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I & M Mark 96A Series

Installation & Maintenance Instructions for MK96A Sanitary Pressure Regulators

Warning: Steriflow Sanitary Pressure Regulators must only be used, installed and repaired in accordance with these Installation & Maintenance Instructions. Observe all applicable public and company codes and regulations. In the event of leakage or other malfunction, call a qualified service person; continued operation may cause system failure or a general hazard. Before servicing any valve, disconnect, shut off, or bypass all pressurized fluid. Before disassembling a valve, be sure to release all spring tension.

Please read these instructions carefully!

Your Steriflow product will provide you with long, trouble-free service if it is correctly installed and maintained. Spending a few minutes now reading these instructions can save hours of trouble and downtime later. When making repairs, use only genuine Jordan Valve parts, available for immediate shipment from the factory.

Introduction

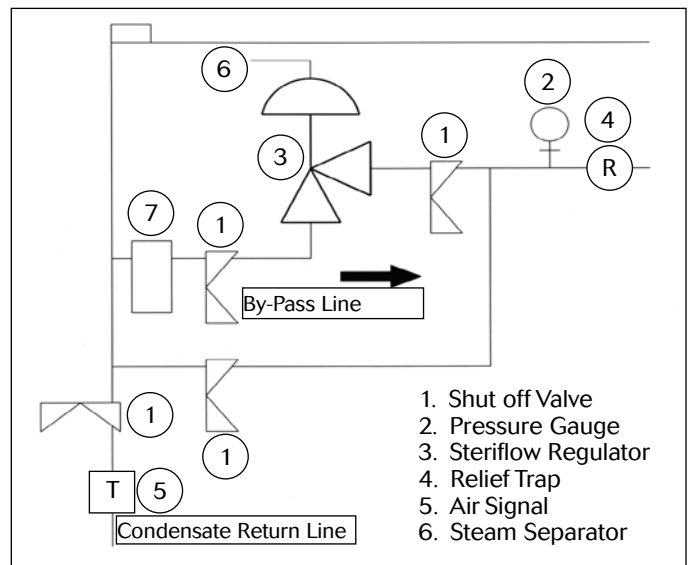
The MK96A is an air loaded sanitary pressure regulating valve (PRV) remote operated. Traditional sanitary PRV's are normally operated and have an adjustment knob that adds or subtracts tension to a spring. The spring sits on a platform on top of a diaphragm that is connected to a stem and valve plug. The opposite, wetted side of the diaphragm is exposed to the outlet side of the valve (downstream pressure). Increasing the tension on the spring moves the diaphragm and stem in the opening direction, conversely increasing the downstream pressure required to close the valve. Stated another way, increasing the spring tension, increases the valve's outlet pressure set point; and decreasing the spring tension, decreases the set point pressure.

The typical sanitary PRV installation location is several feet above grade (clean steam tubing), not easily accessible because of obstructions, or is inaccessible because of it's location in a manufacturing suite. Adjustment of a manual regulator is time consuming, or nearly impossible in these installations, *The MK96A was invented to solve this access problem. It uses a remote mounted, adjustable air pressure source instead of a manually adjusted spring to apply force to the diaphragm stem and plug. Increasing the air pressure on top of the diaphragm, increase the valve's outlet set point pressure, and decreasing the pressure, lowers the outlet pressure set point.*

To enable the valve's operation and adjustment, an air line is connected to the 1/4" air inlet (22) and an air regulator* (remotely installed at grade) is used to adjust the MK96A set point. Alternatively, the MK96A is also offered with an I/P option, allowing the user to remotely drive the air pressure with a 4-20 mA signal from distributed control system (DCS) or PLC logic.

* air regulator must be a self-relieving type

MK96A Ideal Installation



1. The valve is designed for sanitary service and it is assumed that it will be installed into a clean tubing system. Under these conditions, special considerations to protect the valve such as providing line strainers at the valve inlet are not necessary.
2. The regulator should be installed with the inlet (bottom of valve) vertical and the outlet horizontal. This orientation allows unhindered drainage (zero holdup). Please note the valve will function in any position. Contact factory for other possible orientations.
3. Steam regulators are best located at the highest point in the piping with the take-off out of the top of the steam header. This will minimize the possibility of retained water in the regulators flow stream.
4. For best control, 3' 0" straight sections of pipe should be installed on either side of the regulator to insure a non-turbulent flow profile.
5. Use caution in tightening commercial sanitary fittings. Over-tightening can cause the gasket to extrude into the flow passage.
6. If possible, install a relief valve downstream from the regulator. Set at about 30% above the control point of the regulator.
7. In gas or vapor service, select outlet piping that is at least one pipe size larger than the inlet.

8. Operate the regulator within its pressure and temperature rating as stamped on the valve nameplate.
9. If using an air regulator with your MK96A, install a 1/4" tube fitting into the 1/4" FNPT air inlet (22) on the top of the MK96A. Connect an appropriate length of 1/4" tubing (following local best practice) to the tube fitting and connect the other end to the air pressure regulator at an accessible grade location. Follow the instructions that come with your air regulator for proper installation, operation and maintenance.
10. If using an I/P with your MK96A, connect the I/P air outlet directly to the MK96A inlet using a threaded Hex nipple and connect the air line to a tube fitting on the I/P inlet connection. Note: Follow local electrical code classifications and best practice, and make sure the I/P you have selected has the proper NEMA or IS rating classification. If not, an alternative might be to locate the I/P in the nearest Instrumentation/Electrical cabinet with the proper classification. Regardless, make sure you follow the installation, operation and maintenance instructions that come with your I/P, and follow all local best practices, and electrical codes with regard to wiring and commissioning.

Start-Up

1. Fully open the process line block valve downstream of the regulator using manual air load regulator.
2. Slowly open the inlet block valve at the regulator inlet.
3. Slowly open and close the downstream block valve several times; this will stroke the valve and confirm satisfactory operation.
4. With both block valves open, slowly increase the airload regulator's air signal to increase downstream pressure until it reaches the desired MK96A value.
5. If using an air regulator with your MK96A, follow steps 1-3 above. With both block valves open, slowly increase the dome air signal by adjusting the air regulator knob (following adjustment instructions in air regulator installation manual) until the process pressure downstream of the MK96A reaches the desired value. Record the air regulator set point in appropriate documents, or in the control system information database.
6. If using an I/P with your MK96A, follow steps 1-3 above. With both block valves open, slowly increase the dome air pressure to the MK96A inlet by driving the I/P's mA input to a value that produces the desired MK96A outlet pressure. Record the mA set point value for the PLC, or DCS programmer in the proper document or in the control system information database. Note: Most DCS or PLC HMI programs allow for manual override of an output signal (manually adjust 4-20 mA output). If that is not possible, the I/P wiring (most are two wire devices) can be disconnected, and a process loop calibrator can

be used to artificially drive the I/P to the desired output.

Maintenance

Caution: Make certain that there is no pressure in the valve before loosening any fittings or joints. The following steps are recommended:

1. Close the regulator inlet block valve.
2. Allow pressure to bleed off through downstream piping. Do not attempt to reverse the flow through the valve by bleeding pressure from the regulator outlet to the inlet side.
3. When the upstream and downstream pressure gauges indicate that all pressure has been removed from the system, remove the airload or disconnect the I/P following the devices maintenance manual. The valve can now be serviced.

Note: Refer to the drawing at the end of this document for description and proper orientation of parts.

Clean-In-Place / Steam-In-Place

To perform this procedure, the valve is held in the open position by applying an air load greater than the CIP/SIP pressure.

Disassembling the Valve

1. Insure that the valve is not pressurized by following the Caution at the beginning on the *Maintenance* section.
2. Remove the airload.
3. Remove the actuator (4) by removing the hex bolts (17).
4. Remove the hex jam nut (16), cylinder (14) and lockwasher (15). Caution- beware of spring compression.
5. Remove the spring and adapter (3).
6. Remove the spacer (11), upper diaphragm plate (10), and diaphragm (9) from the stem (5). Remove the lower diaphragm plate (8) and o-rings (19), (20) where applicable.
7. Remove the stem (5) from the bottom (inlet) of the body (1).

Preparing the Valve for Assembly

- All parts should be cleaned and examined. Damaged parts should be replaced.
- All O-rings should be lubricated with any lubricant that is compatible with both your process and the o-ring material.
- EPDM o-rings must not be exposed to mineral oil as it will cause them to swell and make them difficult to install.

- For soft seated valves: clean threads on the stem (5) and on the retainer (7), and apply Loctite primer 7649 and sealant below, following Loctite's instructions. Allow to dry. Install new soft seat (6) on retainer (or onto stem when application on low flow versions). Apply Loctite Sealant 2640 to threads and thread the retainer (7) onto the stem (5). Tighten until the screw threads bottom out. Allow to cure.

Assembling the Valve

1. Install stem (5) into the body (1).
2. Lubricate o-ring (19) and install into the groove on the stem (5). Install lower diaphragm plate (8) onto the stem (5). Lubricate o-ring (20) if so required and install into the groove in the lower diaphragm plate (8).
3. Install diaphragm (9) onto stem (5).
4. Install upper diaphragm plate (10) onto stem (5).
5. Install spacer (11) onto stem (5).
6. Center diaphragm (9) onto body (1). Install adapter (3) onto body (1). The adapter (3) should engage the pilot diameter on the body (1). Lubricate o-ring (21) and install into groove on adapter (3).
7. Install the spring (18) and lockwasher (15) onto the stem (5).
8. Install cylinder (14) onto stem (5).
9. Install hex jam nut (16) onto stem (5) and tighten; apply Loctite Primer 7649 and Sealant 2640 (following Loctite's instructions) to the threads to lock joint.
10. Secure actuator (4) to the body (1). Hand tighten the hex bolts (17).
11. Torque hex bolts (17) to 200 in-pounds (17 foot pounds).

Troubleshooting

If You Experience Erratic Control:

- Oversizing causes cycling and hunting, and reduces the rangeability of the valve. Make certain that your sizing is correct.
- Steam traps may require maintenance.
- Safety valve may be defective.
- Valve seat in MK 96A may be defective – Inspect for damage and replace stem (5) and/or body (1) if necessary.
- Valve plug in Mark 96A may not be moving freely. Inspect bushing (12) and replace if required.

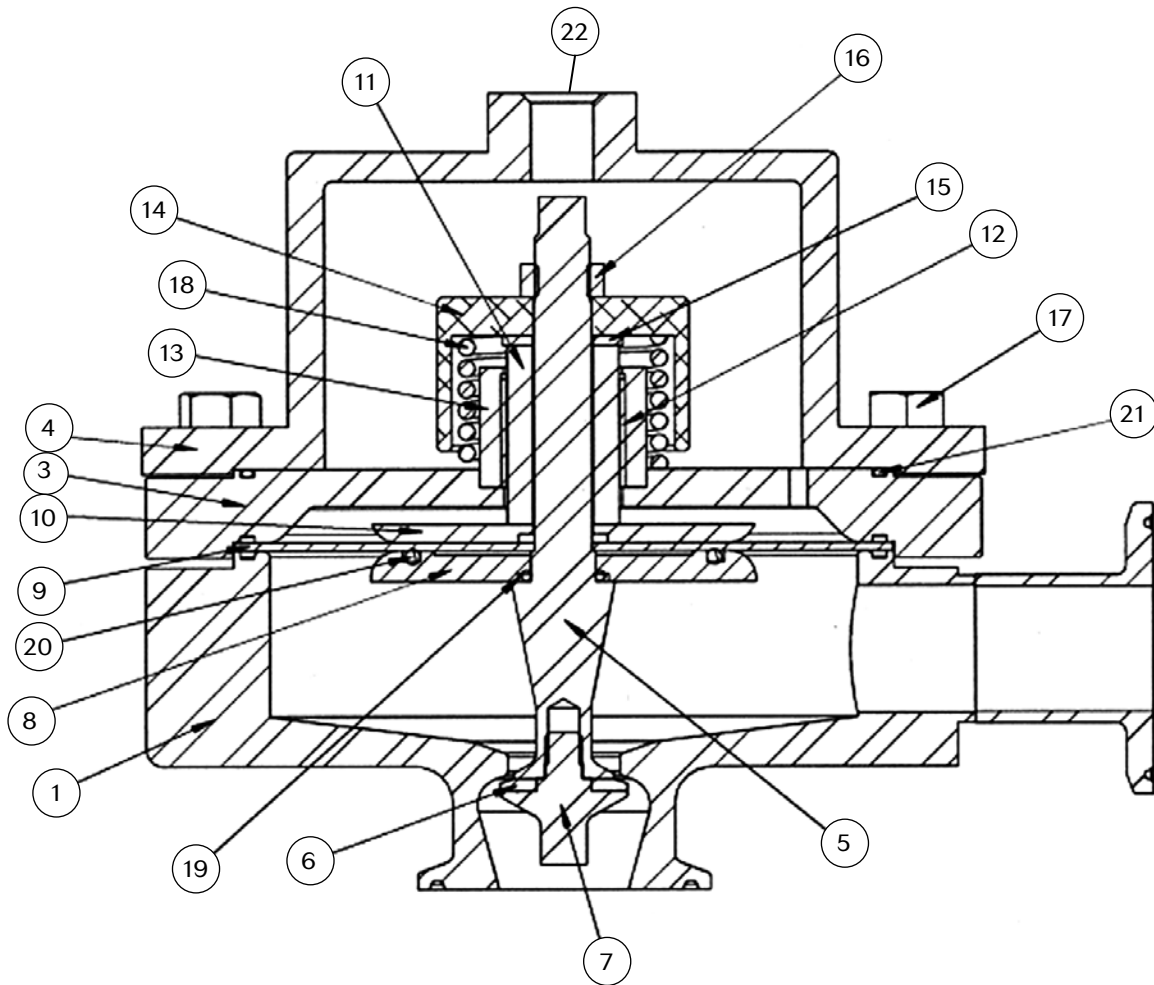
If You Experience Downstream Pressure Build-Up:

- Valve seat in Mark 96A may be defective – replace stem (5) and/or body (1).
- Valve plug in Mark 96A may not be moving freely. Inspect bushing (12) and replace is required.
- Diaphragm (9) in Mark 96A may have failed; replace diaphragm if necessary.

If You Cannot Maintain Regulated Pressure:

- Piping may be blocked or inadequately sized.
- Inlet pressure may be set too low.
- Airload may be too low; check setting.
- Valve may be undersized for required flow; make certain that your sizing is correct.

Illustration and Parts List



Item	Description	Qty.	Item	Description	Qty.
1	Body	1	13	Gland	1
3	Adapter	1	14	Cylinder	1
4	Actuator	1	15	Washer	1
5	Stem	1	16	Jam Nut	1
6	Seat	1	17	Bolt	8
7	Seat Retainer	1	18	Spring	1
8	Lower Diaphragm Plate	1	19	O-Ring, Stem	1
9	Diaphragm	1	20	O-Ring, Lower Diaphragm Plate	1
10	Upper Diaphragm Plate	1	21	O-Ring, Adapter	1
11	Spacer	1	22	1/4" NPT Air Inlet	1
12	Bushing	1			