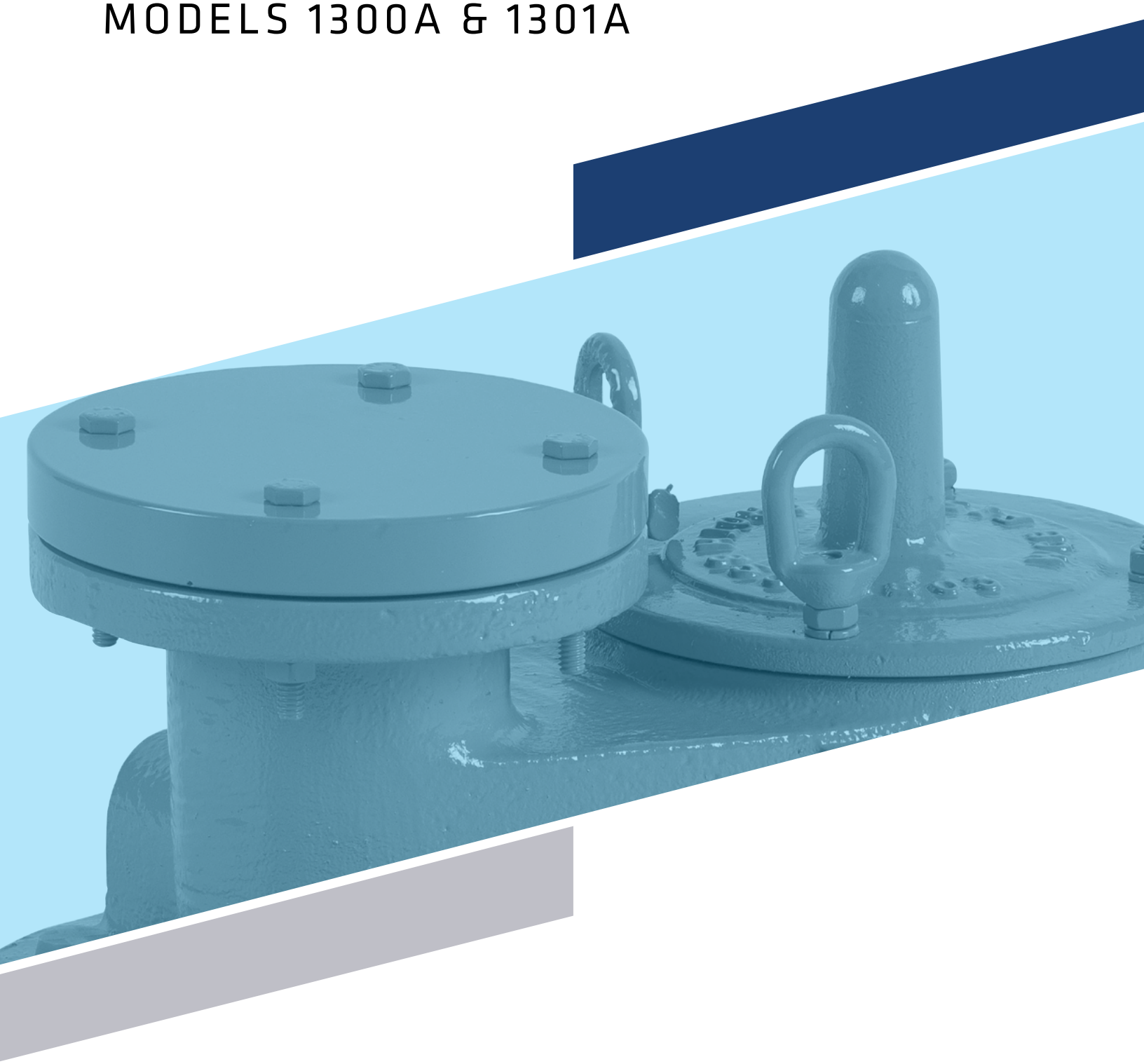
GROTH®
CORPORATION

VACUUM RELIEF VALVES

MODELS 1300A & 1301A



MODELS 1300A & 1301A

The Groth Models 1300A & 1301A are used when vacuum relief is the only requirement. Intake relief necessary under working conditions is achieved by a spring or weight loaded pallet. This feature reduces the possibility of tank damage due to an excessive vacuum condition. Valve size must be selected to perform required vacuum relief under operating and thermal conditions.

Technical Details

- Certification: ATEX and PED Approval
- Materials: Aluminum, Carbon Steel, Stainless Steel, special materials upon request

Model 1300A

- Sizes: 2" (DN50) through 12" (DN300)
- Vacuum Settings: 0.5 osi to 17.3 osi (2.15 mbarg to 1.19 barg)

Model 1301A

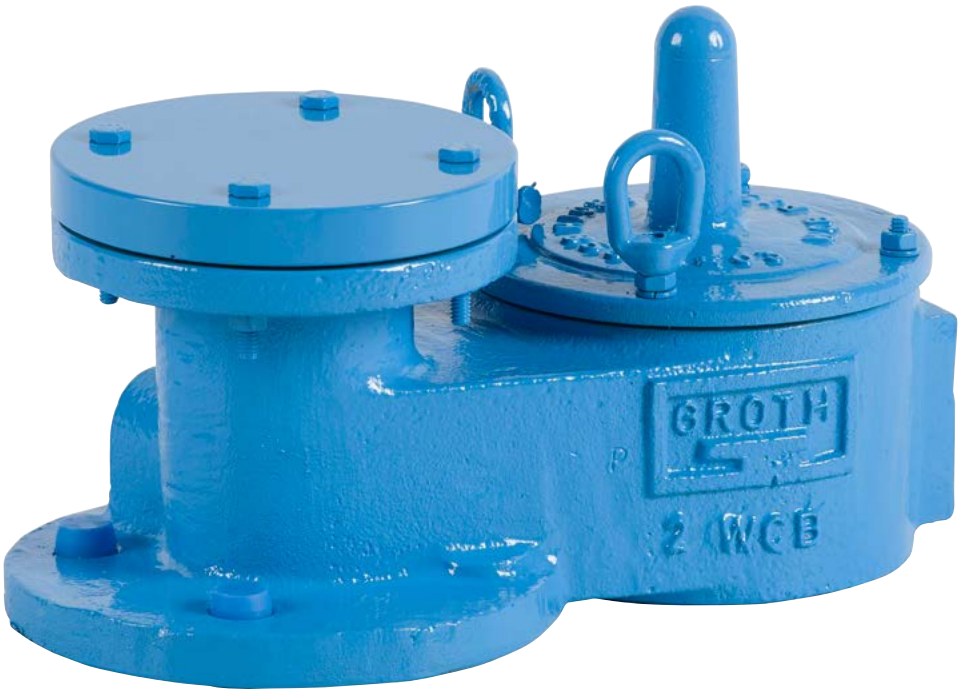
- Sizes: 2" (DN50) through 12" (DN300)
- Vacuum Settings: 1 psig to 12 psig (68.9 mbarg to 827 mbarg)
- Additional Materials: Fiberglass

Features

- Modular Construction
- Cushioned air seating
- Fluoropolymer seating diaphragms minimize sticking caused by resinous vapors and atmospheric moisture
- Self-draining housing body and drip rings to protect seating surfaces from condensate and freezing
- Design avoids vacuum buildup due to binding or clogging of the vent

Options

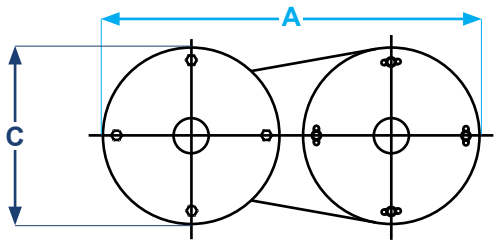
- Seating Diaphragm Options: FKM, Buna-N or other materials

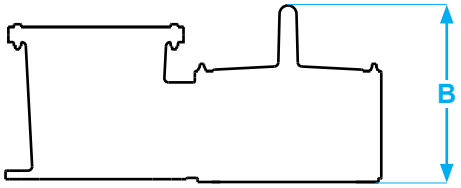


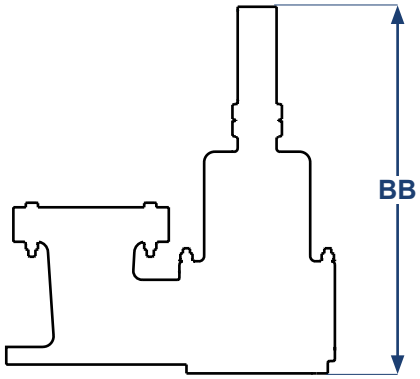
SPECIFICATIONS

Size◊ In (mm)	Max. Set Vacuum Weight Loaded oz/in² (gm/cm²)	Max. Set Vacuum Spring Loaded	Min. Set Vacuum Weight Loaded	Max. W.P.† for Min. Vacuum Setting	Min. Vac. Setting for Max. W.P.†	A Length In (mm)	B Height In (mm)	BB Height In (mm)	C Width In (mm)	Approx. Ship Wt. for Al Lbs (kg)
2 (50)	12 (52.7)	12 psig Spring Loaded Pressure (0.84 kg/cm²)	*0.5 oz/in² Weight Loaded (2.20 gm/cm²)	See TPD for Vacuum Settings and MAWP		11.62 (295)	6.87 (174)	14 (356)	6 (152)	15 (7)
3 (80)	11 (48.3)					15.75 (400)	7.75 (196)	16.25 (413)	7.75 (197)	21 (10)
4 (100)	11 (48.3)					17.25 (438)	9.62 (244)	19.87 (505)	9 (229)	32 (14)
6 (150)	16 (70.3)					23.50 (597)	11.87 (301)	27 (686)	12 (305)	61 (28)
8 (200)	16 (70.3)					28.50 (724)	15.50 (394)	31.87 (810)	14.50 (368)	81 (37)
10 (250)	16 (70.3)					33.25 (845)	18.62 (473)	37.87 (962)	16.50 (419)	121 (55)
12 (300)	16 (70.3)					37.25 (946)	21.62 (549)	42 (1067)	19 (483)	165 (75)

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







MODEL 1300A 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	4.70	10.3	16.0	34.7	60.5	91.1	129
1.00	0.58	5.05	11.0	17.2	37.3	65.0	97.9	138
1.73	1.00	6.63	14.5	22.6	49.0	85.3	129	182
2.00	1.16	7.12	15.6	24.2	52.6	91.6	138	195
2.60	1.50	8.10	17.7	27.6	59.8	104	157	222
3.00	1.73	8.70	19.0	29.6	64.2	112	169	238
3.46	2.00	9.33	20.4	31.8	68.9	120	181	256
4.00	2.31	10.0	21.9	34.1	74.0	129	194	274
6.00	3.47	12.2	26.7	41.5	90.1	157	237	334
8.00	4.62	14.0	30.6	47.7	103	180	272	384
10.0	5.78	15.6	34.0	53.0	115	200	302	427
12.0	6.93	17.0	37.1	57.8	125	218	329	465
15.0	8.66	18.8	41.1	64.0	139	242	365	516
20.0	11.6	21.4	46.8	72.9	158	276	415	587
25.0	14.4	23.6	51.5	80.3	174	304	457	646
30.0	17.3	25.4	55.6	86.6	188	327	493	697

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.

Pf = Flowing pressure
Ps = Set pressure
% OV = [(Pf - Ps)/Ps] x 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	0.42	0.43	0.44	0.45	0.46	0.46	0.47	0.48	0.49	0.50
20	0.51	0.52	0.52	0.53	0.54	0.55	0.56	0.56	0.57	0.58
30	0.59	0.59	0.60	0.61	0.61	0.62	0.63	0.64	0.64	0.65
40	0.66	0.66	0.67	0.68	0.68	0.69	0.70	0.70	0.71	0.72
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 1300A	1.Read flow capacity at set pressure from table	Flow = 74,000 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 74,000 = 64,380 SCFH

MODEL 1300A 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	mb	2 (50)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
22	2.16	0.13	0.29	0.45	0.98	1.71	2.58	3.65
50	4.90	0.20	0.44	0.68	1.48	2.58	3.88	5.48
75	7.35	0.24	0.53	0.83	1.81	3.15	4.74	6.70
100	9.80	0.28	0.62	0.96	2.08	3.62	5.46	7.72
125	12.3	0.31	0.69	1.07	2.32	4.04	6.09	8.60
150	14.7	0.34	0.75	1.17	2.53	4.41	6.65	9.40
175	17.2	0.37	0.81	1.26	2.73	4.75	7.16	10.1
200	19.6	0.39	0.86	1.34	2.91	5.07	7.64	10.8
225	22.1	0.42	0.91	1.42	3.08	5.36	8.08	11.4
250	24.5	0.44	0.96	1.49	3.23	5.64	8.49	12.0
275	27.0	0.46	1.00	1.56	3.38	5.90	8.88	12.6
300	29.4	0.48	1.04	1.62	3.52	6.14	9.25	13.1
375	36.8	0.53	1.16	1.80	3.91	6.81	10.3	14.5
500	49.0	0.60	1.32	2.05	4.45	7.75	11.7	16.5
625	61.3	0.66	1.45	2.26	4.90	8.54	12.9	18.2
750	73.5	0.72	1.57	2.44	5.29	9.22	13.9	19.6

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.

Pf = Flowing pressure
Ps = Set pressure
% OV = [(Pf - Ps)/Ps] x 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	0.42	0.43	0.44	0.45	0.46	0.46	0.47	0.48	0.49	0.50
20	0.51	0.52	0.52	0.53	0.54	0.55	0.56	0.56	0.57	0.58
30	0.59	0.59	0.60	0.61	0.61	0.62	0.63	0.64	0.64	0.65
40	0.66	0.66	0.67	0.68	0.68	0.69	0.70	0.70	0.71	0.72
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 1300A	1.Read flow capacity at set vacuum from table	Flow = 2,080 NCMH
100 mmWC Set Vacuum [P_s]	2.Calculate over-vacuum	% OV = [(175 - 100)/100] x 100 = 75%
175 mmWC Flowing Vacuum [P_f]	3.Read "C" factor from table	"C" = 0.87
	4.Calculate flow capacity	Flow = 0.87 x 2,080 = 1,810 NCMH

MODEL 1301A 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)						
psig	2 (50)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
1.00	13.8	30.5	52.9	120	197	302	422
1.10	14.5	31.9	55.4	126	206	316	442
1.20	15.1	33.2	57.7	131	215	330	460
1.30	15.7	34.5	59.9	136	223	342	478
1.40	16.2	35.7	62.0	141	231	355	495
1.50	16.8	36.9	64.0	145	239	366	511
1.75	18.0	39.6	68.7	156	256	393	548
2.00	19.1	42.0	73.0	166	272	417	582
2.25	20.1	44.3	76.9	174	286	439	613
2.50	21.0	46.3	80.4	183	300	460	641
2.75	21.9	48.2	83.7	190	312	478	667
3.00	22.7	49.9	86.6	197	323	495	691
3.25	23.4	51.4	89.3	203	333	511	713
3.50	24.0	52.8	91.8	208	342	525	732
>3.50	CONSULT FACTORY FOR VACUUM SETTINGS GREATER THAN 3.5 PSIG						

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 pressure 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.

Pf = Flowing pressure
Ps = Set pressure
% OV = [(Pf - Ps)/Ps] x 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	0.27	0.29	0.30	0.32	0.33	0.35	0.36	0.38	0.39	0.40
30	0.42	0.43	0.44	0.45	0.47	0.48	0.49	0.50	0.51	0.52
40	0.53	0.54	0.55	0.56	0.57	0.58	0.59	0.60	0.61	0.62
50	0.63	0.64	0.65	0.66	0.67	0.67	0.68	0.69	0.70	0.71
60	0.72	0.72	0.73	0.74	0.75	0.76	0.76	0.77	0.78	0.79
70	0.80	0.80	0.81	0.82	0.82	0.83	0.84	0.85	0.85	0.86
80	0.87	0.87	0.88	0.89	0.90	0.90	0.91	0.92	0.92	0.93
90	0.94	0.94	0.95	0.96	0.96	0.97	0.97	0.98	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 = 0.83

Example Flow Capacity Calculation

6" Model 1301A	1.Read flow capacity at set vacuum from table	Flow = 166,000 SCFH
2 psig Set Vacuum [P_s]	2.Calculate over-vacuum	% OV = [(3.50 - 2.0)/2.0] x 100 = 75%
3.5 psig Flowing Vacuum [P_f]	3.Read "C" factor from table	"C" = 0.83
	4.Calculate flow capacity	Flow = 0.83 x 166,000 = 137,780 SCFH

MODEL 1301A VACUUM RELIEF CAPACITY

Air Flow Capacity at 100% Over-Vacuum (Double Set Vacuum) 1000 Normal Cubic Meters per Hour at 0° F							
Set Vacuum (P_s)	Size In (mm)						
barg	2 (50)	3 (80)	4 (100)	6 (150)	8 (200)	10 (250)	12 (300)
0.07	0.41	0.90	1.55	3.52	5.77	8.87	12.4
0.10	0.48	1.06	1.83	4.16	6.83	10.5	14.6
0.11	0.51	1.11	1.92	4.35	7.14	11.0	15.3
0.12	0.53	1.15	1.99	4.53	7.43	11.4	15.9
0.13	0.55	1.20	2.07	4.69	7.70	11.8	16.5
0.14	0.56	1.24	2.14	4.85	7.96	12.2	17.1
0.15	0.58	1.27	2.20	5.00	8.21	12.6	17.6
0.16	0.60	1.31	2.27	5.14	8.44	13.0	18.1
0.17	0.61	1.35	2.33	5.28	8.66	13.3	18.6
0.18	0.63	1.38	2.38	5.41	8.88	13.6	19.0
0.19	0.64	1.41	2.44	5.53	9.08	13.9	19.4
0.20	0.66	1.44	2.49	5.65	9.27	14.2	19.8
0.22	0.68	1.49	2.58	5.86	9.62	14.8	20.6
0.24	0.70	1.54	2.67	6.05	9.93	15.2	21.3
>0.24	CONSULT FACTORY FOR VACUUM SETTINGS GREATER THAN 0.24 BARG						

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 pressure 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.

Pf = Flowing pressure
Ps = Set pressure
% OV = [(Pf - Ps)/Ps] x 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	0.27	0.29	0.30	0.32	0.33	0.35	0.36	0.38	0.39	0.40
30	0.42	0.43	0.44	0.45	0.47	0.48	0.49	0.50	0.51	0.52
40	0.53	0.54	0.55	0.56	0.57	0.58	0.59	0.60	0.61	0.62
50	0.63	0.64	0.65	0.66	0.67	0.67	0.68	0.69	0.70	0.71
60	0.72	0.72	0.73	0.74	0.75	0.76	0.76	0.77	0.78	0.79
70	0.80	0.80	0.81	0.82	0.82	0.83	0.84	0.85	0.85	0.86
80	0.87	0.87	0.88	0.89	0.90	0.90	0.91	0.92	0.92	0.93
90	0.94	0.94	0.95	0.96	0.96	0.97	0.97	0.98	0.99	1.00

Example to find "C" factor from table:
Read "C" factor for 72% over-vacuum at intersection of row 40 and column 2

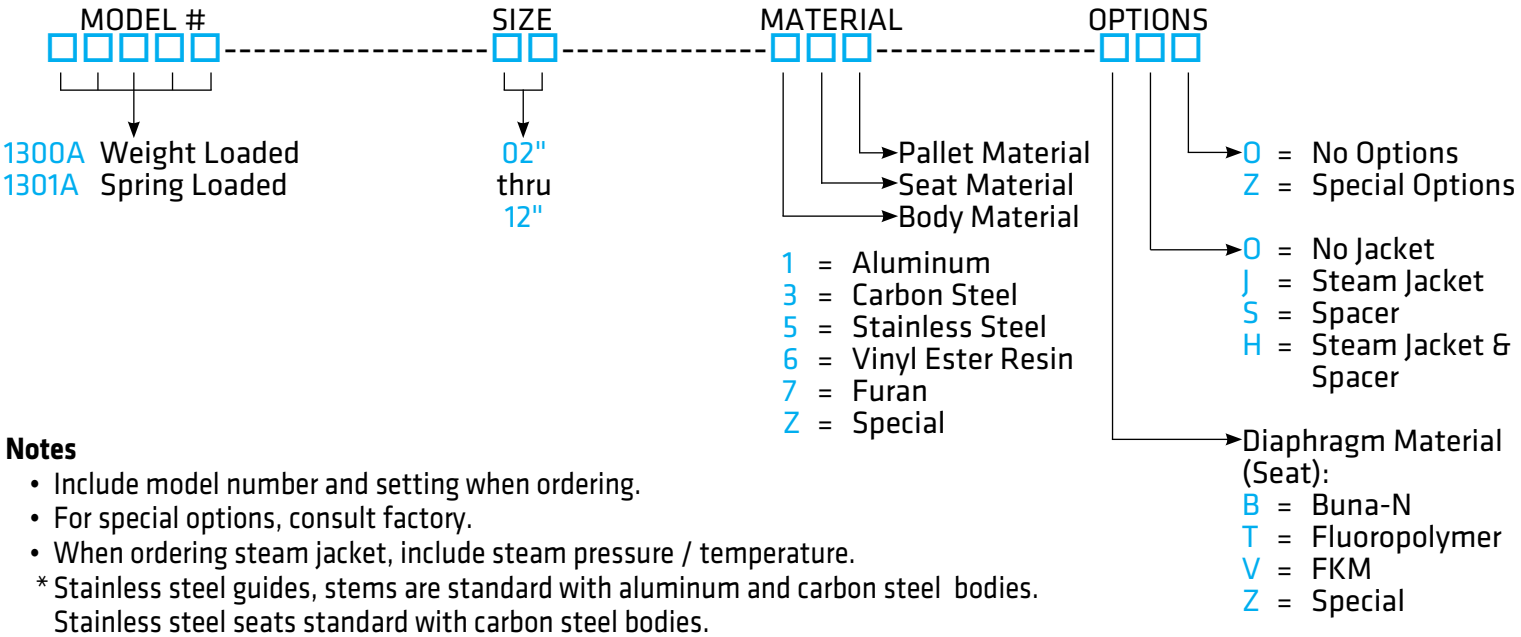
"C" factor at 42% OV = 0.55

Example Flow Capacity Calculation

6" Model 1301A	1.Read flow capacity at set vacuum from table	Flow = 4,530 NCMH
0.12 barg Set Vacuum [P_s]	2.Calculate over-vacuum	% OV = [(0.17 - 0.12)/0.12] x 100 = 42%
0.17 barg Flowing Vacuum [P_f]	3.Read "C" factor from table	"C" = 0.55
	4.Calculate flow capacity	Flow = 0.55 x 4,530 = 2,492 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

1	3	0	0	A	–	0	2	–	1	1	5	–	T	0	0

Indicates a 2" Model 1300A with Aluminum Body and Seat, Stainless Steel Pallet, Fluoropolymer Seat Diaphragm, and no other options.

GROTH CORPORATION®

GROTHCORP.COM