



3170 Wasson Road • Cincinnati, OH 45209 USA  
Phone 513-533-5600 • Fax 513-871-0105  
E-Mail: info@richardsind.com • www.jordanvalve.com

# I & M 601/602

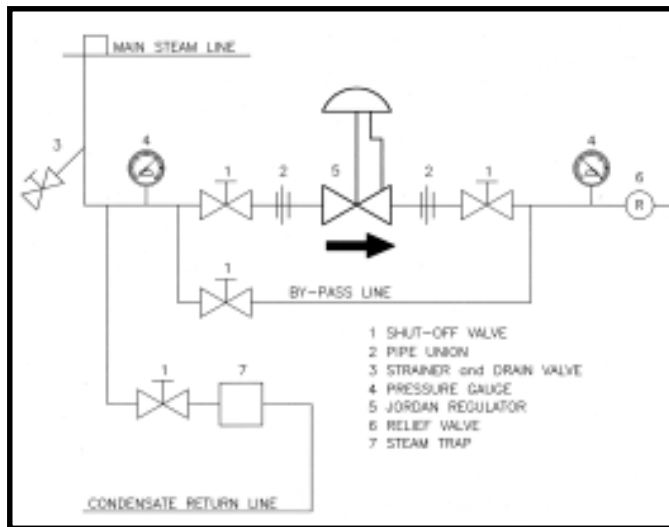
## Installation & Maintenance Instructions for Mark 601/602 High Flow Pressure Regulators

**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 Schematic



## Valve Installation

1. To protect the regulator from grit, scale, thread chips and other foreign matter, all pipe lines and piping should be blown out and thoroughly cleaned before the regulator is installed.
2. Shutoff valves, pressure gauges and bypass piping should be installed as indicated in the diagram to provide easier adjustment, operation, and testing.
3. In preparing threaded pipe connections, care should be exercised to prevent pipe sealing compound from getting into the pipe lines. Pipe sealing compound should be used sparingly, leaving the two lead threads clean.
4. **A line strainer should be installed on the inlet side of the regulator to protect it from grit, scale and other foreign matter. A .033 perforated screen is usually suitable. Line strainers are available for immediate shipment from Jordan Valve.**

5. Install the regulator in the highest horizontal line of piping to provide drainage for inlet and outlet piping, to prevent water hammer and to obtain faster regulation.
6. The flow arrow on the regulator body must be pointed in the direction of flow. The regulator may be installed vertically or horizontally without affecting its operation.
7. For best control, 3'-0" straight sections of pipe should be installed on either side of the regulator.
8. In hot vapor lines, upstream and downstream piping near the regulator should be insulated to minimize condensation.
9. If possible, install a relief valve downstream from the regulator. Set at 15 psi above the control point of the regulator.
10. Expand the outlet piping at least one pipe size if the controlled pressure (downstream) is 25% of the inlet pressure or less. A standard tapered expander connected to the outlet of the regulator is recommended.
11. Where surges are severe, a piping accumulator is recommended.

## Start-Up

With the inlet and outlet shutoff valves closed:

1. Throttle the bypass valve so that the pressure to be controlled is maintained near the set point.
2. Slowly open the inlet shutoff valve.
3. Open the outlet shutoff valve.
4. Slowly close the bypass valve, but do not close it fully until you are certain that the regulator has control of the system.
5. To change the controlled pressure, turn the adjusting screw clockwise to increase pressure, counterclockwise to decrease pressure.
6. Body and cap bolts should be retightened per torque procedures after valve reaches operating temperature.

## 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 inlet shutoff 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 upstream side of the valve.
3. When the pressure gauges indicate that all pressure has been removed from the system, close the outlet shutoff valve, and the valve may be serviced.

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

---

## Valve Seats

---

### A. Disassembly

The seats of Jordan regulators are precision-lapped. Maintaining such tolerances is of paramount importance for your assurance of excellent control and tight shutoff. Do not use metallic objects in removing the seats. Care in handling is imperative.

1. Close shutoff valve on each side of the regulator.
2. Remove the regulator from the line.
3. Secure the body hex in a vise. Remove the cap bolts (3) and lift the cap (2) straight up.
4. Remove the pressure ring (9). Remove the disc and plate assembly (8/7) by lifting the assembly straight up from the valve body. Place the assembly on the bench with the disc (8) up.

It is imperative that the disc pin assembly is not rotated when disassembling, cleaning or reassembling, since this affects the stroke adjustment of the valve.

5. Clean the plate seat with fine emery cloth. Clean the body and cap cores with a good quality solvent.
6. To clean the disc and plate, remove the guide screws (10). Place 4/0 polishing cloth or jeweler's cloth on a smooth, flat surface and polish the lapped surfaces of the disc and plate. If these parts are scarred, do not attempt to relap them, but return them to Jordan Valve for repair or replacement. The pressure ring (9) may be polished in the same manner.

### B. Reassembly

1. Place the disc on the plate and replace the guide screws. Tighten the guide screws but do not allow the screws to bind the disc against the plate.
2. Replace the disc and plate assembly and the pressure ring. Make sure that the disc pin (4) engages the disc, and that the plate seats solidly against the plate seat in the body.
3. With the adjusting screw (19) compressing the range spring (16), check the orifice alignment of the disc and plate. The orifices must be fully open and in perfect alignment. If the orifices are not aligned, the disc pin (4) has probably been rotated. Remove the disc and plate assembly and rotate the disc pin to raise it or lower it for proper alignment.
4. If further adjustment of the disc pin does not provide perfect alignment, proceed to "Valve Stroke Adjustment".
5. Once the orifices in the plate and disc are properly aligned, place a straight edge across the body bolt holes on the horizontal center line of the valve (perpendicular to the valve movement.) Gently rotate the disc and plate assembly until the edges of the orifice slots are parallel to the straight edge and replace the cap, being careful not to rotate the disc and plate assembly.
6. Replace the cap and cap bolts, and tighten uniformly being careful not to torque excessively. See recommended torque values later in this document.

---

## Diaphragm Replacement

---

### A. Disassembly

1. In removing the diaphragm (12), you must first remove the valve disc and valve plate. This is outlined under "Valve Seats" in the previous section.
2. Remove the compression of the adjusting spring by rotating the adjusting screw counterclockwise.
3. Remove the spring housing screws (15) and spring housing (14). Remove adjusting spring (16) and spring seat (17).
4. Hold the disc pin with an open end wrench and remove the diaphragm assembly by rotating counterclockwise. The diaphragm assembly consists of the upper diaphragm plate (13), diaphragm (12) and lower diaphragm plate (11).
5. If the diaphragm must be replaced, secure the upper diaphragm plate in the vise. A face spanner wrench should be used to remove the lower diaphragm plate from the assembly. If a face spanner wrench is not available, use a punch and hammer, but make certain to remove all burrs prior to reassembling.
6. Remove the diaphragm and replace in reverse order.

### B. Assembly and Stroke Adjustment

1. In assembly, note that the valve stroke adjustment is determined by how far the diaphragm assembly is screwed onto the stem. Holding the disc pin with an open end wrench, screw the diaphragm assembly onto the valve stem until the disc pin is centered in the valve body.
2. Place the valve plate and the valve disc in the valve body, using the same precautions as outlined under "Valve Seats".
3. Push the diaphragm assembly down against the valve body and check the orifice alignment of the disc and plate. The orifices should be fully open and in perfect alignment.
4. If the orifices are not in perfect alignment, rotate the diaphragm assembly counterclockwise to lower the valve disc, and clockwise to raise the valve disc.
5. The total stroke of the Mark 601/602 PRV is equal to the orifice width plus 1/32" overlap. Consequently, perfect adjustment is required for proper operation.
6. After proper adjustment has been obtained, remove the valve plate and valve disc to eliminate the possibility of damage during topworks reassembly.
7. Place adjusting spring and spring seat on the upper diaphragm plate.
8. Before replacing the spring housing, make certain that the diaphragm is centered in the body recess. This same recess aligns the spring housing.
9. In replacing the spring housing, make certain that it seats properly in this recess.
10. Replace the spring housing screws and tighten **only finger-tight**. Thread the adjusting screw into spring housing until the seats are in their fully open position. Tighten the spring housing screws to torque values shown later in this document.
11. Replace seats, pressuring ring, and cap.

---

## Disc Pin

---

1. Remove the valve disc and the valve plate, following the procedure outlined under "Valve Seats" on the preceding page.
2. Remove the diaphragm as outlined under "Diaphragm Replacement" on the preceding page.
3. Holding the disc pin assembly with an open end wrench, loosen the locknut (6). The stem can now be unscrewed from the disc pin and removed.
4. Remove the disc pin and locknut.
5. Check the condition and clean all parts. Clean the lower guide hole in the valve body and replace defective parts.
6. Reassemble in reverse order and follow the procedures outlined under "Diaphragm Replacement" and "Valve Seats" for proper adjustment. When reassembling, thread the stem fully into the disc pin.

---

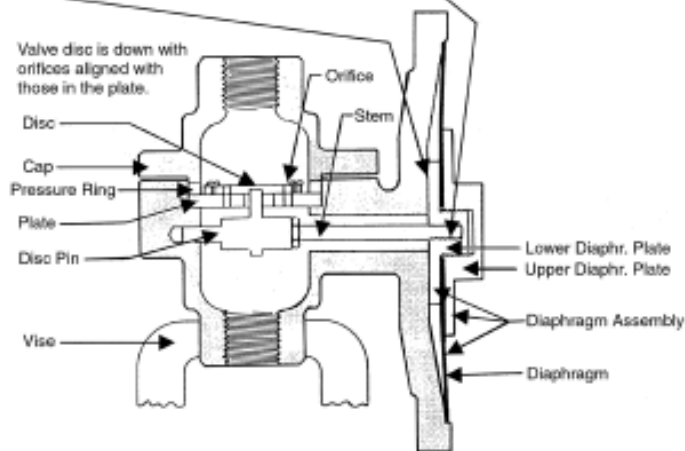
## Stroke Adjustment

---

1. The stroke adjustment is made with the spring housing and adjusting spring removed from the valve.

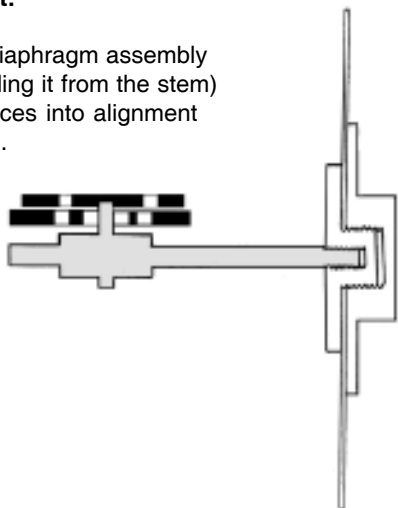
2. The valve orifices should be open and in perfect alignment when the diaphragm assembly is pressed against the valve body as illustrated.

3. The valve stroke adjustment is determined by how far the stem is screwed into the diaphragm plate. Rotate the diaphragm assembly to raise or lower the valve disc. Unthread the diaphragm assembly partially to lower the disc, or thread the stem deeper into the assembly to raise the disc.



### If Stroke is Too Short:

To correct, turn the diaphragm assembly toward you (unthreading it from the stem) bringing the disc orifices into alignment with the plate orifices.



---

## 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 downstream may require maintenance.
- Safety valve may be defective and need repair.
- There may be excessive foreign matter on the seats, and seats should be removed and cleaned.
- Valve stroke may need readjustment.
- Valve disc may not be moving freely. Check disc guide clearance and correct if needed.

### If Valve Will Not Operate:

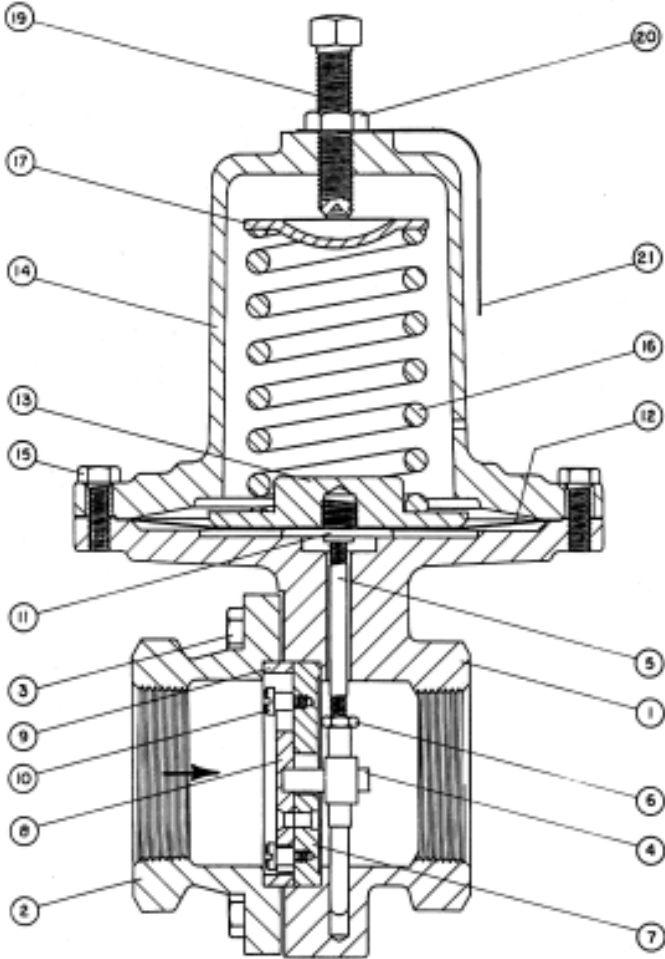
- Diaphragm may be ruptured and require replacement.
- Adjusting spring may be broken and require replacement.
- Spring may be set improperly and require resetting.

### If Stroke is Too Long:

To correct, turn the diaphragm assembly away from you (threading it farther onto the stem) bringing the disc orifices into alignment with the plate orifices.

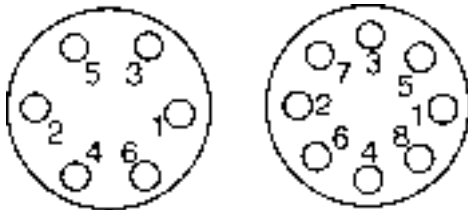


## Illustration & Parts List



No.	Description	Qty.
1	Body	1
2	Cap	1
3	Bolt	8
*4	Disc Pin	1
*5	Stem	1
*6	Locknut	1
*7	Plate	1
*8	Disc	1
*9	Pressure Ring	1
*10	Guide Screws	2
11	Lower Diaphragm Plate	1
*12	Diaphragm	1
13	Upper Diaphragm Plate	1
14	Spring Housing	1
15	Bolt	12
16	Spring	A.R.
17	Spring Seat	1
19	Adjusting Screw	1
20	Jam Nut	1
21	Nameplate	1
* Recommended Spare Parts		

## Torque Values



### Torque for Bolts Connecting Valve Cap to Valve Body:

- Cast Iron, Ductile Iron, or Bronze Valves: 140 inch/pounds
- Carbon Steel or Stainless Steel Valves: 200 inch/pounds

**Torque for Spring Housing Screws:** 200 inch/pounds

## Ordering Spare Parts

Use only genuine Jordan Valve parts to keep your Jordan regulator in good working order. In order to supply you with the precise parts designed for your specific valve, we need to know the following information when you request spare parts:

- Valve serial number (found on nameplate)
- Valve model number
- Body size
- Body material
- End connections (if flanged, supply flange rating)
- Spring range or set point

