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# SB 10/11 Series Back Pressure/ Relief Valves

CHEMLINE Plastics Limited

*Your Pipeline To Quality*

## PVC, PP, PVDF

**SERIES:** SB10 and SB11

**SIZES:** 3/8" – 2"

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

**DIAPHRAGM:** Teflon® Bonded EPDM

**SEALS:** EPDM, FPM (Viton®)

CRN REGISTERED
CONSULT CHEMLINE

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 on the Teflon® control diaphragm opening the valve, allowing excess pressure to flow downwards through the orifice.

The SB10/11 Series is very sensitive to pressure changes and requires low overpressure to fully open. It is designed for *clean fluids* only.

## Sensitive and Reliable

## Designed for Long Life

## True Union Ends

### Features

**True Union Ends**
- Easy installation and maintenance
- Eliminate chemical leakage problems common with old fashioned threaded connections

**Long Cycling Life**
- Dynamic seal is Teflon® bonded EPDM for high chemical resistance
- This moulded diaphragm is designed for superior sealing and flex life

**Designed for Superior Performance**
- Valves are hydraulically designed for low hysteresis ("backlash") and to eliminate chatter
- Low overpressure to fully open
- Sensitive to pressure changes

### Technical

**Set Pressure Ranges:**
- SB10 – 3 to 60 psi
- SB11 – 7 to 150 psi

– The only difference between SB10 and SB11 is the strength of spring

**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.

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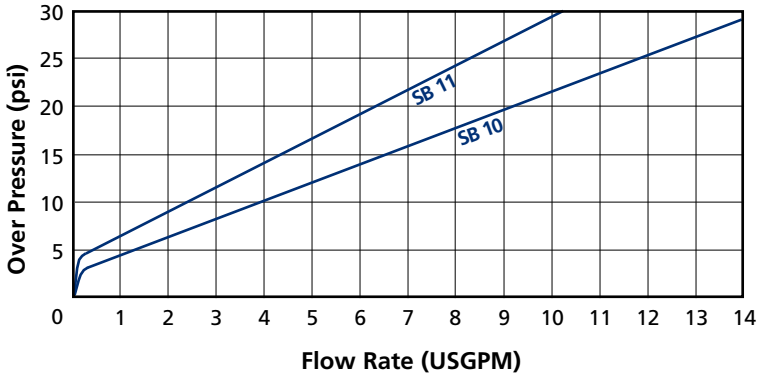
# SB 10/11 Back Pressure/Relief Valves

## OVER PRESSURE VS. FLOW RATE

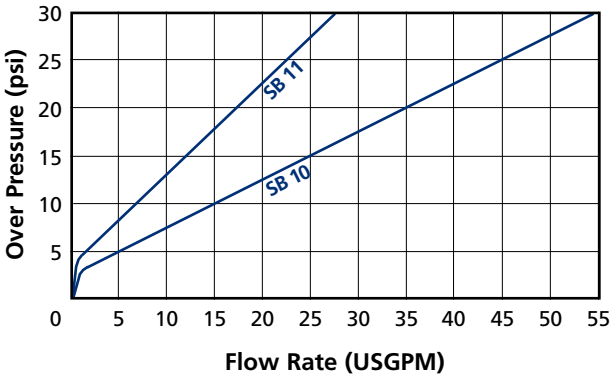
The curves show the relationship between the over pressure (inlet pressure above the set pressure) and the approximate flow rate through the valve for water at 20°C (68°F). These values vary depending on:

- 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.

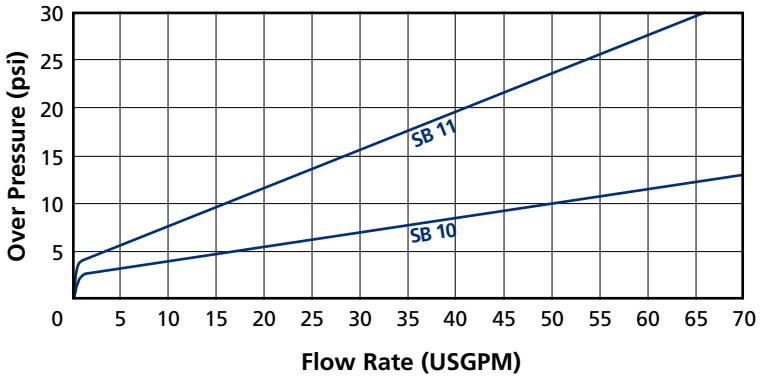
### VALVE SIZES 3/8" and 1/2"




### VALVE SIZES 3/4" and 1"




### VALVE SIZES 1-1/4", 1-1/2" and 2"



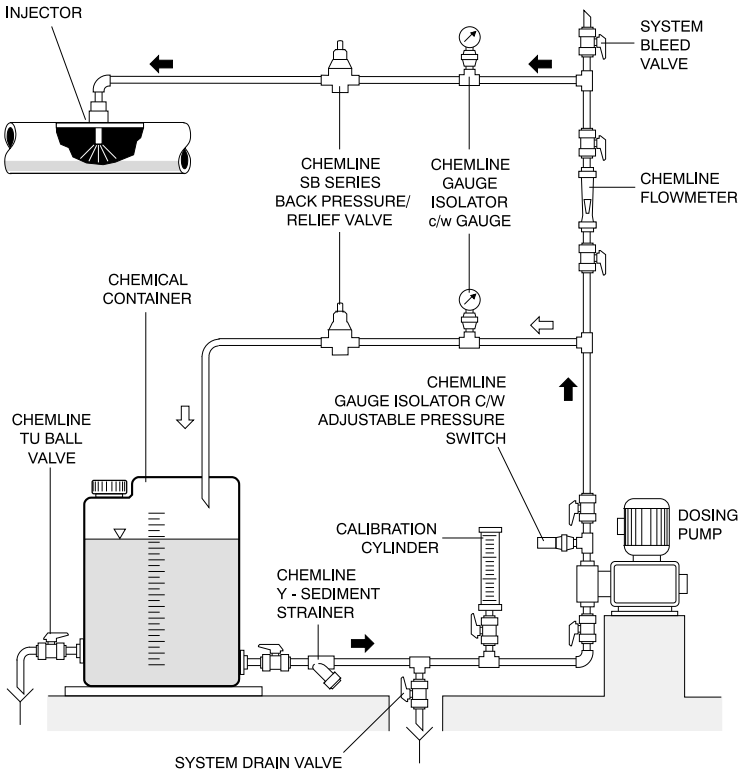
**ChemFlare™ Ends**

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

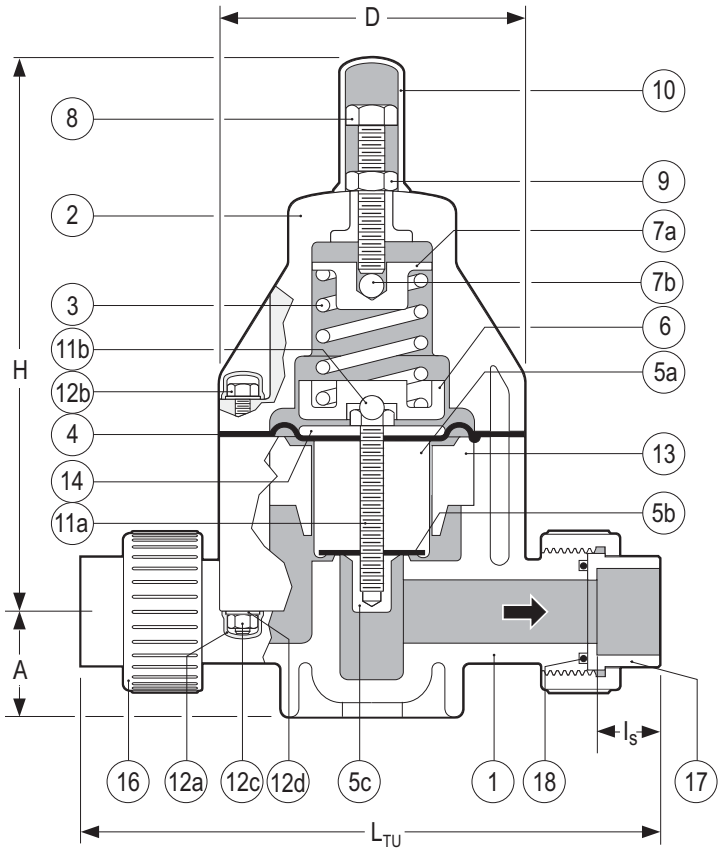
**Optional Pressure Gauge**

- For inlet and/or outlet

## TYPICAL DOSING SYSTEM SCHEMATIC



# SB 10/11 Back Pressure/Relief Valves




**True Union Body**

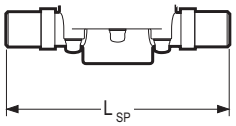
## PARTS

▲ Recommended Spare Parts

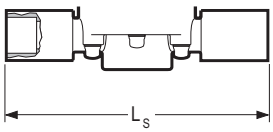
| No. | Part | Pcs. | Materials |
|---|---|---|---|
| 1 | Body | 1 | PVC, PP, PVDF |
| 2 | Bonnet | 1 | PPG |
| 3 | Spring | 1 | Galvanized Steel |
| 4▲ | Control Diaphragm | 1 | Teflon® PTFE bonded EPDM |
| 5a▲ | Piston | 1 | PVC, PP, PVDF |
| 5b▲ | Seat | 1 | EPDM, FPM (Viton®) |
| 5c▲ | Seat Retainer | 1 | PVC, PP, PVDF |
| 6 | Lower Spring Retainer | 1 | Cad. Plated Steel |
| 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 |
| 11a▲ | Piston Bolt | 1 | 304 SS |
| 11b | Ball | 1 | 304 SS |
| 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 | Cad. Plated Steel |
| 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

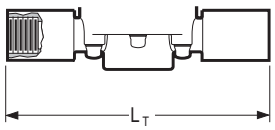
## OTHER ENDS



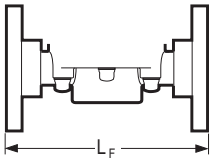

**Spigot Body**



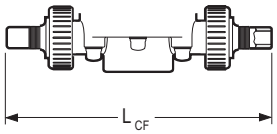

**Socket**




**Threaded**




**Flanged**




**ChemFlare™**

## DIMENSIONS INCHES — WEIGHTS LB. — $C_V$ VALUES

| Size | D | H | PVC A | PVC $l_s$ | PVC $L_{TU}$† | PVC $L_{SP}$ | PVC $L_S$ | PVC $L_T$ | PVC $L_F$ | PVC $L_{CF}$ | PP and PVDF A | PP and PVDF $L_{SP}$* | PP and PVDF $L_{TU}$† | 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 | – | 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‡ | 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 | – | 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 | 9.6 | 13.2 | 11.4 | 9.4 | 12.4 | 21.4 |

† True Union Bodies come standard with socket ends. Threaded union ends are available. ** Consult Chemline.
* 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. ‡ Tube size can be reduced to 1/4" tube, $L_{CF}$ = 7.74" for 1/4", 8.26" for 3/8".

# SB 10/11 Back Pressure/Relief Valves

## MAXIMUM PRESSURES PSI

| Size | PVC | | | | PP | | | | | PVDF | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 20°C 68°F | 30°C 86°F | 40°C 104°F | 50°C 122°F | 30°C 86°F | 40°C 104°F | 50°C 122°F | 60°C 140°F | 70°C 158°F | 30°C 86°F | 50°C 122°F | 70°C 158°F | 80°C 176°F | 90°C 194°F | 100°C 212°F |
| **3/8"** | 150 | 105 | 60 | 15 | 150 | 90 | 60 | 37 | 15 | 150 | 100 | 60 | 45 | 30 | 15 |
| **1/2"** | 150 | 105 | 60 | 15 | 150 | 90 | 60 | 37 | 15 | 150 | 100 | 60 | 45 | 30 | 15 |
| **3/4"** | 150 | 105 | 60 | 15 | 150 | 90 | 60 | 37 | 15 | 150 | 100 | 60 | 45 | 30 | 15 |
| **1"** | 150 | 105 | 60 | 15 | 150 | 90 | 60 | 37 | 15 | 150 | 100 | 60 | 45 | 30 | 15 |
| **1-1/4"** | 150 | 105 | 60 | 15 | 150 | 90 | 60 | 37 | 15 | 150 | 100 | 60 | 45 | 30 | 15 |
| **1-1/2"** | 150 | 105 | 60 | 15 | 150 | 90 | 60 | 37 | 15 | 150 | 100 | 60 | 45 | 30 | 15 |
| **2"** | 150 | 105 | 60 | 15 | 150 | 90 | 60 | 37 | 15 | 150 | 100 | 60 | 45 | 30 | 15 |

**Temperature Ranges: PVC** 0 to 50°C (32 to 122°F), **PP** –20 to 70°C (–4 to 158°F), **PVDF** –40 to 100°C (–40 to 212°F).

## SAMPLE SPECIFICATION

- All Back Pressure/Relief Valves in PVC, PP or PVDF shall be Chemline SB10 or SB11 Series or equal in sizes 1/2" to 2". SB10 shall have inlet set pressure range of 3 to 60 psi and SB11 shall have an inlet set pressure range of 7 to 150 psi. All valves shall have a maximum inlet pressure rating of 150 psi. Valves shall be suitable for aggressive clean non scaling chemicals.
- All exposed external metal parts including spring tensioning bolt and body bolts shall be 304 stainless steel covered with polyethylene caps.
- All valves shall have a large Teflon® coated control diaphragm to fully open at no more than 10-15% over pressure.
- Static seals shall be EPDM or FPM (Viton®).
- Socket ends 1/2" to 2" shall be Schedule 80 and conform to ASTM D-2467.
- Threaded ends 1/2" to 2" shall be Schedule 80 and conform to ASTM D-2464.
- Butt fusion ends in PP and PVDF shall be compatible with Chemline metric polypropylene and PVDF piping systems.
- Flanged ends shall be ANSI Class 150.
- PVC compound shall have an ASTM cell classification 13463-A, with minimum suffix "A" designation for chemical resistance as per ASTM D-1784.
- All polypropylene material shall conform to ASTM D-4101 PP 0211B67272 material requirements.
- All PVDF material shall be unpigmented conforming to ASTM D-3222 Type 2 suspension resin material requirements and also with USDA Title 21, Chapter I, Part 177.2510 requirements for contact with food.
- All valves shall have chemical resistant labels permanently marked with manufacturing number to provide production level traceability.

## ORDERING EXAMPLE

| **Chemline Back Pressure/Relief Valves** | **SB11** | **A** | **005** | **V** | **U** |
|---|---|---|---|---|---|
| Pressure Range | **SB10** – 3 to 60 psi<br>**SB11** – 7 to 150 psi | | | | |
| Body Material | **A** – PVC **B** – PP | **K** – PVDF | | | |
| Size | **003** – 3/8" **005** – 1/2" **007** – 3/4" **010** – 1"<br>**012** – 1-1/4" **015** – 1-1/2" **020** – 2" | | | | |
| Elastomers | **E** – EPDM **V** – FPM (Viton®) | | | | |
| Ends | **S** – Socket **T** – Threaded **F** – Flanged **U** – Union Socket<br>**CFx** – ChemFlare™ **Blank** – Spigot (Butt) | | | | |

**Example:** Chemline SB 11 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.

## OPTION

- **Integral Pressure Gauge** – for inlet and/or outlet

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