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## I & M Mark 695X Series

Installation & Maintenance Instructions for the  
 Mark 695X Tank Blanketing Regulator

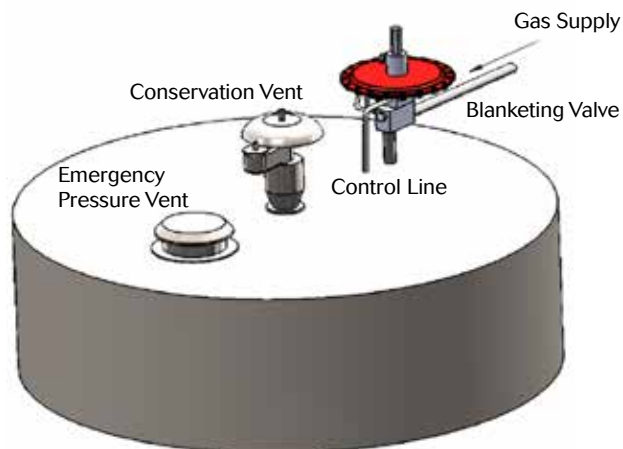
**Warning:** Jordan Valve Pressure Regulators must only be used, installed and repaired in accordance with these Installation & Maintenance Instructions. Observe all applicable public and company codes and regulations. In the event of leakage or other malfunction, call a qualified service person; continued 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 Jordan Valve 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.

### Ideal Installation



1. To protect the valve from grit, scale, thread chips and other foreign matter, ALL pipelines and piping components should be blown out and thoroughly cleaned before the installation process begins.
2. Shutoff valves, pressure gauges and by-pass piping are optional, and if installed should be in accordance with all applicable codes, standards, and practices. They are recommended to provide easier adjustment, operation, and testing.
3. The flow arrow on the valve body must be pointed in the direction of flow. Ideally, the valve should be installed in the highest horizontal line of piping.
4. Install the relief valve on the tank. Set above the control point of the valve but below the maximum safety limit for the tank.

5. It is strongly recommended that the installer read and be thoroughly familiar with API 2000, Standard Information for Tank Blanketing Regulator Selection before installing and attempting to operate this product.

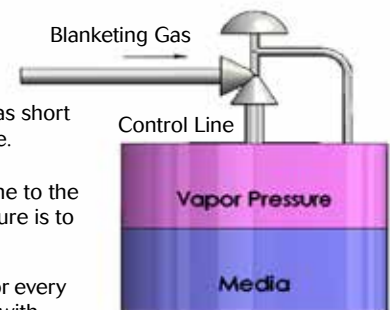
### Control Line

A control line must be installed as follows:

1. Connect one end of a 1/2" NPS pipe to the fitting on the bottom of the main valve actuator.
2. Connect the other end to an appropriate fitting on the tank.
3. DO NOT locate the control line tap in any location where turbulence or abnormal velocities may occur.
4. The control line should be sloped away from the valve.
5. Install a pressure gauge to measure pressure in the tank itself, not in the outlet piping or the control line to aid in setting the valve.

Control line should slope downward toward the tank to prevent condensation buildup.

1. Make the control line as short and straight as possible.
2. Connect the control line to the point where the pressure is to be controlled.
3. Increase 1 pipe size for every 10 feet of control line, with setpoints less than 5" w.c. (0,012 bar).



### Control Line Piping Recommendation

- Keep the regulator as close to the tank as possible and as high as possible.
- Minimize the length of the downstream pipe coming from the valve.

- NEVER reduce the pipe size on the valve outlet to the tank. This line must always be as large as the valve size, or one pipe size larger to assure it does not act as a restriction.
- Any downstream isolation valve after the regulator must be a full port type. The isolation valve cannot act as a restriction.
- The sensing line must be a minimum of 3/8" tube.
- A sensing line isolation valve is recommended Again, must be full ported.
- Slope the sensing line to the sensing port on the tank.
- Keep the sensing line as short and straight as possible.
- For each 10 feet of sensing line, increase the tube by 1/8". (Especially important on the blanket pressures of less than 5 inches of water column).
- Keep the sensing port on the tank as far removed as possible from the downstream pipe outlet going into the tank.

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## Start-Up

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With the inlet, and bypass shutoff valves closed, and no pressure in the downstream line:

1. Slowly open the inlet valve just enough to start flow through the valve. Observe the tank pressure gauge. Increase the downstream pressure slowly by gradually opening the inlet valve.
2. Do not fully open the inlet valve until you are sure that the regulator has control of the system. Usually, the handwheel on the inlet valve will turn freely when this is achieved.
3. To change the controlled pressure, adjust the set screw (34), and secure with the jam nut (35), and the closing cap (33).

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## Trouble Shooting

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The first step in troubleshooting a piloted pressure regulator is to classify the action of the controlled pressure into one of the following categories:

- A. Under Pressure: Controlled pressure too low; not enough flow or no flow through valve.
- B. Over Pressure: Valve will not close or controlled pressure increases after valve closes.
- C. Pressure Fluctuates: Controlled pressure rises and falls, will not settle out under low loads.

The next step is to determine what could cause the trouble. The third step is to locate and remedy the cause by the process of elimination. Make no assumptions and check the easy ones first. The guide below lists the controlled pressure action, common causes and procedure for checking each cause.

### Controlled pressure action UNDER PRESSURE:

- Valve undersized for application. Check capacity required and valve capacity. As described in API-2000.
- Line strainer screen clogged. Blow down strainers or visually check that they are clear.
- Incorrect setting on range spring. Vary the setting and check response.
- Main valve diaphragm or balance diaphragm ruptured. See section on valve maintenance.
- Malfunction of other piping components. Check for leaking safety valves, inadvertently opened or closed valves.

### Controlled pressure action OVER PRESSURE:

- Incorrect setting on range spring. Vary the setting and check response.
- Main valve seats leaking. Close inlet shut-off valve, allow downstream pressure to bleed off, close outlet valve and remove loading pressure tubing. Back out adjusting screw on valve until free. Crack open inlet shut-off valve - if the fluid issues from the main valve port, the main valve seats are leaking.
- By-pass shut-off leaking. During period of leakage close outlet shut-off valve, observe downstream pressure gauge
- Under certain circumstances, the vent valve may be open when the tank is not being filled. This may not be caused by an inability to control or seat leakage. The tank may be "outbreathing" due to increases in the temperature of the gas or contents inside the tank.

### Controlled Pressure Fluctuates:

- Valve oversized. Check capacity required and valve capacity per API 2000.

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## Main Valve

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**Note: All work to the main valve can be accomplished in-line. The only reason to remove the valve is if the location makes it too difficult to work on the regulator.**

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## Section I - Diaphragm Replacement

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**Parts Required for this operation:** seal washer (22), diaphragm (17), two actuator case gaskets (16), and closing cap 2-018 o-ring (32).

1. Remove closing cap (33). Remove and discard closing cap o-ring (32).
2. Mark position of adjusting screw (34) where it meets the jam nut (35).
3. Slightly loosen the jam nut (35) and remove the adjusting screw (34), leaving the jam nut in position.
4. Remove actuator case bolts and washers (25)(26) (27). Remove upper actuator case assembly (24).
5. Remove the upper spring guide (29) and range spring (28). Remove the diaphragm assembly (18).
6. Remove and discard the upper and lower actuator case gaskets (16).
7. Remove the diaphragm retaining nut (20) from the diaphragm assembly. Remove the upper diaphragm plate (18), diaphragm (17), lower diaphragm plate (19), and discard the seal washer (22).

If replacing only the diaphragm, reassemble in reverse order using new replacement parts. If replacing internal seals or other parts, continue to Section II below.

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## Section II - Internal Seal Replacement

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**Parts Required for this operation:** Jordan Valve seal kit consisting of the following parts: teflon lower case gasket (6), pilot upper cage 2-122 o-ring (9), two pilot body inner 2-128 o-rings (11), pilot plug 2-111 o-ring (10), diaphragm balance (8), four threadseal washers (14).

1. Remove and discard the upper and lower actuator case gaskets (16).
2. Remove four HHCS (15) and discard threadseal washers (14). Remove the lower case (13).
3. Remove and discard the teflon lower case gasket (6). Remove and discard the pilot upper cage o-ring (9).
4. Firmly grasp the stem of the pilot plug (5) and pull the pilot upper cage (4) out of the main body (1). Remove the pilot plug return spring (7) and the pilot lower cage (2) from the main body (1).
5. Remove the pilot plug assembly (5)(8)(3) from the pilot upper cage.
6. Remove and discard the two pilot body inner o-rings (11).
7. Retrieve the pilot plug assembly (4)(17)(30) from step 4 above. Separate the components and discard the diaphragm balance (8).
8. Rebuild the pilot plug assembly using a new diaphragm balance from the repair kit. Make sure the

“bead” on the diaphragm balance faces the pilot piston (3) as shown in Detail ‘A’ on the parts diagram. Install the new the pilot plug o-ring (10) onto the pilot plug (5).

9. Lubricate and install the two new pilot body inner o-rings (11).
10. Place the pilot lower cage (2) back into the main body bore. Place the pilot return spring (7) into the pilot lower cage (2).
11. Place the pilot plug assembly into the pilot lower cage, making sure the “bead” on the diaphragm balance goes into the groove on the top of the pilot lower cage (2).
12. Install the pilot upper cage (4) into the main body (1), making sure the stem of the pilot plug (5) is visible through the top of the pilot upper cage. Install a new pilot upper cage o-ring (9).
13. Replace the teflon lower case gasket (6), and place the lower case (13) onto the top of the teflon lower case gasket. Secure the lower case to the main body with four HHCS (15) and four new threadseal washers (14).

Return to Section I above and reassemble in reverse order.

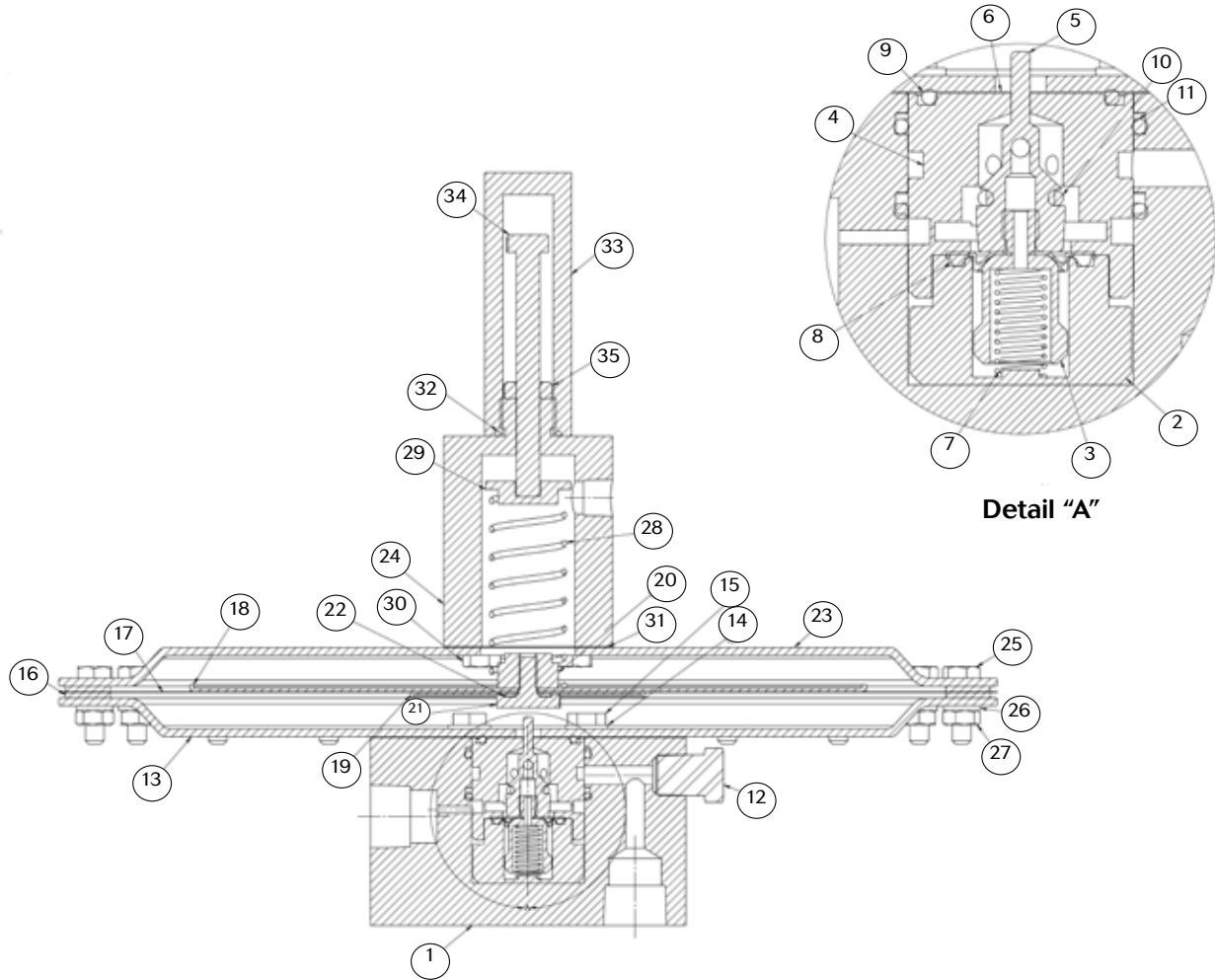
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## Section III - Filter/Dripwell Maintenance (if equipped)

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Please refer to the documentation for the filter/dripwell that was supplied with your valve for periodic recommended maintenance of this accessory.

## Illustration and Parts List



Item	Description	Qty.	Item	Description	Qty.
1	Main Body	1	19	Lower Diaphragm Plate	1
2	Pilot Lower Cage	1	20	Diaphragm Retaining Nut	1
3	Pilot Piston	1	21	Diaphragm Retainer	1
4	Pilot Upper Cage	1	22	Fastener Seal (Diaphragm Retainer)	1
5	Pilot Plug	1	23	Actuator Case (Upper)	1
6	Lower Case Gasket	1	24	Spring Housing	1
7	Pilot Return Spring, #358	1	25	HHCS 1/4 - 20 x 7/8"	20
8	Diaphragm Balance	1	26	1/4" Lockwasher	20
9	O-Ring, #122	1	27	Hex Nut 1/4 - 20	20
10	O-Ring, #111	1	28	Range Spring	1
11	O-Ring, #128	2	29	Upper Spring Guide	1
12	1/4" Hex Pipe Plug	1	30	HHCS 1/4 - 20 x 5/8"	4
13	Actuator Case (Lower)	1	31	Spring Housing Gasket	1
14	1/4" Parker Threadseal	4	32	O-Ring, #018	1
15	HHCS 1/4 - 20 x 1"	4	33	Closing Cap	1
16	Actuator Case Gasket	2	34	Adjusting Screw	1
17	Diaphragm PFA	1	35	Jam Nut 5/16 - 18	1
18	Upper Diaphragm Plate	1			