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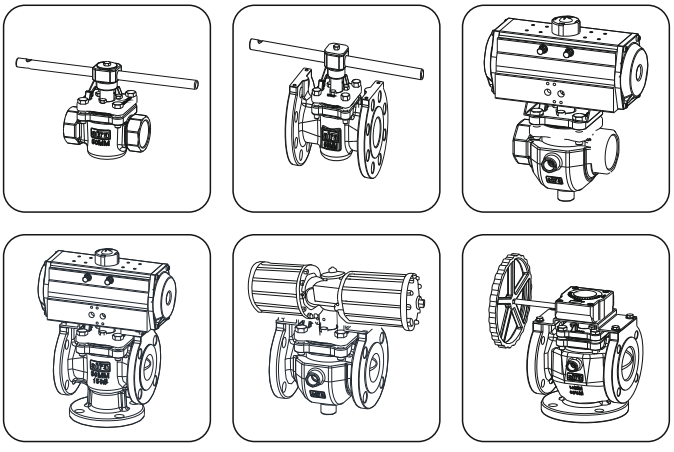
PLUG VALVES

Installation, Operation & Maintenance



IOM No: AEA-IOM-PLUG-0024-R0

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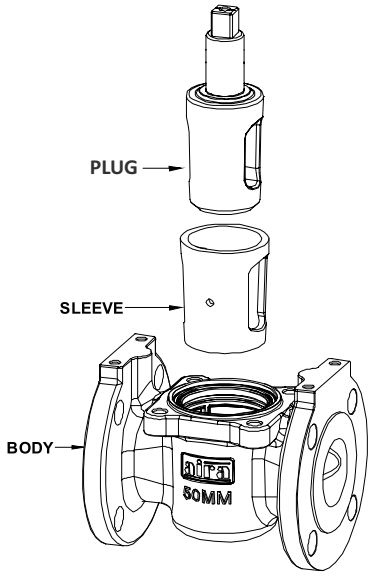
1. CONSTRUCTION AND DESIGN FEATURES

General

aira sleeved & lined plug valve are designed in accordance with API599 for ANSI class Ratings 150 to 300, nominal sizes from ½" to 20" valves have been designed for use with Various combinations of material such as : carbon steel, low carbon steel, special alloy, Stainless steel, monel, inconel.

Construction Details

Basic structure is plug, sleeve, body. Sleeve is inserted inside the body. Tapered plug is Inserted onto the + sleeve. The sleeve is acting as a soft seat. And completely surrounds Plug creating a real sealing surfaces. Also not permitting any dead space in the flow path. Plug is rotating 90 degree. When it is aligned with the body port, flow is open. When the Plug is rotated so that plug port is perpendicular to the body port the flow is blocked. The Media kept in the plug while at closed position, will be contained in the plug port only, And when the valve is open again, the flow will flush the out and no remains.



Threefold Sealing System

The zero leakage stem sealing is achieved by threefold sealing system. The primary seal is provided by the sleeve. The sealing is so tight that no leakage can be observed even without a valve cover.

The secondary and tertiary seal (top seal package) are provided by a PTFE delta ring and a diaphragm. The sealing is also so tight that no leakage can be observed even without a sleeve. A test report is available at request.

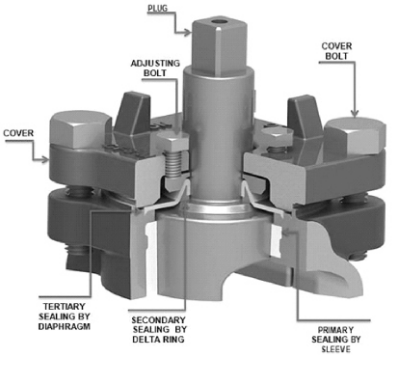


Figure [a]

Unmatched Superior Sealing. Bi-directional Zero leakage.

Primary sealing by PTFE sleeve with high pressure ribs for IN-line sealing. Independent secondary sealing by diaphragm. Tertiary by wedge ring. Leaving absolutely no chance for atmospheric leakage.

360° Port Lips

360° port lips provide a **self-cleaning** action to remove scaling and adhering media.
PTFE even through high grade plastic which is vulnerable to cold flow (deformations) when subjected to varying loads and temperature. In a plug valve the 360° port acts along with upper and lower boundary restrict the sleeve **preventive cold flow.**

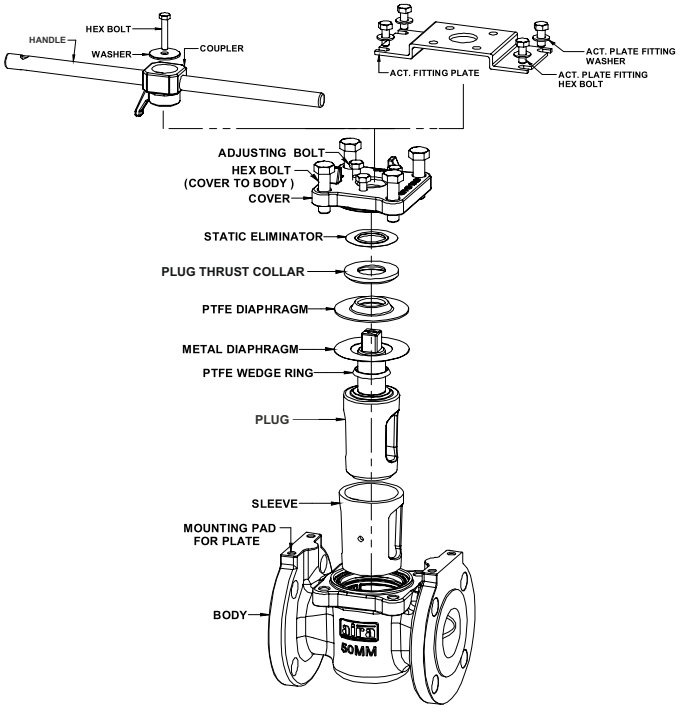
No Maintenance

In case of PTFE sleeve wear from usage, a slight turn of adjustment bolt plug down regaining sealing pressure making valve as good as new.
No lubrication in needed even after long period of inactivity, thanks to low co-efficient of friction of PTFE sleeves and smooth finished surface of plug.

Introduction & Design Features

A high standard of performance is achieved by intimate contact between plug and the firmly fixed PTFE sleeve in the body and by separate atmospheric seals.

Body Design: The PTFE sleeve serves as the seat for the valve plug thus eliminating contact of two metal surfaces. Turning effort is low and galling is avoided. The design also permits the use of any body/plugs material combination. Positive shutoff is ensured and the valves are free from regular maintenance.



Warning! – aira SLEEVED PLUG VALVES should never be installed where service conditions could exceed the valve ratings. Failure to heed warning may result in personal injury and/or property damage.

2. PRECAUTION

Safety first! For your safety, take the following precautions before removing the valve from the line, or before any disassembly:

- Be sure you know what fluid is in the line. If there is any doubt, double-check with the proper supervisor.
- Wear any protective clothing and equipment normally required to avoid injury from the particular fluid in the line.
- Depressurize the line and drain the system fluid.
- **DO NOT** pressurizes the valve without an actuator mounted on it. **DO NOT** removes an actuator from a valve under pressure.
- Before you install a valve in, or remove it from the line, cycle the valve fully closed. The valve must be removed from the line in the closed position.

3. TRANSPORTATION, RECEIVING AND STORAGE

Valve is being packed in Boxes or pallets while shipping to the customer, care should be Taken store them in a suitable place. We recommended storing the valves indoors in a dry and Dust free atmosphere while unpacking the valves Check that the valves and any other accessories have not been damaged during transportation.

CAUTION: PLACING THE VALVES DIRECTLY ON THE GROUND OR ON A CONCRETE FLOOR SHOULD BE AVOIDED!

- All wrapping and protection on valve should **not** be removed until the valve is ready for installation.
- When handing the valve either by hand or by mechanical means, special care should be taken not to damage the lever or gear operator. Lifting the valve casually may damage the valve components.

4. TOOL REQUIREMENT FOR LIFTING

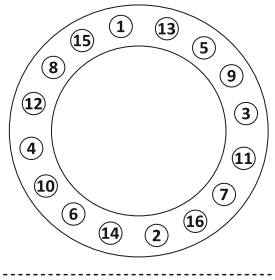
There are no special tools required for installation and maintenance that are not commercially available. Any lifting devices used to move the valve into a desired position shall be of sufficient size to support the weight of the valve and gear box assembly. Nylon slings secured around the valve bearing areas are recommended to reduce the possibility of mechanical damage occurring to the valve body and gear box. The assembly should never be lifted by the gear box.

5. INSTALLATION

- **Read** the **PRECAUTIONS** section carefully before installing the valve in line.
- When removing the valve from storage a careful check should be made to ensure that the valve has not been damage during the storage period. If for some unforeseen circumstances that the valves were soiled during transportation, the user must clean the valve prior to installation. The user may clean the valve by water, steam or pressurized air.
- Valve should be checked for identification purpose and ensure that characteristics of valve matches to those specified for piping specifications. For the line where that is to be mounted. Nameplate gives the necessary information.
- Make sure the pipeline and pipe flange faces are clean. Any foreign material such as pipe scale, metal chips, welding slag, welding rods etc., can obstruct ball movement or damage the ball or seat.
- The Valve should be thoroughly cleaned at flow passage, visible plug portions at port and top thread portions before installation. If necessary, apply oil to plug portions at body port keeping the valve in closed position and operate 2 to 3 times.
- When you are sure about that valve installing in centre then secure the valve between flanges. Compress the flange gasket **EVENLY** by tightening the fasteners in an alternating sequence (Refer to figure (b)).

NOTE : DO NOT fully tighten the flange fasteners initially.

Figure [b]
Bolt Tightening



CORRECT
Sequence for
Tightening / Untightening

6. MAINTENANCE

PERIODIC INSPECTION

- Annual inspection should be made to check up valve plug and PTFE sleeve. If worm or pitted, substitute new ones.
- It is recommended to replace the PTFE diaphragm, wedge ring and gland packing unless the parts are in very good condition.
- If the valve is leaking, tighten the adjuster screw uniformly so that the leak is arrested.

UNUSUAL CASE

- If something unusual is noticed, plugging or damage of sleeve can be suspected. in such a case, the plug must be removed and causes investigated.

PTFE SLEEVE

- In case the PTFE sleeve is damaged, The same is to be replaced. However it is recommended to sand the Body or valve to the manufacturer (aira) factory so the PTFE sleeve is fitted in to the body properly with Proper tools and care.

7. GEAR OPERATOR MOUNTING / SETTING PROCEDURE

1. Mount gear operator (Item 1) on top of Ball valve with bolts and washers provided with each assembly.
2. Loosen the stop screws and locking nuts (Item 2, 3 & 4) approximately three to four turns on both sides of the gear operator.
3. Rotate hand wheel to the full open position and tighten the “open” stop screw (Item 4). Now tighten the locking nut (Item 2).
4. Rotate hand wheel to the full closed position and tighten the “Closed” stop screw (Item 3). Now tighten the locking nut (Item 2).
5. Open disc to 20% then back to closed position. Re-adjust stop screw and nut (Item 3) if necessary. You have now properly adjusted both the “Open” and “Closed” stop positions.

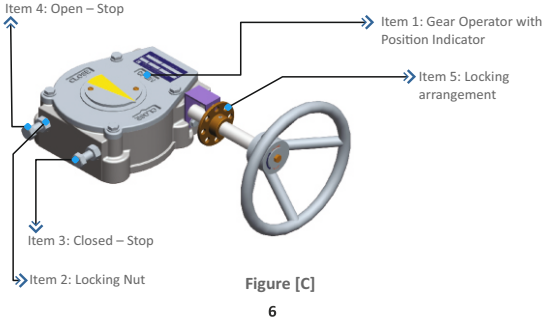


Figure [C]