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SB12 Series Back Pressure/Relief Valves

CHEMLINE PLASTICS
SUPERIOR FLOW SOLUTIONS

PVC PP PVDF

CRN Registered as Category C Fittings Consult Chemline

NSF[3] Certified to NSF/ANSI 61

SERIES: SB12

SIZES: 3/8" – 4"

ENDS: True Union Socket, Threaded or ChemFlare™[1] Spigot[2] Bodies with Plain, Socket, Threaded or Flanged ends

DIAPHRAGM: PTFE Bonded EPDM

SEALS: EPDM, FKM (Viton®)

The Chemline SB Series Back Pressure/ Relief Valve has two functions. As a ***back pressure valve***, installed in-line downstream of a pump, the back pressure below the metering pump is maintained. When installed in the branch of a tee it is a ***pressure relief valve***. The valve stays closed until inlet pressure reaches the set pressure which is adjusted by turning the spring tensioning bolt. Inlet pressure acts upward against the piston allowing excess pressure to flow upwards through the orifice.

The SB12 Series has a built-in check valve function, desirable for dosing applications. It is not so sensitive as to open with every pulsation from a metering pump.

features

True Union Ends

- Easy installation and maintenance
- Eliminate chemical leakage problems common with old fashioned threaded connections

Long Cycling Life

- Dynamic seal is PTFE bonded EPDM for high chemical resistance
- This moulded diaphragm is designed for superior sealing and flex life

Superior Performance in Dosing Systems

- Valves are hydraulically designed for very low hysteresis ("backlash") and to eliminate chatter
- Built-in check (non-return) function
- Valve opening depends on inlet pressure only and is uneffected by changes in downstream (back) pressure

CRN Registration numbers by province

- Ontario: OC10134.5
- Newfoundland: OC10134.50
- Alberta: OC10134.52
- Saskatchewan/Manitoba/Quebec: OC10134.56
- New Brunswick: OC10134.57
- Nova Scotia: OC10134.58
- P.E.I.: OC10134.59
- British Columbia: not required

technical

Set Pressure Ranges

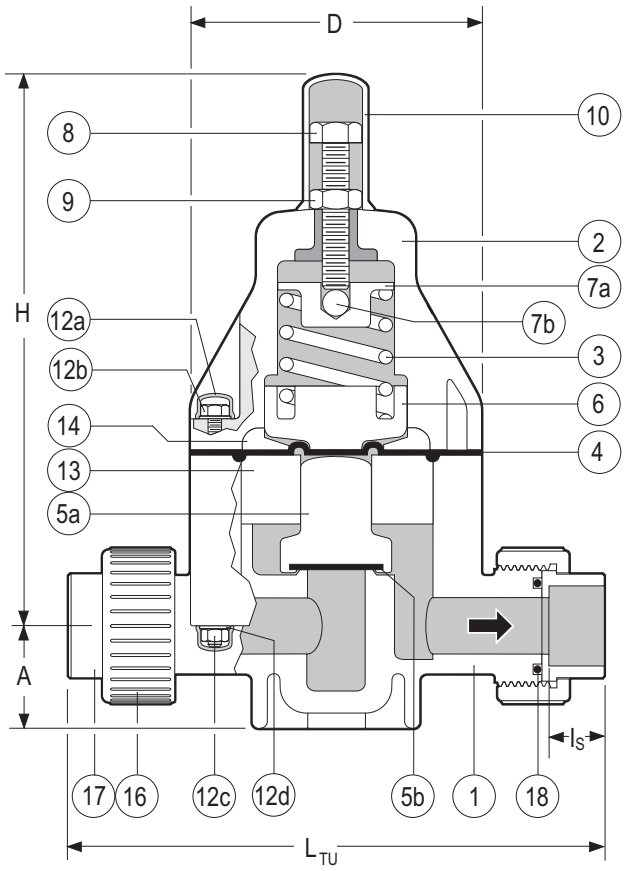
- 1/2" to 2" – 5 to 150 psi
- 2-1/2" and 3" – 7.5 to 150 psi
- 2-1/2" to 4" – 4 to 60 psi (optional)
- 4" – 7.5 to 90 psi

Maximum Viscosity

- 120cP is maximum recommended service viscosity

[1] For ChemFlare™ end connectors, consult Chemline.
[2] PP and PVDF spigot ends have DIN dimensions and will butt fuse directly to Chemline PP and PVDF piping systems.
[3] PVC valves with EPDM or FKM (Viton®) seals are certified under NSF/ANSI Standard 61 for contact with drinking water.

SB12 Series Back Pressure/Relief Valves 1/2" to 2"



True Union Body

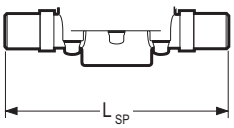
PARTS

▲ Recommended Spare Parts

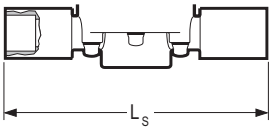
No.	Part	Pcs.	Materials
1	Body	1	PVC, PP, PVDF
2	Bonnet	1	PPG
3	Spring	1	Galvanized Steel
4▲	Control Diaphragm	1	PTFE bonded EPDM
5a▲	Piston	1	PVC, PP, PVDF
5b▲	Seat	1	EPDM, FPM(Viton®)
6	Lower Spring Retainer	1	PPG
7a	Upper Spring Retainer	1	Cad. Plated Steel
7b	Ball	1	304 SS
8	Spring Tensioning Bolt	1	304 SS
9	Lock Nut	1	304 SS
10	Spring Bolt Cap	1	PE
12a	Bolt/Nut Cap	8/12[1]	PE
12b	Hex Bolt	4/6[1]	304 SS
12c	Hex Nut	4/6[1]	304 SS
12d	Washer	8/12[1]	304 SS
13	Spacer Disc	1	PVC, PP, PVDF
14	Pressure Plate	1	PP
16	Union Nut	2	PVC, PP, PVDF
17	End Connector	2	PVC, PP, PVDF
18▲	Face O-Ring	2	EPDM, FPM(Viton®)

[1] 1/2" size / 3/4" to 2" sizes

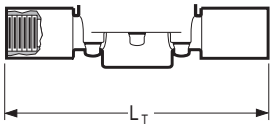
OTHER ENDS



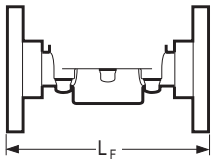
Spigot Body



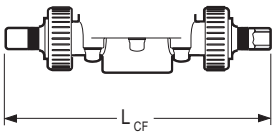
Socket



Threaded



Flanged



ChemFlare™

DIMENSIONS INCHES

WEIGHTS LB.

Cv VALUES

Size	D	H	PVC A	PVC I_S	PVC L_{TU}[2]	PVC L_{SP}[3]	PVC L_S	PVC L_T	PVC L_F	PVC L_{CF}	PP and PVDF A	PP and PVDF L_{SP}[3]	PP and PVDF L_{TU}[2]	PVC	PP	PVDF	USGPM Flow at 1 psi △P
3/8"	3.2	6.9	1.0	0.6	6.5	5.7	7.4	7.2	4.5	8.2	0.9	5.7	**	1.8	1.5	2.2	2.1
1/2"	3.2	6.9	1.0	0.6	6.8	5.7	8.0	7.8	6.3	8.3[4]	0.9	5.7	7.1	1.9	1.6	2.4	3.0
3/4"	4.2	8.0	1.5	0.7	8.3	6.9	9.3	8.9	7.4	9.7	1.4	6.9	8.4	4.1	3.5	4.6	6.6
1"	4.2	8.0	1.5	0.9	8.5	6.9	9.6	9.3	7.4	10.2	1.4	6.9	8.7	4.2	3.5	4.7	8.7
1-1/4"	5.8	10.3	2.2	1.0	10.9	8.8	11.6	11.2	9.2	13.5	2.1	8.8	10.9	11.0	9.0	12.0	18.0
1-1/2"	5.8	10.3	2.2	1.2	11.1	8.8	12.2	11.5	9.5	–	2.1	8.8	11.2	11.2	9.2	12.2	20.0
2"	5.8	10.3	2.2	1.5	11.3	9.6	12.9	12.0	10.0	–	2.1	8.8	13.2	11.4	9.4	12.4	21.4

[2] True Union bodies come standard with socket ends. Threaded union ends are available. ** Consult Chemline.
[3] Spigot bodies are used for non union socket, threaded or flanged ends. All spigot ends have metric dimensions and the PP and PVDF spigots butt fuse directly to Chemline PP and PVDF piping. [4] Tube size can be reduced to 1/4" tube, LCF = 7.74" for 1/4", 8.26" for 3/8".

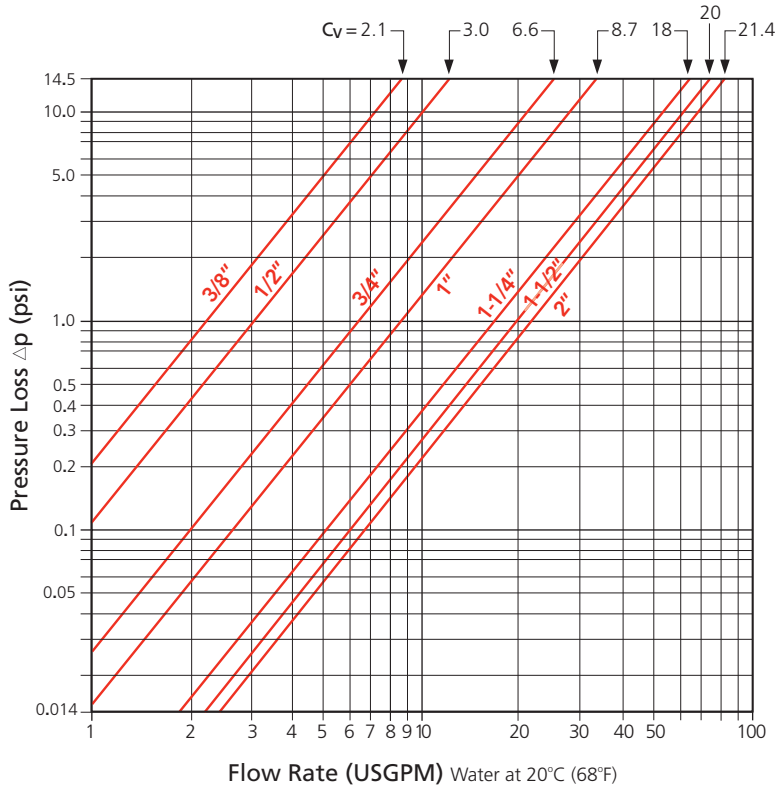
MAXIMUM PRESSURES PSI

Size	PVC 20°C 68°F	PVC 30°C 86°F	PVC 40°C 104°F	PVC 50°C 122°F	PP 30°C 86°F	PP 40°C 104°F	PP 50°C 122°F	PP 60°C 140°F	PP 70°C 158°F	PVDF 30°C 86°F	PVDF 50°C 122°F	PVDF 70°C 158°F	PVDF 80°C 176°F	PVDF 90°C 194°F	PVDF 100°C 212°F
1/2"– 2"	150	105	60	15	150	90	60	37.5	15	150	100	60	45	30	15

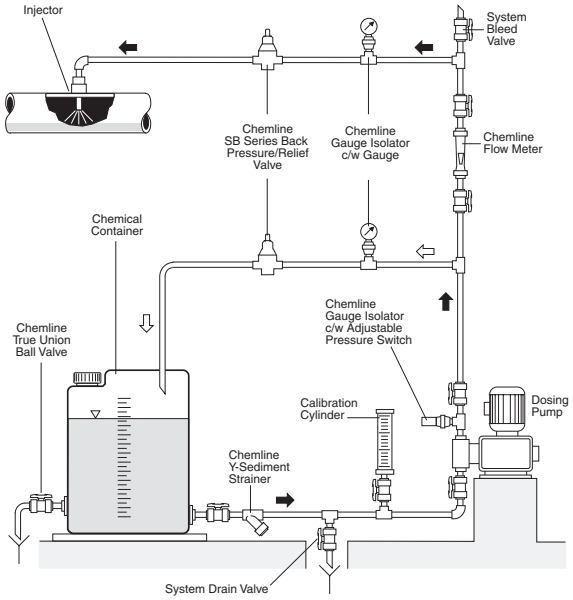
Temperature Ranges: PVC 0 to 50°C (32 to 122°F), **PP** 10 to 70°C (50 to 158°F), **PVDF** –30 to 100°C (–22 to 212°F).

SB12 Series Back Pressure/Relief Valves 1/2” to 2”

pressure loss nomogram for SB12 valves 3/8” to 2”

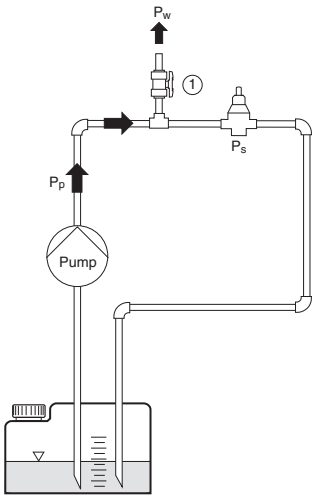


typical dosing system schematic



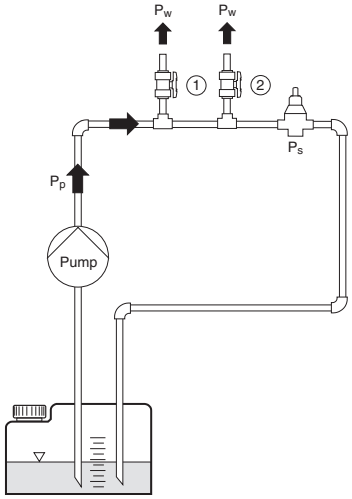
application of pressure relief valves

Constant System Pressure



$P_p \geq P_w$
$P_p \geq P_s$ → valve opens
$P_p \leq P_s$ → valve closed

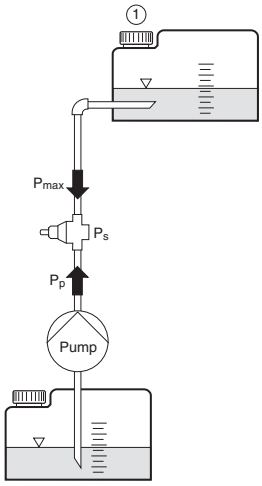
Consumer 1 and/or 2 Open, Valve Closes



$P_p \geq P_s$ → valve opens
$P_p \leq P_s$ → valve closed

Non-Return Valve

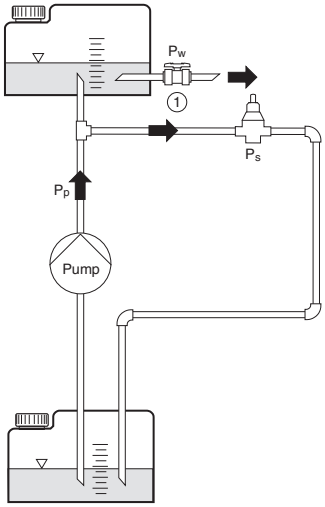
Container 1 is located above the pump



$P_s \geq P_{max}$
$P_p \geq P_s$ → valve opens
$P_p \leq P_s$ → valve closed

Overflow Valve

Pressure of container or application system should not exceed the maximum pressure value



$P_s \leq P_w$
$P_p \geq P_s$ → valve opens
$P_p \leq P_s$ → valve closed

P_w = Working Pressure
P_p = Pump Pressure
P_s = Set Pressure

SB12 Series Back Pressure/Relief Valves 1/2" to 2"

working pressure vs. flow rate

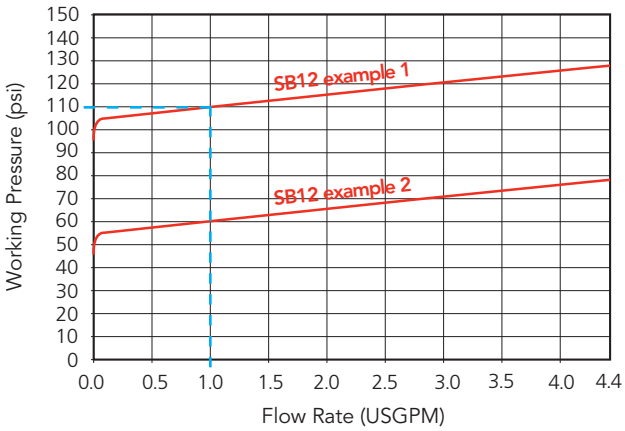
The curves show the relationship between the working pressure and the approximate flow rate through the valve for water at 20°C (68°F) . These values will vary depending on:

- The configuration of the piping and the pressure losses associated with it
- The fluid if not water at 20°C (68°F)
- Whether the pressure is rising or falling, hysteresis is approximately 4 psi for 1/2" to 2" valves. For valves 2-1/2" to 4", hysteresis is approximately 14.5 psi.

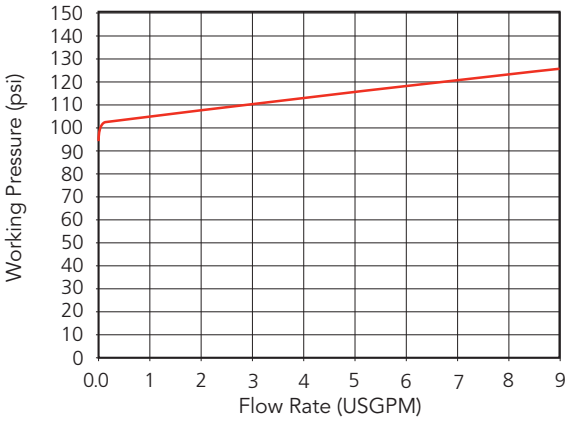
operation examples

1. The valve is set closed at 100 psi. At a pressure increase of 10 psi, a flow of approximately 1.0 USGPM will be reached.
   - set pressure = 100 psi
   - working pressure = 110 psi
   - opening pressure = approximately 104 psi
2. The valve is set closed at 50 psi. At a pressure increase of 10 psi, a flow of approximately 1.0 USGPM will be reached.
   - set pressure = 50 psi
   - working pressure = 60 psi
   - opening pressure = approximately 54 psi

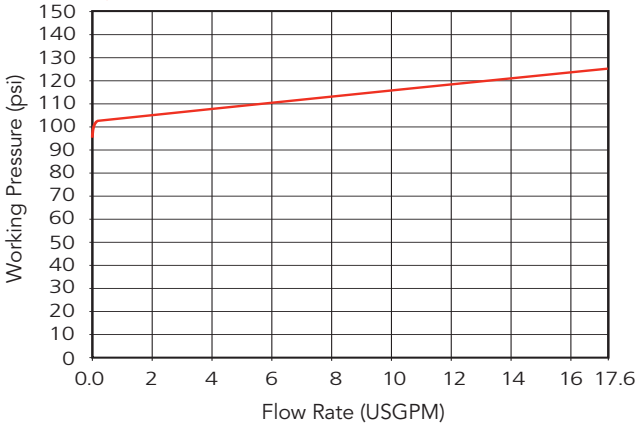
3/8" Valves



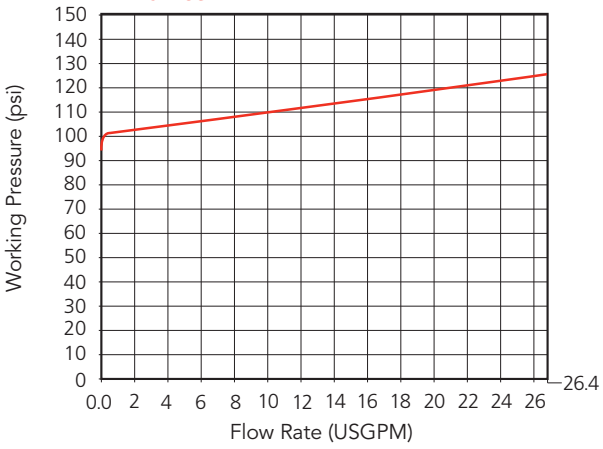
1/2" Valves



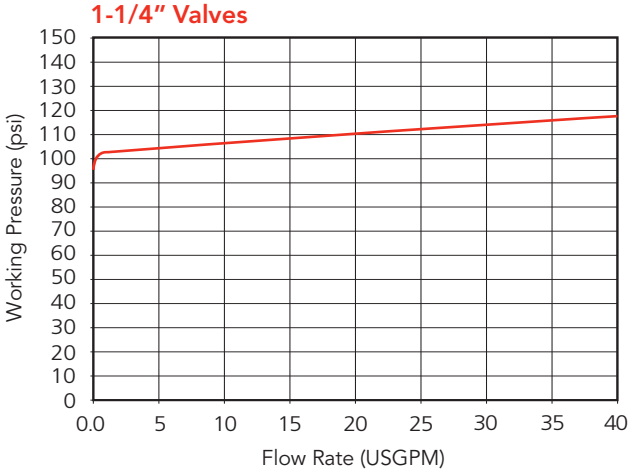
3/4" Valves



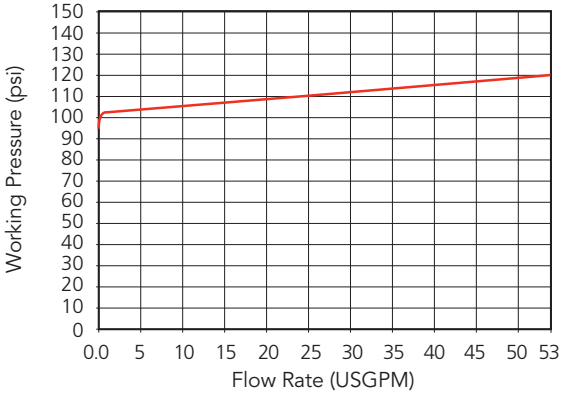
1" Valves



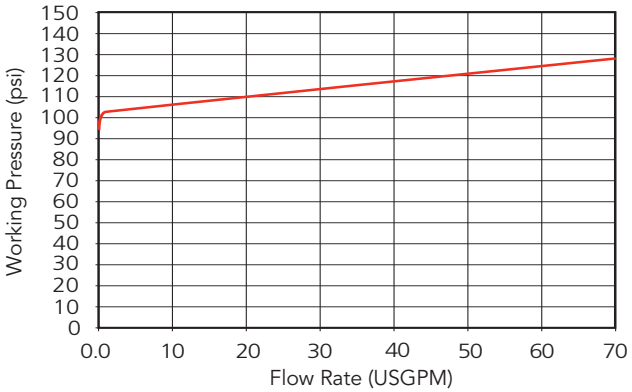
1-1/4" Valves



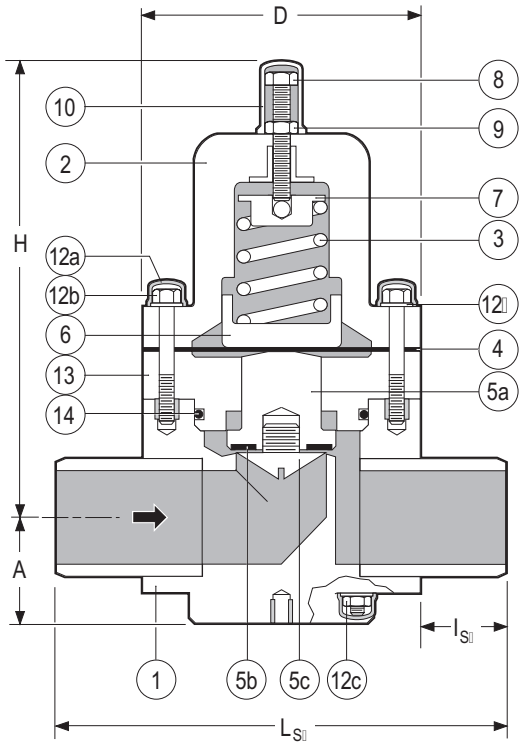
1-1/2" Valves



2" Valves



SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"



Spigot Body

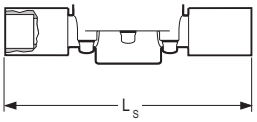
PARTS

▲ Recommended Spare Parts

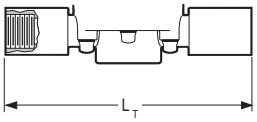
No.	Part	Pcs.	Materials
1	Body	1	PVC, PP, PVDF
2	Bonnet	1	PPG
3	Spring	1	Galvanized Steel
4▲	Control Diaphragm	1	PTFE bonded EPDM
5a▲	Piston	2	PVC, PP, PVDF
5b▲	Seat	1	EPDM, FPM(Viton®)
5c▲	Seat Retainer	1	PVC, PP, PVDF
6	Lower Spring Retainer	1	PPG
7	Upper Spring Retauner	1	304 SS
8	Spring Tensioning Bolt	1	304 SS
9	Lock Nut	1	304 SS
10	Spring Bolt Cap	1	PE
12a	Hex Bolt/Nut Cap	20	PE
12b	Hex Bolt/Stud	12[1]	304 SS
12c	Hex Nut	20	304 SS
12d	Washer	20	304 SS
13	Spacer Disc	1	PVC, PP, PVDF
14	Spacer O ring	1	EPDM, FPM(Viton®)

[1] 2 large upper bolts, 2 shorter lower bolts, 8 studs

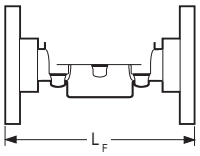
OTHER ENDS



Socket



Threaded



Flanged

ChemFlare™ Ends

- For connection to PFA tube. Leak-free connections for difficult services such as sodium hypochlorite

DIMENSIONS INCHES

WEIGHTS LB.

Cv VALUES

Size	PVC, PP & PVDF A	D	H	L_{SP}[2]	l_{SP}	PVC L_F	WEIGHTS PVC	PP	PVDF	Cv VALUES USGPM Flow at 1 psi △P
2-1/2"	2.7	6.9	11.1	11.2	2.1	12.2	20.9	15.4	24.6	41
3"	3.0	7.9	12.2	14.2	3.1	15.0	26.4	23.8	30.8	63
4"	3.7	9.8	14.2	16.5	3.3	16.9	33.0	26.4	37.4	98

[2] Plain spigot ends in PP & PVDF may be butt fused directly to Chemline PP & PVDF piping systems.

Weights based on spigot bodies.

MAXIMUM PRESSURES PSI

Size	PVC 20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	PP 20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	PVDF 30°C 86°F	50°C 122°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F
2-1/2"– 4"	150	90	44	15	150	116	90	60	37.5	15	150	90	55	40	30	15

Temperature Ranges: PVC 0 to 50°C (32 to 122°F), **PP** 10 to 70°C (50 to 158°F), **PVDF** –30 to 100°C (–22 to 212°F).

ORDERING EXAMPLE

Chemline Back Pressure/ Relief Valves	SB12	A	005	V	U
Body Material	**A** – PVC	**B** – PP	**K** – PVDF		
Size	**003** – 3/8" **010** – 1" **020** – 2"	**005** – 1/2" **012** – 1-1/4" **025** – 2-1/2"	**007** – 3/4" **015** – 1-1/2" **030** – 3"	**040** – 4"		
Elastomers	**E** – EPDM	**V** – FPM (Viton®)				
Ends	**S** – Socket **CFx** – ChemFlare™	**T** – Threaded	**F** – Flanged **Blank** – Spigot (Butt)	**U** – Union Socket		

Example: Chemline SB 12 Series, PVC, 1/2" diameter, FPM (Viton®) seals, Union socket ends.
x = 4 for 1/4", **6** for 3/8", **8** for 1/2", **12** for 1" ID tube connections.

OPTIONS

- 4 to 60 psi Pressure Range springs for 2-1/2" to 4" valves
- **Integral Pressure Gauge** – for inlet and/or outlet
- Bodies in 316 Stainless Steel and PTFE

Optional Pressure Gauge

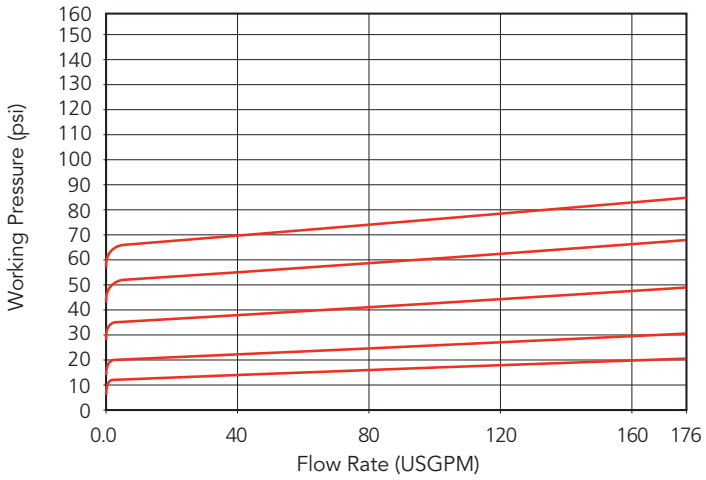
- For inlet and/or outlet

SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"

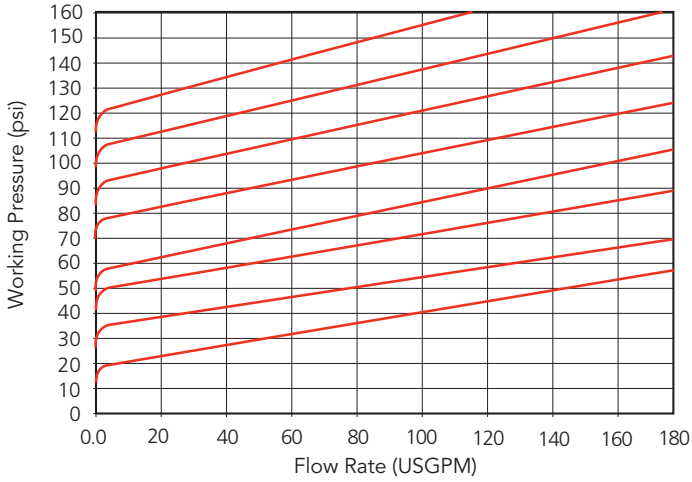
working pressure vs. flow rate

• Whether the pressure is rising or falling, hysteresis is approximately 14.5 psi for 2-1/2" to 4" valves

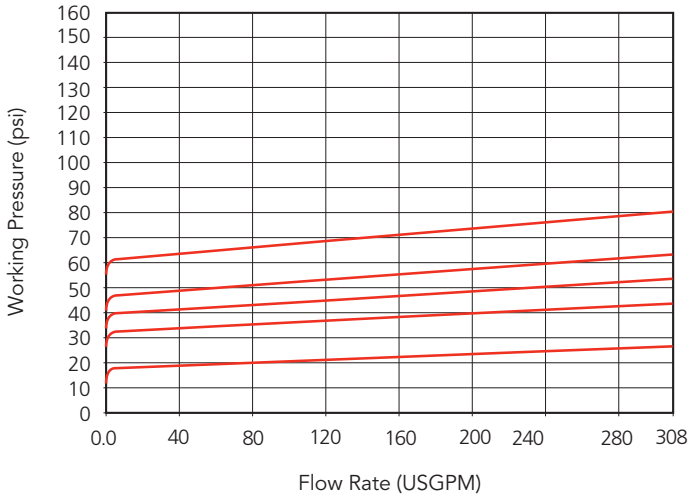
2-1/2" Valves / 4 to 60 psi set pressure range



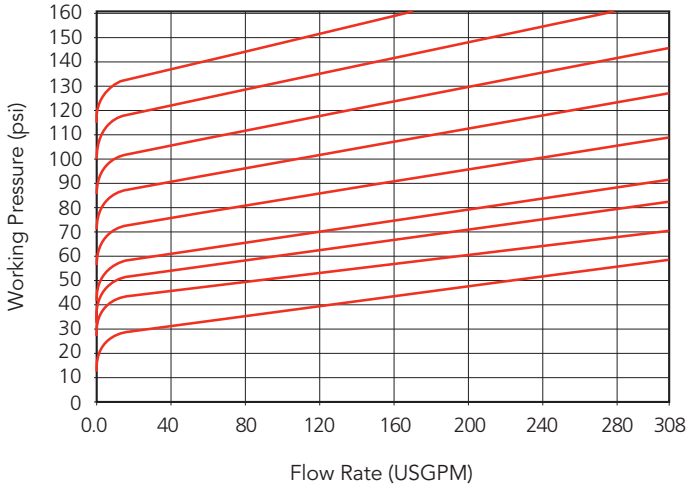
2-1/2" Valves / 7.5 to 150 psi set pressure range



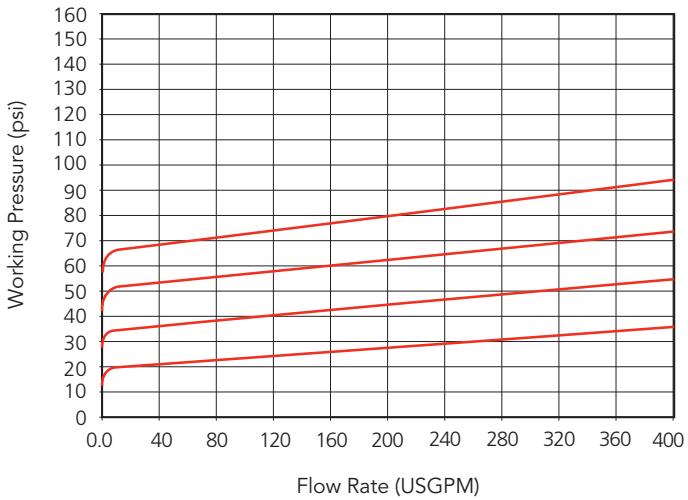
3" Valves / 4 to 60 psi set pressure range



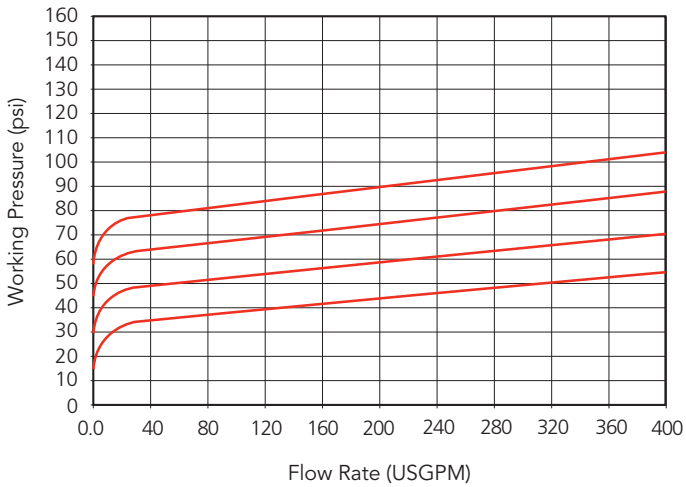
3" Valves / 7.5 to 150 psi set pressure range



4" Valves / 4 to 60 psi set pressure range



4" Valves / 7.5 to 90 psi set pressure range



CHEMLINE PLASTICS
SUPERIOR FLOW SOLUTIONS

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