

## Adjustable Back Pressure & Pressure Relief Valves

### GENERAL INFORMATION

Walchem diaphragm back pressure valves are used to enhance the performance of chemical feed pumps and systems by providing a constant discharge head pressure. These valves also function as an antisiphon valve. The diaphragm is held against the seat by the internal spring. Back pressure is adjustable from 0 - 150PSI via the tamper resistant adjustment screw. When the inlet pressure exceeds the preset pressure the diaphragm lifts off the seat and the chemical flows to the injection point. After each discharge stroke of the pump, as the pressure drops, the diaphragm reseats itself.

Walchem diaphragm pressure relief valves are designed to protect chemical feed pumps and systems from overpressure caused by defective equipment or blockages in the chemical line.

The 3 port design allows chemical to flow through the valve via an internal chamber. When the pressure in the chemical line exceeds the preset pressure of the valve the diaphragm lifts off the seat and the chemical then flows out the bottom port back to the chemical tank. Relief pressure is adjustable from 0 - 150PSI via the tamper resistant screw in the top of the valve.



### INSTALLATION

#### Back Pressure Valve:

Generally, the back pressure valve can be installed anywhere in the discharge line, provided there is some downstream pressure at the dosage point. If there is no downstream pressure the back pressure valve should be installed at the dosage point to prevent siphoning and drainage of the chemical line. All Walchem valves are factory set at 50PSI, unless otherwise specified. Field adjustment is possible with the adjustment screw.

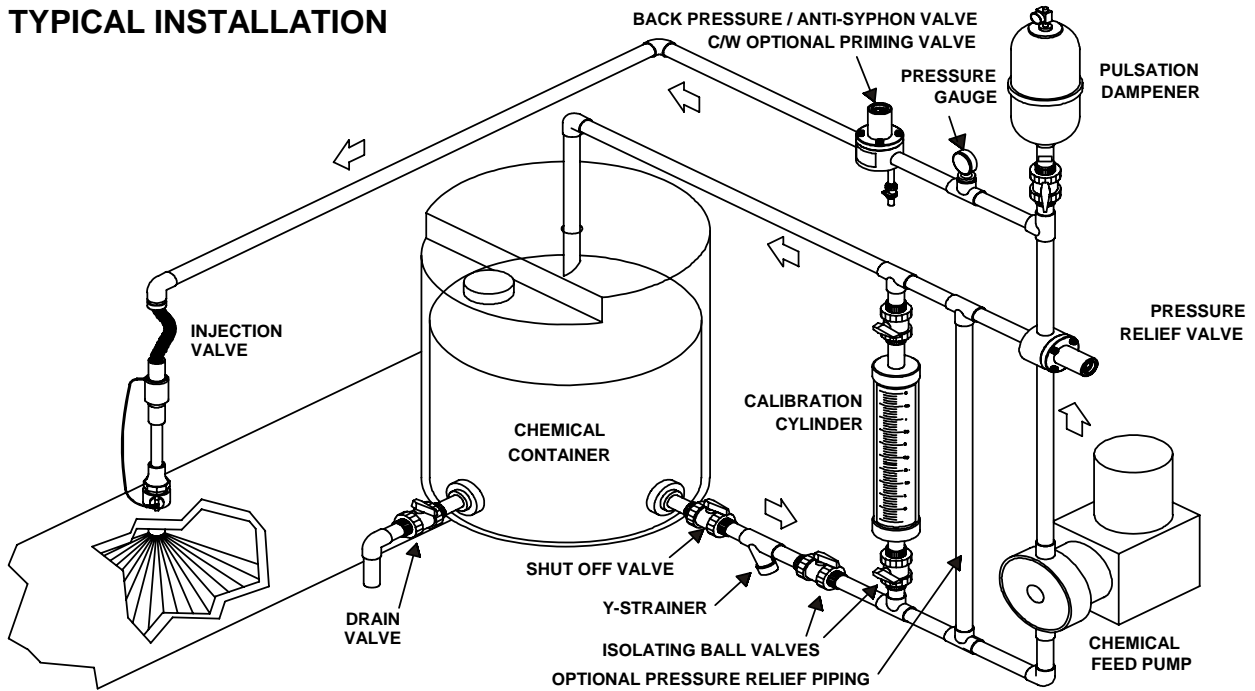
Back pressure valve performance will be enhanced with the installation of a pulsation dampener to smooth out the discharge / suction cycles of the pump. Thus, the diaphragm is free to float inside the valve chamber, minimizing the wear on the stress points of the diaphragm. For many low pressure applications dampeners without diaphragms are acceptable. These pulsation dampeners should be sized at 12 - 15 times the dosage volume of the pump head. For some applications diaphragm type dampeners are required. Generally speaking 5 to 10% dampening is sufficient. Consult with your pump manufacturer to get his recommendations.

#### Pressure Relief Valve:

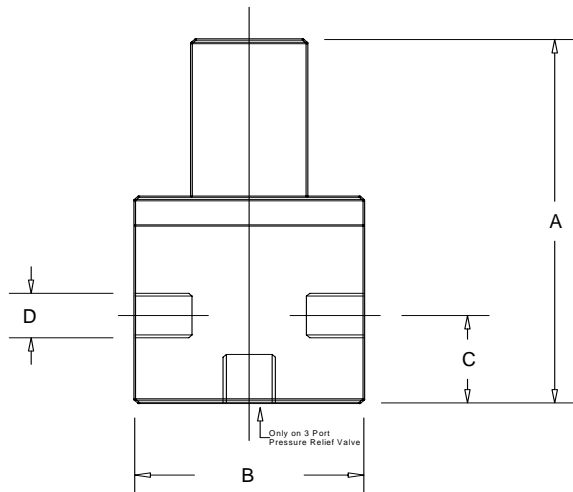
Installation should be made as close to the chemical pump discharge valve as possible, without any equipment, especially shut-off valves, between the valve and the pump. Direction of flow must be across the valve, however the side of entry is not important. All Walchem valves are factory set at 50psi, however field adjustment is possible with the adjustment screw.

The optimum installation for the relief valve is to vent the relief port back to the chemical tank, or directly to a containment area. However if this is not possible, the relief port can be piped back into the suction side of the pump. This will apply the suction head to the relief port. To compensate, divide the NPSH by 4 and add this pressure to the relief valve setting.

## TYPICAL INSTALLATION



## DIMENSIONS



D	A	B	C
1/4"	3.50	2.375	0.750
3/8"	3.50	2.375	0.750
1/2" T-Series	4.60	2.375	1.125
1/2"	5.50	3.50	1.125
3/4"	5.50	3.50	1.125
1"	6.25	3.50	1.375
1 1/2"	9.00	4.50	2.10
2"	9.00	5.00	2.10

NOTE: Dimensions are general. See dimension sheets for exact sizes of various material valves.

## MAINTENANCE

The pressure relief and back pressure valves were designed with minimizing the amount of maintenance required to keep the valves in operation. However, periodic replacement of the diaphragm is required. To facilitate inspection and replacement, the valve layout is such that removal of the diaphragm can be done without taking the valve out of the chemical line.

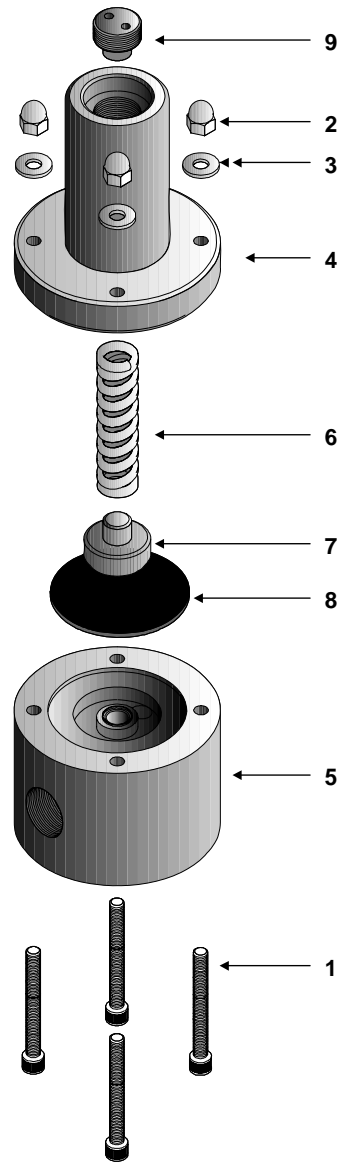
**Caution:** Ensure the system is not under pressure and that the chemical lines are flushed with water before disassembly.

Unscrew the pressure adjustment screw to remove the pressure from the diaphragm. Remove the 4 cap nuts and lift off the valve top. (On T-Series valves unscrew the valve top)

After the diaphragm and the valve seat have been inspected and replaced if necessary check the adjustment spring. Make sure there is no rust or corrosion. Replaced the spring and the spring bumper into the valve top and slide the top back over the four bolts. (On T-Series valves thread the valve top to the valve body)

Snug down the four cap nuts. (On T-Series – Snug hand tight then tighten ¼ turn) Screw in the tension adjuster to approximately the same position as it was prior to disassembly. If an exact pressure setting is required or a different pressure is desired a pressure gauge should be used to verify the setting. Pressure can be increased by turning the pressure adjustment screw clockwise.

**PARTS LIST**



ITEM	DESCRIPTION	PART #
1*	1/4 - 20 X 2 3/4" Bolt - 1/2 - 1" Plastic Valves 5/16 - 18 X 1 1/2" Bolt - 1 1/2" - 2" Metal Valves 5/16 - 18 X 5" Bolt - 1 1/2" - 2" Plastic Valves 10/32 X 3/4" Bolt - 1/4" Metal Valves 10/32 X 1 3/4 Bolt - 1/4" Plastic Valves 1/4 - 20 X 1 1/4" Bolt - 1/2 - 1" Metal Valves	PV-00101 PV-00102 PV-00105 PV-00106 PV-00106 PV-00108
2*	10/32 Cap hex nut 1/4 - 20 Cap hex nut 5/16 - 18 Cap hex nut	PV-00201 PV-00202 PV-00203
3*	10/32 Flat washer 1/4 Flat washer 5/16 Flat washer	PV-00301 PV-00302 PV-00303
4	1/4" - 3/8" & T-Series Alloy Valve Top, Bolted - PVC, Grey 1/4" - 3/8" & T-Series Alloy Valve Top, Bolted - PVC, Orange 1/4" - 3/8" & T-Series Alloy Valve Top, Bolted - PVC, Yellow 1/4" - 3/8" & T-Series Alloy Valve Top, Bolted - PVC, Green 1/4" - 3/8" & 1/2" T-Series Valve Top, Threaded - PVC, Grey 1/4" - 3/8" & 1/2" T-Series Valve Top, Threaded - PVC, Orange 1/4" - 3/8" & 1/2" T-Series Valve Top, Threaded - PVC, Yellow 1/4" - 3/8" & 1/2" T-Series Valve Top, Threaded - PVC, Green 1/2" - External Adjustment Valve Top - PVC (Tiberian) 1/4" - 3/8" & T-Series Alloy Valve Top - Coated Steel 1/4" - 3/8" & T-Series Alloy Valve Top - 316 SS 1/2" - 1" Valve Top - PVC, Grey 1/2" - 1" Valve Top - PVC, Orange 1/2" - 1" Valve Top - PVC, Yellow 1/2" - 1" Valve Top - PVC, Green 1/2" - 1" Valve Top - CPVC 1/2" - 1" Valve Top - Steel 1/2" - 1" Valve Top - 316 SS 1 1/2" - 2" Valve Top; 5 1/2" Valves, PVC 1 1/2" - 2" Valve Top; 5 1/2" Valves, Coated Steel 1 1/2" - 2" Valve Top; 5 1/2" Valves, 316 SS 1 1/2" Valve Top; 4 1/2" Valves, PVC 1 1/2" Valve Top; 4 1/2" Valves, Coated Steel 1 1/2" Valve Top; 4 1/2" Valves, 316 SS 2" Valve Top; 5" Valves, PVC 2" Valve Top; 5" Valves, Coated Steel 2" Valve Top; 5" Valves, 316 SS	PV-004011 PV-004012 PV-004013 PV-004014 PV-004015 PV-004016 PV-004017 PV-004018 PV-004019 PV-004020 PV-00403 PV-004051 PV-004052 PV-004053 PV-004054 PV-004055 PV-00406 PV-00407 PV-00408 PV-00409 PV-00410 PV-00411 PV-00412 PV-00413 PV-00414 PV-00415 PV-00416
6	Pressure Spring - 1/4" - 3/8" & T-Series Valve; 0 - 150 psi Pressure Spring - 1/4" - 3/8" & T-Series Valve; 0 - 50 psi Pressure Spring - 1/4" - 3/8" & T-Series Valve; 50 - 350 psi Pressure Spring - 1/2" - 1" Valve; 0 - 150 psi Pressure Spring - 1/2" - 1" Valve; 0 - 50 psi Pressure Spring - 1/2" - 1" Valve; 50 - 350 psi Pressure Spring - 1/2" - 1" Valve; 0 - 100 psi, 316 SS Pressure Spring - 1 1/2" - 2" Valve	PV-00601 PV-006011 PV-006012 PV-00602 PV-006021 PV-006122 PV-006123 PV-00603
7	Support Disc - 1/4" - 3/8" & T-Series Valve, PP Support Disc - 1/4" - 3/8" & T-Series Valve, 316 SS Support Disc - 1/2 - 1" Valve, PP Support Disc - 1/2 - 1" Valve, 316 SS Support Disc - 1 1/2" - 2" Valve, PP Support Disc - 1 1/2" - 2" Valve, 316 SS	PV-00701 PV-00702 PV-00705 PV-00706 PV-00708 PV-00709
8	Diaphragm - 1/4" - 3/8" & T-Series Valve - PTFE / EPDM Diaphragm - 1/4" - 3/8" & T-Series Valve - Viton Diaphragm - 1/4" - 3/8" & T-Series Valve - PTFE / Viton (High Temp) Diaphragm - 1/2" - 1" Valve - PTFE / EPDM Diaphragm - 1/2" - 1" Valve - Viton Diaphragm - 1/2" - 1" Valve - PTFE / Viton (High Temperature) Diaphragm - 1 1/2" - 2" Valve - PTFE / EPDM Diaphragm - 1 1/2" - 2" Valve - Viton	PV-00800 PV-00802 PV-00803 PV-00810 PV-00812 PV-00813 PV-00820 PV-00821
9	Adjustment Screw - 1/4" - 1" Valve PVC Adjustment Screw - 1/4" - 1" Valve PVC, Slotted Adjustment Screw - 1/4" - 1" Valve Coated Steel Adjustment Screw - 1/4" - 1" Valve Coated Steel, Slotted Adjustment Screw - 1 1/2" - 2" Valve PVC Adjustment Screw - 1 1/2" - 2" Valve Coated Steel	PV-00900 PV-00902 PV-00901 PV-00903 PV-00920 PV-00921

5	1/4" Valve Body PVC 1/4" T-Series Valve Body PVC, 1/4" Valve Body PP 1/4" T-Series Valve Body PP 1/4" Valve Body PTFE 1/4" T-Series Valve Body PTFE 1/4" Valve Body PVDF 1/4" T-Series Valve Body PVDF 1/4" Valve Body 316 SS 1/4" Valve Body Alloy 20 1/4" Valve Body Hast C 1/4" Valve Body CPVC 1/4" T-Series Valve Body CPVC 3/8" Valve Body PVC 3/8" T-Series Valve Body PVC, 3/8" Valve Body PP 3/8" T-Series Valve Body PP 1/4" Valve Body PTFE 3/8" T-Series Valve Body PTFE 3/8" Valve Body PVDF 3/8" T-Series Valve Body PVDF 3/8" Valve Body 316 SS 3/8" Valve Body Alloy 20 3/8" Valve Body Hast C 3/8" Valve Body CPVC 3/8" T-Series Valve Body CPVC 1/2" Valve Body PVC 1/2" T-Series Valve Body PVC 1/2" Valve Body PP 1/2" T-Series Valve Body PP 1/2" Valve Body PTFE 1/2" T-Series Valve Body PTFE 1/2" Valve Body PVDF 1/2" T-Series Valve Body PVDF 1/2" Valve Body 316 SS 1/2" T-Series Valve Body 316 SS 1/2" Valve Body Alloy 20 1/2" T-Series Valve Body Alloy 20 1/2" Valve Body Hast C 1/2" T-Series Valve Body Hast C 1/2" Valve Body CPVC 1/2" T-Series Valve Body CPVC 3/4" Valve Body PVC 3/4" Valve Body PP 3/4" Valve Body PTFE 3/4" Valve Body PVDF 3/4" Valve Body 316 SS 3/4" Valve Body Alloy 20 3/4" Valve Body Hast C 3/4" Valve Body CPVC 1" Valve Body PVC 1" Valve Body PP 1" Valve Body PTFE 1" Valve Body PVDF 1" Valve Body 316 SS 1" Valve Body Alloy 20 1" Valve Body Hast C 1" Valve Body CPVC 1 1/2" Valve Body PVC 1 1/2" Valve Body PP 1 1/2" Valve Body PTFE 1 1/2" Valve Body PVDF 1 1/2" Valve Body 316 SS 1 1/2" Valve Body Alloy 20 1 1/2" Valve Body Hast C 1 1/2" Valve Body CPVC 2" Valve Body PVC 2" Valve Body PP 2" Valve Body PTFE 2" Valve Body PVDF 2" Valve Body 316 SS 2" Valve Body Alloy 20 2" Valve Body Hast C 2" Valve Body CPVC	BPV-00501 BPV-005011 BPV-00502 BPV-005021 BPV-00503 BPV-005031 BPV-00504 BPV-005041 BPV-00505 BPV-00506 BPV-00507 BPV-00508 BPV-005081 BPV-00561 BPV-005611 BPV-00562 BPV-005621 BPV-00563 BPV-005631 BPV-00564 BPV-005641 BPV-00565 BPV-00566 BPV-00567 BPV-00568 BPV-005681 BPV-00511 BPV-005111 BPV-00512 BPV-005121 BPV-00513 BPV-005131 BPV-00514 BPV-005141 BPV-00515 BPV-005151 BPV-00516 BPV-005161 BPV-00517 BPV-005171 BPV-00518 BPV-005181 BPV-00521 BPV-00522 BPV-00523 BPV-00524 BPV-00525 BPV-00526 BPV-00527 BPV-00528 BPV-00531 BPV-00532 BPV-00533 BPV-00534 BPV-00535 BPV-00536 BPV-00537 BPV-00538 BPV-00541 BPV-00542 BPV-00543 BPV-00544 BPV-00545 BPV-00546 BPV-00547 BPV-00548 BPV-00551 BPV-00552 BPV-00553 BPV-00554 BPV-00555 BPV-00556 BPV-00557 BPV-00558	PRV-00501 PRV-005011 PRV-00502 PRV-005021 PRV-00503 PRV-005031 PRV-00504 PRV-005041 PRV-00505 PRV-00506 PRV-00507 PRV-00508 PRV-005081 PRV-00561 PRV-005611 PRV-00562 PRV-005621 PRV-00563 PRV-005631 PRV-00564 PRV-005641 PRV-00565 PRV-00566 PRV-00567 PRV-00568 PRV-005681 PRV-00511 PRV-005111 PRV-00512 PRV-005121 PRV-00513 PRV-005131 PRV-00514 PRV-005141 PRV-00515 PRV-005151 PRV-00516 PRV-005161 PRV-00517 PRV-005171 PRV-00518 PRV-005181 PRV-00521 PRV-00522 PRV-00523 PRV-00524 PRV-00525 PRV-00526 PRV-00527 PRV-00528 PRV-00531 PRV-00532 PRV-00533 PRV-00534 PRV-00535 PRV-00536 PRV-00537 PRV-00538 PRV-00541 PRV-00542 PRV-00543 PRV-00544 PRV-00545 PRV-00546 PRV-00547 PRV-00548 PRV-00551 PRV-00552 PRV-00553 PRV-00554 PRV-00555 PRV-00556 PRV-00557 PRV-00558
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\*Not used with T-Series Valves