

Type 21 Ball Valves



options + accessories



ChemFlare™ Ends

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



Optional Lock-out Handle & Hasp

- To prevent unauthorized operation of the valve
- Used during maintenance shut-downs



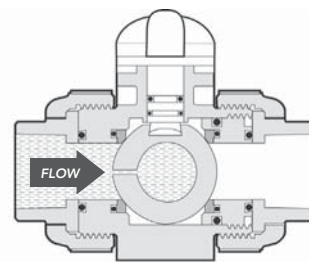
One-piece moulded PVC and CPVC 6" socket ends

- Allows installation of 4" valve in 6" line
- Factory moulded, not fabricated with couplings and reducers cemented together
- Fixed to valve mechanically just like the one-piece moulded factory flanges



Different Colour Handles

- Choose a handle colour other than standard red for colour coding different services



Vented Ball

- For sodium hypochlorite services at any concentration
- Valve shown in closed position

electric + pneumatic actuation

Pneumatic and Electric Actuators

- A complete range of actuators and control accessories are available, mounted to valves using PPG plastic brackets and stainless steel couplings. Refer to separate data sheets.



Electromni® Electric



Q Series Electric



A Series Electric

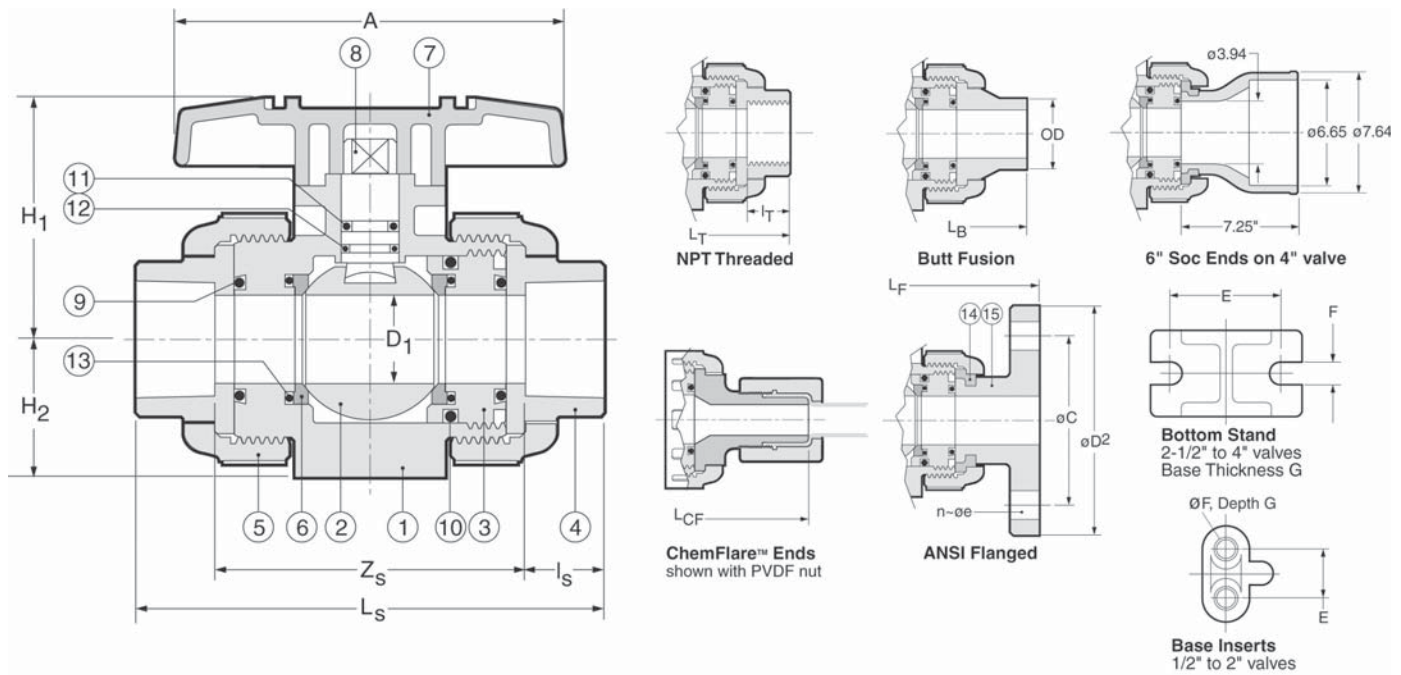


V Series Electric
with Local Control Station



PA Series Pneumatic

Type 21 Ball Valves



PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
1	Body	1	PVC, CPVC, PP, PVDF
2	Ball	1	PVC, CPVC, PP, PVDF
3	Carrier ¹	1/2	PVC, CPVC, PP, PVDF
4	End Connector	2	PVC, CPVC, PP, PVDF
5	Union Nut	2	PVC, CPVC, PP, PVDF
6▲	Ball Seat	2	PTFE
7	Handle	1	ABS

¹ 1 carrier for sizes 1/2" to 2", 2 carriers for sizes 2-1/2" to 4"

² EPDM seals standard with PVC, CPVC, PP; FKM (Viton®) with PVDF valves

³ 2 pcs 1/2" to 2", 6 pcs 2-1/2" to 4"

PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
8	Stem	1	PVC, CPVC, PP, PVDF
9▲	Face O-Ring ²	2	EPDM, FKM (Viton®)
10▲	Carrier O-Ring ²	2	EPDM, FKM (Viton®)
11▲	Upper Thicker Stem O-Ring ²	1	EPDM, FKM (Viton®)
12▲	Lower Thinner Stem O-Ring ²	1	EPDM, FKM (Viton®)
13	Seat Cushion ²	2	EPDM, FKM (Viton®)
14	Flange Retainer ³	2/6	PVDF
15	Flange	2	PVC, CPVC, PP, PVDF

DIMENSIONS INCHES

Size	D				End Connections														Valve Base		
					Socket			Threaded		Factory Flanged					Butt		ChemFlare™				
	Bore	A	H ₁	H ₂	L _S	Z _S	I _S	I _T	L _T	L _F	D ₂	C	n	e	L _B	OD	L _{CF}	Tube ⁴	E	F ⁵	G
1/2"	.59	3.6	2.03	1.14	4.45	2.70	.875	.64	4.02	5.63	3.50	2.38	4	.62	4.88	.79	6.12	1/2"	.75	.29	.43
3/4"	.79	3.9	2.34	1.38	5.08	3.08	1.00	.65	4.72	6.77	3.88	2.75	4	.62	5.67	.98	6.52	3/4"	.75	.29	.43
1"	.98	4.3	2.68	1.54	5.75	3.50	1.13	.81	5.16	7.36	4.25	3.12	4	.62	6.06	1.26	7.26	1"	.75	.29	.43
1-1/4"	1.22	4.8	3.17	1.85	6.46	5.21	1.25	.85	5.91	7.48	4.62	3.50	4	.62	6.85	1.57	9.58	1-1/4"	1.18	.35	.59
1-1/2"	1.57	5.2	3.50	2.17	7.24	4.49	1.38	.85	6.42	8.35	5.00	3.88	4	.62	7.64	1.97	—	—	1.18	.35	.59
2"	2.01	6.3	4.02	2.60	8.23	5.23	1.50	1.90	7.76	9.21	6.00	4.75	4	.75	8.82	2.48	—	—	1.18	.35	.59
2-1/2"	2.28	7.87	4.96	2.83	9.45	5.95	1.75	1.21	8.46	10.20	7.00	5.49	4	.75	9.72	2.95	—	—	1.89	.35	.23
3"	2.70	9.45	5.51	3.35	11.10	7.35	1.88	1.30	10.39	11.97	7.50	6.00	4	.75	11.61	3.54	—	—	2.17	.43	.28
4"	3.54	11.81	7.01	4.33	13.88	9.87	2.00	1.38	14.17	14.65	9.00	7.50	8	.75	14.76	4.33	—	—	2.56	.43	.32

⁴ ChemFlare™ ends are available for reduced tube sizes down to 1/4".

⁵ Optional threaded inserts: 1/2" to 1" valves – UNC 1/4"-20; 1-1/4" to 2" valves – UNC 5/16"-18. 'Recoil' brand inserts require drilling before insertion.

Type 21 Ball Valves



WORKING PRESSURES PSI, Water, Non-Shock

VACUUM RATING • 29.9 inches mercury

Size	PVC			CPVC						PP			PVDF				
	20°C 68°F	40°C 104°F	50°C 122°F	20°C 68°F	40°C 104°F	50°C 122°F	60°C 140°F	80°C 176°F	90°C 194°F	20°C 68°F	60°C 140°F	80°C 176°F	20°C 68°F	40°C 104°F	60°C 140°F	80°C 176°F	100°C 212°F
1/2"–2"	230	165	150	230	165	150	120	75	55	150	85	55	230	185	150	110	85
2-1/2"–4"	150	150	150	150	150	150	120	75	55	150	70	40	150	150	150	110	85

Temperature Ranges: PVC 0 to 60°C (32 to 140°F), CPVC 0 to 95°C (32 to 203°F), PP –20 to 80°C (–4 to 176°F), PVDF –40 to 100°C (–40 to 212°F)

WEIGHTS LB. THREADED or SOCKET **WEIGHTS** LB. FLANGED

Size	PVC	CPVC	PP	PVDF	PVC	CPVC	PP	PVDF
1/2"	0.4	0.4	0.4	0.4	0.9	0.9	0.7	1.1
3/4"	0.7	0.7	0.7	0.9	1.3	1.5	1.1	1.5
1"	0.9	1.1	0.9	1.1	1.8	2.0	1.5	2.2
1-1/4"	1.5	1.5	1.3	1.8	2.6	2.9	2.0	3.3
1-1/2"	2.4	2.6	1.5	2.9	3.7	4.0	2.6	4.4
2"	4.0	4.4	2.6	4.9	5.5	6.0	4.0	8.2
2-1/2"	5.1	5.5	3.7	6.2	7.3	7.7	5.3	8.8
3"	8.2	8.8	5.5	9.9	10.1	11.0	7.5	12.6
4"	19.4	21.8	13.2	24.9	21.6	23.4	15.4	26.7

Cv VALUES VS. BALL ANGLE

Size	0%	25%	50%	75%	100%
1/2"	0	0.35	1.3	5.5	14.
3/4"	0	0.73	2.8	11.5	29.
1"	0	1.2	4.5	18.6	47.
1-1/4"	0	1.8	6.8	28.4	72.
1-1/2"	0	3.9	14.7	61.2	155.
2"	0	4.8	18.0	75.0	190.
2-1/2"	0	9.1	34.7	144.0	365.
3"	0	10.2	39.0	162.0	410.
4"	0	17.0	64.6	269.0	680.

SAMPLE SPECIFICATION

- All True Union Ball Valves in PVC, CPVC, PP or PVDF shall be Chemline Type 21 or equal sizes 1/2" to 2" in PVC, CPVC, and PVDF rated at 230 psi and in PP 150 psi maximum working pressure. Sizes 2-1/2", 3" and 4" rated at 150 psi maximum working pressure with EPDM, FKM (Viton®) or CPE seals. Ball seats shall be PTFE with elastomer cushions for closure with minimum stem torques.
- All valves will have Safety Shear stem design, blowout-proof with double o-rings for safety. The top o-ring groove shall be deeper so that if the stem breaks off under excessive torque the lower o-ring will remain intact and the valve will hold pressure.
- All valves shall be full port and two-way blocking design.
- All valves will be CRN (Canadian Registration Number) registered with TSSA.
- PVC valves with EPDM or FKM (Viton®) seals shall be certified under NSF/ANSI Standard 61 for contact with drinking water.
- All valves shall have chemical resistant labels permanently marked with manufacturing number to provide production level traceability.
- PVC compound shall have an ASTM cell classification 12454-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784 (CSA report LO 4000-172).
- CPVC compound shall have an ASTM cell classification 23567-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784.
- PP material will conform to ASTM D-4101 PP 021 B 67272 material requirements.
- PVDF material shall be unpigmented conforming to ASTM D-3222 material requirements and to be USDA Title 21 Chapter 1 Part 177. 2510 requirements for contact with food.
- Socket ends in PVC and CPVC shall be Schedule 80 and conform to ASTM D-2467.
- Threaded ends shall be Schedule 80 and conform to ASTM D-2464.
- Butt fusion ends in PP or PVDF will be compatible with Chemline PP or PVDF metric piping systems.
- Flanged ends shall be ANSI Class 150 one-piece factory moulded (not fabricated) to ensure maximum strength and close tolerance end to end dimensions.

ORDERING EXAMPLE

Chemline True Union Ball Valves		21	A	020	E	S
Body Material	A – PVC B – PP	C – CPVC K – PVDF				
Size ¹	002 – 1/4" 010 – 1" 025 – 2-1/2"	003 – 3/8" 012 – 1-1/4" 030 – 3"	005 – 1/2" 015 – 1-1/2" 040 – 4"	007 – 3/4" 020 – 2" 060 – 6"		
Seals	E – EPDM S – Socket	V – FKM (Viton®) T – Threaded	C – CPE F – Flanged	B – Nitrile B – Butt ²	A – Aflas® CF – ChemFlare™	

Example: Chemline Type 21 True Union Ball Valve, PVC, 2", with EPDM seals, socket ends.

¹ 1/4" is normally the 3/8" valve reduced. 6" is 4" valve with 6" end connections.

² PP, PVDF and ECTFE (Halar®) metric butt fusion ends (1/2" to 4") connect to Chemline PP, PVDF and ECTFE (Halar®) piping systems.

OTHER OPTIONS & ACCESSORIES

- **Alternate O-Ring Seals**
- **Stem Extensions** made to any length
- **Limit Switches** – For open and/or closed position indication
- **Municipal Operating Nut**
- **Lubrication-free Valves** – Factory clean room assembled
- **Vented Ball** – For sodium hypochlorite applications



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CS-303-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VARFPV207282	PRV9-513	DIA: 25 mm (1")	RELIEF VALVE	TYPE: RELIEF VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A			COAGULA NT DOSING SKID		
CHEMLINE	VARFPV207282	PRV9-514	DIA: 25 mm (1")	RELIEF VALVE	TYPE: RELIEF VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A			COAGULA NT DOSING SKID		

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SB12 Series Back Pressure/Relief Valves



SERIES: SB12

SIZES: 3/8" – 4"

ENDS: True Union Socket, Threaded or ChemFlare™¹
Spigot² Bodies with Plain, Socket, Threaded or
Flanged ends

DIAPHRAGM: PTFE Bonded EPDM

SEALS: EPDM, FKM (Viton®)

CRN
Registered
as Category C Fittings
Consult Chemline



True Union Ends
Easy installation and maintenance

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 unaffected 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

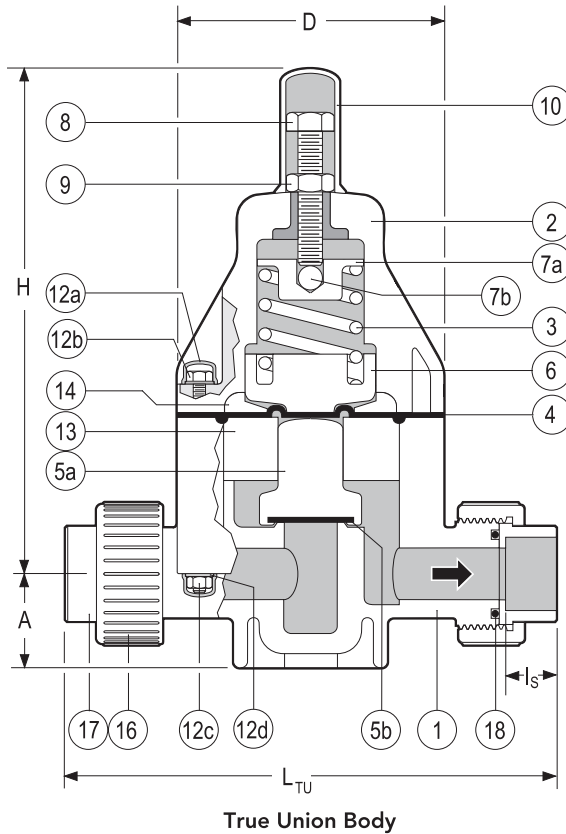
- 120cP is maximum recommended service viscosity

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"



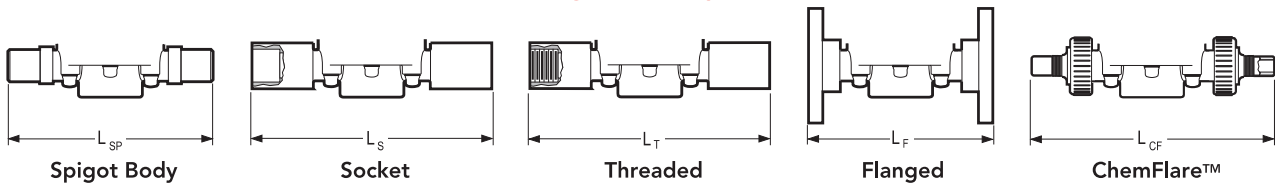
PARTS

▲ 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



DIMENSIONS INCHES

WEIGHTS LB. Cv VALUES

Size	PVC													PP and PVDF			USGPM Flow at 1 psi ΔP
	D	H	A	I _s	L _{TU} ²	L _{SP} ³	L _S	L _T	L _F	L _{CF}	A	L _{SP} ³	L _{TU} ²	PVC	PP	PVDF	
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

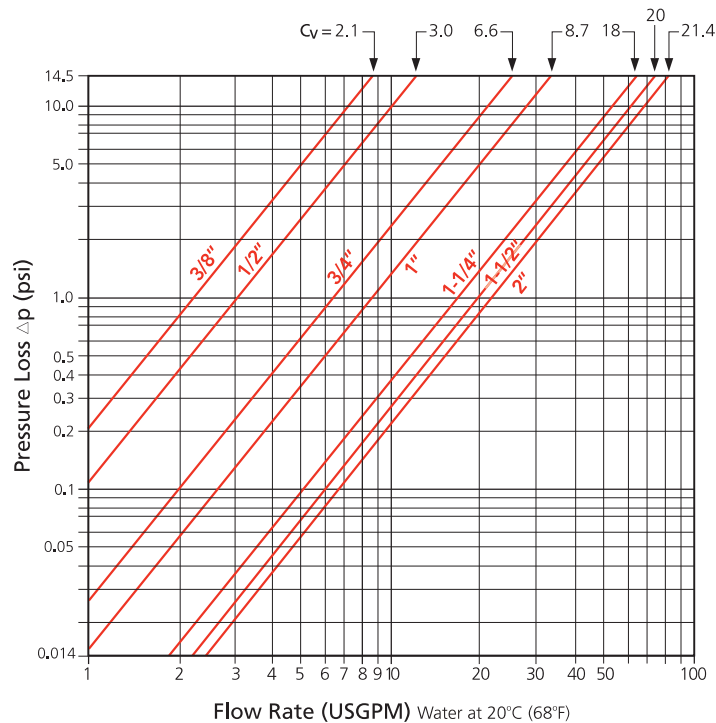
Size	PVC				PP					PVDF						
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	30°C 86°F	50°C 122°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	
1/2"—2"	150	105	60	15	150	90	60	37.5	15	150	100	60	45	30	15	

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).

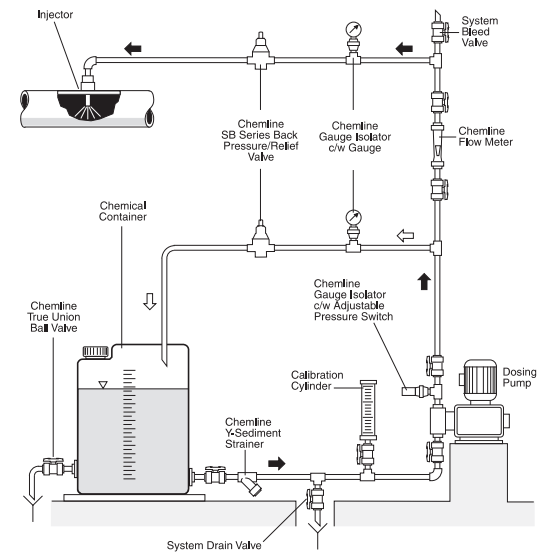
SB12 Series Back Pressure/Relief Valves 1/2" to 2"



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

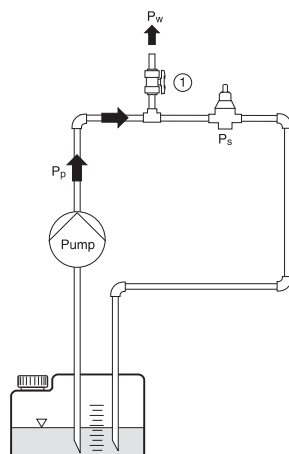


typical dosing system schematic



application of pressure relief valves

Constant System Pressure



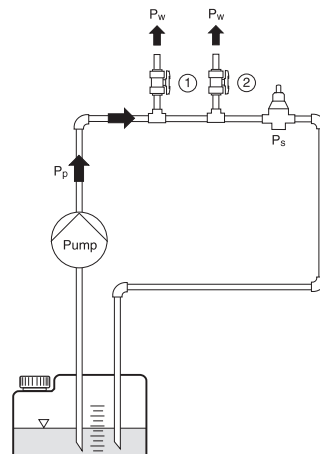
$P_p \geq P_w$

$P_p \geq P_s \rightarrow$ valve opens

$P_p \leq P_s \rightarrow$ valve closed

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

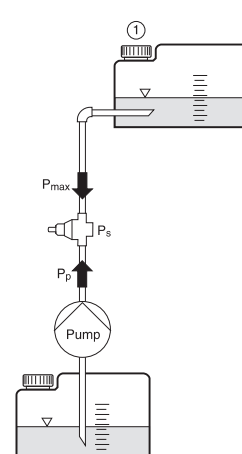
Consumer 1 and/or 2 Open, Valve Closes



$P_p \geq P_s \rightarrow$ valve opens

$P_p \leq P_s \rightarrow$ valve closed

Non-Return Valve
 Container 1 is located above the pump



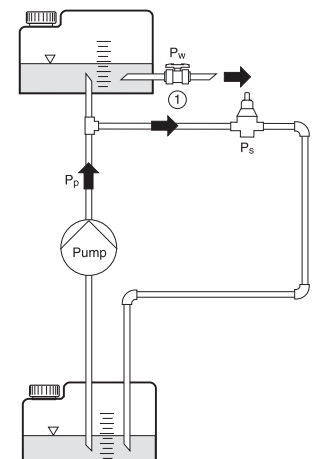
$P_s \geq P_{max}$

$P_p \geq P_s \rightarrow$ valve opens

$P_p \leq P_s \rightarrow$ valve closed

Overflow Valve

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



$P_s \leq P_w$

$P_p \geq P_s \rightarrow$ valve opens

$P_p \leq P_s \rightarrow$ valve closed

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



working pressure vs. flow rate

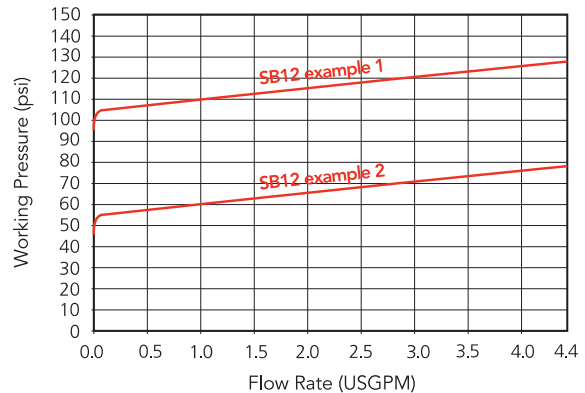
The curves show the relationship between the working pressure and the approximate flow rate through the valve for water at 20°C (68°F). These values will vary depending on:

- 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.

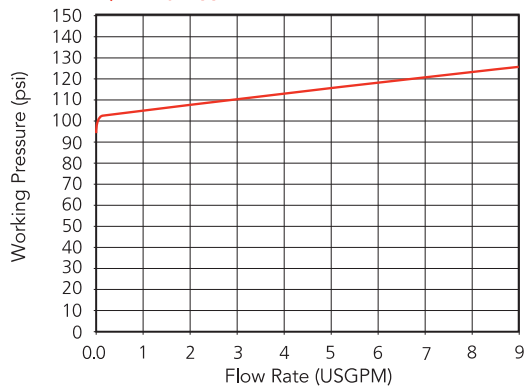
operation examples

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

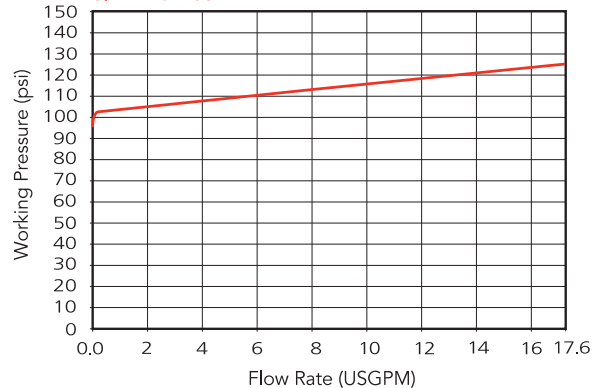
3/8" Valves



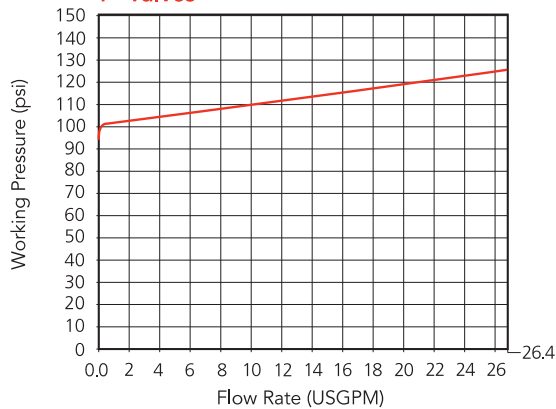
1/2" Valves



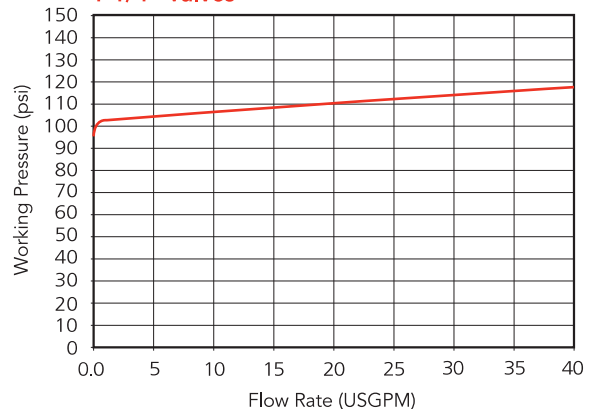
3/4" Valves



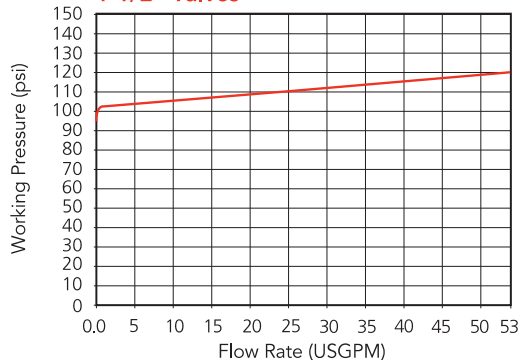
1" Valves



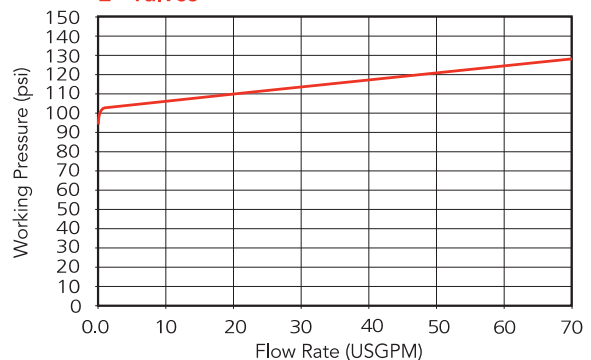
1-1/4" Valves



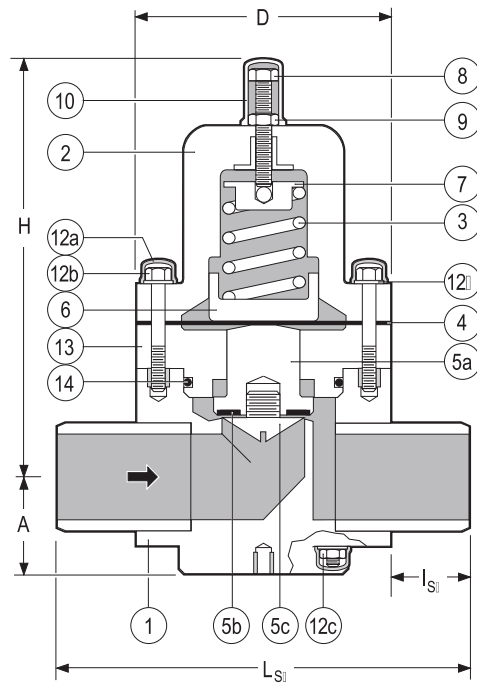
1-1/2" Valves



2" Valves

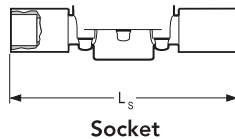


SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"

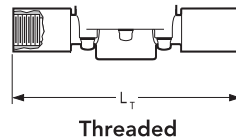


Spigot Body

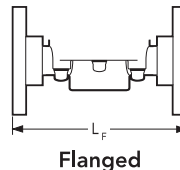
OTHER ENDS



Socket



Threaded



Flanged

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 Retainer	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



ChemFlare™ Ends

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

DIMENSIONS INCHES

Size	PVC, PP & PVDF					PVC	WEIGHTS LB.			Cv VALUES	
	A	D	H	L _{SP} ²	L _{SP}	L _F	PVC	PP	PVDF	USGPM Flow at 1 psi ΔP	
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				PP						PVDF							
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	20°C 68°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		
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" 005 – 1/2" 007 – 3/4" 010 – 1" 012 – 1-1/4" 015 – 1-1/2" 020 – 2" 025 – 2-1/2" 030 – 3" 040 – 4"				
Elastomers	E – EPDM V – FPM (Viton®)				
Ends	S – Socket T – Threaded F – Flanged U – Union Socket CFX – ChemFlare™ Blank – Spigot (Butt)				

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

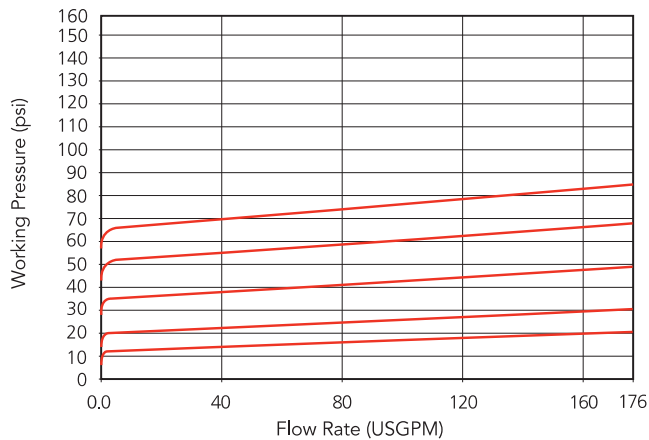
SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"



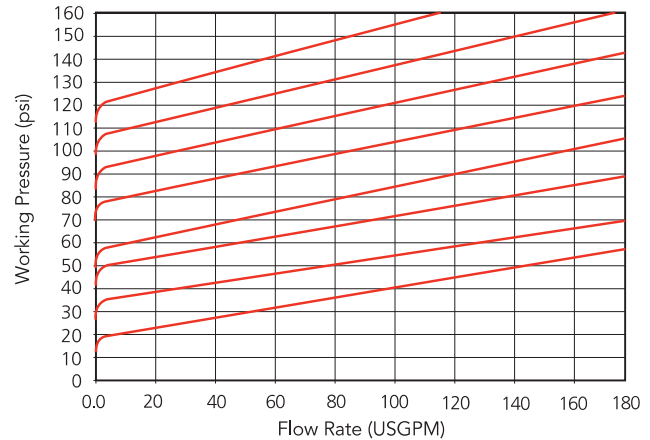
working pressure vs. flow rate

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

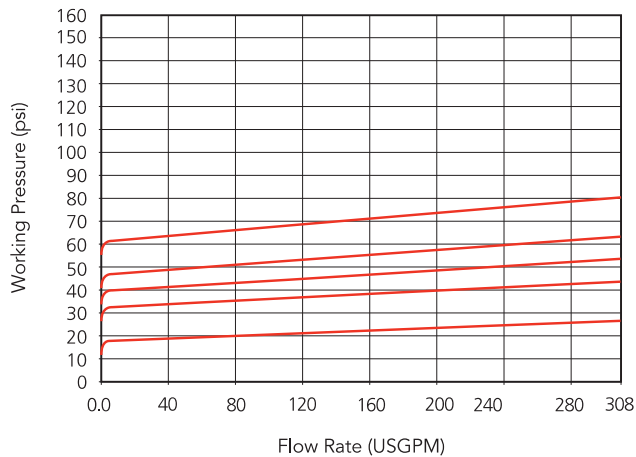
2-1/2" Valves / 4 to 60 psi set pressure range



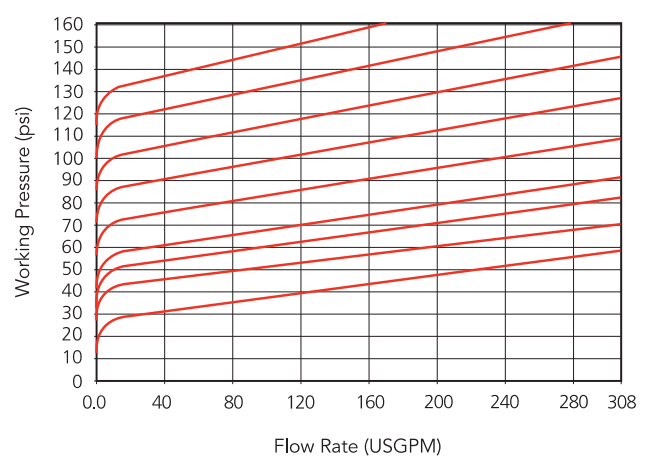
2-1/2" Valves / 7.5 to 150 psi set pressure range



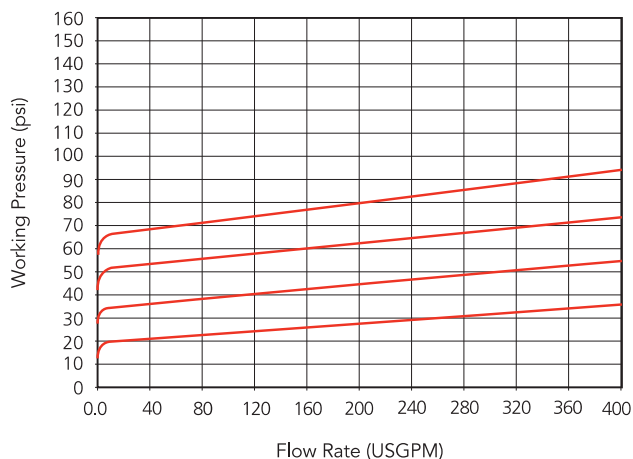
3" Valves / 4 to 60 psi set pressure range



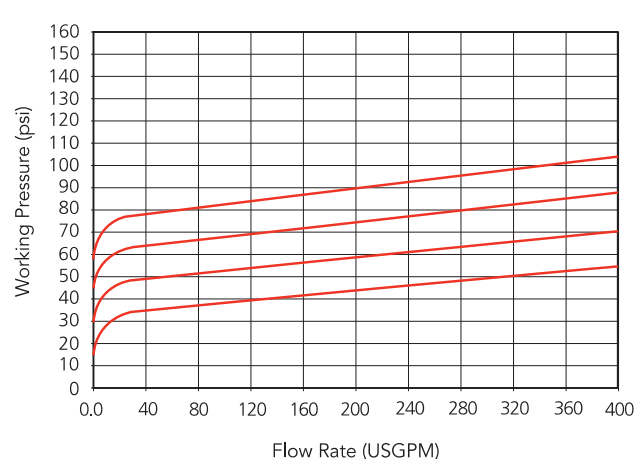
3" Valves / 7.5 to 150 psi set pressure range



4" Valves / 4 to 60 psi set pressure range



4" Valves / 7.5 to 90 psi set pressure range



CHEMLINE PLASTICS
SUPERIOR FLOW SOLUTIONS

55 Guardsman Road, Thornhill, ON, L3T 6L2, Canada | ISO 9001:2008 Certified
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CS-305-170 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VARFPV348512	BPV9-514	DIA: 25 mm (1")	BACKPRESSURE VALVE	TYPE: BACK PRESSURE VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU + SGA-005-002-P- G + P025-160- BM//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A	(CONFIG. L_U)		COAGULA NT DOSING SKID		

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SB12 Series Back Pressure/Relief Valves



SERIES: SB12

SIZES: 3/8" – 4"

ENDS: True Union Socket, Threaded or ChemFlare™¹
Spigot² Bodies with Plain, Socket, Threaded or
Flanged ends

DIAPHRAGM: PTFE Bonded EPDM

SEALS: EPDM, FKM (Viton®)

CRN
Registered
as Category C Fittings
Consult Chemline



True Union Ends
Easy installation and maintenance

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 unaffected 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

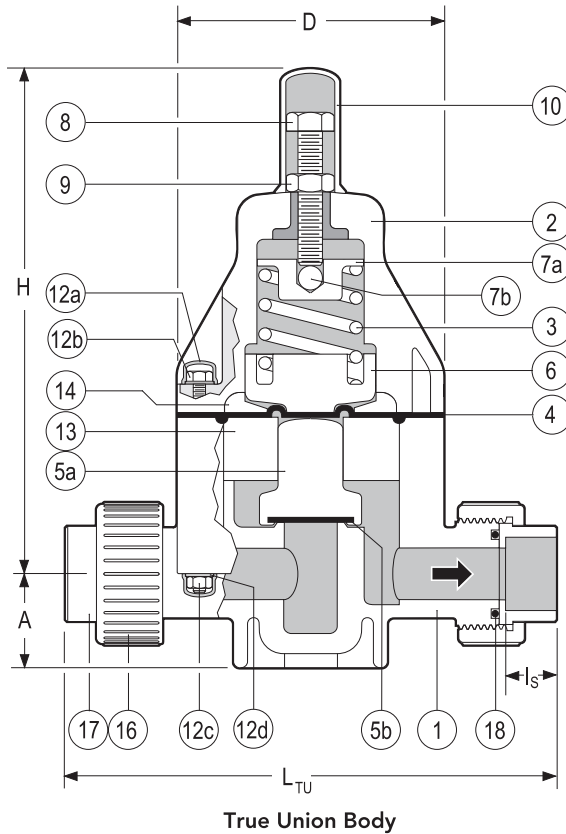
- 120cP is maximum recommended service viscosity

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"



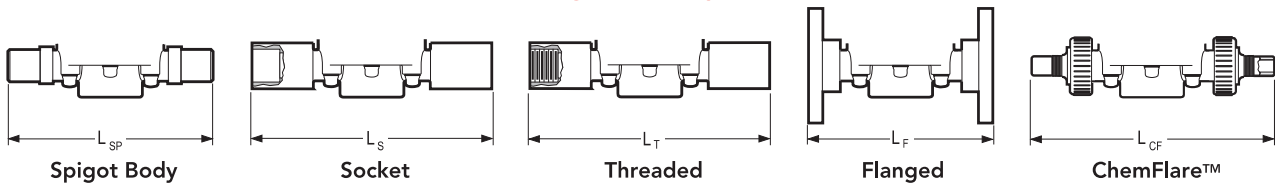
PARTS

▲ 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



DIMENSIONS INCHES

WEIGHTS LB. Cv VALUES

Size	PVC													PP and PVDF			USGPM Flow at 1 psi ΔP
	D	H	A	I _s	L _{TU} ²	L _{SP} ³	L _S	L _T	L _F	L _{CF}	A	L _{SP} ³	L _{TU} ²	PVC	PP	PVDF	
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

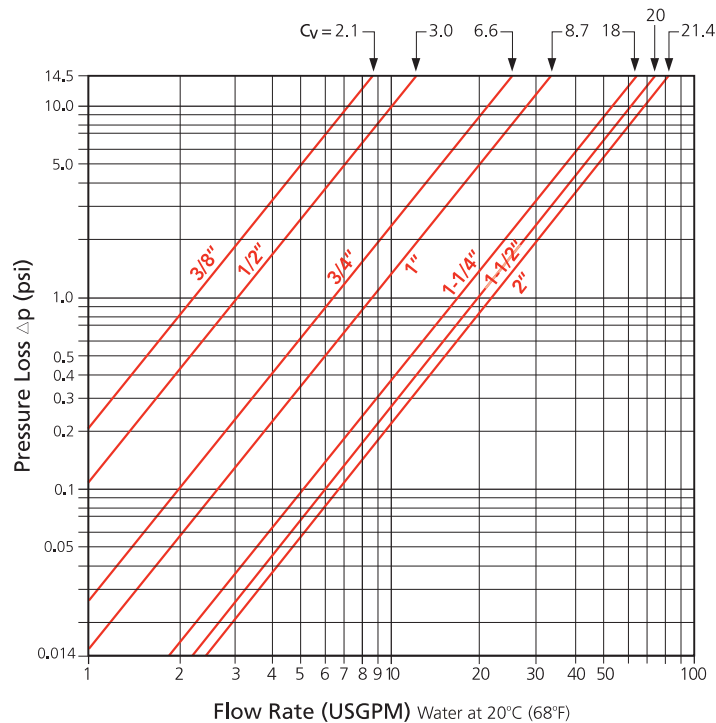
Size	PVC				PP					PVDF						
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	30°C 86°F	50°C 122°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	
1/2"—2"	150	105	60	15	150	90	60	37.5	15	150	100	60	45	30	15	

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).

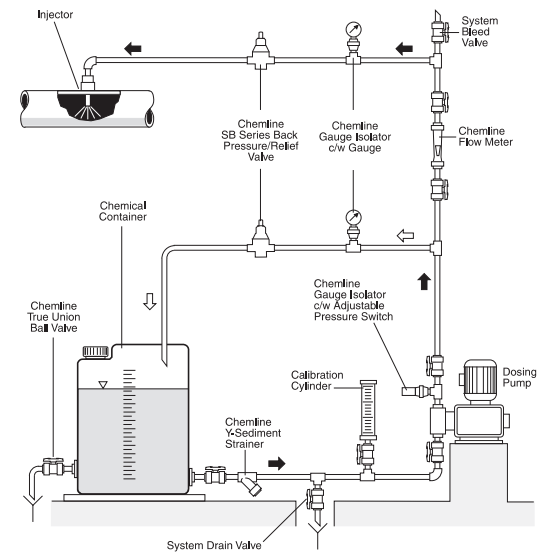
SB12 Series Back Pressure/Relief Valves 1/2" to 2"



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

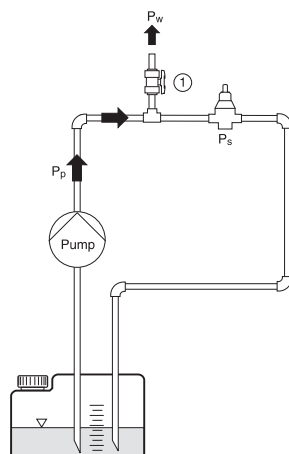


typical dosing system schematic



application of pressure relief valves

Constant System Pressure



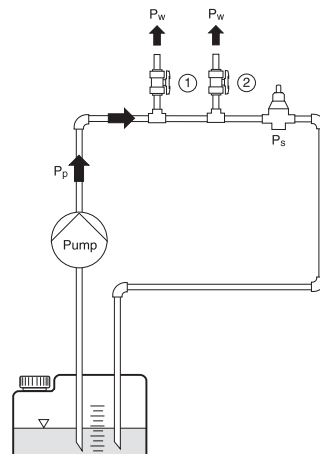
$P_p \geq P_w$

$P_p \geq P_s \rightarrow$ valve opens

$P_p \leq P_s \rightarrow$ valve closed

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

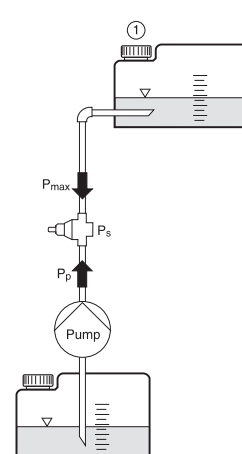
Consumer 1 and/or 2 Open, Valve Closes



$P_p \geq P_s \rightarrow$ valve opens

$P_p \leq P_s \rightarrow$ valve closed

Non-Return Valve
 Container 1 is located above the pump



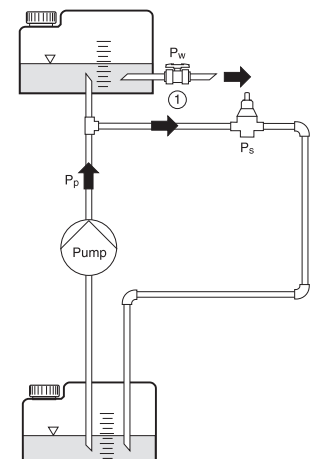
$P_s \geq P_{max}$

$P_p \geq P_s \rightarrow$ valve opens

$P_p \leq P_s \rightarrow$ valve closed

Overflow Valve

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



$P_s \leq P_w$

$P_p \geq P_s \rightarrow$ valve opens

$P_p \leq P_s \rightarrow$ valve closed

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



working pressure vs. flow rate

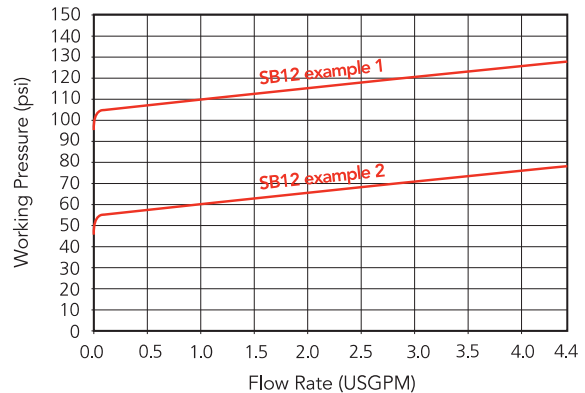
The curves show the relationship between the working pressure and the approximate flow rate through the valve for water at 20°C (68°F). These values will vary depending on:

- 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.

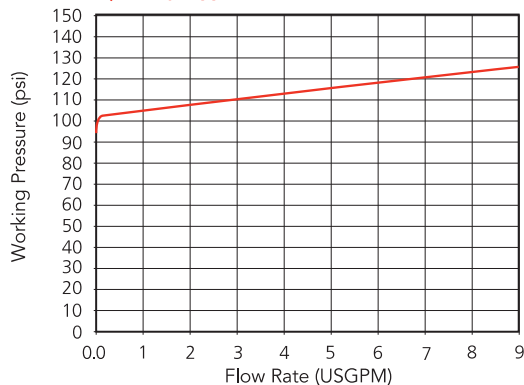
operation examples

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

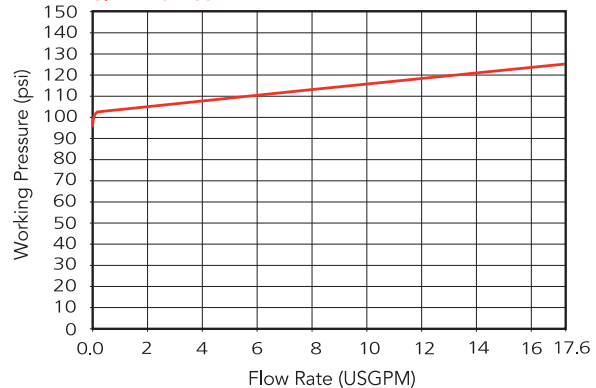
3/8" Valves



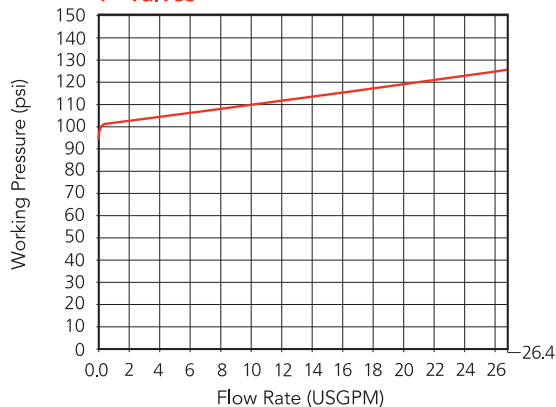
1/2" Valves



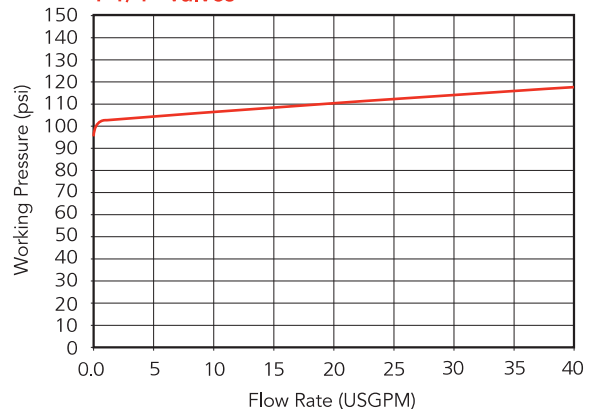
3/4" Valves



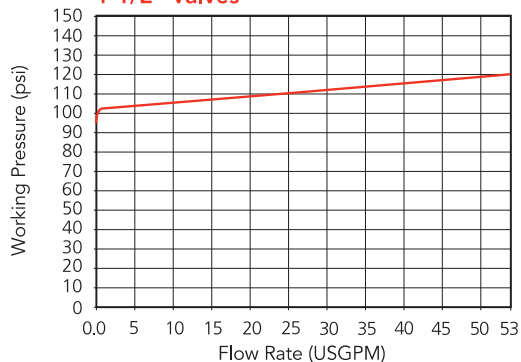
1" Valves



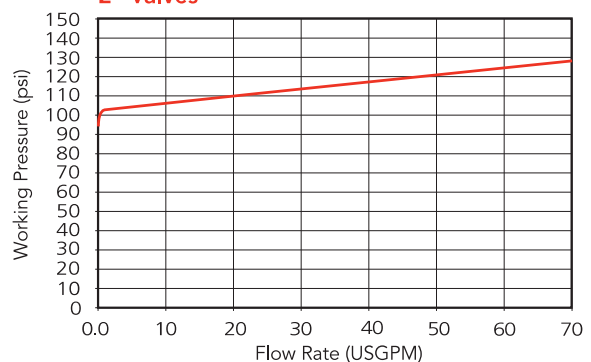
1-1/4" Valves



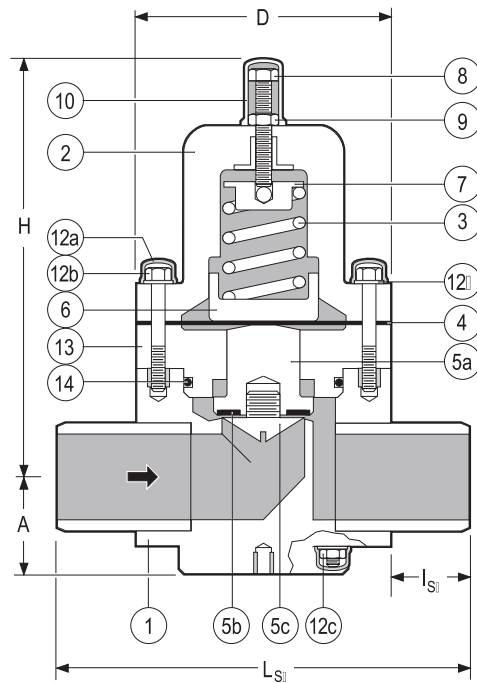
1-1/2" Valves



2" Valves

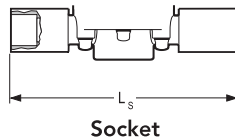


SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"

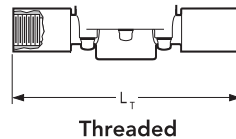


Spigot Body

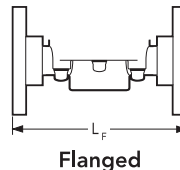
OTHER ENDS



Socket



Threaded



Flanged

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 Retainer	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



ChemFlare™ Ends

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

DIMENSIONS INCHES

Size	PVC, PP & PVDF					PVC	WEIGHTS LB.			Cv VALUES	
	A	D	H	L _{SP} ²	L _{SP}	L _F	PVC	PP	PVDF	USGPM Flow at 1 psi ΔP	
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				PP						PVDF							
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	20°C 68°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		
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" 005 – 1/2" 007 – 3/4" 010 – 1" 012 – 1-1/4" 015 – 1-1/2" 020 – 2" 025 – 2-1/2" 030 – 3" 040 – 4"				
Elastomers	E – EPDM V – FPM (Viton®)				
Ends	S – Socket T – Threaded F – Flanged U – Union Socket CFx – ChemFlare™ Blank – Spigot (Butt)				

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

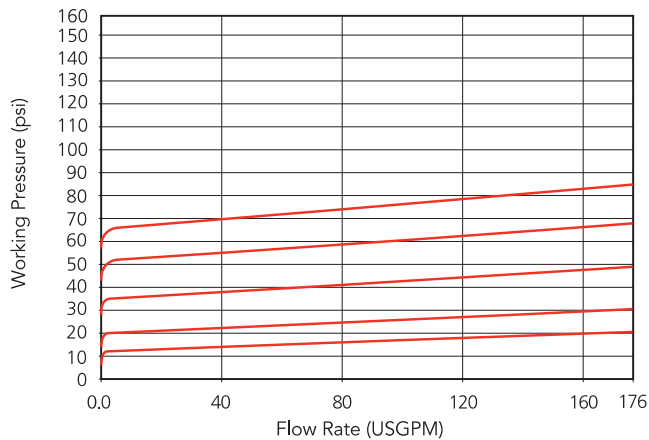
SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"



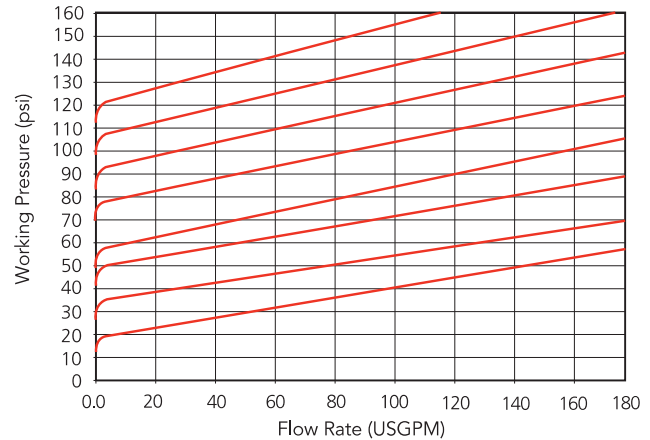
working pressure vs. flow rate

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

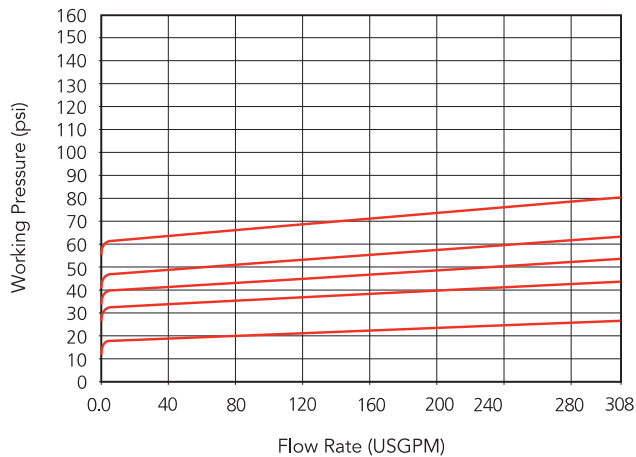
2-1/2" Valves / 4 to 60 psi set pressure range



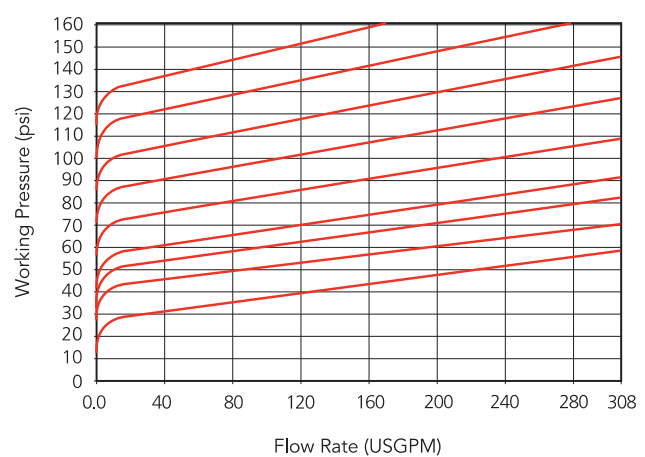
2-1/2" Valves / 7.5 to 150 psi set pressure range



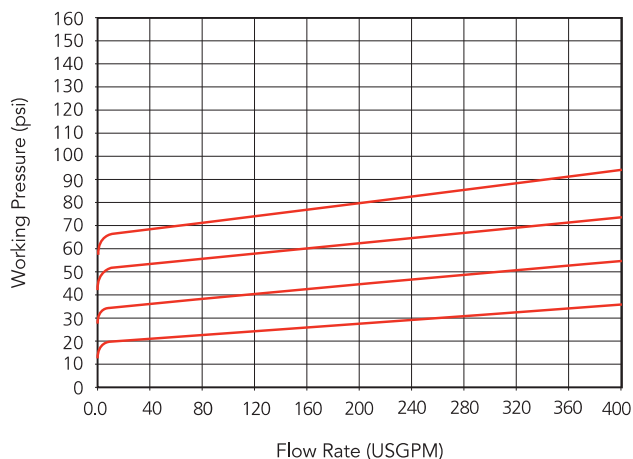
3" Valves / 4 to 60 psi set pressure range



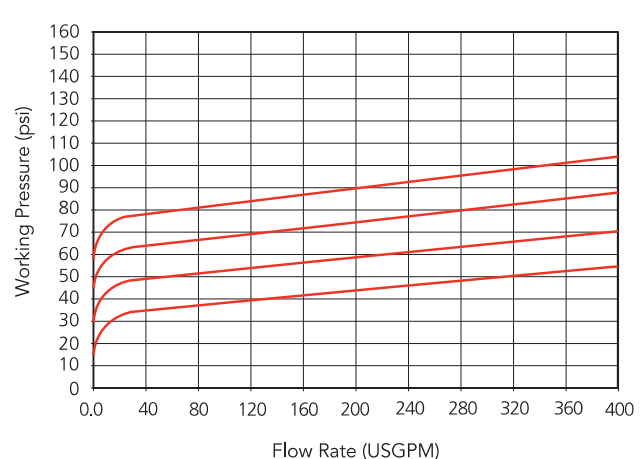
3" Valves / 7.5 to 150 psi set pressure range



4" Valves / 4 to 60 psi set pressure range



4" Valves / 7.5 to 90 psi set pressure range



CHEMLINE PLASTICS
SUPERIOR FLOW SOLUTIONS

55 Guardsman Road, Thornhill, ON, L3T 6L2, Canada | ISO 9001:2008 Certified
tel.905.889.7890 | fax.905.889.8553 | request@chemline.com | chemline.com

Gauge Isolators



SERIES: SG

INLET CONNECTION: 1/4" or 1/2" Threaded¹

INSTRUMENT CONNECTION: 1/4" or 1/2" Threaded

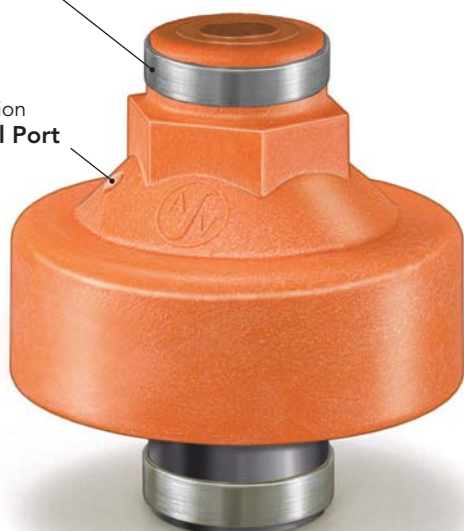
DIAPHRAGM: PTFE

CRN
Registered
Consult Chemline



Stainless Steel Bands Prevent FNPT ports from splitting

Provision for **Fill Port**



Chemline SG Series Gauge Isolators allow inexpensive pressure gauges, or any other pressure instrument to be used in corrosive services. The upper chamber (gauge side) is filled with a stable fluid such as glycol or glycerine². A diaphragm separates it from the lower chamber which receives the media under pressure.

The 1/2" gauge connection allows use of the popular 4" and 4-1/2" diameter gauges. Pressure switches or transmitters may also be installed. Customers can easily fill isolators and install their own gauges.

Features

Easy to Mount Gauges

- It is easy to fill an isolator and field mount a gauge. No special equipment is required.
- Will accept popular 4" and 4-1/2" diameter gauges

Provision for Fill Port

- Housing may be drilled and tapped by Chemline or customer for a threaded fill port. This is used for filling isolator using a vacuum filling station

High Chemical Resistance

- Choice of body materials for a wide range of applications
- PTFE bonded EPDM dished diaphragm for high chemical resistance and sensitivity

Heavy Duty Design for Safety

- PPG³ top chamber
- Heavy wall connection ports

CRN Registration number by province

- Ontario: OH16085.5

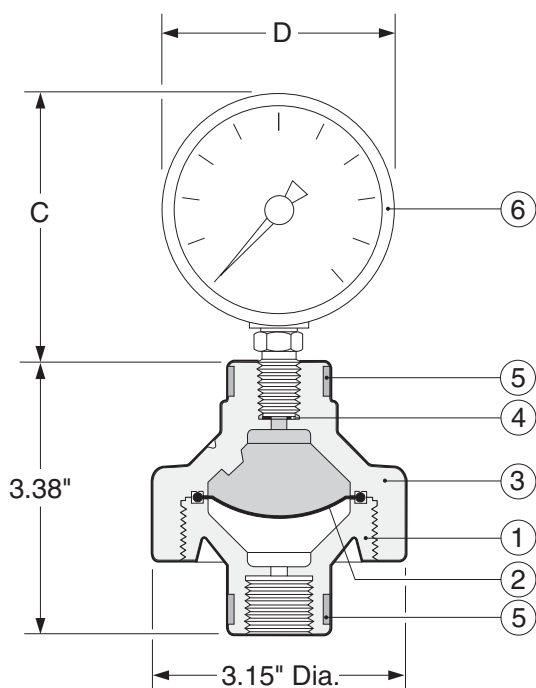
Optional Gauges

- Isolators are available alone or with gauge mounted and prefilled with glycol²



- A With 2" gauge
- B With 4-1/2" gauge
- C With 2" back mount gauge
- D With pressure transmitter

¹ Other available inlet connections are 1/2" socket or 1/2" to 1" flanged.
² Other fluids are available for special applications such as chlorine service.
³ Glass reinforced polypropylene.
⁴ PVC isolators are certified under NSF/ANSI Standard 61 for contact with drinking water.



PARTS

No.	Part	Pcs.	Materials
1	Body	1	PVC, PP, PVDF
2	Diaphragm	1	PTFE
3	Bonnet	1	PPG ¹
4	Gasket	1	EPDM
5	Stainless Steel Bands	2	304 SS
6	Optional Gauge	1	See below

¹PPG = Glass reinforced polypropylene

OPTIONAL GAUGES

- Chemline offers the gauges listed below mounted to isolator and prefilled with glycol, glycerine or special fluid for chlorine applications. These gauges have dials and cases filled with either glycol (standard), glycerine or silicon for corrosion resistance and dampening.
- Chemline SG gauge isolators are not recommended for vacuum applications. They will not affect the gauge accuracy as low as approximately 3 psi. The accuracy depends on the process conditions and the gauge installed on it.

OTHER OPTIONS

- Flanged** inlet connections
- Threaded Fill Port** – drilled, tapped and plugged
- Chemline will mount any pressure instrument supplied free issue by customer

DIMENSIONS (Gauge Isolator with optional gauge installed) INCHES

Optional Gauge Ordering No.	Gauge Diameter	Gauge Connection	Housing	Bourdon Tube	Window	Accuracy	Dimensions	
							C	D(max.)
P025-xx	2-1/2"	1/4"	316 SS	Brass	Polycarbonate	±1.5% of span	3.1	2.5
P025-xx-SS	2-1/2"	1/4"	316 SS	316 SS	Polycarbonate	±1.5% of span	3.1	2.5
P025-xx-SS/BM	2-1/2" Back Mount	1/4"	316 SS	316 SS	Polycarbonate	±1.5% of span	1.6	2.5
P025-xx-BM	2-1/2" Back Mount	1/4"	316 SS	Brass	Polycarbonate	±1.5% of span	1.6	2.5
P040-xx-SS	4"	1/2"	316 SS	316 SS	Safety Glass	±1% of span	4.5	4.0
P045-xx-SS	4-1/2"	1/2"	PBTP Plastic ²	316 SS	Acrylic	±0.5% of span	6.3	5.8

xx denotes the maximum gauge pressure i.e., 30, 60, 100, 160 or 200 psi. See data page for recommended working pressures.

² PBTP = glass filled polyester.

WORKING PRESSURES PSI

Material	10 – 20°C 50 – 68°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	120°C 248°F	Net Weights Pounds ³
PVC	150	100	80	45	15	–	–	–	–	–	1.0
PP	150	125	100	80	65	45	–	–	–	–	0.7
PVDF	150	150	150	125	105	85	70	60	45	30	1.3

Temperature Ranges: PVC 0 to 60°C (32 to 140°F), PP 10 to 80°C (50 to 176°F), PVDF –30 to 120°C (–22 to 248°F).

NR = Not Recommended. ³ Weights are for unfilled 1/2" x 1/2" isolators without gauges. 1/2" x 1/4" isolators are 20% lighter.

WEIGHTS

ORDERING EXAMPLE

Chemline Gauge Isolators	SG	A	005-	002	P	G
Body Material	A – PVC	B – PP	K – PVDF			
Inlet Size	002 – 1/4"	005 – 1/2" (Standard)				
Instrument Connection	002 – 1/4"	005 – 1/2"				
Diaphragm	P – PTFE bonded EPDM					
Filling & Mounting	G – Add only if isolator is supplied filled with glycol and gauge or pressure instrument is mounted by Chemline. Separate gauge item numbers are listed above.					

Example: Chemline SG Series Gauge Isolator, PVC, 1/2" x 1/4" FNPT inlet x instrument connections, PTFE diaphragm.

Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0008_PCH

by: GH

chkd: GP

appvd: CB



COAGULANT DOSING SKID

CALIBRATION CYLINDER

OIM manual section: 4.3.8.5

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CS-500-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
PRIMARY FLUID	PUSPPV200288	CYL9-514	N/A	CALIBRATION CYLINDER	CALIBRATION CYLINDER/MANUFACTURER: PRIMARY FLUID/MODEL: PV2-4000	N/A	N/A	COAGULA NT DOSING SKID		

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ACCUDRAW® Calibration Cylinders



Polypropylene



PVC



Glass



NEW!

- PVC with removable "O" ring sealed top for easy cleaning
- yellow polypropylene level indicator float for high visibility

ACCUDRAW® has been developed for the accurate calibration of metering pumps. Standard features include:

- translucent
- chemical resistant
- break resistant
- threaded, socket or flanged
- colored graduations and lettering
- PVC has dual scale USGPH & ml
- PVC sizes 100 - 20000 ml
- POLY sizes 100 - 4000 ml
- POLY meets ISO standards
- Glass sizes 100 - 20000 ml
- custom designs available

For detailed product information visit our website: primaryfluid.com





ACCUDRAW® Calibration Cylinders

"For Accuracy That Counts"

For complete product information visit our website: primaryfluid.com



Flanged: Glass, PVC



Flanged: PVC



PV#4

Sizing and Ordering Information:

ACCUDRAW Standard Materials of Construction

AC = All polypropylene construction (see below for options)
PV = All polyvinylchloride construction (see below for options)
ACS = Glass*

Example: AC#1-1000B

AC = PP (polypropylene)
#1 = Bottom threaded connection only
1000 = 1000 ml
B = BSP Thread

Note: Cylinders are NOT pressure vessels

e.g. Part # **AC #1 - 1000 B**

Type:

AC = Polypropylene
PV = PVC
ACS = Glass

Style:

1 = Bottom threaded conn. only
2 = Top and Bottom threaded conn.
3 = Bottom threaded conn. c/w
removable vented dust cap
4 = Top/Bottom threaded conn. c/w
removable "O" ring sealed top
and float ring level indicator

***Glass calibration cylinders
available in Style 2 only**

Graduation Scale:

PP - ml only
PVC - ml and GPH
Glass - ml only

Std. connection is NPT thread

Optional: add suffix as follows

S = Socket weld connection
(PVC only)
GTV = Glass/TFE construction
GKV = Glass/PVDF construction
GCV = Glass/CPVC construction
GSV = Glass/SS construction
B = BSP Thread
F = Flanged

Substitute **E** for **V**
for **EPDM** wetted "O" ring seal

Sizes:

100 =	100 ml	(1.6 GPH)	PP, PVC, Glass
250 =	250 ml	(4 GPH)	PP, PVC, Glass
500 =	500 ml	(8 GPH)	PP, PVC, Glass
1000 =	1000 ml	(16 GPH)	PP, PVC, Glass
2000 =	2000 ml	(32 GPH)	PP, PVC, Glass
4000 =	4000 ml	(64 GPH)	PP, PVC, Glass
6000 =	6000 ml		Glass only
8000 =	8000 ml		Glass only
10000 =	10000 ml	(160 GPH)	PVC, Glass
20000 =	20000 ml	(320 GPH)	PVC, Glass

Material

Custom sizes and materials available.



ACCUDRAW® Calibration Cylinders



ACCUDRAW® Glass Calibration Cylinders are ideal for the calibration of metering pumps, batch systems and for handling hazardous chemicals.

- volumes calibrated in ml
- construction materials available include TFE, PVDF, CPVC and 316 stainless steel
- sealing "O" rings are Viton and Buna N
- outer shield of acrylic construction
- port connections in NPT, metric or flanged
- standard sizes 100 - 20,000 ml
- custom designs available to your specifications

Sizing and Ordering Information: Glass Construction

Size	Conn.	Model # For TFE End Flgs	Model # For 316 S/S End Flgs	Model # For PVDF End Flgs	Model # For CPVC End Flgs
100 ml	1/2" NPT	ACS#2-100-GTV	ACS#2-100-GSV	ACS#2-100-GKV	ACS#2-100-GCV
250 ml	1/2" NPT	ACS#2-250-GTV	ACS#2-250-GSV	ACS#2-250-GKV	ACS#2-250-GCV
500 ml	1/2" NPT	ACS#2-500-GTV	ACS#2-500-GSV	ACS#2-500-GKV	ACS#2-500-GCV
1000 ml	1/2" NPT	ACS#2-1000-GTV	ACS#2-1000-GSV	ACS#2-1000-GKV	ACS#2-1000-GCV
2000 ml	1" NPT	ACS#2-2000-GTV	ACS#2-2000-GSV	ACS#2-2000-GKV	ACS#2-2000-GCV
4000 ml	1" NPT	ACS#2-4000-GTV	ACS#2-4000-GSV	ACS#2-4000-GKV	ACS#2-4000-GCV
6000 ml	1" NPT	ACS#2-6000-GTV	ACS#2-6000-GSV	ACS#2-6000-GKV	ACS#2-6000-GCV
8000 ml	2" NPT	ACS#2-8000-GTV	ACS#2-8000-GSV	ACS#2-8000-GKV	ACS#2-8000-GCV
10000 ml	2" NPT	ACS#2-10000-GTV	ACS#2-10000-GSV	ACS#2-10000-GKV	ACS#2-10000-GCV
20000 ml	2" NPT	ACS#2-20000-GTV	ACS#2-20000-GSV	ACS#2-20000-GKV	ACS#2-20000-GCV

Descriptions:

TFE, PVDF and CPVC End Flanges:

Glass cylinder with acrylic outer shield and 3/4" thick (TFE, PVDF or CPVC) end flanges

316 S/S End Flanges:

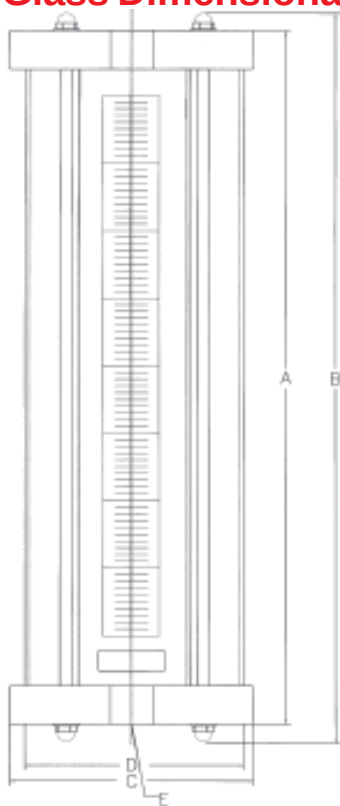
Glass cylinder with acrylic outer shield and 1/2" thick 316 Stainless Steel end flanges

Cylinders are bolted together using stainless steel rods with Viton "O" rings for the glass seal and Buna N "O" rings for the acrylic seal. For EPDM "O" rings, substitute "E" for "V".

Options available: (may affect price and delivery)

- different type or size of thread connection, different "O" ring material, different flange material

Glass Dimensional Information



Note: Cylinders are not pressure vessels.

Dimensions subject to change without notice.

Glass cylinders with TFE, PVDF or CPVC End Flanges

Size ml	DIV ml	A inches	B inches	C inches	D inches	E thread
100	1.00	10.00	11.00	3.00	2.50	1/2" FNPT
250	2.00	12.75	13.50	3.50	3.00	1/2" FNPT
500	5.00	14.50	15.50	4.00	3.50	1/2" FNPT
1000	10.00	16.75	17.75	4.75	4.25	1/2" FNPT
2000	20.00	18.75	19.75	5.50	5.00	1" FNPT
4000	25.00	22.50	23.50	6.50	6.00	1" FNPT
6000	50.00	20.13	21.16	8.00	7.50	1" FNPT
8000	50.00	24.63	25.66	8.00	7.50	2" FNPT
10000	50.00	30.13	31.16	8.00	7.50	2" FNPT
20000	200.00	43.25	44.25	9.00	8.50	2" FNPT

Glass cylinders with 316 Stainless Steel End Flanges

Size ml	DIV ml	A inches	B inches	C inches	D inches	E thread
100	1.00	9.50	10.50	3.00	2.50	1/2" FNPT
250	2.00	12.25	13.00	3.50	3.00	1/2" FNPT
500	5.00	14.00	15.00	4.00	3.50	1/2" FNPT
1000	10.00	16.25	17.25	4.75	4.25	1/2" FNPT
2000	20.00	18.25	19.25	5.50	5.00	1" FNPT
4000	25.00	22.00	23.00	6.50	6.00	1" FNPT
6000	50.00	19.63	20.66	8.00	7.50	1" FNPT
8000	50.00	24.13	25.16	8.00	7.50	2" FNPT
10000	50.00	29.63	30.66	8.00	7.50	2" FNPT
20000	200.00	42.75	43.75	9.00	8.50	2" FNPT

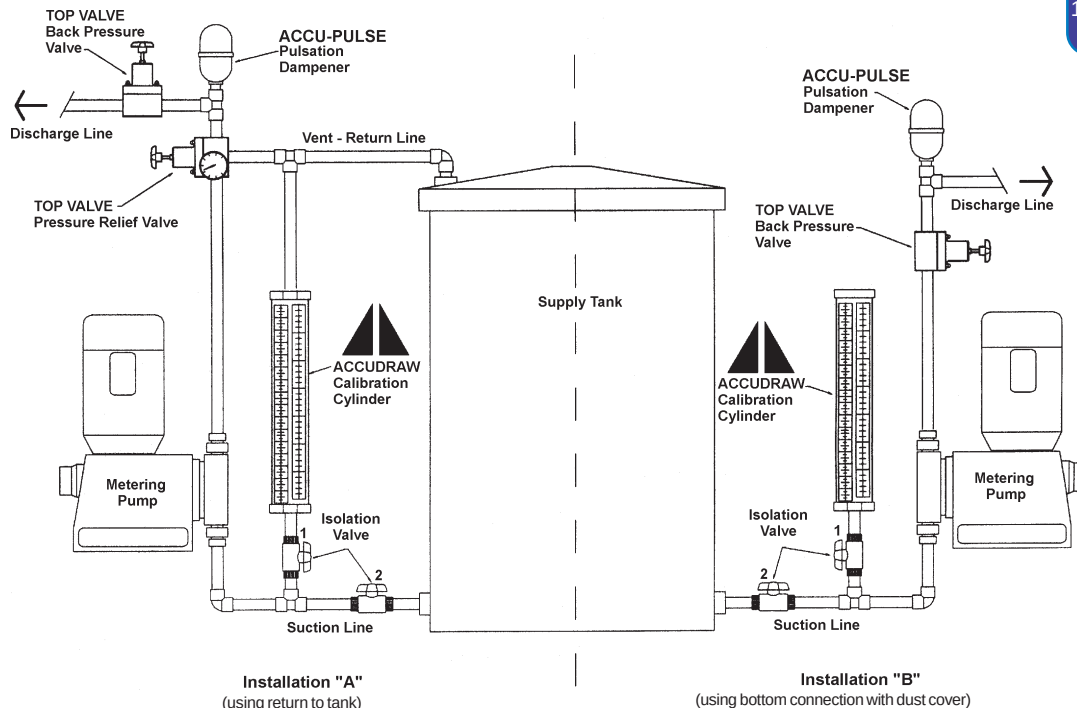


ACCUDRAW® Calibration Cylinders

Installations

Conversion Factors

1 ml = 1 cc
 1000 ml = 1 liter
 ml/sec X 60 = ml/min
 1 US gal/min X 0.063 = liters/sec
 1 US gal = 3.786 liters



Other available products at www.primaryfluid.com

TOP VALVE Back Pressure/Pressure Relief



- long life diaphragm
- range of 15 - 350 PSIG
- air release, optional gauge port
- PVC, CPVC, PVDF, Teflon, polypropylene, stainless, Alloy 20 and Hastelloy C
- 7 sizes 1/4" - 2" NPT
- color coded handles indicate size
- higher pressure & temperature available

PFS Corporation Stops



Designed to inject chemical into the center stream of process.

- isolation valve allows for ease of maintenance
 - available in 6 materials of construction
 - wetted components have comparable or greater chemical resistance than quill construction material
 - standard and custom lengths available
 - connection in NPT, metric or flanged
- Custom built in other sizes & materials.**

ACCUPULSE Pulsation Dampeners



Designed to remove pulsating flows from positive displacement pumps.

- increase system efficiency and pump life; decrease maintenance and costs
- protect pipes, meters, valves and instrumentation from pulsation and vibration
- ensure meter accuracy, longevity and repeatability
- prevent foaming and splashing
- extensive range of materials and sizes with lightweight, compact design

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0008_PCH

by: GH

chkd: GP

appvd: CB



COAGULANT DOSING SKID

PULSATION DAMPENER

OIM manual section: 4.3.8.6

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CS-501-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
PRIMARY FLUID	PUSPPV200278	PD9-514	N/A	PULSATION DAMPENER	PULSATION DAMPENER/MANUF.: ACCU- PULSE// MODEL: APII-PVC-N-2	Vol.: 85 in3/Body Mtl: PVC/Bellows Mtl: NEOPRENE/Size: 3/4" FNPT	N/A	COAGULA NT DOSING SKID		

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ACCU-PULSE

Pulsation Dampeners



ACCU-PULSE Pulsation Dampeners have been developed to remove pulsating flows from positive displacement pumps providing:

- increased system efficiency and pump life
- protection of pipes, meters, valves and instrumentation from pulsation and vibration
- meter accuracy, longevity and repeatability
- prevention of foaming and splashing
- decreased maintenance and costs

Standard Features Include:

- lightweight, compact design
- extensive range of materials and sizes
- easy in-line maintenance
- 2 year warranty

For detailed product information visit our website: primaryfluid.com



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E-Mail: primary@primaryfluid.com
www.primaryfluid.com

ACCU-PULSE Pulsation Dampeners

Dampener Sizing Guide Standard Simplex Metering Pumps:

Note: Separate sizing guide available for air operated double diaphragm pumps.

The following are general ranges for sizing ACCU-Pulse Pulsation dampeners for metering pump applications. Models stated are based on 10% pressure fluctuations and a Simplex single acting metering pump. For 5% pressure fluctuation, divide the Capacity per Stroke Range numbers in the chart below by 2.

To calculate cubic inches per stroke: $\frac{\text{gallons per minute}}{\text{strokes per minute}} = \text{gallons per stroke}$

Gallons per stroke X 231 cu inches per gallon = cubic inch per stroke

Example: $\frac{.15}{100} = .0015 \text{ GPS}$ Therefore: $.0015 \times 231 = 0.3465 \text{ Cubic inches per stroke}$
= API Dome Top Dampener

Capacity per Stroke Range	ACCU-Pulse Dampener
0 to 0.22 Cubic Inches	APIF Flat Top
0.23 to 0.75 Cubic Inches	API Dome Top
0.76 to 2.71 Cubic Inches	APIIF Flat Top
2.72 to 6.40 Cubic Inches	APII Dome Top
6.41 to 12.96 Cubic Inches	APIIIF Flat Top
12.97 to 27.89 Cubic Inches	APIII Dome Top

Note:

For other pump factors, or residual pulsation, contact factory.

Ordering Information

Example: Part # AP - I - PVC - E - 1 - E

ACCU-PULSE

AP = Standard 150/300 PSIG
APH = High Pressure 1000/600 PSIG
APX = High Pressure 4000 PSIG

Series

I = 10 cu in capacity
IF = 4 cu in capacity
II = 85 cu in capacity
IIF = 36 cu in capacity
III = 370 cu in capacity
IIIF = 175 cu in capacity
IV = 1155 cu in capacity (AP only)
8 = 8 cu in capacity (APX only)
12 = 12 cu in capacity (APX only)
16 = 16 cu in capacity (APX only)
24 = 24 cu in capacity (APX only)

Body Material

PP = Polypropylene
PVC = Polyvinylchloride (not available in Series IV)
PVDF = Polyvinylidene Fluoride
S/S = 316L Stainless Steel
ALL20 = Alloy 20 (not available in Series IV)
HAST = Hastelloy C
CS = Carbon Steel
CPVC = Chlorinated Polyvinyl Chloride*

* (available in Series I only)

Optional Flanges

Add suffix -F for flanges

Size

0 = 3/8" npt(f) series I Std Metal
1 = 1/2" npt(f) series I Std Plastic
2 = 3/4" npt(f) series II Std All
3 = 1" npt(f) series II (Optional)
4 = 2" npt(f) series III
5 = 3" flanged series IV
6 = 4" flanged series IV

Bellows material

N = Neoprene
B = Buna-N
H = Hypalon
E = EPDM (Nordel)
V = Viton
T = Teflon
S = Santoprene
P = Polyvinylchloride

APX Series available ONLY with:

Body: 316L Stainless Steel

Size: 1/2" npt(f)

Bellows: Buna-N, EPDM & Viton

Note:

CRN certification available.
Food grade material available.
Other sizes and materials available.
Please contact factory.

For detailed product information visit our website: primaryfluid.com

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OPERATION AND MAINTENANCE MANUAL
AMARUQ WTP – NUNAVUT
VEOLIA PROJECT: 5000 218 009

4 – DETAILED TECHNICAL DOCUMENTATION

4.3 – SHOP DRAWINGS

4.3.9 – CATIONIC POLYMER DOSING SKID

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0009_PCH

by: GH

chkd: GP

appvd: CB



SUBMITTAL PACKAGE

CATIONIC POLYMER DOSING SKID

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0009_PCH

by: GH

chkd: GP

appvd: CB



CATIONIC POLYMER DOSING SKID

PROCESS DATASHEET

OIM manual section: 4.3.9.1

REFER TO 5000218009_PSDS_0009_PCH_VWT

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Project name: AMARUQ
Project#: 5000218009
Document #: SPK_0009_PCH
by: GH
chkd: GP
appvd: CB



CATIONIC POLYMER DOSING SKID

GENERAL ARRANGEMENT DRAWING

OIM manual section: 4.3.9.2

REFER TO 5000218009_GA_0009_PCH_VWT

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0009_PCH

by: GH

chkd: GP

appvd: CB



CATIONIC POLYMER DOSING SKID PUMP(S)

OIM manual section: 4.3.9.3

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CS-999-006 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ		
ENGINEER:	Gabriel Hébert		
PROJECT MANAGER:	Clément B		
PHONE NUMBER:			
SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES		
SUBMITTED TO (RESPONSIBLE):			
PROJECT NUM REFERENCE.:			
LOT NUMBER:			

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
SEEPEX	ST-999-006	P9-621		CAVITY PROGRESSIVE PUMP	CATIONIC POLYMER DOSING SKID // Model BN // 60 - 670 LPH // 80 psi // Vertical installation // Rotate motor so that conduit box is on top // Burgmann mechanical seal // 316SS for wetted parts and NBR for seals // NPT inlet and outlet // TSE device //	Steel painted base plate // CW rotation // CW Marathon Motors 575V/3PH/60HZ		CATIONIC POLYMER DOSING SKID		
SEEPEX	ST-999-006	P9-622		CAVITY PROGRESSIVE PUMP	CATIONIC POLYMER DOSING SKID // Model BN // 60 - 670 LPH // 80 psi // Vertical installation // Rotate motor so that conduit box is on top // Burgmann mechanical seal // 316SS for wetted parts and NBR for seals // NPT inlet and outlet // TSE device //	Steel painted base plate // CW rotation // CW Marathon Motors 575V/3PH/60HZ		CATIONIC POLYMER DOSING SKID		
SEEPEX	ST-999-006	P9-623		CAVITY PROGRESSIVE PUMP	CATIONIC POLYMER DOSING SKID // Model BN // 60 - 670 LPH // 80 psi // Vertical installation // Rotate motor so that conduit box is on top // Burgmann mechanical seal // 316SS for wetted parts and NBR for seals // NPT inlet and outlet // TSE device //	Steel painted base plate // CW rotation // CW Marathon Motors 575V/3PH/60HZ		CATIONIC POLYMER DOSING SKID		

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4/23/2018

qty.: 3

Item 10 (cationic Polymer)

Progressive cavity pump

BN 05-12

Application data

Conveyed product	Polymer
Flowability	flowable
Viscosity	low viscosity (<500 cP/mPas)
Solids content	not specified
Size of solids	not specified
Specific gravity	unknown, 1 kg/dm³ assumed
Product temperature	32°F - 113°F
pH value	5-9
Kind of operation	continuous
Operating hours	8h/day
Location	indoor, dry atmosphere
Altitude of installation	up to 1000 m assumed
Surrounding temperature	normal (32-113°F)

Performance data

	Capacity	Pressure	Speed	
	0.26 USGPM	80 psi	41 rpm	min
	3 USGPM	80 psi	390 rpm	max
Starting torque	30 lb.ft			
Req. power at pump shaft	0.75 HP			
Inlet pressure	flooded suction (up to 0,5bar)			
NPSHr	7 ft			

Tolerances according to SEEPEX standards.

Materials and executions

Installation	vertical, drive on top
Direction of rotation	counter clockwise (left)
Lantern - Design	with cover plates
Lantern - Material	EN-JL 1040 (gci-25)
Suction casing - Design	standard
Suction casing - Material	1.4408 / ASTM A351 grade CF8M
Pressure branch - Design	standard
Pressure branch - Material	1.4408 / ASTM A351 grade CF8M
Position of branch	position 1
Suction connection	1 1/2" NPT
Pressure connection	1 1/4" NPT
Joint - Design	pin joint with joint sleeve, grease filled
Joint - Material	standard
Joint - Universal joint sleeve: material	NBR - Perbunan
Coupling rod - Design	standard
Coupling rod - Material	1.6582 encapsulated
Rotor - Design	standard
Rotor - Material	1.4404 / AISI 316L
Rotor - Coating	ductile chromium coating
Stator - Design	standard with TSE, sensor sleeve 1.4404
Stator - Material	NBR - Perbunan
Shaft sealing	mechanical seal
Code	back-to-back GLRD - LA
Shaft diameter	30 mm
Make	Burgmann
Rotating/stationary seal face	SiC SiC
Elastomers	FPM - Viton

Spring	1.4571 / AISI 316Ti
Metal parts	1.4571 / AISI 316Ti
Type	MG1-G60 Q1Q1 VGG
Casing - material	1.4404 / AISI 316L
Casing - connection standard	NPT
Plug-in Shaft - Design	standard
Plug-in Shaft - Material	1.4404 / AISI 316L
Bolting - Design	completely stainless steel
Painting - Number of colors	single-colored standard
Painting - Painted components	1 complete combination
Painting - Color	Standard Enamel (SEEPEx Blue)

Drive

Type	Gear & Motor at freq. inv.		
Make	Nord		
Model	SK12VLF/140TC		
Mounting position	V1		
Ratio (i)	4.49		
	Norm	Min	Max
Speed	401 rpm	41 rpm	390 rpm
Motor speed	1800 rpm	182 rpm	1751 rpm
Frequency	60 Hz	6 Hz	58 Hz
Make	Marathon Motors		
Model	145THTN6060		
Rated output	2 HP		
Rated speed	1800 rpm		
Starting	direct on frequency inverter		
Explosion proof	Weatherproof		
Efficiency class	IE1		
Terminal box position acc. to supplier	not specified		
Cable entry position acc. to supplier	not specified		
Voltage	rated voltage 575V		
Frequency	60Hz		
Enclosure	TENV		
Thermal class	F		
Winding protection	Thermostats		

The frequency inverter has to follow a linear U/f characteristic curve (constant torque).
It's essential to have a minimum overload capability of 150% for at least 3 seconds. (see technical data sheet)

Baseplate

Design	baseplate for block pump, design with side feet
Material	steel, painted
GPU Type Code	B-ST-LS

Dry running protection device (TSE)

Design	standard design, complete - sensor sleeve fitted to the stator of the pump with integrated temperature sensor - connection head (IP55) - separate TSE control device suitable for mounting inside a control panel
Voltage	110-115V/50-60Hz
Temperature coefficient	NTC

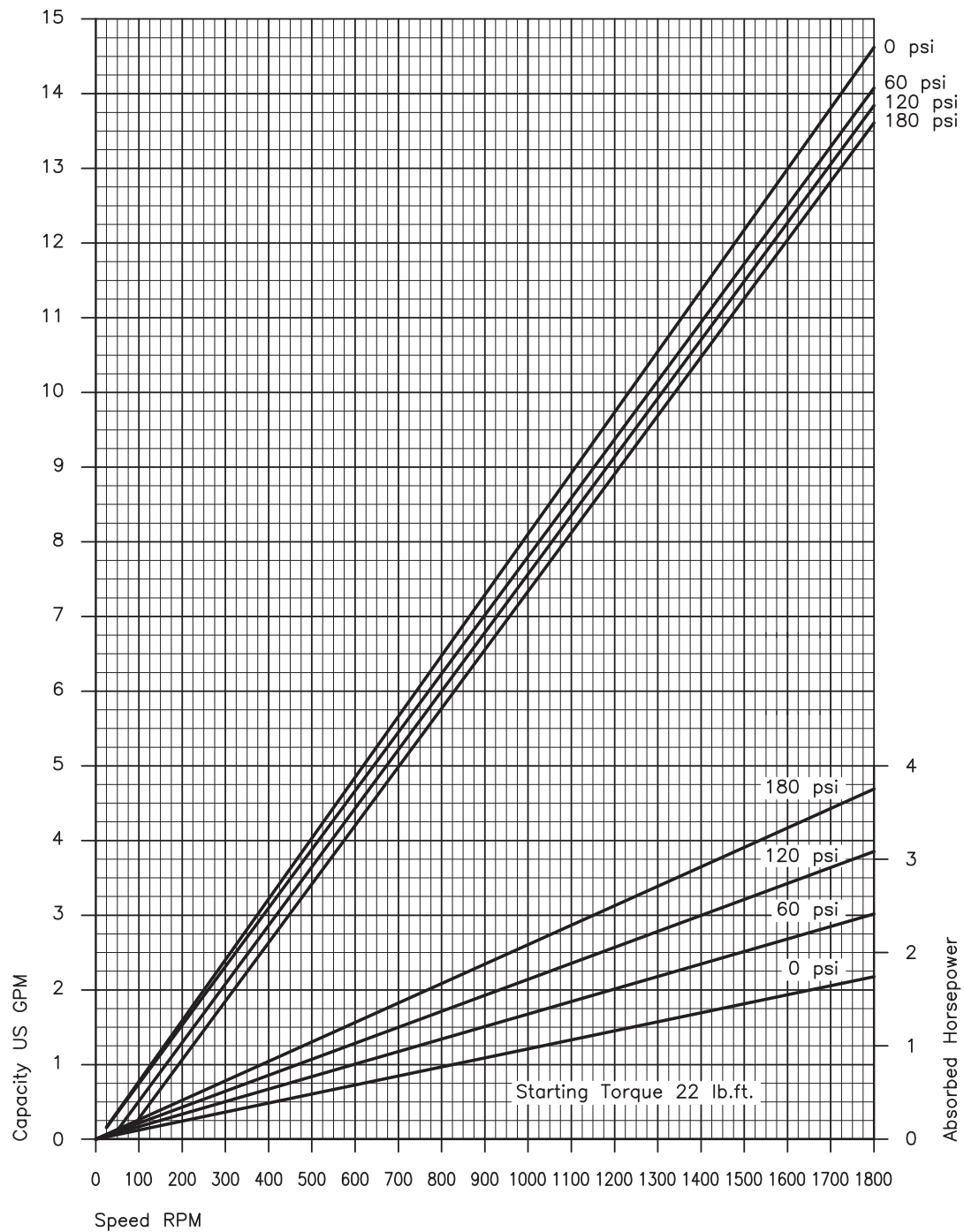
Material sensor sleeve	1.4404
Material connection head	aluminium

Packing	
Type of packing	cardboard box (US)
Type of transport	truck / railway
Quantity of pumps per package	1 pump per package

Optional: Seal flush system

Design	SEEPEX standard double mechanical seal flush system: - Isolation valve - Strainer, 20 mesh - Needle valve - Pressure regulator, 10-125psi adjust - Solenoid valve, 120VAC, NC - 1/4" NPT seal water connection plumbed to inlet of gland housing. - 1/4" NPT drain connection plumbed to outlet of gland housing. Solenoid and needle valve located on the discharge.
Type	SEEPEX standard double acting mechanical seal flush system
Connection	1/8" NPT connection
Pressure Range	10 - 125 psi
Solenoid valve voltage	120V AC

Characteristic Curves
Size
05-12



Values based upon water 68°F ; For notes on drive selection refer to PER

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0009_PCH

by: GH

chkd: GP

appvd: CB



CATIONIC POLYMER DOSING SKID

VALVES

OIM manual section: 4.3.9.4

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CS-301-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VABLPV200249	P9-621-V003	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200249	P9-621-V004	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200249	P9-622-V003	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VABLPV200249	P9-622-V004	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200249	P9-623-V003	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200249	P9-623-V004	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	V9-623	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	V9-624	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VABLPV200251	V9-625	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	V9-627	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	V9-628	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-621-V001	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-621-V002	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VABLPV200253	P9-622-V001	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-622-V002	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-623-V001	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		
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CHEMLINE	VABLPV200253	V9-622	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			CATIONIC POLYMER DOSING SKID		

Type 21 Ball Valves



SERIES: Type 21

SIZES: 3/8" – 4"

ENDS: Socket, Threaded, Flanged, Butt¹ or ChemFlare™

SEATS: PTFE

SEALS²: EPDM, FKM (Viton®), CPE³

CRN
Registered
Consult Chemline



The Chemline Type 21 True Union Ball valve incorporates state of the art features for long term performance. This is a full port, full blocking True Union valve pressure rated at 16 bar (230 psi)⁴. Double stem o-rings and Safety Shear stem design provide for a high degree of safety on hazardous fluid applications. All sizes have an ISO standard actuator mounting platform integral to the valve body. This provides for sturdy and secure mounting of pneumatic or electric actuators.

Features

Pressure rated to 230 psi⁴

- Provides a high factor of safety

Integral Actuator Mounting Platform

- Actuation is easy. Electric or pneumatic actuators may be mounted in the field.

Full Port

- High capacity and low pressure drops

Fully Blocking

- Downstream union nut may be safely disassembled for piping maintenance while valve is closed off under full system pressure

Built-In Spanner Wrench

- Top of the handle is designed to be used as a tool for accessing internal parts

Safety Shear Stem Design

- Stem has double o-rings
- Designed to hold full pressure even if stem breaks due to excessive torque

High Chemical Resistant Material

- PVC and CPVC compounds have an "A" chemical resistance rating as per ASTM D-1784. They have outperformed other PVC and CPVC compounds on aggressive chemicals.

¹ Butt ends for fusion to Chemline metric PP, PVDF or ECTFE (Halar®) piping.

² Other materials are available.

³ CPE=Chlorinated Polyethylene.

⁴ PVC, CPVC and PVDF 1/2" to 2" are rated at 230 psi; 2-1/2" to 4" and all size PP valves are rated at 150 psi at 20°C.

⁵ PVC valves with EPDM or FKM (Viton®) seals are certified under NSF/ANSI Standard 61 for contact with drinking water.

Type 21 Ball Valves



features

Double Stem O-Rings – Safety Shear Design

- Upper o-ring groove is deeper than lower. In case of excessive stem torque, stem will shear at the upper groove, leaving the inner o-ring intact to seal against full line pressure.



PTFE Seats have Elastomer Cushions

- Improved sealing while lowering stem torques
- Self adjusts for seat wear



Built in Spanner Wrench

- For removing or tightening the seat carrier
- All parts are replaceable



Integral Actuator Mounting Platform

- Actuation is easy. Electric or pneumatic actuators may be mounted in the field. Simply pull off the handle to reveal a standard ISO 5211 mounting platform which accepts bolt-on hardware.



Fully Blocking

- Downstream pipe may be removed while upstream side is still pressurized. This may be done with valve installed in either direction.



Base Mounting Pad

- Optional threaded inserts allow valves to be securely anchored
- Supplied standard with actuated valves

Type 21 Ball Valves



options + accessories



ChemFlare™ Ends

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



Optional Lock-out Handle & Hasp

- To prevent unauthorized operation of the valve
- Used during maintenance shut-downs



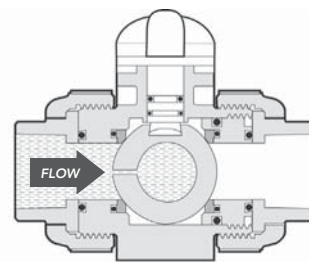
One-piece moulded PVC and CPVC 6" socket ends

- Allows installation of 4" valve in 6" line
- Factory moulded, not fabricated with couplings and reducers cemented together
- Fixed to valve mechanically just like the one-piece moulded factory flanges



Different Colour Handles

- Choose a handle colour other than standard red for colour coding different services



Vented Ball

- For sodium hypochlorite services at any concentration
- Valve shown in closed position

electric + pneumatic actuation

Pneumatic and Electric Actuators

- A complete range of actuators and control accessories are available, mounted to valves using PPG plastic brackets and stainless steel couplings. Refer to separate data sheets.



Electromni® Electric



Q Series Electric



A Series Electric

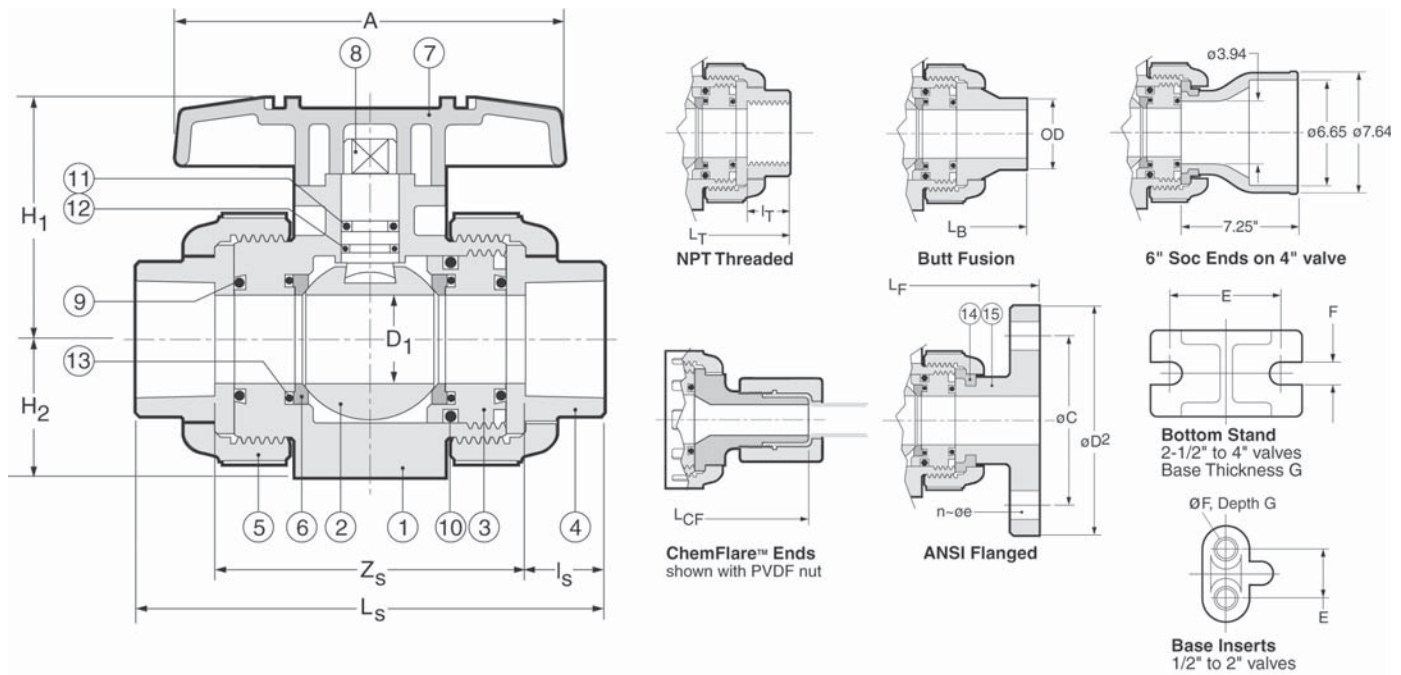


V Series Electric
with Local Control Station



PA Series Pneumatic

Type 21 Ball Valves



PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
1	Body	1	PVC, CPVC, PP, PVDF
2	Ball	1	PVC, CPVC, PP, PVDF
3	Carrier ¹	1/2	PVC, CPVC, PP, PVDF
4	End Connector	2	PVC, CPVC, PP, PVDF
5	Union Nut	2	PVC, CPVC, PP, PVDF
6▲	Ball Seat	2	PTFE
7	Handle	1	ABS

¹ 1 carrier for sizes 1/2" to 2", 2 carriers for sizes 2-1/2" to 4"

² EPDM seals standard with PVC, CPVC, PP; FKM (Viton®) with PVDF valves

³ 2 pcs 1/2" to 2", 6 pcs 2-1/2" to 4"

PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
8	Stem	1	PVC, CPVC, PP, PVDF
9▲	Face O-Ring ²	2	EPDM, FKM (Viton®)
10▲	Carrier O-Ring ²	2	EPDM, FKM (Viton®)
11▲	Upper Thicker Stem O-Ring ²	1	EPDM, FKM (Viton®)
12▲	Lower Thinner Stem O-Ring ²	1	EPDM, FKM (Viton®)
13	Seat Cushion ²	2	EPDM, FKM (Viton®)
14	Flange Retainer ³	2/6	PVDF
15	Flange	2	PVC, CPVC, PP, PVDF

DIMENSIONS INCHES

Size	D				End Connections														Valve Base		
					Socket			Threaded		Factory Flanged					Butt		ChemFlare™				
	Bore	A	H ₁	H ₂	L _S	Z _S	I _S	I _T	L _T	L _F	D ₂	C	n	e	L _B	OD	L _{CF}	Tube ⁴	E	F ⁵	G
1/2"	.59	3.6	2.03	1.14	4.45	2.70	.875	.64	4.02	5.63	3.50	2.38	4	.62	4.88	.79	6.12	1/2"	.75	.29	.43
3/4"	.79	3.9	2.34	1.38	5.08	3.08	1.00	.65	4.72	6.77	3.88	2.75	4	.62	5.67	.98	6.52	3/4"	.75	.29	.43
1"	.98	4.3	2.68	1.54	5.75	3.50	1.13	.81	5.16	7.36	4.25	3.12	4	.62	6.06	1.26	7.26	1"	.75	.29	.43
1-1/4"	1.22	4.8	3.17	1.85	6.46	5.21	1.25	.85	5.91	7.48	4.62	3.50	4	.62	6.85	1.57	9.58	1-1/4"	1.18	.35	.59
1-1/2"	1.57	5.2	3.50	2.17	7.24	4.49	1.38	.85	6.42	8.35	5.00	3.88	4	.62	7.64	1.97	—	—	1.18	.35	.59
2"	2.01	6.3	4.02	2.60	8.23	5.23	1.50	1.90	7.76	9.21	6.00	4.75	4	.75	8.82	2.48	—	—	1.18	.35	.59
2-1/2"	2.28	7.87	4.96	2.83	9.45	5.95	1.75	1.21	8.46	10.20	7.00	5.49	4	.75	9.72	2.95	—	—	1.89	.35	.23
3"	2.70	9.45	5.51	3.35	11.10	7.35	1.88	1.30	10.39	11.97	7.50	6.00	4	.75	11.61	3.54	—	—	2.17	.43	.28
4"	3.54	11.81	7.01	4.33	13.88	9.87	2.00	1.38	14.17	14.65	9.00	7.50	8	.75	14.76	4.33	—	—	2.56	.43	.32

⁴ ChemFlare™ ends are available for reduced tube sizes down to 1/4".

⁵ Optional threaded inserts: 1/2" to 1" valves – UNC 1/4"-20; 1-1/4" to 2" valves – UNC 5/16"-18. 'Recoil' brand inserts require drilling before insertion.

Type 21 Ball Valves



WORKING PRESSURES PSI, Water, Non-Shock

VACUUM RATING • 29.9 inches mercury

Size	PVC			CPVC						PP			PVDF				
	20°C 68°F	40°C 104°F	50°C 122°F	20°C 68°F	40°C 104°F	50°C 122°F	60°C 140°F	80°C 176°F	90°C 194°F	20°C 68°F	60°C 140°F	80°C 176°F	20°C 68°F	40°C 104°F	60°C 140°F	80°C 176°F	100°C 212°F
1/2"–2"	230	165	150	230	165	150	120	75	55	150	85	55	230	185	150	110	85
2-1/2"–4"	150	150	150	150	150	150	120	75	55	150	70	40	150	150	150	110	85

Temperature Ranges: PVC 0 to 60°C (32 to 140°F), CPVC 0 to 95°C (32 to 203°F), PP –20 to 80°C (–4 to 176°F), PVDF –40 to 100°C (–40 to 212°F)

WEIGHTS LB. THREADED or SOCKET **WEIGHTS** LB. FLANGED

Size	PVC	CPVC	PP	PVDF	PVC	CPVC	PP	PVDF
1/2"	0.4	0.4	0.4	0.4	0.9	0.9	0.7	1.1
3/4"	0.7	0.7	0.7	0.9	1.3	1.5	1.1	1.5
1"	0.9	1.1	0.9	1.1	1.8	2.0	1.5	2.2
1-1/4"	1.5	1.5	1.3	1.8	2.6	2.9	2.0	3.3
1-1/2"	2.4	2.6	1.5	2.9	3.7	4.0	2.6	4.4
2"	4.0	4.4	2.6	4.9	5.5	6.0	4.0	8.2
2-1/2"	5.1	5.5	3.7	6.2	7.3	7.7	5.3	8.8
3"	8.2	8.8	5.5	9.9	10.1	11.0	7.5	12.6
4"	19.4	21.8	13.2	24.9	21.6	23.4	15.4	26.7

Cv VALUES VS. BALL ANGLE

Size	0%	25%	50%	75%	100%
1/2"	0	0.35	1.3	5.5	14.
3/4"	0	0.73	2.8	11.5	29.
1"	0	1.2	4.5	18.6	47.
1-1/4"	0	1.8	6.8	28.4	72.
1-1/2"	0	3.9	14.7	61.2	155.
2"	0	4.8	18.0	75.0	190.
2-1/2"	0	9.1	34.7	144.0	365.
3"	0	10.2	39.0	162.0	410.
4"	0	17.0	64.6	269.0	680.

SAMPLE SPECIFICATION

- All True Union Ball Valves in PVC, CPVC, PP or PVDF shall be Chemline Type 21 or equal sizes 1/2" to 2" in PVC, CPVC, and PVDF rated at 230 psi and in PP 150 psi maximum working pressure. Sizes 2-1/2", 3" and 4" rated at 150 psi maximum working pressure with EPDM, FKM (Viton®) or CPE seals. Ball seats shall be PTFE with elastomer cushions for closure with minimum stem torques.
- All valves will have Safety Shear stem design, blowout-proof with double o-rings for safety. The top o-ring groove shall be deeper so that if the stem breaks off under excessive torque the lower o-ring will remain intact and the valve will hold pressure.
- All valves shall be full port and two-way blocking design.
- All valves will be CRN (Canadian Registration Number) registered with TSSA.
- PVC valves with EPDM or FKM (Viton®) seals shall be certified under NSF/ANSI Standard 61 for contact with drinking water.
- All valves shall have chemical resistant labels permanently marked with manufacturing number to provide production level traceability.
- PVC compound shall have an ASTM cell classification 12454-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784 (CSA report LO 4000-172).
- CPVC compound shall have an ASTM cell classification 23567-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784.
- PP material will conform to ASTM D-4101 PP 021 B 67272 material requirements.
- PVDF material shall be unpigmented conforming to ASTM D-3222 material requirements and to be USDA Title 21 Chapter 1 Part 177. 2510 requirements for contact with food.
- Socket ends in PVC and CPVC shall be Schedule 80 and conform to ASTM D-2467.
- Threaded ends shall be Schedule 80 and conform to ASTM D-2464.
- Butt fusion ends in PP or PVDF will be compatible with Chemline PP or PVDF metric piping systems.
- Flanged ends shall be ANSI Class 150 one-piece factory moulded (not fabricated) to ensure maximum strength and close tolerance end to end dimensions.

ORDERING EXAMPLE

Chemline True Union Ball Valves		21	A	020	E	S
Body Material	A – PVC B – PP	C – CPVC K – PVDF				
Size ¹	002 – 1/4" 010 – 1" 025 – 2-1/2"	003 – 3/8" 012 – 1-1/4" 030 – 3"	005 – 1/2" 015 – 1-1/2" 040 – 4"	007 – 3/4" 020 – 2" 060 – 6"		
Seals	E – EPDM S – Socket	V – FKM (Viton®) T – Threaded	C – CPE F – Flanged	B – Nitrile B – Butt ²	A – Aflas® CF – ChemFlare™	

Example: Chemline Type 21 True Union Ball Valve, PVC, 2", with EPDM seals, socket ends.

¹ 1/4" is normally the 3/8" valve reduced. 6" is 4" valve with 6" end connections.

² PP, PVDF and ECTFE (Halar®) metric butt fusion ends (1/2" to 4") connect to Chemline PP, PVDF and ECTFE (Halar®) piping systems.

OTHER OPTIONS & ACCESSORIES

- **Alternate O-Ring Seals**
- **Stem Extensions** made to any length
- **Limit Switches** – For open and/or closed position indication
- **Municipal Operating Nut**
- **Lubrication-free Valves** – Factory clean room assembled
- **Vented Ball** – For sodium hypochlorite applications



CHEMLINE PLASTICS
SUPERIOR FLOW SOLUTIONS

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tel.905.889.7890 | fax.905.889.8553 | request@chemline.com | chemline.com

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CS-305-170 : Identification sheet

VWTC PROJECT NUMBER:	5000218009
PROJECT NAME:	AEM AMARUQ
ENGINEER:	Gabriel Hébert
PROJECT MANAGER:	Clément B
PHONE NUMBER:	

SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
SUBMITTED TO (RESPONSIBLE):	
PROJECT NUM REFERENCE.:	
LOT NUMBER:	

REV:	1
------	---

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VARFPV348512	PRV9-621	DIA: 25 mm (1")	RELIEF VALVE	TYPE: BACK PRESSURE VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU + SGA-005-002-P- G + P025-160- BM//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A	(CONFIG. L_U)		CATIONIC POLYMER DOSING SKID		
CHEMLINE	VARFPV348512	PRV9-622	DIA: 25 mm (1")	RELIEF VALVE	TYPE: BACK PRESSURE VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU + SGA-005-002-P- G + P025-160- BM//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A	(CONFIG. L_U)		CATIONIC POLYMER DOSING SKID		
CHEMLINE	VARFPV348512	PRV9-623	DIA: 25 mm (1")	RELIEF VALVE	TYPE: BACK PRESSURE VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU + SGA-005-002-P- G + P025-160- BM//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A	(CONFIG. L_U)		CATIONIC POLYMER DOSING SKID		

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SB12 Series Back Pressure/Relief Valves



SERIES: SB12

SIZES: 3/8" – 4"

ENDS: True Union Socket, Threaded or ChemFlare™¹ Spigot² Bodies with Plain, Socket, Threaded or Flanged ends

DIAPHRAGM: PTFE Bonded EPDM

SEALS: EPDM, FKM (Viton®)

CRN
Registered
as Category C Fittings
Consult Chemline



Spring
Tensioning
Bolt

True Union Ends

Easy installation and maintenance

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 unaffected 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

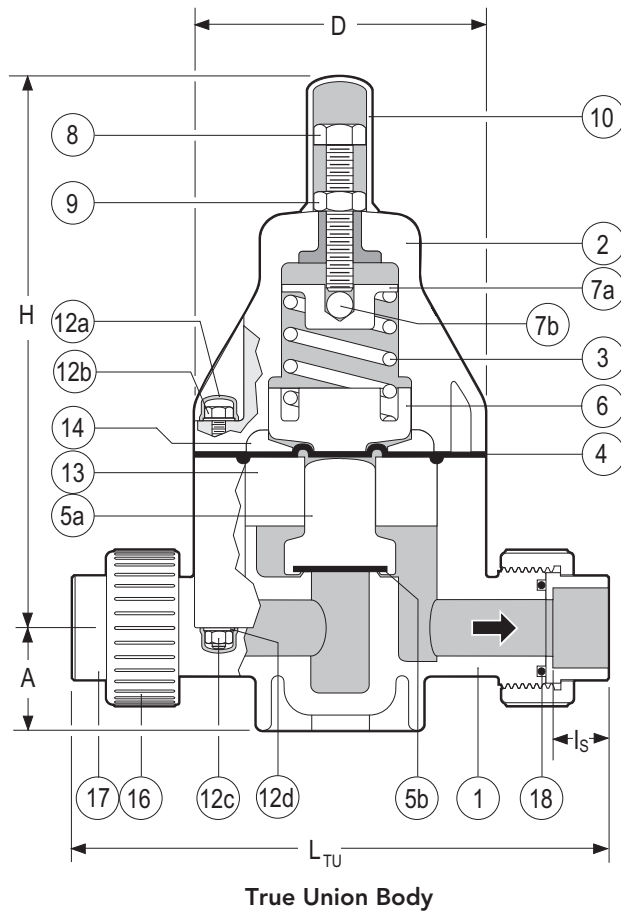
- 120cP is maximum recommended service viscosity

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

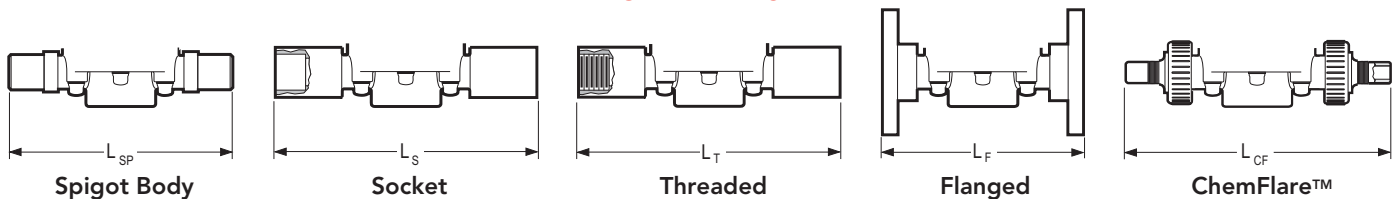
PARTS

▲ 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



DIMENSIONS INCHES

Size	D	H	PVC								PP and PVDF			WEIGHTS LB.			Cv VALUES
			A	I _S	L _{TU} ²	L _{SP} ³	L _S	L _T	L _F	L _{CF}	A	L _{SP} ³	L _{TU} ²	PVC	PP	PVDF	
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

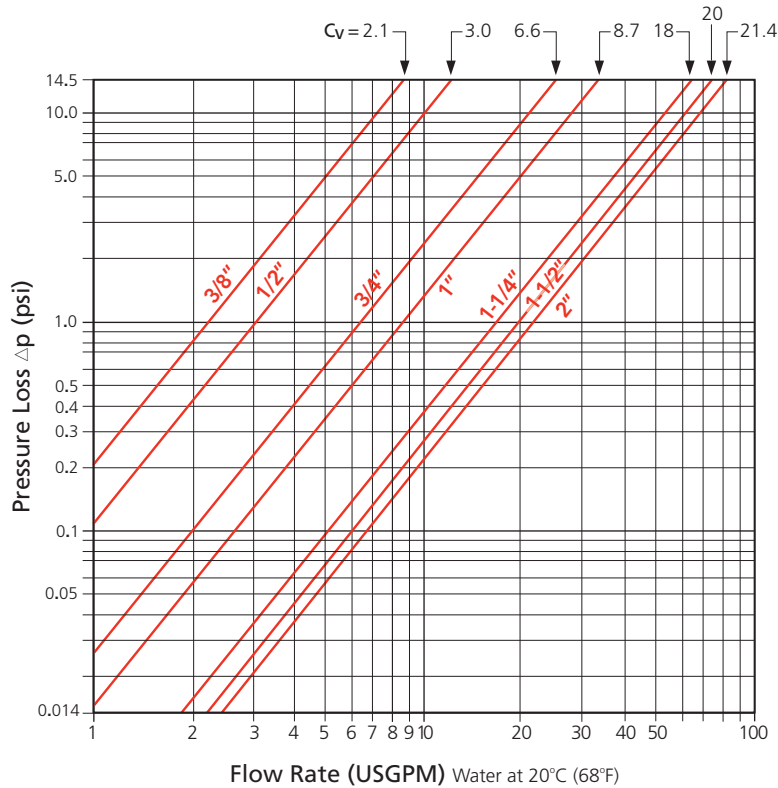
Size	PVC				PP					PVDF						
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	30°C 86°F	50°C 122°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	
1/2"–2"	150	105	60	15	150	90	60	37.5	15	150	100	60	45	30	15	

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).

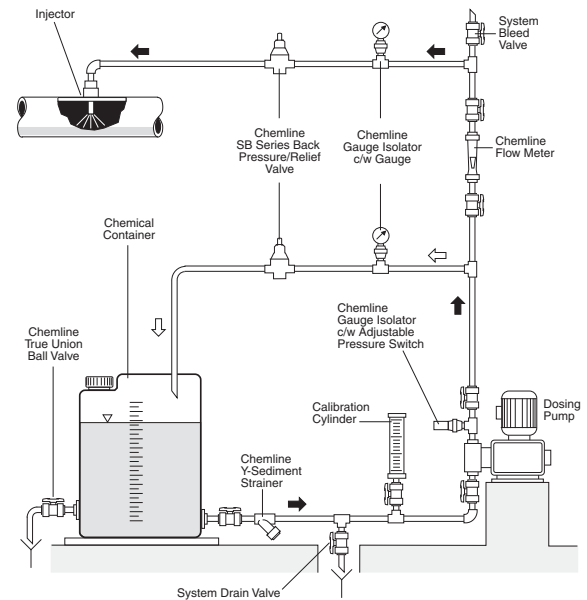
SB12 Series Back Pressure/Relief Valves 1/2" to 2"



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

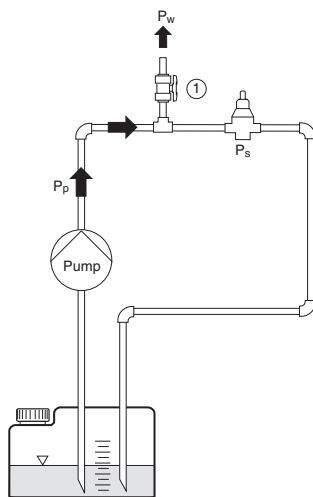


typical dosing system schematic



application of pressure relief valves

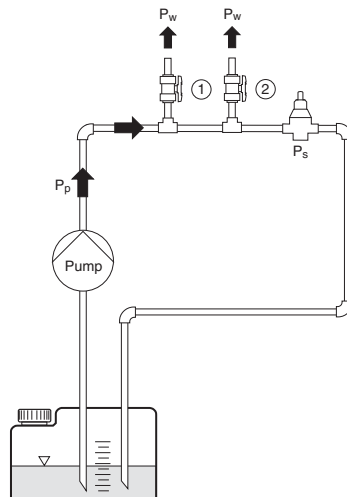
Constant System Pressure



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

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

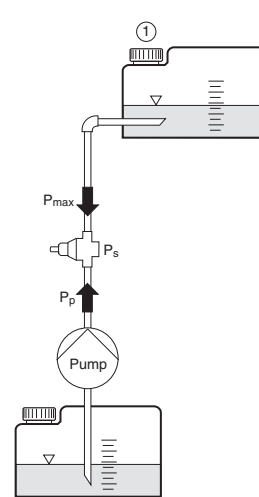
Consumer 1 and/or 2 Open, Valve Closes



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

Non-Return Valve

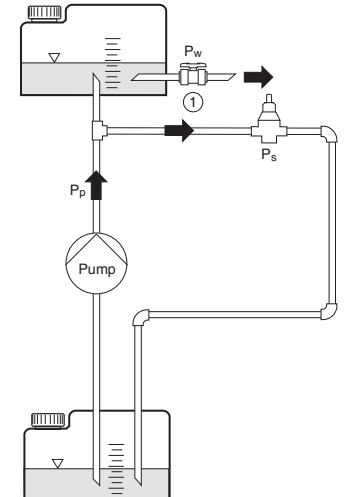
Container 1 is located above the pump



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

Overflow Valve

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



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

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



working pressure vs. flow rate

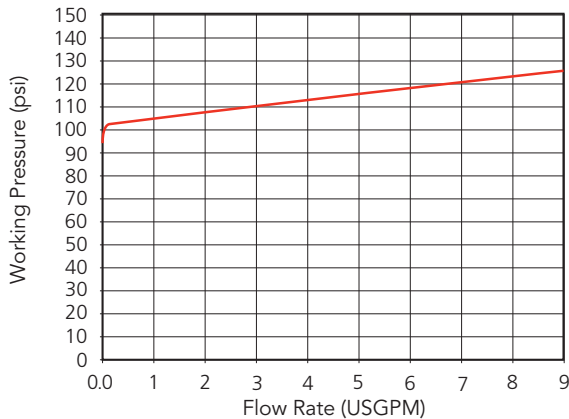
The curves show the relationship between the working pressure and the approximate flow rate through the valve for water at 20°C (68°F). These values will vary depending on:

- 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.

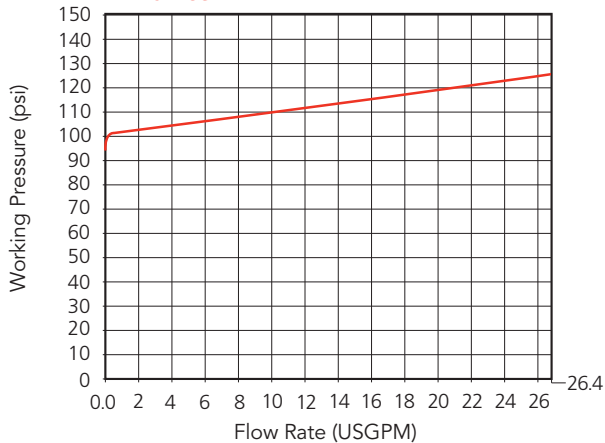
operation examples

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

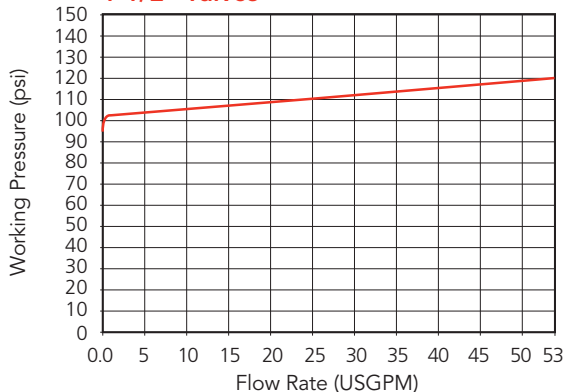
1/2" Valves



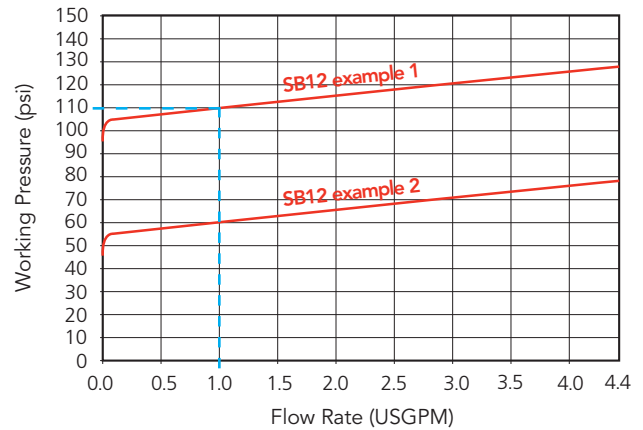
1" Valves



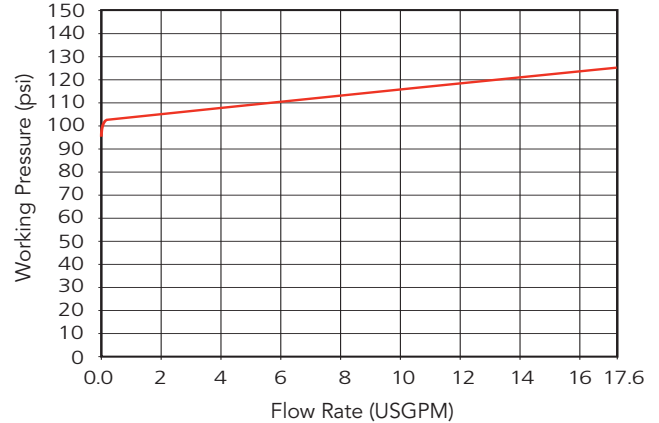
1-1/2" Valves



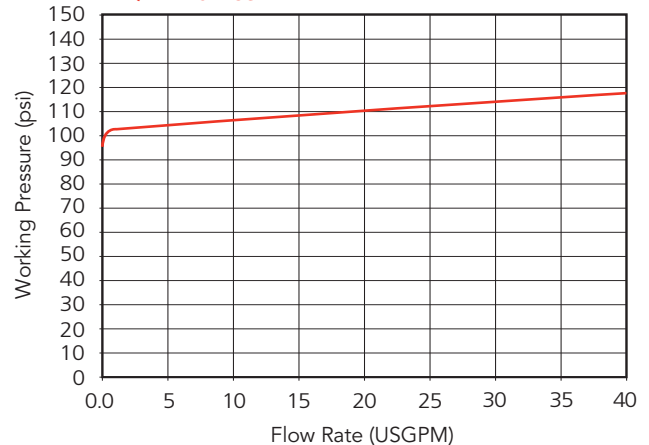
3/8" Valves



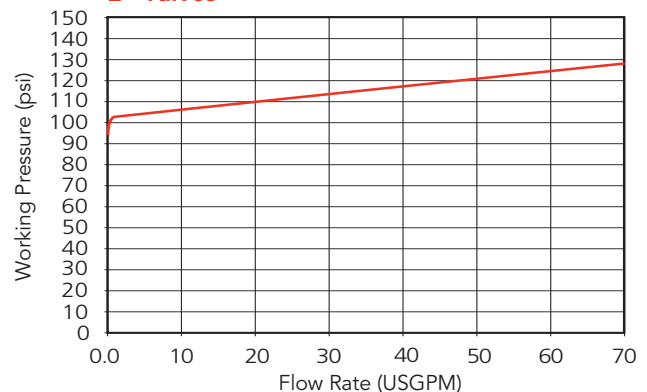
3/4" Valves



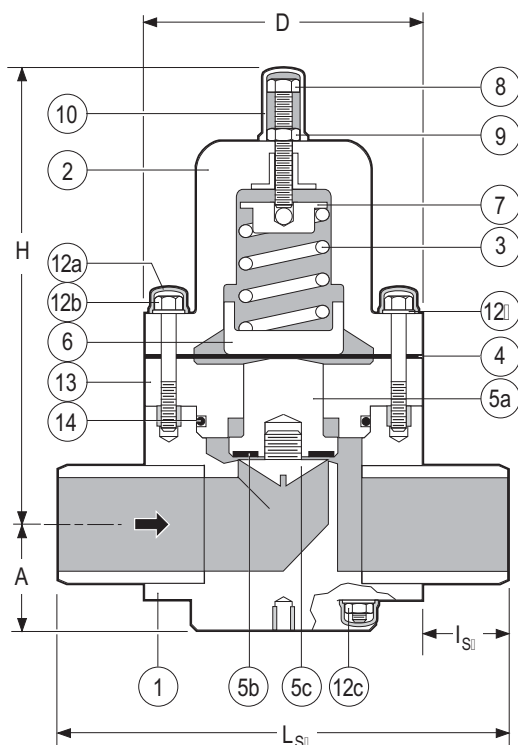
1-1/4" Valves



2" Valves

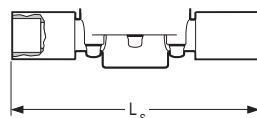


SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"

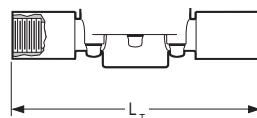


Spigot Body

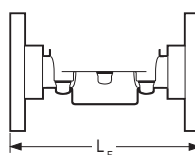
OTHER ENDS



Socket



Threaded



Flanged

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 Retainer	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

ChemFlare™ Ends

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



DIMENSIONS INCHES

Size	PVC, PP & PVDF					PVC	WEIGHTS LB.			Cv VALUES	
	A	D	H	L _{SP} ²	I _{SP}	L _F	PVC	PP	PVDF	USGPM Flow at 1 psi ΔP	
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				PP						PVDF					
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	20°C 68°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
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"	005 – 1/2"	007 – 3/4"		
	010 – 1"	012 – 1-1/4"	015 – 1-1/2"		
	020 – 2"	025 – 2-1/2"	030 – 3"	040 – 4"	
Elastomers	E – EPDM	V – FPM (Viton®)			
Ends	S – Socket	T – Threaded	F – Flanged	U – Union Socket	
	CFx – ChemFlare™		Blank – Spigot (Butt)		

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

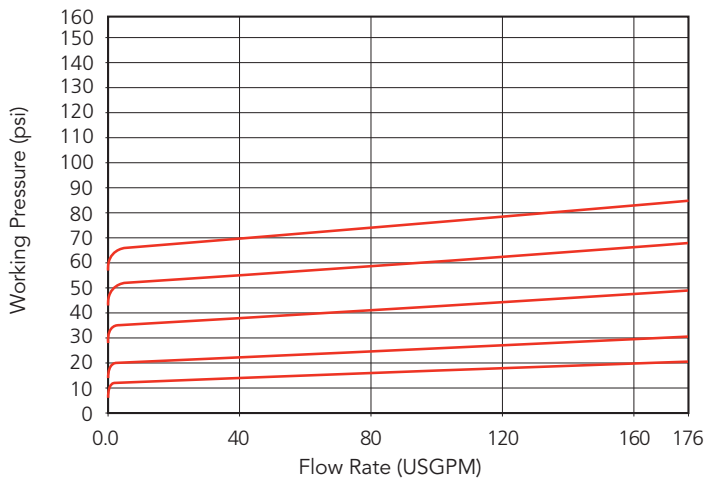
SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"



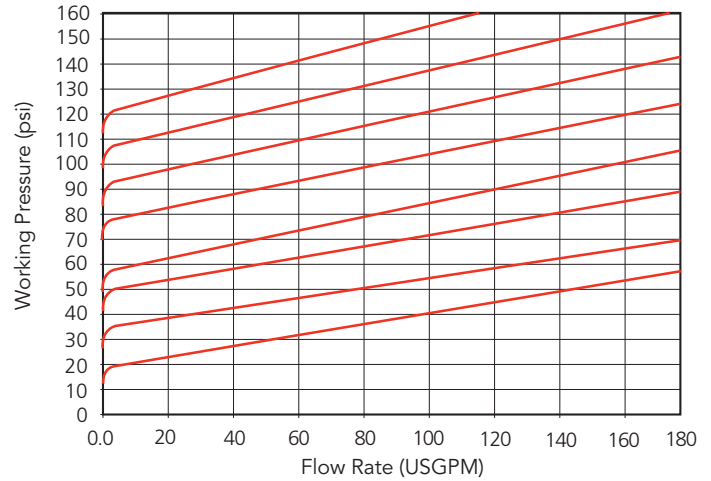
working pressure vs. flow rate

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

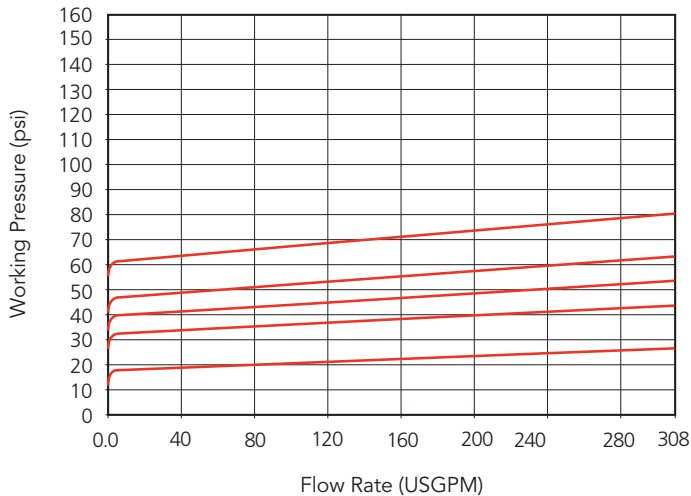
2-1/2" Valves / 4 to 60 psi set pressure range



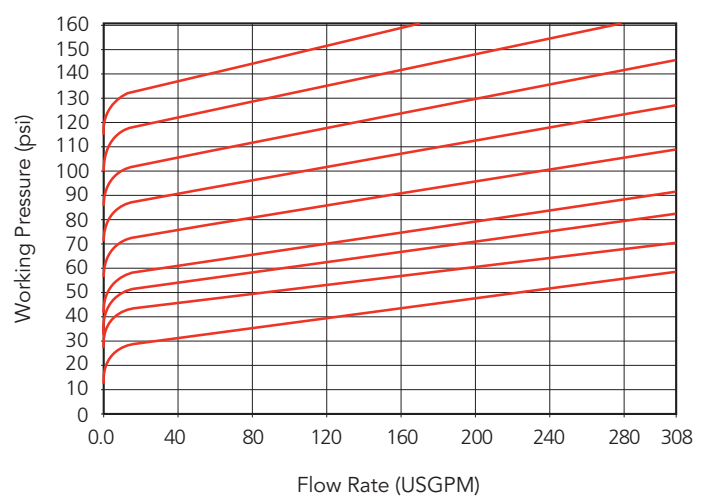
2-1/2" Valves / 7.5 to 150 psi set pressure range



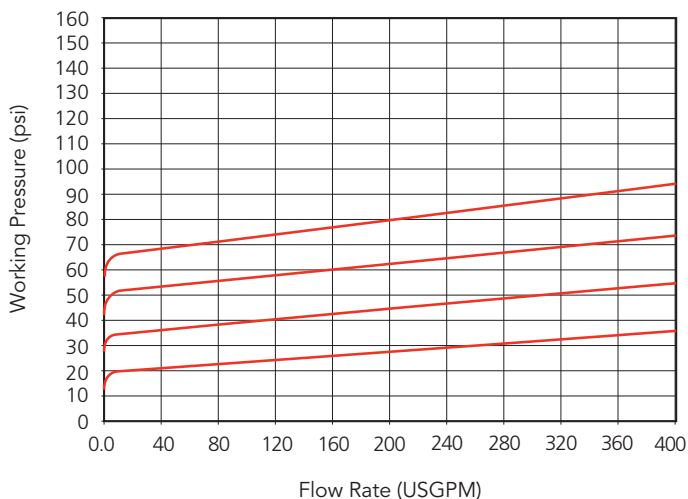
3" Valves / 4 to 60 psi set pressure range



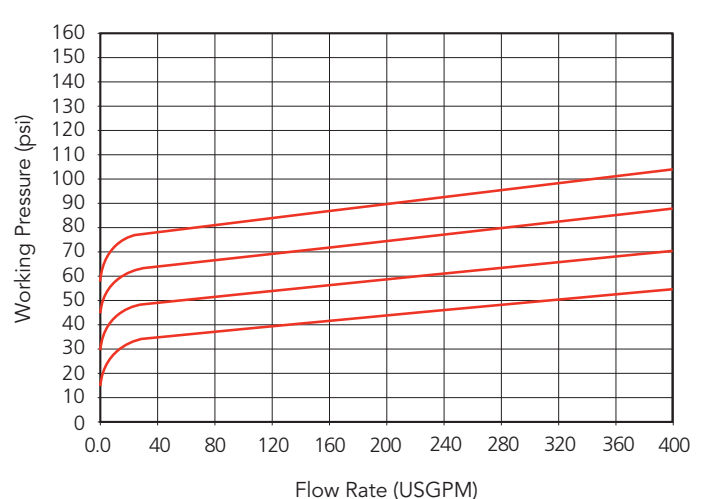
3" Valves / 7.5 to 150 psi set pressure range



4" Valves / 4 to 60 psi set pressure range



4" Valves / 7.5 to 90 psi set pressure range



Gauge Isolators



SERIES: SG

INLET CONNECTION: 1/4" or 1/2" Threaded¹

INSTRUMENT CONNECTION: 1/4" or 1/2" Threaded

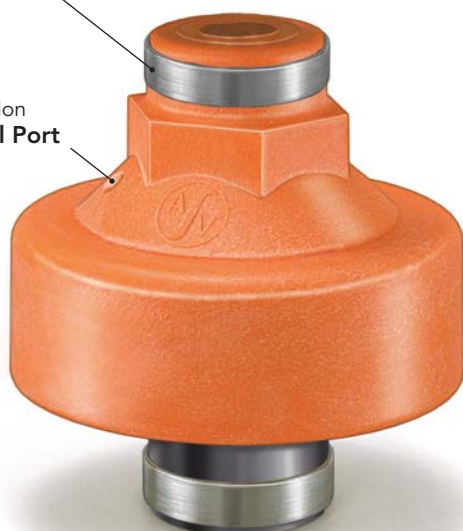
DIAPHRAGM: PTFE

CRN
Registered
Consult Chemline



Stainless Steel Bands Prevent FNPT ports from splitting

Provision for **Fill Port**



Chemline SG Series Gauge Isolators allow inexpensive pressure gauges, or any other pressure instrument to be used in corrosive services. The upper chamber (gauge side) is filled with a stable fluid such as glycol or glycerine². A diaphragm separates it from the lower chamber which receives the media under pressure.

The 1/2" gauge connection allows use of the popular 4" and 4-1/2" diameter gauges. Pressure switches or transmitters may also be installed. Customers can easily fill isolators and install their own gauges.

Features

Easy to Mount Gauges

- It is easy to fill an isolator and field mount a gauge. No special equipment is required.
- Will accept popular 4" and 4-1/2" diameter gauges

Provision for Fill Port

- Housing may be drilled and tapped by Chemline or customer for a threaded fill port. This is used for filling isolator using a vacuum filling station

High Chemical Resistance

- Choice of body materials for a wide range of applications
- PTFE bonded EPDM dished diaphragm for high chemical resistance and sensitivity

Heavy Duty Design for Safety

- PPG³ top chamber
- Heavy wall connection ports

CRN Registration number by province

- Ontario: OH16085.5

Optional Gauges

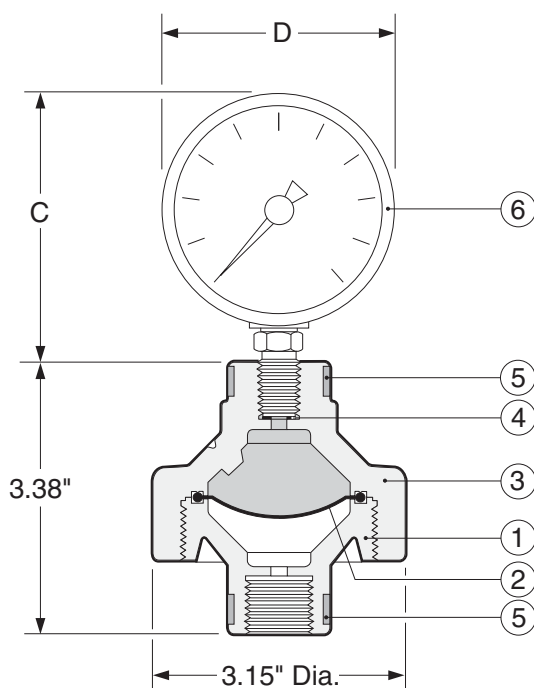
- Isolators are available alone or with gauge mounted and prefilled with glycol²



- A With 2" gauge
- B With 4-1/2" gauge
- C With 2" back mount gauge
- D With pressure transmitter

¹ Other available inlet connections are 1/2" socket or 1/2" to 1" flanged.
² Other fluids are available for special applications such as chlorine service.
³ Glass reinforced polypropylene.
⁴ PVC isolators are certified under NSF/ANSI Standard 61 for contact with drinking water.

Gauge Isolators



PARTS

No.	Part	Pcs.	Materials
1	Body	1	PVC, PP, PVDF
2	Diaphragm	1	PTFE
3	Bonnet	1	PPG ¹
4	Gasket	1	EPDM
5	Stainless Steel Bands	2	304 SS
6	Optional Gauge	1	See below

¹PPG = Glass reinforced polypropylene

OPTIONAL GAUGES

- Chemline offers the gauges listed below mounted to isolator and prefilled with glycol, glycerine or special fluid for chlorine applications. These gauges have dials and cases filled with either glycol (standard), glycerine or silicon for corrosion resistance and dampening.
- Chemline SG gauge isolators are not recommended for vacuum applications. They will not affect the gauge accuracy as low as approximately 3 psi. The accuracy depends on the process conditions and the gauge installed on it.

OTHER OPTIONS

- Flanged** inlet connections
- Threaded Fill Port** – drilled, tapped and plugged
- Chemline will mount any pressure instrument supplied free issue by customer

DIMENSIONS (Gauge Isolator with optional gauge installed) INCHES

Optional Gauge Ordering No.	Gauge Diameter	Gauge Connection	Housing	Bourdon Tube	Window	Accuracy	Dimensions	
							C	D(max.)
P025-xx	2-1/2"	1/4"	316 SS	Brass	Polycarbonate	±1.5% of span	3.1	2.5
P025-xx-SS	2-1/2"	1/4"	316 SS	316 SS	Polycarbonate	±1.5% of span	3.1	2.5
P025-xx-SS/BM	2-1/2" Back Mount	1/4"	316 SS	316 SS	Polycarbonate	±1.5% of span	1.6	2.5
P025-xx-BM	2-1/2" Back Mount	1/4"	316 SS	Brass	Polycarbonate	±1.5% of span	1.6	2.5
P040-xx-SS	4"	1/2"	316 SS	316 SS	Safety Glass	±1% of span	4.5	4.0
P045-xx-SS	4-1/2"	1/2"	PBTP Plastic ²	316 SS	Acrylic	±0.5% of span	6.3	5.8

xx denotes the maximum gauge pressure i.e., 30, 60, 100, 160 or 200 psi. See data page for recommended working pressures.

² PBTP = glass filled polyester.

WORKING PRESSURES PSI

Material	10 – 20°C 50 – 68°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	120°C 248°F	Net Weights Pounds ³
PVC	150	100	80	45	15	–	–	–	–	–	1.0
PP	150	125	100	80	65	45	–	–	–	–	0.7
PVDF	150	150	150	125	105	85	70	60	45	30	1.3

Temperature Ranges: PVC 0 to 60°C (32 to 140°F), PP 10 to 80°C (50 to 176°F), PVDF –30 to 120°C (–22 to 248°F).

NR = Not Recommended. ³ Weights are for unfilled 1/2" x 1/2" isolators without gauges. 1/2" x 1/4" isolators are 20% lighter.

WEIGHTS

ORDERING EXAMPLE

Chemline Gauge Isolators	SG	A	005-	002	P	G
Body Material	A – PVC	B – PP	K – PVDF			
Inlet Size	002 – 1/4"	005 – 1/2" (Standard)				
Instrument Connection	002 – 1/4"	005 – 1/2"				
Diaphragm	P – PTFE bonded EPDM					
Filling & Mounting	G – Add only if isolator is supplied filled with glycol and gauge or pressure instrument is mounted by Chemline. Separate gauge item numbers are listed above.					

Example: Chemline SG Series Gauge Isolator, PVC, 1/2" x 1/4" FNPT inlet x instrument connections, PTFE diaphragm.

Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0009_PCH

by: GH

chkd: GP

appvd: CB



CATIONIC POLYMER DOSING SKID

CALIBRATION CYLINDER

OIM manual section: 4.3.9.5

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CS-500-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
PRIMARY FLUID	PUSPPV200284	CYL9-621	L: 23,16 " X W: 6,906 "	CALIBRATION CYLINDER	CALIBRATION CYLINDER/MANUFACTURER: PRIMARY FLUID/MODEL: PV2-10000	N/A	N/A	CATIONIC POLYMER DOSING SKID		

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ACCUDRAW® Calibration Cylinders



Polypropylene



PVC



Glass



- PVC with removable "O" ring sealed top for easy cleaning
- yellow polypropylene level indicator float for high visibility

ACCUDRAW® has been developed for the accurate calibration of metering pumps. Standard features include:

- translucent
- chemical resistant
- break resistant
- threaded, socket or flanged
- colored graduations and lettering
- PVC has dual scale USGPH & ml
- PVC sizes 100 - 20000 ml
- POLY sizes 100 - 4000 ml
- POLY meets ISO standards
- Glass sizes 100 - 20000 ml
- custom designs available

For detailed product information visit our website: primaryfluid.com





ACCUDRAW® Calibration Cylinders

"For Accuracy That Counts"

For complete product information visit our website: primaryfluid.com



Flanged: Glass, PVC



Flanged: PVC



PV#4

Sizing and Ordering Information:

ACCUDRAW Standard Materials of Construction

AC = All polypropylene construction (see below for options)
PV = All polyvinylchloride construction (see below for options)
ACS = Glass*

Example: AC#1-1000B

AC = PP (polypropylene)
#1 = Bottom threaded connection only
1000 = 1000 ml
B = BSP Thread

Note: Cylinders are NOT pressure vessels

e.g. Part # **AC #1 - 1000 B**

Type:

AC = Polypropylene
PV = PVC
ACS = Glass

Style:

1 = Bottom threaded conn. only
2 = Top and Bottom threaded conn.
3 = Bottom threaded conn. c/w
removable vented dust cap
4 = Top/Bottom threaded conn. c/w
removable "O" ring sealed top
and float ring level indicator

***Glass calibration cylinders
available in Style 2 only**

Graduation Scale:

PP - ml only
PVC - ml and GPH
Glass - ml only

Std. connection is NPT thread

Optional: add suffix as follows

S = Socket weld connection
(PVC only)
GTV = Glass/TFE construction
GKV = Glass/PVDF construction
GCV = Glass/CPVC construction
GSV = Glass/SS construction
B = BSP Thread
F = Flanged

Substitute **E** for **V**
for **EPDM** wetted "O" ring seal

Sizes:

100 =	100 ml	(1.6 GPH)	PP, PVC, Glass
250 =	250 ml	(4 GPH)	PP, PVC, Glass
500 =	500 ml	(8 GPH)	PP, PVC, Glass
1000 =	1000 ml	(16 GPH)	PP, PVC, Glass
2000 =	2000 ml	(32 GPH)	PP, PVC, Glass
4000 =	4000 ml	(64 GPH)	PP, PVC, Glass
6000 =	6000 ml		Glass only
8000 =	8000 ml		Glass only
10000 =	10000 ml	(160 GPH)	PVC, Glass
20000 =	20000 ml	(320 GPH)	PVC, Glass

Material

Custom sizes and materials available.



ACCUDRAW® Calibration Cylinders



ACCUDRAW® Glass Calibration Cylinders are ideal for the calibration of metering pumps, batch systems and for handling hazardous chemicals.

- volumes calibrated in ml
- construction materials available include TFE, PVDF, CPVC and 316 stainless steel
- sealing "O" rings are Viton and Buna N
- outer shield of acrylic construction
- port connections in NPT, metric or flanged
- standard sizes 100 - 20,000 ml
- custom designs available to your specifications

Sizing and Ordering Information: Glass Construction

Size	Conn.	Model # For TFE End Flgs	Model # For 316 S/S End Flgs	Model # For PVDF End Flgs	Model # For CPVC End Flgs
100 ml	1/2" NPT	ACS#2-100-GTV	ACS#2-100-GSV	ACS#2-100-GKV	ACS#2-100-GCV
250 ml	1/2" NPT	ACS#2-250-GTV	ACS#2-250-GSV	ACS#2-250-GKV	ACS#2-250-GCV
500 ml	1/2" NPT	ACS#2-500-GTV	ACS#2-500-GSV	ACS#2-500-GKV	ACS#2-500-GCV
1000 ml	1/2" NPT	ACS#2-1000-GTV	ACS#2-1000-GSV	ACS#2-1000-GKV	ACS#2-1000-GCV
2000 ml	1" NPT	ACS#2-2000-GTV	ACS#2-2000-GSV	ACS#2-2000-GKV	ACS#2-2000-GCV
4000 ml	1" NPT	ACS#2-4000-GTV	ACS#2-4000-GSV	ACS#2-4000-GKV	ACS#2-4000-GCV
6000 ml	1" NPT	ACS#2-6000-GTV	ACS#2-6000-GSV	ACS#2-6000-GKV	ACS#2-6000-GCV
8000 ml	2" NPT	ACS#2-8000-GTV	ACS#2-8000-GSV	ACS#2-8000-GKV	ACS#2-8000-GCV
10000 ml	2" NPT	ACS#2-10000-GTV	ACS#2-10000-GSV	ACS#2-10000-GKV	ACS#2-10000-GCV
20000 ml	2" NPT	ACS#2-20000-GTV	ACS#2-20000-GSV	ACS#2-20000-GKV	ACS#2-20000-GCV

Descriptions:

TFE, PVDF and CPVC End Flanges:

Glass cylinder with acrylic outer shield and 3/4" thick (TFE, PVDF or CPVC) end flanges

316 S/S End Flanges:

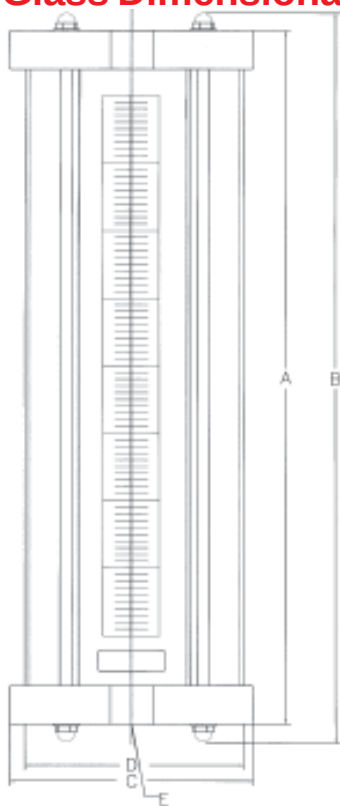
Glass cylinder with acrylic outer shield and 1/2" thick 316 Stainless Steel end flanges

Cylinders are bolted together using stainless steel rods with Viton "O" rings for the glass seal and Buna N "O" rings for the acrylic seal. For EPDM "O" rings, substitute "E" for "V".

Options available: (may affect price and delivery)

- different type or size of thread connection, different "O" ring material, different flange material

Glass Dimensional Information



Note: Cylinders are not pressure vessels.

Dimensions subject to change without notice.

Glass cylinders with TFE, PVDF or CPVC End Flanges

Size ml	DIV ml	A inches	B inches	C inches	D inches	E thread
100	1.00	10.00	11.00	3.00	2.50	1/2" FNPT
250	2.00	12.75	13.50	3.50	3.00	1/2" FNPT
500	5.00	14.50	15.50	4.00	3.50	1/2" FNPT
1000	10.00	16.75	17.75	4.75	4.25	1/2" FNPT
2000	20.00	18.75	19.75	5.50	5.00	1" FNPT
4000	25.00	22.50	23.50	6.50	6.00	1" FNPT
6000	50.00	20.13	21.16	8.00	7.50	1" FNPT
8000	50.00	24.63	25.66	8.00	7.50	2" FNPT
10000	50.00	30.13	31.16	8.00	7.50	2" FNPT
20000	200.00	43.25	44.25	9.00	8.50	2" FNPT

Glass cylinders with 316 Stainless Steel End Flanges

Size ml	DIV ml	A inches	B inches	C inches	D inches	E thread
100	1.00	9.50	10.50	3.00	2.50	1/2" FNPT
250	2.00	12.25	13.00	3.50	3.00	1/2" FNPT
500	5.00	14.00	15.00	4.00	3.50	1/2" FNPT
1000	10.00	16.25	17.25	4.75	4.25	1/2" FNPT
2000	20.00	18.25	19.25	5.50	5.00	1" FNPT
4000	25.00	22.00	23.00	6.50	6.00	1" FNPT
6000	50.00	19.63	20.66	8.00	7.50	1" FNPT
8000	50.00	24.13	25.16	8.00	7.50	2" FNPT
10000	50.00	29.63	30.66	8.00	7.50	2" FNPT
20000	200.00	42.75	43.75	9.00	8.50	2" FNPT

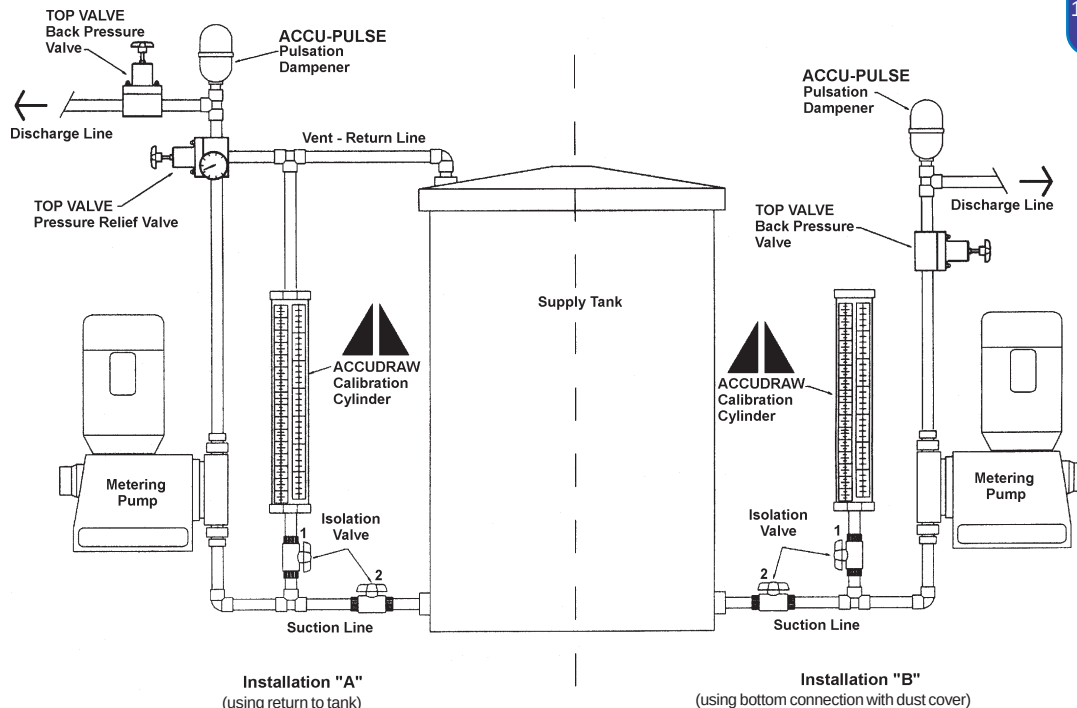


ACCUDRAW® Calibration Cylinders

Installations

Conversion Factors

1 ml = 1 cc
 1000 ml = 1 liter
 ml/sec X 60 = ml/min
 1 US gal/min X 0.063 = liters/sec
 1 US gal = 3.786 liters



Other available products at www.primaryfluid.com

TOP VALVE Back Pressure/Pressure Relief



- long life diaphragm
- range of 15 - 350 PSIG
- air release, optional gauge port
- PVC, CPVC, PVDF, Teflon, polypropylene, stainless, Alloy 20 and Hastelloy C
- 7 sizes 1/4" - 2" NPT
- color coded handles indicate size
- higher pressure & temperature available

PFS Corporation Stops



Designed to inject chemical into the center stream of process.

- isolation valve allows for ease of maintenance
 - available in 6 materials of construction
 - wetted components have comparable or greater chemical resistance than quill construction material
 - standard and custom lengths available
 - connection in NPT, metric or flanged
- Custom built in other sizes & materials.**

ACCUPULSE Pulsation Dampeners



Designed to remove pulsating flows from positive displacement pumps.

- increase system efficiency and pump life; decrease maintenance and costs
- protect pipes, meters, valves and instrumentation from pulsation and vibration
- ensure meter accuracy, longevity and repeatability
- prevent foaming and splashing
- extensive range of materials and sizes with lightweight, compact design

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OPERATION AND MAINTENANCE MANUAL

AMARUQ WTP – NUNAVUT

VEOLIA PROJECT: 5000 218 009

4 – DETAILED TECHNICAL DOCUMENTATION

4.3 – SHOP DRAWINGS

4.3.10 – ANIONIC POLYMER DOSING SKID

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0010_PCH

by: GH

chkd: GP

appvd: CB



SUBMITTAL PACKAGE

ANIONIC POLYMER DOSING SKID

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0010_PCH

by: GH

chkd: GP

appvd: CB



ANIONIC POLYMER DOSING SKID

PROCESS DATASHEET

OIM manual section: 4.3.10.1

REFER TO 5000218009_PSDS_0010_PCH_VWT

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0010_PCH

by: GH

chkd: GP

appvd: CB



ANIONIC POLYMER DOSING SKID

GENERAL ARRANGEMENT DRAWING

OIM manual section: 4.3.10.2

REFER TO 5000218009_GA_0010_PCH_VWT

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0010_PCH

by: GH

chkd: GP

appvd: CB



ANIONIC POLYMER DOSING SKID PUMP(S)

OIM manual section: 4.3.10.3

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CS-999-007 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	AGNICO EAGLE MINES	
ENGINEER:	Gabriel Hébert		
PROJECT MANAGER:	Clément B		
PHONE NUMBER:			

SUBMITTED TO (COMPANY):

SUBMITTED TO (RESPONSIBLE):

PROJECT NUM REFERENCE.:

LOT NUMBER:

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
SEEPEX	ST-999-007	P9-524		ANIONIC POLYMER METERING PUMP	ANIONIC POLYMER DOSING SKID // Model BN // 60 - 670 LPH // 80 psi // Vertical installation // Rotate motor so that conduit box is on top // Burgmann mechanical seal // 316SS for wetted parts and NBR for seals // NPT inlet and outlet // TSE device //	Steel painted base plate // CW rotation // CW Marathon Motors 575V/3PH/60HZ		ANIONIC POLYMER DOSING SKID		
SEEPEX	ST-999-007	P9-525		ANIONIC POLYMER METERING PUMP	ANIONIC POLYMER DOSING SKID // Model BN // 60 - 670 LPH // 80 psi // Vertical installation // Rotate motor so that conduit box is on top // Burgmann mechanical seal // 316SS for wetted parts and NBR for seals // NPT inlet and outlet // TSE device //	Steel painted base plate // CW rotation // CW Marathon Motors 575V/3PH/60HZ		ANIONIC POLYMER DOSING SKID		
SEEPEX	ST-999-007	P9-526		ANIONIC POLYMER METERING PUMP	ANIONIC POLYMER DOSING SKID // Model BN // 60 - 670 LPH // 80 psi // Vertical installation // Rotate motor so that conduit box is on top // Burgmann mechanical seal // 316SS for wetted parts and NBR for seals // NPT inlet and outlet // TSE device //	Steel painted base plate // CW rotation // CW Marathon Motors 575V/3PH/60HZ		ANIONIC POLYMER DOSING SKID		

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4/23/2018

qty.: 3

Item 10 (cationic Polymer)

Progressive cavity pump

BN 05-12

Application data

Conveyed product	Polymer
Flowability	flowable
Viscosity	low viscosity (<500 cP/mPas)
Solids content	not specified
Size of solids	not specified
Specific gravity	unknown, 1 kg/dm³ assumed
Product temperature	32°F - 113°F
pH value	5-9
Kind of operation	continuous
Operating hours	8h/day
Location	indoor, dry atmosphere
Altitude of installation	up to 1000 m assumed
Surrounding temperature	normal (32-113°F)

Performance data

	Capacity	Pressure	Speed	
	0.26 USGPM	80 psi	41 rpm	min
	3 USGPM	80 psi	390 rpm	max
Starting torque	30 lb.ft			
Req. power at pump shaft	0.75 HP			
Inlet pressure	flooded suction (up to 0,5bar)			
NPSHr	7 ft			

Tolerances according to SEEPEX standards.

Materials and executions

Installation	vertical, drive on top
Direction of rotation	counter clockwise (left)
Lantern - Design	with cover plates
Lantern - Material	EN-JL 1040 (gci-25)
Suction casing - Design	standard
Suction casing - Material	1.4408 / ASTM A351 grade CF8M
Pressure branch - Design	standard
Pressure branch - Material	1.4408 / ASTM A351 grade CF8M
Position of branch	position 1
Suction connection	1 1/2" NPT
Pressure connection	1 1/4" NPT
Joint - Design	pin joint with joint sleeve, grease filled
Joint - Material	standard
Joint - Universal joint sleeve: material	NBR - Perbunan
Coupling rod - Design	standard
Coupling rod - Material	1.6582 encapsulated
Rotor - Design	standard
Rotor - Material	1.4404 / AISI 316L
Rotor - Coating	ductile chromium coating
Stator - Design	standard with TSE, sensor sleeve 1.4404
Stator - Material	NBR - Perbunan
Shaft sealing	mechanical seal
Code	back-to-back GLRD - LA
Shaft diameter	30 mm
Make	Burgmann
Rotating/stationary seal face	SiC SiC
Elastomers	FPM - Viton

Spring	1.4571 / AISI 316Ti
Metal parts	1.4571 / AISI 316Ti
Type	MG1-G60 Q1Q1 VGG
Casing - material	1.4404 / AISI 316L
Casing - connection standard	NPT
Plug-in Shaft - Design	standard
Plug-in Shaft - Material	1.4404 / AISI 316L
Bolting - Design	completely stainless steel
Painting - Number of colors	single-colored standard
Painting - Painted components	1 complete combination
Painting - Color	Standard Enamel (SEEPEx Blue)

Drive

Type	Gear & Motor at freq. inv.		
Make	Nord		
Model	SK12VLF/140TC		
Mounting position	V1		
Ratio (i)	4.49		
	Norm	Min	Max
Speed	401 rpm	41 rpm	390 rpm
Motor speed	1800 rpm	182 rpm	1751 rpm
Frequency	60 Hz	6 Hz	58 Hz
Make	Marathon Motors		
Model	145THTN6060		
Rated output	2 HP		
Rated speed	1800 rpm		
Starting	direct on frequency inverter		
Explosion proof	Weatherproof		
Efficiency class	IE1		
Terminal box position acc. to supplier	not specified		
Cable entry position acc. to supplier	not specified		
Voltage	rated voltage 575V		
Frequency	60Hz		
Enclosure	TENV		
Thermal class	F		
Winding protection	Thermostats		

The frequency inverter has to follow a linear U/f characteristic curve (constant torque).
It's essential to have a minimum overload capability of 150% for at least 3 seconds. (see technical data sheet)

Baseplate

Design	baseplate for block pump, design with side feet
Material	steel, painted
GPU Type Code	B-ST-LS

Dry running protection device (TSE)

Design	standard design, complete - sensor sleeve fitted to the stator of the pump with integrated temperature sensor - connection head (IP55) - separate TSE control device suitable for mounting inside a control panel
Voltage	110-115V/50-60Hz
Temperature coefficient	NTC

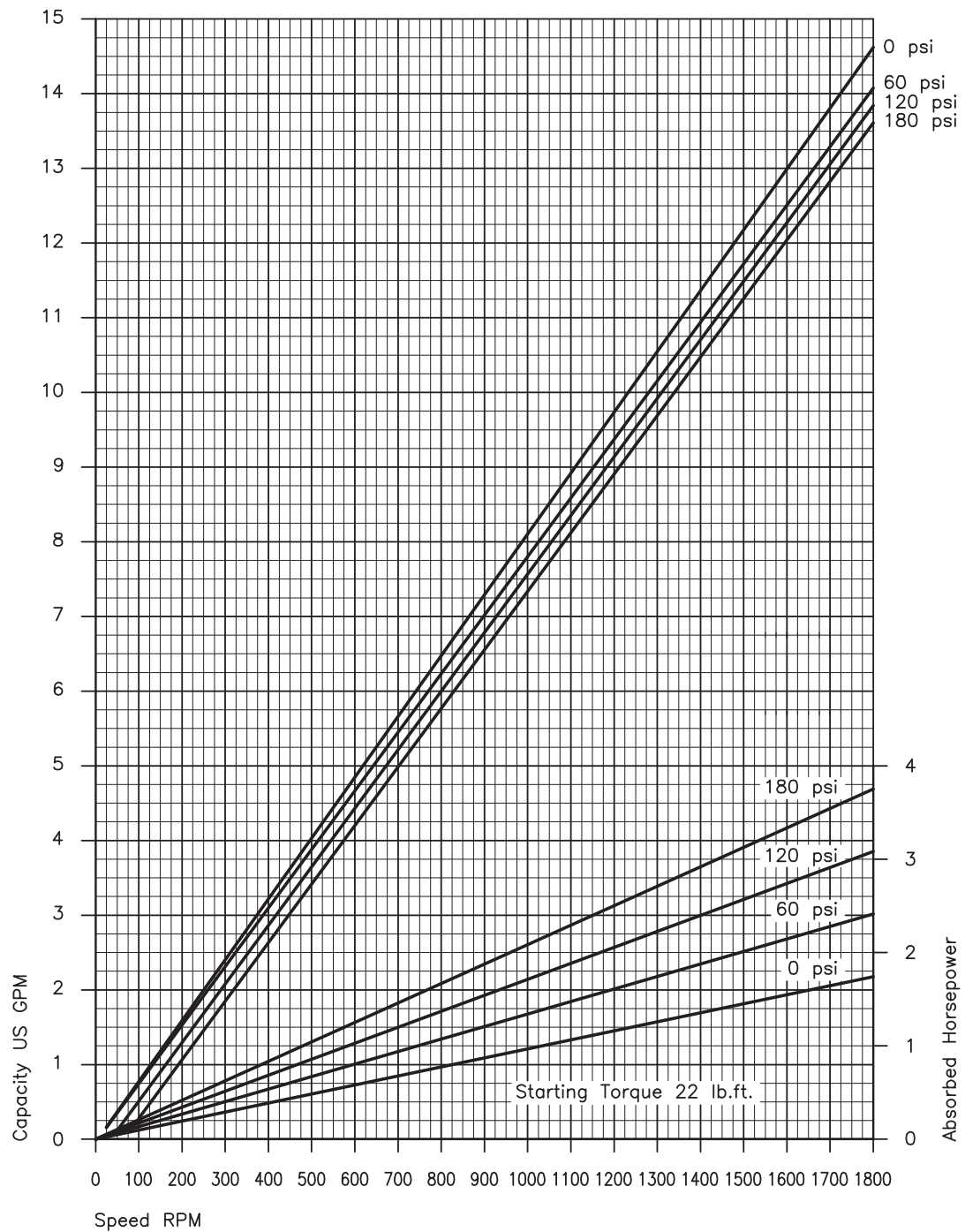
Material sensor sleeve	1.4404
Material connection head	aluminium

Packing	
Type of packing	cardboard box (US)
Type of transport	truck / railway
Quantity of pumps per package	1 pump per package

Optional: Seal flush system

Design	SEEPEX standard double mechanical seal flush system: - Isolation valve - Strainer, 20 mesh - Needle valve - Pressure regulator, 10-125psi adjust - Solenoid valve, 120VAC, NC - 1/4" NPT seal water connection plumbed to inlet of gland housing. - 1/4" NPT drain connection plumbed to outlet of gland housing. Solenoid and needle valve located on the discharge.
Type	SEEPEX standard double acting mechanical seal flush system
Connection	1/8" NPT connection
Pressure Range	10 - 125 psi
Solenoid valve voltage	120V AC

Characteristic Curves
Size
05-12



Values based upon water 68°F ; For notes on drive selection refer to PER

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0010_PCH

by: GH

chkd: GP

appvd: CB



ANIONIC POLYMER DOSING SKID

VALVES

OIM manual section: 4.3.10.4

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CS-301-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VABLPV200249	P9-524-V003	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200249	P9-525-V003	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200249	P9-526-V003	DIA: 13 mm (1/2")	CLEANING VALVE	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 005-E-C//CONNECTION TYPE : COMBO 13 mm (1/2")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VABLPV200251	P9-524-V005	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	P9-525-V005	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	P9-526-V005	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	V9-523	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	V9-524	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VABLPV200251	V9-525	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200251	V9-526	DIA: 25 mm (1")	ISOLATION VALVE (DISCHARGE)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 010-E-S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-524-V001	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-524-V002	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-525-V001	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VABLPV200253	P9-525-V002	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-526-V001	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	P9-526-V002	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VABLPV200253	V9-522	DIA: 38 mm (1- 1/2")	ISOLATION VALVE (SUCTION)	TYPE: BALL VALVE//MANUFACTURER : CHEMLINE//MODEL : Type21-A- 015-E-S//CONNECTION TYPE : FLANGED N/A//BODY : PVC (ASTM D1784)// SEAL SEAT :PTFE EPDM// STEM : PVC			ANIONIC POLYMER DOSING SKID		

Type 21 Ball Valves



SERIES: Type 21

SIZES: 3/8" – 4"

ENDS: Socket, Threaded, Flanged, Butt¹ or ChemFlare™

SEATS: PTFE

SEALS²: EPDM, FKM (Viton®), CPE³

CRN
Registered
Consult Chemline



The Chemline Type 21 True Union Ball valve incorporates state of the art features for long term performance. This is a full port, full blocking True Union valve pressure rated at 16 bar (230 psi)⁴. Double stem o-rings and Safety Shear stem design provide for a high degree of safety on hazardous fluid applications. All sizes have an ISO standard actuator mounting platform integral to the valve body. This provides for sturdy and secure mounting of pneumatic or electric actuators.

Features

Pressure rated to 230 psi⁴

- Provides a high factor of safety

Integral Actuator Mounting Platform

- Actuation is easy. Electric or pneumatic actuators may be mounted in the field.

Full Port

- High capacity and low pressure drops

Fully Blocking

- Downstream union nut may be safely disassembled for piping maintenance while valve is closed off under full system pressure

Built-In Spanner Wrench

- Top of the handle is designed to be used as a tool for accessing internal parts

Safety Shear Stem Design

- Stem has double o-rings
- Designed to hold full pressure even if stem breaks due to excessive torque

High Chemical Resistant Material

- PVC and CPVC compounds have an "A" chemical resistance rating as per ASTM D-1784. They have outperformed other PVC and CPVC compounds on aggressive chemicals.

¹ Butt ends for fusion to Chemline metric PP, PVDF or ECTFE (Halar®) piping.

² Other materials are available.

³ CPE=Chlorinated Polyethylene.

⁴ PVC, CPVC and PVDF 1/2" to 2" are rated at 230 psi; 2-1/2" to 4" and all size PP valves are rated at 150 psi at 20°C.

⁵ PVC valves with EPDM or FKM (Viton®) seals are certified under NSF/ANSI Standard 61 for contact with drinking water.

features

Double Stem O-Rings – Safety Shear Design

- Upper o-ring groove is deeper than lower. In case of excessive stem torque, stem will shear at the upper groove, leaving the inner o-ring intact to seal against full line pressure.



PTFE Seats have Elastomer Cushions

- Improved sealing while lowering stem torques
- Self adjusts for seat wear



Built in Spanner Wrench

- For removing or tightening the seat carrier
- All parts are replaceable



Integral Actuator Mounting Platform

- Actuation is easy. Electric or pneumatic actuators may be mounted in the field. Simply pull off the handle to reveal a standard ISO 5211 mounting platform which accepts bolt-on hardware.



Fully Blocking

- Downstream pipe may be removed while upstream side is still pressurized. This may be done with valve installed in either direction.



Base Mounting Pad

- Optional threaded inserts allow valves to be securely anchored
- Supplied standard with actuated valves

Type 21 Ball Valves



options + accessories



ChemFlare™ Ends

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



Optional Lock-out Handle & Hasp

- To prevent unauthorized operation of the valve
- Used during maintenance shut-downs



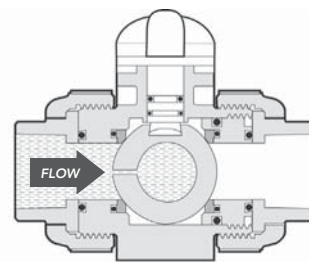
One-piece moulded PVC and CPVC 6" socket ends

- Allows installation of 4" valve in 6" line
- Factory moulded, not fabricated with couplings and reducers cemented together
- Fixed to valve mechanically just like the one-piece moulded factory flanges



Different Colour Handles

- Choose a handle colour other than standard red for colour coding different services



Vented Ball

- For sodium hypochlorite services at any concentration
- Valve shown in closed position

electric + pneumatic actuation

Pneumatic and Electric Actuators

- A complete range of actuators and control accessories are available, mounted to valves using PPG plastic brackets and stainless steel couplings. Refer to separate data sheets.



Electromni® Electric



Q Series Electric



A Series Electric

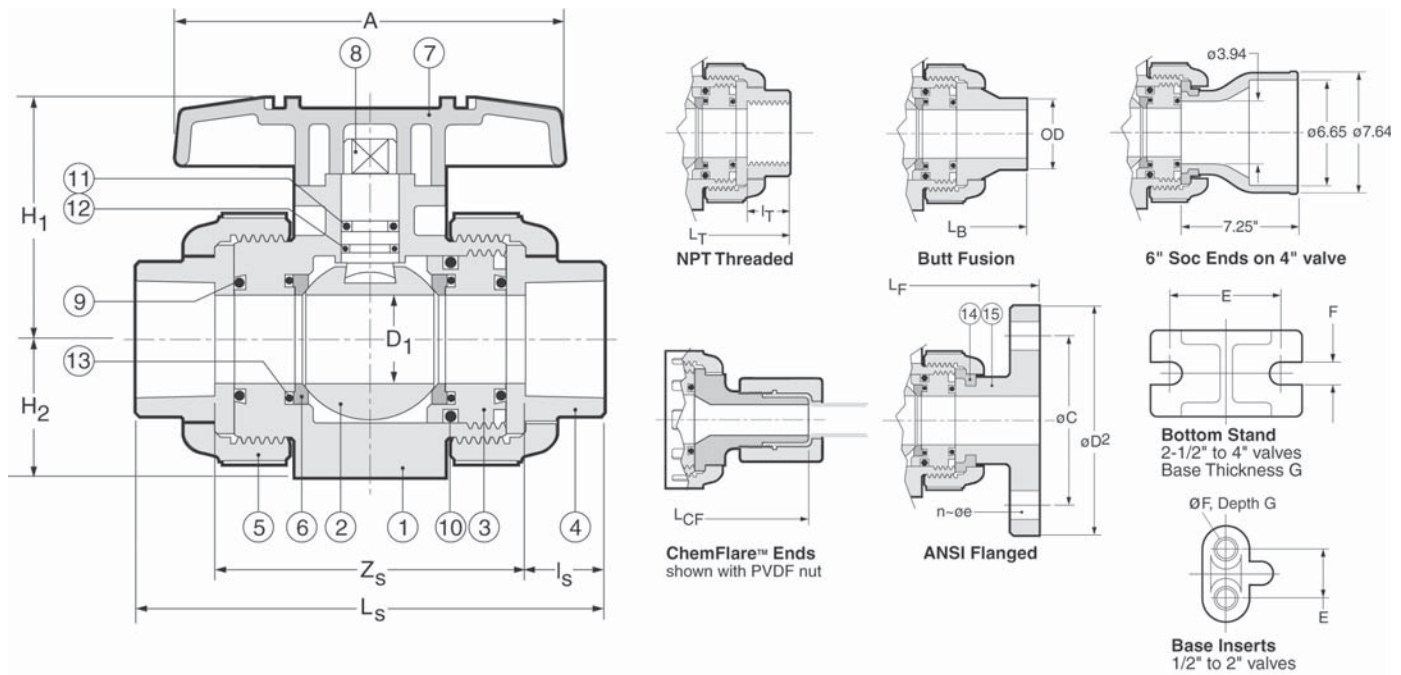


V Series Electric
with Local Control Station



PA Series Pneumatic

Type 21 Ball Valves



PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
1	Body	1	PVC, CPVC, PP, PVDF
2	Ball	1	PVC, CPVC, PP, PVDF
3	Carrier ¹	1/2	PVC, CPVC, PP, PVDF
4	End Connector	2	PVC, CPVC, PP, PVDF
5	Union Nut	2	PVC, CPVC, PP, PVDF
6▲	Ball Seat	2	PTFE
7	Handle	1	ABS

¹ 1 carrier for sizes 1/2" to 2", 2 carriers for sizes 2-1/2" to 4"

² EPDM seals standard with PVC, CPVC, PP; FKM (Viton®) with PVDF valves

³ 2 pcs 1/2" to 2", 6 pcs 2-1/2" to 4"

PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
8	Stem	1	PVC, CPVC, PP, PVDF
9▲	Face O-Ring ²	2	EPDM, FKM (Viton®)
10▲	Carrier O-Ring ²	2	EPDM, FKM (Viton®)
11▲	Upper Thicker Stem O-Ring ²	1	EPDM, FKM (Viton®)
12▲	Lower Thinner Stem O-Ring ²	1	EPDM, FKM (Viton®)
13	Seat Cushion ²	2	EPDM, FKM (Viton®)
14	Flange Retainer ³	2/6	PVDF
15	Flange	2	PVC, CPVC, PP, PVDF

DIMENSIONS INCHES

Size	D				End Connections														Valve Base		
	Bore	A	H ₁	H ₂	Socket			Threaded		Factory Flanged					Butt		ChemFlare™		Tube ⁴		
					L _s	Z _s	I _s	I _T	L _T	L _F	D ₂	C	n	e	L _B	OD	L _{CF}	Tube ⁴	E	F ⁵	G
1/2"	.59	3.6	2.03	1.14	4.45	2.70	.875	.64	4.02	5.63	3.50	2.38	4	.62	4.88	.79	6.12	1/2"	.75	.29	.43
3/4"	.79	3.9	2.34	1.38	5.08	3.08	1.00	.65	4.72	6.77	3.88	2.75	4	.62	5.67	.98	6.52	3/4"	.75	.29	.43
1"	.98	4.3	2.68	1.54	5.75	3.50	1.13	.81	5.16	7.36	4.25	3.12	4	.62	6.06	1.26	7.26	1"	.75	.29	.43
1-1/4"	1.22	4.8	3.17	1.85	6.46	5.21	1.25	.85	5.91	7.48	4.62	3.50	4	.62	6.85	1.57	9.58	1-1/4"	1.18	.35	.59
1-1/2"	1.57	5.2	3.50	2.17	7.24	4.49	1.38	.85	6.42	8.35	5.00	3.88	4	.62	7.64	1.97	—	—	1.18	.35	.59
2"	2.01	6.3	4.02	2.60	8.23	5.23	1.50	1.90	7.76	9.21	6.00	4.75	4	.75	8.82	2.48	—	—	1.18	.35	.59
2-1/2"	2.28	7.87	4.96	2.83	9.45	5.95	1.75	1.21	8.46	10.20	7.00	5.49	4	.75	9.72	2.95	—	—	1.89	.35	.23
3"	2.70	9.45	5.51	3.35	11.10	7.35	1.88	1.30	10.39	11.97	7.50	6.00	4	.75	11.61	3.54	—	—	2.17	.43	.28
4"	3.54	11.81	7.01	4.33	13.88	9.87	2.00	1.38	14.17	14.65	9.00	7.50	8	.75	14.76	4.33	—	—	2.56	.43	.32

⁴ ChemFlare™ ends are available for reduced tube sizes down to 1/4".

⁵ Optional threaded inserts: 1/2" to 1" valves – UNC 1/4"-20; 1-1/4" to 2" valves – UNC 5/16"-18. 'Recoil' brand inserts require drilling before insertion.

Type 21 Ball Valves



WORKING PRESSURES PSI, Water, Non-Shock

VACUUM RATING • 29.9 inches mercury

Size	PVC			CPVC						PP			PVDF				
	20°C 68°F	40°C 104°F	50°C 122°F	20°C 68°F	40°C 104°F	50°C 122°F	60°C 140°F	80°C 176°F	90°C 194°F	20°C 68°F	60°C 140°F	80°C 176°F	20°C 68°F	40°C 104°F	60°C 140°F	80°C 176°F	100°C 212°F
1/2"–2"	230	165	150	230	165	150	120	75	55	150	85	55	230	185	150	110	85
2-1/2"–4"	150	150	150	150	150	150	120	75	55	150	70	40	150	150	150	110	85

Temperature Ranges: PVC 0 to 60°C (32 to 140°F), CPVC 0 to 95°C (32 to 203°F), PP –20 to 80°C (–4 to 176°F), PVDF –40 to 100°C (–40 to 212°F)

WEIGHTS LB. THREADED or SOCKET **WEIGHTS** LB. FLANGED

Size	PVC	CPVC	PP	PVDF	PVC	CPVC	PP	PVDF
1/2"	0.4	0.4	0.4	0.4	0.9	0.9	0.7	1.1
3/4"	0.7	0.7	0.7	0.9	1.3	1.5	1.1	1.5
1"	0.9	1.1	0.9	1.1	1.8	2.0	1.5	2.2
1-1/4"	1.5	1.5	1.3	1.8	2.6	2.9	2.0	3.3
1-1/2"	2.4	2.6	1.5	2.9	3.7	4.0	2.6	4.4
2"	4.0	4.4	2.6	4.9	5.5	6.0	4.0	8.2
2-1/2"	5.1	5.5	3.7	6.2	7.3	7.7	5.3	8.8
3"	8.2	8.8	5.5	9.9	10.1	11.0	7.5	12.6
4"	19.4	21.8	13.2	24.9	21.6	23.4	15.4	26.7

Cv VALUES VS. BALL ANGLE

Size	0%	25%	50%	75%	100%
1/2"	0	0.35	1.3	5.5	14.
3/4"	0	0.73	2.8	11.5	29.
1"	0	1.2	4.5	18.6	47.
1-1/4"	0	1.8	6.8	28.4	72.
1-1/2"	0	3.9	14.7	61.2	155.
2"	0	4.8	18.0	75.0	190.
2-1/2"	0	9.1	34.7	144.0	365.
3"	0	10.2	39.0	162.0	410.
4"	0	17.0	64.6	269.0	680.

SAMPLE SPECIFICATION

- All True Union Ball Valves in PVC, CPVC, PP or PVDF shall be Chemline Type 21 or equal sizes 1/2" to 2" in PVC, CPVC, and PVDF rated at 230 psi and in PP 150 psi maximum working pressure. Sizes 2-1/2", 3" and 4" rated at 150 psi maximum working pressure with EPDM, FKM (Viton®) or CPE seals. Ball seats shall be PTFE with elastomer cushions for closure with minimum stem torques.
- All valves will have Safety Shear stem design, blowout-proof with double o-rings for safety. The top o-ring groove shall be deeper so that if the stem breaks off under excessive torque the lower o-ring will remain intact and the valve will hold pressure.
- All valves shall be full port and two-way blocking design.
- All valves will be CRN (Canadian Registration Number) registered with TSSA.
- PVC valves with EPDM or FKM (Viton®) seals shall be certified under NSF/ANSI Standard 61 for contact with drinking water.
- All valves shall have chemical resistant labels permanently marked with manufacturing number to provide production level traceability.
- PVC compound shall have an ASTM cell classification 12454-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784 (CSA report LO 4000-172).
- CPVC compound shall have an ASTM cell classification 23567-A with a minimum suffix "A" designation for chemical resistance as per ASTM D-1784.
- PP material will conform to ASTM D-4101 PP 021 B 67272 material requirements.
- PVDF material shall be unpigmented conforming to ASTM D-3222 material requirements and to be USDA Title 21 Chapter 1 Part 177. 2510 requirements for contact with food.
- Socket ends in PVC and CPVC shall be Schedule 80 and conform to ASTM D-2467.
- Threaded ends shall be Schedule 80 and conform to ASTM D-2464.
- Butt fusion ends in PP or PVDF will be compatible with Chemline PP or PVDF metric piping systems.
- Flanged ends shall be ANSI Class 150 one-piece factory moulded (not fabricated) to ensure maximum strength and close tolerance end to end dimensions.

ORDERING EXAMPLE

Chemline True Union Ball Valves		21	A	020	E	S
Body Material	A – PVC B – PP	C – CPVC K – PVDF				
Size ¹	002 – 1/4" 010 – 1" 025 – 2-1/2"	003 – 3/8" 012 – 1-1/4" 030 – 3"	005 – 1/2" 015 – 1-1/2" 040 – 4"	007 – 3/4" 020 – 2" 060 – 6"		
Seals	E – EPDM S – Socket	V – FKM (Viton®) T – Threaded	C – CPE F – Flanged	B – Nitrile B – Butt ²	A – Aflas® CF – ChemFlare™	

Example: Chemline Type 21 True Union Ball Valve, PVC, 2", with EPDM seals, socket ends.

¹ 1/4" is normally the 3/8" valve reduced. 6" is 4" valve with 6" end connections.

² PP, PVDF and ECTFE (Halar®) metric butt fusion ends (1/2" to 4") connect to Chemline PP, PVDF and ECTFE (Halar®) piping systems.

OTHER OPTIONS & ACCESSORIES

- **Alternate O-Ring Seals**
- **Stem Extensions** made to any length
- **Limit Switches** – For open and/or closed position indication
- **Municipal Operating Nut**
- **Lubrication-free Valves** – Factory clean room assembled
- **Vented Ball** – For sodium hypochlorite applications



CHEMLINE PLASTICS
SUPERIOR FLOW SOLUTIONS

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CS-302-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VANRPV30291 2	CV15-011	DIA: 25 mm (1")	CHECK VALVE - CARRIER WATER	TYPE: CHECK 150 PSI//MANUFACTURER : CHEMLINE//MODEL : BTA010EC//CONNECTION TYPE :COMBO 1"//BODY : PVC// SEAL SEAT :EPDM // STEM : N/A			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VANRPV30291 2	CV15-021	DIA: 25 mm (1")	CHECK VALVE - CARRIER WATER	TYPE: CHECK 150 PSI//MANUFACTURER : CHEMLINE//MODEL : BTA010EC//CONNECTION TYPE :COMBO 1"//BODY : PVC// SEAL SEAT :EPDM // STEM : N/A			ANIONIC POLYMER DOSING SKID		

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Ball Check & Foot Valves



SERIES: BT: True Union Check
BC: Single Union Check
FT: True Union Check
FV: Single Union Check

SIZES: 1/2" – 4"

ENDS: Threaded, Socket, Flanged, Butt¹ or ChemFlare™²

SEAT/SEALS: EPDM, FKM (Viton®), PTFE coated FKM (Viton®)

CRN
Registered
Consult Chemline



The economical and versatile Chemline Ball Check Valve is the most popular type of non-return valves for pipe sizes under 6". A wide selection of body and seat materials, and end connections are available for many different applications. It has good flow capacity and will handle many slurry and suspended solid services. This valve works in both horizontal and vertical lines. The Foot Valve is for end of line services such as sumps.

Features

- **True Union to 2"**
- **Full Port to 4"**
- **NSF Certified³**
- **Built-in Union Design** – For easy installation and maintenance
- **Free Floating Ball** – The only moving part
- **Uniseat/Seal** – Easily removable
- **May be used either horizontally or vertically**
- **Excellent flow characteristics**
- **Low seating and opening pressures**



True Union Check
1/2" to 2" in all materials



Single Union Check
1/2" to 4" in PVC
2-1/2" to 4" in CPVC, PP and PVDF



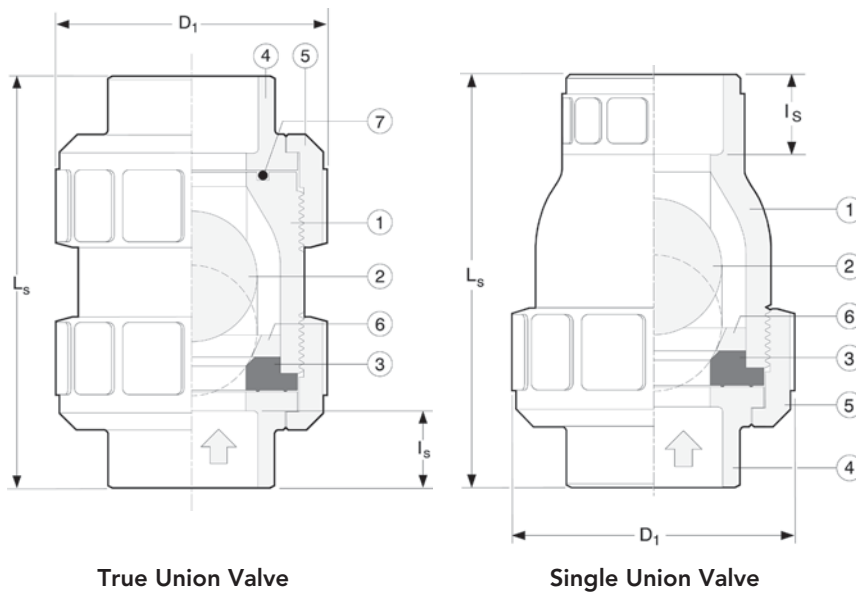
Foot Valve is light weight
and has a low profile basket

¹ PP and PVDF Butt fusion ends (available 1/2" to 2") connect to Chemline PP and PVDF piping systems.

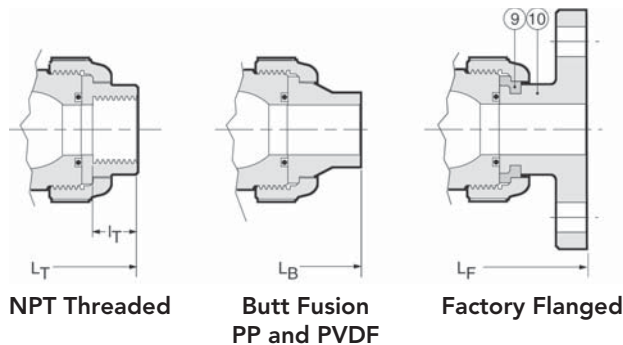
² For ChemFlare™ end connectors, consult Chemline.

³ PVC valves with EPDM or FKM (Viton®) seals are certified under NSF/ANSI Standard 61 for contact with drinking water.

Ball Check Valves



UNION END CONNECTIONS



PARTS

▲ Recommended Spare Parts

No.	Part	Pcs. T/U S/U	Materials
1	Body	1 1	PVC, CPVC, PP, PVDF
2	Ball	1 1	PVC, CPVC, PP, PVDF
3▲	Uniseat/Seal ¹	1 1	EPDM, FKM(Viton®), PTFE coated FKM (Viton®)
4	End Connector	2 1	PVC, CPVC, PP, PVDF
5	Union Nut	2 1	PVC, CPVC, PP, PVDF
6	Stop Ring	1 1	PVC, CPVC, PP, PVDF
7	Face O-Ring	1 1	EPDM, FKM(Viton®)
9	Flange Retainer ²	2 1	PVDF
10	Factory Flange ³	2 1	PVC, CPVC, PP, PVDF

¹ Standard seals are EPDM in PVC, CPVC and PP valves, PTFE coated FKM (Viton®) in PVDF valves. Coating is .002" thick.

² True Union: 2 pcs 1/2" to 2", 6 pcs 1-1/2" to 4"
Single Union: 1 pcs 1/2" to 2", 3 pcs 2-1/2" to 4".

³ True Union flanged valves have two factory flanges. Single Union valves have one factory flange and one fabricated flange. Consult Chemline for details on fabricated type.

DIMENSIONS INCHES

Size	D ₁ I _s I _T			True Union						Single Union			True Union Socket or Butt				Single Union
				PVC & CPVC			PP & PVDF			PVC							
				L _T	L _S	L _F	L _T	L _B	L _F	L _T	L _S	L _F	PVC	CPVC	PP	PVDF	PVC
1/2"	1.9	0.69	0.59	3.4	3.4	5.1	3.4	4.0	5.1	3.2	3.4	5.6	0.3	0.3	0.2	0.3	0.2
3/4"	2.4	0.72	0.67	4.1	3.9	6.1	4.1	4.4	6.1	3.8	3.7	6.6	0.5	0.5	0.3	0.6	0.4
1"	2.8	0.88	0.79	4.5	4.4	6.5	4.5	4.8	6.5	4.2	4.3	7.3	0.7	0.8	0.4	0.9	0.6
1-1/4"	3.1	0.94	0.87	5.0	4.9	6.6	5.0	5.9	6.6	6.2	6.3	12.3	1.1	1.2	0.7	1.5	1.5
1-1/2"	3.7	1.09	0.98	5.9	5.9	7.6	5.9	5.8	7.6	5.6	5.7	9.1	1.6	1.7	1.0	2.0	1.3
2"	4.2	1.16	1.10	7.0	6.8	8.4	7.0	6.5	8.4	6.5	6.5	10.5	2.2	2.4	1.4	2.7	1.8

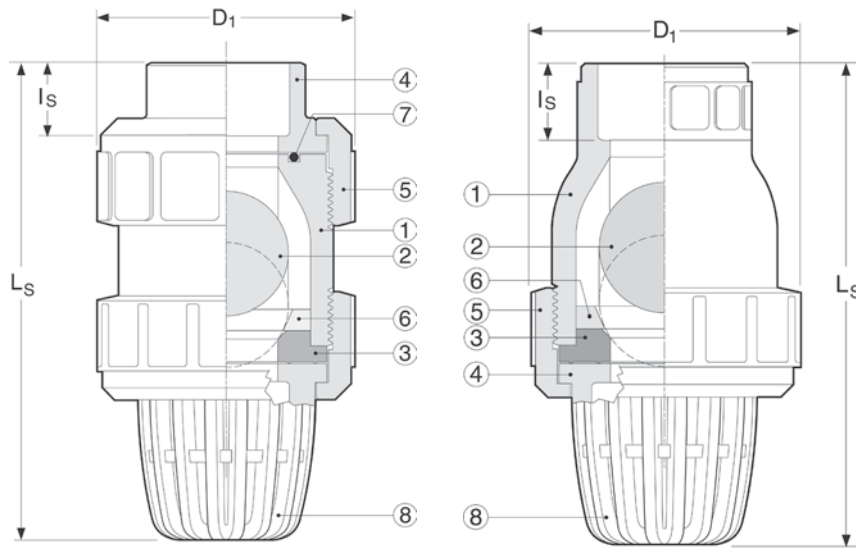
WEIGHTS LB.

DIMENSIONS INCHES

Size	D ₁	I _s ⁴	I _T	Single Union						Single Union			
				PVC & CPVC			PP & PVDF			Single Union			
				L _T	L _S	L _F	L _T	L _B	L _F	PVC	CPVC	PP	PVDF
2-1/2"	6.0	2.10	2.17	10.0	10.4	14.3	8.7	*	*	5.7	6.2	*	*
3"	6.0	1.88	1.38	8.7	9.6	12.2	8.7	*	*	5.1	5.5	3.3	6.3
4"	8.3	2.00	1.77	12.1	12.2	15.0	12.1	*	*	12.7	13.9	8.1	15.7

⁴ Consult Chemline.

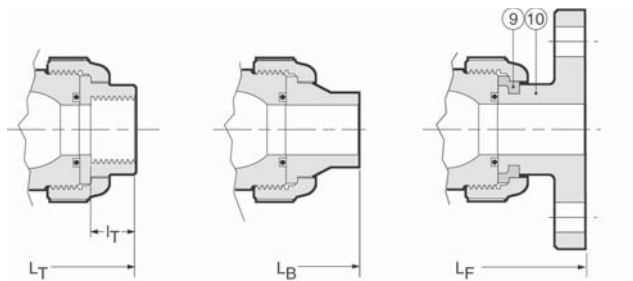
Foot Valves



True Union Valve

Single Union Valve

END CONNECTIONS FOR TRUE UNION VALVE



NPT Threaded

Butt Fusion
PP and PVDF

Factory Flanged

PARTS

▲ Recommended Spare Parts

No.	Part	Pcs. T/U S/U	Materials
1	Body	1 1	PVC, CPVC, PP, PVDF
2	Ball	1 1	PVC, CPVC, PP, PVDF
3▲	Uniseat/Seal ¹	1 1	EPDM, FKM(Viton®), PTFE coated FKM (Viton®)
4	End Connector	2 1	PVC, CPVC, PP, PVDF
5	Union Nut	2 1	PVC, CPVC, PP, PVDF
6	Stop Ring	1 1	PVC, CPVC, PP, PVDF
7	Face O-Ring	1 1	EPDM, FKM(Viton®)
8	Foot Valve Basket	1 1	PVC, CPVC, PP, PVDF
9	Flange Retainer ²	3 0	PVDF
10	Factory Flange ³	1 0	PVC, CPVC, PP, PVDF

¹ Standard seals are EPDM in PVC, CPVC and PP valves, PTFE coated FKM (Viton®) in PVDF valves. Coating is .002" thick.

² True Union: 1 pc 1/2" to 2", 3 pcs 2-1/2" to 4".

³ True Union valves have factory flanges. Single Union have fabricated flanges. Consult Chemline for details on fabricated type.

DIMENSIONS INCHES

WEIGHTS LB.

Size	D ₁	I _s Soc	I _T Thd	True Union PVC & CPVC			Single Union PVC			Single Union PVC Socket
				L _T	L _S	L _F	L _T	L _S	L _F	
1/2"	1.9	0.69	0.59	2.8	2.9	3.7	3.5	3.7	4.7	0.3
3/4"	2.4	0.72	0.67	3.3	3.3	4.4	4.1	4.2	5.4	0.4
1"	2.8	0.88	0.79	3.7	3.7	4.8	4.5	4.8	6.1	0.8
1-1/4"	3.7	0.94	0.87	*	*	*	*	*	*	1.8
1-1/2"	3.7	1.09	0.98	5.4	5.4	6.3	6.8	7.0	8.5	1.7
2"	4.2	1.16	1.10	6.4	6.4	7.2	7.4	7.6	9.3	2.1
2-1/2"	6.0	2.10	2.17	—	—	—	*	*	*	7.4
3"	6.0	1.88	1.38	—	—	—	11.6	12.1	14.2	7.1
4"	8.3	2.00	1.77	—	—	—	14.7	15.0	17.4	15.7

* Consult Chemline for dimensions.

For CPVC (2-1/2" to 4"), PP and PVDF Foot Valve lengths, consult Chemline.

Ball Check & Foot Valves



WORKING PRESSURES PSI

Size	PVC	CPVC				Polypropylene			PVDF			
	0-50°C 32-122°F	0-50°C 32-122°F	60°C 140°F	80°C 176°F	90°C 194°F	-20-30°C -4-90°F	60°C 140°F	80°C 176°F	-20-60°C -4-140°F	80°C 176°F	90°C 194°F	100°C 212°F
1/2"	150	150	115	85	60	150	90	60	150	120	110	85
3/4"	150	150	115	85	60	150	90	60	150	120	110	85
1"	150	150	115	85	60	150	90	60	150	120	110	85
1-1/4"	150	150	115	85	60	150	90	60	150	120	110	85
1-1/2"	150	150	115	85	60	150	90	60	150	120	110	85
2"	150	150	115	85	60	150	90	60	150	120	110	85
2-1/2"	100	100	90	60	45	100	60	45	100	90	60	45
3"	100	100	90	60	45	100	60	45	100	90	60	45
4"	100	100	90	60	45	100	60	45	100	90	60	45

Maximum Temperatures: PVC 0 to 60°C (32 to 140°F), CPVC 0 to 95°C (32 to 203°F), PP -20 to 90°C (-4 to 194°F), PVDF -40 to 100°C (-40 to 212°F)

MINIMUM SEATING

AND OPENING PRESSURE PSI

Cv VALVES

Size	Vertical Piping		Horizontal Piping		Check Valves
	Open	Seating	Open	Seating	
1/2"	0.7	2.8	0.1	2.8	6.5
3/4"	0.7	4.3	0.1	4.3	17.
1"	0.7	4.3	0.1	4.3	25.
1-1/4"	1.4	4.3	0.3	4.3	86.
1-1/2"	1.4	4.3	0.3	4.3	86.
2"	1.4	4.3	0.3	4.3	130.
2-1/2"	1.4	2.8	0.3	2.8	280.
3"	1.4	2.8	0.3	2.8	280.
4"	1.4	2.8	0.3	2.8	500.

VACUUM RATING

- 29.9 inches mercury
- Maximum recommended velocity 5 m/s

SAMPLE SPECIFICATION

All Ball Check valves in PVC, CPVC, PP or PVDF shall be Chemline BT or BC Series or equal with EPDM [FKM (Viton®) or PTFE coated FKM (Viton®)] seats and union ends. Sizes 1/2" to 2" shall be slip-out True Union style, sizes 2-1/2" to 4" shall be single union. The elastomer uniseat/seal shall function as both the ball seat and the union seal. Ball Check valves shall be rated 150 psi up to 2" and 100 psi for sizes 2-1/2" to 4".

ORDERING EXAMPLE

Chemline Ball Check/Foot Valves		BT	A	020	E	S
Valve Type	BT – True Union Ball Check BC – Single Union Ball Check FV – Single Union Foot Valve FT – True Union Foot Valve					
Body Material	A – PVC C – CPVC B – PP K – PVDF					
Size	005 – 1/2" 007 – 3/4" 010 – 1" 012 – 1-1/4" 015 – 1-1/2" 020 – 2" 025 – 2-1/2" 030 – 3" 040 – 4"					
Seals	E – EPDM V – FKM (Viton®) T – PTFE coated FKM (Viton®)					
Ends	S – Socket T – Threaded F – Flanged B – Butt ¹ CF – ChemFlare™					

Example: Ball Check Valve, PVC, 2", with EPDM seat, socket ends.

¹ PP and PVDF metric butt fusion ends (1/2" to 2") connect to Chemline PP and PVDF piping systems.

OPTIONS & ACCESSORIES

- **PTFE coated Uniseat/Seal**
- **Spring Loaded Ball** – Assists ball to seat faster



CS-303-100 : Identification sheet

VWTC PROJECT NUMBER: 5000218009

PROJECT NAME: AEM AMARUQ

ENGINEER: Gabriel Hébert

PROJECT MANAGER: Clément B

PHONE NUMBER:

REV: 1

SUBMITTED TO (COMPANY): AGNICO EAGLE MINES

SUBMITTED TO (RESPONSIBLE):

PROJECT NUM REFERENCE.:

LOT NUMBER:

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VARFPV207282	PRV9-524	DIA: 25 mm (1")	RELIEF VALVE	TYPE: RELIEF VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VARFPV207282	PRV9-525	DIA: 25 mm (1")	RELIEF VALVE	TYPE: RELIEF VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A			ANIONIC POLYMER DOSING SKID		
CHEMLINE	VARFPV207282	PRV9-526	DIA: 25 mm (1")	RELIEF VALVE	TYPE: RELIEF VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A			ANIONIC POLYMER DOSING SKID		

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SB12 Series Back Pressure/Relief Valves



SERIES: SB12

SIZES: 3/8" – 4"

ENDS: True Union Socket, Threaded or ChemFlare™¹ Spigot² Bodies with Plain, Socket, Threaded or Flanged ends

DIAPHRAGM: PTFE Bonded EPDM

SEALS: EPDM, FKM (Viton®)

CRN
Registered
as Category C Fittings
Consult Chemline



Spring
Tensioning
Bolt

True Union Ends

Easy installation and maintenance

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 unaffected 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

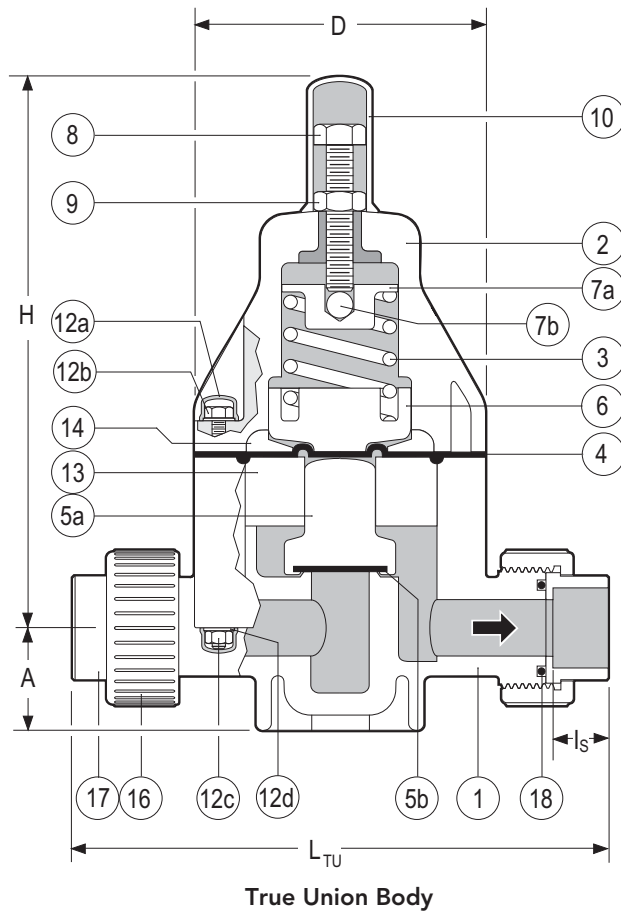
- 120cP is maximum recommended service viscosity

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"



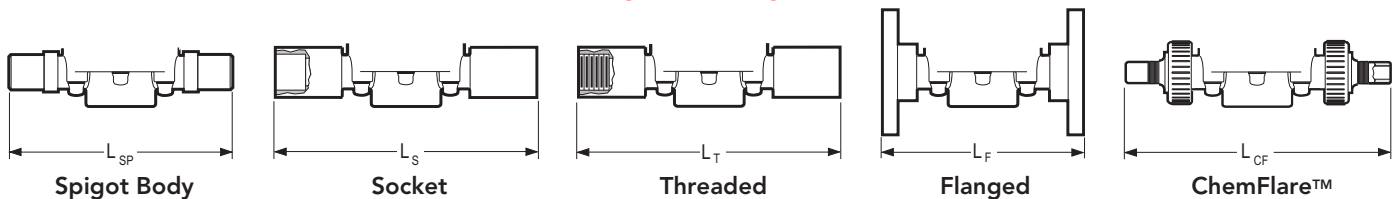
PARTS

▲ 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



DIMENSIONS INCHES

Size	D	H	A	I _s	L _{TU} ²	PVC					PP and PVDF			WEIGHTS LB.			Cv VALUES	USGPM Flow at 1 psi ΔP
						L _{SP} ³	L _S	L _T	L _F	L _{CF}	A	L _{SP} ³	L _{TU} ²	PVC	PP	PVDF		
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

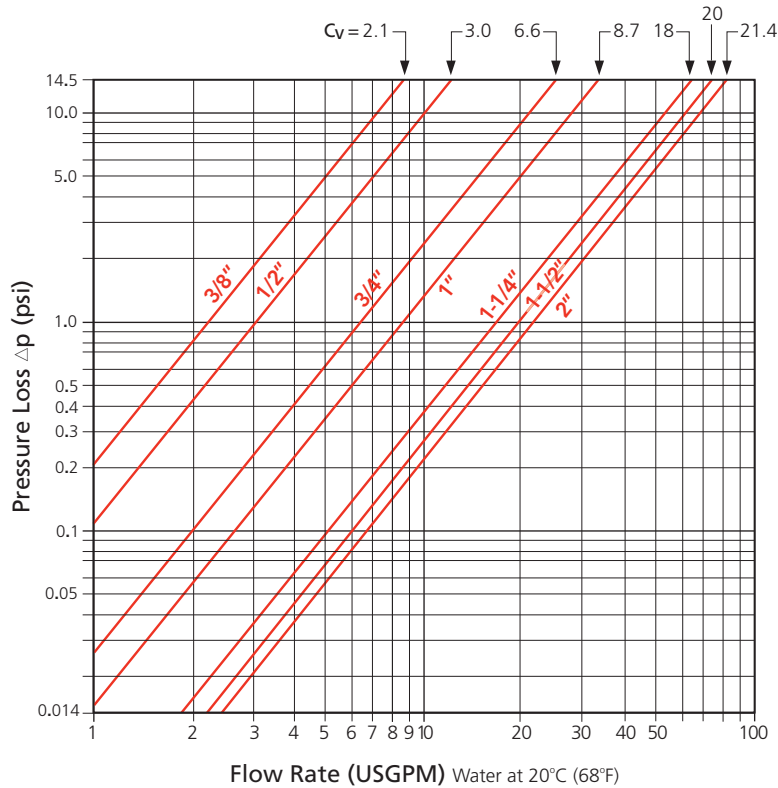
Size	PVC				PP					PVDF						
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	30°C 86°F	50°C 122°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	
1/2"–2"	150	105	60	15	150	90	60	37.5	15	150	100	60	45	30	15	

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).

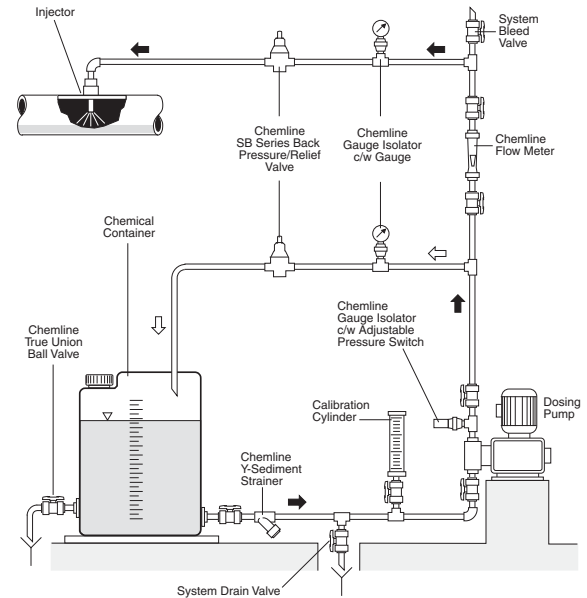
SB12 Series Back Pressure/Relief Valves 1/2" to 2"



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

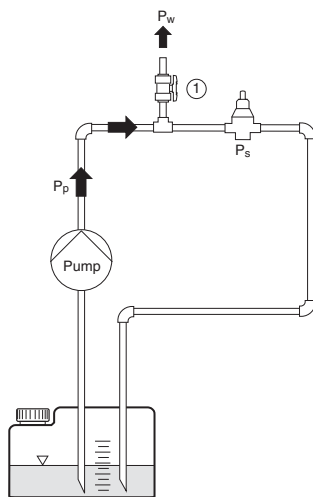


typical dosing system schematic



application of pressure relief valves

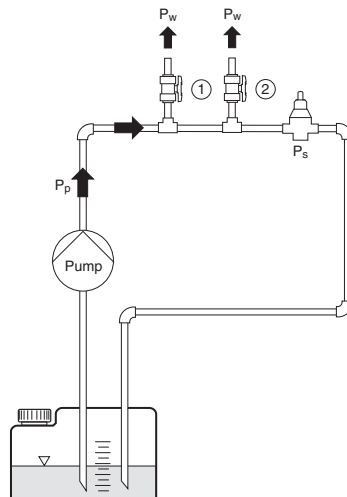
Constant System Pressure



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

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

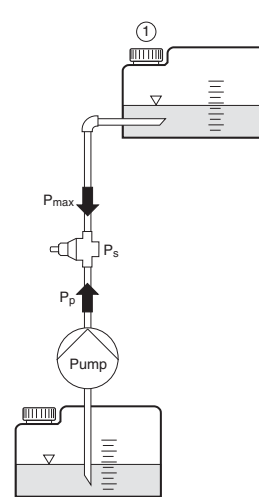
Consumer 1 and/or 2 Open, Valve Closes



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

Non-Return Valve

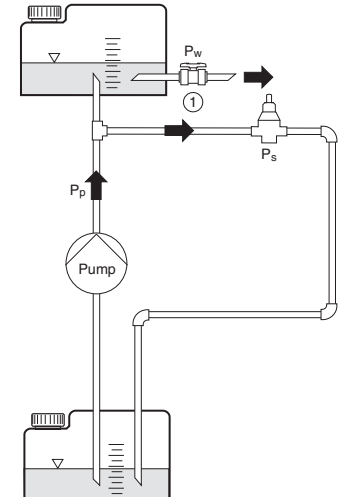
Container 1 is located above the pump



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

Overflow Valve

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



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

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



working pressure vs. flow rate

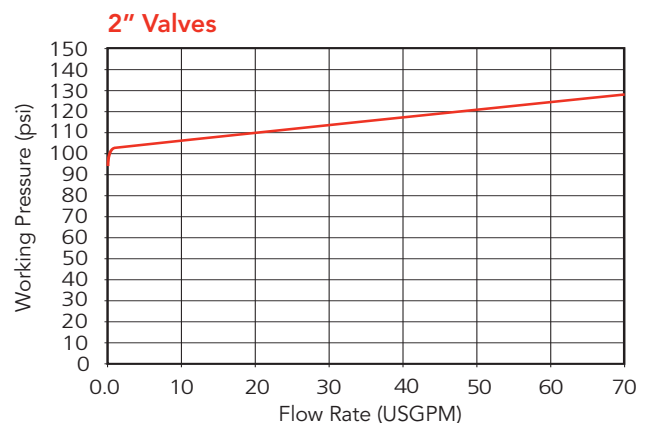
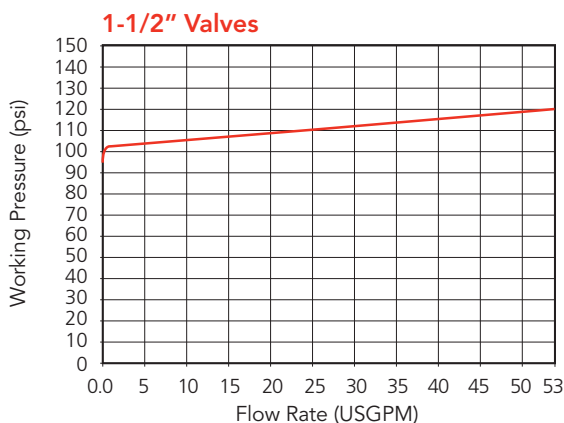
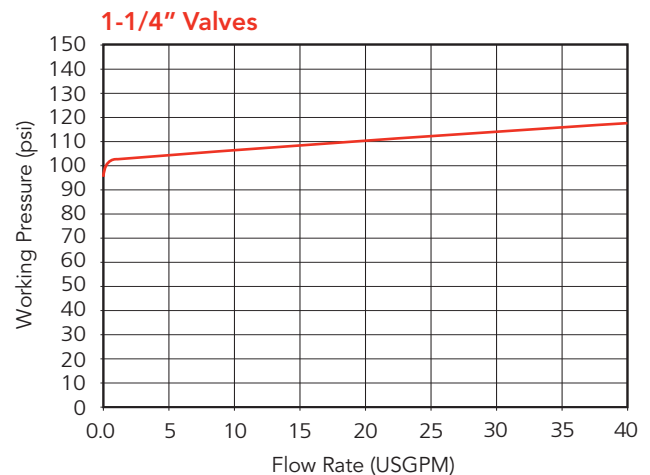
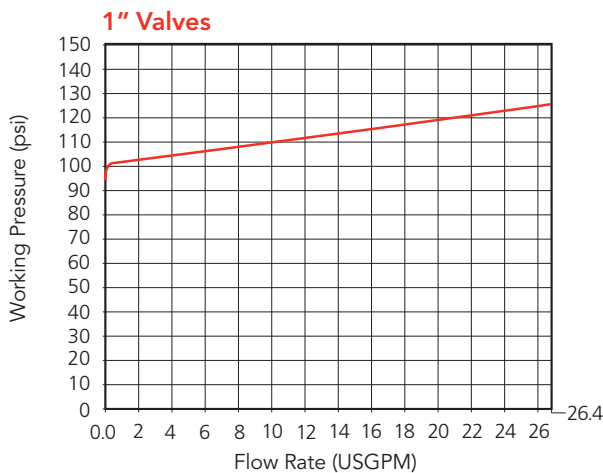
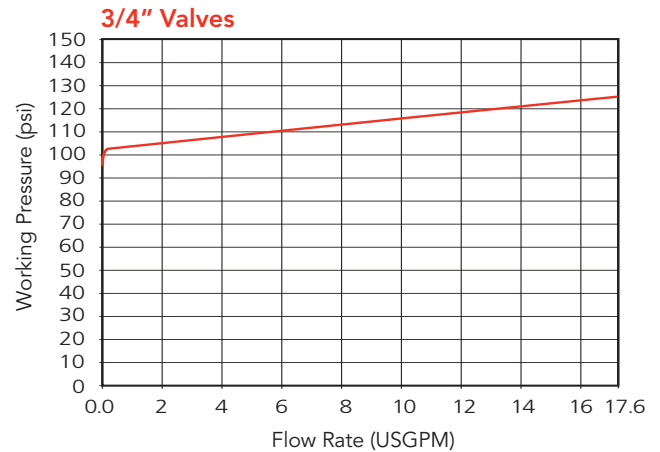
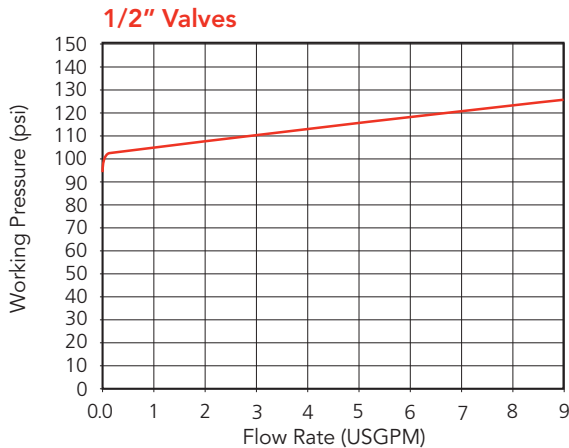
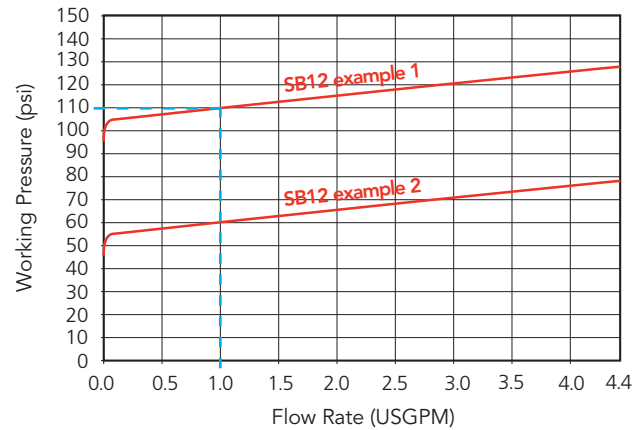
The curves show the relationship between the working pressure and the approximate flow rate through the valve for water at 20°C (68°F). These values will vary depending on:

- 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.

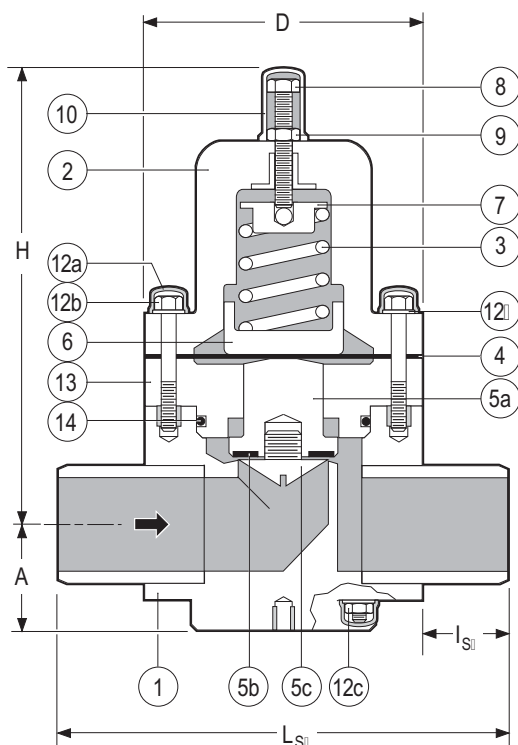
operation examples

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

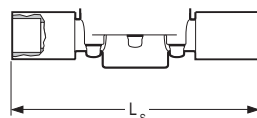


SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"

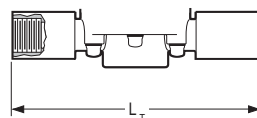


Spigot Body

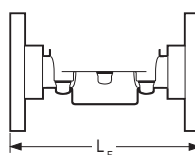
OTHER ENDS



Socket



Threaded



Flanged

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 Retainer	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

ChemFlare™ Ends

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



DIMENSIONS INCHES

Size	PVC, PP & PVDF					PVC	WEIGHTS LB.			USGPM Flow at 1 psi ΔP
	A	D	H	L _{SP} ²	I _{SP}	L _F	PVC	PP	PVDF	
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				PP				PVDF							
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	20°C 68°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
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"	005 – 1/2"	007 – 3/4"		
	010 – 1"	012 – 1-1/4"	015 – 1-1/2"		
	020 – 2"	025 – 2-1/2"	030 – 3"	040 – 4"	
Elastomers	E – EPDM	V – FPM (Viton®)			
Ends	S – Socket	T – Threaded	F – Flanged	U – Union Socket	
	CFx – ChemFlare™		Blank – Spigot (Butt)		

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

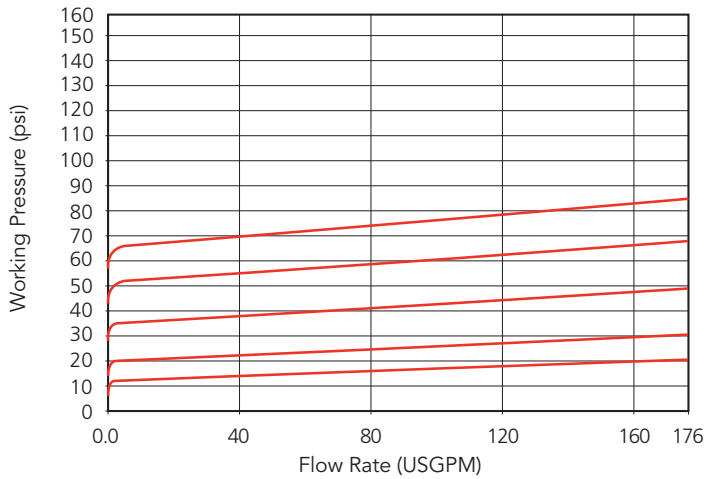
SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"



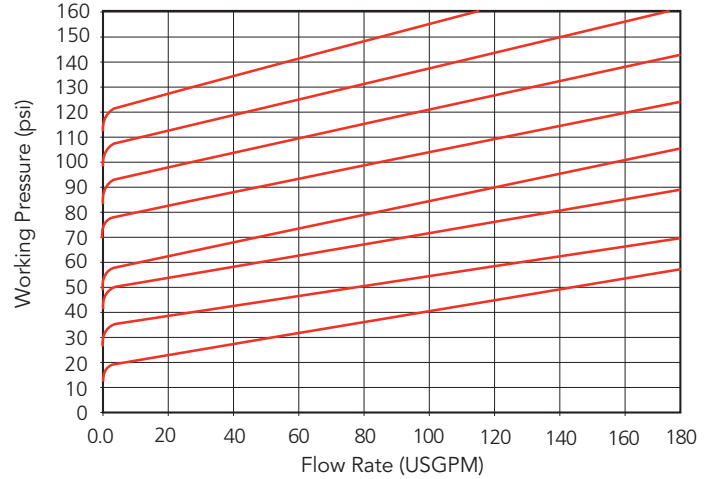
working pressure vs. flow rate

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

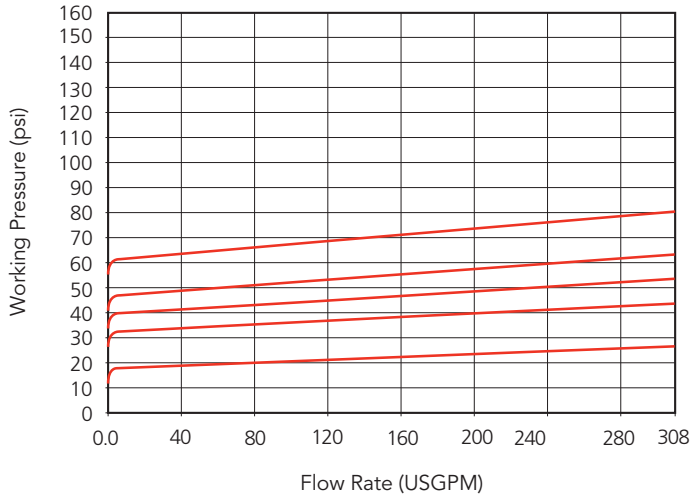
2-1/2" Valves / 4 to 60 psi set pressure range



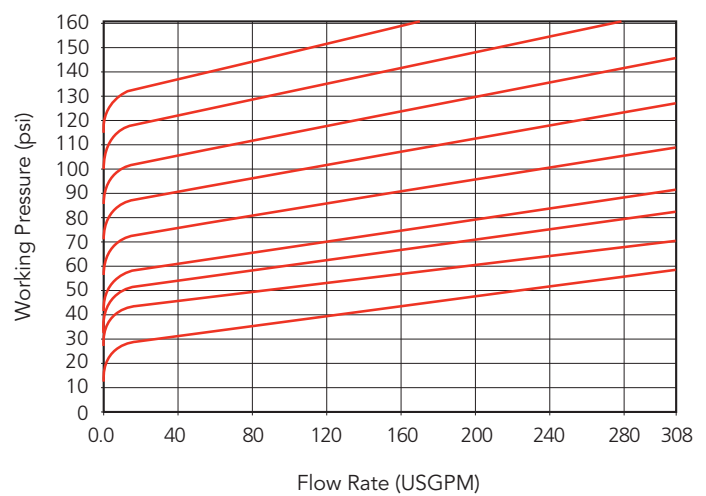
2-1/2" Valves / 7.5 to 150 psi set pressure range



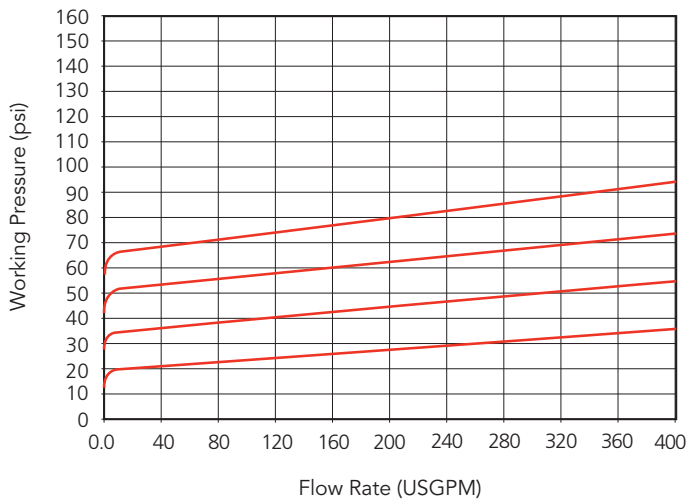
3" Valves / 4 to 60 psi set pressure range



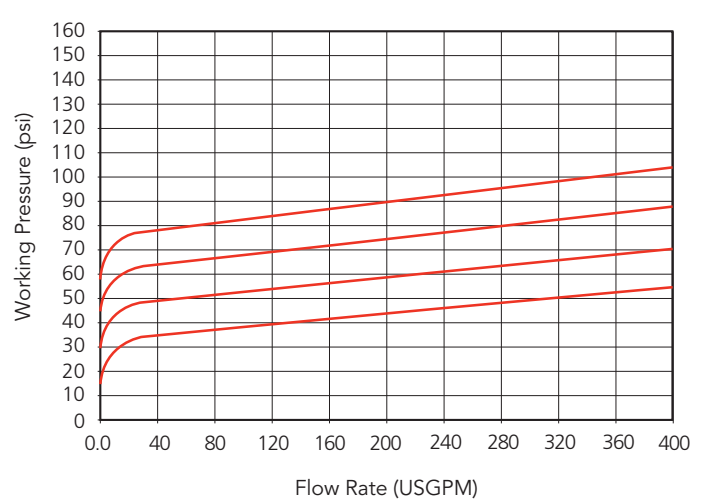
3" Valves / 7.5 to 150 psi set pressure range



4" Valves / 4 to 60 psi set pressure range



4" Valves / 7.5 to 90 psi set pressure range





CS-304-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV: 1
PROJECT NAME:	AGNICO EAGLE MINES	
ENGINEER:	Gabriel Hébert	
PROJECT MANAGER:	Clément B	
PHONE NUMBER:		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
TECKNO VALVE	VASDSS351509	SV15-011	N/A	ON/OFF VALVE - CARRIER WATER	TYPE: SOLENOID VALVE//MANUFACTURER : ASCO//MODEL : 8210G089-120VAC//CONNECTION TYPE : THREADED 25 mm (1") 25 mm (1")//BODY : 304 SS// SEAL SEAT : // STEM : N/A	ACTING : PILOT	NORMALLY : FERMÉ/CLOSED	ANIONIC POLYMER DOSING SKID		
TECKNO VALVE	VASDSS351509	SV15-021	N/A	ON/OFF VALVE - CARRIER WATER	TYPE: SOLENOID VALVE//MANUFACTURER : ASCO//MODEL : 8210G089-120VAC//CONNECTION TYPE : THREADED 25 mm (1") 25 mm (1")//BODY : 304 SS// SEAL SEAT : // STEM : N/A	ACTING : PILOT	NORMALLY : FERMÉ/CLOSED	ANIONIC POLYMER DOSING SKID		

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Features

- Wide range of pressure ratings, sizes, and resilient materials provide long service life and low internal leakage
- High flow valves for liquid, corrosive, and air/inert gas service
- Industrial applications include:
 - Car wash
 - Laundry equipment
 - Air compressors
 - Industrial water control
 - Pumps

Construction

Valve Parts in Contact with Fluids		
Body	Brass	304 Stainless Steel*
Seals and Discs	NBR or PTFE	
Disc-Holder	PA	
Core Tube	305 Stainless Steel	
Core and Plugnut	430F Stainless Steel	
Springs	302 Stainless Steel	
Shading Coil	Copper	Silver

*Catalog Numbers 8210G127, 8210G129, 8210G132, 8210G133 have 316L Stainless Steel bodies.

Electrical

Standard Coil and Class of Insulation	Watt Rating and Power Consumption				Spare Coil Part Number			
	DC Watts	AC			General Purpose		Explosionproof	
		Watts	VA Holding	VA Inrush	AC	DC	AC	DC
F	-	6.1	16	40	238210	-	238214	-
F	11.6	10.1	25	70	238610	238710	238614	238714
F	16.8	16.1	35	180	272610	97617	272614	97617
F	-	17.1	40	93	238610	-	238614	-
F	-	20	43	240	99257	-	99257	-
F	-	20.1	48	240	272610	-	272614	-
F	30.8	-	-	-	-	501695	-	501696
H	40.6	-	-	-	-	238910	-	238914

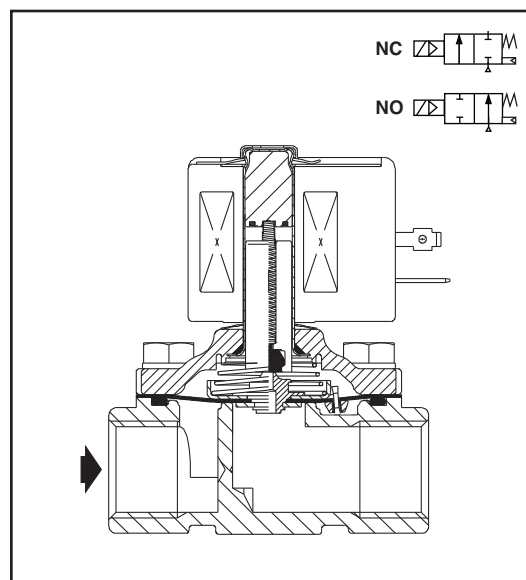
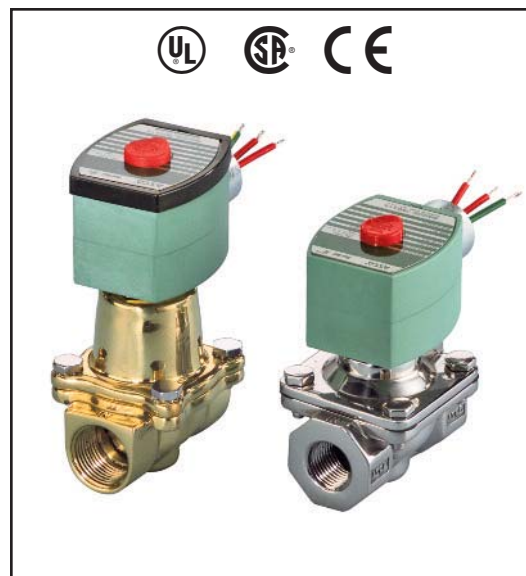
Standard Voltages: 24, 120, 240, 480 volts AC, 60 Hz (or 110, 220 volts AC, 50 Hz). 6, 12, 24, 120, 240 volts DC. Must be specified when ordering.
 Other voltages available when required.

Solenoid Enclosures

Standard: RedHat II - Watertight, Types 1, 2, 3, 3S, 4, and 4X; RedHat - Type I.

Optional: RedHat II - Explosionproof and Watertight, Types 3, 3S, 4, 4X, 6, 6P, 7, and 9; Red-Hat - Explosionproof and Watertight, Types 3, 4, 4X, 7, and 9.

(To order, add prefix "EF" to catalog number, except Catalog Numbers 8210B057, 8210B058, and 8210B059, which are not available with Explosionproof enclosures.)
 See *Optional Features Section* for other available options.



Nominal Ambient Temp. Ranges

RedHat II/RedHat AC: 32°F to 125°F (0°C to 52°C)

RedHat II DC: 32°F to 104°F (0°C to 40°C)

RedHat DC: 32°F to 77°F (0°C to 25°C)
 (104°F/40°C occasionally)

8210G227 AC: 32°F to 130°F (0°C to 54°C)

DC: 32°F to 90°F (0°C to 32°C)

Refer to *Engineering Section* for details.

Approvals

UL listed as indicated. CSA certified.

RedHat II meets applicable CE directives.

Refer to *Engineering Section* for details.

ATEX/IECEx certified with prefix "EV" as listed. Refer to *Optional Features Electrical Section* for details.

Specifications (English units)

Pipe Size (in)	Orifice Size (in)	Cv Flow Factor	Min.	Operating Pressure Differential (psi)						Max. Fluid Temp. °F		Brass Body			Stainless Steel Body			Watt Rating/ Class of Coil Insulation ⑦											
				Max. AC			Max. DC																						
				Air-Inert Gas	Water	Light Oil @ 300 SSU	Air-Inert Gas	Water	Light Oil @ 300 SSU	AC	DC	Catalog Number	Const. Ref. ④	UL ⑤ Listing	Catalog Number	Const. Ref. ④	UL ⑤ Listing	AC	DC										
NORMALLY CLOSED (Closed when de-energized), NBR or PTFE ② Seating																													
3/8	3/8	1.5	①	150	125	-	40	40	-	180	150	8210G073 ③	1P	●	8210G036 ③	1P	●	6.1/F	11.6/F										
3/8	5/8	3	0	150	150	-	40	40	-	180	150	8210G093	5D	○	-	-	-	10.1/F	11.6/F										
3/8	5/8	3	5	200	150	135	125	100	100	180	150	8210G001 ▼	6D	○	-	-	-	6.1/F	11.6/F										
3/8	5/8	3	5	300	300	300	-	-	-	175	-	8210G006 ✓	5D	○	-	-	-	17.1/F	-										
1/2	7/16	2.2	①	150	125	-	40	40	-	180	150	8210G015 ③	2P	●	8210G037 ③	2P	●	6.1/F	11.6/F										
1/2	5/8	4	0	150	150	-	40	40	-	180	150	8210G094 ✓	5D	○	-	-	-	10.1/F	11.6/F										
1/2	5/8	4	0	150	150	125	40	40	-	175	150	-	-	-	8210G087 ✓	7D	●	17.1/F	11.6/F										
1/2	5/8	4	5	200	150	135	125	100	100	180	150	8210G002 ▼	6D	○	-	-	-	6.1/F	11.6/F										
1/2	5/8	4	5	300	300	300	-	-	-	175	-	8210G007	5D	○	-	-	-	17.1/F	-										
1/2	3/4	4	5	-	300	-	-	300	-	130	90	8210G227	5D	○ †	-	-	-	17.1/F	40.6/H										
3/4	5/8	4.5	0	150	150	125	40	40	-	175	150	-	-	-	8210G088 ✓	7D	●	17.1/F	11.6/F										
3/4	3/4	5	5	125	125	125	100	90	75	180	150	8210G009 ▼	9D	○	-	-	-	6.1/F	11.6/F										
3/4	3/4	5	0	150	150	-	40	40	-	180	150	8210G095 ✓	8D	○	-	-	-	10.1/F	11.6/F										
3/4	3/4	6.5	5	250	150	100	125	125	125	180	150	8210G003 ▼	11D	○	-	-	-	6.1/F	11.6/F										
3/4	3/4	6	0	350	300	200	200	200	200	200	180	8210G026 ② ‡ ◆	40P/10D	●	-	-	-	16.1/F	30.8/F										
1	1	13	0	150	125	125	135	120	120	180	180	8210G054 ‡ ◆	41D/31D	●	8210G089 ‡ ◆	45D/15D	●	16.1/F	30.8/F										
1	1	13	5	150	150	100	125	125	125	180	150	8210G004 ▼	12D	○	-	-	-	6.1/F	11.6/F										
1	1	13.5	0	300	225	115	-	-	-	200	-	8210G027 ‡	42P	●	-	-	-	20.1/F	-										
1	1	13.5	10	300	300	300	-	-	-	175	-	8210G078 ②	13P	-	-	-	-	17.1/F	-										
1 1/4	1 1/8	15	0	150	125	125	135	120	120	180	180	8210G055 ‡ ◆	43D/32D	●	-	-	-	16.1/F	30.8/F										
1 1/4	1 1/8	15	5	150	150	100	125	125	125	180	150	8210G008 ▼	16D	○	-	-	-	6.1/F	11.6/F										
1 1/2	1 1/4	22.5	0	150	125	125	135	120	120	180	180	8210G056 ‡ ◆	44D/33D	●	-	-	-	16.1/F	30.8/F										
1 1/2	1 1/4	22.5	5	150	150	100	125	125	125	180	150	8210G022 ▼	18D	●	8210G127	-	-	6.1/F	11.6/F										
2	1 3/4	43	5	150	125	90	50	50	50	180	150	8210G100	20P	●	8210G129	-	-	6.1/F	11.6/F										
2 1/2	1 3/4	45	5	150	125	90	50	50	50	180	150	8210G101	21P	●	-	-	-	6.1/F	11.6/F										
NORMALLY OPEN (Open when de-energized), NBR Seating (PA Disc-Holder, except as noted)																													
3/8	5/8	3	0	150	150	125	125	125	80	180	150	8210G033	23D	●	-	-	-	10.1/F	11.6/F										
3/8	5/8	3	5	250	200	200	250	200	200	180	180	8210G011 ⑥ ⑨	39D	●	-	-	-	10.1/F	11.6/F										
1/2	5/8	4	0	150	150	125	125	125	80	180	150	8210G034 ✓	23D	●	-	-	-	10.1/F	11.6/F										
1/2	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G030 ✓	37D	●	10.1/F	11.6/F										
1/2	5/8	4	5	250	200	200	250	200	200	180	180	8210G012 ⑥ ⑨	39D	●	-	-	-	10.1/F	11.6/F										
3/4	3/4	5.5	0	150	150	125	125	125	80	180	150	8210G035 ✓	25D	●	-	-	-	10.1/F	11.6/F										
3/4	5/8	3	0	150	150	100	125	125	80	180	150	-	-	-	8210G038 ✓	38D	●	10.1/F	11.6/F										
3/4	3/4	6.5	5	-	-	-	250	200	200	-	180	8210C013	24D	●	-	-	-	-	16.8/F										
3/4	3/4	6.5	5	250	200	200	-	-	-	180	-	8210G013	46D	●	-	-	-	16.1/F	-										
1	1	13	0	125	125	125	-	-	-	180	-	8210B057 ⑥ ⑩	34D	●	-	-	-	20/F	-										
1	1	13	5	-	-	-	125	125	125	-	180	8210D014	26D	●	-	-	-	-	16.8/F										
1	1	13	5	150	150	125	-	-	-	180	-	8210G014	47D	●	-	-	-	16.1/F	-										
1 1/4	1 1/8	15	0	125	125	125	-	-	-	180	-	8210B058 ⑥ ⑩	35D	●	-	-	-	20/F	-										
1 1/4	1 1/8	15	5	-	-	-	125	125	125	-	180	8210D018	28D	●	-	-	-	-	16.8/F										
1 1/4	1 1/8	15	5	150	150	125	-	-	-	180	-	8210G018	48D	●	-	-	-	16.1/F	-										
1 1/2	1 1/4	22.5	0	125	125	125	-	-	-	180	-	8210B059 ⑥ ⑩	36D	●	-	-	-	20/F	-										
1 1/2	1 1/4	22.5	5	-	-	-	125	125	125	-	180	8210D032	29D	●	-	-	-	-	16.8/F										
1 1/2	1 1/4	22.5	5	150	150	125	-	-	-	180	-	8210G032	49D	●	8210G132	-	-	16.1/F	-										
2	1 3/4	43	5	-	-	-	125	125	125	-	150	8210 103	30P	●	-	-	-	-	16.8/F										
2	1 3/4	43	5	125	125	125	-	-	-	180	-	8210G103	50P	●	8210G133	-	-	16.1/F	-										
2 1/2	1 3/4	45	5	-	-	-	125	125	125	-	150	8210 104	27P	●	-	-	-	-	16.8/F										
2 1/2	1 3/4	45	5	125	125	125	-	-	-	180	-	8210G104	51P	●	-	-	-	16.1/F	-										
① 5 psi on Air; 1 psi on Water. ② Valve provided with PTFE main disc. ③ Valve includes Ultem (G.E. trademark) piston. ④ Letter "D" denotes diaphragm construction; "P" denotes piston construction. ⑤ ○ Safety Shutoff Valve; ● General Purpose Valve. Refer to Engineering Section (Approvals) for details.																		⑥ Valves not available with Explosionproof enclosures. ⑦ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts. ⑧ AC construction also has PA seating. ⑨ No disc-holder. ⑩ Stainless steel disc-holder. † UL listed for fire protection systems per UL429A.						‡ DC constructions must have solenoid mounted vertical and upright. ✓ ATEX/IECEx certified with prefix "EV". ▼ ATEX/IECEx certified for DC only with prefix "EV". ◆ Not available in 6 Volt DC. EF and HB prefix only.					

Specifications (Metric units)

Pipe Size (in)	Orifice Size (mm)	Kv Flow Factor (m³/hr)	Operating Pressure Differential (bar)						Max. Fluid Temp. °C		Brass Body			Stainless Steel Body			Watt Rating/ Class of Coil Insulation ⑦																																							
			Min.	Max. AC			Max. DC																																																	
				Air-Inert Gas	Water	Light Oil @ 300 SSU	Air-Inert Gas	Water	Light Oil @ 300 SSU	AC	DC	Catalog Number	Const. Ref. ④	UL ⑤ Listing	Catalog Number	Const. Ref. ④	UL ⑤ Listing	AC	DC																																					
NORMALLY CLOSED (Closed when de-energized), NBR or PTFE ② Seating																																																								
3/8	10	1.3	①	10	9	-	3	3	-	82	65	8210G073 ③	1P	●	8210G036 ③	1P	●	6.1/F	11.6/F																																					
3/8	16	2.6	0	10	10	-	3	3	-	82	65	8210G093	5D	○	-	-	-	10.1/F	11.6/F																																					
3/8	16	2.6	0.3	14	10	9	9	7	7	82	65	8210G001 ▼	6D	○	-	-	-	6.1/F	11.6/F																																					
3/8	16	2.6	0.3	21	21	21	-	-	-	79	-	8210G006 ✓	5D	○	-	-	-	17.1/F	-																																					
1/2	11	1.9	①	10	9	-	3	3	-	82	65	8210G015 ③	2P	●	8210G037 ③	2P	●	6.1/F	11.6/F																																					
1/2	16	3.4	0	10	10	-	3	3	-	82	65	8210G094 ✓	5D	○	-	-	-	10.1/F	11.6/F																																					
1/2	16	3.4	0	10	10	9	3	3	-	79	65	-	-	-	8210G087 ✓	7D	●	17.1/F	11.6/F																																					
1/2	16	3.4	0.3	14	10	9	9	7	7	82	65	8210G002 ▼	6D	○	-	-	-	6.1/F	11.6/F																																					
1/2	16	3.4	0.3	21	21	21	-	-	-	79	-	8210G007	5D	○	-	-	-	17.1/F	-																																					
1/2	19	3.4	0.3	-	21	-	-	21	-	54	32	8210G227	5D	○ †	-	-	-	17.1/F	40.6H																																					
3/4	16	3.9	0	10	10	9	3	3	-	79	65	-	-	-	8210G088 ✓	7D	●	17.1/F	11.6/F																																					
3/4	19	4.3	0.3	9	9	9	7	6	5	82	65	8210G009 ▼	9D	○	-	-	-	6.1/F	11.6/F																																					
3/4	19	4.3	0	10	10	-	3	3	-	82	65	8210G095 ✓	8D	○	-	-	-	10.1/F	11.6/F																																					
3/4	19	5.6	0.3	17	10	7	9	9	9	82	65	8210G003 ▼	11D	○	-	-	-	6.1/F	11.6/F																																					
3/4	19	5.1	0	24	21	14	14	14	14	93	82	8210G026 ② † ◆	40P/10D	●	-	-	-	16.1F	30.8/F																																					
1	25	11	0	10	9	9	9	8	8	82	82	8210G054 † ◆	41D/31D	●	8210G089 † ◆	45D/15D	●	16.1/F	30.8/F																																					
1	25	11	0.3	10	10	7	9	9	9	82	65	8210G004 ▼	12D	○	-	-	-	6.1/F	11.6/F																																					
1	25	11.5	0	21	16	8	-	-	-	93	-	8210G027 †	42P	●	-	-	-	20.1/F	-																																					
1	25	11.5	0.7	21	21	21	-	-	-	79	-	8210G078 ②	13P	-	-	-	-	17.1/F	-																																					
1 1/4	29	13	0	10	9	9	9	8	8	82	82	8210G055 † ◆	43D/32D	●	-	-	-	16.1/F	30.8/F																																					
1 1/4	29	13	0.3	10	10	7	9	9	9	82	65	8210G008 ▼	16D	○	-	-	-	6.1/F	11.6/F																																					
1 1/2	32	19.5	0	10	9	9	9	8	8	82	82	8210G056 † ◆	44D/33D	●	-	-	-	16.1/F	30.8/F																																					
1 1/2	32	19.5	0.3	10	10	7	9	9	9	82	65	8210G022 ▼	18D	●	8210G127	-	-	6.1/F	11.6/F																																					
2	44	37	0.3	10	9	6	3	3	3	82	65	8210G100	20P	●	8210G129	-	-	6.1/F	11.6/F																																					
2 1/2	44	39	0.3	10	9	6	3	3	3	82	65	8210G101	21P	●	-	-	-	6.1/F	11.6/F																																					
NORMALLY OPEN (Open when de-energized), NBR Seating (PA Disc-Holder, except as noted)																																																								
3/8	16	2.6	0.0	10	10	9	9	9	6	82	65	8210G033	23D	●	-	-	-	10.1/F	11.6/F																																					
3/8	16	2.6	0.3	17	14	14	17	14	14	82	82	8210G011 ⑥ ⑥	39D	●	-	-	-	10.1/F	11.6/F																																					
1/2	16	3.4	0	10	10	9	9	9	6	82	65	8210G087 ✓	7D	●	-	-	-	10.1/F	11.6/F																																					
1/2	16	2.6	0	10	10	7	9	9	6	82	65	-	-	-	8210G087 ✓	7D	●	10.1/F	11.6/F																																					
1/2	16	3.4	0.3	17	14	14	17	14	14	82	82	8210G012 ⑥ ⑥	39D	●	-	-	-	10.1/F	11.6/F																																					
3/4	19	4.7	0	10	10	9	9	9	6	82	65	8210G087 ✓	7D	●	-	-	-	10.1/F	11.6/F																																					
3/4	16	2.6	0	10	10	7	9	9	6	82	65	-	-	-	8210G087 ✓	7D	●	10.1/F	11.6/F																																					
3/4	19	5.6	0.3	-	-	-	17	14	14	-	82	-	8210C013	24D	●	-	-	-	16.8/F																																					
3/4	19	5.6	0.3	17	14	14	-	-	-	82	-	8210G013	46D	●	-	-	-	16.1/F	-																																					
1	25	11	0	9	9	9	-	-	-	82	-	8210B057 ⑥ ⑥	34D	●	-	-	-	20/F	-																																					
1	25	11	0.3	-	-	-	9	9	9	-	82	-	8210D014	26D	●	-	-	-	16.8/F																																					
1	25	11	0.3	10	10	9	-	-	-	82	-	8210G014	47D	●	-	-	-	16.1/F	-																																					
1 1/4	29	13	0	9	9	9	-	-	-	82	-	8210B058 ⑥ ⑥	35D	●	-	-	-	20/F	-																																					
1 1/4	29	13	0.3	-	-	-	9	9	9	-	82	-	8210D018	28D	●	-	-	-	16.8/F																																					
1 1/4	29	13	0.3	10	10	9	-	-	-	82	-	8210G018	48D	●	-	-	-	16.1/F	-																																					
1 1/2	32	19.5	0	9	9	9	-	-	-	82	-	8210B059 ⑥ ⑥	36D	●	-	-	-	20/F	-																																					
1 1/2	32	19.5	0.3	-	-	-	9	9	9	-	82	-	8210D032	29D	●	-	-	-	16.8/F																																					
1 1/2	32	19.5	0.3	10	10	9	-	-	-	82	-	8210G032	49D	●	8210G132	-	-	16.1/F	-																																					
2	44	37	0.3	-	-	-	9	9	9	-	65	-	8210 103	30P	●	-	-	-	16.8/F																																					
2	44	37	0.3	9	9	9	-	-	-	82	-	8210G103	50P	●	8210G133	-	-	16.1/F	-																																					
2 1/2	44	39	0.3	-	-	-	9	9	9	-	65	-	8210 104	27P	●	-	-	-	16.8/F																																					
2 1/2	44	39	0.3	9	9	9	-	-	-	82	-	8210G104	51P	●	-	-	-	16.1/F	-																																					
① 0.3 bar on Air; 0.0 bar on Water. ② Valve provided with PTFE main disc. ③ Valve includes Ultem (G.E. trademark) piston. ④ Letter "D" denotes diaphragm construction; "P" denotes piston construction. ⑤ ○ Safety Shutoff Valve; ● General Purpose Valve. Refer to Engineering Section (Approvals) for details.																			⑥ Valves not available with Explosionproof enclosures. ⑦ On 50 hertz service, the watt rating for the 6.1/F solenoid is 8.1 watts. ⑧ AC construction also has PA seating. ⑨ No disc-holder. ⑩ Stainless steel disc-holder. † UL listed for fire protection systems per UL429A.																			‡ DC constructions must have solenoid mounted vertical and upright. ✓ ATEX/IECEx certified with prefix "EV". ▼ ATEX/IECEx certified for DC only with prefix "EV". ◆ Not available in 6 Volt DC. EF and HB prefix only.																		

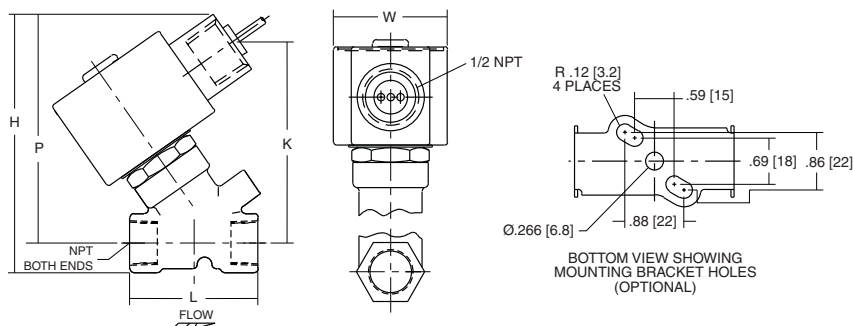
Dimensions: inches (mm)

Const. Ref.		H	K	L	P	W
1*	in	3.85	3.00	1.91	3.41	1.69
	mm	98	76	49	87	43
2*	in	4.17	3.25	2.28	3.63	1.69
	mm	106	83	58	92	43
5	in	3.84	2.31	2.75	3.28	2.28
	mm	98	59	70	83	58
6*	in	3.38	1.94	2.75	2.80	2.28
	mm	86	49	70	71	58
7	in	4.19	2.50	2.81	3.47	2.39
	mm	106	64	71	88	61
8	in	4.13	2.47	2.81	3.44	2.29
	mm	105	63	71	87	58
9*	in	3.66	2.10	2.81	2.96	2.28
	mm	93	53	71	75	58
10*	in	5.20	3.40	2.80	4.50	2.50
	mm	131	86	71	114	62
11*	in	4.16	2.66	3.84	3.52	2.75
	mm	106	68	98	89	70
12	in	5.64	3.15	3.75	4.01	3.36
	mm	143	80	95	102	85
13	in	4.44	3.22	3.75	4.19	5.81
	mm	113	82	95	106	147
15*	in	5.20	3.30	3.80	4.40	3.80
	mm	133	83	98	111	98
16	in	5.64	3.15	3.66	4.01	3.56
	mm	143	80	93	102	90
18*	in	6.11	3.30	4.38	4.16	3.92
	mm	155	84	111	106	100
20*	in	7.33	3.71	5.06	4.57	4.87
	mm	186	94	129	116	124
21*	in	7.33	3.71	5.50	4.57	4.87
	mm	186	94	140	116	124
23	in	4.35	2.65	2.75	3.79	2.28
	mm	110	67	70	96	58
24	in	5.06	X	3.78	4.44	2.75
	mm	129	X	96	113	70
25	in	4.64	2.81	2.81	3.94	2.28
	mm	118	71	71	100	58
26	in	6.53	X	3.75	4.91	3.19
	mm	166	X	95	125	81
27	in	8.22	X	5.50	5.47	4.87
	mm	209	X	140	139	124
28	in	6.53	X	3.66	4.91	3.19
	mm	166	X	93	125	81
29	in	7.03	X	4.38	5.06	4.40
	mm	179	X	111	129	112

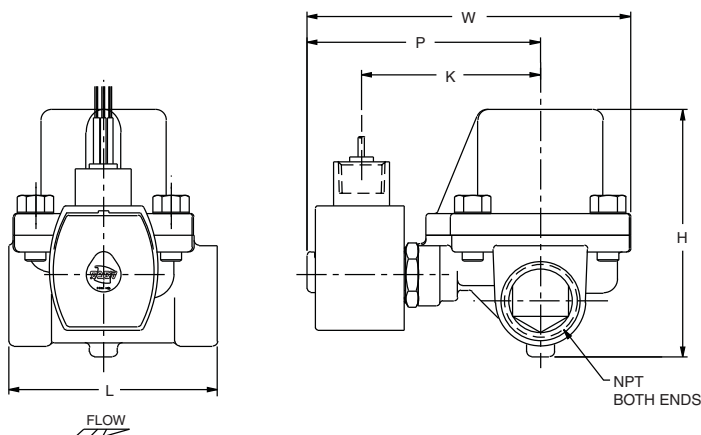
* DC dimensions slightly larger.

IMPORTANT: Valves may be mounted in any position, except as noted in specifications table.

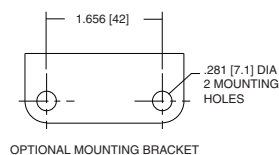
Const. Ref. 1, 2



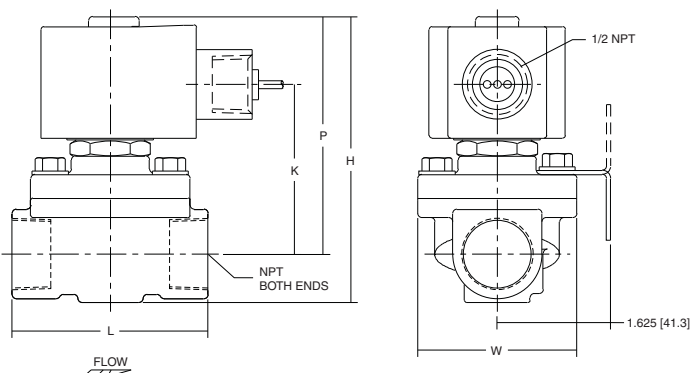
Const. Ref. 13



Const. Ref. 5-9, 11, 23, 25, 37, 38, 40-46



OPTIONAL MOUNTING BRACKET

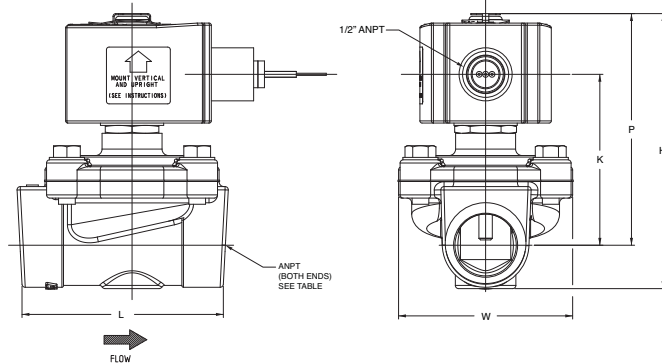


Dimensions: inches (mm)

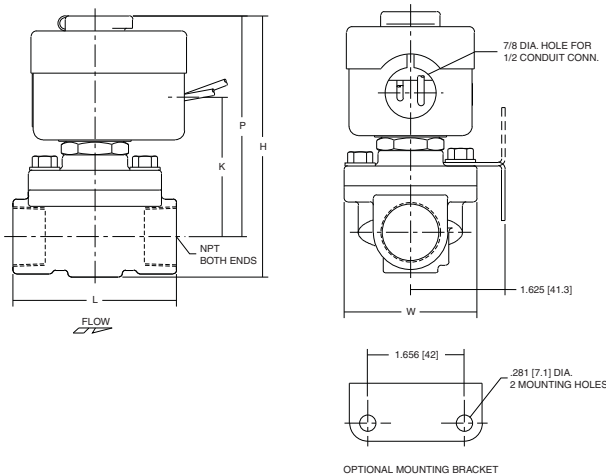
Const. Ref.		H	K	L	P	W
30	in	8.22	X	5.06	5.47	4.87
	mm	209	X	129	139	124
31	in	5.13	3.19	3.76	4.32	3.27
	mm	130	81	95	110	83
32	in	5.60	3.44	3.66	4.57	3.27
	mm	142	87	93	116	83
33	in	5.92	3.66	4.51	4.80	3.89
	mm	150	93	115	122	99
34	in	6.91	X	3.75	6.09	3.25
	mm	176	X	95	155	83
35	in	7.34	X	3.66	6.34	3.25
	mm	186	X	93	161	83
36	in	7.66	X	4.38	6.56	3.91
	mm	195	X	111	167	99
37	in	4.61	2.75	2.81	3.89	2.39
	mm	117	70	71	99	61
38	in	4.61	2.75	2.81	3.89	2.39
	mm	117	70	71	99	61
39	in	5.42	2.31	2.75	4.86	3.80
	mm	138	59	70	123	97
40	in	5.20	3.29	2.81	4.50	2.28
	mm	132	83	71	114	58
41	in	5.13	3.10	3.75	4.32	3.25
	mm	130	79	95	110	83
42	in	6.43	4.40	3.93	5.62	3.25
	mm	163	112	100	143	83
43	in	5.57	3.35	3.66	4.57	3.25
	mm	142	85	93	116	83
44	in	5.90	3.57	4.38	4.79	3.91
	mm	150	91	111	122	99
45	in	5.26	3.17	3.75	4.38	3.84
	mm	134	81	95	111	98
46	in	4.95	3.10	3.84	4.31	2.75
	mm	126	79	98	110	70
47	in	6.43	3.59	3.75	4.81	3.52
	mm	163	91	95	122	90
48	in	6.43	3.59	3.66	4.81	3.73
	mm	163	91	93	122	95
49	in	6.91	3.75	4.38	4.96	4.40
	mm	176	95	111	126	112
50	in	8.13	4.15	5.06	5.37	4.87
	mm	207	105	129	136	124
51	in	8.13	4.15	5.50	5.37	5.18
	mm	207	105	140	136	132

IMPORTANT: Valves may be mounted in any position, except as noted in specifications table.

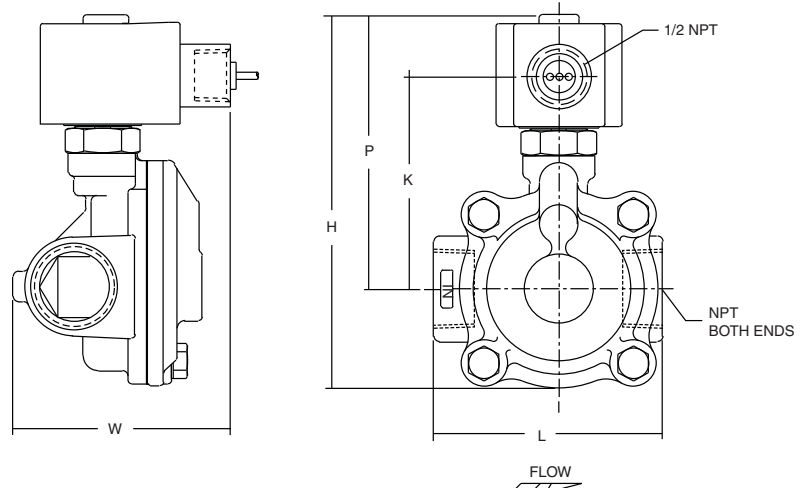
Const. Ref. 10, 15, 31, 32, 33



Const. Ref. 24, 34, 35, 36

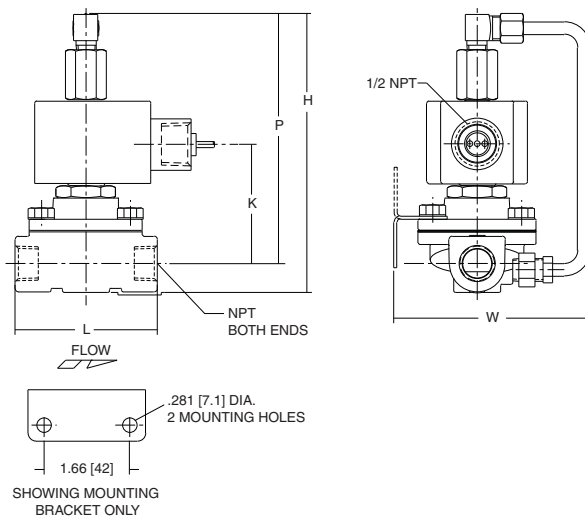


Const. Ref. 12, 16, 26, 28, 47, 48

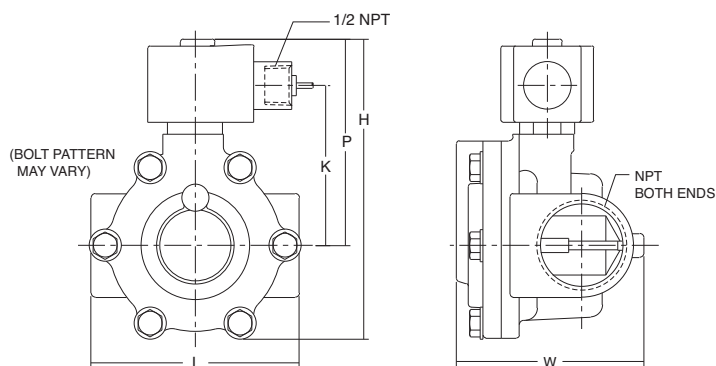


Dimensions: inches (mm)

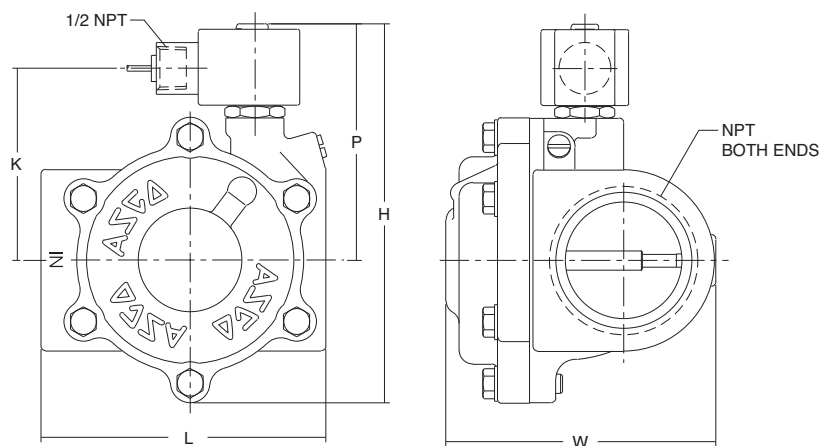
Const. Ref. 39



Const. Ref. 18, 29, 49



Const. Ref. 20, 21, 27, 30, 50, 51





CS-305-170 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	AGNICO EAGLE MINES	
ENGINEER:	Gabriel Hébert		
PROJECT MANAGER:	Clément B		
PHONE NUMBER:			

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VARFPV348512	BPV9-524	DIA: 25 mm (1")	BACKPRESSURE VALVE	TYPE: BACK PRESSURE VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU + SGA-005-002-P- G + P025-160- BM//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A	(CONFIG. L_U)		ANIONIC POLYMER DOSING SKID		
CHEMLINE	VARFPV348512	BPV9-525	DIA: 25 mm (1")	BACKPRESSURE VALVE	TYPE: BACK PRESSURE VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU + SGA-005-002-P- G + P025-160- BM//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A	(CONFIG. L_U)		ANIONIC POLYMER DOSING SKID		
CHEMLINE	VARFPV348512	BPV9-526	DIA: 25 mm (1")	BACKPRESSURE VALVE	TYPE: BACK PRESSURE VALVE 150#//MANUFACTURER : CHEMLINE//MODEL : SB12A010EU + SGA-005-002-P- G + P025-160- BM//CONNECTION TYPE : UNION SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM EPDM// STEM : N/A	(CONFIG. L_U)		ANIONIC POLYMER DOSING SKID		

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SB12 Series Back Pressure/Relief Valves



SERIES: SB12

SIZES: 3/8" – 4"

ENDS: True Union Socket, Threaded or ChemFlare™¹ Spigot² Bodies with Plain, Socket, Threaded or Flanged ends

DIAPHRAGM: PTFE Bonded EPDM

SEALS: EPDM, FKM (Viton®)

CRN
Registered
as Category C Fittings
Consult Chemline



True Union Ends
Easy installation and maintenance

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 unaffected 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

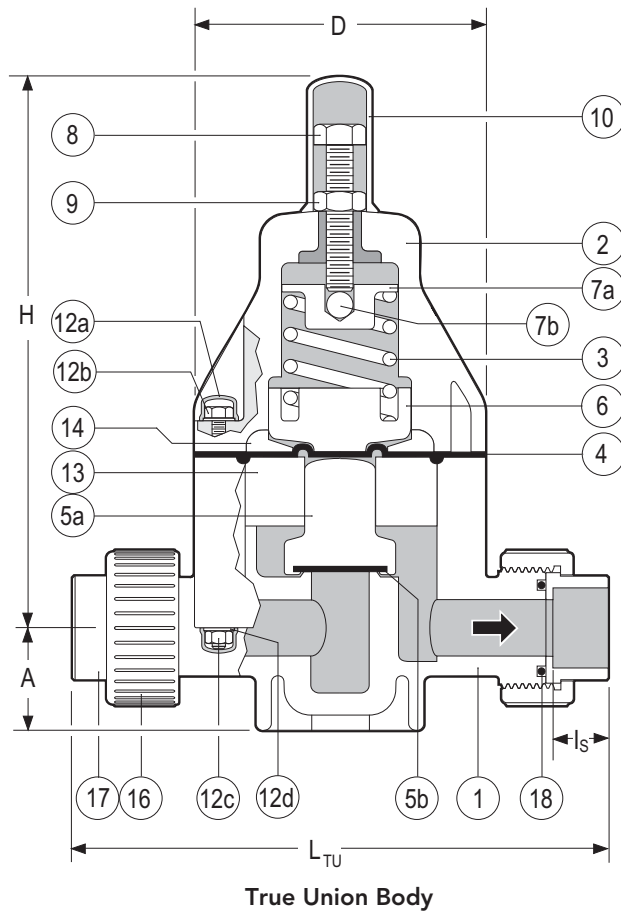
- 120cP is maximum recommended service viscosity

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"



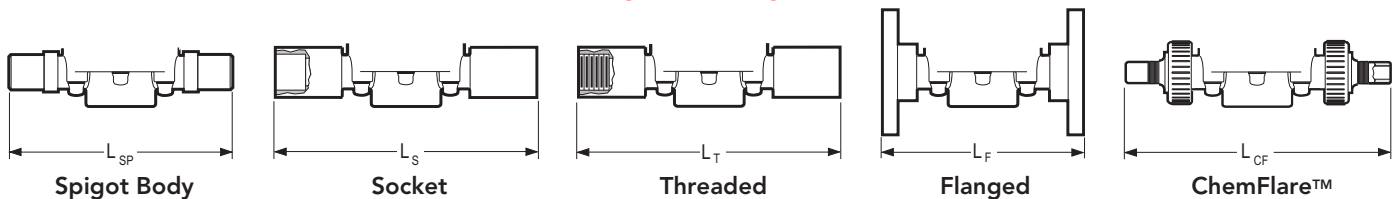
PARTS

▲ 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



DIMENSIONS INCHES

WEIGHTS LB. Cv VALUES

Size	D	H	PVC								PP and PVDF			PVC PP PVDF			USGPM Flow at 1 psi ΔP
			A	I _s	L _{TU} ²	L _{SP} ³	L _S	L _T	L _F	L _{CF}	A	L _{SP} ³	L _{TU} ²				
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

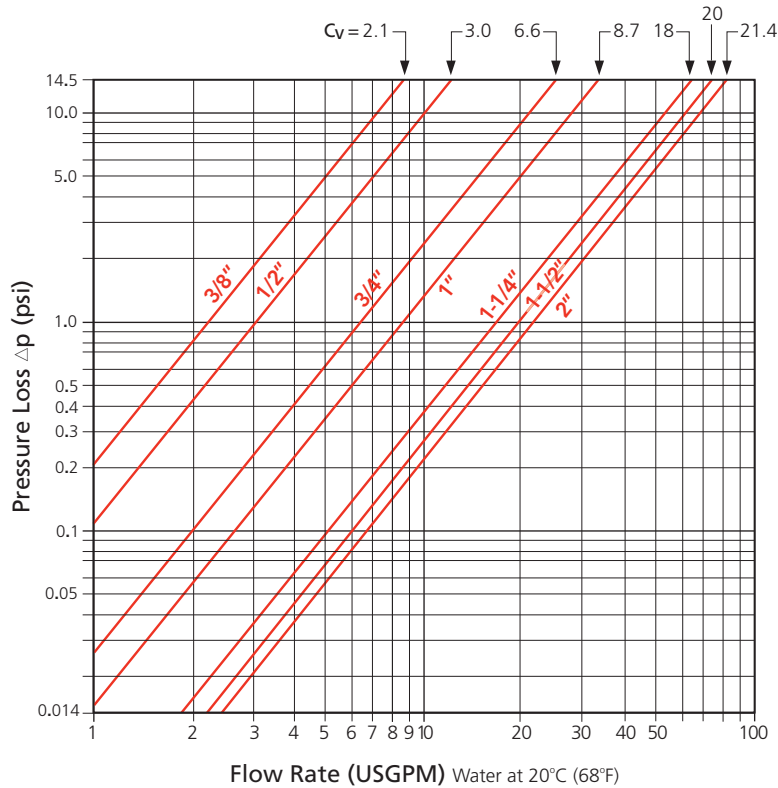
Size	PVC				PP					PVDF						
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	30°C 86°F	50°C 122°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	
1/2"–2"	150	105	60	15	150	90	60	37.5	15	150	100	60	45	30	15	

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).

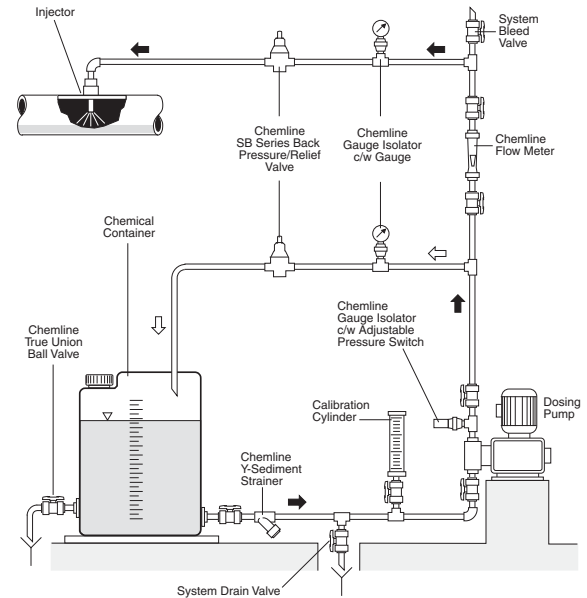
SB12 Series Back Pressure/Relief Valves 1/2" to 2"



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

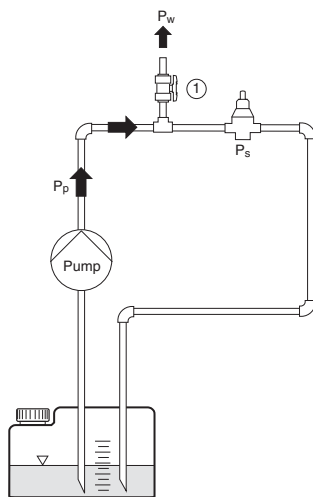


typical dosing system schematic



application of pressure relief valves

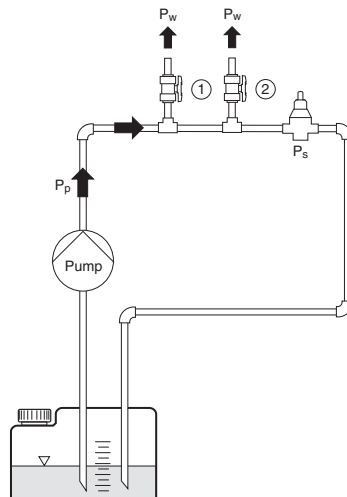
Constant System Pressure



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

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

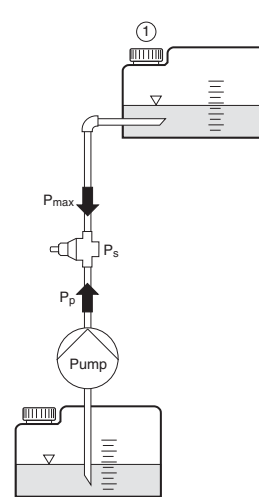
Consumer 1 and/or 2 Open, Valve Closes



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

Non-Return Valve

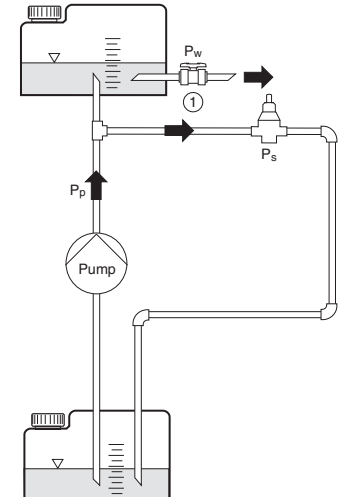
Container 1 is located above the pump



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

Overflow Valve

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



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

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



working pressure vs. flow rate

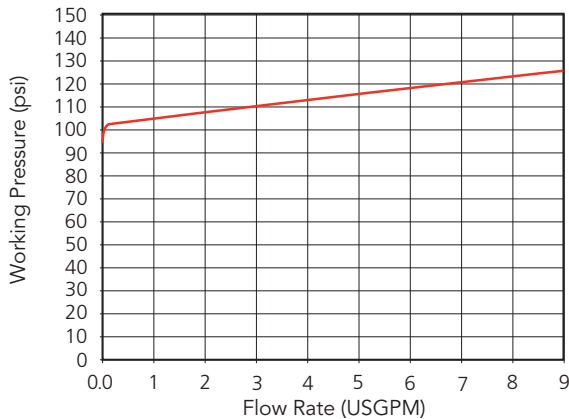
The curves show the relationship between the working pressure and the approximate flow rate through the valve for water at 20°C (68°F). These values will vary depending on:

- 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.

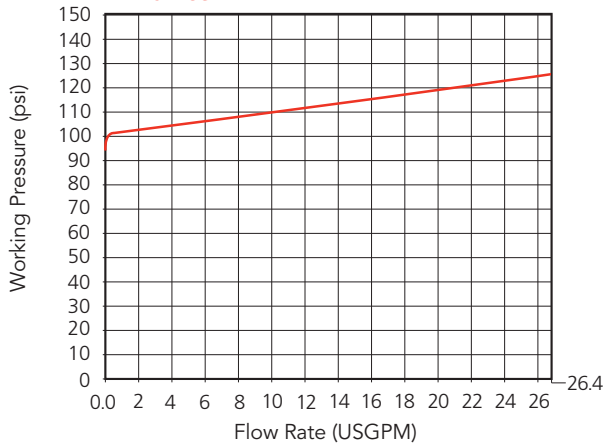
operation examples

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

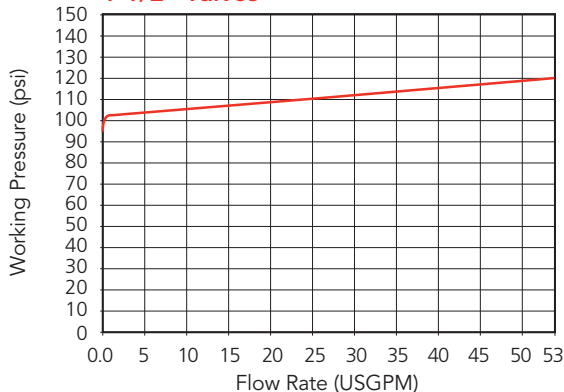
1/2" Valves



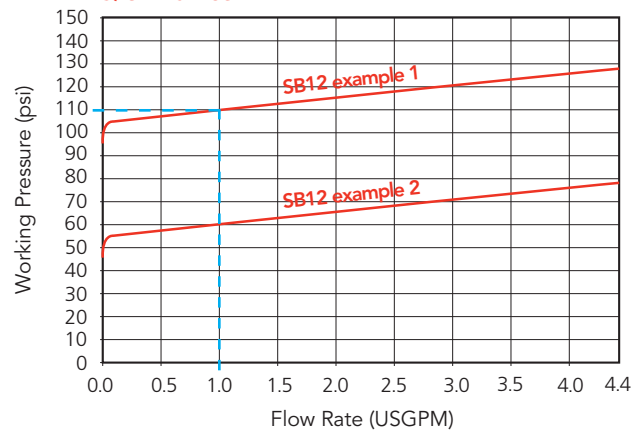
1" Valves



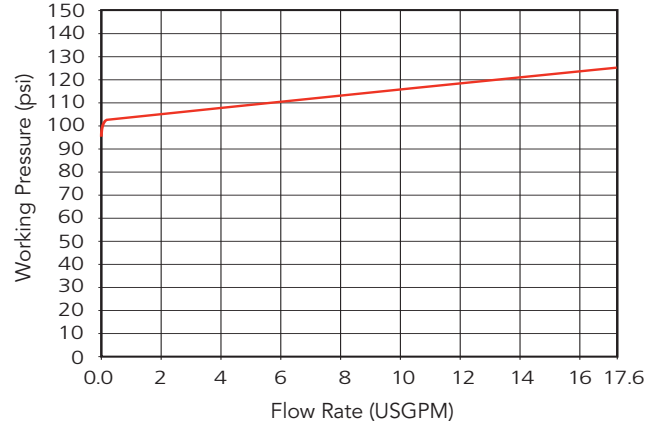
1-1/2" Valves



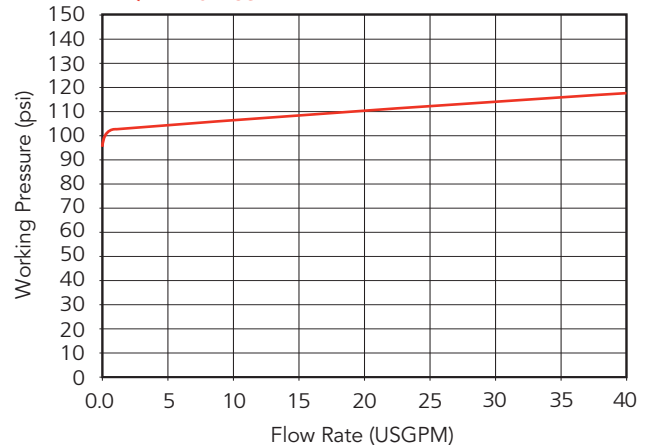
3/8" Valves



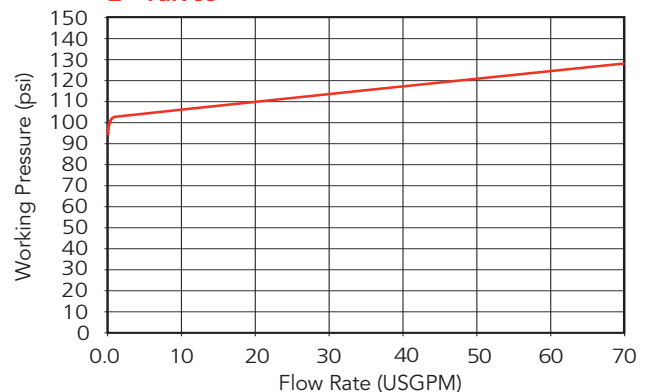
3/4" Valves



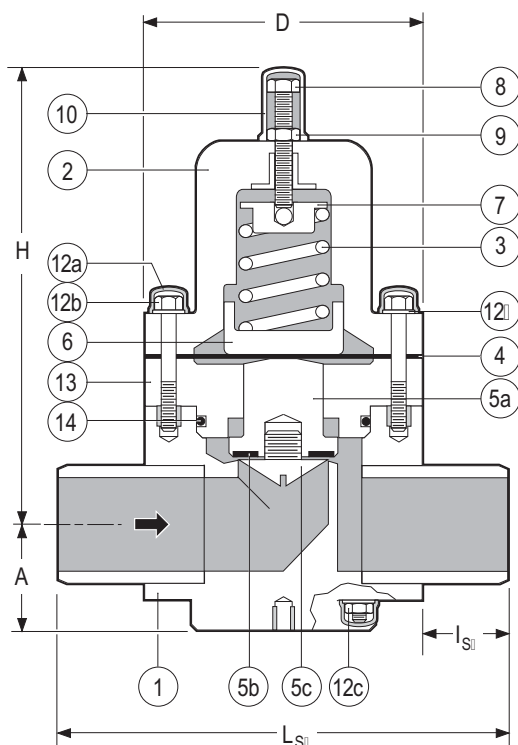
1-1/4" Valves



2" Valves

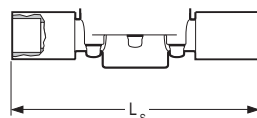


SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"

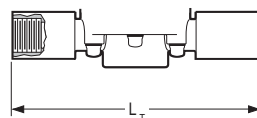


Spigot Body

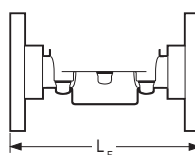
OTHER ENDS



Socket



Threaded



Flanged

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 Retainer	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

ChemFlare™ Ends

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



DIMENSIONS INCHES

Size	PVC, PP & PVDF					PVC	WEIGHTS LB.			Cv VALUES	
	A	D	H	L _{SP} ²	I _{SP}	L _F	PVC	PP	PVDF	USGPM Flow at 1 psi ΔP	
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				PP				PVDF							
	20°C 68°F	30°C 86°F	40°C 104°F	50°C 122°F	20°C 68°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
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"	005 – 1/2"	007 – 3/4"		
	010 – 1"	012 – 1-1/4"	015 – 1-1/2"		
	020 – 2"	025 – 2-1/2"	030 – 3"	040 – 4"	
Elastomers	E – EPDM	V – FPM (Viton®)			
Ends	S – Socket	T – Threaded	F – Flanged	U – Union Socket	
	CFx – ChemFlare™		Blank – Spigot (Butt)		

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

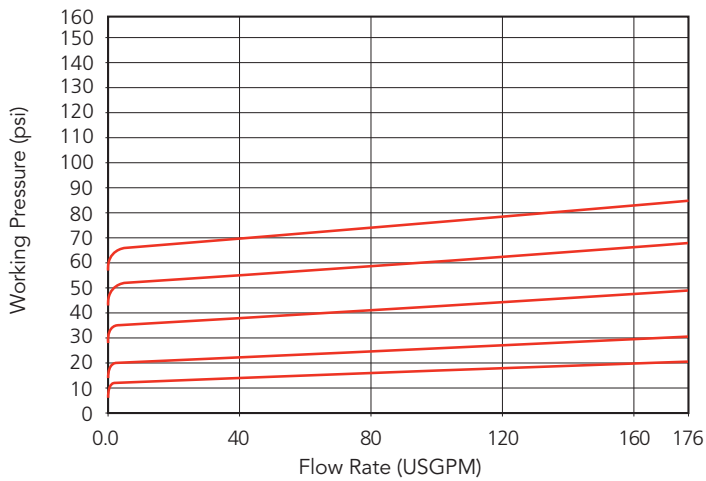
SB12 Series Back Pressure/Relief Valves 2-1/2" to 4"



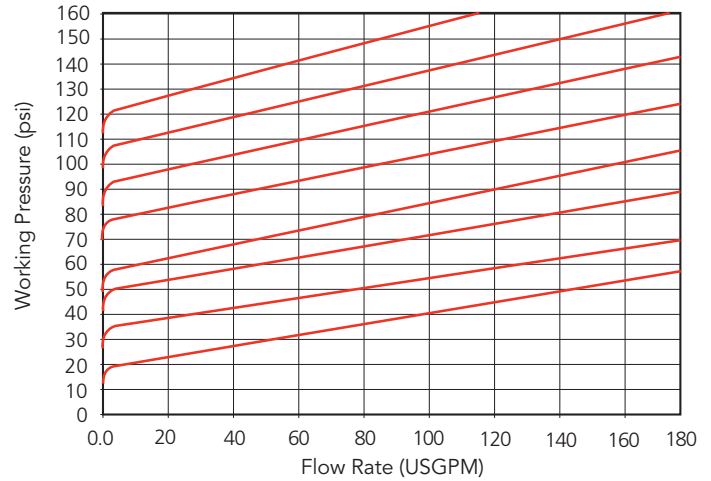
working pressure vs. flow rate

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

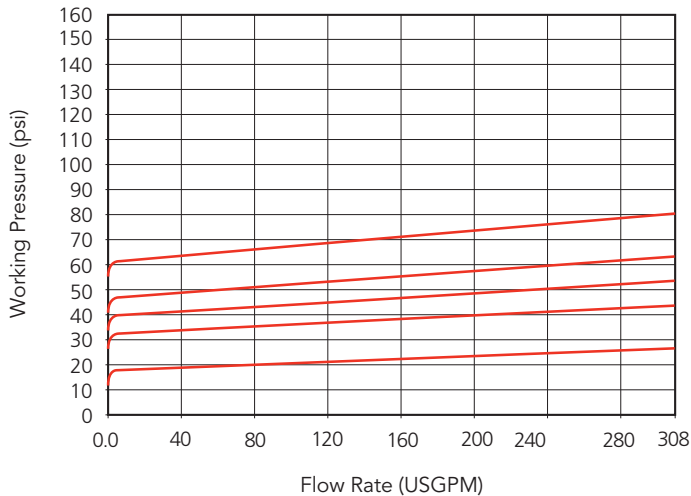
2-1/2" Valves / 4 to 60 psi set pressure range



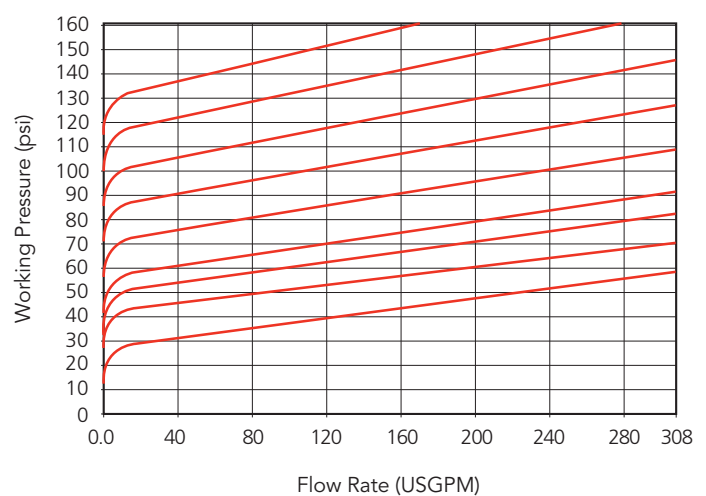
2-1/2" Valves / 7.5 to 150 psi set pressure range



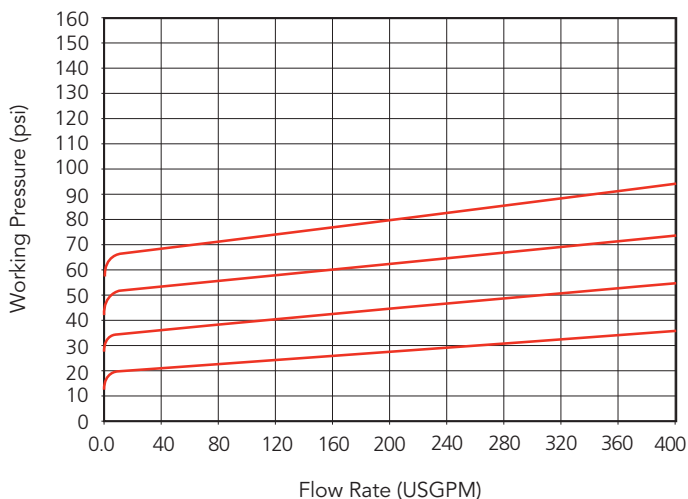
3" Valves / 4 to 60 psi set pressure range



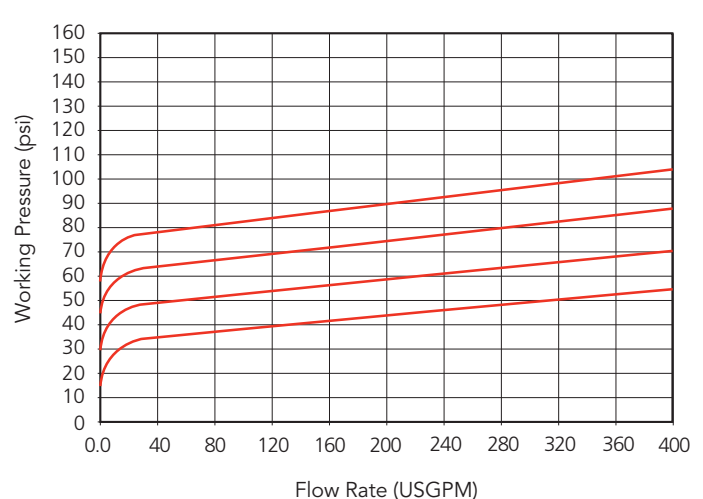
3" Valves / 7.5 to 150 psi set pressure range



4" Valves / 4 to 60 psi set pressure range



4" Valves / 7.5 to 90 psi set pressure range



Gauge Isolators



SERIES: SG

INLET CONNECTION: 1/4" or 1/2" Threaded¹

INSTRUMENT CONNECTION: 1/4" or 1/2" Threaded

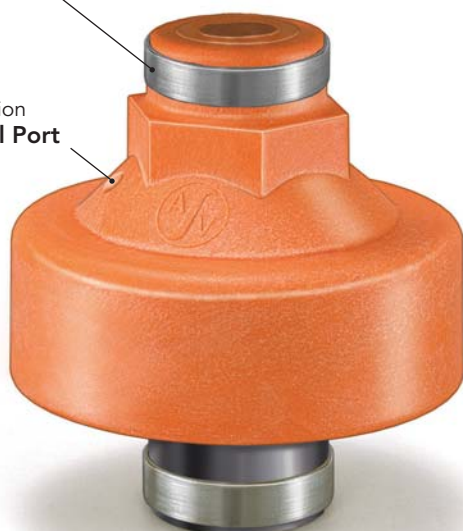
DIAPHRAGM: PTFE

CRN
Registered
Consult Chemline



Stainless Steel Bands Prevent FNPT ports from splitting

Provision for **Fill Port**



¹ Other available inlet connections are 1/2" socket or 1/2" to 1" flanged.
² Other fluids are available for special applications such as chlorine service.
³ Glass reinforced polypropylene.
⁴ PVC isolators are certified under NSF/ANSI Standard 61 for contact with drinking water.

Chemline SG Series Gauge Isolators allow inexpensive pressure gauges, or any other pressure instrument to be used in corrosive services. The upper chamber (gauge side) is filled with a stable fluid such as glycol or glycerine². A diaphragm separates it from the lower chamber which receives the media under pressure.

The 1/2" gauge connection allows use of the popular 4" and 4-1/2" diameter gauges. Pressure switches or transmitters may also be installed. Customers can easily fill isolators and install their own gauges.

Features

Easy to Mount Gauges

- It is easy to fill an isolator and field mount a gauge. No special equipment is required.
- Will accept popular 4" and 4-1/2" diameter gauges

Provision for Fill Port

- Housing may be drilled and tapped by Chemline or customer for a threaded fill port. This is used for filling isolator using a vacuum filling station

High Chemical Resistance

- Choice of body materials for a wide range of applications
- PTFE bonded EPDM dished diaphragm for high chemical resistance and sensitivity

Heavy Duty Design for Safety

- PPG³ top chamber
- Heavy wall connection ports

CRN Registration number by province

- Ontario: OH16085.5

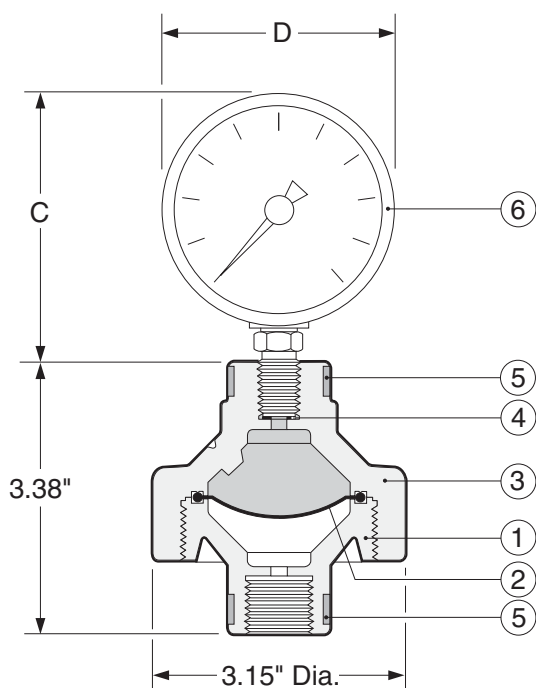
Optional Gauges

- Isolators are available alone or with gauge mounted and prefilled with glycol²



- A With 2" gauge
 B With 4-1/2" gauge
 C With 2" back mount gauge
 D With pressure transmitter

Gauge Isolators



PARTS

No.	Part	Pcs.	Materials
1	Body	1	PVC, PP, PVDF
2	Diaphragm	1	PTFE
3	Bonnet	1	PPG ¹
4	Gasket	1	EPDM
5	Stainless Steel Bands	2	304 SS
6	Optional Gauge	1	See below

¹PPG = Glass reinforced polypropylene

OPTIONAL GAUGES

- Chemline offers the gauges listed below mounted to isolator and prefilled with glycol, glycerine or special fluid for chlorine applications. These gauges have dials and cases filled with either glycol (standard), glycerine or silicon for corrosion resistance and dampening.
- Chemline SG gauge isolators are not recommended for vacuum applications. They will not affect the gauge accuracy as low as approximately 3 psi. The accuracy depends on the process conditions and the gauge installed on it.

OTHER OPTIONS

- Flanged** inlet connections
- Threaded Fill Port** – drilled, tapped and plugged
- Chemline will mount any pressure instrument supplied free issue by customer

DIMENSIONS (Gauge Isolator with optional gauge installed) INCHES

Optional Gauge Ordering No.	Gauge Diameter	Gauge Connection	Housing	Bourdon Tube	Window	Accuracy	Dimensions	
							C	D(max.)
P025-xx	2-1/2"	1/4"	316 SS	Brass	Polycarbonate	±1.5% of span	3.1	2.5
P025-xx-SS	2-1/2"	1/4"	316 SS	316 SS	Polycarbonate	±1.5% of span	3.1	2.5
P025-xx-SS/BM	2-1/2" Back Mount	1/4"	316 SS	316 SS	Polycarbonate	±1.5% of span	1.6	2.5
P025-xx-BM	2-1/2" Back Mount	1/4"	316 SS	Brass	Polycarbonate	±1.5% of span	1.6	2.5
P040-xx-SS	4"	1/2"	316 SS	316 SS	Safety Glass	±1% of span	4.5	4.0
P045-xx-SS	4-1/2"	1/2"	PBTP Plastic ²	316 SS	Acrylic	±0.5% of span	6.3	5.8

xx denotes the maximum gauge pressure i.e., 30, 60, 100, 160 or 200 psi. See data page for recommended working pressures.

² PBTP = glass filled polyester.

WORKING PRESSURES PSI

Material	10 – 20°C 50 – 68°F	30°C 86°F	40°C 104°F	50°C 122°F	60°C 140°F	70°C 158°F	80°C 176°F	90°C 194°F	100°C 212°F	120°C 248°F	Net Weights Pounds ³
PVC	150	100	80	45	15	–	–	–	–	–	1.0
PP	150	125	100	80	65	45	–	–	–	–	0.7
PVDF	150	150	150	125	105	85	70	60	45	30	1.3

Temperature Ranges: PVC 0 to 60°C (32 to 140°F), PP 10 to 80°C (50 to 176°F), PVDF –30 to 120°C (–22 to 248°F).

NR = Not Recommended. ³ Weights are for unfilled 1/2" x 1/2" isolators without gauges. 1/2" x 1/4" isolators are 20% lighter.

WEIGHTS

ORDERING EXAMPLE

Chemline Gauge Isolators	SG	A	005-	002	P	G
Body Material	A – PVC	B – PP	K – PVDF			
Inlet Size	002 – 1/4"	005 – 1/2" (Standard)				
Instrument Connection	002 – 1/4"	005 – 1/2"				
Diaphragm	P – PTFE bonded EPDM					
Filling & Mounting	G – Add only if isolator is supplied filled with glycol and gauge or pressure instrument is mounted by Chemline. Separate gauge item numbers are listed above.					

Example: Chemline SG Series Gauge Isolator, PVC, 1/2" x 1/4" FNPT inlet x instrument connections, PTFE diaphragm.



CS-314-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AGNICO EAGLE MINES		
ENGINEER:	Gabriel Hébert		
PROJECT MANAGER:	Clément B		
PHONE NUMBER:			

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	VAGLPV20783 1	V15-011	25 mm (1")	GLOVE VALVE - CARRIER WATER	TYPE: GLOBE VALVE 150 PSI//MANUFACTURER : CHEMLINE//MODEL : GVA010S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM N/A// STEM : PVC	ACTUATOR TYPE : MANUAL HANDWHEEL// MANUFACTURER : N/A// MODEL # :N/A//		ANIONIC POLYMER DOSING SKID		
CHEMLINE	VAGLPV20783 1	V15-012	25 mm (1")	GLOVE VALVE - CARRIER WATER	TYPE: GLOBE VALVE 150 PSI//MANUFACTURER : CHEMLINE//MODEL : GVA010S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM N/A// STEM : PVC	ACTUATOR TYPE : MANUAL HANDWHEEL// MANUFACTURER : N/A// MODEL # :N/A//		ANIONIC POLYMER DOSING SKID		
CHEMLINE	VAGLPV20783 1	V15-021	25 mm (1")	GLOVE VALVE - CARRIER WATER	TYPE: GLOBE VALVE 150 PSI//MANUFACTURER : CHEMLINE//MODEL : GVA010S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM N/A// STEM : PVC	ACTUATOR TYPE : MANUAL HANDWHEEL// MANUFACTURER : N/A// MODEL # :N/A//		ANIONIC POLYMER DOSING SKID		
CHEMLINE	VAGLPV20783 1	V15-022	25 mm (1")	GLOVE VALVE - CARRIER WATER	TYPE: GLOBE VALVE 150 PSI//MANUFACTURER : CHEMLINE//MODEL : GVA010S//CONNECTION TYPE : SOCKET 25 mm (1")//BODY : PVC// SEAL SEAT :EPDM N/A// STEM : PVC	ACTUATOR TYPE : MANUAL HANDWHEEL// MANUFACTURER : N/A// MODEL # :N/A//		ANIONIC POLYMER DOSING SKID		

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Globe Valves



PVC

PP

CRN
Registered
Consult Chemline

SERIES: GV

SIZES: 1/2" – 4"

ENDS: Socket, Threaded¹, Flanged

SEALS: EPDM²



2-1/2" – 4" Outside Spindle and Yolk Type

The Chemline Globe Valve is an economical throttling valve. Its heavy duty design provides for long service life. The in-line globe design causes relatively high pressure drops, however this is a desirable valve due to its economy and reliability.

Features

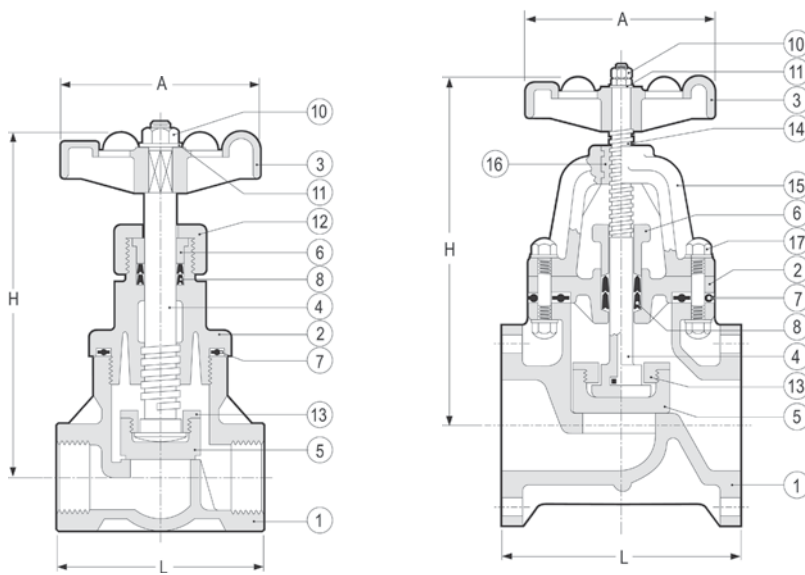
- **Slow Closing**
 - Prevents water hammer in PVC piping
- **Heavy Duty Construction**
 - Long service life
- **An economical throttling valve**



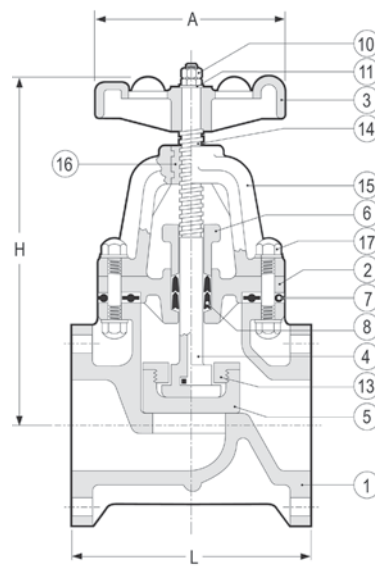
Union Bonnet Design 1/2" – 2"

¹ Socket ends are available custom basis.

² Other seal materials are available special order.



1/2" – 2" Valves



2-1/2" – 4" Valves

PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
1	Body	1	PVC, PP
2	Bonnet	1	PVC, PP
3	Handwheel	1	PP
4	Stem	1	PVC, PP
5	Disc	1	PP
6	Gland	1	PVC, PP
7▲	Bonnet Seal	1	EPDM
8▲	Stem Packing	2	EPDM
10	Nut	1	PVC
11	Washer	1	PVC
12	Gland Nut	1	PVC, PP
13	Disc Retainer	1	PP
14	Stem Top ¹	1	Brass, 400 SS
15	Yolk	1	PP
16	Yolk Sleeve	1	Bronze
17	Bolt & Nut	8 sets	304 SS
18	Stud & Nut	2 sets	304 SS

¹Stem top for valves up to 2" stem are brass. For valves 2-1/2" to 4" stem tops are 400 SS.

DIMENSIONS INCHES

Cv VALUES VS % OPEN

WEIGHTS LB.

Size	A	L Soc	L ² Thd	L ³ Flg	H Open	Valve Opening (%)					No. Turns to Open	PVC Soc/Thd	PVC Flg	PP Thd	PP Flg
						20	40	60	80	100					
1/2"	2.6	4.33	3.35	5.3	5.3	2.6	3.5	3.9	4.0	4.1	2.75	0.64	1.0	0.37	0.66
3/4"	2.6	5.12	3.74	6.0	5.5	4.0	5.5	6.1	6.3	6.4	3.25	1.1	1.3	0.55	0.84
1"	3.6	5.19	4.33	6.8	6.4	6.1	8.4	9.2	9.5	9.7	3.25	1.1	2.2	0.77	1.3
1-1/4"	3.6	–	5.32	8.2	6.6	11.3	15.5	17.1	17.7	18.0	2.50	1.3	2.9	–	–
1-1/2"	5.3	–	5.51	8.4	9.1	13.8	19.0	20.9	21.6	22.0	3.75	2.6	4.6	–	2.9
2"	5.3	–	7.09	11.0	9.9	18.2	25.0	27.5	28.5	29.0	3.25	3.5	5.7	–	3.5
2-1/2"	7.3	–	–	8.7	13.6	35.7	49.2	54.1	56.1	57.0	7.50	–	13.0	–	11.0
3"	7.3	–	–	9.5	14.1	48.9	67.3	74.1	76.7	78.0	7.50	–	15.0	–	11.0
4"	7.3	–	–	11.4	16.5	72.1	99.2	109.0	113.0	115.0	8.50	–	22.0	–	18.0

Note: 1-1/4" size is not available in PP. ²Threaded ends are available in PVC 1/2" to 2" and PP 1/2" to 1".

³L Flanged is for fabricated flanged valves normally supplied 1/2" to 2". Solid flanged (special order) 1/2" to 2" valves have shorter dimensions. Consult Chemline.

WORKING PRESSURES PSI

Size	PVC			Polypropylene		
	0-20°C 32-68°F	40°C 104°F	50°C 122°F	-20-20°C -4-68°F	60°C 140°F	80°C 176°F
1/2" – 1-1/2"	150	105	105	105	90	65
2"	150	105	90	105	70	40
2-1/2" – 3"	150	105	90	105	60	35
4"	150	80	65	105	60	35

Temperature Ranges: PVC 0 to 60°C (32 to 140°F), PP -20 to 90°C (-4 to 194°F).

ORDERING EXAMPLE

Chemline Globe Valves		GV	A	015	T
Body Material	A – PVC B – Polypropylene				
Size	005 – 1/2" 007 – 3/4" 010 – 1" 012 – 1-1/4" 015 – 1-1/2" 020 – 2" 025 – 2-1/2" 030 – 3" 040 – 4"				
Ends	S – Socket T – Threaded F – Flanged				

Example: Chemline Globe Valve, PVC, 1-1/2", threaded ends.

VACUUM RATING

- 29.9 inches mercury

ACCESSORY

- Handwheel lockout

Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0010_PCH

by: GH

chkd: GP

appvd: CB



ANIONIC POLYMER DOSING SKID

CALIBRATION CYLINDER

OIM manual section: 4.3.10.5

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CS-500-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
PRIMARY FLUID	PUSPPV200284	CLY9-521	L: 23,16 " X W: 6,906 "	Calibration Cylinder	CALIBRATION CYLINDER/MANUFACTURER: PRIMARY FLUID/MODEL: PV2-10000	N/A	N/A	ANIONIC POLYMER DOSING SKID		

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ACCUDRAW® Calibration Cylinders



Polypropylene



PVC



Glass



- PVC with removable "O" ring sealed top for easy cleaning
- yellow polypropylene level indicator float for high visibility

ACCUDRAW® *has been developed for the accurate calibration of metering pumps. Standard features include:*

- translucent
- chemical resistant
- break resistant
- threaded, socket or flanged
- colored graduations and lettering
- PVC has dual scale USGPH & ml
- PVC sizes 100 - 20000 ml
- POLY sizes 100 - 4000 ml
- POLY meets ISO standards
- Glass sizes 100 - 20000 ml
- custom designs available

For detailed product information visit our website: primaryfluid.com





ACCUDRAW® Calibration Cylinders

"For Accuracy That Counts"

For complete product information visit our website: primaryfluid.com



Flanged: Glass, PVC



Flanged: PVC



PV#4

Sizing and Ordering Information:

ACCUDRAW Standard Materials of Construction

AC = All polypropylene construction (see below for options)
PV = All polyvinylchloride construction (see below for options)
ACS = Glass*

Example: AC#1-1000B

AC = PP (polypropylene)
#1 = Bottom threaded connection only
1000 = 1000 ml
B = BSP Thread

Note: Cylinders are NOT pressure vessels

e.g. Part # **AC #1 - 1000 B**

Type:

AC = Polypropylene
PV = PVC
ACS = Glass

Style:

1 = Bottom threaded conn. only
2 = Top and Bottom threaded conn.
3 = Bottom threaded conn. c/w
removable vented dust cap
4 = Top/Bottom threaded conn. c/w
removable "O" ring sealed top
and float ring level indicator

***Glass calibration cylinders
available in Style 2 only**

Graduation Scale:

PP - ml only
PVC - ml and GPH
Glass - ml only

Std. connection is NPT thread

Optional: add suffix as follows

S = Socket weld connection
(PVC only)
GTV = Glass/TFE construction
GKV = Glass/PVDF construction
GCV = Glass/CPVC construction
GSV = Glass/SS construction
B = BSP Thread
F = Flanged

Substitute **E** for **V**
for **EPDM** wetted "O" ring seal

Sizes:

100 =	100 ml	(1.6 GPH)	PP, PVC, Glass
250 =	250 ml	(4 GPH)	PP, PVC, Glass
500 =	500 ml	(8 GPH)	PP, PVC, Glass
1000 =	1000 ml	(16 GPH)	PP, PVC, Glass
2000 =	2000 ml	(32 GPH)	PP, PVC, Glass
4000 =	4000 ml	(64 GPH)	PP, PVC, Glass
6000 =	6000 ml		Glass only
8000 =	8000 ml		Glass only
10000 =	10000 ml	(160 GPH)	PVC, Glass
20000 =	20000 ml	(320 GPH)	PVC, Glass

Material

Custom sizes and materials available.



ACCUDRAW® Calibration Cylinders



ACCUDRAW® Glass Calibration Cylinders are ideal for the calibration of metering pumps, batch systems and for handling hazardous chemicals.

- volumes calibrated in ml
- construction materials available include TFE, PVDF, CPVC and 316 stainless steel
- sealing "O" rings are Viton and Buna N
- outer shield of acrylic construction
- port connections in NPT, metric or flanged
- standard sizes 100 - 20,000 ml
- custom designs available to your specifications

Sizing and Ordering Information: Glass Construction

Size	Conn.	Model # For TFE End Flgs	Model # For 316 S/S End Flgs	Model # For PVDF End Flgs	Model # For CPVC End Flgs
100 ml	1/2" NPT	ACS#2-100-GTV	ACS#2-100-GSV	ACS#2-100-GKV	ACS#2-100-GCV
250 ml	1/2" NPT	ACS#2-250-GTV	ACS#2-250-GSV	ACS#2-250-GKV	ACS#2-250-GCV
500 ml	1/2" NPT	ACS#2-500-GTV	ACS#2-500-GSV	ACS#2-500-GKV	ACS#2-500-GCV
1000 ml	1/2" NPT	ACS#2-1000-GTV	ACS#2-1000-GSV	ACS#2-1000-GKV	ACS#2-1000-GCV
2000 ml	1" NPT	ACS#2-2000-GTV	ACS#2-2000-GSV	ACS#2-2000-GKV	ACS#2-2000-GCV
4000 ml	1" NPT	ACS#2-4000-GTV	ACS#2-4000-GSV	ACS#2-4000-GKV	ACS#2-4000-GCV
6000 ml	1" NPT	ACS#2-6000-GTV	ACS#2-6000-GSV	ACS#2-6000-GKV	ACS#2-6000-GCV
8000 ml	2" NPT	ACS#2-8000-GTV	ACS#2-8000-GSV	ACS#2-8000-GKV	ACS#2-8000-GCV
10000 ml	2" NPT	ACS#2-10000-GTV	ACS#2-10000-GSV	ACS#2-10000-GKV	ACS#2-10000-GCV
20000 ml	2" NPT	ACS#2-20000-GTV	ACS#2-20000-GSV	ACS#2-20000-GKV	ACS#2-20000-GCV

Descriptions:

TFE, PVDF and CPVC End Flanges:

Glass cylinder with acrylic outer shield and 3/4" thick (TFE, PVDF or CPVC) end flanges

316 S/S End Flanges:

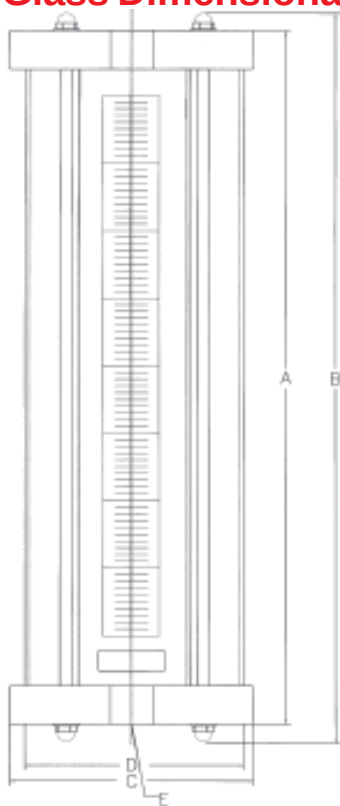
Glass cylinder with acrylic outer shield and 1/2" thick 316 Stainless Steel end flanges

Cylinders are bolted together using stainless steel rods with Viton "O" rings for the glass seal and Buna N "O" rings for the acrylic seal. For EPDM "O" rings, substitute "E" for "V".

Options available: (may affect price and delivery)

- different type or size of thread connection, different "O" ring material, different flange material

Glass Dimensional Information



Note: Cylinders are not pressure vessels.

Dimensions subject to change without notice.

Glass cylinders with TFE, PVDF or CPVC End Flanges

Size ml	DIV ml	A inches	B inches	C inches	D inches	E thread
100	1.00	10.00	11.00	3.00	2.50	1/2" FNPT
250	2.00	12.75	13.50	3.50	3.00	1/2" FNPT
500	5.00	14.50	15.50	4.00	3.50	1/2" FNPT
1000	10.00	16.75	17.75	4.75	4.25	1/2" FNPT
2000	20.00	18.75	19.75	5.50	5.00	1" FNPT
4000	25.00	22.50	23.50	6.50	6.00	1" FNPT
6000	50.00	20.13	21.16	8.00	7.50	1" FNPT
8000	50.00	24.63	25.66	8.00	7.50	2" FNPT
10000	50.00	30.13	31.16	8.00	7.50	2" FNPT
20000	200.00	43.25	44.25	9.00	8.50	2" FNPT

Glass cylinders with 316 Stainless Steel End Flanges

Size ml	DIV ml	A inches	B inches	C inches	D inches	E thread
100	1.00	9.50	10.50	3.00	2.50	1/2" FNPT
250	2.00	12.25	13.00	3.50	3.00	1/2" FNPT
500	5.00	14.00	15.00	4.00	3.50	1/2" FNPT
1000	10.00	16.25	17.25	4.75	4.25	1/2" FNPT
2000	20.00	18.25	19.25	5.50	5.00	1" FNPT
4000	25.00	22.00	23.00	6.50	6.00	1" FNPT
6000	50.00	19.63	20.66	8.00	7.50	1" FNPT
8000	50.00	24.13	25.16	8.00	7.50	2" FNPT
10000	50.00	29.63	30.66	8.00	7.50	2" FNPT
20000	200.00	42.75	43.75	9.00	8.50	2" FNPT

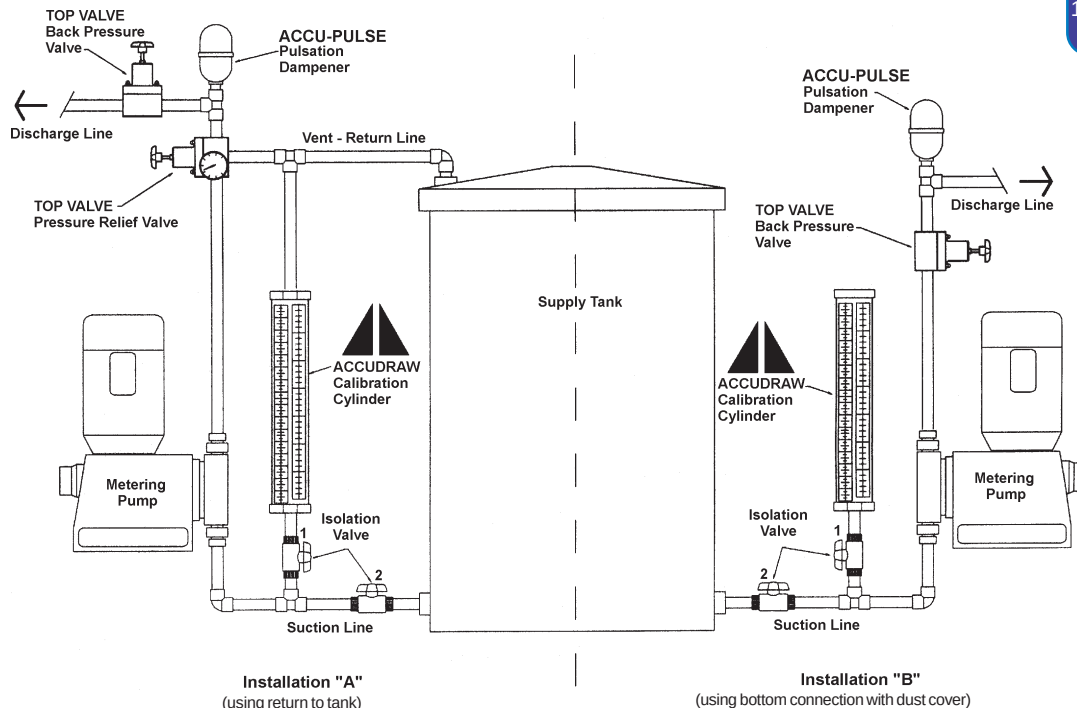


ACCUDRAW® Calibration Cylinders

Installations

Conversion Factors

1 ml = 1 cc
 1000 ml = 1 liter
 ml/sec X 60 = ml/min
 1 US gal/min X 0.063 = liters/sec
 1 US gal = 3.786 liters



Other available products at www.primaryfluid.com

TOP VALVE Back Pressure/Pressure Relief



- long life diaphragm
- range of 15 - 350 PSIG
- air release, optional gauge port
- PVC, CPVC, PVDF, Teflon, polypropylene, stainless, Alloy 20 and Hastelloy C
- 7 sizes 1/4" - 2" NPT
- color coded handles indicate size
- higher pressure & temperature available

PFS Corporation Stops



Designed to inject chemical into the center stream of process.

- isolation valve allows for ease of maintenance
 - available in 6 materials of construction
 - wetted components have comparable or greater chemical resistance than quill construction material
 - standard and custom lengths available
 - connection in NPT, metric or flanged
- Custom built in other sizes & materials.**

ACCUPULSE Pulsation Dampeners



Designed to remove pulsating flows from positive displacement pumps.

- increase system efficiency and pump life; decrease maintenance and costs
- protect pipes, meters, valves and instrumentation from pulsation and vibration
- ensure meter accuracy, longevity and repeatability
- prevent foaming and splashing
- extensive range of materials and sizes with lightweight, compact design

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0010_PCH

by: GH

chkd: GP

appvd: CB



ANIONIC POLYMER DOSING SKID

INSTRUMENTS

OIM manual section: 4.3.10.6

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CS-449-100 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CHEMLINE	IMFWGG30190 7	FI15-011	1	VARIABLE AREA FLOWMETER	VARIABLE AREA FLOWMETER/MANUFACTURER: CHEMLINE/ MODEL: FSA02500	N/A	N/A	ANIONIC POLYMER DOSING SKID		rev1
CHEMLINE	IMFWGG30190 7	FI15-021	1	VARIABLE AREA FLOWMETER	VARIABLE AREA FLOWMETER/MANUFACTURER: CHEMLINE/ MODEL: FSA02500	N/A	N/A	ANIONIC POLYMER DOSING SKID		rev1

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Variable Area Flow Meters



CRN
Registered
Consulting Chemist

SERIES: FC – Compact – 5" Single Scale
FS – Full Size – 7" Dual Scale¹

MATERIALS: Tube: Clear PVC, Polyamide (PA), Polysulfone (PSU) or PVDF²
Float: PVDF
Ends: PVC, CPVC, PP, PVDF, Socket, Threaded, Flanged, Butt or ChemFlare™³

O-RINGS: EPDM, FPM (Viton®)

CAPACITIES: Up to 220 USGPM (50,000 litres per hour)



Chemline F Series Variable Area Flow Meters are ideal for plastic piping. They provide a combination of accurate visual flow rate measurement and clear flow indication from a distance. Optional limit switches allow the units to signal a low or high flow alarm. An optional flow transmitter provides a 4 to 20 mA signal output. These flow meters must be installed vertically with flow upward.

features

Clear Visual Indication

- Large orange float is visible from a distance
- Range indicators slide along dovetail track

Easy Installation and Maintenance

- Just unscrew union nuts and tube slides out of line

Choice of Four Tube Materials for Many Applications:

- **Clear PVC** – For Water or Chemicals up to 60°C (140°F) – High Chemical resistance at low cost
- **Polyamide (PA)** – For Water or Air up to 75°C (167°F) – High impact strength and optical clarity
- **Polysulfone (PSU)** – For Chemicals and Gases up to 100°C (212°F) – High impact strength and good chemical resistance
- **PVDF²** – For Chemicals and Ultrapure fluids up to 110°C (230°F) – High impact strength and excellent chemical resistance.

Ideal for All Types of Plastic Piping

- All types of end connections in PVC, CPVC, PP & PVDF

Low Pressure Drop

Good Measuring Accuracy – Class IV

- $\pm 3\%$ of indicated value, plus $\pm 1\%$ of full scale.
– Read scale at top (largest diameter) of float

Non Fouling

- Float is self supporting in the flow. No guide rod (which can cause the float to jam) is necessary.

¹ USGPM and litres per hour (water) scale is supplied as standard on full size meters.

² Because PVDF is translucent, a magnetic float and limit switches are usually used.

³ For ChemFlare™ end connectors, consult Chemline.

Variable Area Flow Meters



NOTES:

PVDF flow meters are available in all sizes. Change third letter in item number to K.

¹ ΔP = Pressure loss through flow meter with water at 20°C (68°F).

² Dimension L is for PVC Socket ends.

FC SERIES – COMPACT SIZE – 5" SCALE

Single USGPM (water) scale is supplied standard

End Conn. Size	Item Number			Flow Range (water)		Dimensions (inches)			Pressure Drop (psi) ¹	
	PVC Tube	Polyamide Tube	Polysulfone Tube							
				USGPM	Litres per hour	A	L ²	D	Water	Air
3/8"	FCA00020	FCT00020	FCP00020	0.0132 – 0.106	3 – 24	6.50	8.2	1.38	0.05	0.07
	FCA00060	FCT00060	FCP00060	0.022 – 0.264	5 – 60	6.50	8.2	1.38	0.05	0.07
	FCA00100	FCT00100	FCP00100	0.04 – 0.44	10 – 100	6.50	8.2	1.38	0.05	0.07
	FCA00250	FCT00250	FCP00250	0.11 – 1.10	25 – 250	6.50	8.2	1.38	0.05	0.07
1/2"	FCA00051	FCT00051	FCP00051	0.02 – 0.22	5 – 50	6.69	8.7	1.69	0.04	0.06
	FCA00151	FCT00151	FCP00151	0.07 – 0.66	15 – 150	6.69	8.7	1.69	0.04	0.06
	FCA00251	FCT00251	FCP00251	0.11 – 1.10	25 – 250	6.69	8.7	1.69	0.04	0.06
	FCA00401	FCT00401	FCP00401	0.18 – 1.76	40 – 400	6.69	8.7	1.69	0.04	0.06
3/4"	FCA00152	FCT00152	FCP00152	0.07 – 0.66	15 – 150	7.28	9.6	2.09	0.09	0.12
	FCA00402	FCT00402	FCP00402	0.22 – 1.76	40 – 400	7.28	9.6	2.09	0.09	0.12
	FCA00602	FCT00602	FCP00602	0.26 – 2.64	60 – 600	7.28	9.6	2.09	0.09	0.12
	FCA01002	FCT01002	FCP01002	0.44 – 4.40	100 – 1,000	7.28	9.6	2.09	0.09	0.12
1"	FCA00253	FCT00253	FCP00253	0.11 – 1.10	25 – 250	7.87	10.5	2.36	0.09	0.12
	FCA00403	FCT00403	FCP00403	0.18 – 1.76	40 – 400	7.87	10.5	2.36	0.09	0.12
	FCA01003	FCT01003	FCP01003	0.44 – 4.40	100 – 1,000	7.87	10.5	2.36	0.09	0.12
	FCA01503	FCT01503	FCP01503	0.66 – 6.60	150 – 1,500	7.87	10.5	2.36	0.09	0.12

F5 SERIES – STANDARD FULL SIZE – 7" SCALE

Dual USGPM (water) and litres per hour scales are supplied standard

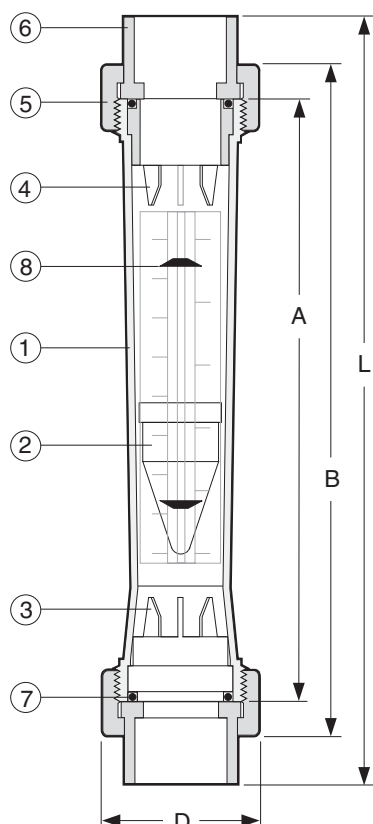
End Conn. Size	Item Number			Flow Range (water)		Dimensions (inches)			Pressure Drop (psi) ¹	
	PVC Tube	Polyamide Tube	Polysulfone Tube							
				USGPM	Litres per hour	A	L ²	D	Water	Air
1"	FSA00600	FST00600	FSP00600	0.26 – 2.64	60 – 600	13.78	16.3	2.36	0.18	0.23
	FSA01000	FST01000	FSP01000	0.44 – 4.40	100 – 1,000	13.78	16.3	2.36	0.18	0.23
1-1/4"	FSA01500	FST01500	FSP01500	0.66 – 6.60	150 – 1,500	13.78	16.6	2.83	0.18	0.23
	FSA02500	FST02500	FSP02500	1.10 – 11.00	250 – 2,500	13.78	16.6	2.83	0.18	0.23
1-1/2"	FSA02000	FST02000	FSP02000	0.88 – 8.80	200 – 2,000	13.78	16.8	3.27	0.18	0.23
	FSA03000	FST03000	FSP03000	1.32 – 13.20	300 – 3,000	13.78	16.8	3.27	0.18	0.23
2"	FSA04000	FST04000	FSP04000	1.76 – 17.60	400 – 4,000	13.78	17.2	4.06	0.32	0.39
	FSA06000	FST06000	FSP06000	2.64 – 26.40	600 – 6,000	13.78	17.2	4.06	0.32	0.39
	FSA10000	FST10000	FSP10000	4.40 – 44.00	1,000 – 10,000	13.78	17.2	4.06	0.32	0.39
2-1/2"	FSA15000	FST15000	FSP15000	6.60 – 66.00	1,500 – 15,000	13.78	17.7	4.80	0.49	0.58
	FSA25000	FST25000	FSP25000	11.00 – 110.00	2,500 – 25,000	13.78	17.7	4.80	0.49	0.58
	FSA50000	FST50000	FSP50000	44.00 – 220.00	10,000 – 50,000	13.78	17.7	4.80	0.49	0.58

CONVERSION CHART – FLOW UNITS

From	To	m ³ /hr	litres/hr	USGPM	ImpGPM	ft ³ /min
m ³ /hr		1	1000	4.4029	3.6662	0.5886
litres/hr		0.001	1	.004403	.003666	.000589
USGPM		0.2271	227.12	1	0.8327	0.1337
ImpGPM		0.2728	272.77	1.2009	1	0.1605
ft ³ /min		1.6990	1699	7.4806	6.2289	1

Values based on water at 20°C (68°F).

Variable Area Flow Meters



PARTS

▲ Recommended Spare Parts

No.	Part	Pcs.	Materials
1	Tube	1	Polyamide (PA), Polysulfone (PSU), Clear PVC, PVDF
2	Float	1	PVDF (standard or magnetic)
3	Lower Float Stop	1	PVDF
4	Upper Float Stop	1	PVDF
5	Union Nut	2	PVC, PPG, PVDF
6	End Connector	2	PVC, CPVC, PP or PVDF
7▲	O-Rings	2	EPDM, FPM(Viton®)
8▲	Range Indicator	2	ABS

ACCESSORIES

- **Limit Switches** – One switch for both maximum or minimum. A magnetic float is required.
- **Switch Ratings** – P (max) = 10 VA, E (max) = 470VAC, I (max) = 0.5A
- **Throttling Valve** for flow control
- **4–20 mA Output Signal Unit** must be factory calibrated for specific service

OPTIONS

- **Custom Direct Reading Scale** for services other than water
- **Alternate O-Rings** – ie. FPM (Viton®)
- **End Size Reduction** – Accuracy is not significantly affected by end reduction
- **Other Ends** – Threaded, socket or flanged end connections in PVC, CPVC, PP or PVDF. Butt ends in PP or PVDF.

MAXIMUM WORKING PRESSURES AND TEMPERATURE RANGES

Construction (‡ = Optional Materials)				Maximum	
Tube	O-Rings	Union Nuts	Ends	Pressure ²	Temperature Range
PVC	EPDM	PVC	PVC	150 psi	0 to 60°C (32 to 140°F)
Polyamide (PA)	EPDM	PVC	PVC	150 psi	0 to 60°C (32 to 140°F)
Polyamide (PA)	EPDM	PPG‡	PP or CPVC‡	150 psi	0 to 75°C (32 to 167°F)
Polysulfone (PSU)	EPDM	PVC	PVC	150 psi	0 to 60°C (32 to 140°F)
Polysulfone (PSU)	EPDM	PPG‡	PP or CPVC‡	150 psi	0 to 90°C (32 to 194°F)
PVDF	FPM(Viton®)	PVDF	PVDF	150 psi	–40 to 110°C (–40 to 230°F)

²150 psi is not recommended at maximum temperatures. Consult Chemline.

flow meter sizing – liquid flow

Standard Scale values are for clean water flow at 20°C (68°F). For liquids with densities and viscosities similar to water (ie. specific gravity of 1.0 and viscosities between 0.5 cP and 1.3 cP) the standard water scale will be accurate enough.

The table below shows correction factors to be applied for liquids with specific gravities other than 1.0. Multiply the correction factor by the water scale value to obtain actual flow rate. Example: For a liquid of specific gravity of 1.66, the correction factor is 0.740. For water flow range of 100 to 1000 litres/hr, corrected range becomes 74 to 740 litres/hr. Viscosity should be between 0.5 cP and 1.3 cP for standard scales to be accurate.

For “sizing” liquid flows ie. determining actual flow range of a tube, please advise the **chemical name, concentration, temperature, specific gravity and viscosity**. Custom direct reading scales in any units are available special order.

SCALE CORRECTION FACTORS – FOR LIQUIDS WITH SPECIFIC GRAVITIES OTHER THAN 1.00

Specific Gravity	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
	Scale Correction Factor									
0.4	1.647	1.626	1.605	1.585	1.565	1.548	1.529	1.513	1.495	1.479
0.5	1.462	1.447	1.433	1.418	1.404	1.391	1.377	1.364	1.351	1.339
0.6	1.326	1.316	1.304	1.292	1.282	1.271	1.259	1.250	1.239	1.229
0.7	1.220	1.211	1.202	1.192	1.183	1.175	1.167	1.157	1.149	1.142
0.8	1.134	1.125	1.117	1.111	1.104	1.096	1.089	1.082	1.075	1.068
0.9	1.062	1.055	1.048	1.042	1.035	1.030	1.024	1.017	1.011	1.005
1.0	1.000	0.994	0.988	0.982	0.978	0.972	0.967	0.962	0.956	0.951
1.1	0.947	0.943	0.936	0.932	0.927	0.923	0.917	0.913	0.909	0.904
1.2	0.900	0.895	0.891	0.887	0.883	0.878	0.874	0.870	0.866	0.862
1.3	0.858	0.854	0.850	0.846	0.842	0.838	0.835	0.831	0.827	0.824
1.4	0.820	0.818	0.814	0.810	0.806	0.803	0.800	0.797	0.794	0.791
1.5	0.787	0.784	0.781	0.778	0.776	0.773	0.770	0.767	0.764	0.759
1.6	0.756	0.754	0.751	0.748	0.745	0.742	0.740	0.737	0.734	0.730
1.7	0.728	0.726	0.723	0.720	0.717	0.714	0.712	0.709	0.706	0.704
1.8	0.701	0.699	0.696	0.694	0.691	0.689	0.686	0.684	0.682	0.679
1.9	0.677	0.674	0.672	0.669	0.667	0.665	0.663	0.661	0.658	0.657
2.0	0.654	0.652	0.650	0.648	0.646	0.644	0.641	0.640	0.637	0.636

flow meter sizing – gas flow

FLOW RANGES FOR AIR – AT STANDARD CONDITIONS (atmospheric pressure 14.7 psia/20°C).

FC SERIES – COMPACT SIZE – 5" SCALE

Flow Meter Item No.	Normal m ³ /hr	Standard CFM
FCT00020	0.2 – 1.0	0.1 – 0.6
FCT00060	0.2 – 2.5	0.1 – 1.5
FCT00100	0.6 – 3.6	0.4 – 2.1
FCT00250	0.5 – 9.0	0.3 – 5.3
FCT00051	0.4 – 2.8	0.2 – 1.6
FCT00151	0.8 – 6.2	0.5 – 3.6
FCT00251	0.9 – 9.5	0.5 – 5.6
FCT00401	2.0 – 15.0	1.2 – 8.8
FCT00152	0.5 – 5.5	0.3 – 3.2
FCT00402	2.0 – 14.0	1.2 – 8.2
FCT00602	2.5 – 22.0	1.5 – 12.9
FCT01002	4.0 – 34.0	2.4 – 20.0
FCT00253	1.0 – 8.0	0.6 – 4.7
FCT00403	2.0 – 14.0	1.2 – 8.2
FCT01003	4.0 – 34.0	2.4 – 20.0
FCT01503	5.0 – 50.0	2.9 – 29.4

FS SERIES – STANDARD FULL SIZE – 7" SCALE

Flow Meter Item No.	Normal m ³ /hr	Standard CFM
FST00600	2.5 – 20	1.5 – 12
FST01000	4 – 34	2.4 – 20
FST01500	5 – 50	2.9 – 29
FST02000	8.5 – 76	5.0 – 45
FST02500	8 – 70	4.7 – 41
FST03000	10 – 90	5.9 – 53
FST04000	14 – 125	8.2 – 74
FST06000	22 – 190	13 – 112
FST10000	35 – 300	21 – 177
FST15000	50 – 500	29 – 294
FST25000	80 – 720	47 – 424
FST50000	400 – 1,500	234 – 883

SCALE CORRECTION FACTORS – FOR AIR AT NON-STANDARD TEMPERATURES AND PRESSURES

Air density is dependent on the actual pressure and temperature. Calculate the Scale Correction Factor using either Method 1 or 2. Multiply the standard air flow ranges above by the Factor to obtain actual flow rates.

Method 1

Calculate the Factor with the following formula.

$$\text{Factor} = \frac{1}{3.7005} \sqrt{\frac{\text{psia}}{(1+0.00367t)}}$$

psia = pressure of the air absolute
 = psig + 14.7 (atmospheric pressure = 14.7 psia)
 t = temperature of the air °C

Method 2

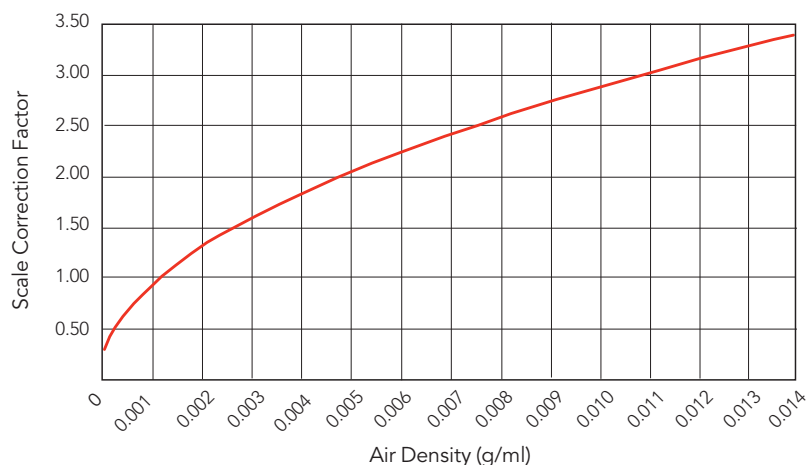
Calculate the density of the air at conditions and find factor from the chart below.

Air Density (g/ml) =

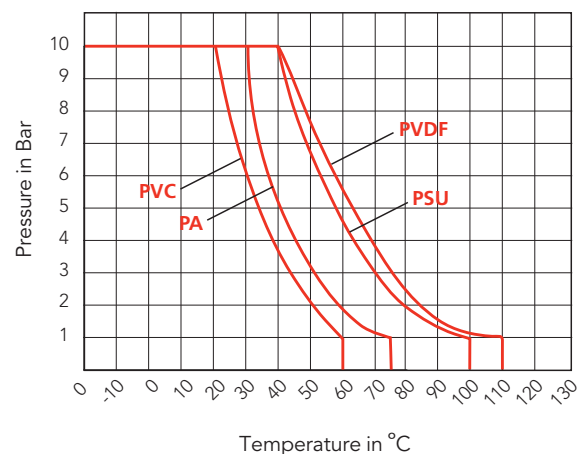
$$\frac{\text{psia}}{11,360 (1+0.00367t)}$$

psia = pressure of the air absolute
 = psig + 14.7 (atmospheric pressure = 14.7 psia)
 t = temperature of the air °C

Air Density vs. Flow Factor



Temperature vs. Pressure



for FC & FS flow meters

The **LSFLO** limit switches serve as switches for minimum or maximum flow values. The normally open latching reed switch closes when the float in the measuring tube reaches and exceeds the switching position. The switch condition is maintained as long as the float is above the limit switch and will open when the float in the tube drops below the switch.

Normally closed switches are available on request.

technical

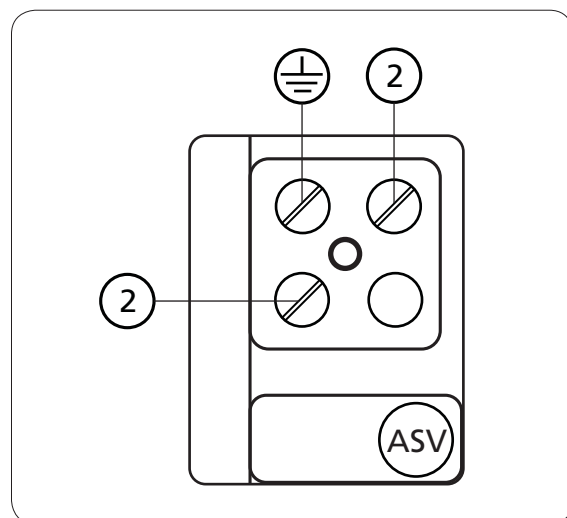
- **Operating voltage:** maximum 230 VAC
- **Operating current:** maximum 0.5 A
- **Constant current when switched:** maximum 1 A
- **Rupturing capacity:** maximum 10 W/10 VA
- **Closed resistance:** < 150 mΩ
- **Open resistance:** > 10¹⁰ Ω
- **Operating temperature:** 0°C(32°F) to 55°C(131°F)
- **Protection:** IP 65 (DIN EN 60528)
- **Hysteresis (switch on and off point):** 3 mm
- **Protection:** IP 65 (DIN EN 60528)
- **Dimensions:** 34 x 17 x 41 mm
- **Weight (with plug):** 40 g
- **Connections:** the polarity of the connections has no influence on the function

INSTALLATION

Screw clamps are used to fit the LSFLO on the dovetail guide of the flow meter.



CONNECTIONS



START-UP

Prior to the first start up it is important that the float passes the LSFLO switch three times to ensure the electronics inside recognize the magnetic field from the floats properly.

ZE3000 Flow Transmitters



for FS flow meters

The **ZE3000** flow transmitter provides a 4–20 mA output signal, generated by detection of the position of the magnetic float.

IMPORTANT: This micro-processor controlled unit is factory calibrated and unique to each flowmeter model. Flowmeter model must be advised when ordering.

technical

- 2-Wire technology
- 4–20 mA analog output (4-20.1 for 8 VDC supply; 4-22.0 for 28 VDC supply)
- 8–28 VDC input
- Factory calibrated (flow meter to be specified when ordering)
- 11 point calibration
- Non-volatile value storage
- 0 Button to compensate for the surrounding magnetic influences
- Factory setting of the lower limit value (low-cut-off) 0-99% according to customer's specifications
- Factory time lag (low-pass filter) 0.1-2.5 sec. according to customer's specifications
- Measuring accuracy: < 0.5%
- Temperature range: -30°C(-20°F) to 65°C(150°F)

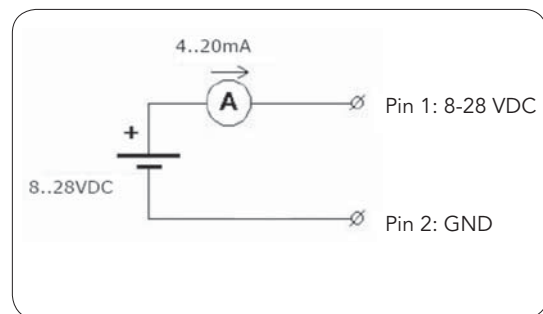
INSTALLATION

Screw clamps are used to fit the ZE3000 on the dovetail guide of the flow meter.

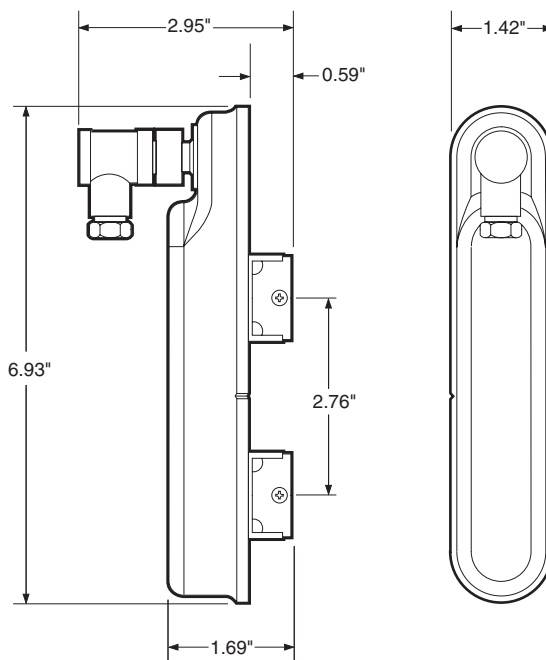
During installation, ensure that the notch of the ZE3000 coincides with the 50% mark on the flow meter scale.

Following this, proceed with the wiring according to the diagram.

WIRING

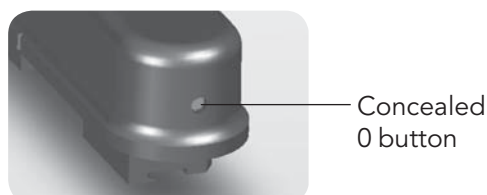


DIMENSIONS



START-UP

After installation and wiring, press the 0 button for at least 2 sec. to compensate for possible electro-magnetic interference. During this time make sure the float is at the bottom of the flowmeter (ie. no flow condition).



Note:

Do not press button during normal operation.

ZE3075 Flow Transmitters



for FC flow meters

The **ZE3075** flow transmitter provides a 2-wire 4–20 mA output signal omit generated by precise detection of the position of the magnetic float.

The magnetic float travels along the reed chain of switches activating them.

This micro-processor controlled unit is field calibrated.

technical

- **2-Wire technology**
- **4–20 mA analog output** (4-20.1 for 8 VDC supply; 4-22.0 for 28 VDC supply)
- **18–30 VDC input**
- **Field calibration**
- **Non-volatile value storage**
- **Measuring length:** 114 mm (4.5")
- **Measuring resolution:** 3.5 mm (0.138")
- **Measuring accuracy:** 3%
- **Temperature range:** –20°C(–4°F) to 70°C(158°F)

INSTALLATION

Screw clamps are used to fit the ZE3075 on the dovetail guide of the flow meter.

During installation, ensure that the top and bottom notches of the ZE3075 coincide with the 10% and 100% marks on the flow meter scale.

Following this, proceed with the wiring according to the diagram.

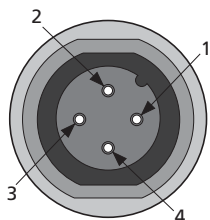
WIRING

The unit is connected with a commercially available unshielded cable.

Where electro-magnetic interference is to be expected, we recommend the use of a shielded cable.

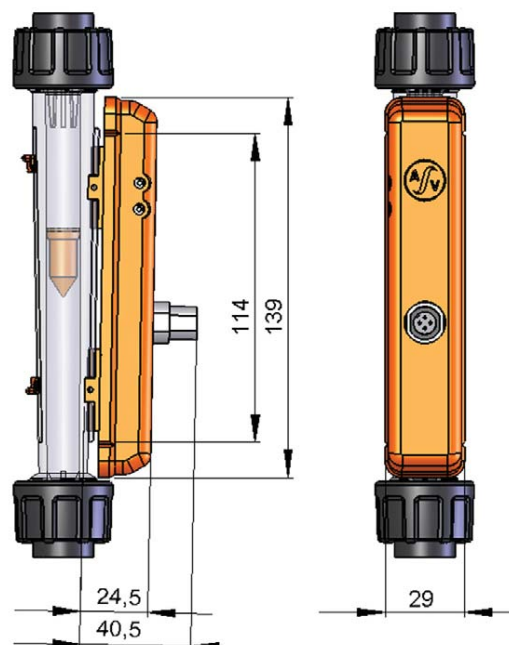
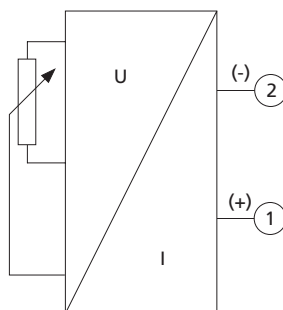
Cable cross section: max. 0.75 mm² cable outer diameter: 6 to 8 mm.

Flange Connector



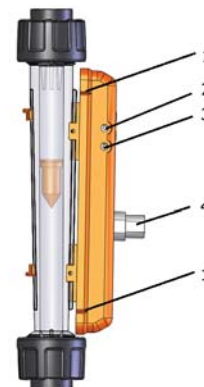
1. Signal (+)
2. Signal (+)
3. n.c.
4. n.c.

Circuit Diagram



COMPONENTS

1. Alignment notches for the proper location of the transmitter
2. Potentiometer for the upper limit value of the output signal
3. Potentiometer for the lower limit value of the output signal
4. Plug connector



CALIBRATION

Compensation between the non-linear scaling of the flowmeter and the linear output signal of the flow data sensor must be performed by adjusting, preferably between 20% and 80% of the flow rate.

20% corresponds to 7.2mA and 80% to 16.8mA.

- Connect the ampermeter and the respective voltage supply to the flow data sensor
- Allow 20% of the flow to pass through the FC flow meter
- Set the min. trimmer potentiometer (3) such that the corresponding current (7.2mA) is shown in the ampermeter
- Allow 80% of the flow to pass through the FC flow meter
- Set the max. trimmer potentiometer (3) such that the corresponding current (16.8mA) is shown in the ampermeter
- Check the values at 20% and 80% several times and repeat the adjustment, if required



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OPERATION AND MAINTENANCE MANUAL
AMARUQ WTP – NUNAVUT
VEOLIA PROJECT: 5000 218 009

4 – DETAILED TECHNICAL DOCUMENTATION

4.3 – SHOP DRAWINGS

4.3.11 – ACTIFLO RECIRCULATION LINE MODIFICATION

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0011_ACP

by: LJ

chkd: GP

appvd: CB



SUBMITTAL PACKAGE

ACTIFLO RECIRCULATION LINE

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Project name: AMARUQ
Project#: 5000218009
Document #: SPK_0011_ACP
by: LJ
chkd: GP
appvd: CB



ACTIFLO RECIRCULATION LINE FIELD INSTALLATION DRAWING

OIM manual section: 4.3.11.1

REFER TO 5000218009_FI_0002_ACP_VWT

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Project name: AMARUQ
Project#: 5000218009
Document #: SPK_0011_ACP
by: LJ
chkd: GP
appvd: CB



ACTIFLO RECIRCULATION LINE HYDRAULIC PROFILE

OIM manual section: 4.3.11.2

REFER TO 5000218009_HY_0001_GEN_VWT

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Project name: AMARUQ

Project#: 5000218009

Document #: SPK_0011_ACP

by: LJ

chkd: GP

appvd: CB



ACTIFLO RECIRCULATION LINE

VALVES

OIM manual section: 4.3.11.4

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CS-301-400 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CFF	VABLSS305300	C2-022	DIA: 38 mm (1- 1/2")	HYDROCYCLONE	TYPE: BALL VALVE//MANUFACTURER : PMP//MODEL : A201 (1- 1/2")//CONNECTION TYPE : THREADED 38 mm (1- 1/2")//BODY : ASTM 351 GR. CF8M// SEAL SEAT :RPTFE PTFE// STEM : SS 316			ACTIFLO RECIRCULATION LINE MODIFICATION		

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2 Piece Ball Valve Full Port

A201
1000 WOG
1/4" – 3" NPT

Adjustable PTFE
Packing

Investment Cast Body
CF8M Body

PTFE Body Seal

Full Bore Design

Stainless Steel
Latch Lock Handle

Blow-out Proof Stem

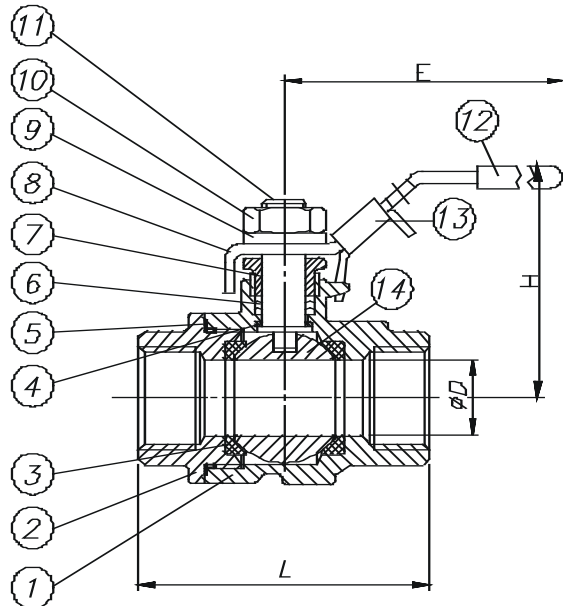
Solid Ball & Stem

Bi-Directional
RPTFE Seats



Pressure Rating

- 1/4" – 2" 1000 WOG
- 2-1/2" – 3" 800 WOG



NO	PART NAME	QTY	SPECIFICATION	
1	BODY	1	WCB	CF8M
2	END CAP	1	WCB	CF8M
3	SEATS	2	RPTFE	RPTFE
4	THRUST WASHER	1	PTFE	PTFE
5	BODY GASKET	1	PTFE	PTFE
6	STEM PACKING	3	PTFE	PTFE
7	PACKING GLAND	1	SS304	SS304
8	HANDLE	1	C.S.	SS304
9	HANDLE WASHER	1	C.S.	SS304
10	HANDLE NUT	1	C.S.	SS304
11	STEM	1	SS304	SS316
12	HANDLE SLEEVE	1	PLASTIC	PLASTIC
13	LOCKING DEVICE	1	C.S.	SS304
14	BALL	1	SS304	SS316

SIZE		1/4"	3/8"	1/2"	3/4"	1"	1-1/4"	1-1/2"	2"	2-1/2"	3"
D	in	0.46	0.50	0.50	0.75	1.00	1.25	1.50	2.00	2.50	3.00
	mm	10	12	15	20	25	32	40	50	65	80
L	in	2.13	2.13	2.68	3.03	3.58	3.98	4.25	4.88	7.28	8.07
	mm	54	54	68	77	91	101	108	124	185	205
H	in	2.32	2.32	2.36	2.91	3.03	3.43	3.66	4.21	5.71	6.10
	mm	59	59	60	74	77	87	93	107	145	155
E	in	4.49	4.49	4.49	5.43	5.43	7.28	7.68	7.68	10.24	10.24
	mm	114	114	114	138	138	185	195	195	260	260

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CS-301-1110 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	SUBMITTED TO (COMPANY):	AGNICO EAGLE MINES
ENGINEER:	Gabriel Hébert	SUBMITTED TO (RESPONSIBLE):	
PROJECT MANAGER:	Clément B	PROJECT NUM REFERENCE.:	
PHONE NUMBER:		LOT NUMBER:	

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CFF	VABLSS200267	PI2-011-V001	DIA: 13 mm (1/2")	ISOLATION VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (1/2")//CONNECTION TYPE : THREADED 13 mm (1/2")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
CFF	VABLSS200267	PI2-011-V002	DIA: 13 mm (1/2")	ISOLATION VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (1/2")//CONNECTION TYPE : THREADED 13 mm (1/2")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
CFF	VABLSS200267	PI2-012-V001	DIA: 13 mm (1/2")	ISOLATION VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (1/2")//CONNECTION TYPE : THREADED 13 mm (1/2")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CFF	VABLSS200267	PI2-012-V002	DIA: 13 mm (1/2")	ISOLATION VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (1/2")//CONNECTION TYPE : THREADED 13 mm (1/2")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
CFF	VABLSS200267	PI2-021-V001	DIA: 13 mm (1/2")	ISOLATION VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (1/2")//CONNECTION TYPE : THREADED 13 mm (1/2")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
CFF	VABLSS200267	PI2-021-V002	DIA: 13 mm (1/2")	ISOLATION VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (1/2")//CONNECTION TYPE : THREADED 13 mm (1/2")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
CFF	VABLSS200267	PI2-022-V001	DIA: 13 mm (1/2")	ISOLATION VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (1/2")//CONNECTION TYPE : THREADED 13 mm (1/2")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
CFF	VABLSS200267	PI2-022-V002	DIA: 13 mm (1/2")	ISOLATION VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (1/2")//CONNECTION TYPE : THREADED 13 mm (1/2")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
CFF	VABLSS200268	V2-012	DIA: 20 mm (3/4")	DRAIN VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (3/4")//CONNECTION TYPE : THREADED 20 mm (3/4")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
CFF	VABLSS200268	V2-013	DIA: 20 mm (3/4")	DRAIN VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (3/4")//CONNECTION TYPE : THREADED 20 mm (3/4")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
CFF	VABLSS200268	V2-022	DIA: 20 mm (3/4")	DRAIN VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (3/4")//CONNECTION TYPE : THREADED 20 mm (3/4")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		

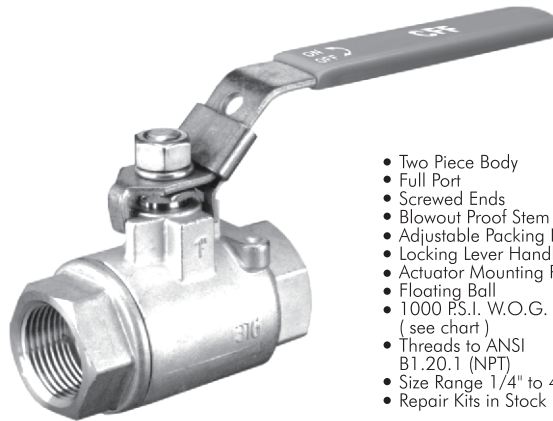
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CFF	VABLSS200268	V2-023	DIA: 20 mm (3/4")	DRAIN VALVE	TYPE: TWO PIECE BALL VALVE 1000 psi W.O.G./MANUFACTURER : CFF//MODEL : SS-2 (3/4")//CONNECTION TYPE : THREADED 20 mm (3/4")//BODY : 316 SS// SEAL SEAT : PTFE TEFLON// STEM : 316 SS C/W MANUAL LEVER			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		

C.F.F. SS · SERIES 316 STAINLESS STEEL VALVES

BALL VALVES

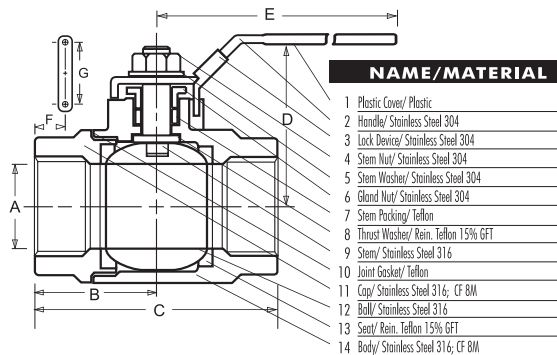


BALL



- Two Piece Body
- Full Port
- Screwed Ends
- Blowout Proof Stem
- Adjustable Packing Nut
- Locking Lever Handle
- Actuator Mounting Pad
- Floating Ball
- 1000 P.S.I. W.O.G.
(see chart)
- Threads to ANSI
B1.20.1 (NPT)
- Size Range 1/4" to 4"
- Repair Kits in Stock

**Manufactured in accordance with
ISO 9002 quality standards.**



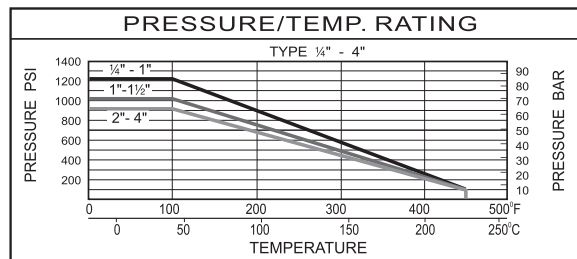
Visit us on-line at:
www.cffstainless.com

SS · 2 BALL VALVE

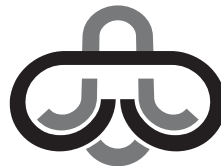
BALL VALVES

DIMENSIONS								
	Nominal Size	(mm/in) A	(mm/in) B	(mm/in) C	(mm/in) D	(mm/in) E	(mm/in) F	(mm/in) G
8	¼	11.6	30	60	45	110	12.7	28.45
		0.457	1.181	2.362	1.772	433.1	0.50	1.120
10	⅜	12.7	30	60	45	110	12.7	28.45
		0.50	1.181	2.362	1.772	433.1	0.50	1.120
15	½	15	32	64	45	130	12.7	28.45
		0.591	1.260	2.520	1.772	5.118	0.50	1.120
20	¾	20	38.5	77	50	130	22.10	34.80
		0.787	1.516	3.032	1.969	5.118	0.87	1.37
25	1	25.4	45	90	65	155	22.10	38.10
		1.00	1.772	3.543	2.559	6.102	0.87	1.37
32	1¼	32	50	100	70	155	23.62	38.10
		1.260	1.967	3.937	2.756	6.102	0.93	1.50
40	1½	38.1	59	118	75	185	23.62	38.10
		1.50	2.323	4.646	2.953	7.283	0.93	1.50
50	2	50.8	68.5	137	85	185	23.62	38.10
		2.00	2.697	5.398	3.346	7.283	0.93	1.50
65	2½	65	82.5	165	136	250	—	70
		2.561	3.248	6.496	5.364	9.843	—	2.756
80	3	80	97.5	195	149	250	—	70
		3.152	3.839	7.677	5.866	9.843	—	2.756

Design and materials are subject to change without notice.



FLOW COEFFICIENT CV										
Size (in.)	¼	⅜	½	¾	1	1¼	1½	2	2½	3
Cv	6	7	10	25	35	46	80	110	310	360
Operating Torques (lbs.)	36	36	43	65	101	158	187	230	430	1380



Visit us on-line at:
www.cffstainless.com



CS-312-110 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	AGNICO EAGLE MINES	
ENGINEER:	Gabriel Hébert		
PROJECT MANAGER:	Clément B		
PHONE NUMBER:			

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
PMP	ST-312-110	V2-010	DIA: 63 mm (2- 1/2")	DRAIN VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1-L/2- 1/2"//CONNECTION TYPE : FLANGED 63 mm (2- 1/2")//BODY : CAST IRON// SEAL SEAT :FONTE DUCTILE REVETUE EN CAOUTCHOU NICKEL// STEM : N/A			ACTIFLO RECIRCULATION LINE MODIFICATION		
PMP	ST-312-110	V2-011	DIA: 63 mm (2- 1/2")	DRAIN VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1-L/2- 1/2"//CONNECTION TYPE : FLANGED 63 mm (2- 1/2")//BODY : CAST IRON// SEAL SEAT :FONTE DUCTILE REVETUE EN CAOUTCHOU NICKEL// STEM : N/A			ACTIFLO RECIRCULATION LINE MODIFICATION		
PMP	ST-312-110	V2-020	DIA: 63 mm (2- 1/2")	DRAIN VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1-L/2- 1/2"//CONNECTION TYPE : FLANGED 63 mm (2- 1/2")//BODY : CAST IRON// SEAL SEAT :FONTE DUCTILE REVETUE EN CAOUTCHOU NICKEL// STEM : N/A			ACTIFLO RECIRCULATION LINE MODIFICATION		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
PMP	ST-312-110	V2-021	DIA: 63 mm (2- 1/2")	DRAIN VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1-L/2- 1/2"//CONNECTION TYPE : FLANGED 63 mm (2- 1/2")//BODY : CAST IRON// SEAL SEAT : FONTE DUCTILE REKETUE EN CAOUTCHOU NICKEL//STEM : N/A			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		

ISO 9001 CERTIFIED



**MILLCENTRIC®
ECCENTRIC PLUG VALVE**



Milliken Valve offers the following for your water and wastewater needs:

- Eccentric Plug Valves
 - Series 601/600 Flanged & MJ
 - Series 601S Stainless Steel
 - Series 601RL Rubber Lined
 - Series 602 High Pressure
 - Series 603 Threaded End
 - Series 604E Three Way
 - Series 606 Grooved End
 - Series 611/610 Flanged & MJ
 - Model 625 UL /CGA Listed
- AWWA Swing Check Valves
- Wafer Check Valves
- Flex Check
- Spring Loaded Check Valves
- AWWA Butterfly Valves
- General Service Butterfly Valves

The Milliken Valve Company designs, develops, manufactures and markets plug, butterfly, and check valves and their respective controls and actuators. These valves are used primarily in the water, wastewater, and industrial markets.

Milliken Valve was started over two decades ago manufacturing the eccentric plug valve for the waste water and HVAC marketplace. Growth has been constant with the addition of a AWWA butterfly valve, general service butterfly valve, swing check valve, rubber flapper check valve, double disc check valve, wafer (outside spring) check valve, globe style check valve and compact wafer check valve.

Milliken believes that in order to satisfy customers, our products need to be considered the best design and the highest quality within the industry. All of our valves have had extensive testing before they are marketed or sold. Milliken's quality standards are a step above the industry norm, and Milliken is committed to standing behind its products in the field. All valves are tested in complete conformance to applicable standards before shipment. In addition, valve designs are routinely sent to independent testing facilities to ensure they meet or exceed expectations.



Millcentric Eccentric Plug Valve

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Suggested Specifications

The Milliken criteria of quality, reliability, safety and value are embodied in the Millcentric® Eccentric valve, setting higher standards for dependable performance with excellent features achieved by the utilization of the very latest design and manufacturing techniques.

- Computer Aided Design
- High Integrity Casting
- CNC manufacturing delivers consistent sizes on all components

All complemented by rigorous Quality Control System

Body

Conforming to AWWA C504 wall thickness, the MILLCENTRIC valve body casting is in ASTM A126 CL B cast iron using high pressure molding techniques. Alternative flanged, grooved or mechanical joint ends are available.

Flange diameter, thickness and drilling conform to ANSI B16.1 Class 125 or 250.

Grooved ends meet AWWA C-606 for ductile or steel pipe. Mechanical joints to AWWA C111 (ANSI A21.11).

Seat

The MILLCENTRIC valve incorporates as standard, on 3" and larger, a 1/8" thick welded 99% nickel seat for corrosion and erosion resistance specifically profiled for low torque and extended seat life.

Stem Seal

High integrity sealing by combining the advantages of a resilient and abrasion resistant U-Cup seal. From vacuum to high pressure, the self-adjusting sealing system (per AWWA C504) gives positive, trouble-free service and is retained independently of the plug stem or external torque device, thereby eliminating periodic maintenance.

Bearings

The plug rotates in permanently lubricated 316 grade stainless steel bearings, located in the body and bonnet, along with upper and lower PTFE thrust washers, which ensure consistently low operating torque.

Plug

Supported on integral trunnions, the plug is totally encapsulated with an elastomer that is molded on 2½" – 48" and vulcanized on 54" and larger to the casting providing tight shut off even under vacuum conditions. High integrity corrosion-free sealing is achieved by a variety of abrasion resistant elastomers which protect the plug right up to the trunnions. When assembled, the light compression of the elastomers onto PTFE thrust washers, prevents entry of abrasive materials into the bearings.

Bonnet Seal

Superior "O" ring sealing with metal/metal contact means lower bolting stresses compared with compression gaskets.

Flow

The port design (round on 2½" – 12" and rectangular on 14" and larger) with streamlined internal contours gives the highest industry capacity straight through flow in the full open position, reducing turbulence and pressure drop and the effect of erosive media. Handling of sludges and slurries is therefore enhanced.

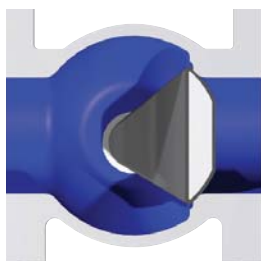
Interchangeable

Because of the common face to face dimension with wedge gate valves (3" – 12"), fitting the tight shut-off rotary MILLCENTRIC valve into existing systems is accomplished without pipeline modifications.

Travel Stops

Adjustable open and closed travel stops are fitted as standard on both wrench and gear operated MILLCENTRIC valves.

Suggested Specifications



- Valve in closed position for bubble tight shut-off
- Normal flow direction gives pressure assisted sealing
- Torques are low even in reverse flow



- Plug rotates away from the seat for instant opening
- Seat wear and operating torque reduced
- No further seat contact until valve is closed again



- Design of Millcentric plug valve allows modulating control over the full 90° travel
- Ideally suited for balancing service
- Standard rotary valve provides control and tight shut off in one valve



- Plug is out of flow path when fully open
- Straight through, uninterrupted smooth flow
- Round port reduces turbulence and erosion, lowers pumping costs and can be "pigged" to clean the pipeline

Installation

The Millcentric® plug valve is suitable for flow and shut-off in either direction. Seat end downstream is the preferred orientation and any reverse flow requirement should be stated at the time of order. For use on fluids with suspended solids, installation with the seat upstream and the valve stem horizontal is recommended with, plug rotation to the top of the valve will ensure smooth operation.

In-Line Maintenance

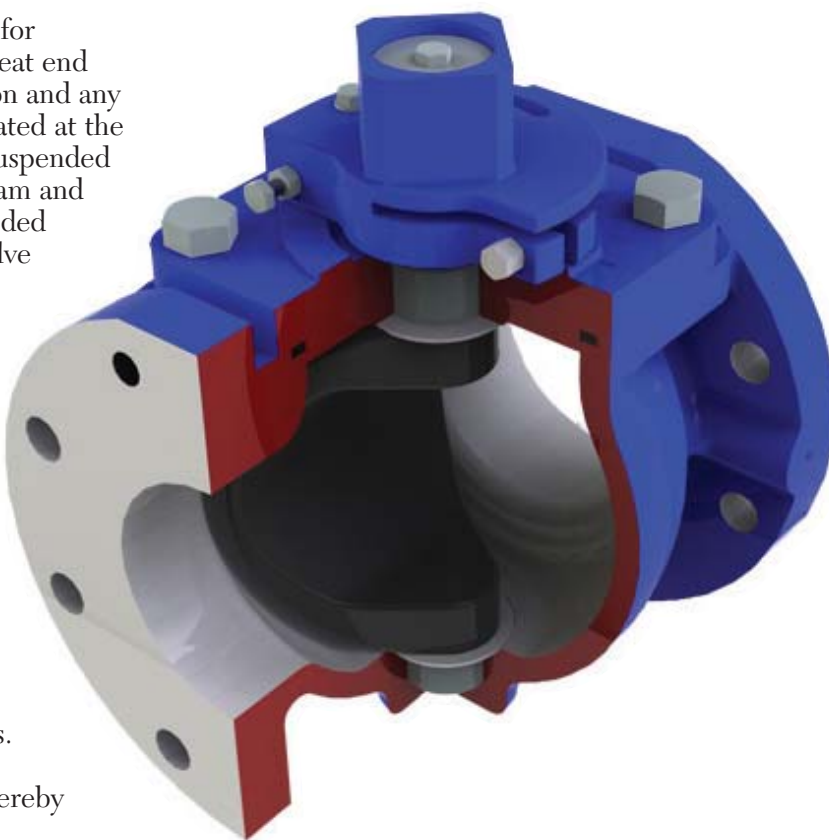
In the unlikely event of stem leakage, the stem seals can be easily replaced without removing the bonnet. Access to the body for cleaning or inspection does not require removal from the line.

Modular Construction

Design of the bonnet and stem allows for on-site adaption of gear operators, power actuators, or extension devices on to standard valves. Conversion can be easily undertaken without removing the valve bonnet, thereby minimizing downtime.

Power Operation

Pneumatic, electric or hydraulic operation is available, complete with accessories such as limit switches, solenoid valves and positioners when required.



Technical Data

ORDERING INFORMATION

Valve Types

Mechanical Joint Cast Iron
Mechanical Joint Ductile Iron
ANSI 125 Flanged Cast Iron
ANSI 125 Flanged Ductile Iron
ANSI 150 Flanged Ductile Iron
ANSI 250 Flanged Ductile Iron
ANSI 125 Grooved for Steel Pipe
ANSI 125 Grooved for Ductile Pipe
ANSI 150 Flanged 316SS

SEAT

Nickel (3" & Larger)
Epoxy (2½" ONLY)
316SS (on stainless steel valve only)
Rubberlined
Glasslined

ELASTOMER TRIM

EPDM
Buna-Nitrile
Viton
Neoprene
Natural

MANUAL OPERATORS

Above Ground Gear and Handwheel
Above Ground Gear with 2" Nut
Buried Gear with 2" Nut
Memory Stop Gear with Handwheel
Lever / Wrench (8" & smaller)
Direct Nut (8" & smaller)

Example: 4" 601N3AGHW = 4" ANSI 125 Flanged, Nickel Seat, Neoprene plug with Above Ground Gear and Handwheel

Designation

600
610
601
611
621
602
606S
606D
601S

N
E
S
RL
GL

0
1
2
3
4

AGHW
AGNUT
BG
MGHW
L
TC

PRESSURE RATING

12" and smaller	ANSI 125	175 psi
14" and larger	ANSI 125	150 psi
20" and smaller	ANSI 150	285 psi
12" and smaller	ANSI 250	400 psi
14" and larger	ANSI 250	300 psi

Body Hydrotest = 150% of rated pressure / Seat Test = 100% of rated pressure
Testing per AWWA C517

ELASTOMERS AVAILABLE FOR MILLCENTRIC VALVE

Natural rubber is also available.

Nitrile

A general purpose material sometimes referred to as BUNA-N or HYCAR with a -20°F to 212°F temperature range. Used on sewage, water, hydrocarbon and mineral oils.

EPDM

An excellent polymer for use on chilled water through to LP steam applications having a temperature range of -35°F to 250°F. Resistance to many acids, alkalies, detergents, phosphate esters, alcohols and glycols is an added benefit.

Neoprene

This versatile material shows outstanding resistance to abrasion and ozone. Chemical resistance to a wide range of petroleum base products and dilute acids and alkalies. Temperature range -20°F to 225°F.

Viton

Retention of mechanical properties at high temperature is an important feature of this elastomer: temperature range is -10°F to 300°F. It also has excellent resistance to oils, fuels, lubricants and most mineral acids and aromatic hydrocarbons.
Note: Not for water or steam applications.

Valves are only tested for bi-directional shut-off if specified at time of order. Contact Milliken for bi-directional ratings.

NOTE: We recommend mechanical joint or buried flanged valves to have gear operators

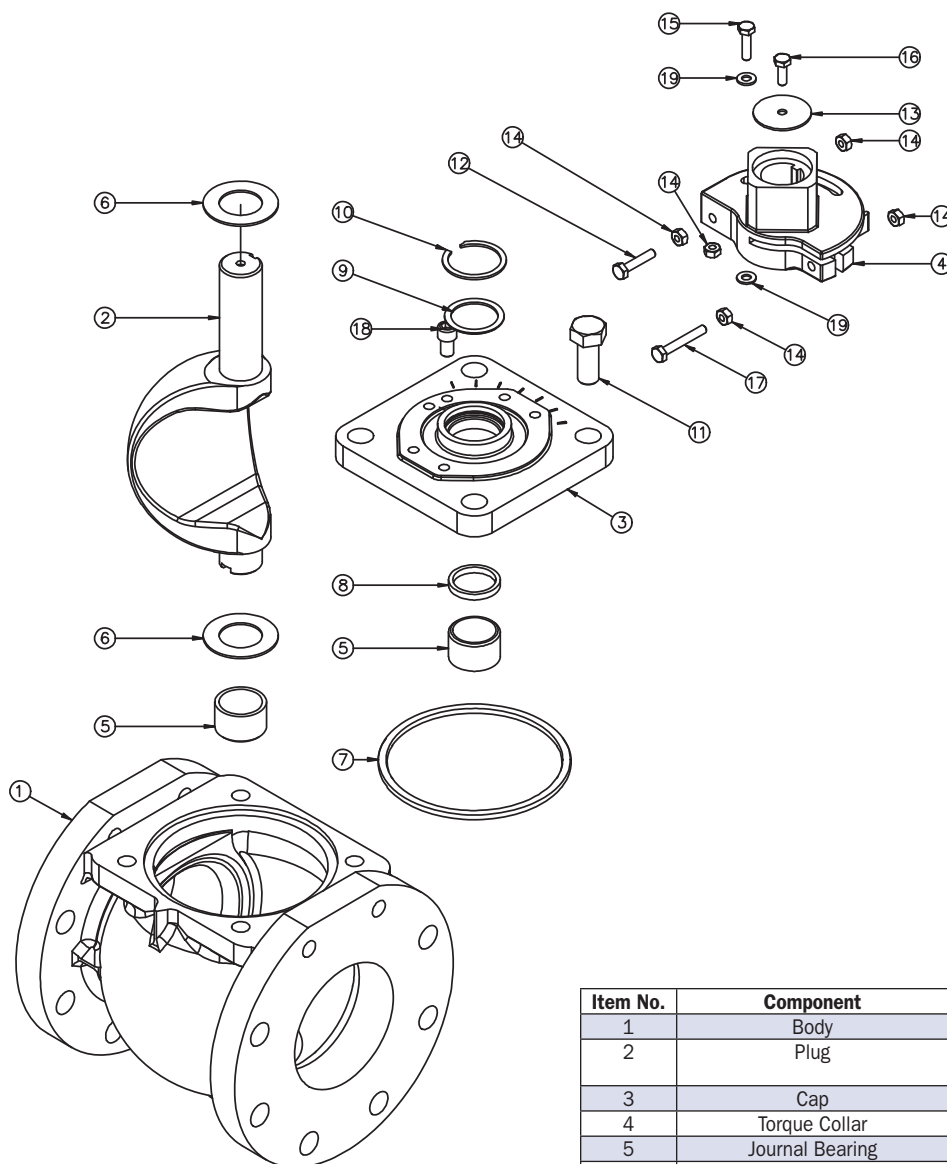
NOTE: We recommend valves for bi-directional service to have gear operators

Elastomer Selection Chart

Service	Elastomer	Average Useful Temp. Range	Service	Elastomer	Average Useful Temp. Range	Service	Elastomer	Average Useful Temp. Range
Acetone	EPDM	-35°F to 250°F	Caustic Soda	EPDM	-35°F to 250°F	Oil, Animal	Nitrile	-20°F to 212°F
Air	EPDM	-35°F to 250°F	Cement Slurry	EPDM	-35°F to 250°F	Oil, Mobil Therm Light	Viton	10°F to 250°F
Air w/Oil	Nitrile	0°F to 212°F	Copper Sulphate	EPDM	-35°F to 250°F	Oil, Mobil Therm 600	Viton	10°F to 250°F
Alcohol AMYL	EPDM	0°F to 212°F	Creosote (Coal)	Nitrile	-20°F to 212°F	Oil, Mobil Therm 603	Nitrile	-20°F to 212°F
Alcohol Aromatic	Viton	10°F to 250°F	Coal Slurry	Nitrile	-20°F to 212°F	Oil, Lubricating	Nitrile	-20°F to 212°F
Alcohol Butyl	Neoprene	-20°F to 225°F	Diesel Fuel No. 3	Nitrile	-20°F to 212°F	Oil, Vegetable	Nitrile	-20°F to 212°F
Alcohol Denatured	Nitrile	-20°F to 212°F	Diethylene Glycol	EPDM	-35°F to 250°F	Paint, Latex	Nitrile	-20°F to 212°F
Alcohol Ethyl	EPDM	-20°F to 250°F	Ethylene Glycol	EPDM	-35°F to 250°F	Phosphate Ester	EPDM	-35°F to 250°F
Alcohol Grain	Nitrile	-20°F to 212°F	Fatty Acid	Nitrile	-20°F to 212°F	Propane	Nitrile	-20°F to 212°F
Alcohol Isopropyl	Neoprene	-20°F to 225°F	Fuel Oil No. 2	Nitrile	-20°F to 212°F	Rape Seed Oil	EPDM	-35°F to 250°F
Alcohol Methyl	EPDM	-20°F to 250°F	Fertilizer Liquid H ₂ N ₂ O ₂	EPDM	-35°F to 250°F	Sewage with Oils	Nitrile	-20°F to 212°F
Ammonia Anhydrous	Neoprene	-20°F to 225°F	Gasoline Keg	Nitrile	-20°F to 212°F	Sodium Hydroxide 20%	EPDM	-35°F to 250°F
Ammonium Nitrate	EPDM	-20°F to 250°F	Gas Natural	Nitrile	-20°F to 212°F	Starch	EPDM	-35°F to 250°F
Ammonia, water	EPDM	-20°F to 250°F	Glue, Animal	Nitrile	-20°F to 212°F	Steam to 250°F	EPDM	-35°F to 250°F
Animal Fats	Nitrile	-20°F to 212°F	Green Liquor	EPDM	-20°F to 212°F	Stoddard, Solvent	Nitrile	-20°F to 80°F
Black Liquor	EPDM	-20°F to 250°F	Hydraulic Oil (Petro)	Nitrile	-20°F to 212°F	Sulphuric Acid 10% 50%	Neoprene	-20°F to 158°F
Blast Furnace Gas	Neoprene	-20°F to 225°F	Hydrogen	Nitrile	-20°F to 212°F	Sulphuric Acid 100%	Viton	10°F to 300°F
Butane	Nitrile	-20°F to 212°F	JF4, JP5	Viton	-20°F to 212°F	Trichloroethylene Dry	Viton	10°F to 300°F
Bunker Oil "C"	Nitrile	-20°F to 212°F	Kerosene	Nitrile	0°F to 212°F	Triethanol Amine	EPDM	-35°F to 250°F
Calcium Chloride	EPDM	-20°F to 250°F	Ketone	EPDM	-35°F to 250°F	Varnish	Viton	10°F to 300°F
Carbon Dioxide	EPDM	-20°F to 250°F	Lime Slurry	EPDM	-35°F to 250°F	Water, Fresh	EPDM	-35°F to 250°F
Carbon Monoxide (Cold)	Neoprene	-20°F to 150°F	Methane	Nitrile	-20°F to 212°F	Water, Salt	EPDM	-35°F to 250°F
Carbon Monoxide (Hot)	Viton	10°F to 300°F	Methyl Ethyl Ketone	EPDM	-35°F to 250°F	Xylene	Viton	10°F to 300°F
Carbon Tetrachloride	Viton	10°F to 300°F	Naptha (Berzin)	Nitrile	-20°F to 212°F			

NOTE: Above elastomer/temperature chart are guidelines only. See Milliken Compatibility Chart for specific applications.

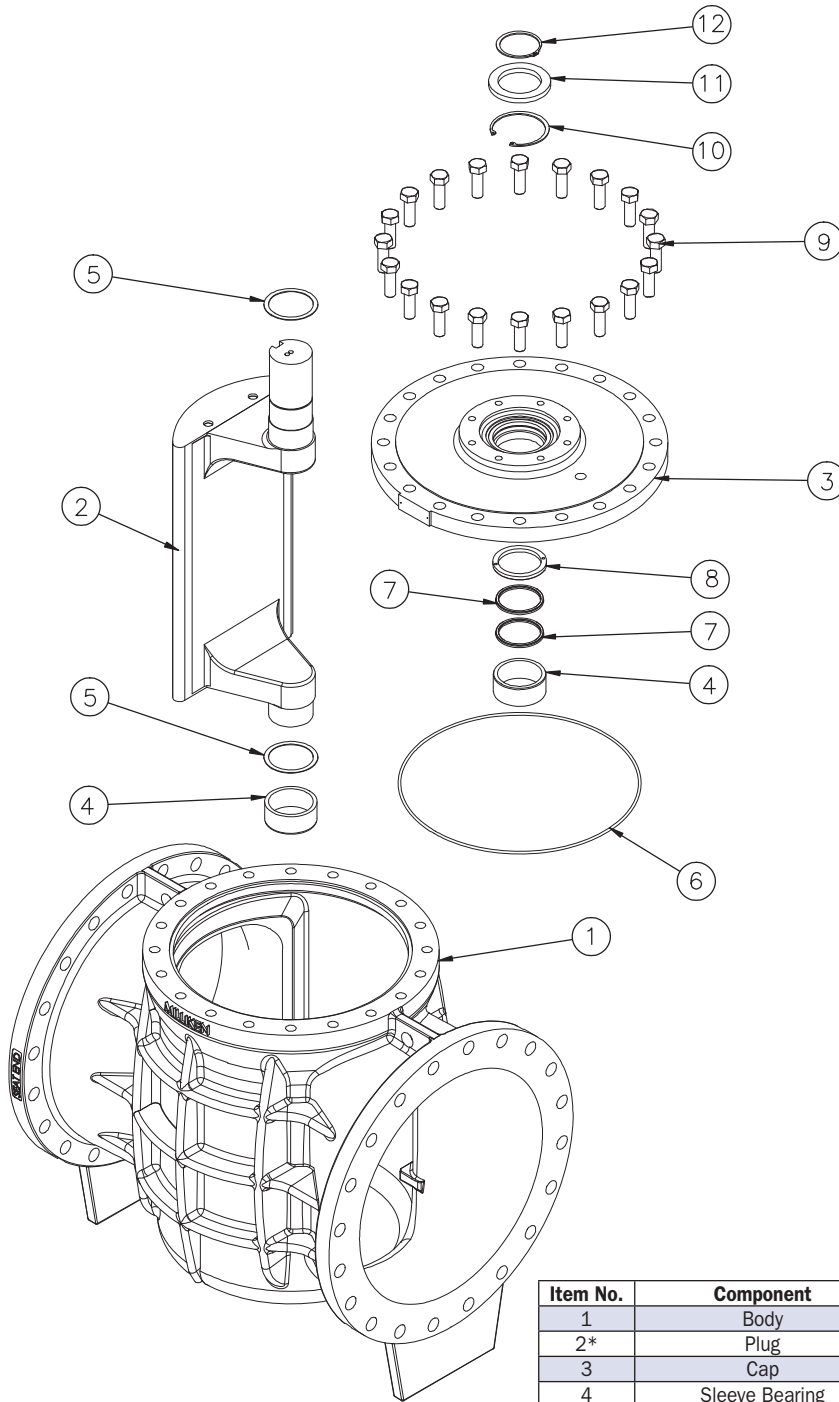
Standard Materials of Construction, Fig. 601/600, 12" & Smaller



Item No.	Component	Material
1	Body	Cast Iron A126 Class B
2	Plug	Rubber Coated Ductile Iron ASTM A536
3	Cap	Cast Iron A126 Class B
4	Torque Collar	Ductile Iron ASTM A536
5	Journal Bearing	St. Steel — ANSI 316
6	PTFE Washer (Grit Seal)	PTFE
7	O Ring	Elas. as Spec.
8	U Cup Seal	Elas. as Spec.
9	Washer	Brass — ASTM B-138-675
10	Internal Snap Ring	Spring Steel
11	Setscrew	Steel (Zinc Plated)
12*	Closed Stop	Steel (Zinc Plated)
13*	Locking Washer	Steel
14*	Nut	Steel (Zinc Plated)
15*	Open Stop	Steel (Zinc Plated)
16*	Setscrew	Steel (Zinc Plated)
17*	Torque Bolt	Steel (Zinc Plated)
18*	Travel Stop	Steel
19*	Washer	Steel

*NOTE: Torque Collar Assembly on 8" and Smaller

Standard Materials of Construction, Fig. 601/600, 14" & Larger



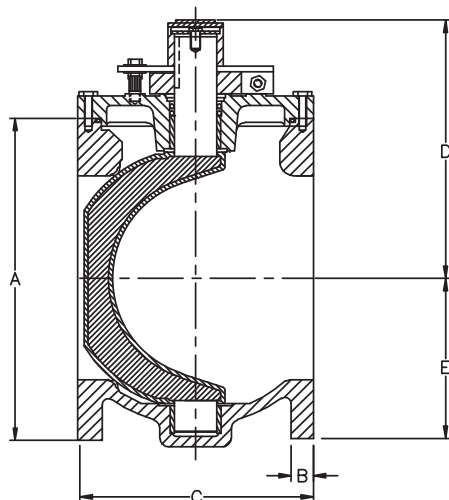
Item No.	Component	Material	Qty.
1	Body	Cast Iron A126 Class B	1
2*	Plug	Rubber Coated See Note 1	1
3	Cap	Cast Iron A126 Class B	1
4	Sleeve Bearing	Stainless Steel/Bronze	2
5	PTFE Washer (Grit Seal)	PTFE	2
6	Cap "O" Ring	Elas. as Spec.	1
7	U Cup Seal	Elas. as Spec.	2
8*	Seal Retaining Ring	See Note 2	1
9	Cap Screw	Steel (Zinc Plated)	A/R
10	Internal Snap Ring	Spring Steel	1
11	Support Collar	Steel	1
12	External Snap Ring	Spring Steel	1

*NOTE 1: Plugs: Ductile Iron — ASTM A536 on 14" – 20"
Cast Iron — A126 Class B on 24" and larger

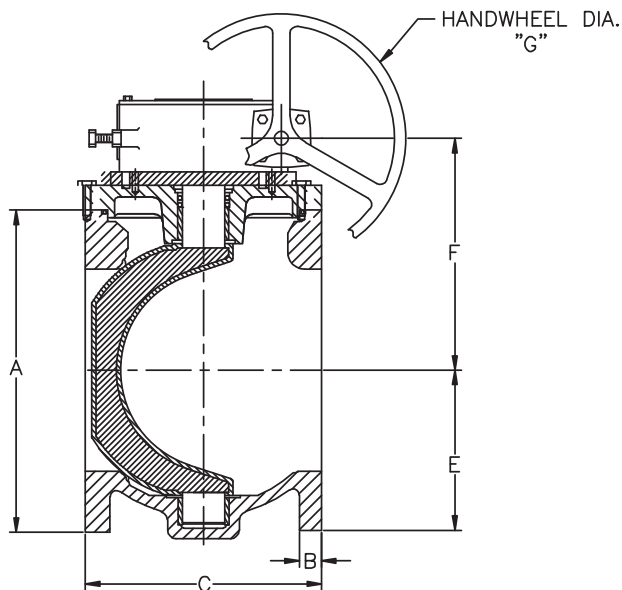
*NOTE 2: Seal Retaining Ring: Brass — ASTM B-138-675 on 14" – 20"
Steel on 24" and larger

Fig. 601 Cast Iron / 611 Ductile Iron – Flanged End
2½" – 12", 175 PSI

2½" – 8" VALVES ONLY



2½" – 12" VALVES



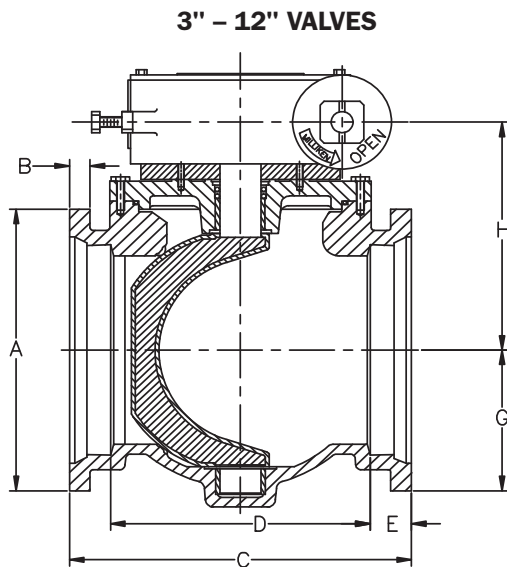
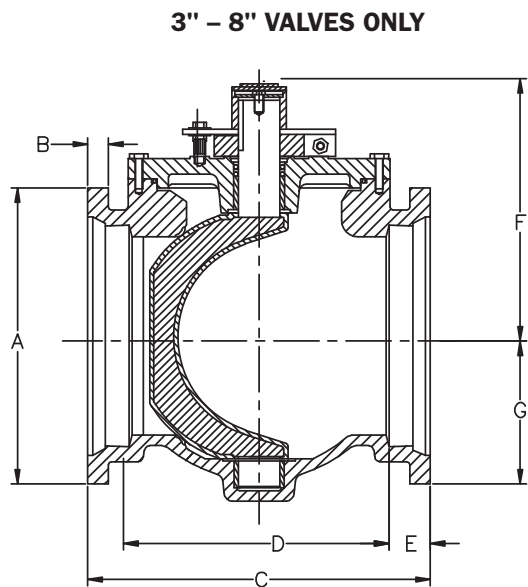
FLANGED END — ANSI 125								
SIZE	2.50	3	4	5	6	8	10*	12*
A	7.00	7.50	9.00	10.00	11.00	13.50	16.00	19.00
B	.69	.75	.94	.94	1.00	1.13	1.19	1.25
C	7.50	8.00	9.00	10.00	10.50	11.50	13.00	14.00
D	6.19	6.19	7.25	8.38	8.38	10.69	—	—
E	3.50	3.75	4.50	5.75	5.75	7.63	8.88	10.00
F	5.16	5.16	6.31	7.56	7.56	9.63	11.13	12.81
G	6.00	6.00	6.00	6.00	6.00	12.00	12.00	12.00
WEIGHT (approx.)	30	40	70	105	115	190	345**	440**

*10" & above have gear operators as standard

**Weight includes gear operator

NOTE: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

Fig. 600 Cast Iron / 610 Ductile Iron – Mechanical Joint
3" – 12", 175 PSI



MECHANICAL JOINT END						
SIZE	3	4	6	8	10*	12*
A	7.69	9.00	11.13	13.38	15.63	17.94
B	.94	1.00	1.06	1.13	1.19	1.25
C	11.50	14.25	15.75	17.38	15.63	20.75
D	6.00	9.25	10.75	12.39	14.39	15.75
E	2.75	2.50	2.50	2.50	2.50	2.50
F	6.19	7.25	8.38	10.69	—	—
G	3.84	4.50	5.56	6.69	7.81	8.97
H	5.16	6.31	7.56	9.63	11.13	12.81
WEIGHT (approx.)	50	80	125	200	360**	480**

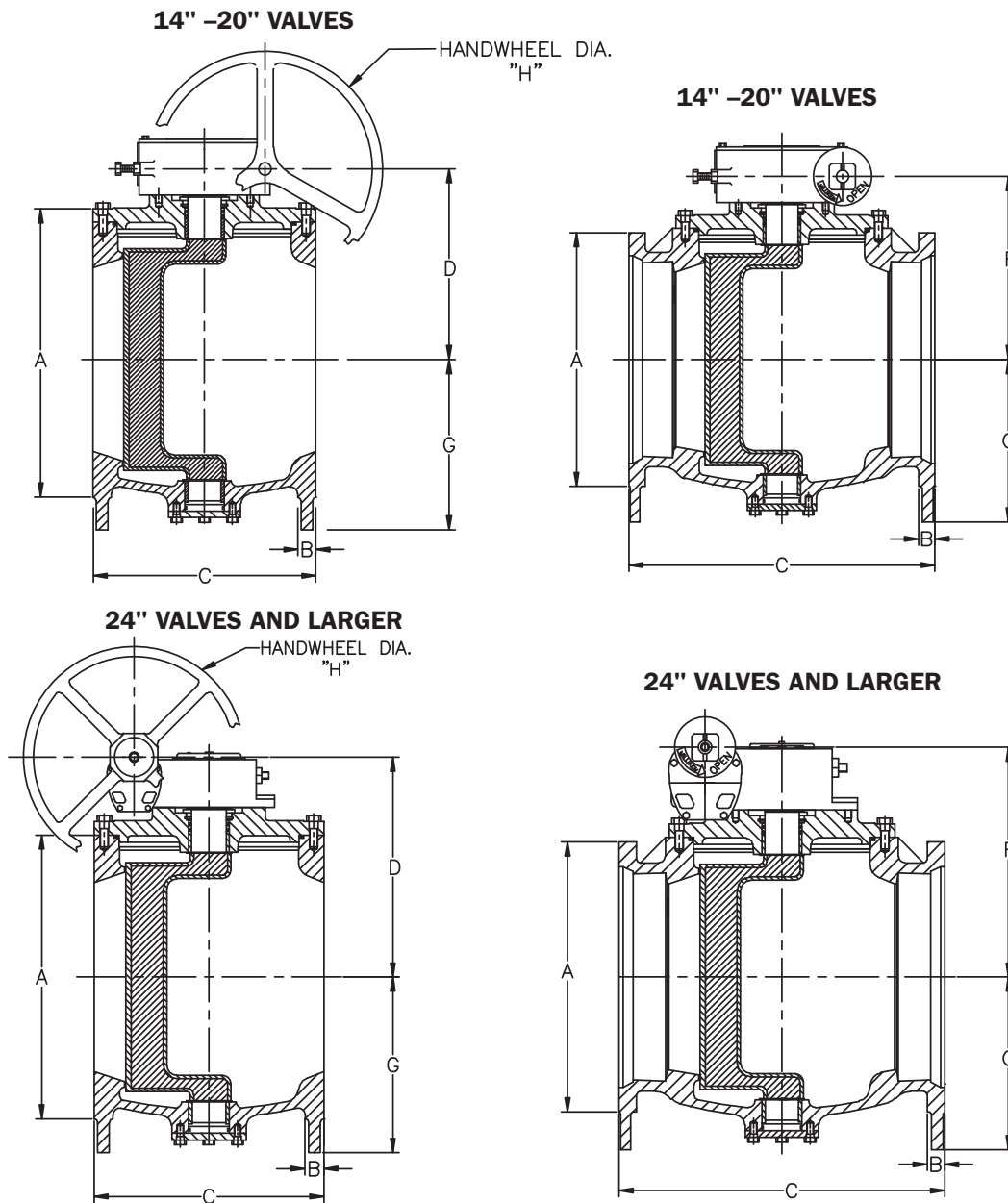
*10" & above have gear operators as standard

**Weight includes gear operator

We recommend gears on all Mechanical Joint Valves

NOTE: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

Fig. 601 Cast Iron / 611 Ductile Iron Flanged End
Fig. 600/610 Ductile Iron Mechanical Joint End
14" & Larger, 150 PSI



FLANGED END — ANSI 125										
SIZE	14	16	18	20	24	30	36	42	48	54
A	21.00	23.50	25.00	27.50	32.00	38.75	46.00	53.00	59.00	66.25
B	1.38	1.44	1.56	1.69	1.88	2.13	2.38	2.63	2.75	3.00
C	17.00	17.75	21.50	23.50	42.00	51.00	60.00	72.00	84.00	96.00
D	14.56	15.81	16.36	17.63	25.13	29.00	33.51	33.88	39.57	50.86
G	13.00	14.00	15.00	16.00	21.62	24.43	29.00	29.00	36.00	36.00
H	18.00	18.00	18.00	18.00	24.00	24.00	24.00	30.33	30.00	30.00
WEIGHT (approx.)	905	1030	1355	1880	3800	5200	6950	10160	13350	15100

Flanged Valves Meet ANSI B16.1

MECHANICAL JOINT END									
SIZE	14	16	18	20	24	30	36	42	48
A	20.13	22.56	24.84	27.06	31.50	39.13	46.00	53.13	60.00
B	1.31	1.38	1.43	1.50	1.62	1.68	2.00	2.00	2.00
C	24.50	27.25	29.25	31.00	42.00	51.00	60.00	72.00	84.00
F	14.56	15.81	16.36	17.63	25.13	29.00	33.51	33.88	39.57
G	13.00	14.00	15.00	16.00	21.62	24.75	29.00	29.00	36.00
WEIGHT (approx.)	905	1030	1355	1880	3800	5200	6950	10160	13350

Mechanical Joint Valves Meet ANSI 21.11 & AWWA C-111

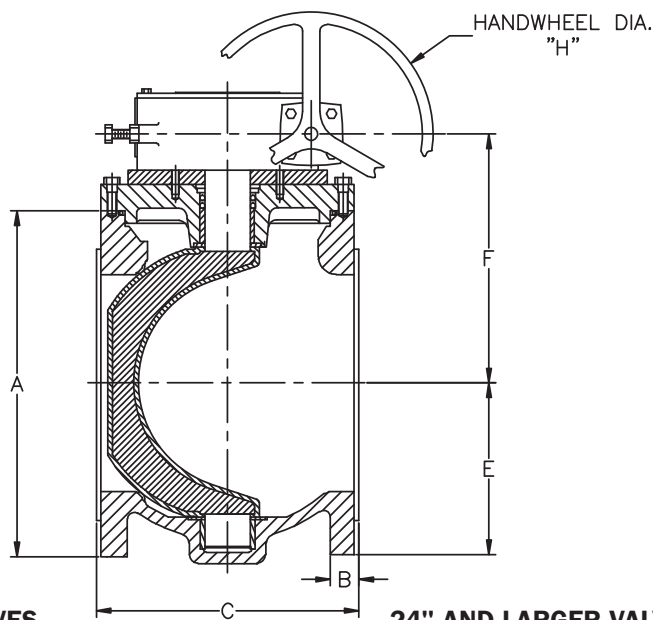
Weight includes gear operator

NOTE: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams.

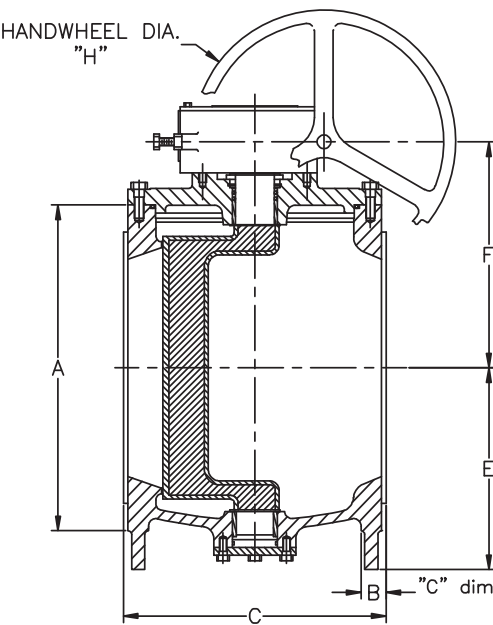
NOTE: Dimensions on 60" and larger available upon request.

Fig. 602 Class 250 Flanged End
2½" – 12", 400 PSI, 14" – 36", 300 PSI

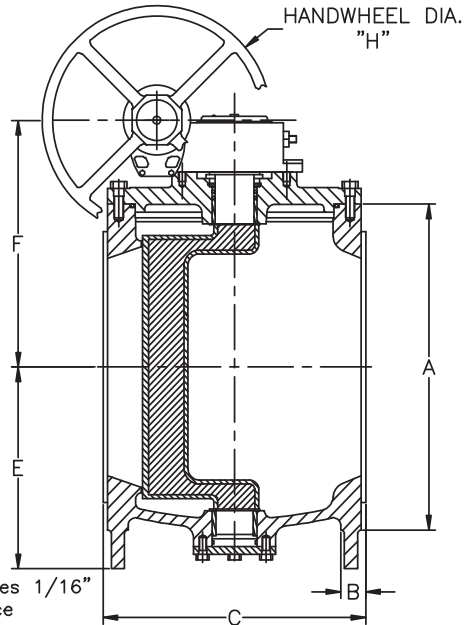
2½" – 12" VALVES



14" – 20" VALVES



24" AND LARGER VALVES



FLANGED END — ANSI 250															
SIZE	2.50	3	4	5	6	8	10	12	14	16	18	20	24	30	36
A	7.50	8.25	10.00	11.00	12.50	15.00	17.50	20.50	23.00	25.50	28.00	30.50	36.00	43.00	50.00
B	1.06	1.13	1.25	1.38	1.44	1.63	1.88	2.00	2.12	2.25	2.38	2.50	2.75	3.00	3.38
C	9.50	11.13	12.00	15.00	15.88	16.50	18.00	19.75	18.50	19.38	23.13	25.00	42.88	51.88	61.00
E	3.50	3.75	4.50	5.75	5.75	17.63	8.88	10.00	13.00	14.00	15.00	16.00	21.62	24.75	29.00
F	5.16	5.16	6.31	7.56	7.56	9.63	11.13	12.81	14.56	15.81	16.36	17.63	22.81	27.59	33.00
H	6.00	6.00	6.00	6.00	6.00	12.00	12.00	12.00	18.00	18.00	18.00	18.00	24.00	24.00	24.00
WEIGHT (approx.)	70	80	120	162	170	275	398	590	980	1125	1830	2060	4160	5700	7670

All above have gear operators as standard

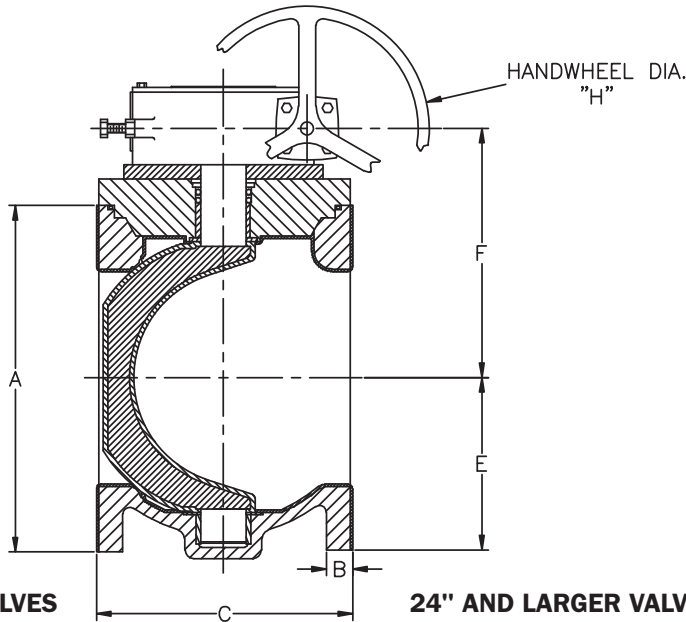
Weight includes gear operator

NOTE: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

NOTE: Dimensions on 42" and larger available upon request

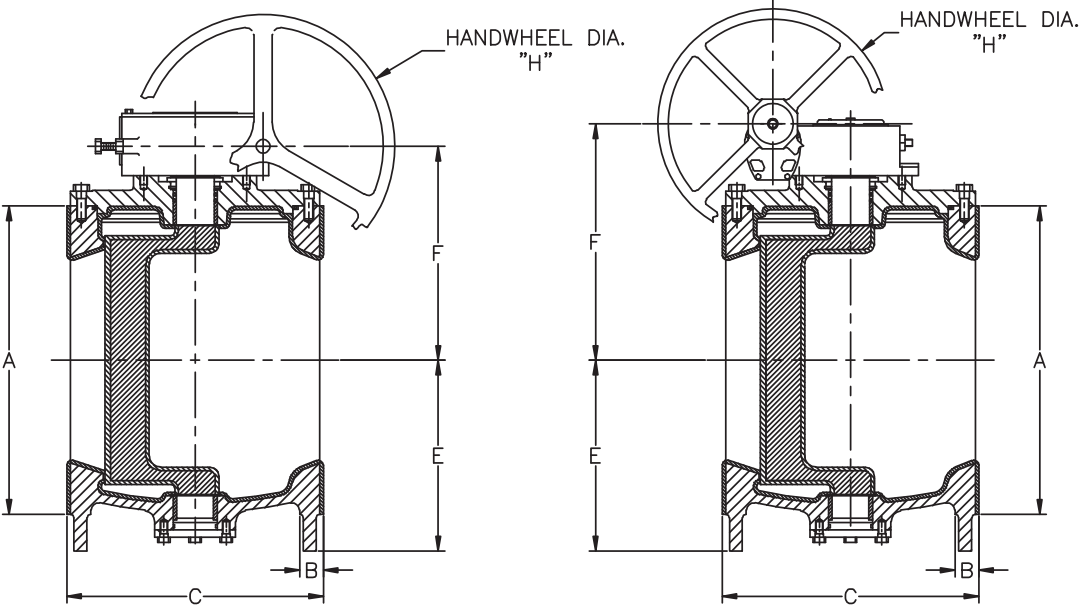
Fig. 601RL Rubberlined – Flanged End
3" – 12", 175 PSI, 14" & Larger, 150 PSI

3" – 12" VALVES



14" – 20" VALVES

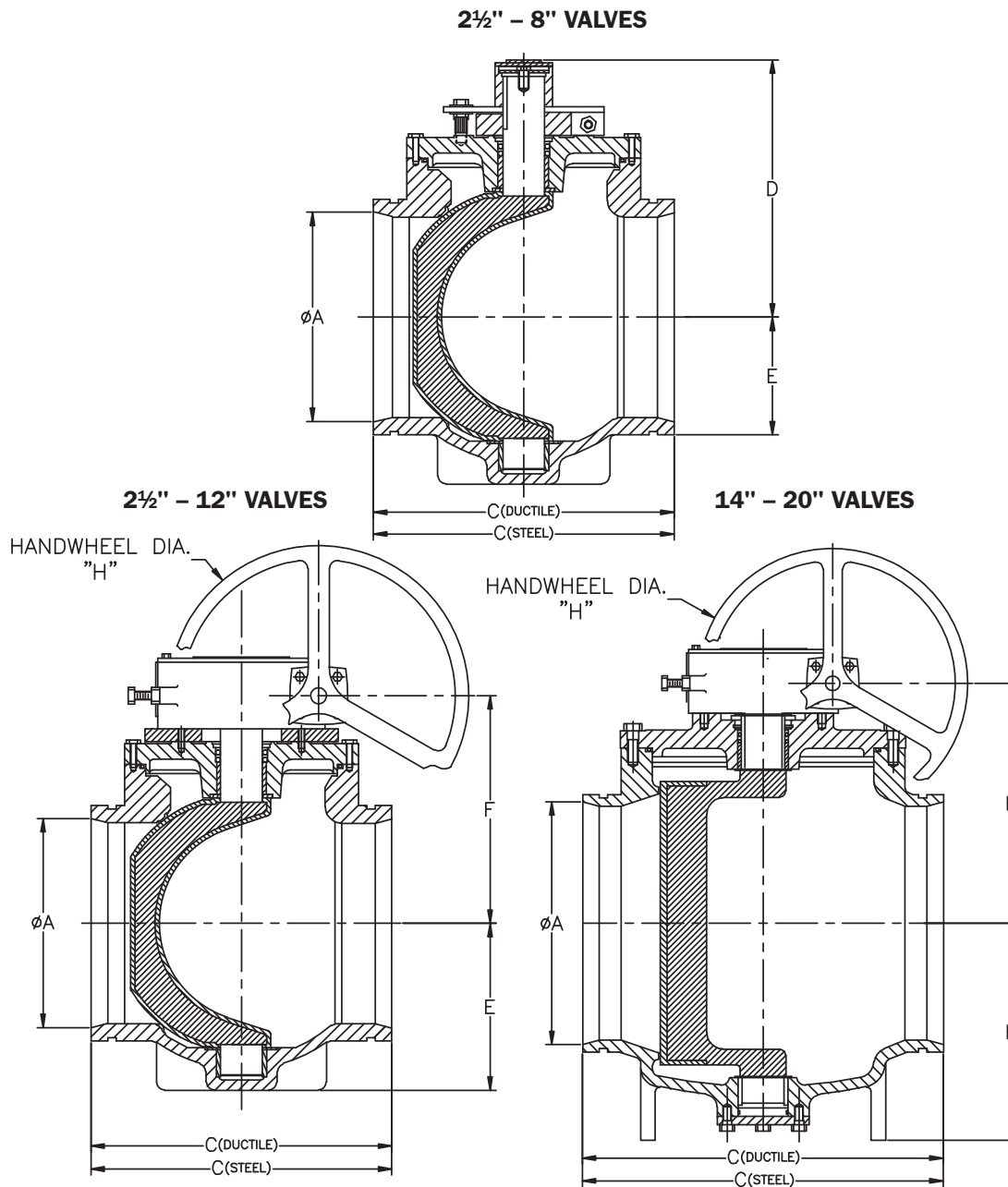
24" AND LARGER VALVES



FLANGED END — ANSI 125 RUBBER LINED															
SIZE	3	4	5	6	8	10	12	14	16	18	20	24	30	36	42
A	7.50	9.00	10.00	11.00	13.50	16.00	19.00	21.00	23.25	25.00	27.50	32	38.75	46.00	53.00
B	.88	1.07	1.07	1.13	1.26	1.32	1.38	1.26	2.25	2.38	2.50	2.75	3.00	3.38	3.38
C	8.25	9.25	10.25	10.75	11.75	13.25	14.25	17.25	18.00	21.75	23.75	42.25	51.25	60.25	72.25
E	3.75	4.50	7.75	7.75	7.63	8.88	10.00	13.00	14.00	15.00	16.00	21.63	24.75	29.00	29.00
F	5.16	6.31	7.56	7.56	9.63	11.13	12.81	14.56	15.81	16.36	17.63	25.13	29.00	33.51	33.88
H	6.00	6.00	6.00	6.00	12.00	12.00	12.00	18.00	18.00	18.00	18.00	24.00	24.00	24.00	24.00
WEIGHT (approx.)	70	100	135	145	240	345	440	905	1030	1355	1880	3800	5200	6940	10160

All above have gear operators as standard
 Weight includes gear operator
 NOTE: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams
 NOTE: Dimensions on 48" and larger available upon request

Fig. 606 Grooved End
2½" – 12", 175 PSI, 14" – 20", 150 PSI



GROOVED END — AWWA 606												
SIZE	2.50	3	4	5	6	8	10*	12*	14*	16*	18*	20*
A	2.50	3.00	4.00	5.00	6.00	8.00	10.00	12.00	14.00	15.25	16.19	18.06
C (Duct.)	N/A	9.06	10.25	N/A	12.50	14.00	16.56	18.00	21.63	N/A	27.50	30.00
C (Steel)	7.13	8.50	10.13	12.38	12.38	13.88	16.44	17.88	21.63	22.50	27.50	30.00
D	6.19	6.19	7.25	8.38	8.38	10.69	—	—	—	—	—	—
E	3.50	3.75	4.50	5.75	5.75	7.63	8.88	10.00	10.00	14.00	15.00	16.00
F	5.16	5.16	6.31	7.56	7.56	9.63	11.13	12.86	13.56	15.81	16.35	17.63
H	6.00	6.00	6.00	6.00	6.00	12.00	12.00	12.00	12.00	18.00	18.00	18.00
WEIGHT (approx.)	20	30	50	70	80	145	325**	420**	RTF	RTF	RTF	RTF

*10" & above have gear operators as standard

**Weight includes gear operator

NOTE: Drawings are for information purposes only; please request certified drawings before preparing piping diagrams

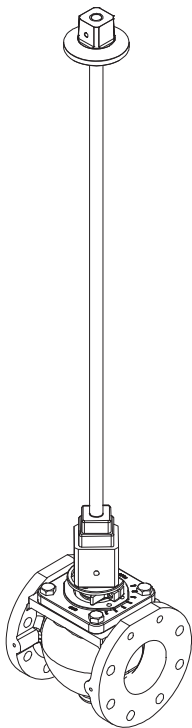
NOTE: Larger sizes are available. Contact Milliken Valve for data.

Adaption

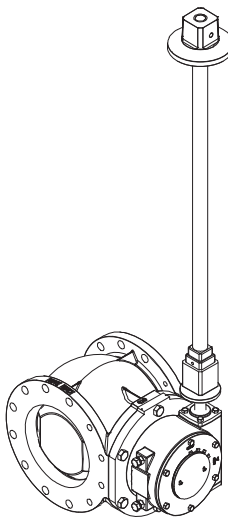
A range of extended stems & floor mounted stands for remote operation, particularly in buried service, are available.

Chainwheels & locking devices are readily incorporated onto the Millcentric Valve.

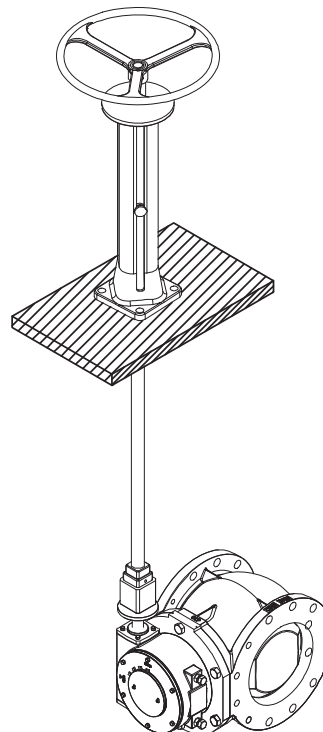
**Valve with extended stem & 2" nut
(Only for 8" and smaller valves)**



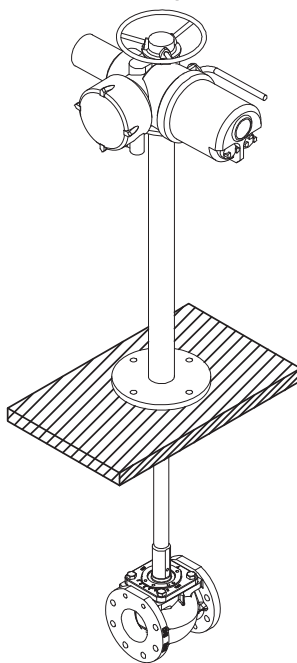
**Valve with extended stem,
buried gear and 2" nut**



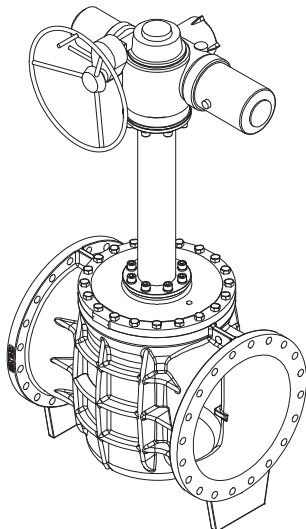
Valve with indicating floorstand



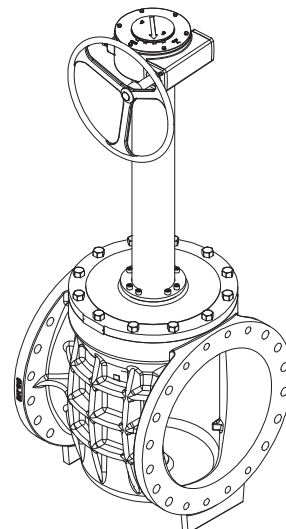
**Valve with non-indicating floorstand
& motor operator**



**Valve with extended bonnet
& motor operator**



Valve with extended bonnet with gear



Technical Specification Series 601/600 Valves

TECHNICAL SPECIFICATION ECCENTRIC PLUG VALVES AWWA C517-09 Standards Series 601/600 Valves

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125/150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA/ANSI C-111-92**. Grooved ends shall be manufactured to the dimensions of **ANSI/AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 2½"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-126 Class B** cast iron in accordance with **AWWA C-517-09 Section 4.3.3.1**. Valves 3" and larger shall be furnished with a welded-in overlay seat of ⅛" thick of not less than 99% nickel in accordance with **AWWA C-517-09, Section 4.3.3.4**. Sprayed, plated or screwed-in seats are not acceptable.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for sizes 20" and smaller, and **ASTM A126 Class B Cast Iron** for sizes 24" and larger in compliance with **AWWA C-517-09 Sections 4.3.3.1 and 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517-09, Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type 316 stainless steel **ASTM A-743 Grade CF-8M**. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517-09 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2½"-8" shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removeable levers or extended "T" handles.

Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2½"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517-09 Section 5.2.2** when requested.

Plug valves shall be Millcentric **Series 601/600** as manufactured by **Milliken Valve Company of Bethlehem, Pennsylvania**.

Technical Specification Series 602 Class 250 Valves

TECHNICAL SPECIFICATION ANSI CLASS 250 ECCENTRIC PLUG VALVES AWWA C517-09 Standards Series 602 Valves

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 250** including facing, drilling and flange thickness. Ports shall be round on sizes 2½" through 12" to facilitate "pigging" when required. Valves 14" and larger shall be of a rectangular port design.

Valve bodies shall be of **ASTM A-536 Grade 65-45-12** ductile iron in accordance with **AWWA C-517-09 Section 4.3.3.2**. Valves 3" and larger shall be furnished with a welded-in overlay seat of ⅛" thick of not less than 99% nickel in accordance with **AWWA C-517-09 Section 4.3.3.4**. Sprayed, plated or screwed-in seats are not acceptable.

Plugs shall be of **ASTM A-536-Grade 65-45-12** in compliance with **AWWA C-517-09 Section 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517- 09 Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type 316 stainless steel **ASTM A-743 Grade CF-8M**. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517-09 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Worm gear operators shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 400 psi for valves 2½"-12" and 300 psi for valves 14"-48" with pressure behind the plug.

Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517-09 Section 5.2.2** when requested.

Plug valves shall be **Series 602** as manufactured by **Milliken Valve Company of Bethlehem, Pennsylvania**.

Technical Specification Series 601RL Rubberlined Valves

TECHNICAL SPECIFICATION RUBBERLINED ECCENTRIC PLUG VALVES AWWA C517-09 Standards Series 601RL Valves

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125/150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA/ANSI C-111- 92**. Grooved ends shall be manufactured to the dimensions of **ANSI/AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 2½"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-126 Class B** cast iron in accordance with **AWWA C- 517-09 Section 4.3.3.1**. The interior of the valve bodies shall be covered with a suitable elastomer with a minimum thickness of ⅛". The elastomer shall extend through the valve flow way and onto the flanges to ensure a positive seal.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for sizes 20" and smaller, and **ASTM A126 Class B Cast Iron** for sizes 24" and larger in compliance with **AWWA C-517-09 Sections 4.3.3.1 and 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517-09, Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type 316 stainless steel **ASTM A-743 Grade CF-8M**. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517-09 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Worm gear operators shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2½"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517-09 Section 5.2.2** when requested.

Plug valves shall be Millcentric® **Series 601RL** as manufactured by **Milliken Valve Company of Bethlehem, Pennsylvania**.

Technical Specification Series 601S – Stainless Steel Valves

TECHNICAL SPECIFICATION STAINLESS STEEL ECCENTRIC PLUG VALVES AWWA C517-09 Standards Series 601S Valves

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125** including facing, drilling and flange thickness. Ports shall be round on sizes 2½"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **CF8M (316 stainless steel)**. Valves shall be furnished with 316 stainless steel seat in accordance with **AWWA C-517-09 Section 4.3.3.4**.

Plugs shall be of **CF8M (316 stainless steel)**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517-09 Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type 316 stainless steel **ASTM A-743 Grade CF-8M**. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517-09 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2½"-8" shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removable levers or extended "T" handles.

Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2½"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517-09 Section 5.2.2** when requested.

Plug valves shall be Millcentric® **Series 601S** as manufactured by **Milliken Valve Company of Bethlehem, Pennsylvania**.

Technical Specification Series 611/610 Ductile Iron Valves

TECHNICAL SPECIFICATION DUCTILE IRON ECCENTRIC PLUG VALVES AWWA C517-09 Standards Series 611/610 Valves

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125/150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA/ANSI C-111-92**. Grooved ends shall be manufactured to the dimensions of **ANSI/AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 2½"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-536 Grade 65-45-12** in accordance with **AWWA C-517-09 Section 4.3.3.2**. Valves 3" and larger shall be furnished with a welded-in overlay seat of ⅛" thick of not less than 99% nickel in accordance with **AWWA C-517-09, Section 4.3.3.4**. Sprayed, plated or screwed-in seats are not acceptable.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for all sizes in accordance with **AWWA C-517-09 Section 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517-09, Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type 316 stainless steel **ASTM A-743 Grade CF-8M**. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517-09 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2½"-8" shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removeable levers or extended "T" handles.

Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2½"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517-09 Section 5.2.2** when requested.

Plug valves shall be Millcentric® **Series 611/610** as manufactured by **Milliken Valve Company of Bethlehem, Pennsylvania**.

Technical Specification Series 601GL Glass Lined Valves

TECHNICAL SPECIFICATION GLASS LINED ECCENTRIC PLUG VALVES 3"-30" AWWA C517-09 Standards Series 601GL/600GL Valves

Valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended. Flanged valves shall be manufactured in accordance with **ANSI B16.1 Class 125/150** including facing, drilling and flange thickness. Mechanical joint ends shall be in compliance with **AWWA/ANSI C-111-92**. Grooved ends shall be manufactured to the dimensions of **ANSI/AWWA C606** for ductile or steel pipe as required. Ports shall be round on sizes 3"-12" and rectangular port design on valves 14" and larger. All valves shall be capable of being "pigged" with a soft pig when required.

Valve bodies shall be of **ASTM A-126 Class B** cast iron in accordance with **AWWA C-517-09 Section 4.3.3.1**. Interior of valves shall be glass lined at .008-.012 mils thickness, covering the entire interior of valve bodies and stopping at the flange faces.

Plugs shall be of **ASTM A-536-Grade 65-45-12** for sizes 20" and smaller, and **ASTM A126 Class B Cast Iron** for sizes 24" and larger in compliance with **AWWA C-517-09 Sections 4.3.3.1 and 4.3.3.2**. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to **AWWA C-517-09, Section 4.3.3.6**. Bearings shall be of sintered, oil impregnated type 316 stainless steel **ASTM A-743 Grade CF-8M**. Valve shaft seals shall be of the "U" cup type in accordance with **AWWA C-517-09 Section 4.4.7**. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves 2½"-8" shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with removeable levers or extended "T" handles.

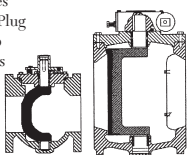
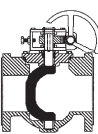
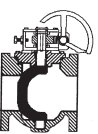
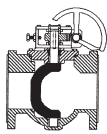
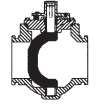
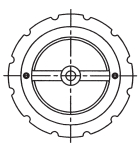
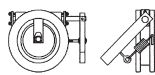
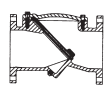
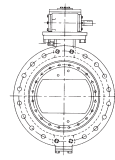
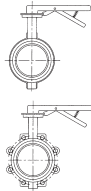
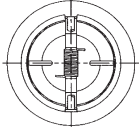
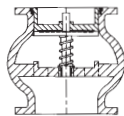
Worm gear operators, where required, shall be of the heavy duty construction with the ductile iron quadrant supported on the top and bottom by oil impregnated bronze bearings. The worm gear and shaft shall be manufactured of hardened steel and run on high efficiency roller bearings. All worm gear operators shall be sized for bi-directional shutoff at the valves design pressure rating.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi for valves 2½"-12" and 150 psi for valves 14" and larger. Each valve shall be given a hydrostatic and seat test with the test results being certified when required by the customer. Certified copies of Proof-of-Design test reports shall be furnished as outlined in **AWWA C-517-09 Section 5.2.2** when requested.

Plug valves shall be Millcentric Series **601GL/600GL** as manufactured by **Milliken Valve Company of Bethlehem, Pennsylvania**.

Notes



Series 600/601 Eccentric Plug Valve Welded Nickel Seat Stainless Steel Bearings ANSI-B16.1 Flanges Solid Ductile Iron Plug Low Pressure Drop Flanged & MJ Ends Sizes 2"-72" FL Sizes 3"-48" MJ Flanged and MJ 	Series 601SS Eccentric Plug Valve Integral Stainless Seat Stainless Bearings Stainless Steel Body ANSI B16.5 Class 150 Flanges Solid Stainless Steel Plug Low Pressure Drop Size: 1/2"-24" 	Series 601RL Eccentric Plug Valve Soft or Hard Rubber Lining Stainless Steel Bearings ANSI B16.1 Flanges Solid Ductile Iron Plug Low Pressure Drop Sizes 3"-54" Metal Plugs Available - Consult Factory Rubber Lined 	Series 602 Eccentric Plug Valve Welded Nickel Seat Stainless Steel Bearings ANSI B16.1 Class 250 Flanges Solid Ductile Iron Plug Low Pressure Drop Sizes 2-1/2"-54" High Pressure 
Series 603 Eccentric Plug Valve Solid Ductile Iron Plug Round Port Low Pressure Drop Memory Stop NPT End Connections Sizes 1/2"-2" Threaded End 	Series 604E Eccentric Plug Valve Epoxy Seat Solid Ductile Iron Plug Stainless Steel Bearings Low Pressure Drop Lift & Turn NOT Required High Solids & Flow Capacity Sizes 3"-16" Three Way Valve 	Series 606 Eccentric Plug Valve Welded Nickel Seat Stainless Steel Bearings AWWA C-606 Grooved Solid Ductile Iron Plug Low Pressure Drop Ductile or Steel Pipe Sizes 3"-24" Grooved End 	Series 611/610 Eccentric Plug Valve Ductile Iron Body ANSI B16.1 Flanges MJ AWWA C111 Welded Nickel Seat Solid Ductile Iron Plug Low Pressure Drop Sizes 2"-72" FL Sizes 3"-48" MJ Flanged and MJ 
Model 625 Eccentric Plug Valve Available in Threaded and Flanged Ends Rated for 175 psi Sizes 1/2"-4" UL/CGA Listed 	Series 8000 AWWA Swing Check Full waterway Weight or Spring Bronze/SS Body Seat Ring Bronze/Buna/EPDM disc insert Sizes 2"-36" 	Series 8500 AWWA Swing Check Full waterway Ductile Iron Construction Weight or Spring Air Cushion SS body seat ring Buna disc insert Sizes 3"-24" 	Series 9000 AWWA Swing Check Clear waterway Weight or Spring Air or Oil Cushion Bronze/SS Body seat ring Bronze/Buna/EPDM disc insert Sizes 3"-72" 
Model 720A Wafer Check Valve Center Guided Check Valve Rated for 250 psi SS Disc/EPDM Seat Sizes 2"-12" 	Series 700 Wafer Check Valve ANSI Class 125/150 High Flow Capacity Narrow Face-to-Face Sizes 3"-12" 316 SS Internals Disc Position Indicator Wafer Check Valve 	Figure 851 Flex Check Million Cycle Certification Complete Ductile Iron Construction 285 psi Pressure Rating Fully Epoxy Lined Interior No Internal Shafts, Bearings or Bushings No External Levers, Weights or Springs Hard or Soft Rubberlining Available 2"-24" Size Range Backflush Devices Proximity Switches 	Figure 510A/511A AWWA Butterfly Valve Complies with AWWA C-504 Class 150B Flanged or MJ Cast iron body and disc Seat in body Flow through disc on 24" and larger Epoxy Paint on all sizes standard 3" - 72" 
Figure 565/566 General Service Butterfly Valve Meets MSS SP 67 Cast Iron Body Bronze Disc Other Materials Upon Request Wrench or Gear Operated Available 2"-24" Size Range 	Figure 740A Double Disc Check Valve Wafer pattern check valve rated for 250 psi. Available in sizes 2"-36" with a SS Disc/EPDM Seat 	Figure 821A Globe Style Check Valve Center guided check valve. SS Disc/EPDM Seat and is available in sizes 2"-24". 	• ISO 9001:2000 Certified • Field Services Available • Engineering Services



Bethlehem, PA
Phone (610) 861-8803
Fax (610) 861-8094

www.millikenvalve.com



ISO 9001 Certified



**1/2" - 2" MILLCENTRIC®
ECCENTRIC PLUG VALVE**



Milliken Valve offers the following for your water and wastewater needs:

- Eccentric Plug Valves
 - Series 601/600 Flanged & MJ
 - Series 601S Stainless Steel
 - Series 601RL Rubber Lined
 - Series 602 High Pressure
 - Series 613 Threaded End
 - Series 604 Three Way
 - Series 606 Grooved End
 - Series 611/610 Flanged & MJ
 - Series 625 UL/CGA Listed
- AWWA Swing Check Valves
- Wafer Check Valves
- Flex Check Valves
- Spring Loaded Check Valves
- AWWA Butterfly Valves
- General Service Butterfly Valves

Milliken Valve designs, develops, manufactures and markets plug valves and check valves which are available with various accessories, controls and actuators. These valves are used primarily in the water, wastewater and industrial markets.

Milliken Valve was founded over 25 years ago and manufactures the eccentric plug valve for water, wastewater and industrial applications. Milliken has grown consistently until it is now a leading manufacturer of high quality plug valves.

Milliken has a quality management system independently certified to ISO 9001.

A market leading, wide selection of plug valves are available for most water, wastewater and industrial applications:

Multiport 100% Port 3-Way Plug Valve

- 3-Way Valve 3" – 16", suitable for flow diversion and isolation.

Eccentric Plug Valve

- Size range ½" - 72"
- Pressure rating up to Class 250
- Rubber lined 3" and larger
- Glass lined 3" and larger
- Stainless steel ½" - 48"

Flex Check Valve

The eccentric plug valve is perfectly complemented by a soft-seated flexible-disc check valve in sizes 2" to 24" and is available with manual back-flushing device, position indicator and limit switch.

Swing Check Valve

Milliken Valve also has a wide selection of high quality metal or soft seated swing check valves in sizes 2" to 72" with accessories available for spring or weight assisted closing and air cushion or oil decelerator anti-slam devices under the respected CCNE brand.

Overview of Valve Details - 1/2" - 2"

The Milliken criteria of quality, reliability, safety and value are embodied in the MILLCENTRIC® Eccentric valve, setting higher standards for dependable performance with excellent features achieved by the utilization of the very latest design and manufacturing techniques.

- Computer Aided Design
- High Integrity Casting
- CNC manufacturing delivers consistent sizes on all components

All complemented by a rigorous Quality Control System

Body

The MILLCENTRIC valve body casting is ASTM A536 65-45-12 ductile iron using high pressure molding techniques. Threaded connection available on 1/2"-2" sizes. Flanged connection available on 2" size.

Flange diameter, thickness and drilling conform to ANSI B16.1 Class 125.

Seat

The valve seat shall be furnished with an overlay of corrosion and abrasion resistant epoxy.

Stem Seal

High integrity sealing by combining the advantages of a resilient and abrasion resistant U-Cup seal. From vacuum to high pressure, the self-adjusting sealing system (per AWWA C504) gives positive, trouble-free service and is retained independently of the plug stem or external torque device, thereby eliminating periodic maintenance.

Bearings

The plug rotates in permanently lubricated stainless steel bearings, located in the body and bonnet, along with upper and lower PTFE thrust washers which ensure consistently low operating torque.

Plug

Supported on integral trunnions, the plug is totally encapsulated with an elastomer that is molded to the casting providing tight shut off even under vacuum conditions. High integrity corrosion-free sealing is achieved by a variety of abrasion resistant elastomers which protect the plug right up to the trunnions. When assembled, the light compression of the elastomers onto PTFE thrust washers prevents entry of abrasive materials into the bearings.

Bonnet Seal

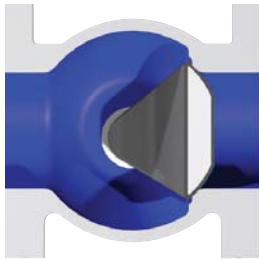
Superior "O" ring sealing with metal/metal contact means lower bolting stresses compared with compression gaskets.

Flow

The full round port design with streamlined internal contours gives the highest industry capacity straight through flow in the full open position, reducing turbulence and pressure drop and the effect of erosive media. Handling of sludges and slurries is therefore enhanced.

Travel Stops

Adjustable open and closed travel stops are fitted as standard on both wrench and gear operated MILLCENTRIC valves.



- Valve in closed position for bubble tight shut-off
- Normal flow direction gives pressure assisted sealing
- Torques are low even in reverse flow



- Plug rotates away from the seat for instant opening
- Seat wear and operating torque reduced
- No further seat contact until valve is closed again



- Design of MILLCENTRIC® plug valve allows modulating control over the full 90° travel
- Ideally suited for balancing service
- Standard rotary valve provides control and tight shut off in one valve



- Plug is out of flow path when fully open
- Straight through, uninterrupted smooth flow
- Round port reduces turbulence and erosion, lowers pumping costs and can be "pigged" to clean the pipeline

Installation

The MILLCENTRIC® plug valve is suitable for flow and shut-off in either direction. Seat end downstream is the preferred orientation and any reverse flow requirement should be stated at the time of order. For use on fluids with suspended solids, installation with the seat upstream and the valve stem horizontal is recommended with plug rotation to the top of the valve.

In-Line Maintenance

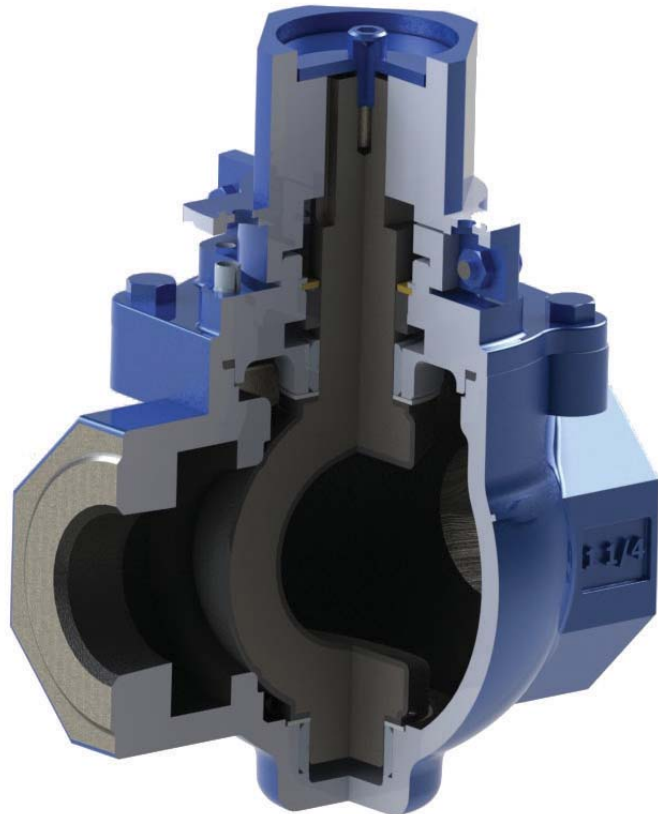
In the unlikely event of stem leakage, the stem seals can be easily replaced without removing the bonnet. Access to the body for cleaning or inspection does not require removal from the line.

Modular Construction

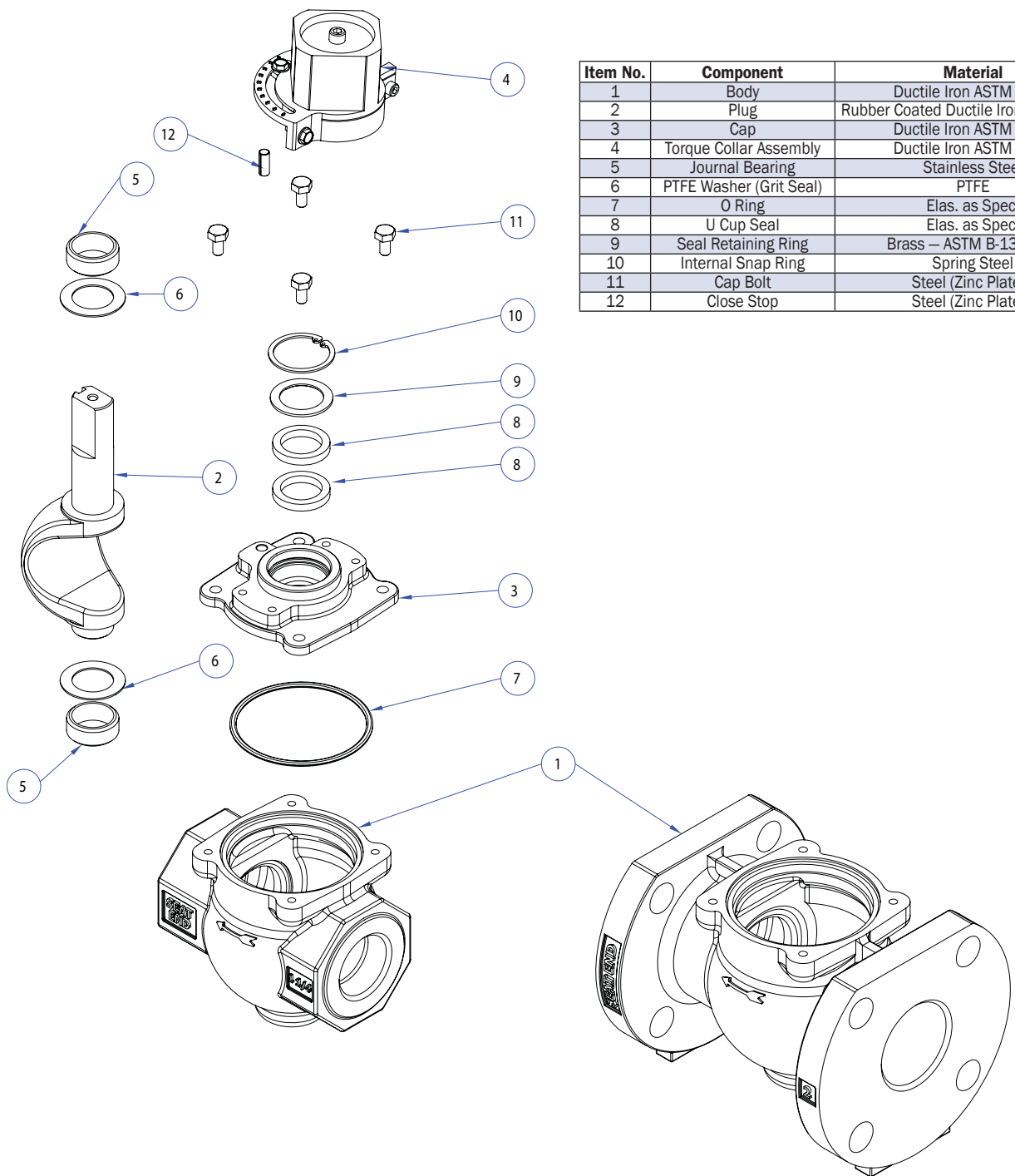
Design of the bonnet and stem allows for on-site adaption of gear operators, power actuators, or extension devices on to standard valves. Conversion can be easily undertaken without removing the valve bonnet, thereby minimizing downtime.

Power Operation

Pneumatic, electric or hydraulic operation is available, complete with accessories such as limit switches, solenoid valves and positioners when required.



Standard Materials of Construction, Fig. 613A/611A, 1/2" - 2"



Item No.	Component	Material	Qty.
1	Body	Ductile Iron ASTM A536	1
2	Plug	Rubber Coated Ductile Iron ASTM A536	1
3	Cap	Ductile Iron ASTM A536	1
4	Torque Collar Assembly	Ductile Iron ASTM A536	1
5	Journal Bearing	Stainless Steel	2
6	PTFE Washer (Grit Seal)	PTFE	2
7	O Ring	Elas. as Spec.	1
8	U Cup Seal	Elas. as Spec.	2
9	Seal Retaining Ring	Brass — ASTM B-138-675	1
10	Internal Snap Ring	Spring Steel	1
11	Cap Bolt	Steel (Zinc Plated)	AR
12	Close Stop	Steel (Zinc Plated)	1

Technical Data

ORDERING INFORMATION

Valve Types

Threaded NPT Ductile Iron
ANSI 125 Flanged Ductile Iron (2" only)
Threaded NPT 316 SS
ANSI 150 Flanged 316SS (2" only)

Designation

613A
611A
603AS
601AS

SEAT

Epoxy
316SS (on stainless steel valve only)

E
S

ELASTOMER TRIM

EPDM
Buna-Nitrile
Viton*
Neoprene*

0
1
2
3

* Consult factory for availability

MANUAL OPERATORS

Lever/Wrench
Direct Nut
Above Ground Gear & Handwheel
Above Ground Gear & 2" Nut
Buried Gear with 2" Nut
Memory Stop Gear & Handwheel
Above Ground Gear & Chainwheel

L
TC
AGHW
AGNUT
BG
MGHW
AGCW

Valves are only tested for bi-directional shut-off if specified at time of order. Contact Milliken for bi-directional ratings.

PRESSURE RATING

613A	NPT	400 PSI
611A	ANSI 125	175 PSI
603AS	NPT	400 PSI
601AS	ANSI 150	275 PSI

Body Hydrotest = 150% of rated pressure

Seat Test = 100% of rated pressure

Testing per AWWA C517

Elastomer Selection Chart

Service	Elastomer	Average Useful Temperature Range	Service	Elastomer	Average Useful Temperature Range	Service	Elastomer	Average Useful Temperature Range
Acetone	EPDM	-35°F to 250°F	Caustic Soda	EPDM	-35°F to 250°F	Oil Animal	Nitrile	-20°F to 212°F
Air	EPDM	-35°F to 250°F	Cement Slurry	EPDM	-35°F to 250°F	Oil Mobil Therm Light	Viton	10°F to 250°F
Air w/Oil	Nitrile	0°F to 212°F	Copper Sulphate	EPDM	-35°F to 250°F	Oil Mobil Therm 600	Viton	10°F to 250°F
Alcohol, Amyl	EPDM	0°F to 212°F	Creosote (Coal)	Nitrile	-20°F to 212°F	Oil Mobil Therm 603	Nitrile	-20°F to 212°F
Alcohol, Aromatic	Viton	10°F to 250°F	Coal Slurry	Nitrile	-20°F to 212°F	Oil Lubricating	Nitrile	-20°F to 212°F
Alcohol, Butyl	Neoprene	-20°F to 225°F	Diesel Fuel No. 3	Nitrile	-20°F to 212°F	Oil Vegetable	Nitrile	-20°F to 212°F
Alcohol, Denatured	Nitrile	-20°F to 212°F	Diethylene Glycol	EPDM	-35°F to 250°F	Paint Latex	Nitrile	-20°F to 212°F
Alcohol, Ethyl	EPDM	-20°F to 250°F	Ethylene Glycol	EPDM	-35°F to 250°F	Phosphate Ester	EPDM	-35°F to 250°F
Alcohol, Grain	Nitrile	-20°F to 212°F	Fatty Acid	Nitrile	-20°F to 212°F	Propane	Nitrile	-20°F to 212°F
Alcohol, Isospropyl	Neoprene	-20°F to 225°F	Fuel Oil No. 2	Nitrile	-20°F to 212°F	Rape Seed Oil	Nitrile	-35°F to 250°F
Alcohol, Methyl	EPDM	-20°F to 250°F	Fertilizer Liquid (H ₄ N ₂ O ₂)	EPDM	-35°F to 250°F	Sewage with Oil	Nitrile	-20°F to 212°F
Ammonia, Anhydrous	Neoprene	-20°F to 225°F	Gasoline Keg	Nitrile	-20°F to 212°F	Sodium Hydroxide 20%	EPDM	-35°F to 250°F
Ammonia, Nitrate	EPDM	-20°F to 250°F	Gas Natural	Nitrile	-20°F to 212°F	Starch	EPDM	-35°F to 250°F
Ammonia, Water	EPDM	-20°F to 250°F	Glue Animal	Nitrile	-20°F to 212°F	Steam 250°F	EPDM	-35°F to 250°F
Animal Fats	Nitrile	-20°F to 212°F	Green Liquor	EPDM	-20°F to 212°F	Stoffard Solvent	Nitrile	-20°F to 80°F
Black Liquor	EPDM	-20°F to 250°F	Hydraulic oil	Nitrile	-20°F to 212°F	Sulphuric Acid 10% 50%	Neoprene	-20°F to 158°F
Blast Furnace Gas	Neoprene	-20°F to 225°F	Hydrogen	Nitrile	-20°F to 212°F	Sulphuric Acid 100%	Viton	10°F to 300°F
Butane	Nitrile	-20°F to 212°F	JP4 JP5	Viton	-20°F to 212°F	Trichlorethylene Dry	Viton	10°F to 300°F
Bunker Oil "C"	Nitrile	-20°F to 212°F	Kerosene	Nitrile	0°F to 212°F	Triethanol Amine	EPDM	-35°F to 250°F
Calcium Chloride	EPDM	-20°F to 250°F	Ketone	EPDM	-35°F to 250°F	Varnish	Viton	10°F to 300°F
Carbon Dioxide	EPDM	-20°F to 250°F	Lime Slurry	EPDM	-35°F to 250°F	Water, Fresh	EPDM	-35°F to 250°F
Carbon Monoxide (Cold)	Neoprene	-20°F to 150°F	Methane	Nitrile	-20°F to 212°F	Water, Salt	EPDM	-35°F to 250°F
Carbon Monoxide (Hot)	Viton	10°F to 300°F	Methyl Ethyl Ketone	EPDM	-35°F to 250°F	Xylene	Viton	10°F to 300°F
Carbon Tetrachloride	Viton	10°F to 300°F	Naptha (Berzin)	Nitrile	-20°F to 212°F			

ELASTOMERS AVAILABLE FOR MILLCENTRIC VALVE

Nitrile

A general purpose material sometimes referred to as BUNA-N or HYCAR with a -20°F to 212°F temperature range. Used on sewage, water, hydrocarbon and mineral oils.

EPDM

An excellent polymer for use on chilled water through to LP steam applications having a temperature range of -35°F to 250°F. Resistance to many acids, alkalies, detergents, phosphate esters, alcohols and glycols is an added benefit.

Neoprene

This versatile material shows outstanding resistance to abrasion and ozone. Chemical resistance to a wide range of petroleum base products and dilute acids and alkalies. Temperature range -20°F to 225°F.

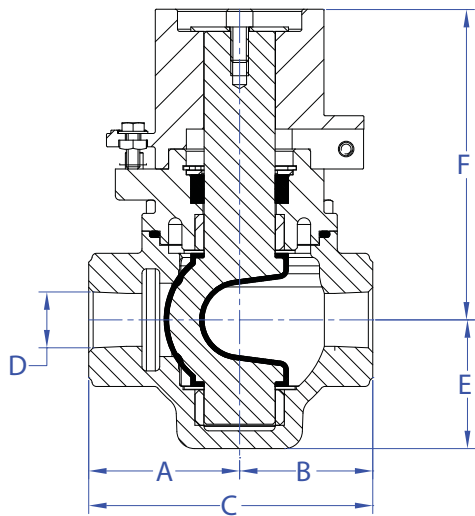
Viton

Retention of mechanical properties at high temperature is an important feature of this elastomer: temperature range is -10°F to 300°F. It also has excellent resistance to oils, fuels, lubricants and most mineral acids and aromatic hydrocarbons. Note: Viton not for water or steam applications.

NOTE: Above elastomer/temperature chart are guidelines only. See Milliken Compatibility Chart for specific applications.

Threaded End:

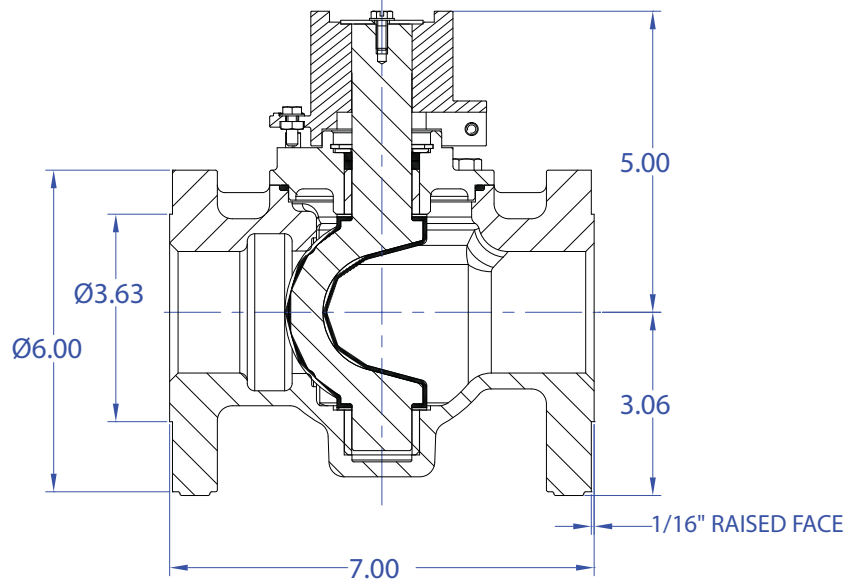
Fig. 613A Ductile Iron/603AS Stainless Steel 1/2" - 2"



THREADED ENDS						
SIZE	1/2	3/4	1	1-1/4	1-1/2	2
A	2.13	2.13	2.13	3.00	3.00	3.00
B	1.88	1.88	1.88	2.50	2.50	2.50
C	4.00	4.00	4.00	5.50	5.50	5.50
D	½" NPT	¾" NPT	1" NPT	1¼" NPT	1½" NPT	2" NPT
E	1.81	1.81	1.81	2.50	2.50	2.50
F	4.38	4.38	4.38	5.00	5.00	5.00
WEIGHT (approx.)	7.50	7.25	7.00	13.00	11.75	10.00

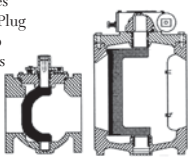
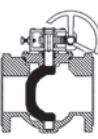
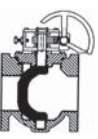
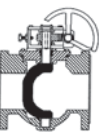
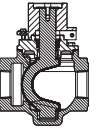
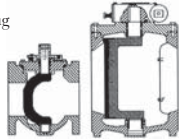
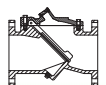
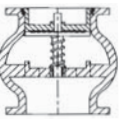
Flanged End:

Fig. 611A Ductile Iron/601AS Stainless Steel 2"



FLANGED ENDS	
SIZE	2
WEIGHT (approx.)	18.00

Note: RAISED FACE IS ONLY ON THE 2" FIG. 601AS STAINLESS STEEL.

Series 600/601 Eccentric Plug Valve Welded Nickel Seat Stainless Steel Bearings ANSI-B16.1 Flanges Solid Ductile Iron Plug Low Pressure Drop Flanged & MJ Ends Sizes 2"-72" FL Sizes 3"-48" MJ Flanged and MJ 	Series 601S Eccentric Plug Valve All Stainless Steel Construction ANSI B16.5 Class 150 Flanges Low Pressure Drop Size: 1/2"-24" 	Series 601RL Eccentric Plug Valve Soft Rubber Lining Stainless Steel Bearings ANSI B16.1 Flanges Solid Ductile Iron Plug Low Pressure Drop Sizes 3"-54" Rubber Lined 	Series 602 Eccentric Plug Valve Welded Nickel Seat Stainless Steel Bearings ANSI B16.1 Class 250 Flanges Solid Ductile Iron Plug Low Pressure Drop Sizes 2-1/2"-54" High Pressure 
Series 613A Eccentric Plug Valve Ductile Iron Construction Round Port Stainless Steel Bearings Low Pressure Drop Memory Stop NPT End Connections Sizes 1/2"-2" Threaded End 	Series 604 100% Port 3 Way Plug Valve Solid Ductile Iron Plug Stainless Steel Bearings Low Pressure Drop Lift & Turn NOT Required High Solids & Flow Capacity Sizes 3"-16" Three Way Valve 	Series 606 Eccentric Plug Valve Welded Nickel Seat Stainless Steel Bearings AWWA C-606 Grooved Solid Ductile Iron Plug Low Pressure Drop Ductile or Steel Pipe Sizes 3"-24" Grooved End 	Series 611/610 Eccentric Plug Valve Ductile Iron Body ANSI B16.1 Flanges MJ AWWA C111 Welded Nickel Seat Solid Ductile Iron Plug Low Pressure Drop Sizes 2"-72" FL Sizes 3"-48" MJ Flanged and MJ 
Model 625 Eccentric Plug Valve Available in Threaded and Flanged Ends Rated for 175 psi Sizes 1/2"-4" UL/CGA Listed 	Series 600FP/601FP Eccentric Plug Valve Full/100% Port Welded Nickel Seat Stainless Steel Bearings ANSI-B16.1 Flanges Solid Ductile Iron Plug Low Pressure Drop Flanged & MJ Ends Sizes 2"-48" FL Sizes 3"-48" MJ 	Figure 396/397 General Service Butterfly Valve Complies with MSS SP 67 Ductile Iron Body DI-NP Disc Other Materials Upon Request Wrench or Gear Operated Available 2"-48" Size Range 	Figure 510A/511A AWWA Butterfly Valve Complies with AWWA C-504 Class 150B Flanged or MJ Cast iron body and disc Seat in body Flow through disc on 24" and larger Epoxy Paint on all sizes standard 3" -72" 
Series 8500 AWWA Swing Check Full waterway Ductile Iron Construction Weight or Spring Air Cushion SS body seat ring Buna disc insert Sizes 3"-24" 	Series 8000 AWWA Swing Check Full waterway Weight or Spring Bronze/SS Body Seat Ring Bronze/Buna/EPDM disc insert Sizes 2"-36" 	Series 9000 AWWA Swing Check Clear waterway Weight or Spring Air or Oil Cushion Bronze/SS Body seat ring Bronze/Buna/EPDM disc insert Sizes 3"-72" 	Model 720A Wafer Check Valve Center Guided Check Valve Rated for 250 psi SS Disc/EPDM Seat Sizes 2"-12" 
Series 700 Wafer Check Valve ANSI Class 125/150 High Flow Capacity Narrow Face-to-Face Sizes 3"-12" 316 SS Internals Disc Position Indicator Wafer Check Valve 	Figure 851 Flex Check Million Cycle Certification Complete Ductile Iron Construction 250 psi Pressure Rating Fully Epoxy Lined Interior No Internal Shafts, Bearings or Bushings No External Levers, Weights or Springs Mechanical Indicator (3"-16") 2"-24" Size Range Backflush Devices Proximity Switches 	Figure 740A Double Disc Check Valve Wafer pattern check valve rated for 250 psi. Available in sizes 2"-48" with a SS Disc/EPDM Seat 	Figure 821A Globe Style Check Valve Center guided check valve. SS Disc/EPDM Seat and is available in sizes 2"-36". 

M
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VALVE

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Bethlehem, PA 18017
Phone (610) 861-8803 Fax (610) 861-8094

SMPLUG-0114



CS-312-200 : Identification sheet

VWTC PROJECT NUMBER:	5000218009	REV:	1
PROJECT NAME:	AEM AMARUQ	AGNICO EAGLE MINES	
ENGINEER:	Gabriel Hébert		
PROJECT MANAGER:	Clément B		
PHONE NUMBER:			
SUBMITTED TO (COMPANY):			
SUBMITTED TO (RESPONSIBLE):			
PROJECT NUM REFERENCE.:			
LOT NUMBER:			

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
PRATT	ST-312-112	P2-011-V001	DIA: 100 mm (4")	ISOLATION VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1-L/4"/CONNECTION TYPE : FLANGED DIA. 100 mm (4")//BODY : CAST IRON//ELASTOMER TRIM: BUNA-N SEAT : NICKEL// STEM : N/A			ACTIFLO RECIRCULATION LINE MODIFICATION		
PRATT	ST-312-112	P2-012-V001	DIA: 100 mm (4")	ISOLATION VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1-L/4"/CONNECTION TYPE : FLANGED DIA. 100 mm (4")//BODY : CAST IRON//ELASTOMER TRIM: BUNA-N SEAT : NICKEL// STEM : N/A			ACTIFLO RECIRCULATION LINE MODIFICATION		
PRATT	ST-312-112	P2-014-V001	DIA: 100 mm (4")	ISOLATION VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1-L/4"/CONNECTION TYPE : FLANGED DIA. 100 mm (4")//BODY : CAST IRON//ELASTOMER TRIM: BUNA-N SEAT : NICKEL// STEM : N/A			ACTIFLO RECIRCULATION LINE MODIFICATION		

SUPPLIER	EQPT CODE	EQPT TAG NO	DIA	DESCRIPTION	INFO 1	INFO 2	INFO 3	APPLIC.	NOTE	REV
PRATT	ST-312-112	P2-021-V001	DIA: 100 mm (4")	ISOLATION VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1- L/4"/CONNECTION TYPE : FLANGED DIA. 100 mm (4")//BODY : CAST IRON// ELASTOMER TRIM: BUNA-N SEAT : NICKEL// STEM : N/A			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
PRATT	ST-312-112	P2-022-V001	DIA: 100 mm (4")	ISOLATION VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1- L/4"/CONNECTION TYPE : FLANGED DIA. 100 mm (4")//BODY : CAST IRON// ELASTOMER TRIM: BUNA-N SEAT : NICKEL// STEM : N/A			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		
PRATT	ST-312-112	P2-023-V001	DIA: 100 mm (4")	ISOLATION VALVE	TYPE: PLUG 175 PSI//MANUFACTURER : PRATT//MODEL : 601N1- L/4"/CONNECTION TYPE : FLANGED DIA. 100 mm (4")//BODY : CAST IRON// ELASTOMER TRIM: BUNA-N SEAT : NICKEL// STEM : N/A			ACTIFLO RECIRCUL ATION LINE MODIFICA TION		