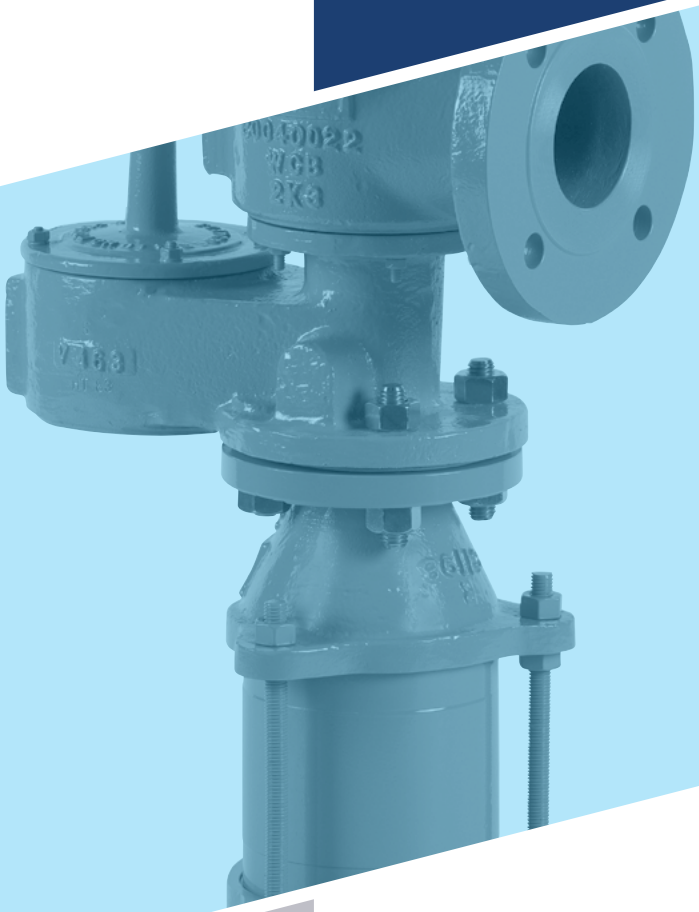
GROTH®
CORPORATION

PRESSURE/VACUUM VALVE & FLAME ARRESTER

MODEL 8820A



MODEL 8820A

The Groth Model 8820A Pressure/Vacuum Relief Valve & Flame Arrester are designed to protect your tank from damage created by overpressure or excessive vacuum, at the same time they provide protection from flame propagation. The result is reduced emission level and increased fire protection and safety.

Technical Details

- Sizes: 2" (DN 50) through 12" (DN 300)
- Pressure Settings 0.5oz/in2 to 15 psig
- Vacuum Settings: 0.5 oz/in2 to 12 psig
- Materials: Aluminum, Carbon Steel, Stainless Steel and other materials

Features

- Cushioned Air Seating
- Fluoropolymer seating diaphragms are standard to minimize sticking caused by resinous vapors and atmospheric moisture
- Self draining housing and drip rings
- Spiral-wound, crimped ribbon flame element
- Modular Construction

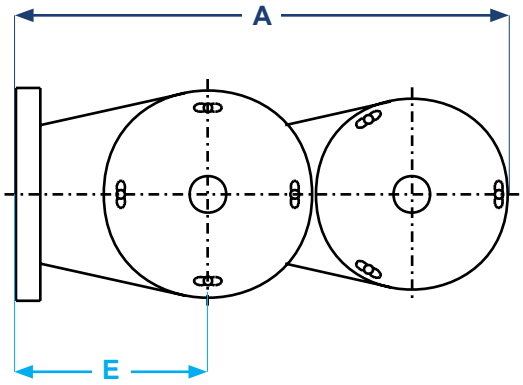
Options

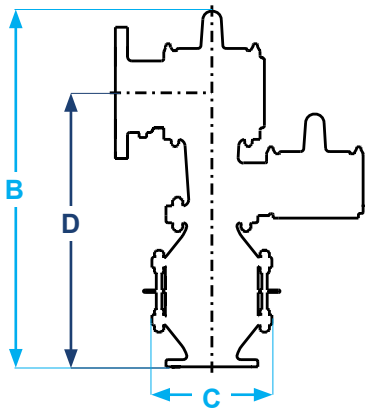
- Buna-N, Fluoropolymer, FKM

SPECIFICATIONS

Inlet Flg◊ In (mm)	Outlet Flg◊ In (mm)	Max. Set Pressure Weight Loaded oz/in² (gm/cm²)	Max. Set Vacuum Weight Loaded oz/in² (gm/cm²)	Max. Setting Spring Loaded	Min. Setting Weight Loaded	Max. W.P.† for Min. Vacuum Setting	Min. Vac. Setting for Max. W.P.†	A Length In (mm)	B Height In (mm)	C Width In (mm)	D In (mm)	E In (mm)	Approx. Ship Al Wt. Lbs (kg)
2 (50)	3 (76)	11 (48.2)	12 (52.7)	15 psig SPRING LOADED PRESSURE (1.05 kg/cm2) 12 psig SPRING LOADED VACUUM (0.84 kg/cm2)	*0.5 oz/in2 WEIGHT LOADED (2.20 gm/cm2)	See TPD2 for Vacuum Settings and MAWP		14.25 (361)	26.62 (676)	8.75 (221)	20.25 (514)	5.50 (140)	45 (20)
3 (80)	4 (102)	13 (57.0)	11 (48.3)					18 (457)	31.12 (790)	9.50 (241)	23.12 (588)	6 (152)	60 (27)
4 (100)	6 (152)	16 (70.3)	11 (48.3)					19.25 (489)	37 (940)	11.50 (292)	26.75 (679)	6.50 (165)	90 (41)
6 (150)	8 (203)	16 (70.3)	16 (70.3)					26.50 (673)	44.75 (1136)	16.50 (419)	31.50 (800)	8.50 (216)	160 (73)
8 (200)	10 (254)	16 (70.3)	16 (70.3)					32.50 (826)	53.50 (1358)	21 (533)	37.37 (949)	10.75 (273)	270 (123)
10 (250)	12 (305)	16 (70.3)	16 (70.3)					37.25 (959)	64.50 (1638)	24.75 (629)	45.25 (1149)	12.50 (318)	420 (190)
12 (300)	14 (356)	16 (70.3)	16 (70.3)					42.75 (1086)	71.62 (1819)	28.62 (727)	50.12 (1273)	15 (381)	600 (273)

† W.P. = Working Pressure. ‡On spring loaded valves, change model number. ◊150# R.F. drilling compatibility F.F. on aluminum and R.F. on carbon steel and stainless steel alloys. 16 oz/in2 set with spacer. SS set weights-consult factory. *Some sizes require non-ferrous components to achieve 0.5 oz/in2 setting.





PRESSURE RELIEF CAPACITY

Air Flow Capacity at 100% Overpressure (Double Set Pressure) 1000 Standard Cubic Feet per Hour at 60° F								
Set Pressure (P_s)		Size In (mm)						
InWC	oz/in^2	2 (50)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
0.87	0.50	2.92	5.68	10.3	20.7	32.3	51.5	59.1
1.00	0.58	3.19	6.34	11.5	23.3	36.2	57.6	67.8
1.73	1.00	4.45	9.23	16.8	34.4	53.0	84.4	105
2.00	1.16	4.84	10.1	18.5	37.8	58.2	92.6	116
2.60	1.50	5.64	11.9	21.7	44.6	68.5	109	138
3.00	1.73	6.12	13.0	23.7	48.8	74.8	119	151
3.46	2.00	6.65	14.1	25.9	53.2	81.6	130	165
4.00	2.31	7.21	15.4	28.2	58.0	88.9	141	180
6.00	3.47	9.07	19.5	35.7	73.6	113	179	230
8.00	4.62	10.7	23.0	42.1	86.8	133	211	272
10.0	5.78	12.1	26.1	47.7	98.6	151	240	309
12.0	6.93	13.3	28.9	52.9	109	167	266	343
15.0	8.66	15.1	32.7	60.0	124	189	301	389
20.0	11.6	17.7	38.4	70.4	146	222	354	457
25.0	14.4	20.0	43.5	79.7	165	252	400	518
30.0	17.3	22.2	48.1	88.2	182	278	443	574

Flow Capacity Calculation
Flow capacity values listed above are based on full open valves at 100% overpressure. Read the flow capacity at 100% overpressure directly from the table above. Use linear sted. If the allowable overpressure is less than 100%, modify the flow capacity using the appropriate "C" factor from the table. If allowable overpressure is more than 100%, consult your Groth Representative.

Calculate the percentage overpressure by the following formula. Note that all pressures are gauge pressure expressed in the same units of measure.

Pf = Flowing pressure
Ps = Set pressure
% OP = [(Pf - Ps)/Ps] x 100

Calculate flow capacity at less than 100% overpressure according to the following example.

"C" Factor Table										
%OP	0	1	2	3	4	5	6	7	8	9
10	••• Consult Factory•••									
20										
30										
40										
50	0.72	0.73	0.73	0.74	0.75	0.75	0.76	0.77	0.77	0.78
60	0.78	0.79	0.80	0.80	0.81	0.81	0.82	0.82	0.83	0.84
70	0.84	0.85	0.85	0.86	0.86	0.87	0.88	0.88	0.89	0.89
80	0.90	0.90	0.91	0.91	0.92	0.92	0.93	0.93	0.94	0.94
90	0.95	0.95	0.96	0.96	0.97	0.97	0.98	0.99	0.99	1.00

Example to find "C" factor from table:
Read "C" factor for 75% overpressure at intersection of row 70 and column 5

"C" factor at 75% OP = 0.87

Example Flow Capacity Calculation

6" Model 8820A	1.Read flow capacity at set pressure from table	Flow = 58,000 SCFH
4 InWC set pressure [P_s]	2.Calculate overpressure	% OP = [(7 - 4)/4] x 100 = 75%
7 InWC flowing pressure [P_f]	3.Read "C" factor from table	"C" = 0.87
	4.Calculate flow capacity	Flow = 0.87 x 58,000 = 50,460 SCFH

PRESSURE RELIEF CAPACITY

Air Flow Capacity at 100% Overpressure (Double Set Pressure) 1000 Normal Cubic Meters per Hour at 0° C							
Set Pressure (P_s)	Size In (mm)						
mmWC	2 (50)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
22.0	0.08	0.17	0.31	0.62	0.96	1.53	1.80
50.0	0.14	0.29	0.52	1.07	1.65	2.62	3.28
75.0	0.17	0.37	0.67	1.38	2.12	3.37	4.27
100	0.20	0.44	0.80	1.64	2.52	4.01	5.11
150	0.26	0.55	1.01	2.08	3.19	5.07	6.51
200	0.30	0.65	1.19	2.46	3.76	5.98	7.70
250	0.34	0.74	1.35	2.79	4.27	6.79	8.75
300	0.38	0.82	1.50	3.10	4.73	7.52	9.70
375	0.43	0.93	1.70	3.51	5.36	8.53	11.0
500	0.50	1.09	2.00	4.12	6.29	10.0	13.0
625	0.57	1.23	2.26	4.67	7.13	11.3	14.7
750	0.63	1.36	2.50	5.17	7.89	12.5	16.3

Flow Capacity Calculation
Flow capacity values listed above are based on full open valves at 100% overpressure. Read the flow capacity at 100% overpressure directly from the table above. Use linear interpolation if the set pressure is not listed. If the allowable overpressure is less than 100%, modify the flow capacity using the appropriate "C" factor from the table. If allowable overpressure is more than 100%, consult your Groth Representative.

Calculate the percentage overpressure by the following formula. Note that all pressures are gauge pressure expressed in the same units of measure.

Pf = Flowing pressure
Ps = Set pressure
% OP = [(Pf - Ps)/Ps] x 100

Calculate flow capacity at less than 100% overpressure according to the following example.

"C" Factor Table										
%OP	0	1	2	3	4	5	6	7	8	9
10 20 30 40	••• Consult Factory•••									
50	0.72	0.73	0.73	0.74	0.75	0.75	0.76	0.77	0.77	0.78
60	0.78	0.79	0.80	0.80	0.81	0.81	0.82	0.82	0.83	0.84
70	0.84	0.85	0.85	0.86	0.86	0.87	0.88	0.88	0.89	0.89
80	0.90	0.90	0.91	0.91	0.92	0.92	0.93	0.93	0.94	0.94
90	0.95	0.95	0.96	0.96	0.97	0.97	0.98	0.99	0.99	1.00

Example to find "C" factor from table:
Read "C" factor for 67% overpressure at intersection of row 60 and column 7

"C" factor at 75% OP = 0.82

Example Flow Capacity Calculation

6" Model 8820A	1.Read flow capacity at set pressure from table	Flow = 2,080 NCMH
150 mmWC Set Pressure [P_s]	2.Calculate overpressure	% OP = [(250 - 150)/150] x 100 = 67%
250 mmWC Flowing Pressure [P_f]	3.Read "C" factor from table	"C" = 0.82
	4.Calculate flow capacity	Flow = 0.82 x 2,080 = 1,706 NCMH

VACUUM RELIEF CAPACITY

Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum) 1000 Standard Cubic Feet per Hour at 60° F								
Set Vacuum (P_s)		Size In (mm)						
InWC	oz/in^2	2 (50)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
0.87	0.50	2.55	5.19	8.80	17.9	28.6	44.3	53.9
1.00	0.58	2.77	5.73	9.70	19.8	31.6	48.9	60.4
1.73	1.00	3.78	8.15	13.6	28.3	45.1	69.4	90.7
2.00	1.16	4.10	8.90	14.9	31.0	49.3	75.8	99.0
2.60	1.50	4.74	10.4	17.4	36.2	57.7	88.6	117
3.00	1.73	5.14	11.3	18.9	39.5	62.9	96.0	128
3.46	2.00	5.56	12.3	20.5	42.9	68.4	105	139
4.00	2.31	6.03	13.4	22.3	46.7	74.4	114	152
6.00	3.47	7.54	16.9	28.1	58.9	93.8	144	193
8.00	4.62	8.84	19.9	33.0	69.4	110	169	227
10.0	5.78	10.0	22.5	37.4	78.6	125	192	258
12.0	6.93	11.1	24.9	41.5	87.1	139	212	286
15.0	8.66	12.5	28.2	46.9	98.6	157	240	324
20.0	11.6	14.7	33.1	55.1	116	184	282	381
25.0	14.4	16.6	37.5	62.3	131	209	319	432
30.0	17.3	18.3	41.5	68.9	145	231	353	478

Flow Capacity Calculation

Flow capacity values listed above are based on full open valves at 100% over-vacuum. Read the flow capacity at 100% over-vacuum directly from the table above. Use linear interpolation if the set vacuum is not listed. If the allowable over-vacuum is less than 100%, modify the flow capacity using the appropriate "C" factor from the table. If allowable over-vacuum is more than 100%, consult your Groth Representative.

Calculate the percentage over-vacuum by the following formula. Note that all pressures are gauge pressure expressed in the same units of measure.

P_f = Flowing pressure
P_s = Set pressure
% OV = $[(P_f - P_s)/P_s] \times 100$

Calculate flow capacity at less than 100% over-vacuum according to the following example.

"C" Factor Table										
%OV	0	1	2	3	4	5	6	7	8	9
10	••• Consult Factory•••									
20										
30										
40										
50	0.72	0.73	0.73	0.74	0.75	0.75	0.76	0.77	0.77	0.78
60	0.78	0.79	0.80	0.80	0.81	0.81	0.82	0.82	0.83	0.84
70	0.84	0.85	0.85	0.86	0.86	0.87	0.88	0.88	0.89	0.89
80	0.90	0.90	0.91	0.91	0.92	0.92	0.93	0.93	0.94	0.94
90	0.95	0.95	0.96	0.96	0.97	0.97	0.98	0.99	0.99	1.00

Example to find "C" factor from table:

Read "C" factor for 75% Over-vacuum at intersection of row 70 and column 5

"C" factor at 75% OV = 0.87

Example Flow Capacity Calculation

6" Model 8820A	1.Read flow capacity at set vacuum from table	Flow = 46,700 SCFH
4 InWC Set Vacuum [P_s]	2.Calculate over-vacuum	% OV = [(7 - 4)/4] x 100 = 75%
7 InWC Flowing Vacuum [P_f]	3.Read "C" factor from table	"C" = 0.87
	4.Calculate flow capacity	Flow = 0.87 x 46,700 = 40,629 SCFH

VACUUM RELIEF CAPACITY

Air Flow Capacity at 100% Over-vacuum (Double Set Vacuum) 1000 Normal Cubic Meters per Hour at 0° C							
Set Vacuum (P_s)	Size In (mm)						
mmWC	2 (50)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
22.0	0.07	0.15	0.26	0.52	0.84	1.29	1.60
28.0	0.08	0.17	0.28	0.58	0.92	1.43	2.00
50.0	0.12	0.25	0.42	0.87	1.39	2.13	2.78
75.0	0.14	0.32	0.53	1.11	1.77	2.72	3.59
100	0.17	0.38	0.63	1.32	2.09	3.21	4.27
150	0.21	0.48	0.79	1.66	2.64	4.05	5.42
200	0.25	0.56	0.93	1.95	3.11	4.76	6.40
250	0.28	0.63	1.05	2.21	3.53	5.40	7.27
300	0.31	0.70	1.17	2.45	3.90	5.97	8.06
375	0.35	0.80	1.32	2.78	4.42	6.77	9.10
500	0.41	0.93	1.55	3.26	5.19	7.94	10.7
625	0.47	1.06	1.76	3.69	5.87	8.98	12.2
750	0.52	1.17	1.94	4.08	6.50	9.90	13.5

Flow Capacity Calculation
Flow capacity values listed above are based on full open valves at 100% over-vacuum. Read the flow capacity at 100% over-vacuum directly from the table above. Use linear interpolation if the set vacuum is not listed. If the allowable over-vacuum is less than 100%, modify the flow capacity using the appropriate "C" factor from the table. If allowable over-vacuum is more than 100%, consult your Groth Representative.

Calculate the percentage over-vacuum by the following formula. Note that all pressures are gauge pressure expressed in the same units of measure.

P_f = Flowing pressure
P_s = Set pressure
% OV = $[(P_f - P_s)/P_s] \times 100$

Calculate flow capacity at less than 100% over-vacuum according to the following example.

"C" Factor Table										
%OV	0	1	2	3	4	5	6	7	8	9
10	••• Consult Factory•••									
20										
30										
40										
50	0.72	0.73	0.73	0.74	0.75	0.75	0.76	0.77	0.77	0.78
60	0.78	0.79	0.80	0.80	0.81	0.81	0.82	0.82	0.83	0.84
70	0.84	0.85	0.85	0.86	0.86	0.87	0.88	0.88	0.89	0.89
80	0.90	0.90	0.91	0.91	0.92	0.92	0.93	0.93	0.94	0.94
90	0.95	0.95	0.96	0.96	0.97	0.97	0.98	0.99	0.99	1.00

Example to find "C" factor from table:
Read "C" factor for 67% over-vacuum at intersection of row 60 and column 7

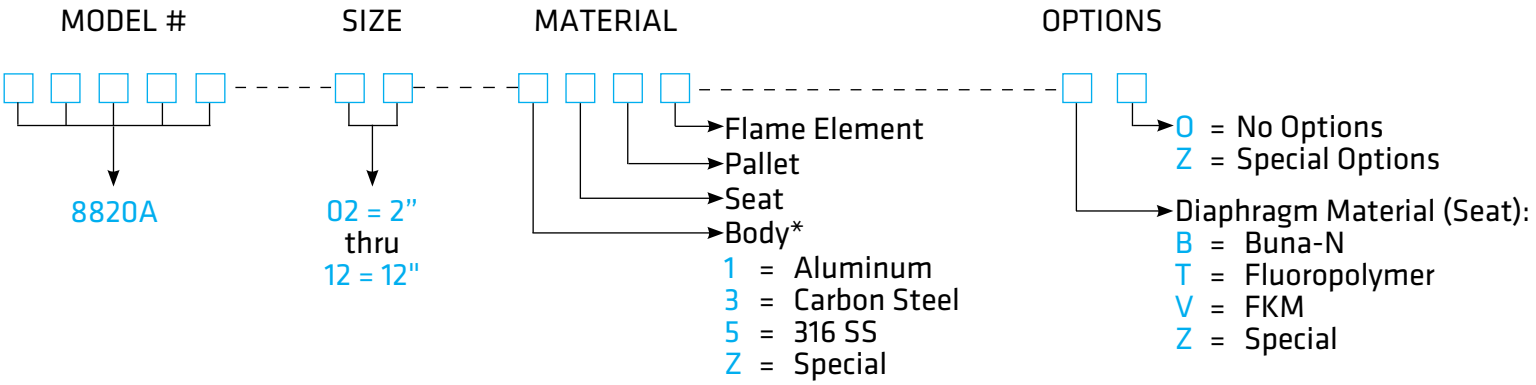
"C" factor at 67% OV = 0.82

Example Flow Capacity Calculation

6" Model 8820A	1.Read flow capacity at set vacuum from table	Flow = 1,660 NCMH
150 mmWC Set Vacuum [P_s]	2.Calculate over-vacuum	% OV = [(250 - 150)/150] x 100 = 67%
250 mmWC Flowing Vacuum [P_f]	3.Read "C" factor from table	"C" = 0.82
	4.Calculate flow capacity	Flow = 0.82 x 1,660 = 1,361 NCMH

HOW TO ORDER

For easy ordering, select proper model numbers



Notes

- Include model number and setting when ordering.
- For special options, consult factory.
- When ordering steam jacket, include steam pressure/temperature.

* Stainless steel guides, stems are standard with aluminum and carbon steel bodies. Stainless steel seats standard with carbon steel bodies.

Example

8	8	2	0	A	–	0	2	–	1	1	5	1	–	T	O

Indicates a 2" Model 8820A with Aluminum Body and Seat, 316 SS Pallet, Fluoropolymer Seat Diaphragm, and no other options.

GROTH® CORPORATION

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