; an extra ring of packing may be added to the top of the stuffing box as a temporary measure. If time permits, replace the packing in the stuffing box. USE ONLY packing suitable for the service as recommended in the parts list.

7.2.3 The self adjusting packing gland uses disc springs to adjust the packing load.

7.2.4 Packing leaks can sometimes be an indication of worn bearings due to your valve being cycled many times. If the lever post tilts, the bearings are probably worn and the valve should be repaired as soon as possible.

### 7.3 Seat Leakage.

7.3.1 Many small seat leaks can be fixed without removing the valve from service. Operate the valve a few times to dislodge any foreign particles lodged between the sealing faces of the seat and the disc. Sometimes the process materials tend to "plate out" and leave deposits on the seat surface. This can be cleaned of by cycling the valve a few times. If for any reason valve does not perform satisfactorily, please notify the factory.



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### 7.4 Air Cylinder.

Refer to MITECH Linear Actuator Maintenance bulletin for Air Cylinder operated valve maintenance.

## 8. REPAIR

- 8.1 Shut off the line and supply pressures before removing valve from the pipeline.
- 8.2 Take valve apart and clean all parts thoroughly. Scrape out all the old packing from stuffing box. Relap both the disc and seat faces. If these faces cannot be cleaned up by lapping, they should be re-faced by surface grinding prior to final lapping. Check for smear metal due to grinding, scraping may be necessary to remove this wire edge. Use fine silicon carbide paper (240 grit) to obtain final edge finish. Loose or rough edges will cause the seat to fail.
- 8.3 Check the post bearings for correct clearance 0.1 mm to 0.2 mm. If post bearing is worn, it must be replaced.
- 8.4 If valve is fitted with seat bushing which are press fitted to the port of the bonnets, check to be sure that they are securely in place.
- 8.5 Recommended repair parts are indicated by asterisk on parts list of drawing supplied for your order. Assembly must be done in a clean environment.

## 9. ASSEMBLY

- 9.1. Clamp inlet bonnet to bench top. Position disk over seat. Locate post lever assembly, complete with spacers and seals, into bearing and lower over disk, disk spring and spring button.
- 9.2. Apply anti seize grease to body gaskets if spiral wound, or gasket adhesive to corrugated klingerite. Position distance ring with both body gaskets in place.
- 9.3. Balance second disk if required on second spring button. Carefully lower outlet bonnet over post shaft checking that the second disk and body gaskets remain in position.
- 9.4. Hand tighten four evenly spaced body studs and nuts. Operate the valve by hand to verify parts have been assembled correctly.
- 9.5 Body bolts must be pulled up evenly and alternately across. First hand tighten them all up evenly.
- 9.6 Turn valve over and install packing as recommended in parts list of specific drawing for your valve size and type. Be sure to stagger joints.
- 9.7 Finally install lever, air cylinder operator or handwheel operator (if necessary). Check for proper centring of disc when valve is fully shut. A slight over travel is preferred.
- 9.8 If you do not have the proper facilities to make the repair, send the valve to the factory and we will repair it for you.

**10. TESTING**

Valve body and seat should be tested for tightness - consult the factory.

