



## SERIES PRHM - PRESSURE REGULATORS INSTALLATION & MAINTENANCE INSTRUCTIONS

### 1. IMPORTANT – BEFORE INSTALLING

Series PRHM pressure regulators will prevent downstream pressure from exceeding the set pressure, when properly installed and used within the recommended ranges of pressure, temperature, and chemical compatibility. A Pressure Regulator *does not* maintain a specific downstream pressure if inlet pressure or flow is too low. The ultimate determination of material compatibility is previous successful use in the same application. See the Product Data Sheet or call our Technical Support for information about your application.

**Caution:** Quick closing valves installed downstream of the regulator may cause water hammer. This may cause leakage or seal damage. Plastic materials will degrade in ultraviolet (UV) light or sunlight. Polypropylene and PVDF (Kynar®) often look similar. Do not install in your system if you are not sure.

**Size Differences:** Note that 3/4" through 2" valves are mostly similar in assembly, appearance, and components. **1/2" size PRHM050 varies from the larger valves due to its size; refer to pages 3 & 6.**

### 2. PRESSURE RATINGS

#### A. Maximum Inlet Pressures for Water\*

Body Mat'l	Color	at 77°F (25°C)		at 104°F (40°C)		at Max. Temp.	
		PSI	Bar	PSI	Bar	PSI @ °F	Bar @ °C
PVC	Dk. Gray	150 PSI	10 Bar	106 PSI	7 Bar	34 @ 140°F	2 @ 60°C
CPVC	Lt. Gray	150 PSI	10 Bar	120 PSI	8 Bar	37 @ 180°F	2 @ 80°C
Polypro	Trans. Wht.	150 PSI	10 Bar	120 PSI	8 Bar	40 @ 180°F	2 @ 80°C
PVDF	Trans. Wht.	150 PSI	10 Bar	120 PSI	8 Bar	22 @ 280°F	1 @ 140°C
PTFE	Opaq. Wht.	150 PSI	10 Bar	140 PSI	10 Bar	Consult Factory	

\* or compatible chemical – ratings reduced for some applications  
Not rated for suction or vacuum. Min. Temperature 40°F (5°C).  
EPDM seals limited to 250°F (120°C), Viton to 300°F (149°C).  
See the Product Data Sheet or consult our Technical Support staff for more information.

**B. Set Pressure Range:** 5 - 125 PSI (0.3 to 8 Bar)

### 3. INSTALLATION

Install the valve in the proper flow direction as indicated by the flow label. The valve may be positioned vertically or horizontally. Proper installation should include pressure gauges mounted upstream and downstream of the regulator for pressure setting and verification.

**Threaded Connections** – Apply a suitable thread sealant (for example, PTFE Tape) to male tapered threads to assure a “leak-tight” seal. Assemble “hand-tight” followed by a quarter (1/4) turn with a strap wrench. Do not over tighten or use pipe wrenches on plastic pipe and components.

**Caution:** PTFE tape will “string” as pipe threads are joined. Loose “strings” could lie across the seating surface and prevent the valve from completely closing. To avoid this problem, clean out old tape, and do not apply tape to the first thread.

**Caution:** Connect to plastic pipe and fittings only; when using metal pipe, install an intervening plastic fitting. Metal pipe and straight threaded pipe tends to cut, stretch, and distort the plastic bodies, resulting in cracking or leaking over time.

**Non-Threaded Connections** – For solvent cementing or heat fusion, follow the instructions supplied with the cement or fusion equipment, or contact your distributor.

**Mounting** – These valves are designed to be supported by the piping. The piping must be properly supported, taking into account the weight of the valve, piping and process liquid.

### 4. PRESSURE SETTING

For instructions specific to Series PRHM050 (1/2" size) please refer to page 3.

Series PRHM senses downstream pressure; a pressure gauge should be installed at the outlet of the valve to accurately set the regulator. Downstream set pressure range is 5 to 125 PSI. The following procedure is for static (no flow) pressure setting. Under flow conditions, the outlet pressure may be slightly lower.

1. Install the regulator in the piping system. Close all downstream outlets to stop flow. The inlet pressure must be higher than the desired set pressure.
2. Loosen the Lock Screw: Loosen the stainless steel lock screw on the upper side of the spring housing, one-half (1/2) to one (1) turn only. Requires a 5/32" allen key. It is important to loosen this lock screw not more than one turn.  
**Do not remove this lock screw** – it will be difficult to reinstall.
3. Adjust the Pressure Setting Screw: Insert a 3/8" allen key in the top of the regulator spring housing to change set pressure. Adjust the set pressure only when the unit is pressurized. From the top of the regulator, looking down on it, turn clockwise to increase set pressure or counter clockwise to decrease set pressure.
4. Tighten the Lock Screw: When the desired pressure setting is achieved and the unit is under line pressure, re-tighten the lock screw with the 5/32" allen key to a torque of 10-15 inch-pounds (1.13 – 1.17 Newton-meters). Do not overtighten.

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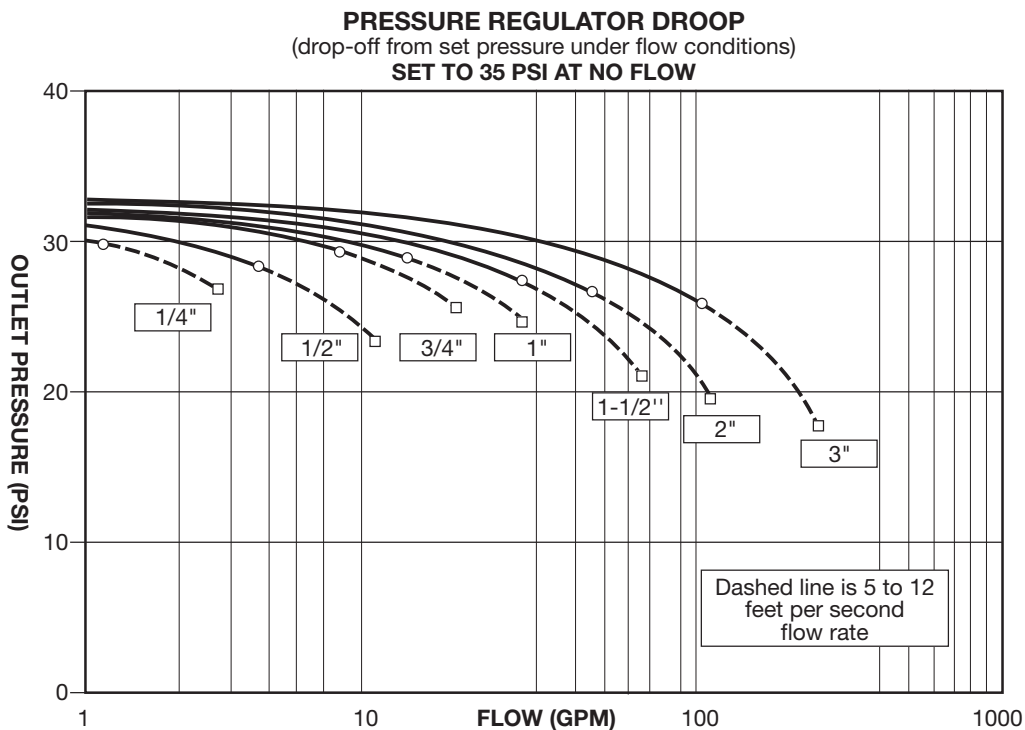
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Pressure can also be set under dynamic (with flow) conditions using the same procedure. If pressure is set under dynamic conditions, outlet pressure will increase when downstream flow is reduced.

**Note:** Series PRHM Pressure Regulators are *non-relieving*. Outlet valves must be open to allow pressure to drop.

### 5. MAINTENANCE

Plast-O-Matic recommends keeping a spare seal kit available for repairs. Seal life will vary in applications due to cycles, temperatures, pressures, chemicals, and concentration. Based on the application, a periodic inspection and maintenance plan should be established. The seal kit part number is "SK" plus the part number less the material suffix. For example, the seal kit for PRHM200V-PV is SKPRHM200V.



## Series PRHM050 PRESSURE REGULATORS 1/2" Size-Specific Installation & Operating Instructions

### Installation

During installation be sure the flow through the valve is in the proper direction. All regulators are marked indicating the flow direction.

Plastic pipe threads should always be wrapped with Teflon tape or other acceptable pipe sealant to effect a positive seal. The assembly need only be made hand-tight followed by a one-quarter turn more with a strap wrench. DO NOT overtighten or use a pipe wrench as future fracture could result.

**NOTE:** Threaded connections should never be made to metal piping.

A proper installation would include pressure gauges mounted up and downstream of the regulator. Plast-O-Matic gauge guards with gauges are suitable as they are designed specifically for corrosive or ultra-pure liquids.

### Operation

A Plast-O-Matic pressure regulator prevents downstream pressure from exceeding the desired set pressure. The regulator is designed to remain closed as long as the set pressure (downstream) is maintained. As equipment downstream of the regulator begins to open and demand flow, the downstream pressure begins to fall and the regulator opens accordingly until its maximum opening is reached. (Check the flow capacity vs. pressure drop charts in Catalog PRHM to insure proper valve size selection.)

As the process is reversed, the downstream pressure begins to increase and the regulator starts closing when the pressure reaches the set pressure, the regulator closes.

**NOTE:** From the above explanation, a pressure regulator does not maintain a specific downstream pressure - it only prevents this pressure from exceeding the set point.

**Caution!** - Avoid quick shut offs of downstream equipment or valves as they transmit liquid shock waves with the possibility of damage to the regulator. If a valve must be closed quickly, install it before the regulator.

### 1/2" Regulator Pressure Setting

The Plast-O-Matic pressure regulator senses downstream pressure; therefore it is necessary to install a pressure gauge at the outlet of the regulator for setting.

1. All valves and equipment downstream of the regulator must be in the off position (no flow taking place).
2. System inlet pressure (maximum 150 PSI, 10 bars) is connected to the inlet of the regulator and the regulator outlet to the downstream piping containing a pressure gauge.
3. The pressure gauge at the regulator outlet will read the set pressure when the upstream pressure is turned on. If the pressure is too low, simply loosen the locking nut on the adjusting bolt and then screw the bolt down or into the spring housing until the desired set pressure is reached. Lock in the setting by tightening the nut.
4. If the pressure gauge reads too high, simply unscrew the adjusting bolt (back it away from the spring housing) until the desired pressure is reached. Open and close an outlet valve to bleed off a little liquid on the downstream side of the regulator to see if the set pressure remains the same. If not, adjust again. Then tighten the locking nut to lock in the setting.



## **PRHM SEAL KIT MAINTENANCE & REPLACEMENT INSTRUCTIONS • ALL SIZES**

### **DISASSEMBLY**

1. Relieve all spring pressure by turning the adjusting screw in the counter clockwise direction. (for PRHM050 remove the adjusting screw assembly)
2. Unscrew and remove the assembly screws. (for PRHM050 remove the union nuts)
3. Remove the spring housing, adjusting screw, spring guide, springs, and base plate. Note: for PRHM075-200 there is an o-ring between the adjusting screw and spring guide that will need to be replaced.
4. Hold the seat & shaft assembly and unscrew the piston bolt which is threaded into the shaft. (for PRHM050 lift up on the rolling diaphragm and unscrew the piston and diaphragm retainer.)
5. Pull the shaft and seat assembly through the bottom of the valve body. Since the seat retainer is welded to the shaft, these parts must be replaced in order to change the seat gasket on 1/2" 3/4" and 1" regulators only.
6. On 1 1/2" and 2" regulators, unscrew the seat retainer from the shaft and remove the seat gasket.
7. Disassemble and discard u-cups and o-rings. Clean out grooves with a clean, soft cloth, then replace u-cups & o-rings. Use a ball end probe to position the u-cups if needed. Lubricate if allowed - especially the u-cups -with a non-petroleum based lubricant.

### **ROLLING DIAPHRAGM INSTALLATION**

1. Clean the old Loctite from the screw and shaft threads. Turn the diaphragm inside out so the wetted side is visible (the rubberized side out, cloth in.)
2. Fit the piston into the diaphragm (small end first).
3. Put the washer on the piston bolt and insert the piston bolt and pull the diaphragm over the piston to remove any wrinkles. Make sure the holes are centered. On 1 1/2" and 2" size regulators, the piston bolt is screwed into the piston. Tighten this bolt securely in the piston before putting the diaphragm on.
4. Insert the diaphragm retainer, and o-rings where required, into the opposite side of the diaphragm.
5. Put a drop of Loctite on the threads near the end of the piston bolt and screw the piston bolt securely into the shaft.

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## PRHM SEAL KIT MAINTENANCE & REPLACEMENT INSTRUCTIONS • ALL SIZES

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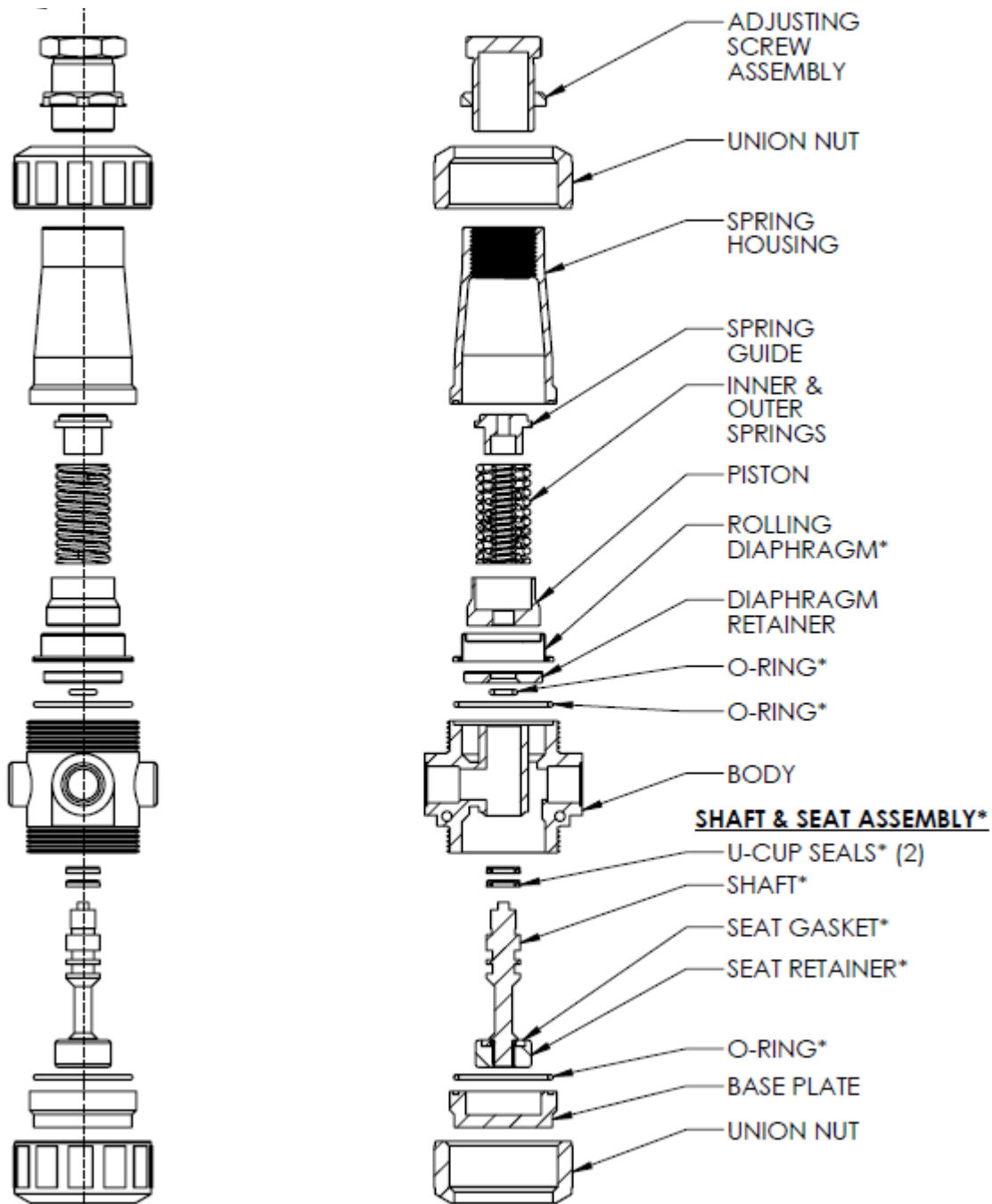
**NOTE: Before beginning Reassembly, you must inspect all parts for dirt, scratches or damage.** Rubber parts should be smooth and not twisted, wrinkled or creased. Make sure u-cups are installed in the direction shown in the figure, lip seal facing toward seat retainer.

### REASSEMBLY

1. Push the shaft and seat assembly into the bottom of the valve body. Use a probe to compress u-cups if needed. Use great care to avoid scratching or denting the soft plastic parts.
2. Check the motion of the shaft: push down alternately on the piston and seat. If the shaft moves smoothly up and down, continue.
3. Pull down on the outer edge of the diaphragm to touch the body. **MAKE SURE THAT THE RUBBER SIDE OF THE ROLLING DIAPHRAGM IS DOWN, AND THE CLOTH SIDE IS VISABLE.**
4. For 1 1/2" and 2" size regulators, install the seat gasket into the seat retainer and make sure it is tucked in and lays completely flat. Then (for all size regulators) hold the seat retainer with a spanner wrench and tighten the piston bolt to the torque value shown on the torque table.
5. Install the springs onto the piston
6. For PRHM075-200 only: Install the adjusting screw and spring guide into the spring housing, ensuring the cut outs on the spring guide line up with the ribs on the inside of the spring housing. With the adjusting spring and spring guide fully seated in the spring housing, tighten the adjustment lock screw to prevent the screw and guide from falling out during assembly.
7. Install the spring housing assembly. Be careful that the diaphragm rim is smooth between the spring housing and body.
8. For PRHM050 only: Install the adjusting screw assembly
9. Install the baseplate and new o-ring.
10. Install the assembly screws and nuts. Tighten all screws in opposing pairs. Refer to the torque table. (For PRHM050 install union nuts) .
11. Unscrew the adjustment lock screw and set the adjusting screw to approximately the original position. The adjusting screw set, the lock screw can be tightened to prevent the adjustment screw from turning.



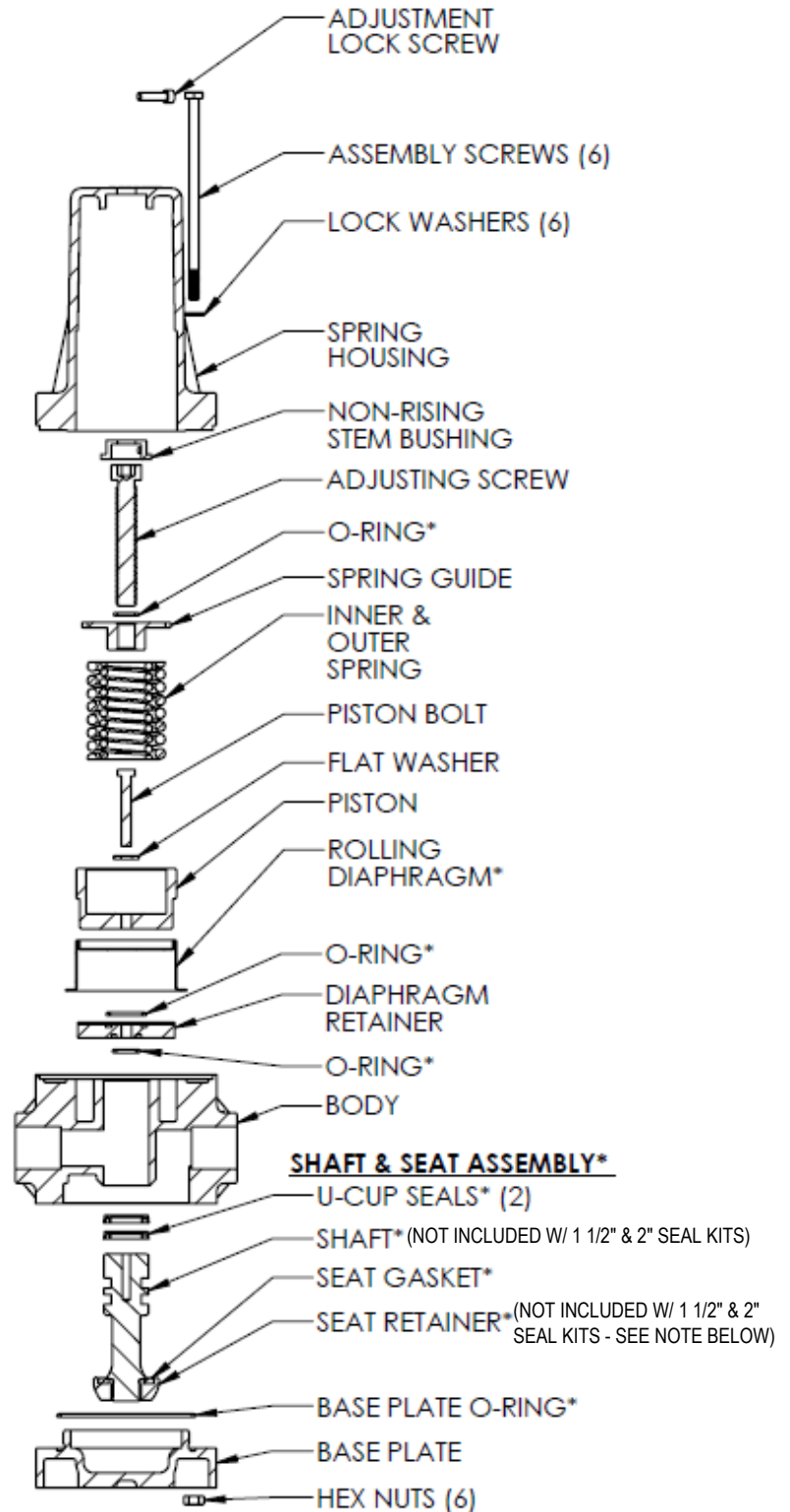
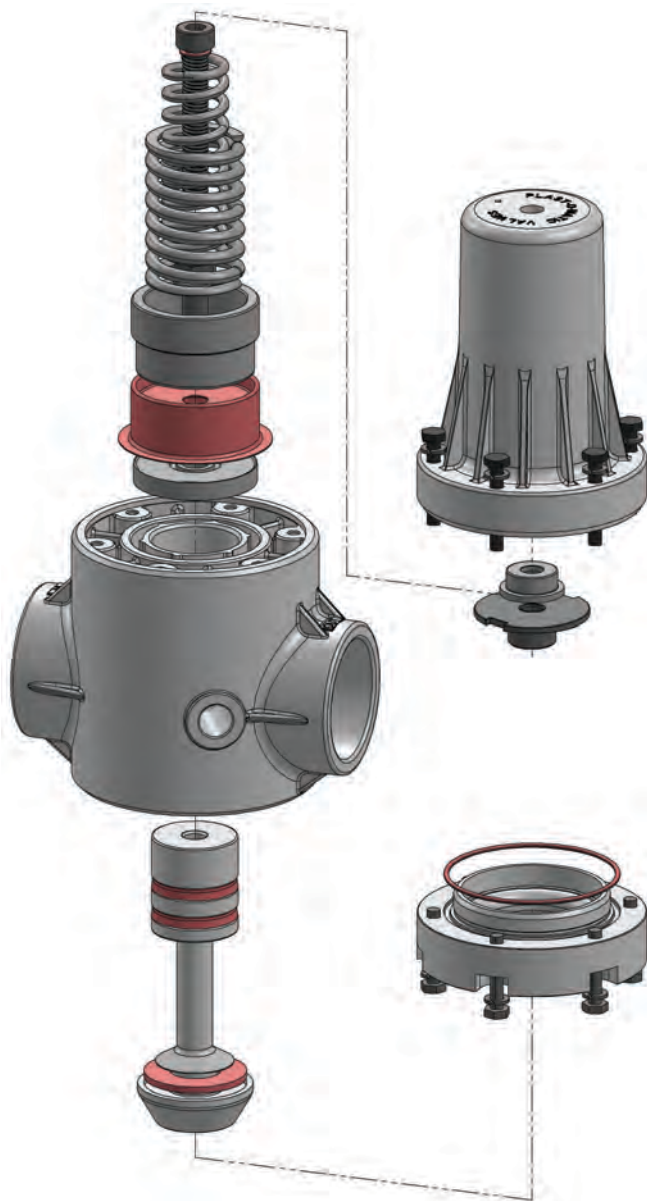
## PRHM SEAL KIT REPLACEMENT DIAGRAM 1/2" SIZE ONLY



\*INCLUDED IN SEAL KIT



## PRHM SEAL KIT REPLACEMENT DIAGRAM 3/4", 1", 1½", 2" SIZES



\* Asterisk indicates part included with Seal Kit. NOTE: The shaft and seat retainer are not included with the seal kit on the 1 1/2" and 2" size regulators. Unscrew the existing shaft and seat retainer and replace the old seat gasket with the new one included in the kit.



SUGGESTED FASTENER TORQUE (INCH POUNDS)				
PRHM	MATERIAL	PISTON BOLT and SEAT RETAINER	TOP ASSEMBLY	BOTTOM ASSEMBLY
½"	ALL MATERIALS	HT + 1/4	HT + 1/4	HT + 1/4
¾" & 1"	PV, CP, PF	40-45	40-45	N/A
¾" & 1"	PP	40-45	40-45	N/A
1-1/2" & 2"	PV, CP, PF	150	40-45	40-45
1-1/2" & 2"	PP	150	25-28	25-28

HT + ¼ = Hand tight plus ¼ turn. For Nm (newton-meters) divide by 9.

TOOL REQUIREMENT				
PRHM	PISTON BOLT	SHAFT & SEAT ASSEMBLY	TOP ASSEMBLY	BOTTOM ASSEMBLY
½"	HAND	SW	HAND	HAND
¾" & 1"	7/16" H	SW	7/16" H	N/A
1-1/2" & 2"	3/4" H	SW	7/16" H	7/16" H

H = WRENCH, SOCKET, OR NUT DRIVER (HEX SIZE GIVEN)  
 SW = SPANNER WRENCH (STRAP WRENCH MAY ALSO BE USED IN MANY CASES)

