



**FLOW SAFE**, INC.

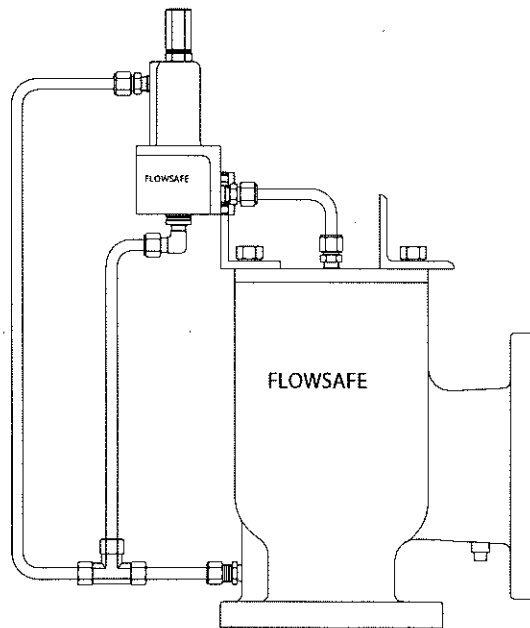
*"Environmental Performance for Industry"*

## **F70VP VACUUM RELIEF VALVE**

"Precision Vacuum Relief Control"

### **FEATURES**

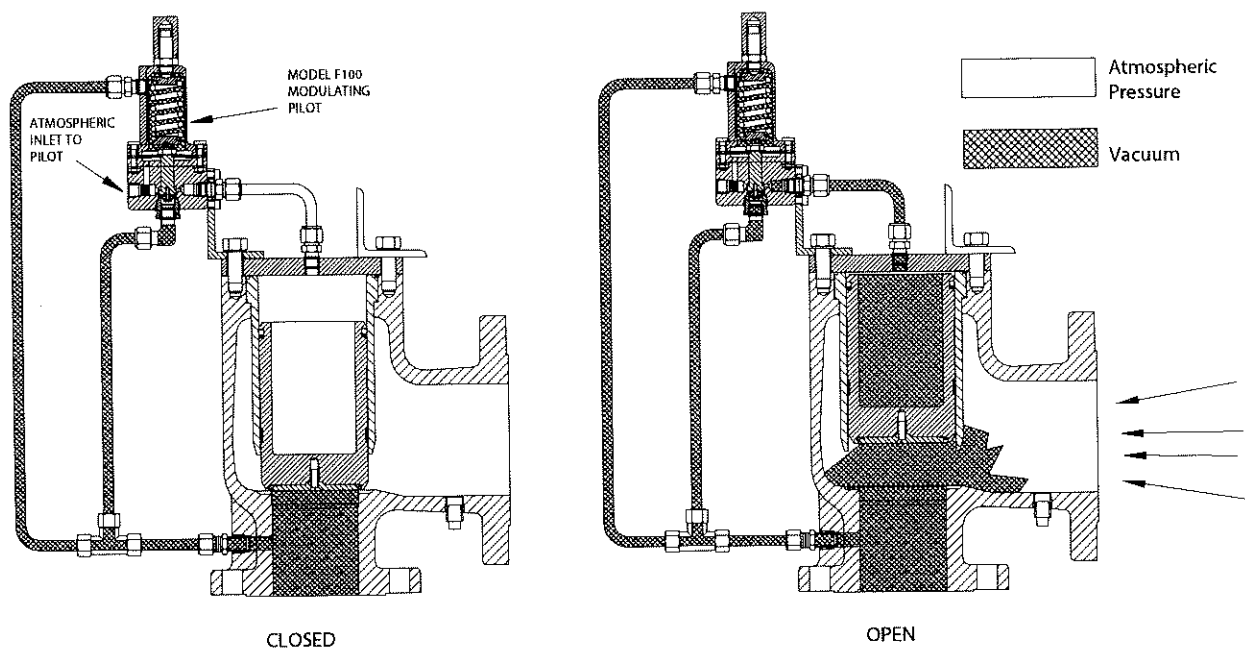
- Long service life – multiple cycling
- Rugged, efficient, low-profile design
- Superior flow capacities
- Repeatable seating – Soft seat design
- Vacuum pressure range to -14.7 psig
- -20 to 400°F temperature range
- Easy installation
- Inline maintenance, low cost of operation



*Need vacuum relief protection? Let the F70VP be the answer!*

# APPLICATION / OPERATION

# F70VP SERIES



Most of the time our work involves positive pressure relief applications. From time to time, we also are challenged with vacuum pressure relief applications. An example is the protection of low-pressure storage tanks that create a vacuum in the tank due to pumping liquid out of the tank. In most cases, it is not desirable to admit outside air into the storage tank because of the formation of ice or the hazard of air/hydrogen mixture. Today, most tank blanketing systems utilize regulators which provide a controlled supply of tank blanketing inert gas. Still, if a runaway situation exists and these regulator systems cannot maintain pace, a vacuum breaker device must be utilized. The F70VP vacuum pressure pilot-operated valve is ideal and is presented in detail as follows.

The operating principle is basically the same as that for the Flow Safe F70PR pilot-operated relief valve and applications for positive pressure relief. A seat force is established by loading the large dome area (area above the piston) of the main valve with a pressure equal to or greater than the inlet pressure under the seat. In the closed condition, atmospheric pressure is present in the dome area and vacuum is present at the inlet, causing a net downward force to close the seat. At set point, the pilot opens and discharges dome pressure. With a partial vacuum established in the dome, atmospheric pressure pushes the piston open and establishes air flow into the valve, relieving the system vacuum. When the pilot reseats, atmospheric pressure is reintroduced to the main valve dome, closing the valve.

Depending on the desired vacuum set point, the F70VP may be furnished without a pilot. In such applications, the main valve dome is connected to the inlet neck with a single length of stainless steel tubing. Operation is the same as described above, except that the set pressure is fixed and is a function of valve size and piston weight. Fixed set points vary from 0.2 psi vacuum (14.5 psia) to about 2.7 psi vacuum (12.0 psia). Contact the factory for specific fixed vacuum set pressure availability.

# FLOW CAPACITIES

# F70VP SERIES

SCFM @ 60°F (#/HR = 4.59 x SCFM)

Relief Pressure psi vacuum (neg. psig)	Nominal Size (Nozzle area)						
	1-1/2" x 2" (1.77 in <sup>2</sup> )	2" x 3" (3.33 in <sup>2</sup> )	3" x 4" (7.40 in <sup>2</sup> )	4" x 6" (11.43 in <sup>2</sup> )	6" x 8" (26.06 in <sup>2</sup> )	8" x 10" (45.66 in <sup>2</sup> )	12" x 16" (111.87 in <sup>2</sup> )
1	185	352	774	1195	2726	4776	11694
2	261	496	1092	1686	3845	6738	16498
3	319	606	1334	2061	4698	8232	20157
4	367	699	1537	2374	5412	9483	23220
5	411	782	1721	2658	6062	10621	26006
6	456	867	1907	2944	6713	11762	28800
7	498	946	2082	3214	7329	12842	31444
8	538	1022	2249	3473	7919	13875	33974
9	576	1096	2411	3723	8488	14872	36414
10	614	1167	2567	3965	9040	15839	38783
11	650	1237	2720	4201	9578	16783	41094
12	686	1305	2870	4432	10106	17707	43356
13	721	1372	3017	4660	10624	18615	45579
14	756	1437	3162	4883	11134	19509	47768
14.7	780	1483	3263	5038	11487	20127	49283

NOTE: Hg (Inches Mercury) x 13.57 = in.wc.  
PSI(pounds/in.<sup>2</sup>) x 2.771 = in.wc.



SUBCRITICAL FLOW



CRITICAL FLOW

## SPECIFICATIONS

Vacuum pressure range	0.2 to 14.7 psi vacuum * (ANSI Class 150)
Temperature range	-20 to 275 °F (400 °F with Viton)
Main valve body material **	Carbon steel (1-1/2 x 2: Aluminum)
Main valve internal part material **	Aluminum
Seat and liner seal material	Nitrile (Buna-N), Viton, or as requested
Piston seal material	Nitrile (Buna-N), Viton, or as requested
Piston wear ring material	Carbon / graphite-filled PTFE
Fitting material	Stainless steel
Fastener material	Carbon steel

\* Minimum vacuum varies by valve size

\*\* Other materials available upon request

# PART NUMBERS / ACCESSORIES F70VP SERIES

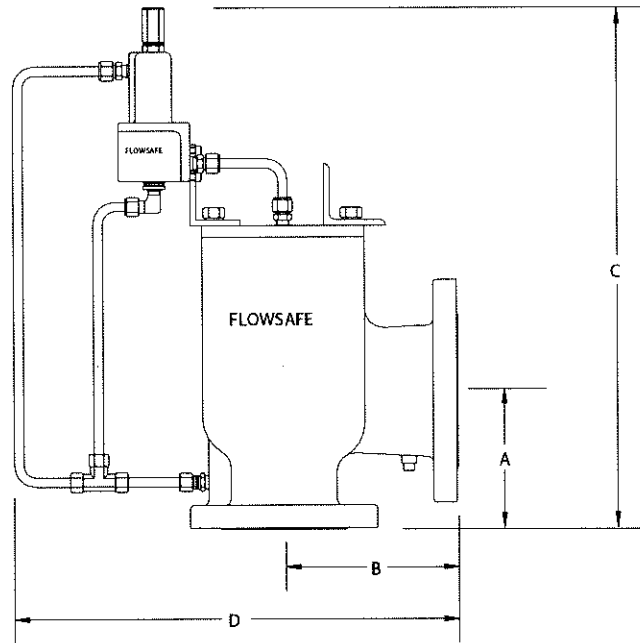
ITEM	PART NUMBER						
	1-1/2" x 2"	2" x 3"	3" x 4"	4" x 6"	6" x 8"	8" x 10"	12" x 16"
Valve ass'y	22-1003-05	22-1000-02	22-1001-02	22-1004-02	22-1005-02	22-1006-02	22-1008-02
Internals kit (piston/liner)	22-3003	22-3001	22-3002	22-3004	22-3005	22-3006	22-3008
Soft goods kit (Buna-N)*	12-2003-11	12-2001-11	12-2002-11	12-2004-11	12-2005-11	12-2006-11	12-2008-11
Backflow preventer	00-4501-03 (3/8" tube ends)						
Closed dome tee	00-6001 (1/2")						

\*Other elastomers available upon request

Various instrument / solenoid valves are also available

## DIMENSIONS & WEIGHTS

SIZE	WEIGHT (lbs)	CONNECTIONS		APPROX. DIMENSIONS (in.)			
		INLET	OUTLET	A	B	C	D
1-1/2 x 2	15	1-1/2" FNPT	2" FNPT	2.75	3.00	12.6	8
2 x 3	55	2" 150# RF	3" 150# RF	4.56	5.30	17.5	13
3 x 4	90	3" 150# RF	4" 150# RF	5.70	7.00	20.5	15
4 x 6	170	4" 150# RF	6" 150# RF	7.75	8.25	22.5	17
6 x 8	250	6" 150# RF	8" 150# RF	9.44	9.50	25.6	19
8 x 10	450	8" 150# RF	10" 150# RF	10.88	11.00	30.0	23
12 x 16	1100	12" 150# RF	16" 150# RF	11.92	15.62	37.0	30



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