

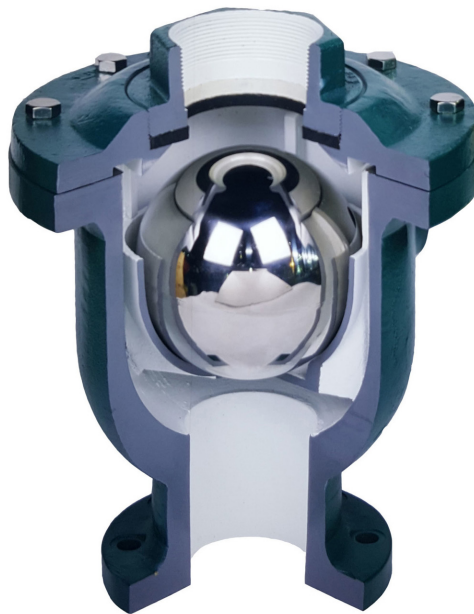


Doc # B-AV-AL-r2

Crispin Air Valves

THE AL SERIES: Air & Vacuum Valve AWWA C512

- Sizes 1/2"-24" Available (NPT Screwed or ANSI Class Flanges)
- Suitable for Potable Water Installations



CRISPIN VALVE

SINCE 1905



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BERWICK, PA 18603



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AL SERIES AIR & VACUUM VALVE



The Crispin Air and Vacuum Unit, with its orifice the same diameter as its inlet, allows large quantities of air to be vented from systems being filled with liquid. The same holds true in reverse for vacuum conditions when the system is drained.

Its design is such that the velocity of air passing through the valve will not blow the float shut at normal design volumes. It will not close until the arrival of liquid in the valve, and will not open to vent accumulating air as long as the system is under pressure and in operation.

AL SERIES ADVANTAGES

- ✓ Available in Sizes 1/2"-24"
- ✓ AWWA C512 Compliant
- ✓ NSF 61 and NSF 372 Certified
- ✓ Vents large quantities of air from systems being filled with liquid.
- ✓ Features Vacuum Function
- ✓ Peripheral Guide System for unobstructed closure
- ✓ Drip-tight closure
- ✓ Buna-N Seating Standard

AL SERIES OPTIONS

- ✓ Both NPT Screwed and ANSI Flanges Available
- ✓ Available in AIS, BA, BAN and BB Configurations
- ✓ Fusion Bonded Epoxy
- ✓ 304 or 316 Stainless Steel Trim
- ✓ 3 Pressure Ranges Offered

Air and Vacuum Valves are available with stainless steel floats and either a standard top or protectop in sizes up to and including 24." All Crispin Air and Vacuum Valves also have guides which direct the float onto the seat upon closure. These guides are peripheral to the float, and fixed to the body or the cup and hanger assembly.

This peripheral guide system allows unobstructed closure because there are no guide bushings to collect dirt and then bind, and there are no shafts to bend or deform, which would prevent a drip tight seal.

All Crispin Air and Vacuum Valves have standard Buna-N seating material with a Shore durometer of 70-80. This standard seat allows drip tight closure beyond 4-5 PSIG. Occasionally, however, a gravity system operates at pressures less than 10 PSIG. These applications require a soft seating material which will prevent leakage down to 2 PSIG. This soft seating material should not be applied to systems with operating pressures greater than 50 PSIG, or high pressure leaks may occur around the seat.

All Crispin valves are designed for a working pressure of 300 PSIG.

Materials and prices are subject to change without notice. Metric and special class flange ratings are available.

CRISPIN KNOWS AIR VALVES, FOUR FAMILY-OWNED GENERATIONS AND COUNTING.



Company founder Clarence Crispin, with sons Fred & Ben



An industry tradeshow in New York, circa 1907



Circa 1940, a Crispin Air Valve installed on the Hoover Dam



An advertisement for valves installed in 1913

The year was 1905. Theodore Roosevelt was in the White House. Ty Cobb was playing his rookie season in the National Baseball League; and in Berwick, PA, a young man named Clarence Crispin gambled that a product he called the "Crispin Air Valve" could revolutionize the fledgling waterworks industry.

Fresh from the Engineering School at Cornell University, Clarence wanted to find a way to boost output at the family-owned Berwick Water Company. Early attempts sought to pump water through a wood stave pipe that ran along the bed of the local Susquehanna River. However, the pipe kept collapsing, destroyed by an excessive vacuum that formed as the pipe drained.

Clarence designed a valve that could release air from a water line while water was running through it, and admit air when the water line drained, all without leaks or breaks in the water's flow. His patented fluid valve became the foundation of the Multiplex Manufacturing Company, known today throughout the waterworks industry as Crispin Valve.

Within 5 years, Crispin Air Valves were solving vacuum problems on the Panama Canal, history's greatest waterworks project. Over 115 years later, they can be found in nearly every country on earth.

Today, Crispin is still family-owned, with Clarence's great-great-grandson, Darren, at the helm.

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AIR & VACUUM VALVE SIZING

The sizing of an air valve is based on the resultant criteria of two operating conditions, that is, filling and draining the pipeline. Each grade must be independently considered in order to determine the most appropriate valve size. Air will be exhausted from the valve at the same rate at which the pipeline fills with a pressure differential maximum of 2psi across the valve.

TO CORRECTLY SIZE AN AIR & VACUUM VALVE:

1. Determine liquid flow capacity in the pipeline.
2. Determine the exhaust flow capacity using the formula at top right.
3. Refer to curves with CFM and pressure differential for valve size required when filling the line.
4. Determine the valve size required to relieve a vacuum by admitting air through the valve. Chezy's formula at right determines the flow of water in a pipe due to gravity.
5. It may be necessary to consider the collapsing pressure of the pipe being vented due to vacuum formation. The steeper of the two grades should be used. For the Collapsing Pressure of Pipe Formula at right, a safety factor of 4 is used due to inconsistencies in the manufacture of pipe.
6. Refer to the curve with the required air capacity through the valve to relieve the vacuum and collapsing pressure of the pipe or 5 psi, whichever is lower. Pick off valve size.
7. Compare the valve sizes obtained for the exhaust flow and vacuum relief conditions, and select the larger valve size for the application.

EXHAUST FLOW CAPACITY FORMULA

$$CFM = \frac{Q}{7.48 \text{ gallons/cu. ft.}}$$

Q = Flow in gallons per minute
CFM = Cubic feet per minute of exhaust air

CHEZY'S FORMULA

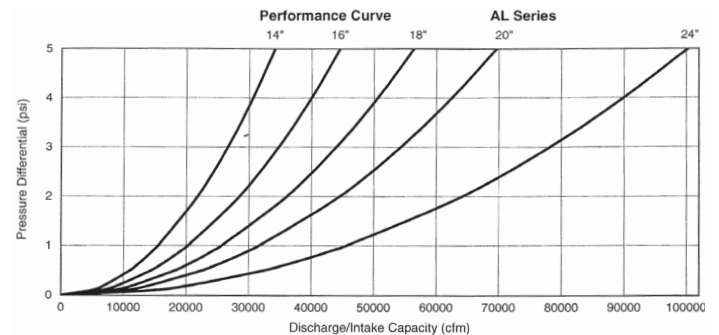
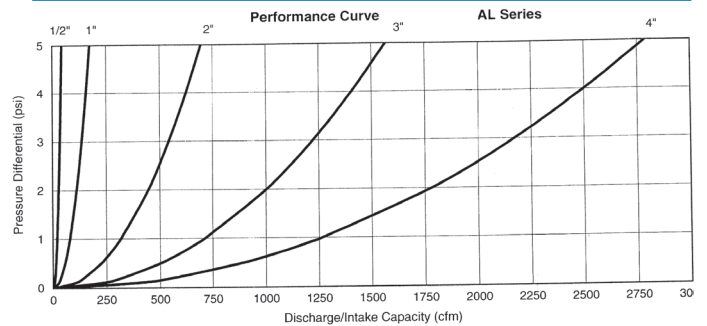
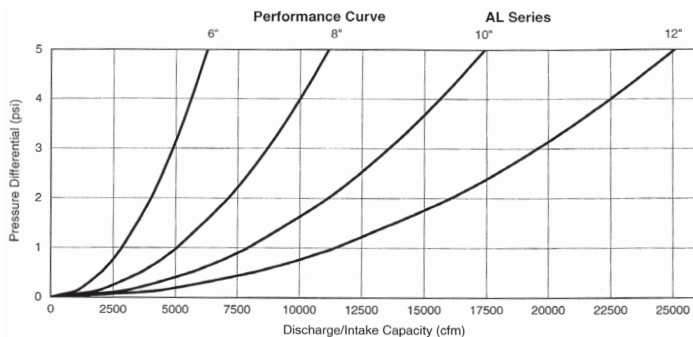
$$Q = \frac{C}{21.27} \sqrt{SD^5}$$

Q = Water flow in cu. ft. per minute
(flow of water due to gravity = air flow thru valve)
C = Chezy's coefficient (110 most commonly used)
S = Slope of pipe (% expressed as decimal)
D = Diameter of the pipe in inches

COLLAPSING PRESSURE OF PIPE FORMULA

$$P = 16,250,000 \left(\frac{T}{D} \right)^3$$

P = Collapse Pressure (psi)
T = Pipe Wall Thickness in inches
D = Diameter of the pipe in inches



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AL Series Air & Vacuum Valve, Sizes 1/2"-24" Dimensional Data

AL Series Dimensional Data													
MODEL	INLET	OUTLET	TRIM	HT (B)	WD (A)	WT (LBS)	MODEL	INLET	OUTLET	TRIM	HT (B)	WD (A)	WT (LBS)
A5	1/2" NPT	1/2" NPT	IBBT	4 9/11"	4 3/4"	8	AL101	10" 125# flg	10" NPT	S/S	21 26/33"	23"	500
*AL10	1" NPT	1" NPT	S/S	6 1/4"	6 1/4"	16	AL102	10" 250# flg	10" NPT	S/S	22 1/2"	23"	550
AL20	2" NPT	2" NPT	S/S	9 3/4"	8 3/4"	44	***AL121	12" 125# flg	12" NPT	S/S	28 3/4"	27"	725
AL21	2" 125# flg	2" NPT	S/S	13 1/4"	8 3/4"	46	*AL122	12" 250# flg	12" HD	S/S	28 3/4"	27"	778
AL22	2" 250# flg	2" NPT	S/S	13 3/8"	8 3/4"	49	*AL141	14" 125# flg	14" HD	S/S	32 3/4"	30"	970
AL30	3" NPT	3" NPT	S/S	11 3/4"	11 1/2"	75	***AL142	14" 250# flg	14" HD	S/S	33 1/2"	30"	1157
AL31	3" 125# flg	3" NPT	S/S	15 3/4"	11 1/2"	89	***AL161	16" 125# flg	16" HD	S/S	34	32"	1093
AL32	3" 250# flg	3" NPT	S/S	16"	11 1/2"	95	***AL162	16" 250# flg	16" HD	S/S	34 3/4"	32"	1276
AL40	4" NPT	4" NPT	S/S	14 1/2"	14"	154	***AL181	18" 125# flg	18" HD	S/S	35"	44 1/2"	1725
AL41	4" 125# flg	4" NPT	S/S	17 1/4"	14"	170	***AL182	18" 250# flg	18" HD	S/S	35"	46 1/2"	1925
AL42	4" 250# flg	4" NPT	S/S	17 56/99"	14"	181	***AL201	20" 125# flg	20" HD	S/S	55"	43"	2150
AL61	6" 125# flg	6" NPT	S/S	15 38/99"	15"	174	***AL202	20" 250# flg	20" HD	S/S	55 1/2"	43"	2200
AL62	6" 250# flg	6" NPT	S/S	16"	15"	197	***AL241	24" 125# flg	24" HD	S/S	64 1/3"	53"	5103
AL81	8" 125# flg.	8" NPT	S/S	18 8/9"	17 3/4"	265	***AL242	24" 250# flg	24" HD	S/S	62 1/2"	53"	5364
AL82	8" 250# flg	8" NPT	S/S	19 1/4"	17 3/4"	295							

* Protectop not available

** Includes ANSI Cl. 125 or 250 companion FLG & NPL

***HD=Hooded. For sizes 12" and larger, flanged outlet are available upon request.

Certified dimensions are available upon request.

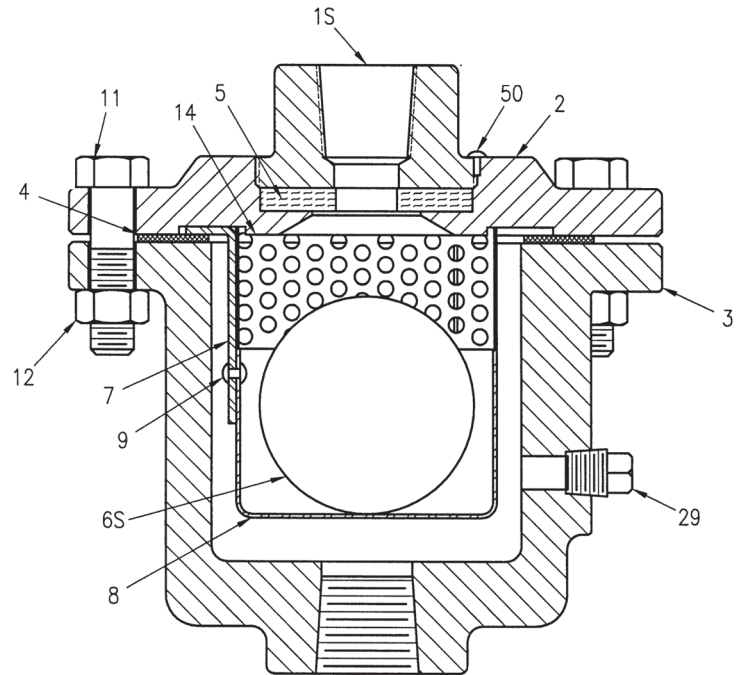


Crispin's A and AL Series Air & Vacuum Valves are available in pressure ratings of 2-40psi, 20-150psi or 151-300psi

Materials and prices are subject to change without notice. Metric and special class flange ratings are available.

A5: 1/2" A Series Air & Vacuum Valve, AWWA C512

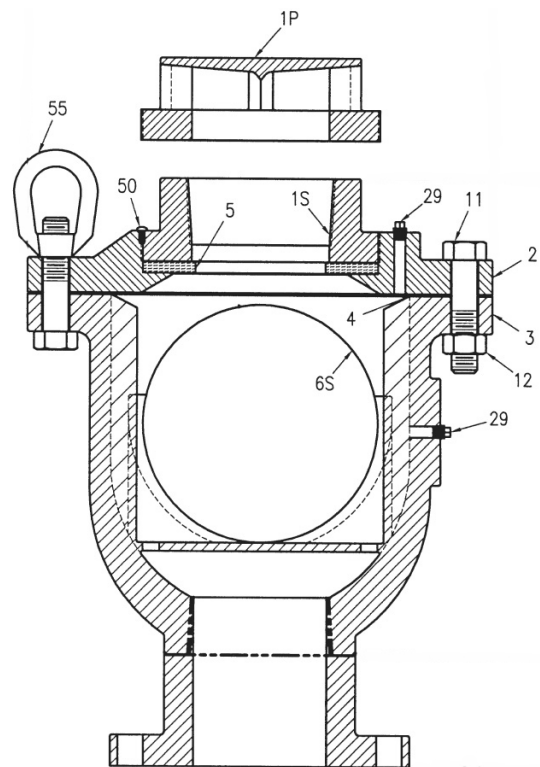
Parts List		
ITEM	DESCRIPTION	MATERIAL
1S	TOP	Cast Iron (A126 Cl. B)
2	FLANGE	Cast Iron (A126 Cl. B)
3	BODY	Cast Iron (A126 Cl. B)
4	GASKET	Armstrong N-8092
5***	SEAT	Buna-N Rubber (D2000)
6S	FLOAT	Stainless Steel (A240)
7	HANGER	Stainless Steel (A240)
8	CUP	Stainless Steel (A240)
9	RIVET	Stainless Steel (A582)
11	BOLT	Steel (A307)
12	NUT	Steel (A563)
14	DIFFUSER	Stainless Steel (A240)
29	PLUG	Brass (B505)
50	INTERFERENCE PIN	Stainless Steel (A582)



The A Series is available with a **Bronze, Brass, Stainless Steel or Alloy Body**

1"-4" Air & Vacuum Valves, AWWA C512

Parts List		
ITEM	DESCRIPTION	MATERIAL
1S*	TOP	Cast Iron (A126 CL B)
1P**	PROTECTOP	Cast Iron (A126 CL B)
2	FLANGE	Cast Iron (A126 CL B)
3F	BODY	Cast Iron (A126 CL B)
4	GASKET	Armstrong N-8092
5***	SEAT	Buna-N Rubber (D2000)
6S	FLOAT	Stainless Steel (A240)
11	BOLT	Steel (A307)
12	NUT	Steel (A563)
29	PLUG	Brass (B505)
50	INTERFERENCE PIN	Stainless Steel (A582)
55	EYE BOLT	Steel (A563)



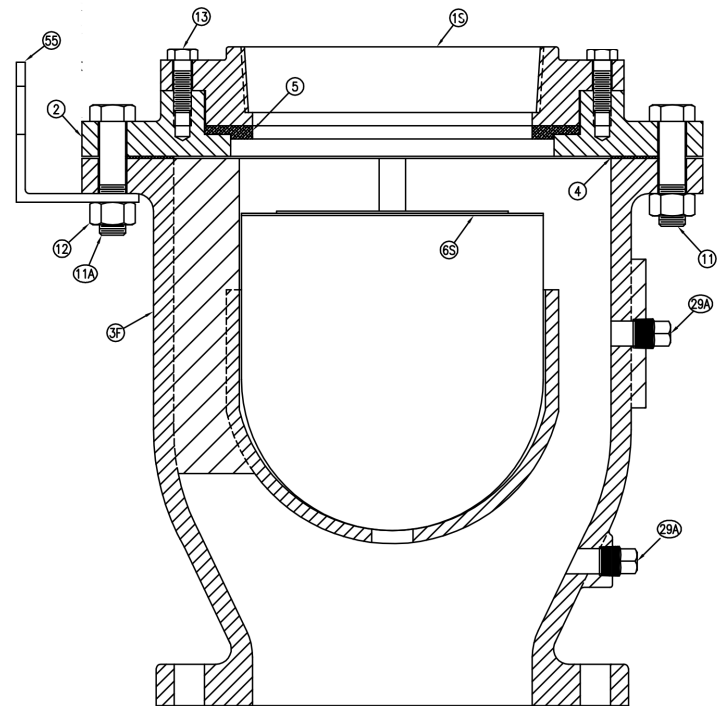
- * Parts are interchangeable and optional at customer's request.
- ** Includes ANSI Cl. 125 or 250 companion Flg. and NPL
- *** Durometer changes when operating pressure is below 20psig or above 150psig.

Materials and prices are subject to change without notice. Metric and special class flange ratings are available.

6"-10" Air & Vacuum Valves, AWWA C512

Parts List

ITEM	DESCRIPTION	MATERIAL
1S*	TOP	Cast Iron (A126 CL B)
2**	FLANGE	Cast Iron (A126 CL B)
3F	BODY	Cast Iron (A126 CL B)
4	GASKET	Armstrong N-8092
5***	SEAT	Buna-N Rubber (D2000)
6S	FLOAT	Stainless Steel (A240)
11	BOLT	Steel (A307)
11A	BOLT	Steel (A307)
12	NUT	Steel (A563)
13	BOLT	Steel (A307)
29A	PLUG	Brass (B505)
55	LIFTING LUG	Steel (A36)

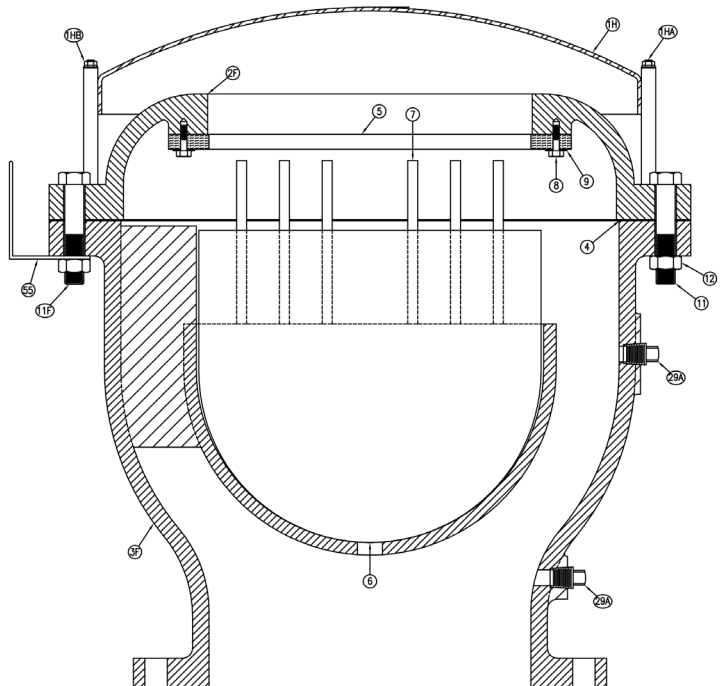


- * Parts are interchangeable and optional at customer's request.
- ** Includes ANSI Cl. 125 or 250 companion Flg. and NPL
- *** Durometer changes when operating pressure is below 20psig or above 150psig.

12"-24" Air & Vacuum Valves, AWWA C512

Parts List

ITEM	DESCRIPTION	MATERIAL
1H	HOOD ASSEMBLY	HRCQ Steel
1HA	HOOD STUD	Steel (A307)
1HB	HOOD NUT	Steel (A563)
2F	FLANGE	Cast Iron (A126 CL B)
3F	BODY	Cast Iron (A126 CL B)
4	GASKET	Armstrong N-8092
5***	SEAT	Buna-N Rubber (D2000)
6	FLOAT	Stainless Steel (A240)
7	FLOAT ROD GUIDE	Stainless Steel (A582)
8	SEAT BOLTS	Stainless Steel (A193)
9	WASHER	Stainless Steel (A240)
11	BOLT	Steel (A307)
11F	BOLT	Steel (A307)
12	NUT	Steel (A563)
29A	PLUG	Brass (B505)
55	LIFTING LUG	Steel (A36)



- ***Durometer changes when operating pressure is below 20psig or above 150psig.

Materials and prices are subject to change without notice. Metric and special class flange ratings are available.



CRISPIN AL SERIES SPECIFICATIONS BY SIZE

Air & Vacuum Valve(s) shall be installed at high points in the main line or as directed by the engineer to release the air in the main during filling, or allow it to enter the system when draining, or when the system is subject to negative pressure. The valve(s) shall operate by sealing the Buna-N rubber outlet seat with a peripheral float as the liquid enters the valve chamber to raise the float. All Crispin Valves are hydrostatically tested at 150% of their maximum working pressure.

1/2 SIZE ADDENDUMS AND OPTIONS

The valve(s) shall be constructed with a cast iron body, and top flange with stainless steel trim, and shall have a _____" NPT screwed inlet and outlet, or ANSI Class (125, 250) flanged inlet with NPT screwed outlet. The peripheral guided float shall be stainless steel.

Option: A vent cap shall be supplied to prevent debris from entering the outlet of the valve.

1"-4" SIZE ADDENDUMS AND OPTIONS

The valve(s) shall be constructed with a cast iron body, and top flange with stainless steel trim, and shall have a _____" NPT screwed inlet and outlet, or ANSI Class (125, 250) flanged inlet with NPT screwed outlet. The peripheral guided float shall be stainless steel.

Option: A protectop shall be supplied to prevent debris from entering the outlet of the valve.

6"-10" SIZE ADDENDUMS AND OPTIONS

The valve(s) shall be constructed with a cast iron body, and cover flange with stainless steel trim, and shall have a _____ ANSI Class (125, 250) flanged inlet. The peripheral guided float shall be stainless steel.

Option: A protectop shall be supplied to prevent debris from entering the outlet of the valve.

12"-24" SIZE ADDENDUMS AND OPTIONS

The valve(s) shall be constructed with a cast iron body, and cover flange with stainless steel trim, and shall have a _____ ANSI Class (125, 250) flanged inlet. The peripheral guided float shall be stainless steel.

Option: A hood shall be supplied to prevent debris from entering the outlet of the valve.

Standard operating pressure for Crispin A Series Valves is 20 to 150 PSIG. Please check one of the following if your operating needs differ: _____ 2 to 40 PSIG _____ 151 to 300 PSIG.

Option: [Where pressures are greater than 300 PSIG] the valves shall be ANSI Class _____ flanged inlet connection, and shall have a (steel, stainless steel or ductile iron) body, top and inlet flange.

The valve(s) shall be Crispin Model _____ as manufactured by Crispin-Multiplex Manufacturing Co., Berwick, PA.

Materials and prices are subject to change without notice. Metric and special class flange ratings are available.