

Installation Guidelines

Introduction

This instruction provides general guidelines for

- diaphragm valve installation
- diaphragm replacement, and
- travel stop adjustment.

Follow the safety precautions below when storing, installing, or operating the diaphragm valve.

Definitions

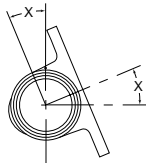
⚠ This symbol indicates information to avoid a potential hazardous situation that may be encountered during use of the product. Failure to follow the instructions may result in injury to person or property.

Transportation and Storage

- Store assembled valves in the "open" position, whenever possible.
- Store valves indoors, if possible, in a clean and dry environment.

Drainability

- The valve drain angle (X) is marked on all standard valve products. To ensure proper drainability, the valve must be mounted with the bonnet at the correct angle.
- For valves with hash marks on the body, mount the valve so that the hash marks are at the 12 o'clock position.
- Proper drainability also requires that the piping be appropriately sloped. This is the responsibility of the system installer and user.



Welding

- **All welding should be done by qualified personnel.**
 1. Disassemble the actuator assembly from the valve body. See **Replacing the Diaphragm** for details.
 2. Perform the welding procedure on the body according to standard industrial practices.
 3. Reassemble the actuator assembly to the valve body. See **Replacing the Diaphragm** for details.
 4. Test the valve for proper function and operation.

Diaphragm Maintenance

Generally, the only routine maintenance required for the diaphragm valve is replacement of the diaphragm.

Diaphragm Replacement Routine

Determine the optimum change cycle. This will be influenced by the line media, including pressure, temperature, and the frequency (duration and temperature) of the steam sterilization between process runs.

Replacing the Diaphragm

- ⚠ Before servicing any installed valve you must**
- **depressurize the system**
 - **cycle the valve**
 - **purge the valve.**

Note: Generally, the diaphragm can be replaced without removing the valve body from the system.

1. Actuate the valve to the open position:
 - for spring-to-close and double-acting actuators, apply air pressure to the *lower* actuator port.
 - for spring-to-open actuators, relieve the air pressure to the *upper* actuator port.
 - for manual actuators, rotate the handwheel counterclockwise until the valve is fully opened.
2. Remove the body fasteners in a cross pattern sequence.
3. Actuate the valve to the closed position:
 - for spring-to-close assemblies, relieve the air pressure to the *lower* actuator port.
 - for spring-to-open and double-acting assemblies, apply air pressure to the *upper* actuator port.
 - for manual assemblies, rotate the handwheel clockwise until the valve is fully closed.
4. Remove the diaphragm from the pneumatic actuator or manual bonnet:

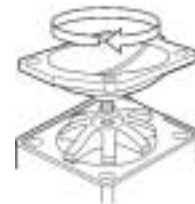
Threaded-stud connection: unthread the diaphragm in a counterclockwise direction.

Bayonet connection: rotate the diaphragm 90° and remove.

5. Check and clean the diaphragm connection threads or recess in the actuator or bonnet.
6. Make sure the new diaphragm and the diaphragm contact areas on the valve body are clean and dry.
7. Make sure the actuator or bonnet connection interface matches the attachment method of the diaphragm to be used.
8. With the actuator or bonnet in the closed position, install the diaphragm as follows:

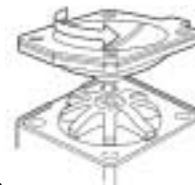
Threaded-stud connection

- Thread the diaphragm into the actuator or bonnet connection point in a clockwise direction to the finger-tight position. Do not overtighten.
- Then turn the diaphragm in a counterclockwise direction until the diaphragm holes align with actuator holes.



Bayonet connection

- Align the bayonet connection on the diaphragm with the slots in the actuator or bonnet connection point.
- Install the bayonet into the connection point recess and rotate the diaphragm until the diaphragm holes align with the actuator holes.



9. Actuate the valve to the open position. See step 1.
10. Align the actuator or bonnet assembly to the valve body and install the body fasteners, washers, and nuts. Hand tighten the fasteners/nuts to secure the actuator or bonnet to the valve.
11. Tighten the fasteners/nuts to the point where the actuator cannot move perpendicular to the body but can still move slightly in parallel with the body, within the clearance of the body bolt holes.

Replacing the Diaphragm

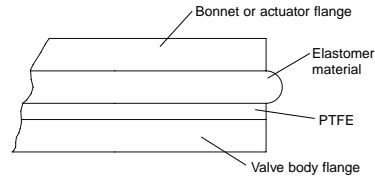
continued

12. Actuate the valve to the closed position. See step 3.
13. Confirm that the bonnet and diaphragm assembly is centered with the valve body. Adjust slightly as required.
14. Tighten the fasteners/nuts uniformly in a cross pattern until the diaphragm's black **elastomer material** is uniformly compressed and is slightly extruded beyond the **bonnet or actuator flange** and the **valve body's flange**.

Note: For manual bonnets with travel stops see **Travel Stop Adjustment**, steps 3 through 10. For all other manual bonnets and pneumatic actuators continue to step 15 in this section.

15. Actuate the valve to the open position. See step 1.
16. Re-tighten the fasteners/nuts of the valve assembly. See step 14.
17. Test the valve for proper function and operation.

Note: Check the fastener torque 24 hours after the valve has reached operating pressure and temperature, and retighten the fasteners as necessary. If leakage occurs at the body seal, immediately depressurize the system and tighten the fasteners as described. If leakage persists, replace the diaphragm. The travel stop must be checked and adjusted as necessary.



Travel Stop Adjustment

⚠ Before servicing any installed valve you must

- depressurize the system
- cycle the valve
- purge the valve.

1. Make sure the bonnet and diaphragm are properly installed before adjusting the travel stop. See **Replacing the Diaphragm** for details.
2. Actuate the valve to the closed position by rotating the **handwheel** clockwise until the valve is fully closed.
3. Using a small, flat-blade screwdriver, remove the **plug** from the top of the handwheel.
4. Using a 4 mm hex wrench, remove the **handwheel lock screw** and **washer** that attach the handwheel to the **stem**.
5. Remove the handwheel by pulling it straight off.
6. Using a 2.5 mm hex wrench, loosen the two **set screws** on the adjustment nut enough to permit the nut to rotate on the stem threads.
7. Remove the **adjustment nut** from the stem by turning it counterclockwise.
8. Verify the valve is fully closed by using an adjustable wrench to turn the stem clockwise until the diaphragm is seated fully.

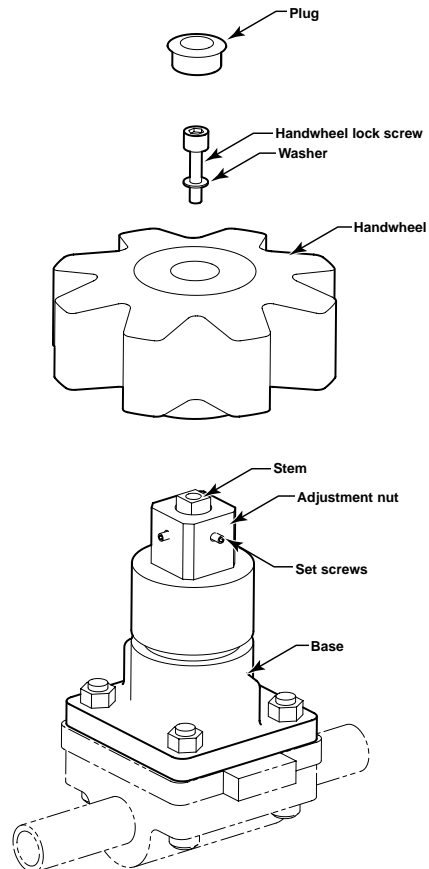
Note: Do not overtighten.

9. Reinstall the adjustment nut by turning clockwise until it seats onto the **base**, metal-to-metal.
10. Tighten the two set screws to the nearest flats of the stem.

Note: This may require a slight rotation back or counterclockwise, to align the "nearest" flats.

11. Replace the handwheel, lock screw, washer, and plug. Tighten firmly.
12. Test the valve for proper function and operation. If the valve does not achieve a leaktight seal when fully closed, repeat steps 1 to 11, with slightly more tightening of the stem as described in step 8.

Note: Operating temperature may affect PTFE diaphragm sealing. After bringing the valve to operating temperature, close fully and check for proper sealing.



Caution: Do not mix or interchange parts with those of other manufacturers.

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