

Model P4000A & P4000AHR

Thermal Expansion Relief Valve

1/2" & 3/4"

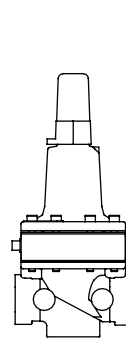


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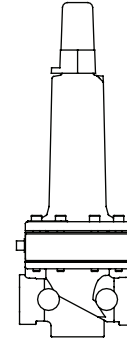
DESCRIPTION

The Zurn Wilkins P4000A Thermal Expansion Relief Valve is a direct acting relief valve. The P4000A uses a spring to force the plunger down upon a seat causing the valve to be normally closed. The P4000A can be set to relieve pressures from 50 to 200 psi and the P4000AHR from 150 to 300 psi. When the inlet pressure reaches the set pressure point it pushes up on the diaphragm which pulls the plunger off the seat. The valve opens to relieve pressure at the inlet and allows water to flow downstream. The P4000A opens and closes within a close pressure range of the set pressure.

All the instructions and references apply to both models, P4000A & P4000AHR.



P4000A



P4000AHR



Installation / Start-up

INSTALLATION

NOTE: Prior to installation of the P4000A, ensure all debris is flushed out the piping system.

1. During the installation of a P4000A in a sprinkler system, Underwriter Laboratories (UL) requires NFPA 13 "Standard for Installation of Sprinkler Systems" be followed.

2. Upon installation UL also requires that the P4000A be tested in accordance with NFPA 13. Thereafter the valve shall be inspected, tested, and maintained in accordance to NFPA 25 "Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems".

3. For making adjustments and servicing allow for adequate space around the valve.

4. Position the P4000A in line matching the direction of flow as indicated on the valve model tag with the proper direction of flow in the system. Once attached to line double check all fasteners are tight and there is no damage prior to pressurizing system.

NOTE: Pressure in some applications can be very high so be thorough in checking and inspecting for proper installation and makeup.

WARNING: Supply adequate drainage on the discharge of the P4000A. To avoid water damage, valve must be plumbed to a safe drain.

5. Zurn Wilkins valves are designed to operate in both the vertical and horizontal positions.

START-UP

CAUTION: To prevent personnel injury and damage to equipment check that downstream venting is adequate prior to start-up and test procedures. **All adjustments under pressure should be made slowly.**

1. Turn the adjustment screw clockwise until the valve spring is compressed fully.

Caution: Do not over tighten the adjustment screw to prevent damaging the valve.

2. With the inlet of the P4000A pressurized slowly turn the adjustment screw counterclockwise until the first sign of water flow. Either listen carefully to the valve for water flow or look through a downstream sight glass.

3. The valve is set to relieve pressure at the current inlet pressure at the first sign of water flow through the relief valve. If the desired set pressure is different than current inlet pressure use the table below. Turn the adjustment screw clockwise to increase set pressure or counterclockwise to decrease set pressure. Add or subtract from the current inlet pressure by turning the adjustment screw the number of turns required to reach the desired set pressure based on the adjustment table.

Note: The valve must be set 10 psi greater than the maximum anticipated system pressure.

| Relief Pilot Adjustment Range | Pressure Change per Turn (PSI)* |
|-------------------------------|---------------------------------|
| 50 - 200 | 23 |
| 150 - 300 | 28.5 |

***Note: Pressure change per turn is approximate. Use a gauge at the inlet of P4000A to set /check relief pressure.**

4. To verify proper operation of the P4000A, view the valve during normal operation and check the valve for relief setting. Adjustments can be made at anytime.

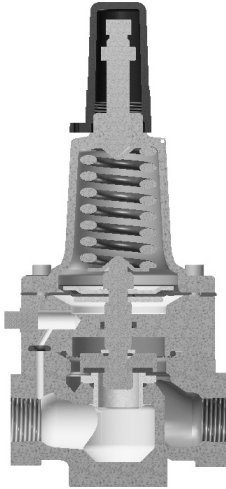
NOTICE: Annual inspection and maintenance is required of all plumbing system components. To ensure proper performance and maximum life, this product must be subject to regular inspection, testing and cleaning.



Operation

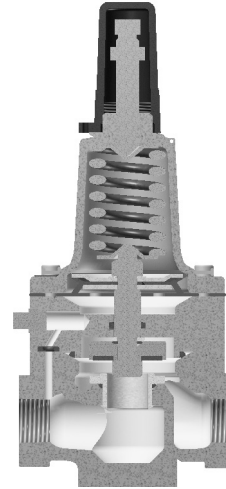
Operation

The Zurn Wilkins P4000A is a direct acting, spring controlled, pressure relief valve which opens from the force of upstream pressure pushing up on the internal diaphragm. The relief set pressure can be easily adjusted by altering the compression force on the spring in the bell. Once upstream pressure rises above the set pressure the diaphragm will further compress the spring on top of the diaphragm allowing the plunger to rise off the seat and water to flow. When the upstream pressure drops back down below the set pressure the compressed spring will force the plunger back on the valve seat sealing the valve drip tight. The valve will open and close drip tight near the relief set pressure.



Drip Tight Closing Operation

The compressed spring forces the plunger on the seat creating a drip tight seal.

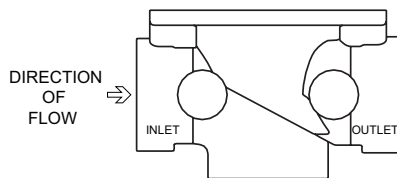


Open Regulating Operation

The Inlet pressure pushes upward on the diaphragm via the internal sensing port. Once the upward force on the diaphragm is greater than the compression force of the spring the plunger will move up off the seat allowing water flow.

Maintenance Instructions

The P4000A Pressure Relief Valve may be installed in any position. The flow direction is shown below. Flow goes from the narrow side to the wide side of the cast body.



Disassembly

Prior to disassembly, relieve all pressure in the system and then remove the P4000A.

1. Secure valve body and turn the adjustment screw all the way out.
2. Next remove 8 socket head screws around the bell using a 5/32" hex key. Note location of tag/inlet. Remove the bell, the spring, and 2 spring discs.
3. Remove the spacer, but take care not to lose the small o-ring between spacer and body. Use a 12mm socket or adjustable wrench on the diaphragm and plunger nuts to disassemble the plunger/diaphragm assembly. Unscrew one end of the stem.
4. At this point slide the plunger/diaphragm assembly out of the spacer.
5. Use soft jaws or a towel and pliers to clamp the stem. Be careful not to scratch the stem as this is an o-ring

surface. Use an adjustable wrench on the opposite nut to remove the remaining plunger/diaphragm assembly.

6. The parts removed from the disassembled diaphragm and plunger assembly are a plunger, small washer, 2 o-rings, 2 nuts, a medium washer, a large washer, diaphragm, and lock washer.
7. Use a small pin or nail to carefully remove the o-ring on the inside through hole of the spacer.

8. After complete disassembly thoroughly clean and inspect all components before reassembly. Replace parts as necessary after inspection.

9. The pilot seat generally does not need to be removed, but if after inspection it requires replacement it can be removed with a 1-1/16" socket.

P4000A Valve Reassembly

Reassembly of the P4000A is the reverse of disassembly.

1. Carefully install a new o-ring in the through hole of the spacer.
2. Place the medium washer (with round outer edge toward the diaphragm) on the side of the stem with the chamfered tip.
3. Follow the washer by putting on a new o-ring, new diaphragm, large washer (with the inner step against the diaphragm), lock washer, and 5/16" nut (chamfered side away from diaphragm) then hand tighten.
4. Slide the stem through the spacer with the diaphragm assembly on the spacer side with a circular groove on the top surface.

Maintenance Instructions

5. On the other side of the stem place the small washer, o-ring, plunger (with the rubber facing away from the spacer), and nut.
6. Use adjustable wrenches to tighten the plunger and diaphragm nuts.
7. Place new sensing hole o-ring in small hole on the spacer.
8. Install the spacer assembly on to the body with the plunger sitting on the valve seat.
9. Place a spring disk on the stem, then the spring, another spring disk and bell.
10. Insert socket head cap screws into bell holes and thread into valve body. Place model tag on the four screws that straddle the body inlet. Tighten all screws in a cross pattern.
11. Install adjusting screw by hand with jam nut. Set valve once reinstalled into system. For further assistance or ordering replacement parts go to www.zurn.com or call product support 877-222-5356.

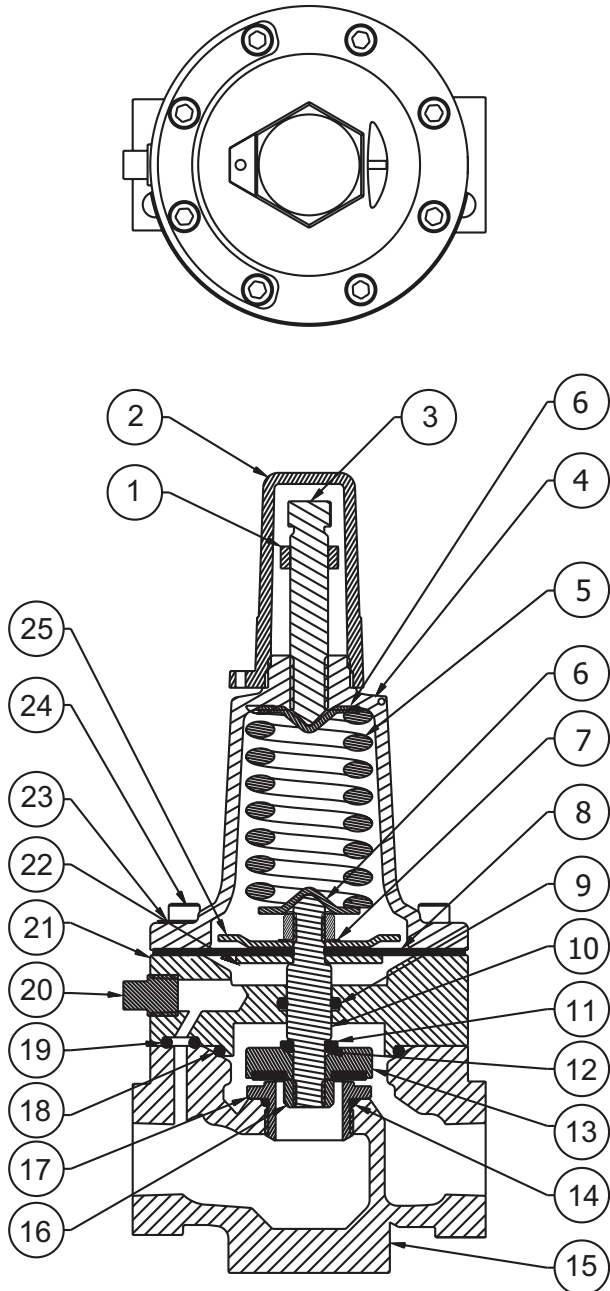


Table 1

| ITEM | DESCRIPTION |
|------|--------------------------------------|
| 1 | 3x8-16 Jam Hex Nut SS |
| 2 | Adjustment Cover |
| 3 | 3/8-16 Adjustment Bolt |
| 4 | Spring Bell |
| 5 | Spring |
| 6 | Spring Disc |
| 7 | 5/16" Internal Tooth Lock Washer, SS |
| 8 | Diaphragm |
| 9 | O-ring |
| 10 | Relief Valve Stem |
| 11 | 5/16" Flat Washer, SS |
| 12 | O-ring |
| 13 | Relief Plunger Assy. |
| 14 | O-ring |
| 15 | 1/2" Relief Valve Body |
| 16 | 5/16-18 Diaphragm Nut, SS |
| 17 | Relief Valve Seat |
| 18 | O-ring |
| 19 | O-ring |
| 20 | 1/8" NPT Plug |
| 21 | Relief Valve Spacer |
| 22 | Relief Lower Diaphragm Washer |
| 23 | Tag |
| 24 | 10-32 X 1-1/2" Screw |
| 25 | Relief Upper Diaphragm Disc, SS |

Troubleshooting

Problem

1. Valve not opening
(Valve not relieving pressure)

Possible Causes

1. The spring is over compressed
2. Foreign matter obstruction
3. Damaged diaphragm or stem o-rings
4. Stem dragging on spacer
5. Plugged sensing Port/sensing line
6. Valve installed backward

Corrective Action

1. Loosen the adjusting screw
2. Disassemble and remove obstruction, replace parts as necessary
3. Disassemble and replace diaphragm or o-rings
4. Disassemble valve, and check for scale or damage on stem and spacer o-ring
5. Check sensing line and/or port and remove obstruction
6. Compare valve body with diagram on page 2 for correct orientation

2. Valve not closing
(Valve dripping or relieving pressure below set pressure)

1. Weak or no spring compression
2. Spring damaged
3. Spring discs out of place
4. Stem dragging on spacer
5. Cut, worn or chipped plunger seal, seat or plunger o-ring

1. Turn adjusting screw in to increase relief pressure
2. Disassemble and replace spring as needed
3. Disassemble and replace or adjust spring disc as needed
4. Disassemble valve, and check for scale or damage on stem and spacer o-ring
5. Check plunger surface, seat and o-ring. Clean/replace as needed

3. Leakage from valve

1. Damaged diaphragm, stem or spacer o-ring
2. Ports not sealed
3. Loose diaphragm nut / bell screws

1. Disassemble and replace damaged part as needed
2. Remove and reinstall port fittings, use Teflon tape or pipe sealant to ensure good seal
3. Disassemble and re-tighten the diaphragm nut or bell screws

WARRANTY: ZURN WILKINS Valves are guaranteed against defects of material or workmanship when used for the services recommended. If in any recommended service, a defect develops due to material or workmanship, and the device is returned, freight prepaid, to ZURN WILKINS within 12 months from date of purchase, it will be repaired or replaced free of charge. ZURN WILKINS' liability shall be limited to our agreement to repair or replace the valve only.

Proposition 65 Warning This product contains chemicals known to the State of California to cause cancer or birth defects or other reproductive harm.